



steel wire cable tray system cable capacities

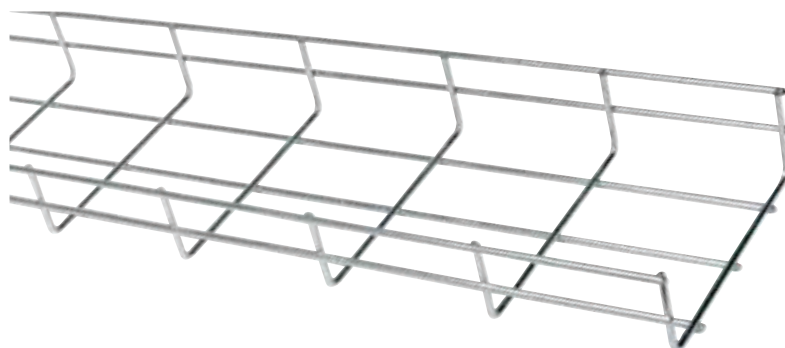
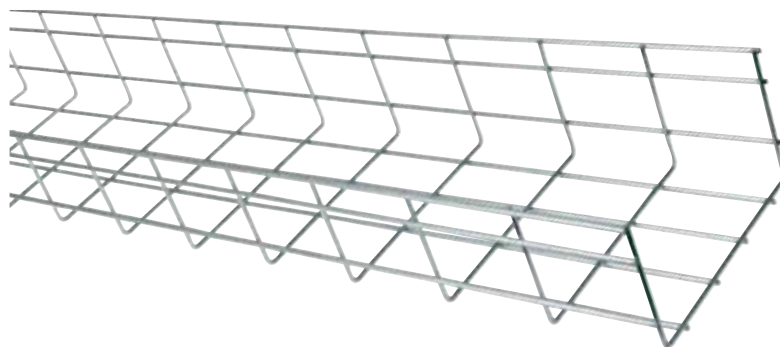
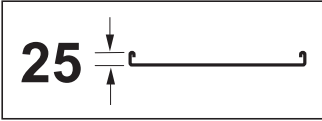


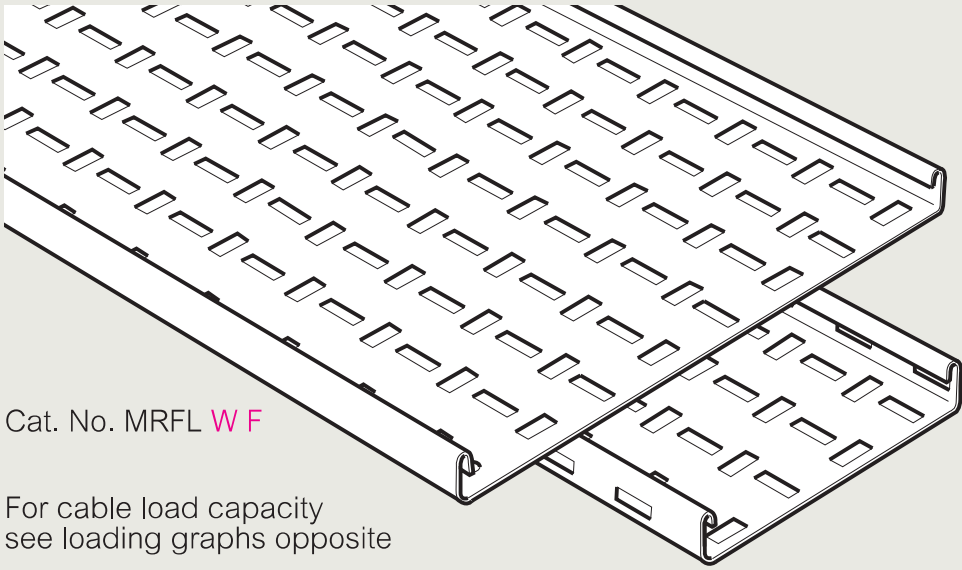
TABLE SHOWING APPROXIMATE CABLE CAPACITIES OF ALL STEEL WIRE CABLE TRAYS USING A 50% FILL RATIO

MC30			APPROX CABLE CAPACITY UNDER NEC 50% RULE		
CABLE TRAY	TOTAL FILL AREA (mm ²)	NEC 50% RULE: ALLOWABLE FILL AREA (mm ²)	CAT 5e 4-pr UTP (4.9mm diam)	CAT 6 4-pr UTP (6.5mm diam)	CAT 6a 4-pr UTP (8.9mm diam)
MC3050	1400	700	37	21	11
MC30100	2800	1400	74	42	23
MC30150	4200	2100	111	63	34
MC30200	5600	2800	148	84	45
MC30300	8400	4200	223	127	68
MC55			APPROX CABLE CAPACITY UNDER NEC 50% RULE		
CABLE TRAY	TOTAL FILL AREA (mm ²)	NEC 50% RULE: ALLOWABLE FILL AREA (mm ²)	CAT 5e 4-pr UTP (4.9mm diam)	CAT 6 4-pr UTP (6.5mm diam)	CAT 6a 4-pr UTP (8.9mm diam)
MC5550	2600	1300	69	39	21
MC555100	5200	2600	138	78	42
MC555150	7800	3900	207	118	63
MC555200	10400	5200	276	157	84
MC555300	15600	7800	414	235	125
MC555400	20800	10400	552	313	167
MC555450	23400	11700	620	353	188
MC555500	26000	13000	689	392	209
MC555600	31200	15599.95	827	470	251
MC106			APPROX CABLE CAPACITY UNDER NEC 50% RULE		
CABLE TRAY	TOTAL FILL AREA (mm ²)	NEC 50% RULE: ALLOWABLE FILL AREA (mm ²)	CAT 5e 4-pr UTP (4.9mm diam)	CAT 6 4-pr UTP (6.5mm diam)	CAT 6a 4-pr UTP (8.9mm diam)
MC106100	10303	5152	273	155	83
MC106150	15452	7726	410	233	124
MC106200	20600	10300	546	310	166
MC106300	30903	15452	819	466	248
MC106400	41200	20600	1092	621	331
MC106450	46348	23174	1229	698	373
MC106500	51503	25752	1366	776	414
MC106600	617800	30900	1639	931	497

Swifts® MRF medium duty return flange
straight lengths



■ Dimensions and weights

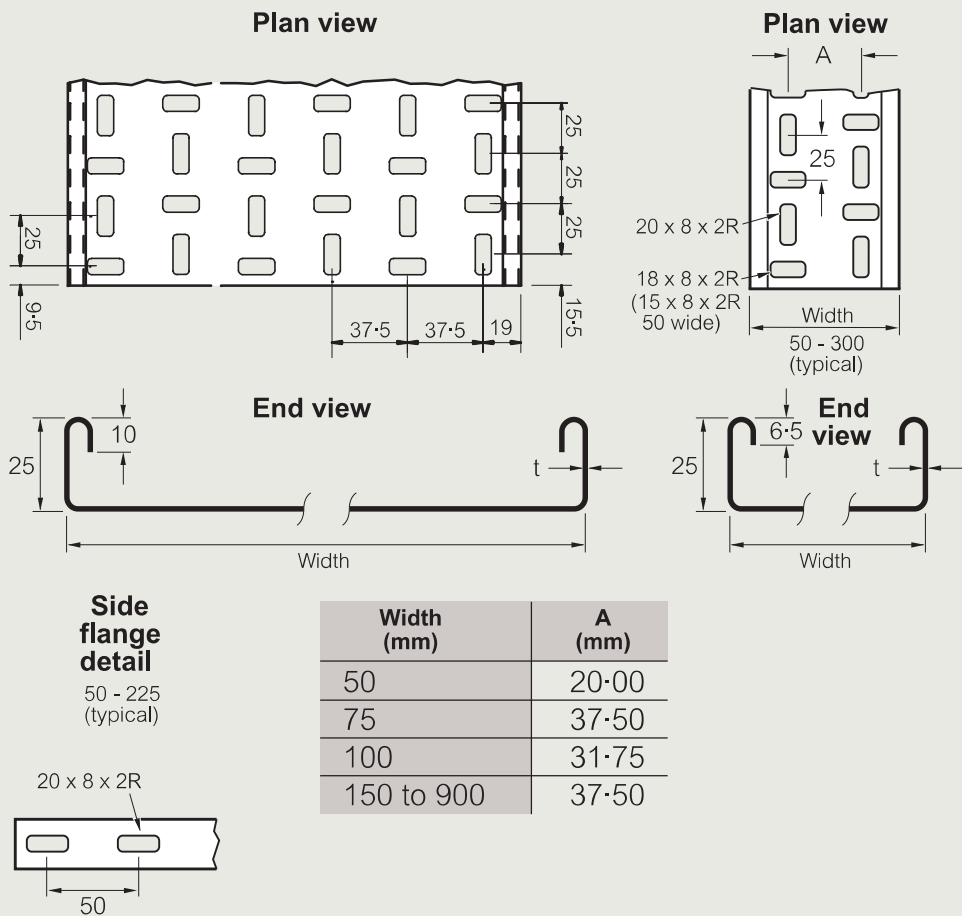


Cat. No. MRFL **WF**

For cable load capacity
see loading graphs opposite

Dimensions

Standard length 3 m



R = radius

Gauges and weights

The gauge 't' for each cable tray width and finish can vary by product and range

Non-standard gauges and finishes are available to special order, contact us on +44 (0) 845 605 4333

Cat. Nos.	Width (mm)	Weight (kg)	Gauge t (mm) G	PG
MRFL 50 F	50	2.0	0.7	0.7
MRFL 75 F	75	2.6	0.7	0.7
MRFL 100 F	100	3.0	0.8	0.7
MRFL 150 F	150	3.9	0.8	0.8
MRFL 225 F	225	6.8	1.0	0.8
MRFL 300 F	300	9.2	1.2	1.0
MRFL 450 F	450	16.5	1.2	1.2
MRFL 600 F	600	21.6	1.2	1.2
MRFL 750 F	750	33.7	1.5	1.4
MRFL 900 F	900	39.7	1.5	1.4

All weights given are in kilograms (kg) and are for a 3m straight length in hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.06
Stainless steel (S) x 0.94
Pre-galvanised (PG) x 0.96
Powder coated (E) x 0.97

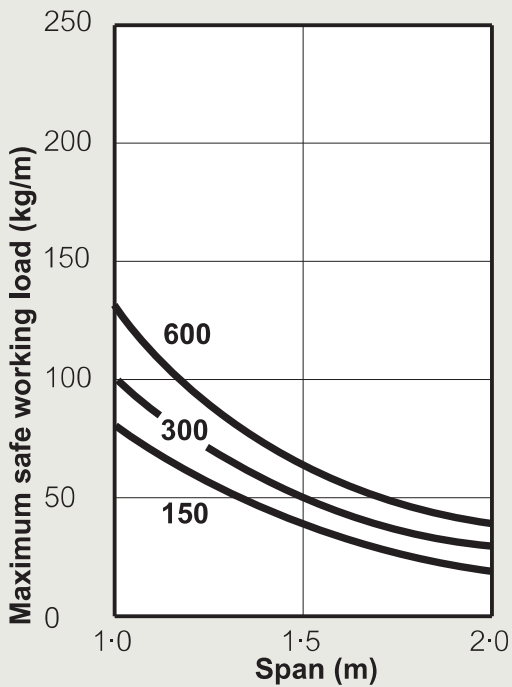
■ Loading graphs

Load tests carried out to BS EN 61537

The loads shown on all graphs are the safe recommended maximum loads that can be applied and must include wind, snow and any other external forces in addition to the cable load

The graphs show the maximum load for tray installed at a support spacing within its recommended range

When the graph line is above the intersection of the required load and span lines, the support equipment is suitable for use within those load and span conditions



For lengths 450 mm wide and greater, the addition of fishplate Cat. No. WF **F** across the underside of the length-to-length joint provides added strength and increases the safe working load, see p. 101

■ Finishes and standards

Standard stocked finish :

G Hot dip galvanised after manufacture to BS EN ISO 1461
PG Pre-galvanised steel to BS EN 10346 : 2009 grade DX51D

Additional finishes :

D Deep galvanised high silicon steel made from BS EN 10025-5 : 2004 Grade S355JOWP
S Stainless steel to BS EN 10088 – 2 grade 1.4404 (equivalent to 316L31)
E Powder coated (to customer's specification)

Note

50 mm wide not available in deep galvanised (D) finish

Sheared steel (particularly stainless steel) does have relatively sharp edges and protective gloves must be worn during handling

All dimensions (mm) are nominal

Key : Replace the letter shown in red with your choice from the following options :

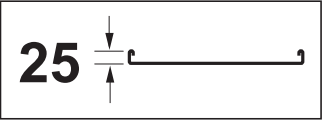
F = Finish : **G** (hot dip galvanised after manufacture), **D** (deep galvanised), **PG** (pre-galvanised steel), **S** (stainless steel), **E** (powder coated)

➔ Coupler sets : see p. 47-48

➔ Fishplates : see p. 101

Swifts® cable tray couplers and fasteners

MRF straight length to straight length couplers



Standard couplers

Couplers are required for joining together MRF straight lengths or cut lengths of tray without the need for further drilling

MRFC standard couplers are supplied in pairs

MRFC 50 standard coupler is supplied singly

Supplied without fasteners – use M6 nuts, bolts and washers (see opposite)

As an alternative coupling method, use quick bolt couplers (Cat. No. MRQBC^F), which are supplied with quick bolt fasteners (Cat. No. QBF) and a tool, see p. 48

Installation (typical)

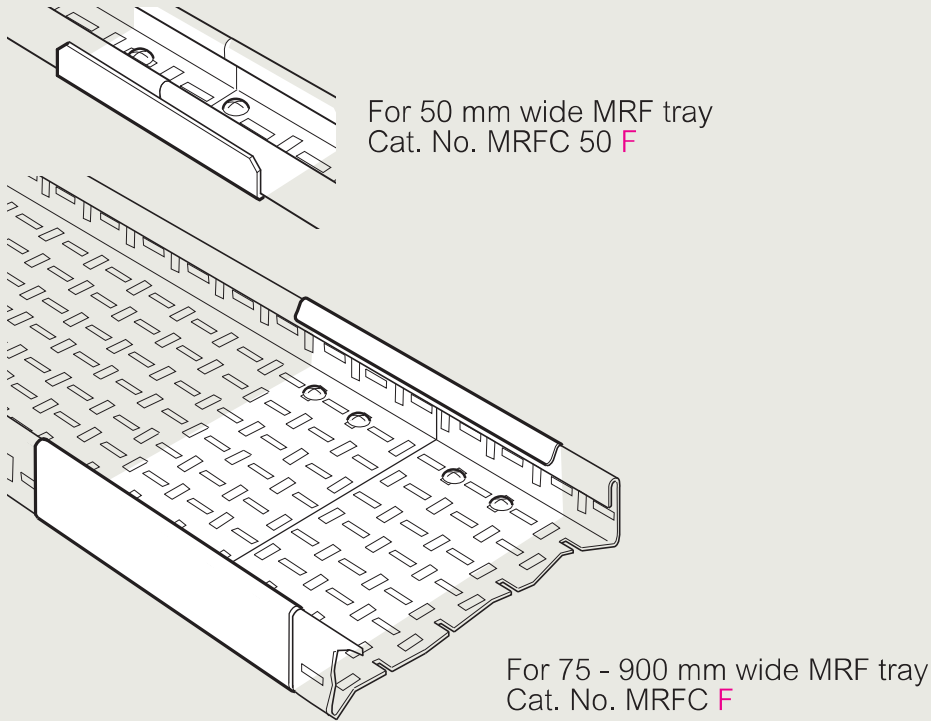


Illustration : SRF shown, MRF similar

Cat. Nos.	Tray range
MRFC ^F 50 ⁽¹⁾	MRF
MRFC ^F ⁽²⁾	MRF

(1) MRFC 50 for 50 mm wide tray only

(2) MRFC for 75-900 mm wide tray only

Assembly

For 50 mm wide MRF tray

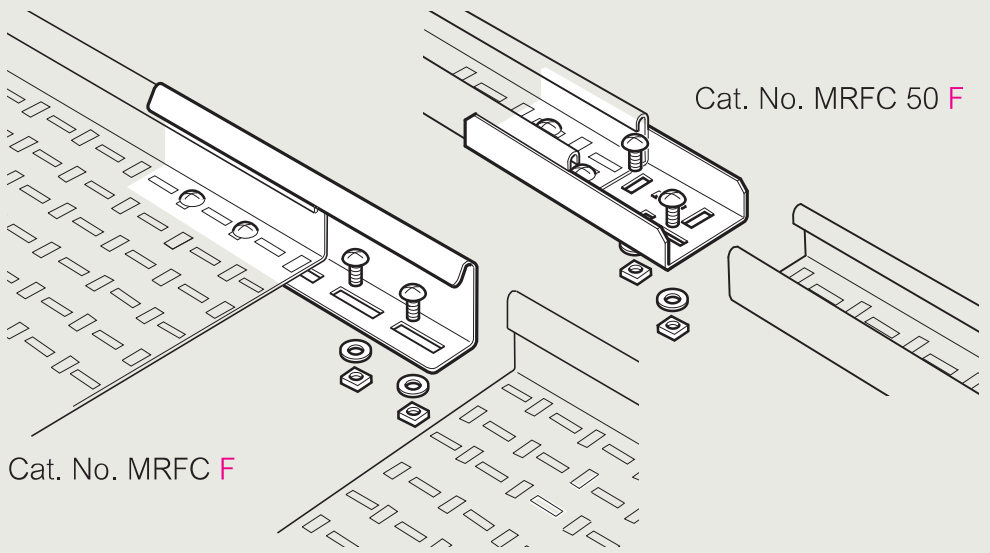
Bring together two lengths and locate the coupler across the underside of the tray joint as shown

Insert two roofing bolts through aligning slots in each tray bed and into the coupler (four bolts per coupler) and secure with roofing washers and nuts

For 75 - 900 mm wide MRF tray

Bring together two lengths and fit a coupler on the outside of adjacent flanges at both sides of the tray joint

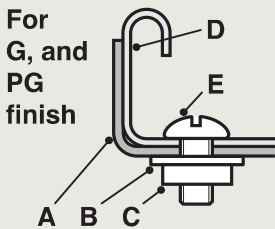
Locate the coupler as shown and insert two roofing bolts through aligning slots in each tray bed and coupler (four bolts per coupler), and secure with roofing washers and nuts



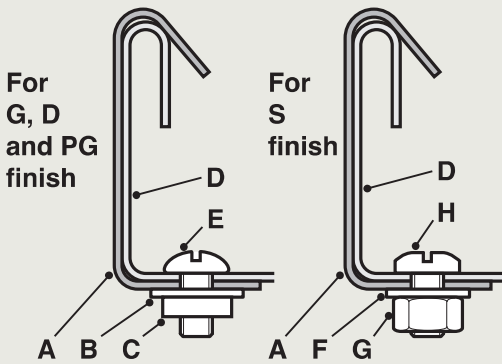
Assembly (continued)

Fasteners

Cat. No. MRFC 50 ^F



Cat. No. MRFC ^F



- A Coupler
- B Roofing washer
- C M6 square nut
- D Straight length
- E M6 x 12 roofing bolt
- F M6 form A washer
- G M6 hexagon nut
- H M6 x 12 pan head screw

Fastener finishes

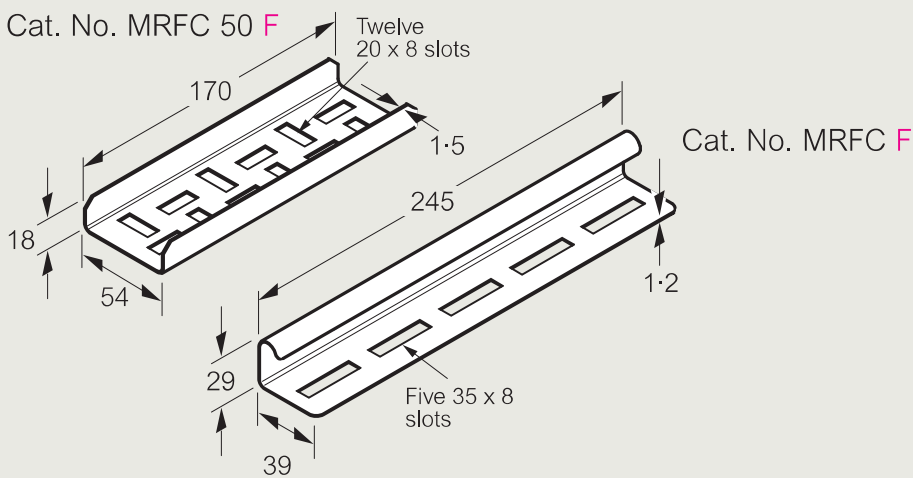
For lengths and fittings with G, D and PG finishes fasteners are galvanised or zinc plated. For trays and fittings with S finish, fasteners are corrosion resistant stainless Grade A470

For lengths and fittings with E finish the choice of material for fasteners will depend on the installation environment – contact us on +44 (0) 845 605 4333

Note

For quick bolt couplers and fasteners, see p. 48

Dimensions and weights



Cat. Nos.	Weight (kg)
MRFC 50 ^F	0.2 single
MRFC ^F	0.4 pair

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.06

Stainless steel (S) x 0.94

Pre-galvanised (PG) x 0.96

Powder coated (E) x 0.97

All dimensions (mm) are nominal

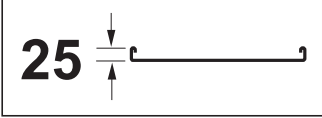
Key : Replace the letter shown in red with your choice from the following options :

^F = Finish : ^G (hot dip galvanised after manufacture), ^D (deep galvanised), ^{PG} (pre-galvanised steel), ^S (stainless steel), ^E (powder coated)

Swifts® cable tray couplers and fasteners

MRF straight length to straight length couplers (continued)

and straight length to fitting coupling



Quick bolt couplers

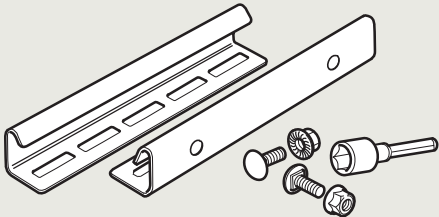
Quick bolt couplers are a stronger, faster, easier and safer method of joining together MRF straight lengths or cut lengths of tray without the need for further drilling

Square-shafted quick bolts lock firmly into position before fixing. The nuts, which have integral washers and a serrated edge to reduce slip and improve earthing, can then be easily tightened using a power tool

Supplied in packs containing 25 pairs of couplers, 100 quick bolt fasteners (Cat. No. QBF) and a FREE power tool attachment

For tray widths 300 mm and above use two additional quick bolt fixings (Cat. No. QBF) per coupler

Quick bolt couplers are not available for 50 mm wide MRF tray



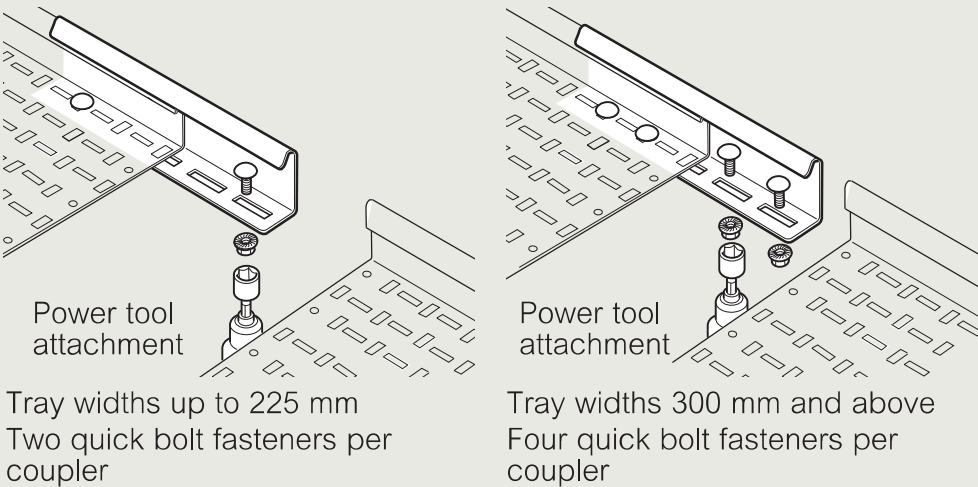
Installation

Typical installation as per standard couplers, replacing nuts, bolts and washers with quick bolt fasteners, Cat. No. QBF

Assembly

Bring together two lengths and fit a coupler on the outside of adjacent flanges at both sides of the tray joint

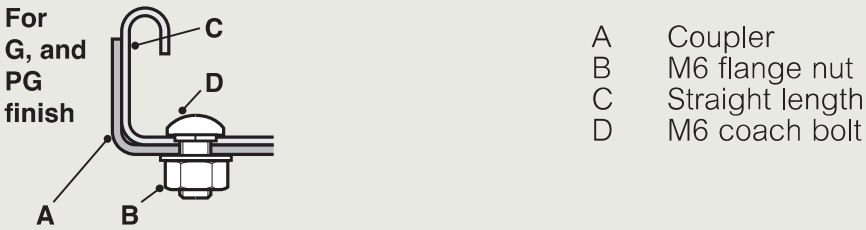
Locate the coupler and insert coach bolts through aligning slots in each tray bed and coupler as shown and secure with nuts



Quick bolt couplers		
Cat. Nos.	Tray range	Weight (kg)
MRQBC F	MRF	0-4 pair

Fasteners

Quick bolt fasteners		
High grade steel with Dacromet finish		
Cat. Nos.	Pack	Size (mm)
QBF	100	M6 x 12



Dimensions and weights

Dimensions

For coupler dimensions see p. 47

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

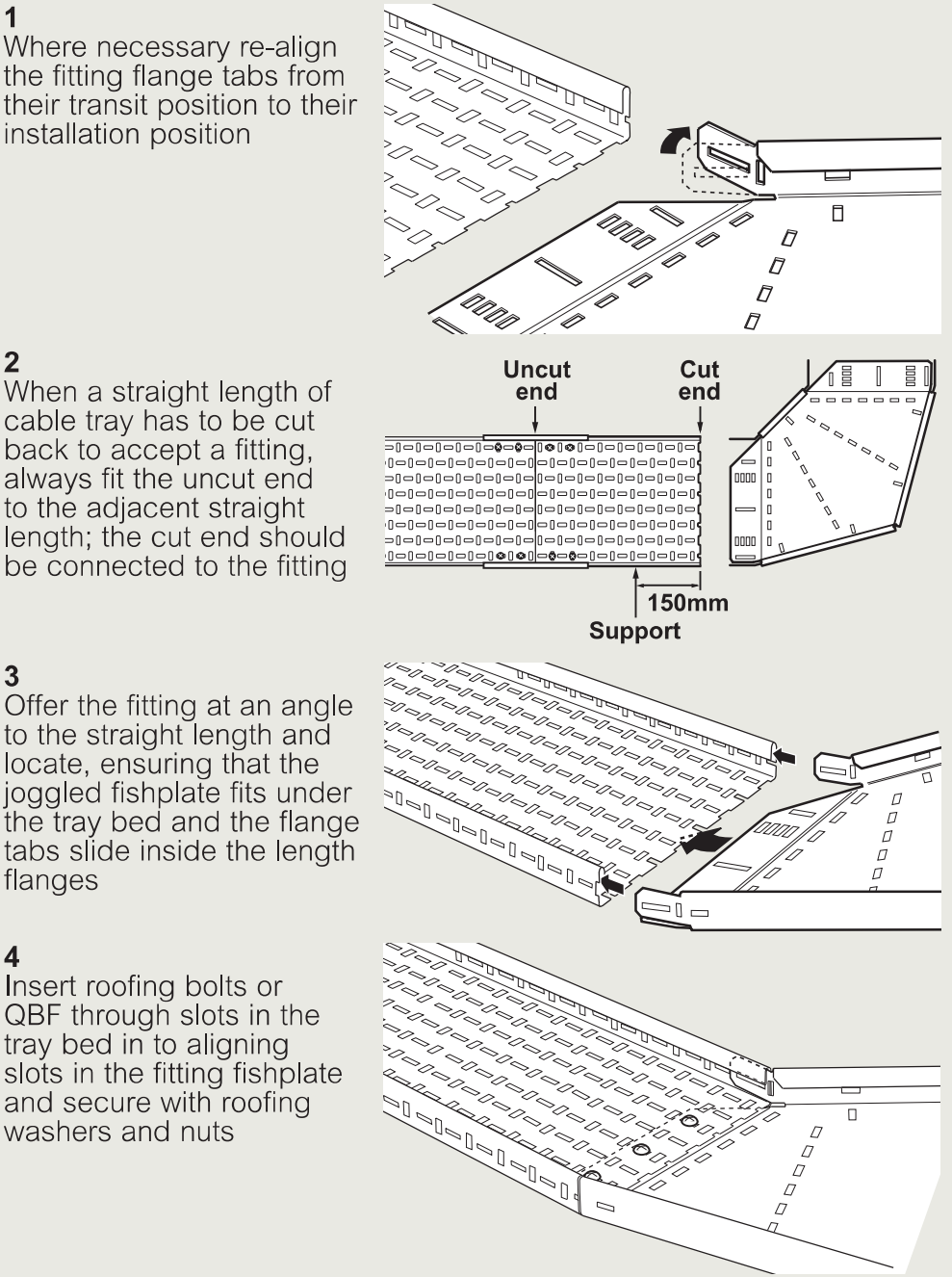
Pre-galvanised (PG) x 0.96

All dimensions (mm) are nominal

➔ Straight lengths : see p. 46

Straight length to fitting coupling

Cable tray fittings must be properly supported. The ideal location for supports is shown in step 2, i.e. 150 mm from the fitting to length joint. For further details see Design Notes, Recommended Support Locations, see p. 128



Note

Fasteners stated are for D, G and PG finishes

For lengths and fittings with S finish use fasteners listed below

Fasteners

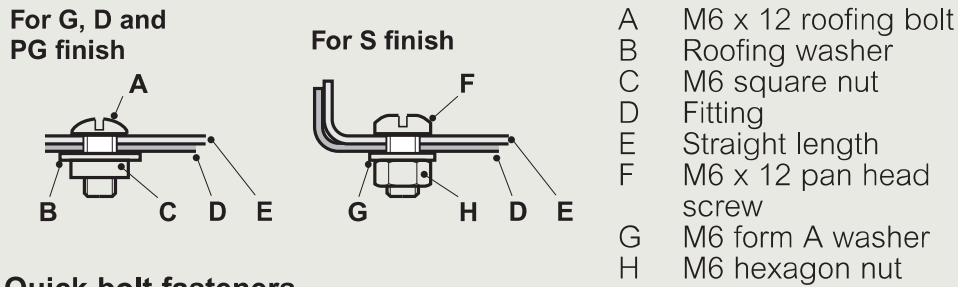
Minimum number of fasteners per joint (not included) :

Widths up to 225 = 2

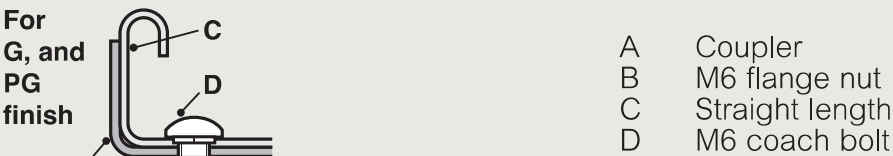
Widths 300 to 600 = 3

Widths 750 and 900 = 4

Roofing bolts



Quick bolt fasteners



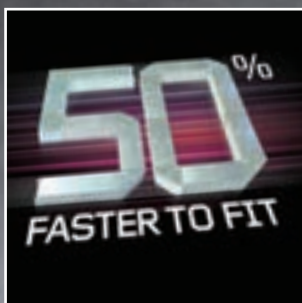
Fastener finish

For lengths and fittings with G, D and PG finishes, fasteners are galvanised or zinc plated. For trays and fittings with S finish, fasteners are corrosion resistant stainless Grade A470

For lengths and fittings with E finish, the choice of material for fasteners will depend on the installation environment - contact us on +44 (0) 845 605 4333

Salamandre®

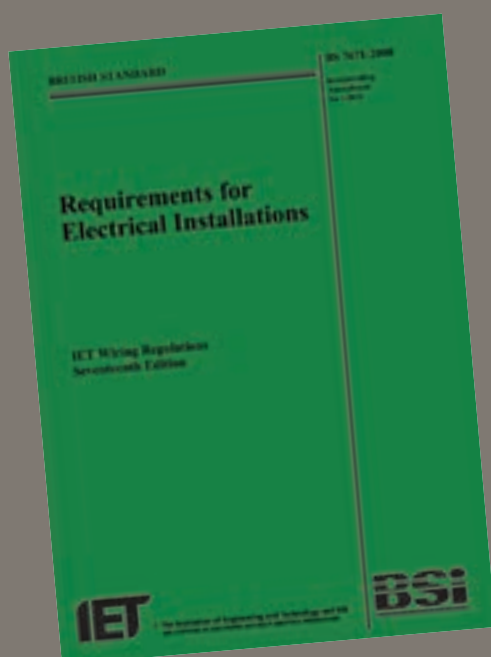
standard and IP4X
distribution trunking



PRODUCT TECHNICAL GUIDE /
INCLUDING LIGHTING TRUNKING

Salamandre® ...

the complete answer to the latest regulations



Legrand has invested heavily in Salamandre distribution trunking to ensure that it provides everything you would expect from the market leader. The latest innovations have been made to keep you up to speed with the amendments to the Wiring Regulations...

Changes to the Wiring Regulations

BS 7671 : 2008 - Amendment No. 1: 2011 came into force on January 1st 2012. This amendment to the 17th Edition of the Wiring Regulations includes specific instructions relating to the requirement for IP conformity of all trunking systems using non-sheathed cables.

Section 521.10.1 of the regulations now includes the following paragraph:

“Non-sheathed cables are permitted if the cable trunking system provides at least the degree of protection IPXXD or IP4X, and if the cover can only be removed by means of a tool or deliberate action.”*

The index of protection

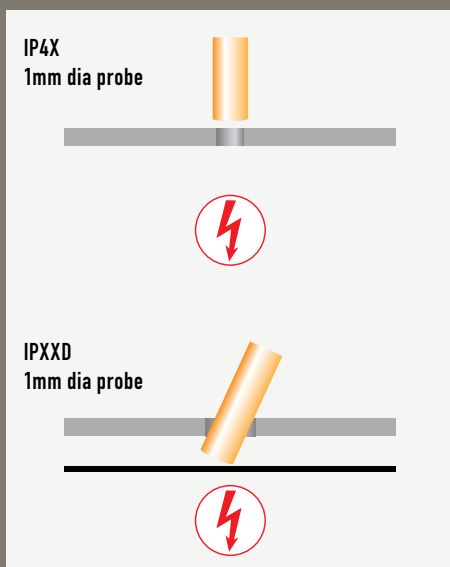
The index of protection is defined in BS EN 60529 - Degree of protection of enclosures of electrical equipment.

As quoted in Section 521.10.1, the Regulations allow two levels for the degree of protection:

IP4X - Protected against solid bodies greater than 1mm in diameter. The test uses a 1mm diameter, 100mm long test probe / wire. The probe is applied with a force of $1N \pm 10\%$ and is not allowed to enter the enclosure being tested.

IPXXD - Solid bodies no greater than 1mm in diameter may enter the top of the enclosure but will remain clear of hazardous parts. The test uses a 1mm diameter, 100mm long test probe / wire. The top of the enclosure may allow entry of the 100mm long test wire, however the wire is not allowed to touch any hazardous parts within the enclosure.

The Salamandre range of distribution trunking has evolved to include a simple solution to IP4X conformity.

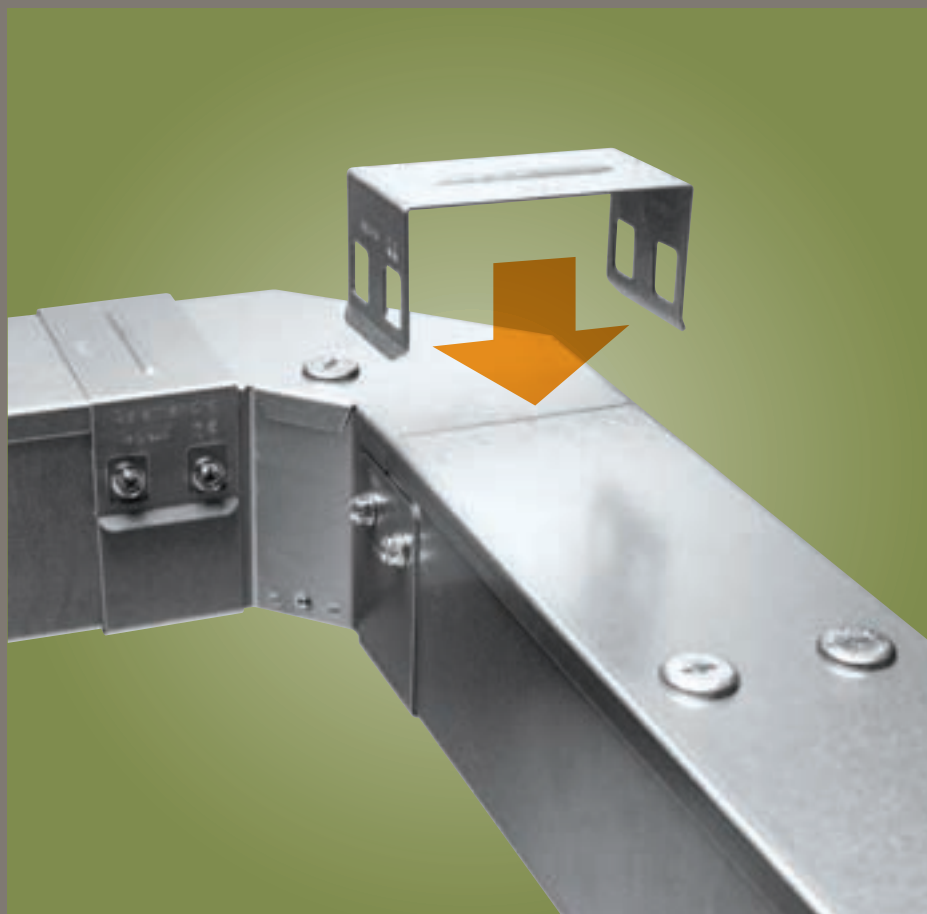


* Permission to reproduce extracts from BS 7671:2008+A1:2011 is granted by the British Standards Institution (BSI) and the Institute of Engineering and Technology (IET). No other use of this material is permitted.
BS 7671:2008 Incorporating Amendment No 1: 2011 can be purchased in hardcopy format only from the IET website <http://electrical.theiet.org/> and the BSI online shop: <http://shop.bsigroup.com>

A simple, convenient solution

To achieve IP4X conformity using Salamandre requires the addition of a simple 'cover strap' which is connected to each coupler over the joint between two lids.

The range of IP4X fittings has all the benefits of Salamandre (see p. 4) and integrates fully with existing lengths and accessories to provide a total solution when using non-sheathed cable.



For IP4X protection, simply clip a 'cover strap' to each coupler over the joint between two lids

IP4X fittings should be specified to achieve the correct level of conformity

Fit faster... fit Salamandre®

50% faster to fit... Don't just take our word for it!

Independent tests by **BSRIA** confirm that Salamandre is at least 50% faster to fit than its predecessor.*

Luckins, author of the **Electrical Installation Times Guide** has recognised that Salamandre is significantly different from other trunking available in the current market and has therefore reflected the time-saving results that were achieved during the testing in their electronic database.

listed in
LUCKINS
DATABASE

*When fitting length to length or length to fitting. Full report available on request from Legrand.

Faster fitting for huge time savings

Salamandre distribution trunking sets the standard for fitting speed. With its unique pre-fitted coupling system, integrated shake-proof screws and a clip-on lid, fitting times can be 50% quicker than any alternative - at least. Together with a smooth safety edge for easier handling, the extensive Salamandre range is the ideal fit for anyone focused on reducing installation times.

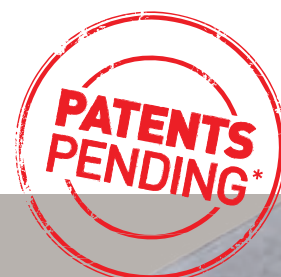
Save time, save money

The innovative design of Salamandre has led not only to real time, demonstrable savings for installers and contractors, but also to a significantly reduced total installed cost. Save time on site, save money on labour costs.

Salamandre simplifies and saves time at every stage. With 18 sizes and 1,700 catalogue numbers, the range keeps a consistency with catalogue numbers (similar to its predecessor) to maintain ease of ordering.

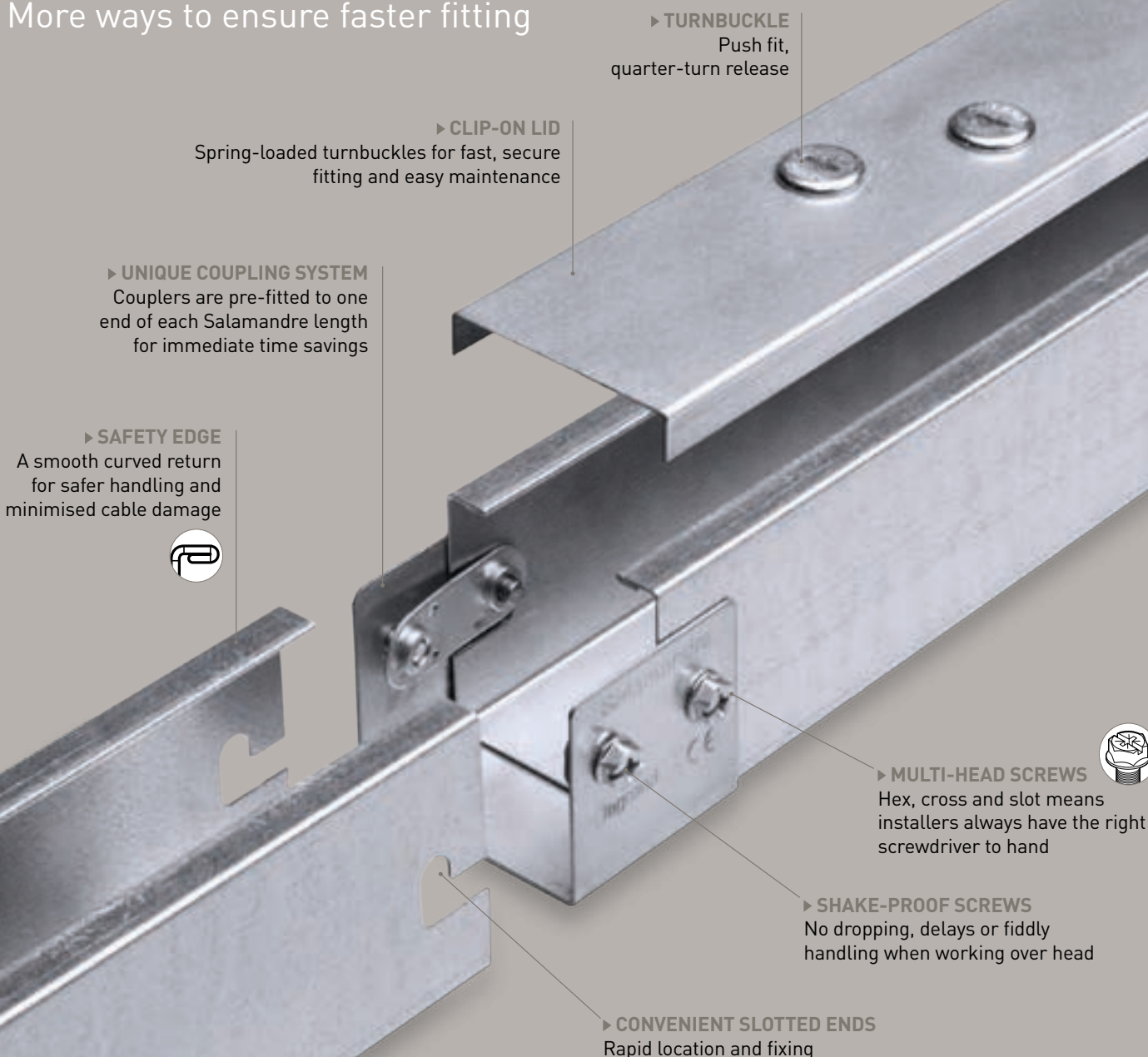


More innovations... more ways to save time



More innovations

More ways to ensure faster fitting



*UK patent application Nos GB1013839.4 and GB1016044.8

Legrand - global strength built on local knowledge

With a 15% share of the global market, the Legrand Group is the world specialist in cable management systems... and with our established Swifts, Salamandre and Arena-Walsall ranges, our cable management division has a firm leadership position in the UK.



Sustainable development

From design through to manufacturing, the Legrand Group selects materials and processes that respect people and the environment.

- Efficient and environmentally aware product design
- Product functions that help to avoid energy waste
- Management of manufacturing and logistics sites
- Integration of environmental concerns and ISO 14001 procedures at the Group's global sites. *

* 84% of sites are ISO 14001:2004 accredited including all UK sites.



Legrand in the UK - powered by specialists

In the UK Legrand has developed a customer focused structure which harnesses the power of its market leading specialist brands to deliver innovative, integrated solutions for every phase of construction.

Salamandre® ... a winner in the fast lane

**The Silverstone Wing, Silverstone,
Northamptonshire**

The project

The Silverstone Wing is the name of the new pit and paddock complex at the home of British motor racing, Silverstone.

The multi-million pound development provides world class facilities that include new garages, a race control building, conference and exhibition space, a new podium, media centre, hospitality and VIP spectator zones.

The solution

NG Bailey became the first company in the UK to specify and install our Salamandre distribution trunking throughout the Silverstone Wing.

The product, which is 50 per cent quicker to install than its predecessor when fitting length to length or length to fitting, was specified following an initial meeting with NG Bailey's project manager, Kevin Dunn.

Kevin, who was impressed by the potential cost savings the system offered due to the reduction in the amount of time needed to install it, said: "Time on site is always precious and any new product that delivers time savings is always welcome, but a product that reduces installation time by 50 per cent really is something for Legrand to shout about."

NG Bailey's site supervisor, Steve Povey helped with the initial installation of the trunking, working alongside an experienced electrician and an apprentice – both of whom gave it a glowing report.

"The Salamandre trunking really impressed me," said Steve. "I liked the clip on lids and hexagonal head fixing screws, especially as they allowed me to use a nut driver to secure them rather than standard cross head driver."

The new Silverstone Wing was completed in time to play host to the 2011 British Grand Prix.



Salamandre® distribution trunking

standard and IP4X trunking ranges

STANDARD TRUNKING RANGE

TRUNKING		FITTINGS										
Size (mm)	Lengths, lids and couplers	Top lid 90° bends – gussett	Top lid 90° bends – square	Inside lid 90° bends – gussett	Inside lid 90° bends – square	Outside lid 90° bends – gussett	Outside lid 90° bends – square	Top lid 45° bends	Inside lid 45° bends	Outside lid 45° bends	Top lid tees – gusset	Top lid tees – square
50 x 50	MGR22	MGR22AGL	MGR22ASL	MGR22BGL	MGR22BSL	MGR22CGL	MGR22CSL	MGR22AL	MGR22BL	MGR22CL	MGR22AGT	MGR22AST
75 x 50	MGR32	MGR32AGL	MGR32ASL	MGR32BGL	MGR32BSL	MGR32CGL	MGR32CSL	MGR32AL	MGR32BL	MGR32CL	MGR32AGT	MGR32AST
75 x 75	MGR33	MGR33AGL	MGR33ASL	MGR33BGL	MGR33BSL	MGR33CGL	MGR33CSL	MGR33AL	MGR33BL	MGR33CL	MGR33AGT	MGR33AST
100 x 50	MGR42	MGR42AGL	MGR42ASL	MGR42BGL	MGR42BSL	MGR42CGL	MGR42CSL	MGR42AL	MGR42BL	MGR42CL	MGR42AGT	MGR42AST
100 x 75	MGR43	MGR43AGL	MGR43ASL	MGR43BGL	MGR43BSL	MGR43CGL	MGR43CSL	MGR43AL	MGR43BL	MGR43CL	MGR43AGT	MGR43AST
100 x 100	MGR44	MGR44AGL	MGR44ASL	MGR44BGL	MGR44BSL	MGR44CGL	MGR44CSL	MGR44AL	MGR44BL	MGR44CL	MGR44AGT	MGR44AST
150 x 50	MGR62	MGR62AGL	MGR62ASL	MGR62BGL	MGR62BSL	MGR62CGL	MGR62CSL	MGR62AL	MGR62BL	MGR62CL	MGR62AGT	MGR62AST
150 x 75	MGR63	MGR63AGL	MGR63ASL	MGR63BGL	MGR63BSL	MGR63CGL	MGR63CSL	MGR63AL	MGR63BL	MGR63CL	MGR63AGT	MGR63AST
150 x 100	MGR64	MGR64AGL	MGR64ASL	MGR64BGL	MGR64BSL	MGR64CGL	MGR64CSL	MGR64AL	MGR64BL	MGR64CL	MGR64AGT	MGR64AST
150 x 150	MGR66	MGR66AGL	MGR66ASL	MGR66BGL	MGR66BSL	MGR66CGL	MGR66CSL	MGR66AL	MGR66BL	MGR66CL	MGR66AGT	MGR66AST
225 x 75	MGR93	MGR93AGL	MGR93ASL	MGR93BGL	MGR93BSL	MGR93CGL	MGR93CSL	MGR93AL	MGR93BL	MGR93CL	MGR93AGT	MGR93AST
225 x 100	MGR94	MGR94AGL	MGR94ASL	MGR94BGL	MGR94BSL	MGR94CGL	MGR94CSL	MGR94AL	MGR94BL	MGR94CL	MGR94AGT	MGR94AST
225 x 150	MGR96	MGR96AGL	MGR96ASL	MGR96BGL	MGR96BSL	MGR96CGL	MGR96CSL	MGR96AL	MGR96BL	MGR96CL	MGR96AGT	MGR96AST
225 x 225	MGR99	MGR99AGL	MGR99ASL	MGR99BGL	MGR99BSL	MGR99CGL	MGR99CSL	MGR99AL	MGR99BL	MGR99CL	MGR99AGT	MGR99AST
300 x 75	MGR123	MGR123AGL	MGR123ASL	MGR123BGL	MGR123BSL	MGR123CGL	MGR123CSL	MGR123AL	MGR123BL	MGR123CL	MGR123AGT	MGR123AST
300 x 100	MGR124	MGR124AGL	MGR124ASL	MGR124BGL	MGR124BSL	MGR124CGL	MGR124CSL	MGR124AL	MGR124BL	MGR124CL	MGR124AGT	MGR124AST
300 x 150	MGR126	MGR126AGL	MGR126ASL	MGR126BGL	MGR126BSL	MGR126CGL	MGR126CSL	MGR126AL	MGR126BL	MGR126CL	MGR126AGT	MGR126AST
300 x 300	MGR1212	MGR1212AGL	MGR1212ASL	MGR1212BGL	MGR1212BSL	MGR1212CGL	MGR1212CSL	MGR1212AL	MGR1212BL	MGR1212CL	MGR1212AGT	MGR1212AST

IP4X TRUNKING RANGE

TRUNKING		FITTINGS								
Size (mm)	Lengths, lids and couplers	Cover strap IP4X	Top lid 90° bends – gussett IP4X	Top lid 90° bends – square IP4X	Inside lid 90° bends – gussett IP4X	Inside lid 90° bends – square IP4X	Outside lid 90° bends – gussett IP4X	Outside lid 90° bends – square IP4X	Top lid 45° bends IP4X	Inside lid 45° bends IP4X
50 x 50	MGR22	MGIP2CS	MGIP22AGL	MGIP22ASL	MGIP22BGL	MGIP22BSL	MGIP22CGL	MGIP22CSL	MGIP22AL	MGIP22BL
75 x 50	MGR32	MGIP3CS	MGIP32AGL	MGIP32ASL	MGIP32BGL	MGIP32BSL	MGIP32CGL	MGIP32CSL	MGIP32AL	MGIP32BL
75 x 75	MGR33	MGIP3CS	MGIP33AGL	MGIP33ASL	MGIP33BGL	MGIP33BSL	MGIP33CGL	MGIP33CSL	MGIP33AL	MGIP33BL
100 x 50	MGR42	MGIP4CS	MGIP42AGL	MGIP42ASL	MGIP42BGL	MGIP42BSL	MGIP42CGL	MGIP42CSL	MGIP42AL	MGIP42BL
100 x 75	MGR43	MGIP4CS	MGIP43AGL	MGIP43ASL	MGIP43BGL	MGIP43BSL	MGIP43CGL	MGIP43CSL	MGIP43AL	MGIP43BL
100 x 100	MGR44	MGIP4CS	MGIP44AGL	MGIP44ASL	MGIP44BGL	MGIP44BSL	MGIP44CGL	MGIP44CSL	MGIP44AL	MGIP44BL
150 x 50	MGR62	MGIP6CS	MGIP62AGL	MGIP62ASL	MGIP62BGL	MGIP62BSL	MGIP62CGL	MGIP62CSL	MGIP62AL	MGIP62BL
150 x 75	MGR63	MGIP6CS	MGIP63AGL	MGIP63ASL	MGIP63BGL	MGIP63BSL	MGIP63CGL	MGIP63CSL	MGIP63AL	MGIP63BL
150 x 100	MGR64	MGIP6CS	MGIP64AGL	MGIP64ASL	MGIP64BGL	MGIP64BSL	MGIP64CGL	MGIP64CSL	MGIP64AL	MGIP64BL
150 x 150	MGR66	MGIP6CS	MGIP66AGL	MGIP66ASL	MGIP66BGL	MGIP66BSL	MGIP66CGL	MGIP66CSL	MGIP66AL	MGIP66BL
225 x 75	MGR93	MGIP9CS	MGIP93AGL	MGIP93ASL	MGIP93BGL	MGIP93BSL	MGIP93CGL	MGIP93CSL	MGIP93AL	MGIP93BL
225 x 100	MGR94	MGIP9CS	MGIP94AGL	MGIP94ASL	MGIP94BGL	MGIP94BSL	MGIP94CGL	MGIP94CSL	MGIP94AL	MGIP94BL
225 x 150	MGR96	MGIP9CS	MGIP96AGL	MGIP96ASL	MGIP96BGL	MGIP96BSL	MGIP96CGL	MGIP96CSL	MGIP96AL	MGIP96BL
225 x 225	MGR99	MGIP9CS	MGIP99AGL	MGIP99ASL	MGIP99BGL	MGIP99BSL	MGIP99CGL	MGIP99CSL	MGIP99AL	MGIP99BL
300 x 75	MGR123	MGIP12CS	MGIP123AGL	MGIP123ASL	MGIP123BGL	MGIP123BSL	MGIP123CGL	MGIP123CSL	MGIP123AL	MGIP123BL
300 x 100	MGR124	MGIP12CS	MGIP124AGL	MGIP124ASL	MGIP124BGL	MGIP124BSL	MGIP124CGL	MGIP124CSL	MGIP124AL	MGIP124BL
300 x 150	MGR126	MGIP12CS	MGIP126AGL	MGIP126ASL	MGIP126BGL	MGIP126BSL	MGIP126CGL	MGIP126CSL	MGIP126AL	MGIP126BL
300 x 300	MGR1212	MGIP12CS	MGIP1212AGL	MGIP1212ASL	MGIP1212BGL	MGIP1212BSL	MGIP1212CGL	MGIP1212CSL	MGIP1212AL	MGIP1212BL

STANDARD TRUNKING RANGE													
FITTINGS									ACCESSORIES				
Inside lid tees – gusset	Outside lid tees – gusset	Offset tees ⁽¹⁾	Cross-overs	Offset cross-overs ⁽¹⁾	Reducers ⁽²⁾	Bell-mouths	Change faces – left hand ⁽³⁾	Change faces – right hand ⁽³⁾	Pin racks	End caps	Flanges	Fitting to fitting adaptors	Trunking couplers
MGR22BGT	MGR22CGT	MGR22OST2C	MGR22AGX	MGR22OSX2C	–	MGR22B	MSIP22CLH	MSIP22CRH	MGR22PR	MGR22E	MGR22F	MGR22FA	MGR22C
MGR32BGT	MGR32CGT	MGR32OST2C	MGR32AGX	MGR32OSX2C	MGR32 Z R	MGR32B	–	–	MGR32PR	MGR32E	MGR32F	MGR32FA	MGR32C
MGR33BGT	MGR33CGT	MGR33OST2C	MGR33AGX	MGR33OSX2C	MGR33 Z R	MGR33B	MSIP33CLH	MSIP33CRH	MGR33PR	MGR33E	MGR33F	MGR33FA	MGR33C
MGR42BGT	MGR42CGT	MGR42OST2C	MGR42AGX	MGR42OSX2C	MGR42 Z R	MGR42B	–	–	MGR42PR	MGR42E	MGR42F	MGR42FA	MGR42C
MGR43BGT	MGR43CGT	MGR43OST2C	MGR43AGX	MGR43OSX2C	MGR43 Z R	MGR43B	–	–	MGR43PR	MGR43E	MGR43F	MGR43FA	MGR43C
MGR44BGT	MGR44CGT	MGR44OST2C	MGR44AGX	MGR44OSX2C	MGR44 Z R	MGR44B	MSIP44CLH	MSIP44CRH	MGR44PR	MGR44E	MGR44F	MGR44FA	MGR44C
MGR62BGT	MGR62CGT	MGR62OST2C	MGR62AGX	MGR62OSX2C	MGR62 Z R	MGR62B	–	–	MGR62PR	MGR62E	MGR62F	MGR62FA	MGR62C
MGR63BGT	MGR63CGT	MGR63OST2C	MGR63AGX	MGR63OSX2C	MGR63 Z R	MGR63B	–	–	MGR63PR	MGR63E	MGR63F	MGR63FA	MGR63C
MGR64BGT	MGR64CGT	MGR64OST2C	MGR64AGX	MGR64OSX2C	MGR64 Z R	MGR64B	–	–	MGR64PR	MGR64E	MGR64F	MGR64FA	MGR64C
MGR66BGT	MGR66CGT	MGR66OST2C	MGR66AGX	MGR66OSX2C	MGR66 Z R	MGR66B	MSIP66CLH	MSIP66CRH	MGR66PR	MGR66E	MGR66F	MGR66FA	MGR66C
MGR93BGT	MGR93CGT	MGR93OST2C	MGR93AGX	MGR93OSX2C	MGR93 Z R	MGR93B	–	–	MGR93PR	MGR93E	MGR93F	MGR93FA	MGR93C
MGR94BGT	MGR94CGT	MGR94OST2C	MGR94AGX	MGR94OSX2C	MGR94 Z R	MGR94B	–	–	MGR94PR	MGR94E	MGR94F	MGR94FA	MGR94C
MGR96BGT	MGR96CGT	MGR96OST2C	MGR96AGX	MGR96OSX2C	MGR96 Z R	MGR96B	–	–	MGR96PR	MGR96E	MGR96F	MGR96FA	MGR96C
MGR99BGT	MGR99CGT	MGR99OST2C	MGR99AGX	MGR99OSX2C	MGR99 Z R	MGR99B	MSIP99CLH	MSIP99CRH	MGR99PR	MGR99E	MGR99F	MGR99FA	MGR99C
MGR123BGT	MGR123CGT	MGR123OST2C	MGR123AGX	MGR123OSX2C	MGR123 Z R	MGR123B	–	–	MGR123PR	MGR123E	MGR123F	MGR123FA	MGR123C
MGR124BGT	MGR124CGT	MGR124OST2C	MGR124AGX	MGR124OSX2C	MGR124 Z R	MGR124B	–	–	MGR124PR	MGR124E	MGR124F	MGR124FA	MGR124C
MGR126BGT	MGR126CGT	MGR126OST2C	MGR126AGX	MGR126OSX2C	MGR126 Z R	MGR126B	–	–	MGR126PR	MGR126E	MGR126F	MGR126FA	MGR126C
MGR1212BGT	MGR1212CGT	MGR1212OST2C	MGR1212AGX	MGR1212OSX2C	MGR1212 Z R	MGR1212B	MSIP1212CLH	MSIP1212CRH	MGR1212PR	MGR1212E	MGR1212F	MGR1212FA	MGR1212C

(1) Not available in single compartment. Cat. Nos. shown are for 2 compartment option. For 3 compartment option, replace 2C with 3C
(2) Replace Z with reduced trunking size code required (see p. 10) (3) For non square sizes refer to instructions on p. 25

IP4X TRUNKING RANGE												
FITTINGS										ACCESSORIES		
Outside lid 45° bends IP4X	Top lid tees – gusset IP4X	Top lid tees – square IP4X	Inside lid tees – gusset IP4X	Outside lid tees – gusset IP4X	Cross-overs IP4X	Reducers ⁽¹⁾ IP4X	Bellmouths IP4X	Change faces – left hand ⁽²⁾	Change faces – right hand ⁽²⁾	End caps IP4X	Flanges IP4X	Trunking couplers
MGIP22CL	MGIP22AGT	MGIP22AST	MGIP22BGT	MGIP22CGT	MGIP22AGX	–	MGIP22B	MSIP22CLH	MSIP22CRH	MGIP22E	MGIP22F	MGR22C
MGIP32CL	MGIP32AGT	MGIP32AST	MGIP32BGT	MGIP32CGT	MGIP32AGX	MGIP32 Z R	MGIP32B	–	–	MGIP32E	MGIP32F	MGR32C
MGIP33CL	MGIP33AGT	MGIP33AST	MGIP33BGT	MGIP33CGT	MGIP33AGX	MGIP33 Z R	MGIP33B	MSIP33CLH	MSIP33CRH	MGIP33E	MGIP33F	MGR33C
MGIP42CL	MGIP42AGT	MGIP42AST	MGIP42BGT	MGIP42CGT	MGIP42AGX	MGIP42 Z R	MGIP42B	–	–	MGIP42E	MGIP42F	MGR42C
MGIP43CL	MGIP43AGT	MGIP43AST	MGIP43BGT	MGIP43CGT	MGIP43AGX	MGIP43 Z R	MGIP43B	–	–	MGIP43E	MGIP43F	MGR43C
MGIP44CL	MGIP44AGT	MGIP44AST	MGIP44BGT	MGIP44CGT	MGIP44AGX	MGIP44 Z R	MGIP44B	MSIP44CLH	MSIP44CRH	MGIP44E	MGIP44F	MGR44C
MGIP62CL	MGIP62AGT	MGIP62AST	MGIP62BGT	MGIP62CGT	MGIP62AGX	MGIP62 Z R	MGIP62B	–	–	MGIP62E	MGIP62F	MGR62C
MGIP63CL	MGIP63AGT	MGIP63AST	MGIP63BGT	MGIP63CGT	MGIP63AGX	MGIP63 Z R	MGIP63B	–	–	MGIP63E	MGIP63F	MGR63C
MGIP64CL	MGIP64AGT	MGIP64AST	MGIP64BGT	MGIP64CGT	MGIP64AGX	MGIP64 Z R	MGIP64B	–	–	MGIP64E	MGIP64F	MGR64C
MGIP66CL	MGIP66AGT	MGIP66AST	MGIP66BGT	MGIP66CGT	MGIP66AGX	MGIP66 Z R	MGIP66B	MSIP66CLH	MSIP66CRH	MGIP66E	MGIP66F	MGR66C
MGIP93CL	MGIP93AGT	MGIP93AST	MGIP93BGT	MGIP93CGT	MGIP93AGX	MGIP93 Z R	MGIP93B	–	–	MGIP93E	MGIP93F	MGR93C
MGIP94CL	MGIP94AGT	MGIP94AST	MGIP94BGT	MGIP94CGT	MGIP94AGX	MGIP94 Z R	MGIP94B	–	–	MGIP94E	MGIP94F	MGR94C
MGIP96CL	MGIP96AGT	MGIP96AST	MGIP96BGT	MGIP96CGT	MGIP96AGX	MGIP96 Z R	MGIP96B	–	–	MGIP96E	MGIP96F	MGR96C
MGIP99CL	MGIP99AGT	MGIP99AST	MGIP99BGT	MGIP99CGT	MGIP99AGX	MGIP99 Z R	MGIP99B	MSIP99CLH	MSIP99CRH	MGIP99E	MGIP99F	MGR99C
MGIP123CL	MGIP123AGT	MGIP123AST	MGIP123BGT	MGIP123CGT	MGIP123AGX	MGIP123 Z R	MGIP123B	–	–	MGIP123E	MGIP123F	MGR123C
MGIP124CL	MGIP124AGT	MGIP124AST	MGIP124BGT	MGIP124CGT	MGIP124AGX	MGIP124 Z R	MGIP124B	–	–	MGIP124E	MGIP124F	MGR124C
MGIP126CL	MGIP126AGT	MGIP126AST	MGIP126BGT	MGIP126CGT	MGIP126AGX	MGIP126 Z R	MGIP126B	–	–	MGIP126E	MGIP126F	MGR126C
MGIP1212CL	MGIP1212AGT	MGIP1212AST	MGIP1212BGT	MGIP1212CGT	MGIP1212AGX	MGIP1212 Z R	MGIP1212B	MSIP1212CLH	MSIP1212CRH	MGIP1212E	MGIP1212F	MGR1212C

(1) Replace Z with reduced trunking size code required (see p. 10)
(2) For non square sizes refer to instructions on p. 27

Salamandre® distribution and lighting trunking

order information

Distribution trunking

Salamandre distribution trunking is now available as traditional IP30 or IP4X to comply with the latest wiring regulations

IP30

Standard IP30 fittings are shown on p. 12-13 and have the MGR prefix

IP4X

IP4X fittings are shown on p. 14-15 and are prefixed with MGIP

Trunking lengths are common to both solutions and are detailed on p. 11, accessories on p. 16

To complete an IP4X installation an IP4X cover strap should be fitted to each joint

Trunking size codes

Size (mm) width x depth	Standard trunking
50 x 50	22
75 x 50	32
75 x 75	33
100 x 50	42
100 x 75	43
100 x 100	44
150 x 50	62
150 x 75	63
150 x 100	64
150 x 150	66
225 x 75	93
225 x 100	94
225 x 150	96
225 x 225	99
300 x 75	123
300 x 100	124
300 x 150	126
300 x 300	1212

In the Cat. Nos. shown on p. 11, replace **Z** with the relevant standard trunking size code

Lid fixings

Standard trunking is available with a selection of lid fixings
The chart opposite shows the relevant prefix for each type
Lighting trunking lids are purchased separately and simply clip into place

Range	Prefix
Diecast turnbuckle	MGR
Screwfix (M5 x 9 mm)	MSR
Tamperproof screwfix (M5 x 8 TORX)	MSTR

Fittings

The chart below details each element required to correctly order a fitting

E.g. **MGR33AGX2C** = Turnbuckle 75 x 75 top lid gusset 4 way 2 compartment

Range / Lid fixing	Width	Height	Cover position	Gusset / Square	Function	Compartment
MGR = Turnbuckle	2 = 50 mm	2 = 50 mm	A = Top	G = Gusset	L = Bend	2C = 2 Compartment
MSR = Screw fix	3 = 75 mm	3 = 75 mm	B = Internal	S = Square	T = Tee	3C = 3 Compartment
MSTR = Tamperproof	4 = 100 mm	4 = 100 mm	C = External		X = Cross / 4 way	
MGIP = New IP4X range	6 = 150 mm	6 = 150 mm				
	9 = 225 mm	9 = 225 mm				
	12 = 300 mm	12 = 300 mm				

IP4X

To achieve IP4X, all fittings should be MGIP type (see p. 14-15). All joints must have cover straps fitted. Cover straps are not included with fittings and should be ordered separately

To calculate the number of cover straps required for an installation use the following as a guide

Fitting	No. of IP4X cover straps
Bend	1
Tee	2
Crossover	3
Reducer	1
Bellmouth	1
Flange	1
Endcap	1

Consideration should also be given to cut lengths

Finishes

Finishes	Standard	Lighting
Pre-galvanised steel BS EN 10327 grade DX51D	● eg : MGR33	● eg : LT2610
Powder coated RAL 9003	● eg : MGR33P	● eg : WLT2510

Note :

powder coated versions are supplied with the DTB1 and DTB2 versions of turnbuckle. This is a standard 1/4 turn turnbuckle and not the push-fit type supplied on the standard MGR product

Compartment options

Distribution trunking is available in multi-compartment options
Trunking and fittings are supplied with equal compartments as standard
For unequal compartments, details must be supplied at the time of order
3 compartment is available in width code 3 and above

Distribution trunking lengths

For 1 compartment trunking there is no need to change the Cat. Nos. Example : MGR33

For 2 compartment trunking, add **2C** to the end of the Cat. No. Example : MGR33**2C**

For 3 compartment trunking, add **3C** to the end of the Cat. No. Example : MGR33**2C**

Distribution trunking fittings

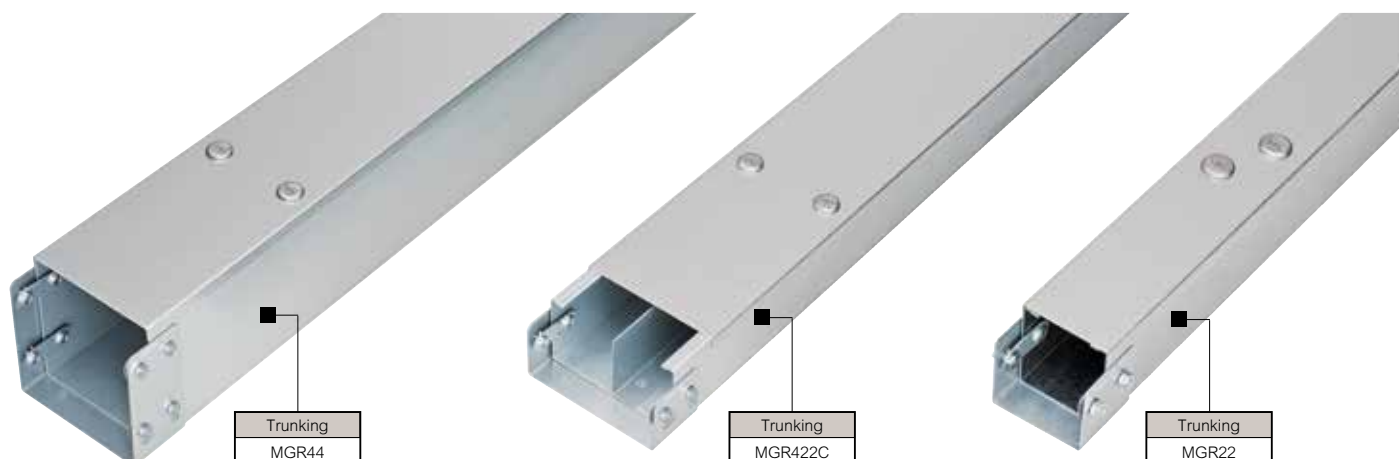
For 1 compartment trunking there is no need to change the Cat. No. Example : MGR33AGL

For 2 compartment trunking, add **2C** to the end of the Cat. No. Example : MGR33AGL**2C**

For 3 compartment trunking, add **3C** to the end of the Cat. No. Example : MGR33AGL**3C**

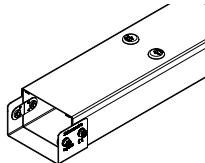
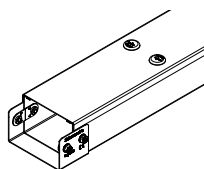
Salamandre® distribution trunking

lengths, lids and couplers



Selection chart (p. 8-9)
Order information (p. 10)
Standards and quality assessment (p. 20)
Dimensions and technical information (p. 21-30)

Pack	Cat. Nos.	Trunking lengths – 3 m																																						
		A safety return edge steel surface trunking system with strength and rigidity Manufactured to BS EN 50085-2-1 Each trunking length is supplied with coupler (fitted), lid and lid fixings Supplied as standard with push-fit diecast turnbuckle fixings. For screwfix or tamperproof screwfix, replace MGR with MSR or MSTR. For more details (see order information p. 10)																																						
		Single compartment																																						
		Also available in multi-compartment options (see p. 10)																																						
		<table><tr><th>Width (mm)</th><th>Depth (mm)</th></tr><tr><td>50</td><td>50</td></tr><tr><td>75</td><td>50</td></tr><tr><td>75</td><td>75</td></tr><tr><td>100</td><td>50</td></tr><tr><td>100</td><td>75</td></tr><tr><td>100</td><td>100</td></tr><tr><td>150</td><td>50</td></tr><tr><td>150</td><td>75</td></tr><tr><td>150</td><td>100</td></tr><tr><td>150</td><td>150</td></tr><tr><td>225⁽¹⁾</td><td>75</td></tr><tr><td>225⁽¹⁾</td><td>100</td></tr><tr><td>225⁽¹⁾</td><td>150</td></tr><tr><td>225⁽¹⁾</td><td>225</td></tr><tr><td>300⁽¹⁾</td><td>75</td></tr><tr><td>300⁽¹⁾</td><td>100</td></tr><tr><td>300⁽¹⁾</td><td>150</td></tr><tr><td>300⁽¹⁾</td><td>300</td></tr></table>	Width (mm)	Depth (mm)	50	50	75	50	75	75	100	50	100	75	100	100	150	50	150	75	150	100	150	150	225 ⁽¹⁾	75	225 ⁽¹⁾	100	225 ⁽¹⁾	150	225 ⁽¹⁾	225	300 ⁽¹⁾	75	300 ⁽¹⁾	100	300 ⁽¹⁾	150	300 ⁽¹⁾	300
Width (mm)	Depth (mm)																																							
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1	MGR96 ⁽¹⁾																																							
1	MGR99 ⁽¹⁾																																							
1	MGR123 ⁽¹⁾																																							
1	MGR124 ⁽¹⁾																																							
1	MGR126 ⁽¹⁾																																							
1	MGR1212 ⁽¹⁾																																							



(1) Use additional cover straps (Cat. Nos. MGIP9TCS and MGIP12TCS) to achieve IP4X conformity, see opposite

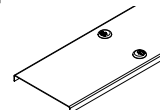
Pack	Cat. Nos.
1	MGR2LID
1	MGR3LID
1	MGR4LID
1	MGR6LID
1	MGR9LID
1	MGR12LID

Spare lids

Spare turnbuckle lids

Diecast turnbuckles included
Lids 50 to 150 wide : 6 per 3 m lid
Lids 225 and 300 wide : 4 per 1.5 m lid

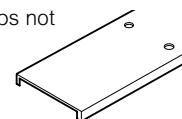
50 mm wide x 3 m long
75 mm wide x 3 m long
100 mm wide x 3 m long
150 mm wide x 3 m long
225 mm wide x 1.5 m long
300 mm wide x 1.5 m long



Spare screwfix and tamperproof screwfix lids

Screws and retaining clips not included (see p. 16)

Lids up to 150 wide :
6 per 3 m lid
Lids 225 and 300 wide :
4 per 1.5 m lid

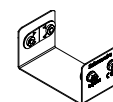


Replace MGR with MSR (screwfix) in the Cat. Nos. above

Accessories

Trunking couplers

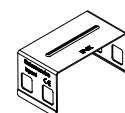
Supplied with coupler screws fitted and backed off



IP4X cover strap

Clips over coupler joint to provide IP4X
Used in conjunction with IP4X fittings, see p. 14 for details

50 mm cover strap
75 mm cover strap
100 mm cover strap
150 mm cover strap
225 mm cover strap
300 mm cover strap

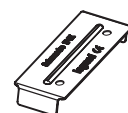


IP4X cover strap for lids

Clips over joint between two lids to provide IP4X conformity

For use with 225 mm and 300 mm wide trunking
Kit includes cover strap
two clip options and M5 fixing screws

225 mm cover strap
300 mm cover strap



Key : Z = trunking size code

Replace Z with the relevant code (see p. 10)



MGR can be replaced by MSR or MSTR for screwfix lids or tamperproof screwfix lids
Also available in multi-compartment options

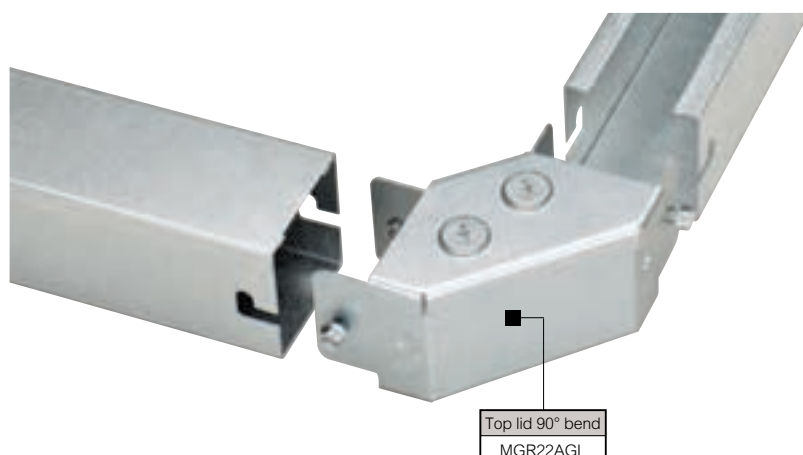
see p. 10

NEW

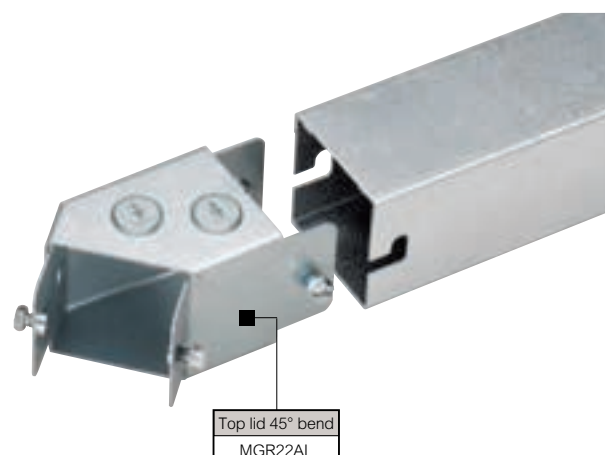
MGIP9TCS
MGIP12TCS

Salamandre® distribution trunking

standard fittings



Top lid 90° bend
MGR22AGL



Top lid 45° bend
MGR22AL



Selection chart (p. 8-9)
Order information (p. 10)
Standards and quality assessment (p. 20)
Dimensions and technical information (p. 24-25)

Pack	Cat. Nos.	Fittings
		90° bends
		All bends are supplied with lid, lid fixings and coupler screws pre-fitted and backed off
		Top lid 90° bends – gusset
1	MGR Z AGL	1 compartment
1	MGR Z AGL2C	2 compartment
1	MGR Z AGL3C	3 compartment
		Top lid 90° bends – square
1	MGR Z ASL	1 compartment
1	MGR Z ASL2C	2 compartment
1	MGR Z ASL3C	3 compartment
		Inside lid 90° bends – gusset
1	MGR Z BGL	1 compartment
1	MGR Z BGL2C	2 compartment
1	MGR Z BGL3C	3 compartment
		Inside lid 90° bends – square
1	MGR Z BSL	1 compartment
1	MGR Z BSL2C	2 compartment
1	MGR Z BSL3C	3 compartment
		Outside lid 90° bends – gusset
1	MGR Z CGL	1 compartment
1	MGR Z CGL2C	2 compartment
1	MGR Z CGL3C	3 compartment
		Outside lid 90° bends – square
1	MGR Z CSL	1 compartment
1	MGR Z CSL2C	2 compartment
1	MGR Z CSL3C	3 compartment

Pack	Cat. Nos.
1	MGR Z AL
1	MGR Z AL2C
1	MGR Z AL3C
1	MGR Z BL
1	MGR Z BL2C
1	MGR Z BL3C
1	MGR Z CL
1	MGR Z CL2C
1	MGR Z CL3C
1	MGR Z F
1	MGR Z E
1	MGR Z EX
1	MSIP Z CLH
1	MSIP Z CRH
1	MGR Z FA

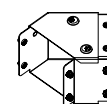
Fittings (continued)

45° bends

All bends are supplied with lid, lid fixings and coupler screws pre-fitted and backed off

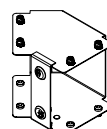
Top lid 45° bends

1 compartment
2 compartment
3 compartment



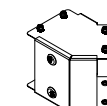
Inside lid 45° bends

1 compartment
2 compartment
3 compartment

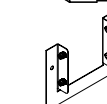


Outside lid 45° bends

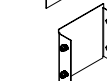
1 compartment
2 compartment
3 compartment



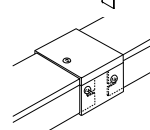
Flange



End cap



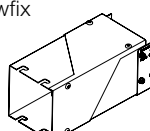
Expansion coupler



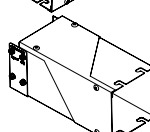
Change faces

Supplied with lids, lid fixings and one trunking connector fitted
Not available in multi-compartment
Only available in IP4X screwfix or tamperproof versions
For non square size options see p. 25

Left hand – square sizes only

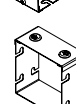


Right hand – square sizes only



Fitting to fitting adaptors

Supplied with lid and lid fixings

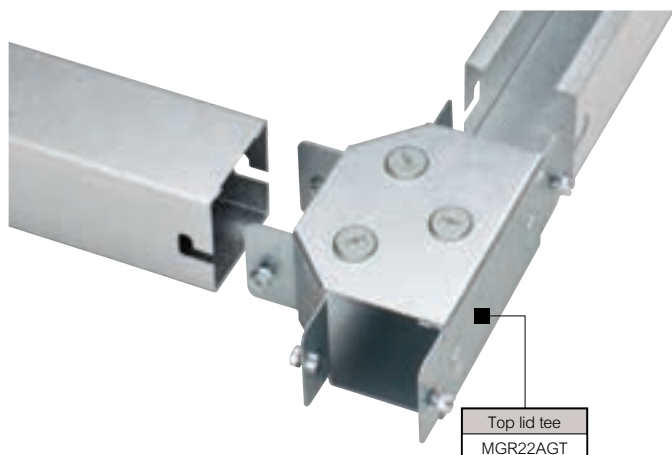
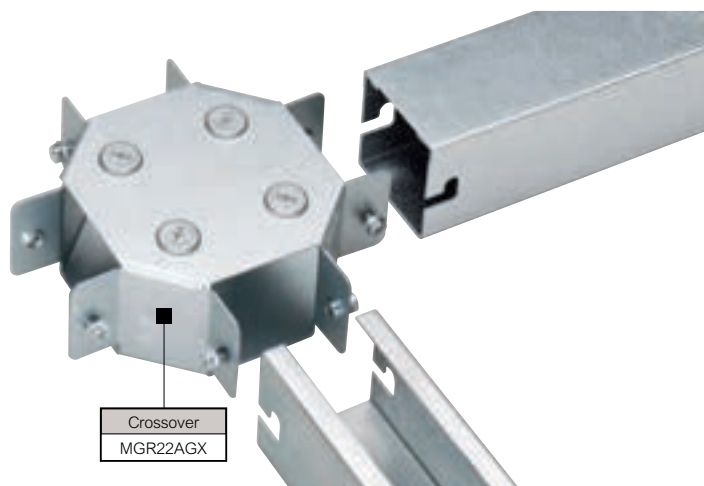


Key : Z = trunking size code
Replace Z with the relevant code (see p. 10)

Note : 3 compartment trunking is available in size codes 32 (75 mm wide) and above

Salamandre® distribution trunking

standard fittings (continued)



Selection chart (p. 8-9)
Order information (p. 10)
Standards and quality assessment (p. 20)
Dimensions and technical information (p. 24-25)

Pack	Cat. Nos.	Fittings (continued)
		Tees All top lid, inside lid and outside lid tees are supplied with lid, lid fixings and coupler screws pre-fitted and backed-off Offset tees are supplied with lids and lid fixings only All 2 and 3 compartment tees include a bridge flyover complete with fixing brackets and screws Bridge flyovers reduce the cable capacity by 50% except on offset products which give full cable capacity Inside and outside lid tees – square, available to special order Contact us on +44 (0) 345 605 4333
		Top lid tees – gusset 1 compartment 2 compartment 3 compartment
1 1 1	MGR Z AGT MGR Z AGT2C MGR Z AGT3C	
		Top lid tees – square 1 compartment 2 compartment 3 compartment
1 1 1	MGR Z AST MGR Z AST2C MGR Z AST3C	
		Inside lid tees – gusset 1 compartment 2 compartment 3 compartment
1 1 1	MGR Z BGT MGR Z BGT2C MGR Z BGT3C	
		Outside lid tees – gusset 1 compartment 2 compartment 3 compartment
1 1 1	MGR Z CGT MGR Z CGT2C MGR Z CGT3C	
		Full capacity offset tees 1 compartment not available Couplers not supplied (see p. 11)
1 1	MGR Z OST2C MGR Z OST3C	

Pack	Cat. Nos.	Fittings (continued)
		Crossovers Supplied with lid, lid fixings and coupler screws pre-fitted and backed-off All 2 and 3 compartment crossovers include a bridge flyover complete with fixing brackets and screws Bridge flyovers reduce the cable capacity by 50% except on offset products which give full cable capacity
1 1 1	MGR Z AGX MGR Z AGX2C MGR Z AGX3C	1 compartment 2 compartment 3 compartment
		Full capacity offset crossovers 1 compartment not available Couplers not supplied (see p. 11) 2 compartment 3 compartment
1 1	MGR Z OSX2C MGR Z OSX3C	
		Reducers Supplied with lids, lid fixings and coupler screws. The larger trunking size uses standard coupler (not supplied) for joining to reducer (Cat. No. MGR Z C see p. 11)
1	MGR Z Z R	
		Bellmouths Supplied with lids, lid fixings and bellmouth to trunking coupler screws
1 1 1	MGR Z B MGR Z B2C MGR Z B3C	1 compartment 2 compartment 3 compartment

Key : Z = trunking size code
Replace Z with the relevant code (see p. 10)



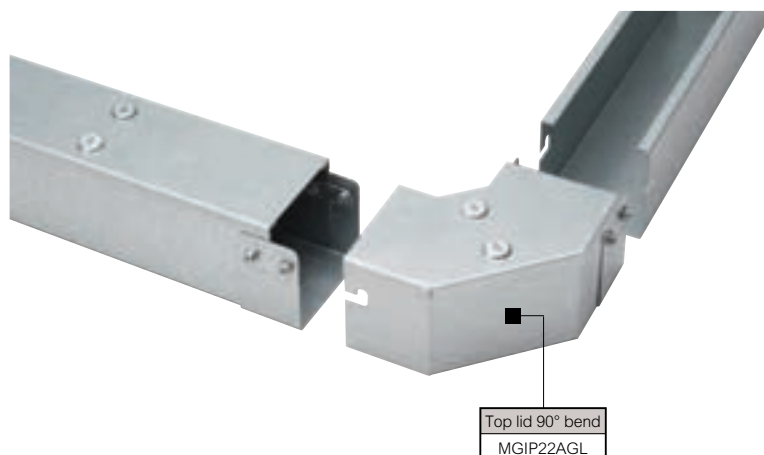
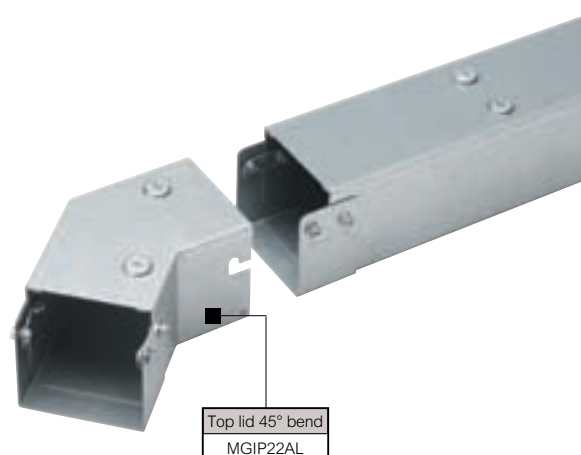
MGR can be replaced by MSR or MSTR for screwfix lids or tamperproof screwfix lids
Also available in multi-compartment options

see p. 10

Salamandre® distribution trunking

IP4X fittings

IP4X



Selection chart (p. 8-9)
Order information (p. 10)
Standards and quality assessment (p. 20)
Dimensions and technical information (p. 26-27)

Pack	Cat. Nos.	Fittings
		IP4X 90° bends All bends are supplied with lid, lid fixings and a coupler pre-fitted with screws backed off, ready to accept slotted trunking
		IP4X top lid 90° bends – gusset
1	MGIP Z AGL	1 compartment
1	MGIP Z AGL2C	2 compartment
1	MGIP Z AGL3C	3 compartment
		IP4X top lid 90° bends – square
1	MGIP Z ASL	1 compartment
1	MGIP Z ASL2C	2 compartment
1	MGIP Z ASL3C	3 compartment
		IP4X inside lid 90° bends – gusset
1	MGIP Z BGL	1 compartment
1	MGIP Z BGL2C	2 compartment
1	MGIP Z BGL3C	3 compartment
		IP4X inside lid 90° bends – square
1	MGIP Z BSL	1 compartment
1	MGIP Z BSL2C	2 compartment
1	MGIP Z BSL3C	3 compartment
		IP4X outside lid 90° bends – gusset
1	MGIP Z CGL	1 compartment
1	MGIP Z CGL2C	2 compartment
1	MGIP Z CGL3C	3 compartment
		IP4X outside lid 90° bends – square
1	MGIP Z CSL	1 compartment
1	MGIP Z CSL2C	2 compartment
1	MGIP Z CSL3C	3 compartment

Pack	Cat. Nos.	Fittings (continued)
		IP4X 45° bends All bends are supplied with lid, lid fixings and a coupler pre-fitted with screws backed off, ready to accept slotted trunking
		IP4X top lid 45° bends
1	MGIP Z AL	1 compartment
1	MGIP Z AL2C	2 compartment
1	MGIP Z AL3C	3 compartment
		IP4X inside lid 45° bends
1	MGIP Z BL	1 compartment
1	MGIP Z BL2C	2 compartment
1	MGIP Z BL3C	3 compartment
		IP4X outside lid 45° bends
1	MGIP Z CL	1 compartment
1	MGIP Z CL2C	2 compartment
1	MGIP Z CL3C	3 compartment
		IP4X change faces Supplied with lids, lid fixings and one trunking connector fitted Not available in multi-compartment Only available in IP4X screwfix or tamperproof versions For non square size options see p. 27
1	MSIP Z CLH	Left hand – square sizes only
1	MSIP Z CRH	Right hand – square sizes only
		IP4X cover strap Clips over coupler joint to provide IP4X. Used in conjunction with IP4X fittings
1	MGIP2CS	50 mm cover strap
1	MGIP3CS	75 mm cover strap
1	MGIP4CS	100 mm cover strap
1	MGIP6CS	150 mm cover strap
1	MGIP9CS	225 mm cover strap
1	MGIP12CS	300 mm cover strap

For lengths, lids and couplers, see p. 11

To achieve IP4X, all joints of the system should have a cover strap fitted. These should be ordered separately – 1 per length, 1 per bend / reducer, 2 per tee, 3 per crossover

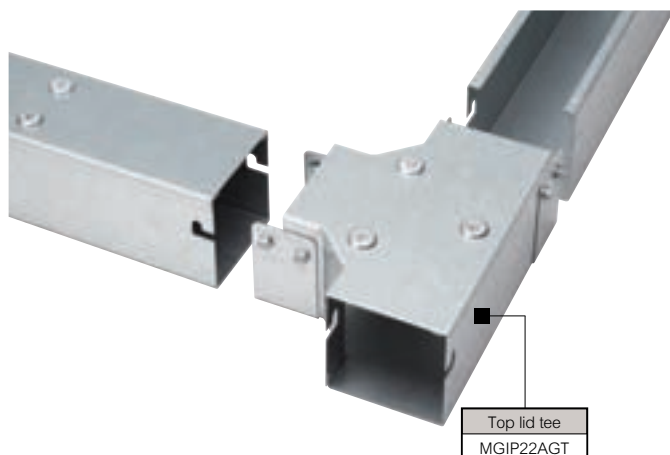
see p. 10

Key : Z = trunking size code
Replace Z with the relevant code (see p. 10)

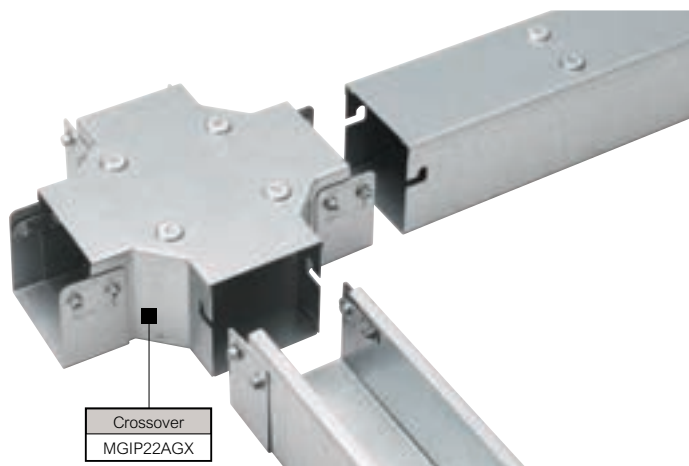
Salamandre® distribution trunking

IP4X fittings (continued)

IP4X



Top lid tee
MGIP22AGT

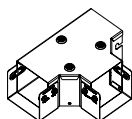
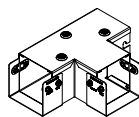
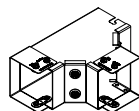
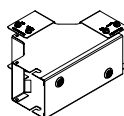


Crossover
MGIP22AGX

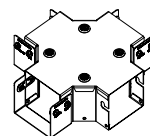
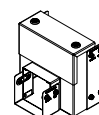
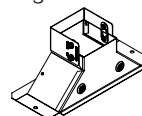
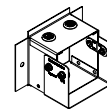
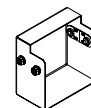
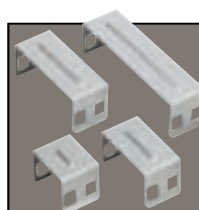


Selection chart (p. 8-9)
Order information (p. 10)
Standards and quality assessment (p. 20)
Dimensions and technical information (p. 26-27)

Pack	Cat. Nos.	Fittings (continued)
		IP4X tees
		All top lid, inside lid and outside lid tees are supplied with lid, lid fixings and two couplers pre-fitted with screws backed-off ready to accept slotted trunking. All 2 and 3 compartment tees include a bridge flyover complete with fixing brackets and screws. Bridge flyovers reduce the cable capacity by 50% except on offset products which give full cable capacity. Inside and outside lid tees – square, available by special order. Contact us on +44 (0) 345 605 4333
		IP4X top lid tees – gusset
1	MGIP Z AGT	1 compartment
1	MGIP Z AGT2C	2 compartment
1	MGIP Z AGT3C	3 compartment
		IP4X top lid tees – square
1	MGIP Z AST	1 compartment
1	MGIP Z AST2C	2 compartment
1	MGIP Z AST3C	3 compartment
		IP4X inside lid tees – gusset
1	MGIP Z BGT	1 compartment
1	MGIP Z BGT2C	2 compartment
1	MGIP Z BGT3C	3 compartment
		IP4X outside lid tees – gusset
1	MGIP Z CGT	1 compartment
1	MGIP Z CGT2C	2 compartment
1	MGIP Z CGT3C	3 compartment



Pack	Cat. Nos.	Fittings (continued)
		IP4X crossovers
		Crossovers are supplied with lid, lid fixings and three couplers pre-fitted with screws backed-off ready to accept slotted trunking. All 2 and 3 compartment crossovers include a bridge flyover complete with fixing brackets and screws. Bridge flyovers reduce the cable capacity by 50% except on offset products which give full cable capacity.
1	MGIP Z AGX	1 compartment
1	MGIP Z AGX2C	2 compartment
1	MGIP Z AGX3C	3 compartment
		IP4X reducers
1	MGIP Z Z R	Supplied with lids, lid fixings and two couplers pre-fitted with screws backed-off ready to accept slotted trunking
		IP4X bellmouths
		Supplied with lids, lid fixings and a coupler pre-fitted with screws backed-off ready to accept slotted trunking
1	MGIP Z B	1 compartment
1	MGIP Z B2C	2 compartment
1	MGIP Z B3C	3 compartment
		IP4X flange
1	MGIP Z F	1 compartment
1	MGIP Z F2C	2 compartment
1	MGIP Z F3C	3 compartment
		IP4X end cap
1	MGIP Z E	1 compartment
1	MGIP Z E2C	2 compartment
1	MGIP Z E3C	3 compartment



To achieve IP4X, all joints of the system should have a cover strap fitted. These should be ordered separately – 1 per length, 1 per bend / reducer, 2 per tee, 3 per crossover

see p. 10

Key : Z = trunking size code
Replace Z with the relevant code (see p. 10)

Salamandre® distribution trunking

accessories and fasteners



Selection chart (p. 8-9)
Order information (p. 10)
Standards and quality assessment (p. 20)
Dimensions and technical information (p. 28)

Accessories

Pack	Cat. Nos.		
10	MGR2CR	Cable retainers	
10	MGR3CR	50 mm wide	
10	MGR4CR	75 mm wide	
10	MGR6CR	100 mm wide	
10	MGR9CR	150 mm wide	
10	MGR12CR	225 mm wide	
		300 mm wide	
1	MGR Z PR	Pin racks	
		1 compartment	
		Multi-compartment trunking	
		Order per compartment	
10	EL	Earth link	
		Fastenings not supplied	
1	MGR22H	Stirrup hangers	
1	MGR33H	Hole for M10 rod	
1	MGR44H	50 mm wide. 50 mm max. depth	
1	MGR66H	75 mm wide. 75 mm max. depth	
		100 mm wide. 100 mm max. depth	
		150 mm wide. 150 mm max. depth	
1	MGR9 Z H	225 mm wide (not illustrated)	
1	MGR12 Z H	300 mm wide (not illustrated)	
10	MGR Z OH	Overhead hanger	
		Hole for M10 rod	
		Trunking must be fixed to base of hanger	
1	MGR2PART	Loose partitions – 3 m	
1	MGR3PART	50 mm deep	
1	MGR4PART	75 mm deep	
1	MGR6PART	100 mm deep	
1	MGR9PART	150 mm deep	
1	MGR12PART	225 mm deep	
		300 mm deep	

Accessories (continued)

Pack	Cat. Nos.		
1	T206	PVC edging strip	
		For fitting on to top edge of partition	
		10 m strip	
1	MSR4SG	Socket plates	
1	MSR6SG	Not applicable to IP4X	
1	MSR9SG	Only available in screwfix or tamperproof	
1	MSR12SG		
		Single	
		100 mm wide	
		150 mm wide	
		225 mm wide	
		300 mm wide	
1	MSR4TS	Twin	
1	MSR6TS	100 mm wide	
1	MSR9TS	150 mm wide	
1	MSR12TS	225 mm wide	
		300 mm wide	
100	ETCLIP	Fasteners	
10	RTB1	M5 clip nut	
10	RTB2	Diecast turnbuckle for lid width up to 150 mm	
100	T301	Diecast turnbuckle for lid width 225 mm and above	
100	T304	Screwfix	
100	T306	M5 x 9	
100	T306	Tamperproof screwfix (M5 TORX) M5 x 8	
100	T306	M5 Hex nut	
1	TX25	Screwdriver for tamperproof screwfix	

Key : Z = trunking size code

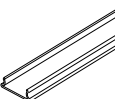
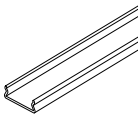
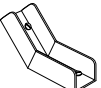
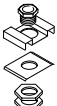
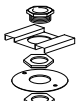
Replace Z with the relevant code (see p. 10)

Note:

For stirrup hangers (where shown), insert ONLY THE SECOND NUMBER from the relevant trunking size code

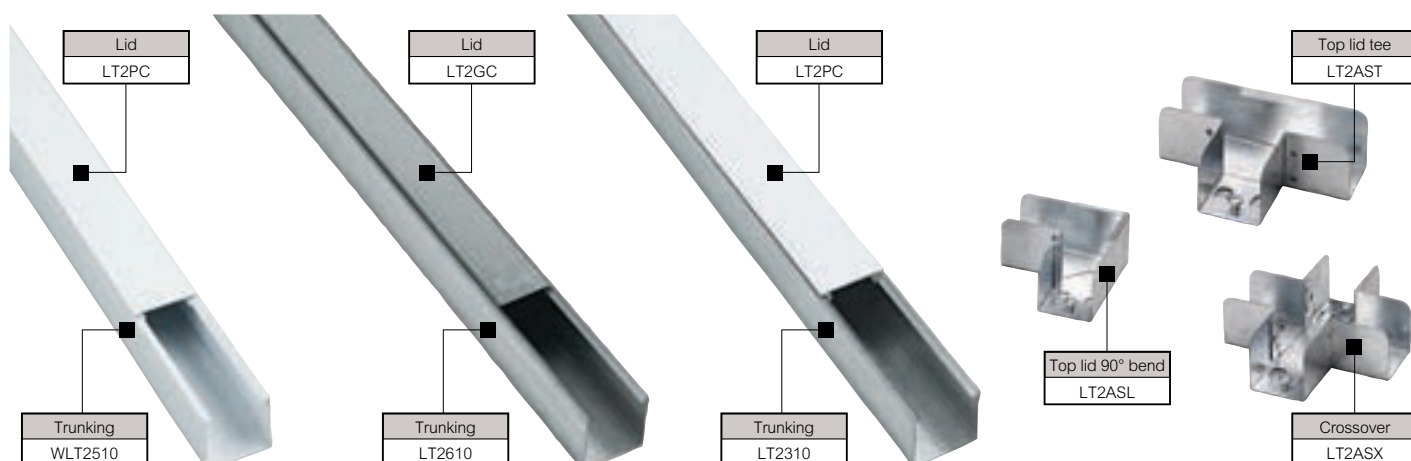
Salamandre® lighting trunking

selection chart

LIGHTING TRUNKING RANGE												
Finish	TRUNKING		FITTINGS									
	Size (mm)	Lengths	Galvanised lid	White plastic standard lids	Top lid 90° bends	Inside lid 90° bends	Outside lid 90° bends	Top lid 45° bends	Inside lid 45° bends	Outside lid 45° bends	Top lid tees	
												
Galvanised	50 x 50	LT2	LT2GC	LT2PC	LT2ASL	LT2BSL	LT2CSL	LT2AL	LT2BL	LT2CL	LT2AST	
Powder coated	50 x 50	WLT2	WLT2GC	LT2PC	WLT2ASL	WLT2BSL	WLT2CSL	WLT2AL	WLT2BL	WLT2CL	WLT2AST	
Finish	FITTINGS			ACCESSORIES								
	Inside lid tees	Outside lid tees	Crossovers	End caps	Flanges	Girder clamps	Stirrup hangers	Suspension units	Pull switch adaptors	Cable retainers	Klik adaptors	Long couplers
												
Galvanised	LT2BST	LT2CST	LT2ASX	LT2E	LT2F	LT2GCL	LT2H	LT2FS	LT2PSA	LT2CR	LT2KL	LT2C
Powder coated	WLT2BST	WLT2CST	WLT2ASX	WLT2E	WLT2F	WLT2GCL	WLT2H	LT2FS	LT2PSA	LT2CR	LT2KL	LT2C

Salamandre® lighting trunking

lengths, lids and fittings



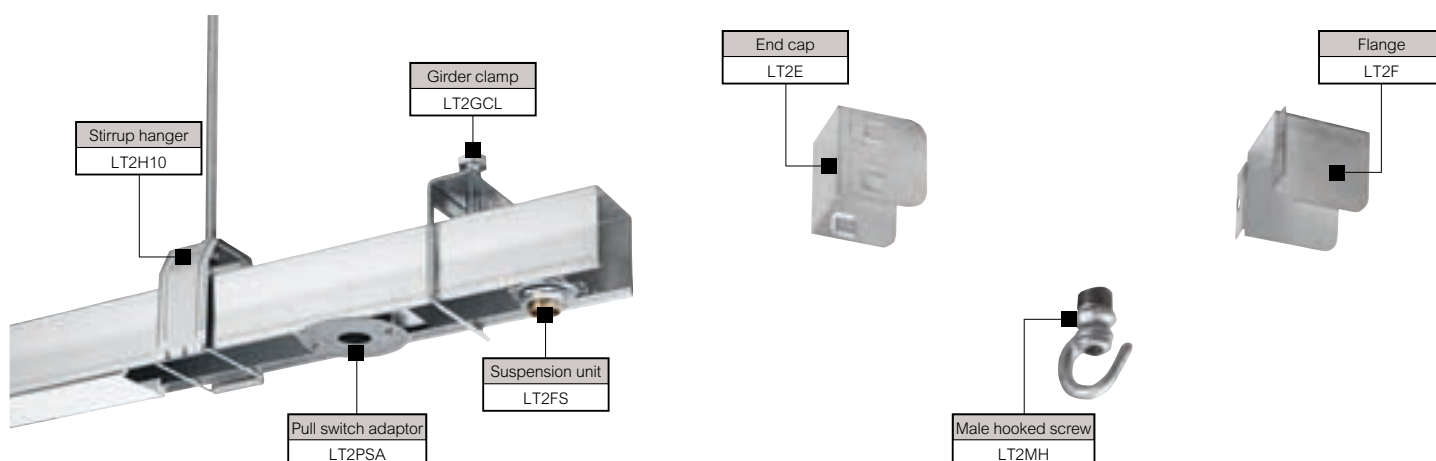
Selection chart (p. 17)
Dimensions and technical information (p. 31)

A 'clip-in' lid trunking system for fast installation
Available with a choice of 3 lids in plastic or galvanised finishes
For white powder coated finish to RAL 9003 product code starts WLT2,
for pre-galvanised code starts LT2
All lighting trunking fittings have friction grip to aid quick installation

Pack	Cat. Nos.	Trunking lengths
1	WLT2510	Lids and couplers not included White Nominal steel thickness 1.0 mm 50 mm x 50 mm – 5 m
1	LT2310	Galvanised Nominal steel thickness 1.0 mm 50 mm x 50 mm – 3 m
1	LT2410	50 mm x 50 mm – 4 m
1	LT2510	50 mm x 50 mm – 5 m
1	LT2610	50 mm x 50 mm – 6 m
1	LT2GC WLT2GC	Lids Lids – galvanised 2 m length Standard width Standard width – painted
1	LT2PC	Lid – white plastic 2 m length Standard width

Pack	Cat. Nos.	Fittings
1	LT2C	Long coupler 50 mm x 50 mm
1	LT2ASL WLT2ASL	Top lid 90° bends 50 mm x 50 mm 50 mm x 50 mm – white
1	LT2BSL WLT2BSL	Inside lid 90° bends 50 mm x 50 mm 50 mm x 50 mm – white
1	LT2CSL WLT2CSL	Outside lid 90° bends 50 mm x 50 mm 50 mm x 50 mm – white
1	LT2AL WLT2AL	Top lid 45° bends 50 mm x 50 mm 50 mm x 50 mm – white
1	LT2BL WLT2BL	Inside lid 45° bends 50 mm x 50 mm 50 mm x 50 mm – white
1	LT2CL WLT2CL	Outside lid 45° bends 50 mm x 50 mm 50 mm x 50 mm – white
1	LT2AST WLT2AST	Top lid tees 50 mm x 50 mm 50 mm x 50 mm – white
1	LT2BST WLT2BST	Inside lid tees 50 mm x 50 mm 50 mm x 50 mm – white
1	LT2CST WLT2CST	Outside lid tees 50 mm x 50 mm 50 mm x 50 mm – white
1	LT2ASX WLT2ASX	Crossovers 50 mm x 50 mm 50 mm x 50 mm – white

Salamandre® lighting trunking accessories



Selection chart (p. 17)
Dimensions and technical information (p. 31)

Pack	Cat. Nos.	Accessories	
1	LT2E WLT2E	End caps 50 mm x 50 mm 50 mm x 50 mm – white	
1	LT2F WLT2F	Flanges 50 mm x 50 mm 50 mm x 50 mm – white	
1	LT2GCL WLT2GCL	Girder clamps 50 mm x 50 mm 50 mm x 50 mm – white	
1	LT2H10	Stirrup hangers 50 mm x 50 mm, 10 mm hole	
1	LT2H20	50 mm x 50 mm, 20 mm hole	
1	WLT2H10 WLT2H20	50 mm x 50 mm – white, 10 mm hole 50 mm x 50 mm – white, 20 mm hole	
10	LT2FS	Suspension unit	
10	LT2PSA	Pull switch adaptor	

Pack	Cat. Nos.	Accessories (continued)	
10	LT2CR	Cable retainer	
10	LT2KL	Klik adaptor For use with S26 Klik socket (not supplied)	
1	LT2MH	Male screwed hook	

Salamandre® distribution trunking

standards and quality assessment

■ Distribution trunking classification

Legrand's steel distribution trunking was previously made to BS 4678 Part 1. This is now an obsolescent standard and has been replaced by the latest BS European standard BS EN 50085-2-1

Classification to BS EN 50085-1 2005 and BS EN 50085-2-1 2006

- Clause 6.2 According to resistance to impact for installation and application : impact 2·0J
- Clause 6.3 According to temperatures given in tables 1, 2 and 3 :

	Min.	Max.
1. Storage and transport	- 25°C	-
2. Installation	- 15°C	-
3. Application	-	+ 60°C

- Clause 6.4 According to resistance to flame propagation : non-flame propagating (unpainted)
- Clause 6.5 According to electrical continuity characteristic : CTS with electrical continuity (maximum linear impedance 1·0 milliohms per metre)
- Clause 6.6 According to electrical insulating characteristic : CTS without electrical insulating characteristic
- Clause 6.7 According to degree of protection provided by enclosure according to BS EN 60529 : 1991 :
IP30 – standard range
IP4X – IP range with cover strap
- Clause 6.9 According to system access cover retention : CTS access cover which can only be opened with a tool
- Clause 6.10 According to electrically protective separation : CTS without internal protective partition
- Clause 6.101 According to position when surface mounted :
CTS surface mounted on wall
CTS surface mounted on ceiling
(CTS mounted away from the wall or ceiling using fixing devices
Declare cover mounted upwards 2·0 metre hanger centres)
- Clause 6.103 According to the functions provided : Type 2 CTS (distribution)

■ Quality assessment and trade association memberships

Legrand offers a vast range of fully integrated cable management products to meet the demands of today's commercial and industrial installations... designed and manufactured to the highest standards at our Scarborough and West Bromwich sites

Quality and environmental assessment

Legrand Electric Limited holds ISO 9001 : 2008 Quality Assessment Registrations from Intertek Systems Certification UK and Bureau Veritas

The Salamandre range is manufactured at Legrand sites that are accredited to ISO 14001 : 2004 Environmental Management System



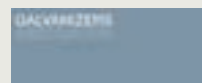
Intertek



Trade association memberships

Legrand Electric Limited is a member of the following trade associations :

- BEAMA
- Galvanizers Association (GA)
- Energy Industries Council (EIC)
- First Point Assessment (FPAL)



Reg no. 10042065

Salamandre® distribution trunking

trunking size, capacity and weights

■ Selecting the size of trunking required

The cable trunking capacity guide shown below can be used for the initial size calculation

This table is based on the maximum number of cables of a given size that can be physically accommodated within the trunking
In an actual installation, however, consideration must be given to a number of other factors :

1. Where cables cross each other such as in a tee or fourway / cross, extra space will be required
2. Depending upon the type of installation, future wiring needs could well require spare trunking capacity
3. Larger cables, in particular, do not lie neatly and flatly. Consideration must be given to the practicality of laying cable within a trunking compartment
4. The cable trunking capacity guide can be used for each compartment within multi-compartment trunking
5. A 50% reduction in capacity will apply at tees and fourway / crosses unless offset fittings are used

■ Cable trunking capacity guide

For each size of cable, multiply the number to be installed by the common factor. Add together the results of these calculations for all cable sizes. The correct trunking size must have a capacity factor equal to or greater than this total

Example :

24 x 16 mm² stranded @ factor 47.8 = 1 147.2

20 x 2.5 mm² solid @ factor 11.9 = 238.0

1 385.2

Minimum trunking size required in this example =

75 x 50 (trunking capacity factor 1 555)

Cable sizes and factors

Size (mm ²) (nom.)	Common cable factor
Solid	
1.5	8.0
2.5	11.9
Stranded	
1.5	8.6
2.5	12.6
4.0	16.6
6.0	21.2
10.0	35.3
16.0	47.8
25.0	73.9
35.0	93.3
50.0	128.7
70.0	167.4
95.0	229.7
120.0	277.6
150.0	343.1
240.0	552.0

Trunking sizes and capacity factors

Size (mm)	Trunking capacity factor
50 x 50	1 037
75 x 50	1 555
75 x 75	2 371
100 x 50	2 091
100 x 75	3 189
100 x 100	4 252
150 x 50	3 091
150 x 75	4 742
150 x 100	6 394
150 x 150	9 697
225 x 75	7 114
225 x 100	9 298
225 x 150	14 652
225 x 225	21 766
300 x 75	9 486
300 x 100	12 788
300 x 150	19 447
300 x 300	38 000

■ Standard distribution trunking weights

The approximate weights given are for pre-galvanised finish only, in kilograms (nominal) and subject to material thickness tolerance

	Size (mm)																	
	50 x 50	75 x 50	75 x 75	100 x 50	100 x 75	100 x 100	150 x 50	150 x 75	150 x 100	150 x 150	225 x 75	225 x 100	225 x 150	225 x 225	300 x 75	300 x 100	300 x 150	300 x 300
Trunking lengths per metre including lid and couplers	1.9	2.8	3.2	3.2	3.7	4.2	4.2	4.7	5.1	7.6	6.1	7.9	9.2	11.0	9.0	9.6	10.8	14.4
Bends	0.3	0.4	0.5	0.5	0.6	0.7	0.9	0.9	1.1	1.3	1.7	2.0	2.4	3.0	2.7	3.0	3.5	3.9
Tees	0.3	0.4	0.5	0.6	0.7	0.7	0.9	1.0	1.1	1.3	1.7	1.9	2.2	2.7	2.6	2.9	3.2	3.6
Crossovers	0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.0	1.1	1.3	1.7	1.8	1.9	2.4	2.6	2.6	2.8	3.3
Reducers	–	0.5	0.5	0.5	0.7	0.8	0.8	0.9	1.0	1.1	1.4	1.5	1.6	1.9	1.8	1.8	1.9	2.8
Bellmouths	0.5	0.8	0.8	1.2	1.3	1.4	1.6	1.7	1.8	1.9	2.2	2.3	2.4	2.9	2.8	2.8	2.9	3.9
Change faces	0.6	0.8	1.0	1.0	1.1	1.3	1.3	1.4	1.5	2.3	1.8	2.4	2.8	3.3	3.0	2.9	3.2	4.3
Loose separators per metre	0.4	0.4	0.5	0.4	0.5	0.7	0.4	0.5	0.7	1.0	0.5	0.7	1.0	1.5	0.5	0.7	1.0	2.0

■ Multi-compartment weights

Trunking lengths

To calculate the weight of multi-compartment trunking add the weight of the relevant number of loose separators to that of the trunking

Fittings

Multiply the weight of the fitting by the appropriate factor

	2 compartment factor	3 compartment factor	MGIP
Bend	1.25	1.50	1.10
Tee	1.50	2.00	1.12
Crossover	1.50	2.00	1.22
Bellmouth	1.25	1.50	1.10

All dimensions (mm) are nominal

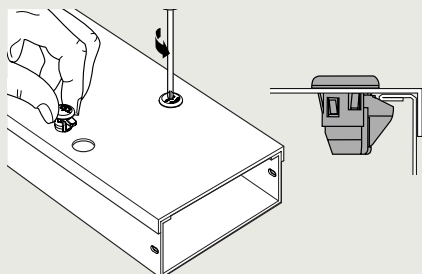
Salamandre® distribution trunking

installation of components

■ Lid fixing details

Diecast turnbuckle

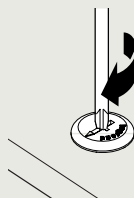
Unique push-fit / 1/4 turn release turnbuckles
Smooth diecast turnbuckle with spring loaded latch allows covers to simply push-fit into place
To release, rotate the turnbuckle 90° using a slot or cross head screwdriver
Manufactured from annealed spring steel and diecast zinc alloy



Drill a 14.1 mm hole in lid to accept turnbuckle



Fit turnbuckle into the lid by holding in latch to locate the first half of the turnbuckle and then push home with your thumb



To lock, the turnbuckle can be turned 90° and the lid can be push fitted or you can fit lid then turn the turnbuckle 90°

Screw fixing

Screws are M5 x 9 mm posidrive, pan head with earth nib on underside of head and a rounded end to prevent cable damage
Manufactured to BS 4183 and BS 3643 from low carbon mild steel, zinc plated and clear passivated

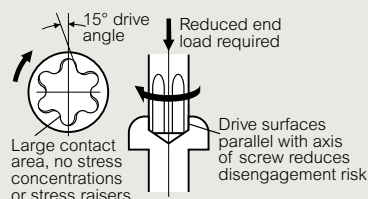
Tamperproof screw fixing

A M5 x 8 mm pan head screw with the efficient high torque TORX®(1) recess
Tamperproof screw fix lids are supplied fitted with mild steel plated screws with TORX®(1) screws bagged separately for fitting when installation is complete

- Torque transmitted positively and accurately
- Large contact area – reduces wear
- Parallel sides – holds screwdriver captive and virtually eliminates slippage

Manufactured to BS 4183 and BS 3643 from low carbon mild steel, zinc plated and clear passivated

A special TORX®(1) screwdriver is needed (see p. 16)



Large contact area, no stress concentrations or stress raisers

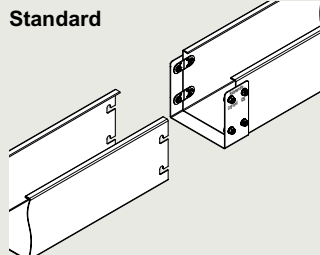
Drive surfaces parallel with axis of screw reduces disengagement risk

■ Coupling details

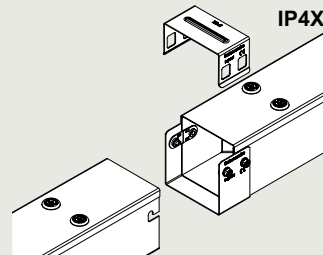
Length to length

One end of each trunking length is supplied with a coupler pre-fitted with receiving screws also pre-fitted and backed off ready to accept opposing trunking end
To connect simply offer the open end internally toward the coupler at a slightly higher level until body locates and drops into slot
Screws can then be tightened by a couple of turns until secure
To achieve IP4X, use standard lengths and simply click the cover strap over the joint

Standard



IP4X



IP4X cable trunking cover strap kit

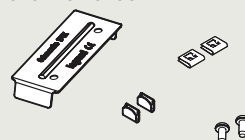
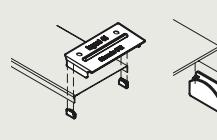
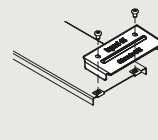
For 225 mm and 300 mm wide trunking
Use cover straps (Cat. Nos. MGIP9TCS and MGIP12TCS) across lid joints in larger sized trunking to achieve IP4X conformity
Cover straps can be fixed with clips or screws (supplied)

IP4X Cover strap kit

Cat. Nos. MGIP9TCS and MGIP9TCS

Clip fix option

Screw fix option



Fitting to length

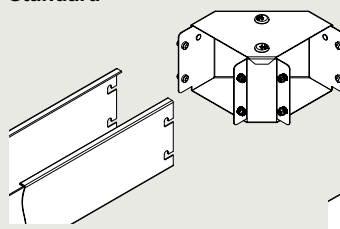
Standard fittings are supplied with an integrated coupler on each open end with screws fitted and backed-off

To connect simply offer the trunking externally toward the fitting at a slightly higher level until body locates and drops into slot

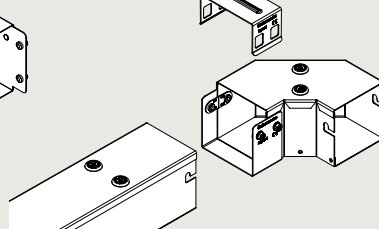
Screws can then be tightened by a couple of turns until secure

To achieve IP4X, use standard lengths, IP4X fittings and the IP4X cover strap

Standard



IP4X



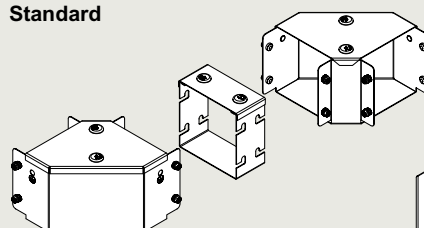
Fitting to fitting

Standard fittings have an integrated coupler, a fittings to fittings adaptor is therefore required (see p. 12)

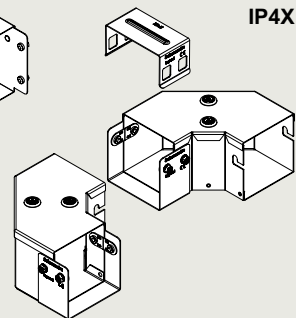
Fittings are then assembled in the same manner as above

IP4X fittings are supplied with an external coupler pre-fitted. To connect two fittings, one coupler may need to be removed. Complete installation with cover strap (purchased separately)

Standard



IP4X



(1) TORX is a registered trademark of Camcat/Textron Inc.

All dimensions (mm) are nominal

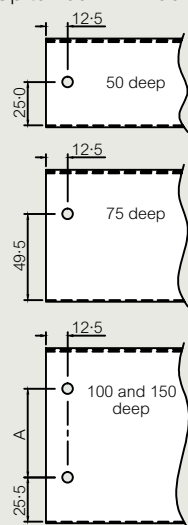
Salamandre® distribution trunking

drilling information with dimensions and technical information

Hole positions for cut lengths

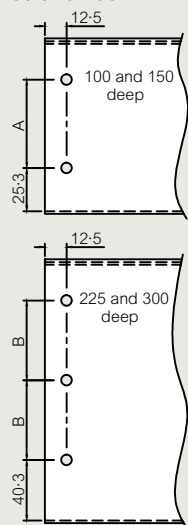
Drill clearance holes in cut length for M5 pan head screws in positions shown below

Up to 150 mm wide



Note :
All dimensions
from inside in
mm (nominal)

100 and 150 mm wide



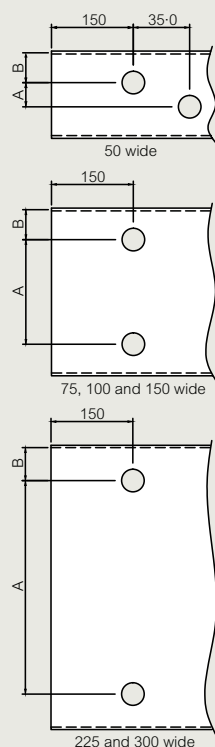
Trunking depth	A
100	51
150	101

Trunking depth	A	C
75	25.0	—
100	51.0	—
225	—	72.5
300	—	110.0

Hole positions for lids cut to length

Turnbuckle

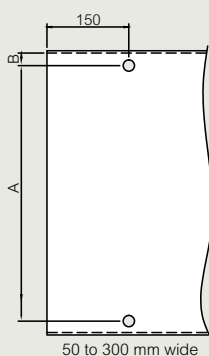
Ø 14.1 mm holes



Cover width	A	B
50	15.0	18.6
75	40.0	18.6
100	65.0	18.6
150	115.0	18.6
225	187.5	21.0
300	263.0	21.0

Screw fixed

Ø 7.2 mm holes



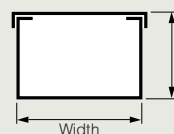
Trunking width	A	B
50	40.0	6.50
75	65.0	7.25
100	90.0	7.25
150	140.0	7.50
225	215.0	5.00
300	290.0	5.00

Trunking lengths

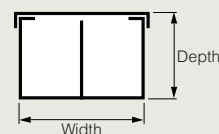
Each trunking length is supplied with lid, lid fixing and pre-fitted coupler with backed off screws

For trunking sizes and size codes (see p. 10)

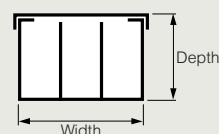
1 compartment



2 compartment

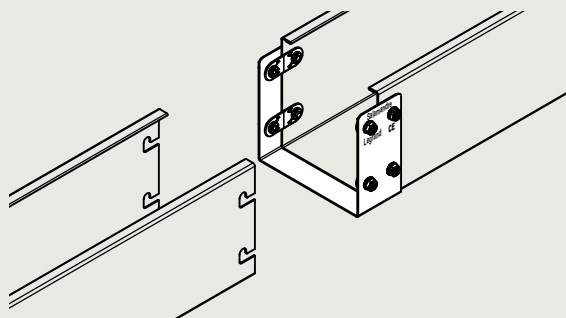
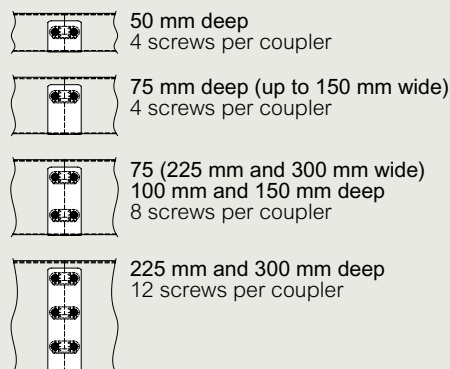


3 compartment



Trunking and fittings are supplied with equal compartments as standard. For unequal compartments, details must be supplied at time of order for this non-standard product

Trunking coupler



Supplied with coupler screws

Sets using 45° bends and fitting adaptors

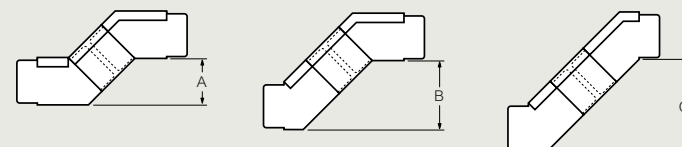
Various offsets can be achieved using two standard MGR 45° bends

Simply connect an inside lid bend to an outside lid bend using a fitting to fitting adaptor (see p. 12), in one of the three configurations below

Available on up to 150 x 150 mm trunking only

For MGIP 45° bends, see p. 26

Supplied with lid and lid fixings



Trunking depth	A	B	C
50	50	75	100
75	60	90	110
100	70	95	115
150	85	105	130

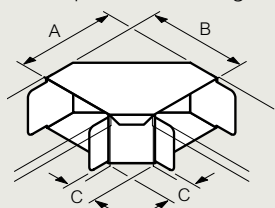
All dimensions (mm) are nominal

Salamandre® distribution trunking

standard fittings – dimensions and technical information

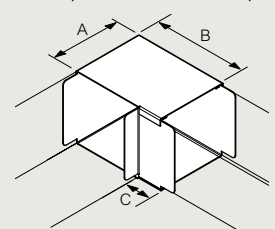
■ 90° bends

AGL top lid 90° bend – gusset



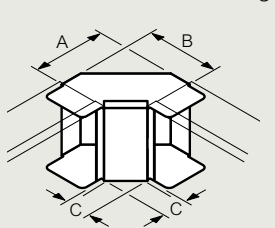
Width	A	B	C
50	75	75	25
75	100	100	25
100	125	125	25
150	175	175	25
225	251	251	25
300	326	326	25

ASL top lid 90° bend – square



Width	A	B	C
50	50	85	35
75	75	110	35
100	100	135	35
150	150	185	35
225	225	260	35
300	300	335	35

BGL inside lid 90° bend – gusset



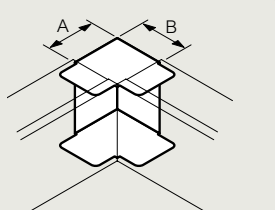
Up to 150 wide

Depth	A	B	C
50	86	86	35
75	110	110	35
100	136	136	35
150	186	186	35

225 and 300 wide

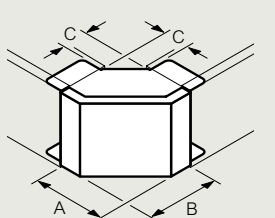
Depth	A	B	C
50	86	86	35
75	110	110	35
100	136	136	35
150	186	186	35
225	305	305	35
300	336	336	35

BSL inside lid 90° bend – square



Depth	A	B
50	50	50
75	75	75
100	100	100
150	150	150
225	225	225
300	300	300

CGL outside lid 90° bend – gusset



Up to 150 wide

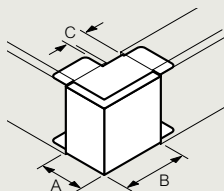
Depth	A	B	C
50	75	75	25
75	100	100	25
100	125	125	25
150	175	175	25

225 and 300 wide

Depth	A	B	C
50	75	75	25
75	100	100	25
100	125	125	25
150	175	175	25
225	250	250	25
300	325	325	25

■ 90° bends (continued)

CSL outside lid 90° bend – square



Width and depth refer to trunking sizes
Dimensions are identical for single and multi-compartment

Up to 150 wide

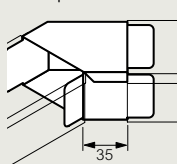
Depth	A	B	C
50	50	75	25
75	75	100	25
100	100	125	25
150	150	175	25

225 and 300 wide

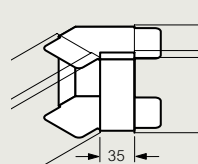
Depth	A	B	C
50	75	74	25
75	100	99	25
100	125	124	25
150	175	174	25
225	250	249	25
300	325	324	25

■ 45° bends

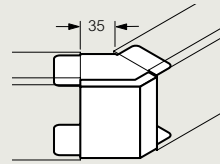
AL top lid 45° bend



BL inside lid 45° bend

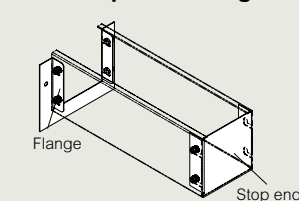
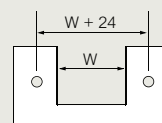


CL outside lid 45° bend

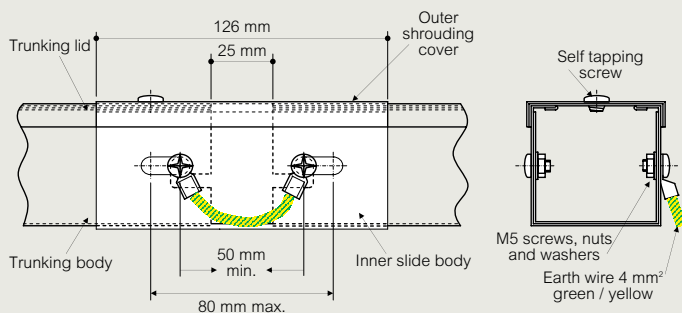


Dimensions are identical for single and multi-compartment

■ End caps and flanges



■ Expansion couplers



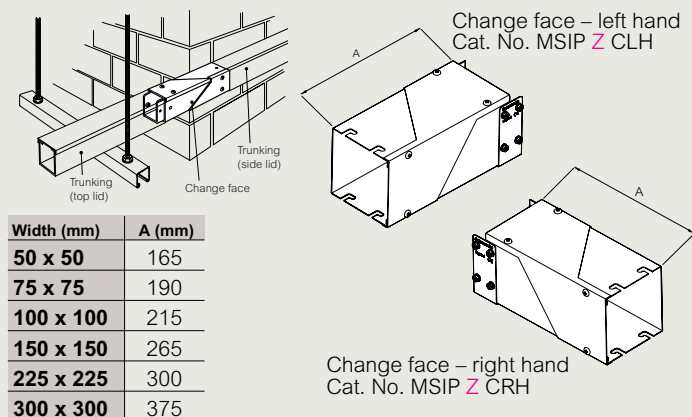
50 x 50 mm trunking shown

Method of operation

Expansion couplers consist of two parts : outer slide body and shrouding cover. Fit trunking into expansion coupler and secure with M5 screws, nut and washer, ensuring earth lead is securely fitted under connecting point. Fit outer shrouded cover to one of the main trunking lids using self tapping screws (supplied)

All dimensions (mm) are nominal

Change faces



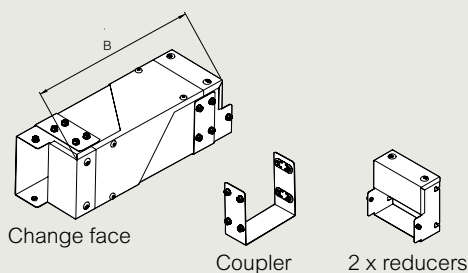
Width (mm)	A (mm)
50 x 50	165
75 x 75	190
100 x 100	215
150 x 150	265
225 x 225	300
300 x 300	375

Width refers to trunking sizes

For non-square trunking, change face units must be used in conjunction with reducers and couplers

For example :

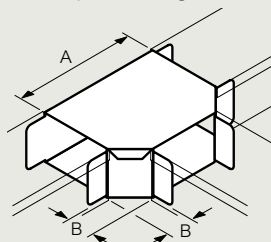
- for Cat. No. MGR62 (150 x 150 mm trunking lengths) use Cat. No. MSIP66CLH change face unit + Cat. No. MGR662R x2 reducers + Cat. No. MGR66C coupler



Overall length (mm)	Trunking size (mm)	B (mm)
50 x 50	285	
75 x 75	310	
100 x 100	335	
150 x 150	385	
225 x 225	420	
300 x 300	495	

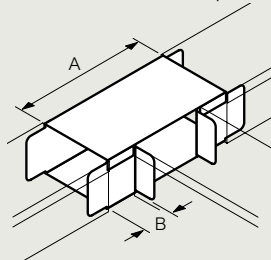
Tees

AGT top lid tee – gusset



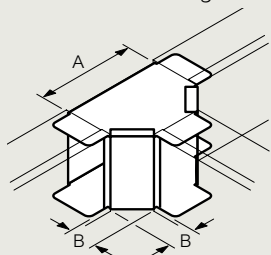
Width	A	B
50	100	25
75	125	25
100	150	25
150	200	25
225	275	25
300	350	25

AST inside lid tee – square



Width	A	B
50	120	35
75	145	35
100	170	35
150	220	35
225	295	35
300	370	35

BGT inside lid tee – gusset



Up to 150 wide

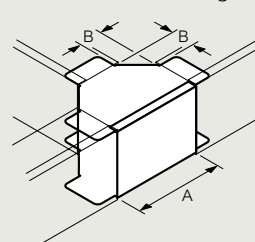
Depth	A	B
50	120	35
75	145	35
100	170	35
150	220	35

225 and 300 wide

Depth	A	B
50	162	35
75	187	35
100	212	35
150	262	35
225	337	35
300	412	35

Tees (continued)

CGT outside lid tee – gusset



Up to 150 wide

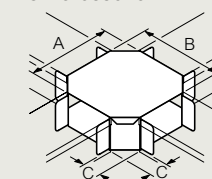
Depth	A	B
50	100	25
75	125	25
100	150	25
150	200	25

225 and 300 wide

Depth	A	B
50	100	25
75	125	25
100	150	25
150	200	25
225	275	25
300	350	25

Crossovers

AGX crossover

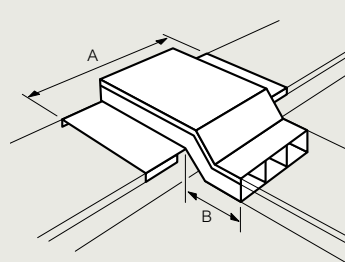


Width	A	B	C
50	100	100	25
75	125	125	25
100	150	150	25
150	200	200	25
225	275	275	25
300	350	350	25

Dimensions are identical for single and multi-compartment

Offset tees and crossovers

Offset tee

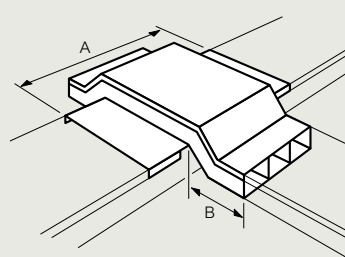


Width and branch of tee	A
50	150
75	175
100	200
150	250
225	325
300	400

Depth of through trunking	B
50	130
75	160
100	196
150	266
225	373
300	478

Note : There is no loss of cable capacity when using offset tees and crossovers

Offset crossover



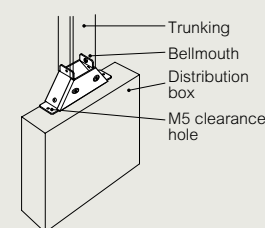
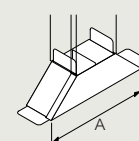
Width of crossover	A
50	150
75	175
100	200
150	250
225	325
300	400

Depth of through trunking	B
50	130
75	160
100	196
150	266
225	373
300	478

Width and Depth refer to trunking sizes
Dimensions are identical for single and multi-compartment

Each offset tee is supplied complete with fixing bracket and M5 pozi pan head screw and nut
Offset tees can be inverted to allow cables to branch off on opposite sides of trunking

Bellmouths



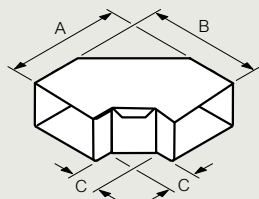
Width	A
50	147
75	172
100	197
150	247
225	322
300	397

Width refers to trunking sizes
Dimensions are identical for single and multi-compartment

All dimensions (mm) are nominal

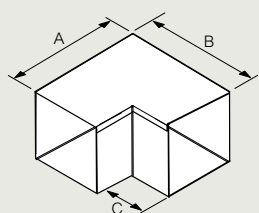
■ 90° bends

AGL top lid 90° bend – gusset



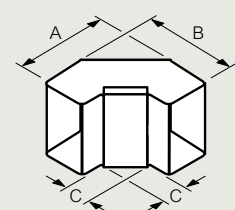
Width	A	B	C
50	105	105	53
75	130	130	53
100	155	155	53
150	205	205	53
225	280	280	53
300	355	355	53

ASL top lid 90° bend – square



Width	A	B	C
50	105	105	53
75	130	130	53
100	155	155	53
150	205	205	53
225	280	280	53
300	355	355	53

BGL inside lid 90° bend – gusset



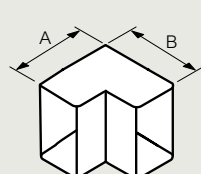
Up to 150 wide

Depth	A	B	C
50	105	105	53
75	130	130	53
100	155	155	53
150	205	205	53

225 and 300 wide

Depth	A	B	C
50	105	105	53
75	130	130	53
100	155	155	53
150	205	205	53
225	280	280	53
300	355	355	53

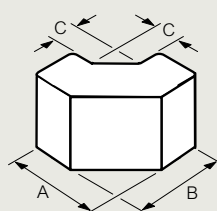
BSL inside lid 90° bend – square



Depth	A	B	C
50	110	110	58
75	135	135	58
100	160	160	58
150	210	210	58
225	285	285	58
300	360	360	58

■ 90° bends (continued)

CGL outside lid 90° bend – gusset



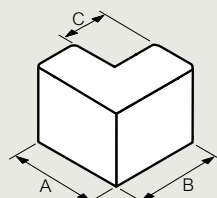
Up to 150 wide

Depth	A	B	C
50	105	105	53
75	130	130	53
100	155	155	53
150	205	205	53

225 and 300 wide

Depth	A	B	C
50	105	105	53
75	130	130	53
100	155	155	53
150	205	205	53
225	280	280	53
300	355	355	53

CSL outside lid 90° bend – square



Up to 150 wide

Depth	A	B	C
50	105	105	53
75	130	130	53
100	155	155	53
150	205	205	53

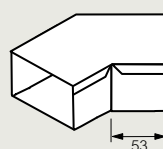
225 and 300 wide

Depth	A	B	C
50	105	105	53
75	130	130	53
100	155	155	53
150	205	205	53
225	280	280	53
300	355	355	53

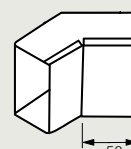
Width and depth refer to trunking sizes
Dimensions are identical for single and multi-compartment

■ 45° bends

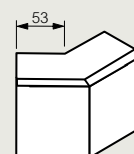
AL top lid 45° bend



BL inside lid 45° bend

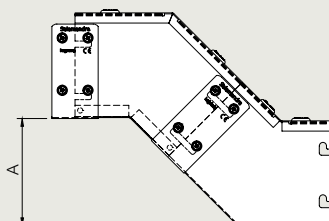


CL outside lid 45° bend



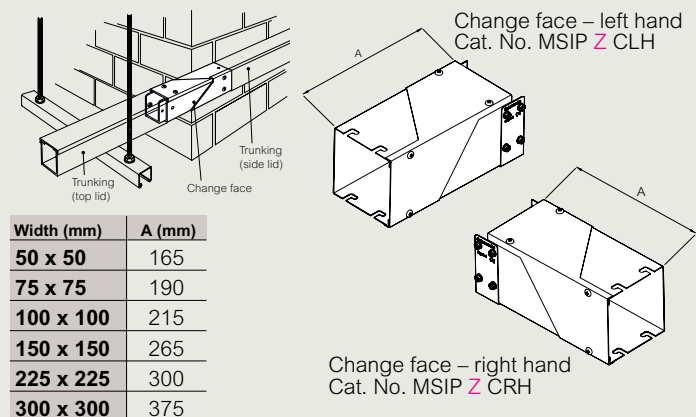
Dimensions are identical for single and multi-compartment

Fitting to fitting (CL and BL)



Depth	A
50	90
75	97
100	104
150	119

Change faces



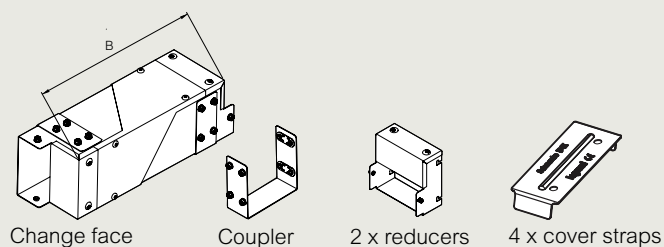
Width (mm)	A (mm)
50 x 50	165
75 x 75	190
100 x 100	215
150 x 150	265
225 x 225	300
300 x 300	375

Width refers to trunking sizes

For non-square trunking, change face units must be used in conjunction with reducers, couplers and cover straps

For example :

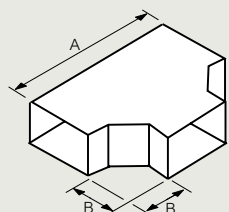
- for Cat. No. MGR62 (150 x 150 mm trunking lengths) use Cat. No. MSIP66CLH change face unit + Cat. No. MGR662R x 2 reducers + Cat. No. MGR66C coupler + Cat. No. MGIP6CS cover strap x 4



Overall length (mm)	B (mm)
Trunking size (mm)	
50 x 50	340
75 x 75	365
100 x 100	390
150 x 150	440
225 x 225	475
300 x 300	550

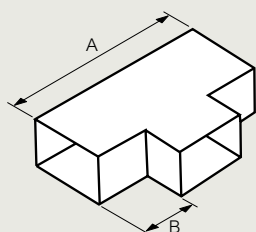
Tees

AGT top lid tee – gusset



Width	A	B
50	157	53
75	182	53
100	207	53
150	257	53
225	332	53
300	407	53

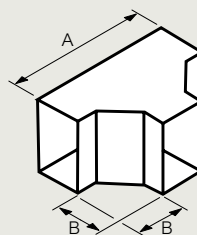
AST inside lid tee – square



Width	A	B
50	157	53
75	182	53
100	207	53
150	257	53
225	332	53
300	407	53

Tees (continued)

BGT inside lid tee – gusset



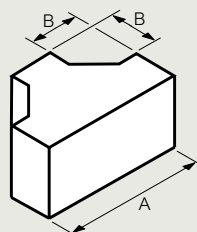
Up to 150 wide

Depth	A	B
50	157	53
75	182	53
100	207	53
150	257	53

225 and 300 wide

Depth	A	B
50	157	53
75	182	53
100	207	53
150	257	53
225	332	53
300	407	53

CGT outside lid tee – gusset



Up to 150 wide

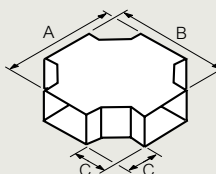
Depth	A	B
50	157	53
75	182	53
100	207	53
150	257	53

225 and 300 wide

Depth	A	B
50	157	53
75	182	53
100	207	53
150	257	53
225	332	53
300	407	53

Crossovers

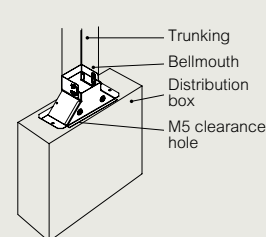
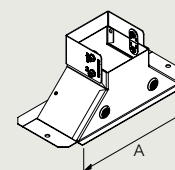
AGX crossover



Width	A	B	C
50	157	157	53
75	182	182	53
100	207	207	53
150	257	257	53
225	332	332	53
300	407	407	53

Dimensions are identical for single and multi-compartment

Bellmouths

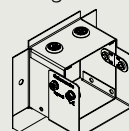
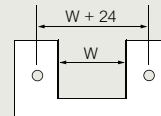


Width	A
50	165
75	190
100	215
150	265
225	340
300	415

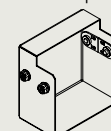
Width refers to trunking sizes
Dimensions are identical for single and multi-compartment

End caps and flanges

Flange



End cap

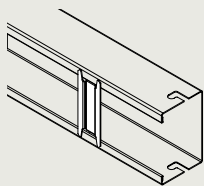


All dimensions (mm) are nominal

Salamandre® distribution trunking

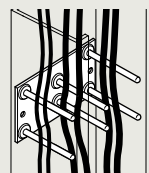
accessories – dimensions and technical information

■ Cable retainers



Used to hold cables in position when trunking is mounted with lid in vertical position, or on the underside of the run. Cable retainers are usually fitted at about one metre centres although this will depend upon the type of cable being installed.

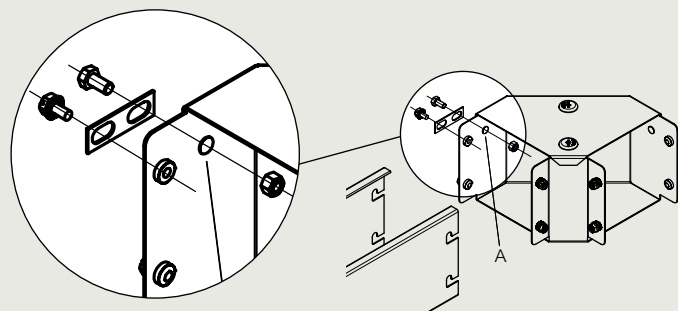
■ Pin racks



Pin rack

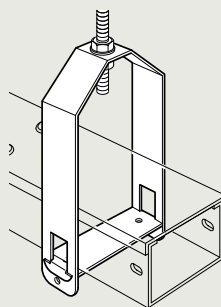
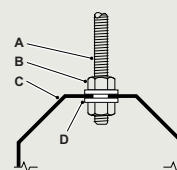
Available for trunking up to 150 mm wide. Supplied in packs of 10. Cables are laid into trunking systems and are pulled through duct systems. In both cases there is usually no need for any type of cleat or clamp unless there are vertical runs. Where vertical runs are required, wiring regulations give the necessary guidance on spacing of cable supports, known as 'pin racks'. Ordered according to the size of the trunking for single compartment trunking, or the size of each compartment for multi-compartment trunking.

■ Earth link



All fittings have 7 mm knockouts (A) for fixing an earth link. An M5 screw and nut are needed for fixing the earth link.

■ Stirrup hangers



- A M10 threaded rod
- B M10 nut
- C Hanger
- D Form A flat washers

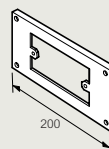
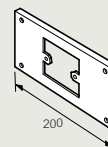
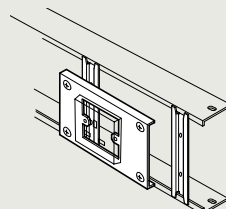
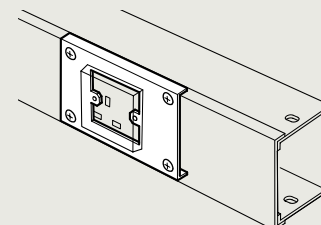
■ Loose separators



Fastenings not supplied. Pop rivet or spot weld on site to suit.

■ Socket plates

Socket plate fixing for screwfix and tamperproof trunking is fixed by retaining clips and screws (see p. 16).



Not applicable on IP4X installations.

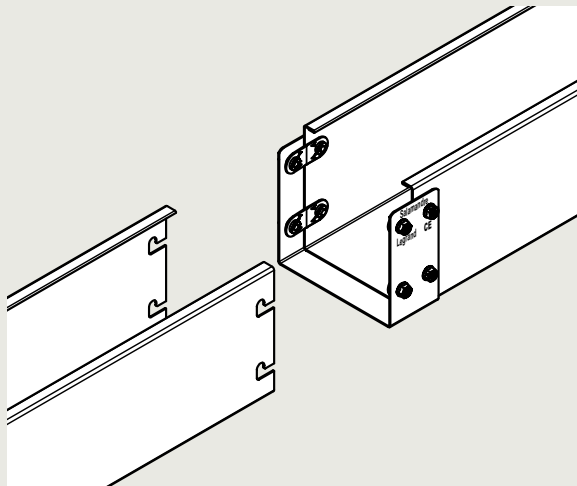
All dimensions (mm) are nominal.

Salamandre® distribution trunking

installation notes

■ Earth bonding

Cable trunking and ducting systems are designed to carry single insulated cables, and such systems must therefore provide the secondary protection required by the Wiring Regulations. This means trunking and ducting systems must be earth bonded together, and then connected to a suitable earth point. Salamandre trunking is designed to provide such earth bonding, provided that the system is fully assembled with all manufacturer's original components, including fixings, and that all fixings are fully tightened. This is achieved by a combination of serrations under the head of the fixing screws and the internal barbs on the fixing bars



■ Electromagnetic Compatibility (EMC)

Cable trunking and ducting systems are considered passive under normal conditions in respect of electromagnetic influences. The installation of current carrying cables may cause emissions and these cables may also be influenced by electromagnetic signals from elsewhere, but the degree of influence will depend on the nature of the installation and the apparatus connected to the system. Specific information relating to the details of cable separation required according to the type of signal, and further information on the subject of EMC, is provided in the relevant Standards and Regulations. However as a basic principle, if power and signal cables are run in separate compartments of a metal trunking system, then the metal segregation will significantly reduce the possibility of one circuit having undesirable effect influence upon another

■ Supporting cable trunking systems

The coupler between all types of cable trunking lengths is to provide electrical and mechanical connection between the lengths; it does not provide a load bearing connection between lengths. Consequently each length must be fully supported so that there is no significant bending force applied to the coupler

Each individual length of trunking is strong enough to carry the maximum number of cables that can be physically fitted into the trunking whilst still being able to correctly fit the cover without applying force. All supports must therefore be designed to carry each length individually without relying on the coupler

■ IP4X vs IPXXD

The index of protection is defined in BS EN 60529 – Degree of protection of enclosures of electrical equipment

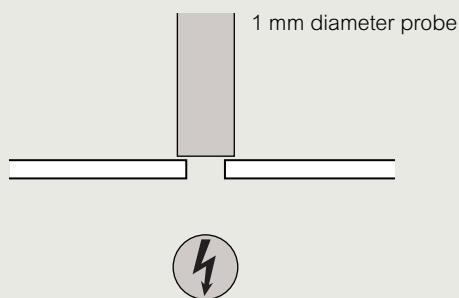
IP4X

Protected against solid bodies greater than 1mm in diameter. The test uses a 1mm diameter, 100mm long test probe / wire. The probe is applied with a force of $1N \pm 10\%$ and is not allowed to enter the enclosure being tested

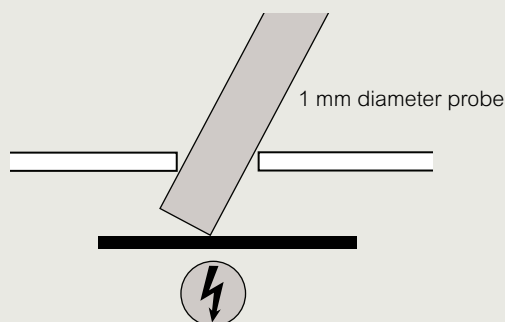
IPXXD

Solid bodies no greater than 1mm in diameter may enter the top of the enclosure but will remain clear of hazardous parts. The test uses a 1mm diameter, 100mm long test probe / wire. The top of the enclosure may allow entry of the 100mm long test wire, however the wire is not allowed to touch any hazardous parts within the enclosure

IP4X



IPXXD



Salamandre® distribution trunking

multi-compartment crossovers and compartment tees

■ Multi-compartment crossovers

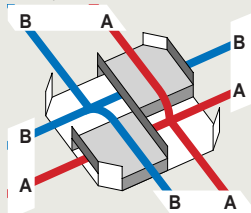
Approximately 50% of cable capacity is lost when using multi-compartment fittings

Where tees or fourway / crosses are used on a multi-compartment system, 'crossover bridges' must be used

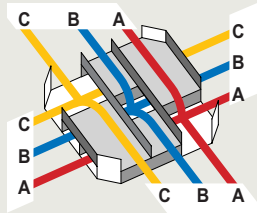
Crossover bridges are supplied as a removeable item, allowing the cables for compartment A to be laid into the trunking. Once these are in position, the crossover bridge can be fitted, and the cables for compartment B laid into position. This obviates the need for threading any cables through the crossover bridge

Examples :

2 compartment crossover



3 compartment crossover

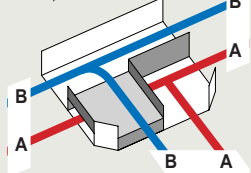


■ Compartment tees

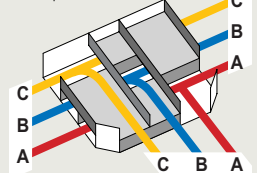
Approximately 50% of cable capacity is lost when using multi-compartment tees

Examples :

2 compartment



3 compartment



Salamandre® lighting trunking

technical information

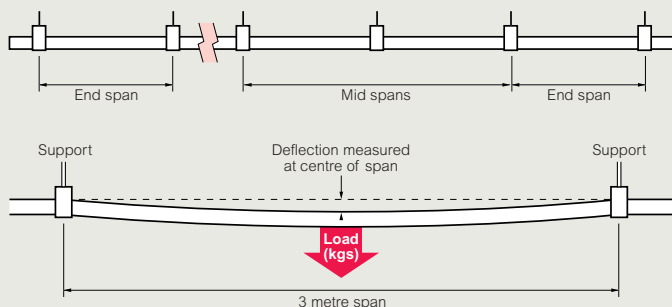
■ Lighting trunking deflection test

The trunking used in the test was Cat. No. LT2512 (50 x 50 mm, 5 metre lengths and 1.0mm thick) joined by long couplers Cat. No. LT2C. Lids were not fitted

Note : if tested with lids fitted, deflection measurements would be slightly reduced

The data shown below was gathered in tests by Legrand, and is given in good faith. It does not, however, constitute a warranty nor imply any guarantee. The loads were applied as point loads through suspension units Cat. No. LT2FS

An end span will give a deflection of about 1.8x the deflection of the continuous span. This can be eliminated by supporting the trunking run close to the end of the run

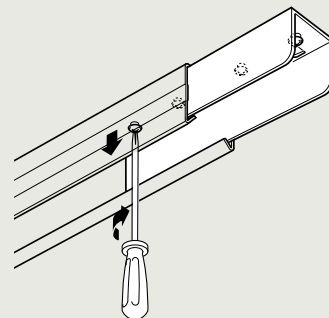


Load (kgs)	Deflection (mm)	
	Mid span 3 m	End span 3 m
6	2.1	3.9
9	2.5	4.6
12	3.6	6.6
15	4.5	8.1

■ Lighting trunking assembly

Coupler

Slide coupler half way into end of trunking. The friction fit tabs hold coupler in place while the first two screws are tightened. Slide next length of trunking onto assembly and tighten remaining screws.



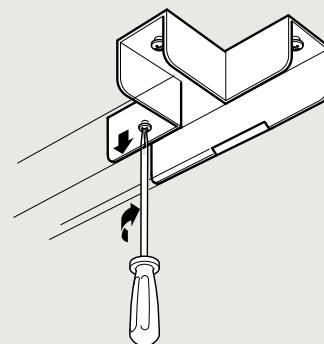
Earth continuity

Trunking body to body earth continuity is provided by the bite fit between the coupler and the return flanges on the trunking body

Top lid tee

To secure, tighten the M5 screws which press the tee against the top flange of the trunking body

The same applies for inside and outside lid tees

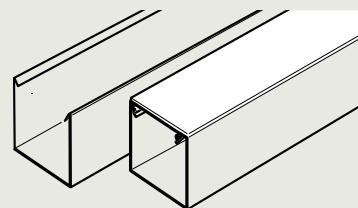


Earth continuity

Tee to trunking body earth continuity is provided by the bite fit between the tee and the return flanges on the trunking body

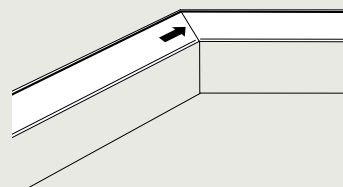
Trunking lids

Lids simply clip into the trunking. They can be cut to any angle to suit fitting



Fixing lids at a top lid 45° bend junction

Cut both lids at 22.5°, then fit into the trunking and slide into position



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Swifts[®] cable ladder

building on innovation



PRODUCT TECHNICAL GUIDE /
INCLUDING SWIFTRACK
AND SUPPORTING SYSTEMS

CONTENTS



INTRODUCTION

Swifts cable ladder features	2
Legrand worldwide	4
Sustainable development	4
UK manufacturing design and accreditation	5
Case studies	6
Intergraph	7

PRODUCT SELECTION

SWIFTS CABLE LADDER S STEMS

Selection charts	10-13
Straight lengths couplers and ttings	
Medium duty (Topaz)	14-15
Heavy duty (Sapphire)	16-17
Extra heavy duty (Emerald)	18-19
Supports	20
Ancillary items	21-23
Covers	23
Fasteners	24

SWIFTRACK CHANNEL SUPPORT S STEM

Channel and channel nuts	25
Cantilever arms	26
Framework brackets	
clamps and accessories	27-28
Standard fixings and fasteners	29-30

CEILING SUPPORT S STEM

Heavy duty	31
------------	----

TECHNICAL SPECIFICATIONS

SWIFTS CABLE LADDER S STEMS

Straight lengths	34-36
Rung details	37
Diagonal bracing	37
Couplers straight lengths	38-42
Pre-fabrication of cable ladder runs	43
Identification and recognition of ttings	43
Couplers ttings	44-45
Flat bends	46-49
Inside and outside risers	50-61
Equal tees	62
Unequal tees	63-68
Branch pieces	69
4 way crosspieces	70-71
Reducers straight / offset	72-73
Supports	74-78
Ancillary items	79-94
Covers	95-98

SWIFTRACK CHANNEL SUPPORT S STEM

Single channels plain and slotted	99
Back-to-back channels	100
Assembly fasteners and channel nuts	101
Cantilever arms	102-103
Framework brackets	104-107
Beam clamps pipe clamps and accessories	107-108

CEILING SUPPORT S STEM

Heavy duty	109
------------	-----

DESIGN NOTES

Selecting the right finish	112-117
Finishes	118-121
Installation of services	122-131
Structural support characteristics	132-139
Packaging handling storage and safety	140-141
Relevant British standards	142-143

Swifts cable ladder... faster by design

An established favourite in the UK and abroad this comprehensive system of slotted rail cable ladder enables the coupling of lengths and fittings without the need for drilling with fewer components and a wealth of innovative time-saving installation features. Swifts cable ladder remains the market leader.



Fewer components... greater time savings

Continual product development and design innovation means that Swifts cable ladder is over 50% faster to install when connecting fittings to lengths...

Integral couplers on all fittings

Number of required fastener sets halved

Two part quick-fit fasteners

50% fewer fixing components





Save time... save money

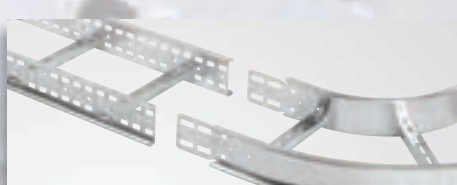
The long-term success of Swifts cable ladder is built on design innovation and time-saving features that put us yet another rung ahead of the rest

The inclusion of **integral couplers on all ladder fittings** used together with our **quick-fit fasteners** more than halves the number of required fixings and dramatically cuts installation time and cost. Supplied as standard on all Topaz Sapphire and Emerald fittings this coupling technique benefits every installation type from medium duty right through to extra heavy duty.

Time-saving innovations reduce man hours and energy usage on site including fewer components for improved assembly times

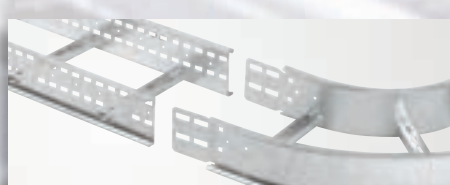


PRODUCT RANGES



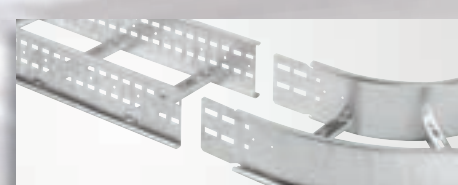
TOPAZ - MEDIUM DUTY

Generally suitable for spans up to 3 m
Side rail height: 100 mm
Available cabling space: 69 mm
Supplied as standard in 3 m lengths
Finishes: G (hot dip galvanised)
D (deep galvanised) and
S (stainless steel)



SAPPHIRE - HEAVY DUTY

Generally suitable for spans up to 3.5 m
Side rail height: 125 mm
Available cabling space: 94 mm
Supplied as standard in 3 m lengths
(lengths up to 6 m available on request)
Finishes: G (hot dip galvanised)
D (deep galvanised) S (stainless steel)
and E (powder coated)



EMERALD - EXTRA HEAVY DUTY

Generally suitable for spans up to 4 m
Side rail height: 150 mm
Available cabling space: 119 mm
Supplied as standard in 3 m lengths
(lengths up to 6 m available on request)
Finishes: G (hot dip galvanised)
D (deep galvanised) and
S (stainless steel)

Legrand - global strength built on local knowledge

With a **share of the global market** the Legrand Group is the world specialist in cable management systems and with our established Swifts Salamandre and Arena-Walsall ranges our cable management division has a **firm leadership position** in the UK.



Sustainable development

From design through to manufacturing the Legrand Group selects materials and processes that respect people and the environment.

Efficient and environmentally aware product design

Product functions that help to avoid energy waste

Management of manufacturing and logistics sites

Integration of environmental concerns and ISO 14001 procedures at the Group's global sites.

84% of sites are ISO 14001:2004 accredited including all UK sites.



Legrand in the UK - powered by specialists

In the UK Legrand has developed a customer focused structure which harnesses the power of its market leading specialist brands to deliver innovative integrated solutions for every phase of construction.

Quality assured UK manufacturing



Swifts cable management ranges have been designed and manufactured at our Scarborough (UK) site since the 1960s. And with its own in-house galvanising facility every product is finished to the highest possible standard following strict quality control guidelines.



Legrand Electric holds ISO 9001 : 2008 Quality Assessment Registrations from Intertek Systems Certification UK and Bureau Veritas

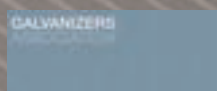


All of Legrand's UK manufacturing sites are accredited to ISO 14001 : 2004 Environmental Management System



Support from design to installation

With in-depth knowledge and experience our expert cable management team provides customers with support and advice for any installation including bespoke solutions (specials) from our in-house design team that can cope with the most demanding requirements for the most challenging projects.



Legrand - the cable management experts

Trusted for installations large and small

Swifts cable ladder has been tried and tested in installations of all sizes throughout the UK and beyond from medium duty requirements in small commercial buildings through to extra heavy duty installations in refineries and heavy industry applications.



Cable management project examples

Process power and marine

Tengiz Second Generation - Kazakhstan
Vesta Wind Turbine Manufacturing Plant - Isle of Wight
Norilsk Nickel Slag Cleaning Furnaces Upgrade - Siberia
Ling Au Nuclear Plant - China
Shell EA and KC upgrades - Nigeria
Dukhan Facilities Upgrade - Qatar
Clare Offshore Platform - Shetlands
Eggborough Power Station - UK

Transport and infrastructure

Dublin Airport - Ireland
Dubai Airport - Dubai
Kings Cross regeneration - London
Channel Tunnel Rail Link - UK/France
Millau Viaduct - France
Tyne Tunnel - UK
Heathrow T2/T3/T4/T5 - UK
National Convention Centre Car Park - Qatar

General

MOD Corsham - Wiltshire
Grand Mosque - Dubai
Hong Kong Hockey Club - Hong Kong
Landmark Tower - Dubai
St. Davids II - Cardiff, Wales
Diwan Al Amiri Utility Building - Qatar
Arcapita Bank - Bahrain
Tian in Electronics Plant - China

Specification data for Intergraph AVEVA and Bentley engineering software systems

As part of our ongoing commitment to customer support Legrand's Swifts cable ladder and cable tray ranges are now integrated into the following plant design modelling systems :

Intergraph's PDS and Smartplant 3D

AVEVA's PDMS

Bentley Systems BBES and BRCM

For many industries achieving higher production goals within budget constraints and strict regulatory requirements is a challenging prospect. Applying engineering software allows for a high quality fast-build maintainable system which offers full work flow managed integration across the entire project enterprise.

Using a library of intelligent Swifts cable ladder and cable tray product models inside a highly productive 3D design software system allows design teams to produce accurate and efficient cable management routing schemes plans and procurement lists as a fully integrated part of the overall plant design.

Key benefits include :

Whole plant lifecycle from FEED (Front End Engineering Design) detailed design and construction through to handover full operation and beyond

Database driven applications manage all of the engineering information in one location

Intelligent rules and relationships including clash detection features

High project visibility and review functionality creating more efficient and productive operations

High performance 3D visuals giving interactive walkthrough and realism features

Making the best use of global design teams leading to concurrent engineering



INTERGRAPH

AVEVA

Bentley
Content Partner

PRODUCT SELECTION



IN THIS SECTION

SWIFTS CABLE LADDER S STEMS

Selection charts 10-13

Medium duty Topaz

Straight lengths	14
Couplers straight lengths	14
Couplers ttings	14
Flat bends	14
Inside and outside risers	14
Equal tees	15
Unequal tees	15
Branch pieces	15
4 way crosspieces	15
Straight reducers	15
Offset reducers	15

Heavy duty Sapphire

Straight lengths	16
Couplers straight lengths	16
Couplers ttings	16
Flat bends	16
Inside and outside risers	16
Equal tees	17
Unequal tees	17
Branch pieces	17
4 way crosspieces	17
Straight reducers	17
Offset reducers	17

Extra heavy duty Emerald

Straight lengths	18
Couplers straight lengths	18
Couplers ttings	18
Flat bends	18
Inside and outside risers	18
Equal tees	19
Unequal tees	19
Branch pieces	19
4 way crosspieces	19
Straight reducers	19
Offset reducers	19

Supports 20

Ancillary items 21-23

Covers 23

Fasteners 24

SWIFTRACK CHANNEL SUPPORT S STEM

Channel and channel nuts 25

Cantilever arms 26

Framework brackets clamps and accessories 27-28

Standard xings and fasteners 29-30

CEILING SUPPORT S STEM

Heavy duty 31

Swifts medium duty Topaz and heavy duty Sapphire

cable ladder systems

MEDIUM DUTY (TOPAZ)

MEDIUM DUTY (TOPAZ)	LADDER		COUPLERS			FITTINGS ⁽¹⁾					
	Widths (mm)	Straight lengths (3 m) F = finish	Coupler sets F = finish	Fitting to fitting coupler sets F = finish	Fitting to straight length fastener sets ⁽¹⁾ F = finish	Flat bends A = angle r = radius F = finish	Inside risers A = angle r = radius F = finish	Outside risers A = angle r = radius F = finish	Equal tees r = radius F = finish	Unequal tees B = branch r = radius F = finish	
	150	ZL 150 F	ZC F	ZFC F	LF F M10P50	ZFB 150 ArF	ZIR 150 ArF	ZOR 150 ArF	ZT 150 r R F	ZUT 150 Br R F	
	300	ZL 300 F	ZC F	ZFC F	LF F M10P50	ZFB 300 ArF	ZIR 300 ArF	ZOR 300 ArF	ZT 300 r R F	ZUT 300 Br R F	
	450	ZL 450 F	ZC F	ZFC F	LF F M10P50	ZFB 450 ArF	ZIR 450 ArF	ZOR 450 ArF	ZT 450 r R F	ZUT 450 Br R F	
	600	ZL 600 F	ZC F	ZFC F	LF F M10P50	ZFB 600 ArF	ZIR 600 ArF	ZOR 600 ArF	ZT 600 r R F	ZUT 600 Br R F	
	750	ZL 750 F	ZC F	ZFC F	LF F M10P50	ZFB 750 ArF	ZIR 750 ArF	ZOR 750 ArF	ZT 750 r R F	ZUT 750 Br R F	
	900	ZL 900 F	ZC F	ZFC F	LF F M10P50	ZFB 900 ArF	ZIR 900 ArF	ZOR 900 ArF	ZT 900 r R F	ZUT 900 Br R F	

HEAVY DUTY (SAPPHIRE)

HEAVY DUTY (SAPPHIRE)	LADDER		COUPLERS			FITTINGS ⁽¹⁾					
	Widths (mm)	Straight lengths (3 m) ⁽²⁾ F = finish	Coupler sets F = finish	Fitting to fitting coupler sets F = finish	Fitting to straight length fastener sets ⁽¹⁾ F = finish	Flat bends A = angle r = radius F = finish	Inside risers A = angle r = radius F = finish	Outside risers A = angle r = radius F = finish	Equal tees r = radius F = finish	Unequal tees B = branch r = radius F = finish	
	150	PL 150 F	PC F	PFC F	LF F M10P50	PFB 150 ArF	PIR 150 ArF	POR 150 ArF	PT 150 r R F	PUT 150 Br R F	
	300	PL 300 F	PC F	PFC F	LF F M10P50	PFB 300 ArF	PIR 300 ArF	POR 300 ArF	PT 300 r R F	PUT 300 Br R F	
	450	PL 450 F	PC F	PFC F	LF F M10P50	PFB 450 ArF	PIR 450 ArF	POR 450 ArF	PT 450 r R F	PUT 450 Br R F	
	600	PL 600 F	PC F	PFC F	LF F M10P50	PFB 600 ArF	PIR 600 ArF	POR 600 ArF	PT 600 r R F	PUT 600 Br R F	
	750	PL 750 F	PC F	PFC F	LF F M10P50	PFB 750 ArF	PIR 750 ArF	POR 750 ArF	PT 750 r R F	PUT 750 Br R F	
	900	PL 900 F	PC F	PFC F	LF F M10P50	PFB 900 ArF	PIR 900 ArF	POR 900 ArF	PT 900 r R F	PUT 900 Br R F	

(1) When connecting fittings to straight lengths, use fastener sets (not available in D finish) LFGM10P50, LFSM10P50, see p. 24

(2) 6 m lengths available on special request, contact us on +44 (0) 845 605 4333

FITTINGS ⁽¹⁾				
Branch piece F = finish	4 way crosspieces r = radius F = finish	Straight reducers K = reduced width F = finish	Offset reducers (left hand) K = reduced width F = finish	Offset reducers (right hand) K = reduced width F = finish
ZB 150 300 R F	ZX 150 r R F	—	—	—
ZB 300 300 R F	ZX 300 r R F	ZSR 300 K F	ZLR 300 K F	ZRR 300 K F
ZB 450 300 R F	ZX 450 r R F	ZSR 450 K F	ZLR 450 K F	ZRR 450 K F
ZB 600 300 R F	ZX 600 r R F	ZSR 600 K F	ZLR 600 K F	ZRR 600 K F
ZB 750 300 R F	ZX 750 r R F	ZSR 750 K F	ZLR 750 K F	ZRR 750 K F
ZB 900 300 R F	ZX 900 r R F	ZSR 900 K F	ZLR 900 K F	ZRR 900 K F

Key : selecting medium duty (Topaz) fittings

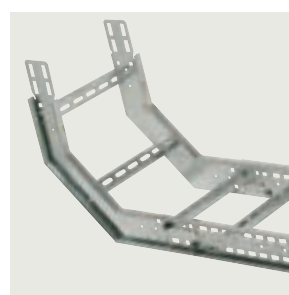
explore the letter combination in red with your choice from the table in option

or

B Branch width (mm)

F Finish (hot dip galvanized or painted)
(deep galvanized) S (stainless steel)
arrowed width between a reducer (mm)

r radius (mm)



Inside risers. See p. 14



Flat bends. See p. 14

FITTINGS ⁽¹⁾				
Branch piece F = finish	4 way crosspieces r = radius F = finish	Straight reducers K = reduced width F = finish	Offset reducers (left hand) K = reduced width F = finish	Offset reducers (right hand) K = reduced width F = finish
PB 150 300 R F	PX 150 r R F	—	—	—
PB 300 300 R F	PX 300 r R F	PSR 300 K F	PLR 300 K F	PRR 300 K F
PB 450 300 R F	PX 450 r R F	PSR 450 K F	PLR 450 K F	PRR 450 K F
PB 600 300 R F	PX 600 r R F	PSR 600 K F	PLR 600 K F	PRR 600 K F
PB 750 300 R F	PX 750 r R F	PSR 750 K F	PLR 750 K F	PRR 750 K F
PB 900 300 R F	PX 900 r R F	PSR 900 K F	PLR 900 K F	PRR 900 K F

Key : selecting heavy duty (Sapphire) fittings

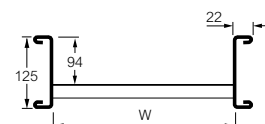
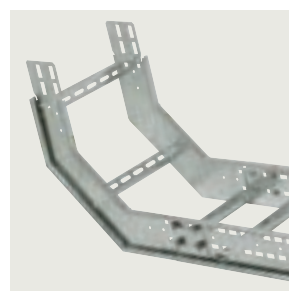
explore the letter combination in red with your choice from the table in option

or

B Branch width (mm)

F Finish (hot dip galvanized or painted)
(deep galvanized) S (stainless steel)
E (powder coated)
arrowed width between a reducer (mm)

r radius (mm)



Inside risers. See p. 16

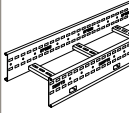
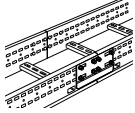
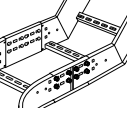
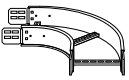
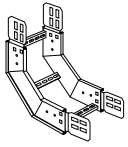
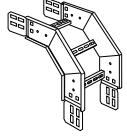
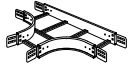
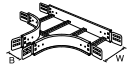


Flat bends. See p. 16

Swifts extra heavy duty Emerald

cable ladder systems

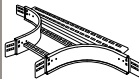
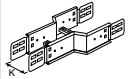
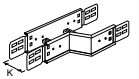
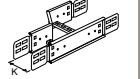
EXTRA HEAVY DUTY (EMERALD)

EXTRA HEAVY DUTY (EMERALD)	LADDER		COUPLERS			FITTINGS ⁽¹⁾				
	Widths (mm)	Emerald straight lengths (3 m) ⁽²⁾ F = finish	Coupler sets F = finish	Fitting to fitting coupler sets F = finish	Fitting to straight length fastener sets ⁽¹⁾ F = finish	Flat bends A = angle r = radius F = finish	Inside risers A = angle r = radius F = finish	Outside risers A = angle r = radius F = finish	Equal tees r = radius F = finish	Unequal tees B = branch r = radius F = finish
										
	150	EL 150 F	EC F	EFC F	LF F M10P50	EFB 150 A r F	EIR 150 A r F	EOR 150 A r F	ET 150 r R F	EUT 150 B r R F
	300	EL 300 F	EC F	EFC F	LF F M10P50	EFB 300 A r F	EIR 300 A r F	EOR 300 A r F	ET 300 r R F	EUT 300 B r R F
	450	EL 450 F	EC F	EFC F	LF F M10P50	EFB 450 A r F	EIR 450 A r F	EOR 450 A r F	ET 450 r R F	EUT 450 B r R F
	600	EL 600 F	EC F	EFC F	LF F M10P50	EFB 600 A r F	EIR 600 A r F	EOR 600 A r F	ET 600 r R F	EUT 600 B r R F
	750	EL 750 F	EC F	EFC F	LF F M10P50	EFB 750 A r F	EIR 750 A r F	EOR 750 A r F	ET 750 r R F	EUT 750 B r R F
	900	EL 900 F	EC F	EFC F	LF F M10P50	EFB 900 A r F	EIR 900 A r F	EOR 900 A r F	ET 900 r R F	EUT 900 B r R F

(1) When connecting fittings to straight lengths, use fastener sets (not available in D finish) LFGM10P50, LFSM10P50, see p. 24

(2) 6 m lengths available on special request, contact us on +44 (0) 845 605 4333

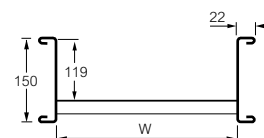
FITTINGS⁽¹⁾

Branch piece F = finish	4 way crosspieces r = radius F = finish	Straight reducers K = reduced width F = finish	Offset reducers (left hand) K = reduced width F = finish	Offset reducers (right hand) K = reduced width F = finish
				
EB 150 300 R F	EX 150 r R F	—	—	—
EB 300 300 R F	EX 300 r R F	ESR 300 K F	ELR 300 K F	ERR 300 K F
EB 450 300 R F	EX 450 r R F	ESR 450 K F	ELR 450 K F	ERR 450 K F
EB 600 300 R F	EX 600 r R F	ESR 600 K F	ELR 600 K F	ERR 600 K F
EB 750 300 R F	EX 750 r R F	ESR 750 K F	ELR 750 K F	ERR 750 K F
EB 900 300 R F	EX 900 r R F	ESR 900 K F	ELR 900 K F	ERR 900 K F

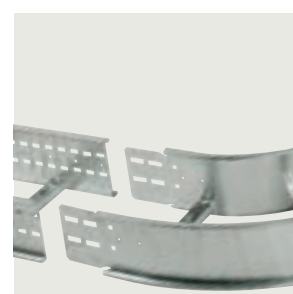
Key : selecting extra heavy duty (Emerald) fittings
 replace the letter 'h' in red with your choice from the following options

h = () or
B Branch width (mm)
F Finish (hot dip galvanized or untreated)
 (deep galvanized) **S** (stainless steel)
 arrowed width when using a reducer (mm)

r = radius (mm)



Inside risers. See p. 18

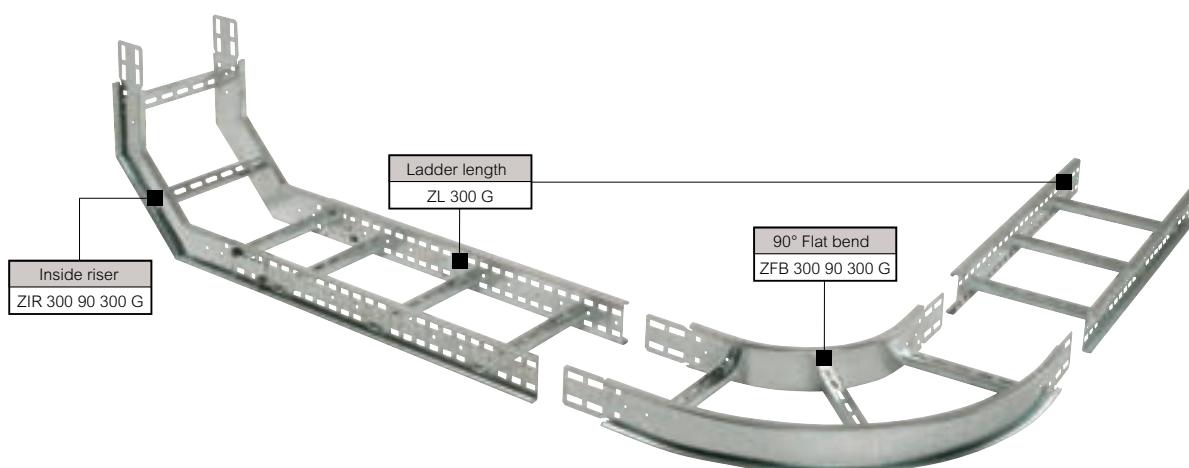


Flat bends. See p. 18

Swifts medium duty Topaz cable ladder

lengths and fittings

100



Selection chart (p. 10-11)

Dimensions and technical information : lengths (p. 34) ; coupler sets (p. 38-45) ; fittings (p. 46-73)

Design notes (p. 112)

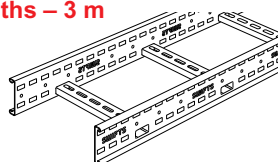
Loading graphs (p. 34)

When connecting fittings to straight lengths, use fastener sets (see below)

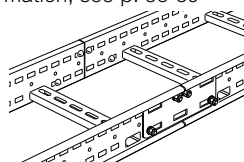
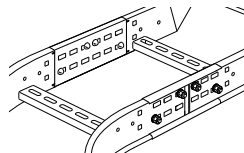
Rung spacing : 300 mm between centres

Standard radius for fittings : 300 and 600 mm

Pack	Cat. Nos.	Straight lengths – 3 m
1	ZL 150 F	150 mm width
1	ZL 300 F	300 mm width
1	ZL 450 F	450 mm width
1	ZL 600 F	600 mm width
1	ZL 750 F	750 mm width
1	ZL 900 F	900 mm width
		For technical information, see p. 34

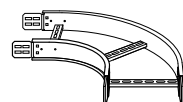
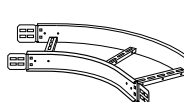
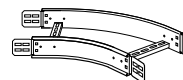
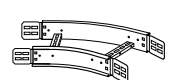
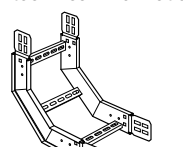
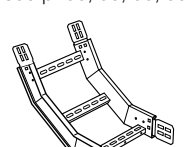
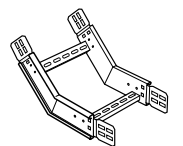
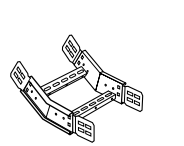
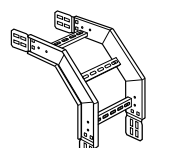
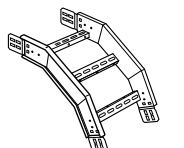
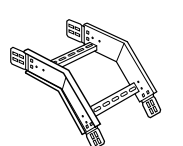
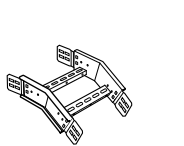


1	ZC F	Coupler sets Straight length to straight length Supplied in pairs, with fasteners (4 per coupler) Use to couple straight lengths to straight lengths For technical information, see p. 38-39
1	ZFC F	Fitting to fitting Supplied in pairs, with fasteners (4 per coupler) Use to couple fitting to fitting For technical information, see p. 44-45



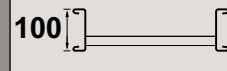
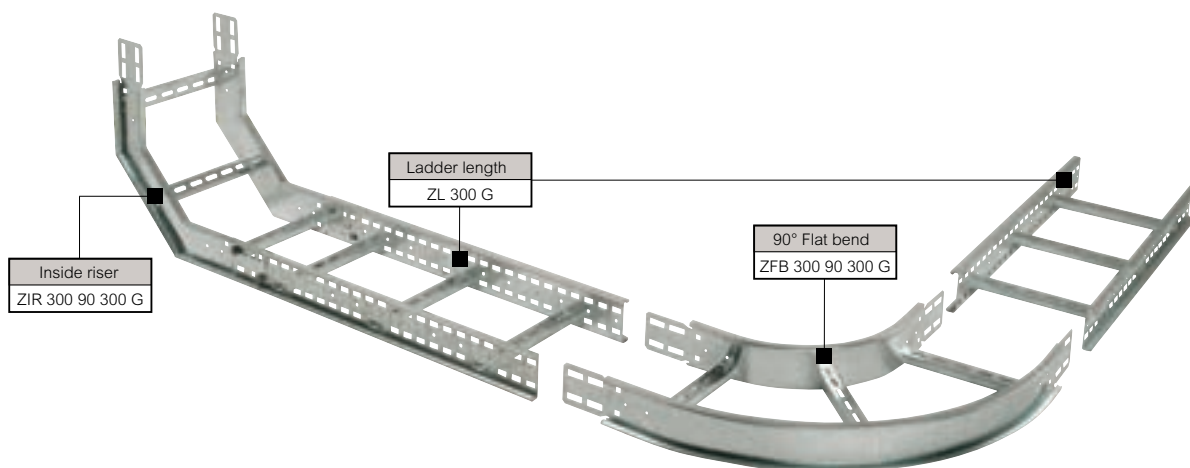
50	LFGM10P50	Fastener sets
50	LFSM10P50	Comprise M10 coach bolt and flange nut
		Hot dip galvanised
		Stainless steel



Pack	Cat. Nos.	Fittings
1	ZFB WArF	Flat bends For technical information, see p. 46-49  90° Flat bend  60° Flat bend  45° Flat bend  30° Flat bend
1	ZIR WArF	Inside risers For technical information, see p. 50, 53, 56, 59  90° Inside riser  60° Inside riser  45° Inside riser  30° Inside riser
1	ZOR WArF	Outside risers For technical information, see p. 50, 53, 56, 59  90° Outside riser  60° Outside riser  45° Outside riser  30° Outside riser

Swifts medium duty Topaz cable ladder

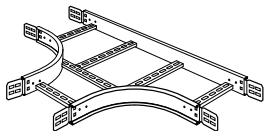
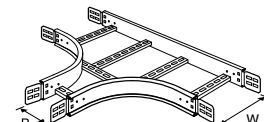
lengths and fittings continued

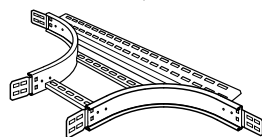
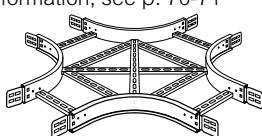
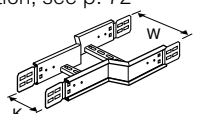
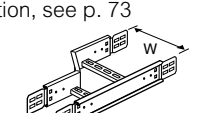
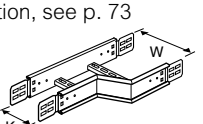


Selection chart (p. 10-11)
 Dimensions and technical information : lengths (p. 34) ; coupler sets (p. 38-45) ; fittings (p. 46-73)
 Design notes (p. 112)
 Loading graphs (p. 34)

When connecting fittings to straight lengths, use fastener sets (see opposite)

Rung spacing : 300 mm between centres
 Standard radius for fittings : 300 and 600 mm

Pack	Cat. Nos.	Fittings (continued)
1	ZTW ^r RF	Tees and crosspieces For all equal and unequal tees and crosspieces, include R in your ordering code to indicate radius dimension. See unequal tee example below Larger width/radius combinations are supplied in two identical halves with fasteners Equal tees For technical information, see p. 62 
1	ZUTW ^B rRF	Unequal tees Example : the ordering code for a hot dip galvanised unequal tee with a 300 main run (W) and a 150 branch (B) with a 600R radius : ZUT 300 150 600R G For technical information, see p. 63-68 

Pack	Cat. Nos.	Fittings (continued)
1	ZB W 300 R F	Branch piece Available in 300 R only For technical information, see p. 69 
1	ZXW ^r RF	4 way crosspiece For technical information, see p. 70-71 
1	ZSRWKF	Straight reducers For technical information, see p. 72 
1	ZLRWKF	Offset reducers – left hand For technical information, see p. 73 
1	ZRRWKF	Offset reducers – right hand For technical information, see p. 73 

Standard dimensions and finishes

ey ele tin medium duty (Topaz) ittin epla e the letter ho n
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Dimensions and finishes available to special order

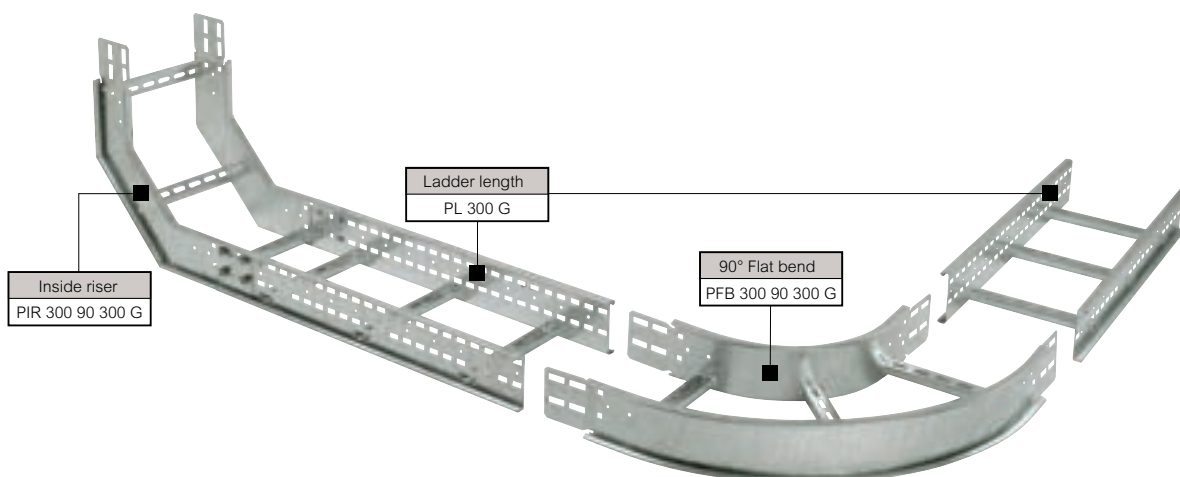
Contact us on +44 (0) 845 605 4333

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Swifts heavy duty Sapphire cable ladder

lengths and fittings

125



Selection chart (p. 10-11)
 Dimensions and technical information : lengths (p. 35) ; coupler sets (p. 38-45) ; fittings (p. 46-73)
 Design notes (p. 112)
 Loading graphs (p. 34)

When connecting fittings to straight lengths, use fastener sets (see below)

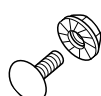
Rung spacing : 300 mm between centres
 Standard radius for fittings : 300 and 600 mm

Pack	Cat. Nos.	Straight lengths – 3 m
1	PL 150 F	150 mm width
1	PL 300 F	300 mm width
1	PL 450 F	450 mm width
1	PL 600 F	600 mm width
1	PL 750 F	750 mm width
1	PL 900 F	900 mm width

6 m lengths available on special request
 For technical information, see p. 35

1	PC F	Straight length to straight length Supplied in pairs, with fasteners (8 per coupler) Use to couple straight lengths to straight lengths For technical information, see p. 38-39
1	PFC F	Fitting to fitting Supplied in pairs, with fasteners (8 per coupler) Use to couple fitting to fitting For technical information, see p. 44-45

50	LFGM10P50	Fastener sets Comprise M10 coach bolt and flange nut Hot dip galvanised Stainless steel
50	LFSM10P50	

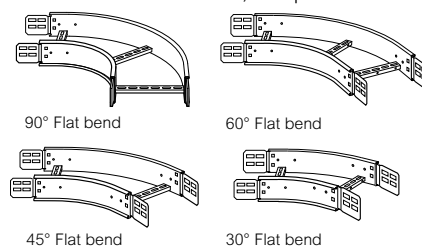


Pack	Cat. Nos.
1	PFB WArF
1	PIR WArF
1	POR WArF

Fittings

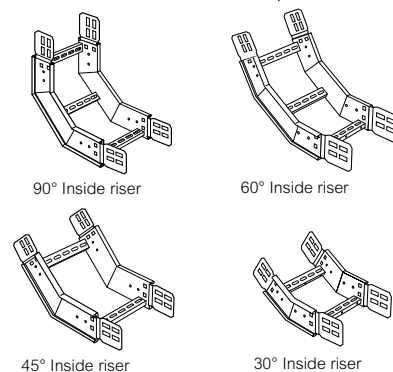
Flat bends

For technical information, see p. 46-49



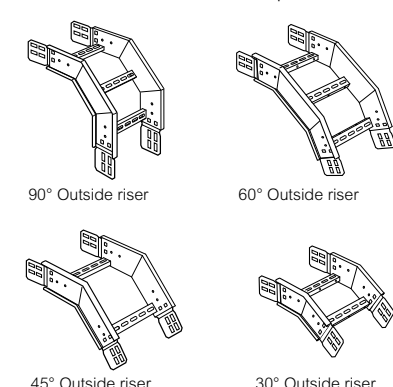
Inside risers

For technical information, see p. 51, 54, 57, 60



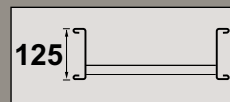
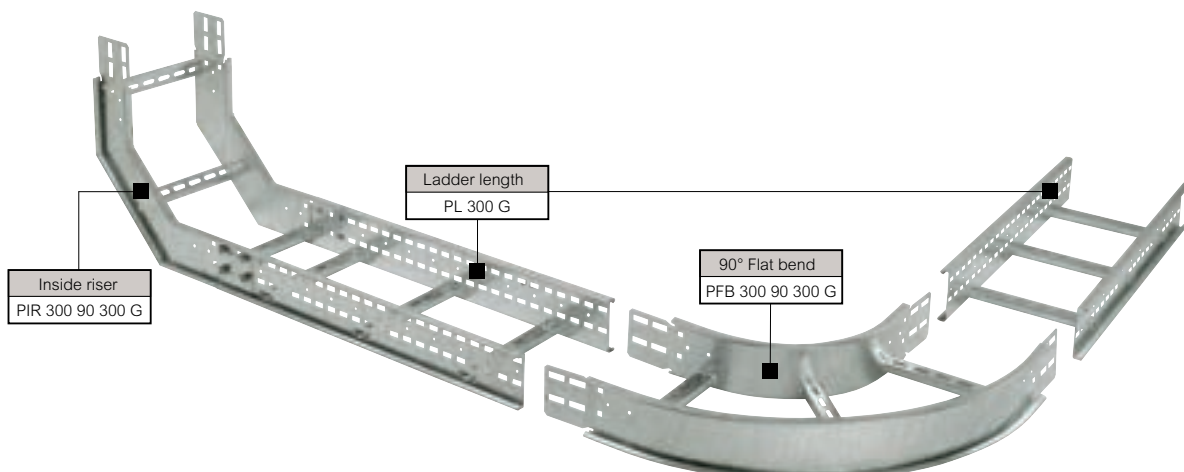
Outside risers

For technical information, see p. 51, 54, 57, 60



Swifts heavy duty Sapphire cable ladder

lengths and fittings continued



Selection chart (p. 10-11)
 Dimensions and technical information : lengths (p. 35) ; coupler sets (p. 38-45) ; fittings (p. 46-73)
 Design notes (p. 112)
 Loading graphs (p. 34)

When connecting fittings to straight lengths, use fastener sets (see opposite)

Rung spacing : 300 mm between centres
 Standard radius for fittings : 300 and 600 mm

Pack	Cat. Nos.	Fittings (continued)
1	PTW ^r RF	Tees and crosspieces For all equal and unequal tees and crosspieces, include R in your ordering code to indicate radius dimension. See unequal tee example below Larger width/radius combinations are supplied in two indential halves with fasteners Equal tees For technical information, see p. 62
1	PUTWB ^r RF	Unequal tees Example : the ordering code for a hot dip galvanised unequal tee with a 300 main run (W) and a 150 branch (B) with a 600R radius : PUT 300 150 600R G For technical information, see p. 63-68

Pack	Cat. Nos.	Fittings (continued)
1	PBW 300 R F	Branch piece. Available in 300 R only For technical information, see p. 69
1	PXW ^r RF	4 way crosspieces For technical information, see p. 70-71
1	PSRWKF	Straight reducers For technical information, see p. 72
1	PLRWKF	Offset reducers – left hand For technical information, see p. 73
1	PRRWKF	Offset reducers – right hand For technical information, see p. 73

Standard dimensions and finishes

every element in heavy duty (Sapphire) fitting is available in the letter 'h' or 'n' in red with your choice from the following options:
 idth ()
 n le () or
 B Branch idth (mm)
 F Finish (hot dip galvanised or a ter manu a ture)
 (deep galvanised) S (tainless steel) E (powder coated)
 arro ed idth when u in a reducer (mm)
 r radius (mm)

Dimensions and finishes available to special order

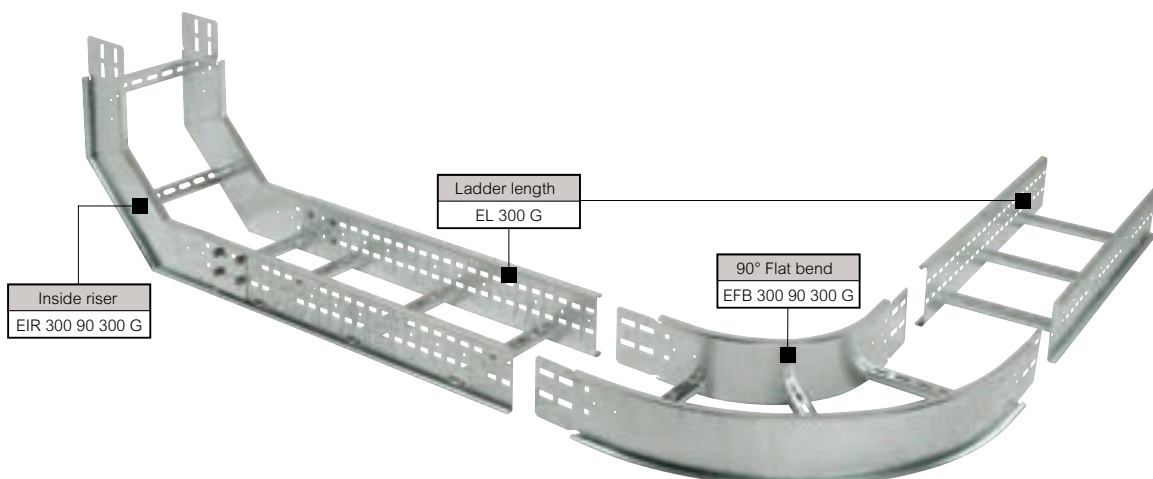
Contact us on +44 (0) 845 605 4333

radius (r) (mm) and
 un Type or type
 idth () (mm)
 and
 n le () available to u tomer pe i iation
 Finish (F) Pile and pa ivation on stainless steel

Swifts extra heavy duty Emerald cable ladder

lengths and fittings

150



Selection chart (p. 10-11)

Dimensions and technical information : lengths (p. 36) ; coupler sets (p. 38-45) ; fittings (p. 46-73)

Design notes (p. 112)

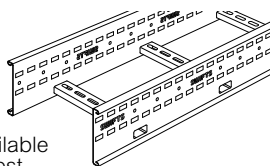
Loading graphs (p. 34)

When connecting fittings to straight lengths, use fastener sets (see below)

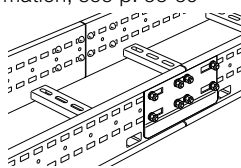
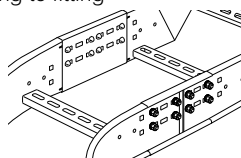
Rung spacing : 300 mm between centres

Standard radius for fittings : 300 and 600 mm

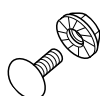
Pack	Cat. Nos.	Straight lengths – 3 m
1	EL 150 F	150 mm width
1	EL 300 F	300 mm width
1	EL 450 F	450 mm width
1	EL 600 F	600 mm width
1	EL 750 F	750 mm width
1	EL 900 F	900 mm width
		6 m lengths available on special request
		For technical information, see p. 36



Pack	Cat. Nos.	Coupler sets
1	EC F	Straight length to straight length Supplied in pairs, with fasteners (8 per coupler) Use to couple straight lengths to straight lengths For technical information, see p. 38-39
1	EFC F	Fitting to fitting Supplied in pairs, with fasteners (8 per coupler) Use to couple fitting to fitting For technical information, see p. 44-45



Pack	Cat. Nos.	Fastener sets
50	LFGM10P50	Comprise M10 coach bolt and flange nut
50	LFSM10P50	Hot dip galvanised
		Stainless steel

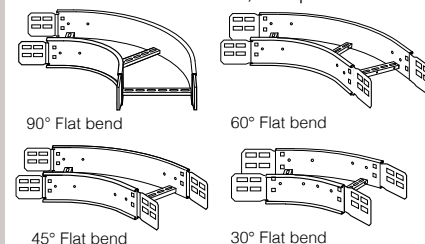


Pack	Cat. Nos.	Fittings
1	EFB WArF	Flat bends For technical information, see p. 46-49
1	EIR WArF	Inside risers For technical information, see p. 52, 55, 58, 61
1	EOR WArF	Outside risers For technical information, see p. 52, 55, 58, 61

Fittings

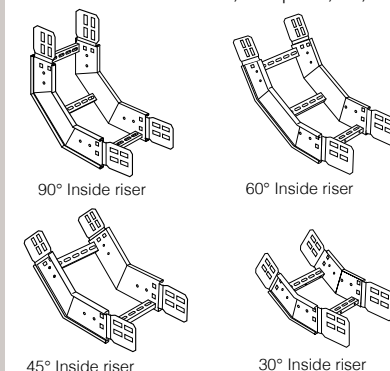
Flat bends

For technical information, see p. 46-49



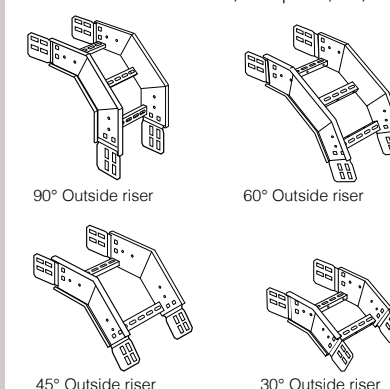
Inside risers

For technical information, see p. 52, 55, 58, 61



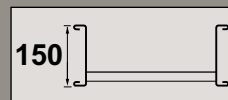
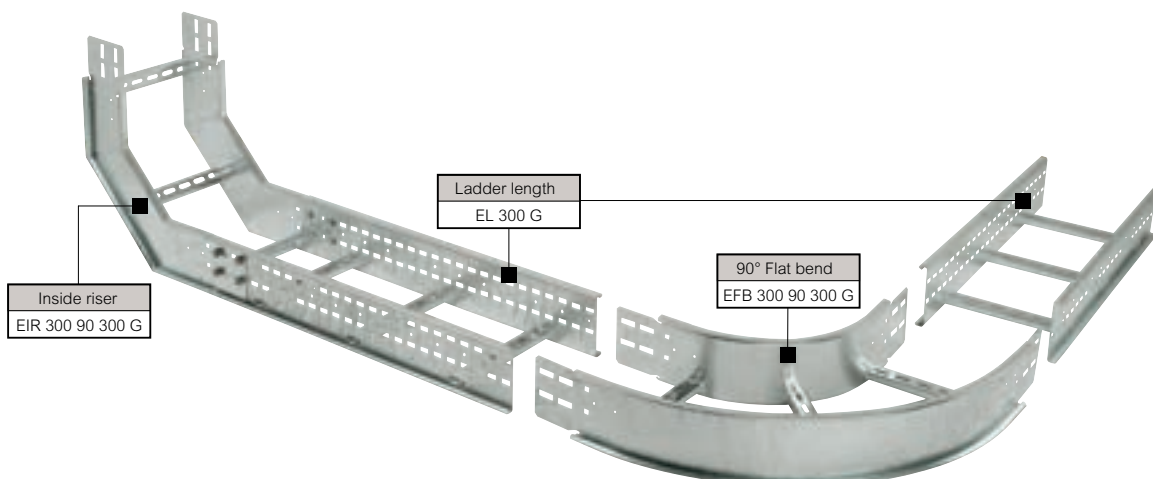
Outside risers

For technical information, see p. 52, 55, 58, 61



Swifts extra heavy duty Emerald cable ladder

lengths and fittings continued



Selection chart (p. 10-11)
 Dimensions and technical information : lengths (p. 36) ; coupler sets (p. 38-45) ; fittings (p. 46-73)
 Design notes (p. 112)
 Loading graphs (p. 34)

When connecting fittings to straight lengths, use fastener sets (see opposite)

Rung spacing : 300 mm between centres
 Standard radius for fittings : 300 and 600 mm

Pack	Cat. Nos.	Fittings (continued)
1	ETW ^r RF	Tees and crosspieces For all equal and unequal tees and crosspieces, include R in your ordering code to indicate radius dimension. See unequal tee example below. Larger width/radius combinations are supplied in two indential halves with fasteners Equal tees For technical information, see p. 62
1	EUTW ^B rRF	Unequal tees Example : the ordering code for a hot dip galvanised unequal tee with a 300 main run (W) and a 150 branch (B) with a 600R radius : PUT 300 150 600R G For technical information, see p. 63-68

Pack	Cat. Nos.	Fittings (continued)
1	EBW ^r 300RF	Branch piece For technical information, see p. 69 Available in 300 R only
1	EXW ^r RF	4 way crosspieces For technical information, see p. 70-71
1	ESRWKF	Straight reducers For technical information, see p. 72
1	ELRWKF	Offset reducers – left hand For technical information, see p. 73
1	ERRWKF	Offset reducers – right hand For technical information, see p. 73

Standard dimensions and finishes

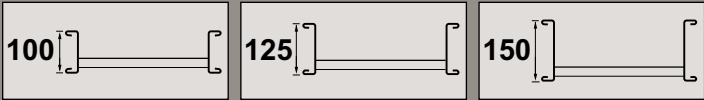
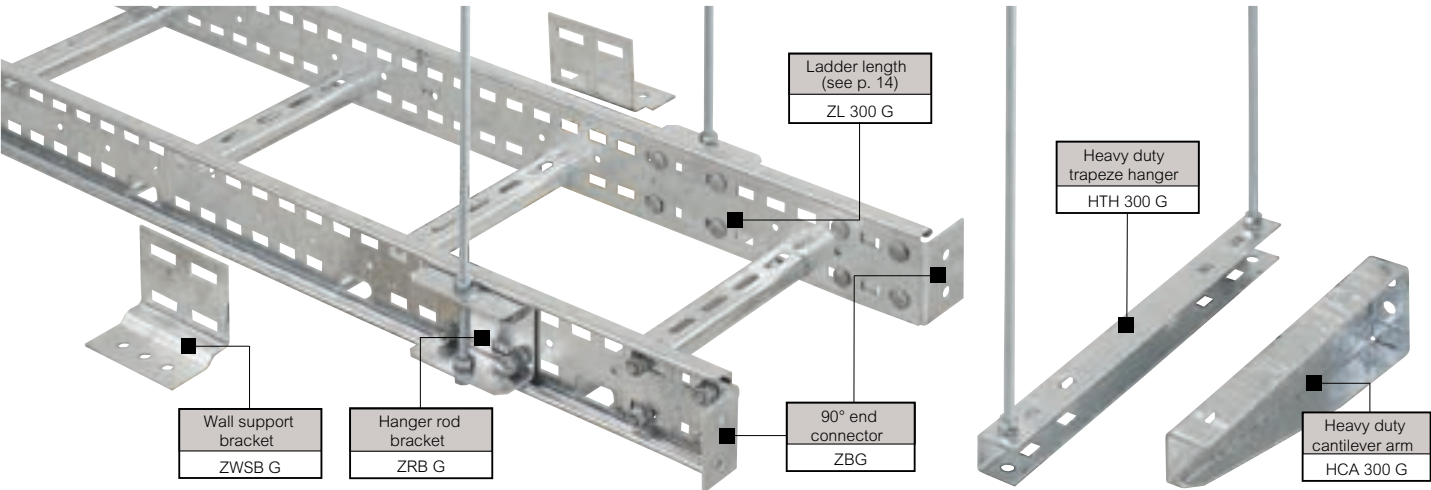
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Dimensions and finishes available to special order

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Swifts cable ladder supports
medium duty Topaz heavy duty Sapphire and
extra heavy duty Emerald



Dimensions and technical information (p. 74-78)

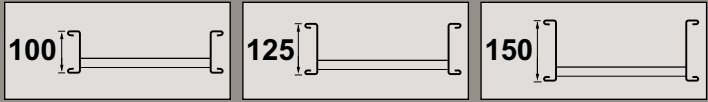
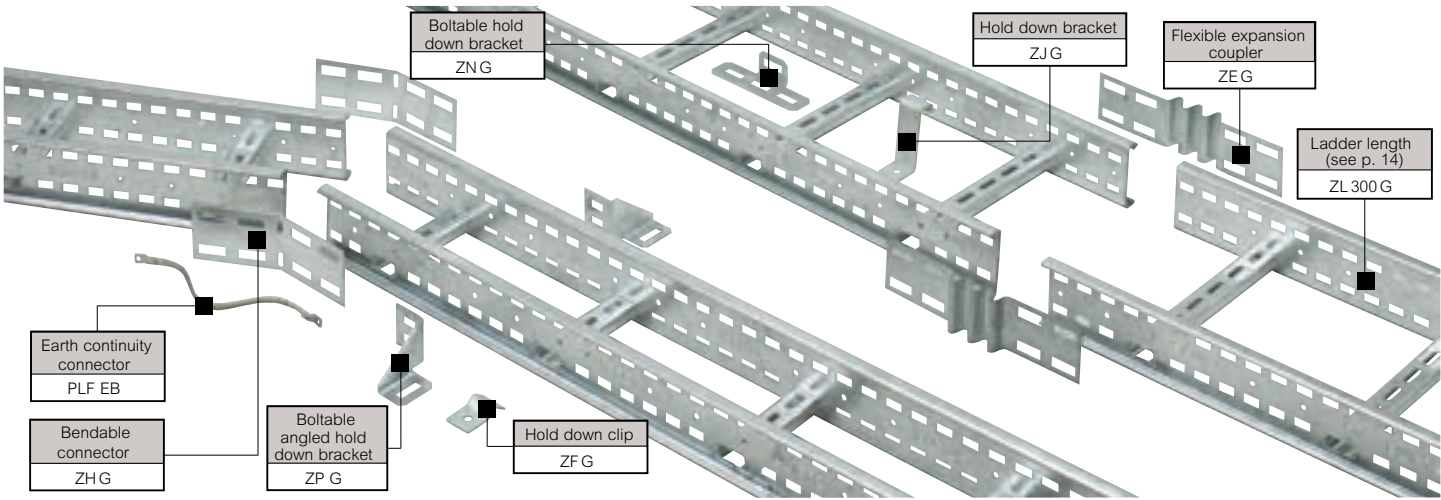
Pack	Cat. Nos.	Supports
		For use with medium duty (Topaz), heavy duty (Sapphire) and extra heavy duty (Emerald) ladder
1	HCA WF	Heavy duty cantilever arms Supplied singly without fasteners Use to fit horizontal runs of ladder to flat surfaces and Swiftrack channel All arms have slots in top flanges to accept ladder hold down brackets For technical information, see p. 74
1	HTH WF	Heavy duty trapeze hangers Supplied singly without fasteners Support horizontal runs of ladder from overhead structure Use M12 threaded rods For technical information, see p. 75
1	ZRB F	Hanger rod brackets When hanger rod brackets are fitted to ladder, covers can not be used Supplied in pairs with bracket to ladder fasteners Support horizontal runs of ladder from overhead structure Use M10 threaded rods, (see p. 24) For technical information, see p. 76
1	PRB F	Medium duty (Topaz)
1	ERB F	Heavy duty (Sapphire)
1		Extra heavy duty (Emerald)

Pack	Cat. Nos.	Supports (continued)
		Wall support brackets Supplied in pairs with bracket to ladder fasteners Fit horizontal or vertical runs of ladder to vertical surfaces and Swiftrack channel For technical information, see p. 77
1	ZWSB F	Medium duty (Topaz)
1	PWSB F	Heavy duty (Sapphire)
1	EWSB F	Extra heavy duty (Emerald)
		90° end connectors Supplied in pairs with bracket to ladder fastener Fits ends of ladder to vertical surfaces For technical information, see p. 78
1	ZB F	Medium duty (Topaz)
1	PB F	Heavy duty (Sapphire)
1	EB F	Extra heavy duty (Emerald)

ey ele tin medium duty (Topaz) heavy duty (Sapphire) and extra
heavy duty (Emerald) upport epla e the letter ho n in red ith
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idth
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Swifts cable ladder ancillary items

medium duty Topaz heavy duty Sapphire and extra heavy duty Emerald



Dimensions and technical information (p. 79-83)
Dimensions and technical information coupler sets (p. 38-45)

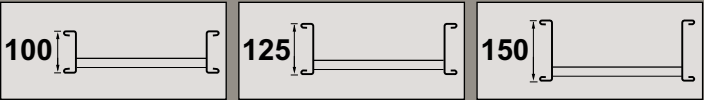
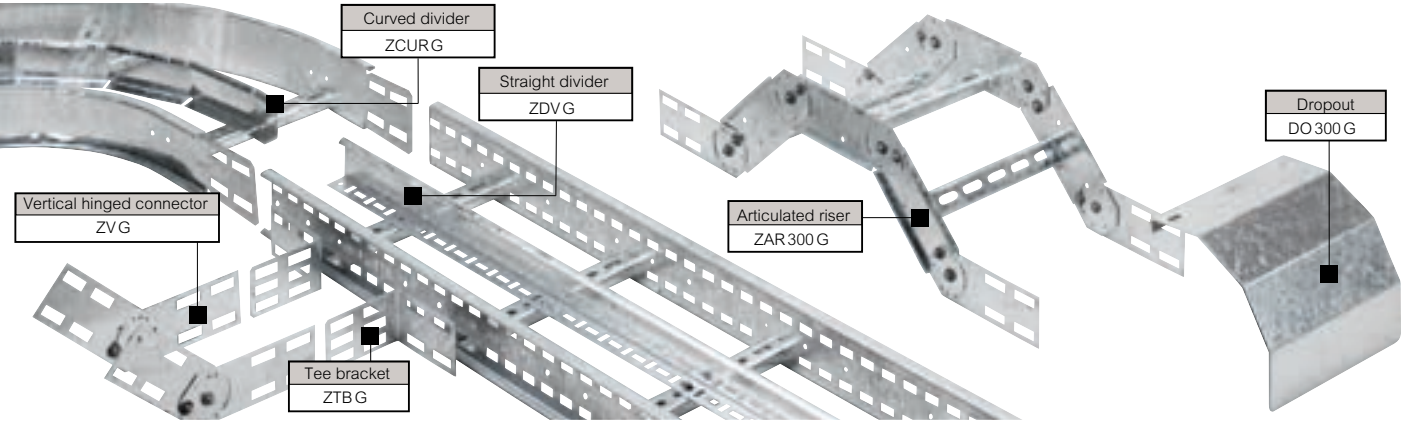
Pack	Cat. Nos.	Ancillary items
		Bendable connectors
		Supplied in pairs with fasteners For fabricating fittings on site to make up bends, reducers and compensate for misalignment of straight lengths For technical information, see p. 41
1	ZH F	Medium duty (Topaz)
1	PH F	Heavy duty (Sapphire)
1	EH F	Extra heavy duty (Emerald)
		Flexible expansion couplers
		Supplied in pairs with fasteners Provide a semi-flexible joint to compensate for relative movement when spanning separate structures or changes in ladder lengths due to temperature variation For technical information, see p. 40
1	ZE F	Medium duty (Topaz)
1	PE F	Heavy duty (Sapphire)
1	EE F	Extra heavy duty (Emerald)
		Earth continuity connectors
10	PLFEB	Medium duty (Topaz), heavy duty (Sapphire), extra heavy duty (Emerald) M6 brass fasteners included in pack Copper braid and copper lugs both in electroplated finish Conductor area : 16 mm ² For technical information, see p. 79

Pack	Cat. Nos.	Ancillary items (continued)
		Hold down clip
		Supplied singly without fasteners Fits ladder to flat surfaces, Swiftrack channel or heavy duty trapeze hangers which have slots in the top flange to accept fasteners For insulated version, add IN after Cat. No., eg. ZFIN F. (Note : note available in D finish) For technical information, see p. 80
1	ZF F	Medium duty (Topaz)
1	PF F	Heavy duty (Sapphire)
1	EF F	Extra heavy duty (Emerald)
		Hold down bracket
		Supplied singly without fasteners Fits ladder to flat surfaces, Swiftrack channel, cantilever arms or heavy duty trapeze hangers which have slots in the top flange to accept fasteners For insulated version, add IN after Cat. No., eg. ZJIN F. (Note : note available in D finish) For technical information, see p. 81
1	ZJ F	Medium duty (Topaz)
1	PJ F	Heavy duty (Sapphire)
1	EJ F	Extra heavy duty (Emerald)
		Boltable hold down bracket
		Supplied singly with bracket to ladder fastener Fits ladder to Swiftrack channel in fabricated steel support structure For technical information, see p. 82
1	ZN F	Medium duty (Topaz)
1	PN F	Heavy duty (Sapphire)
1	EN F	Extra heavy duty (Emerald)
		Boltable angled hold down brackets
		Supplied in handed pairs with bracket to ladder fastener Fits ladder to heavy duty cantilever arms and trapeze hangers which have slots in the side flange to accept fasteners For technical information, see p. 83
1	ZPF	Medium duty (Topaz)
1	PPF	Heavy duty (Sapphire)
1	EPF	Extra heavy duty (Emerald)

ey ele tin medium duty (Topaz) heavy duty (Sapphire) and extra heavy duty (Emerald) support epla e the letter ho n in red ith your hoi e rom the ollo in option idth
F Fini h (hot dip alvani ed a ter manu a ture) (deep alvani ed) S (tainle teel) E (po der coated)

Swifts cable ladder ancillary items
continued

Topaz Sapphire and Emerald



 Dimensions and technical information (p. 84-94)

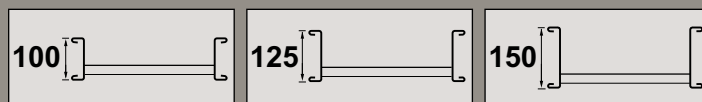
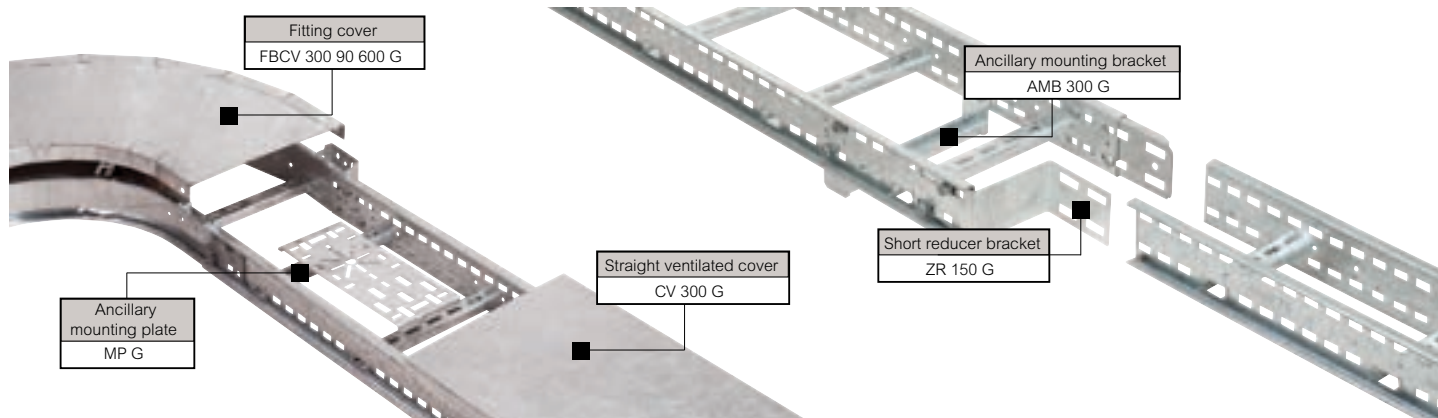
Pack	Cat. Nos.	Ancillary items (continued)
		Straight dividers – 3·0 m
		Supplied with fasteners For technical information, see p. 84
1	ZDV F	Medium duty (Topaz)
1	PDV F	Heavy duty (Sapphire)
1	EDV F	Extra heavy duty (Emerald)
		Curved dividers – 1·0 m
		Supplied with fasteners Drill on site to suit rung position For technical information, see p. 84
1	ZCUR F	Medium duty (Topaz)
1	PCUR F	Heavy duty (Sapphire)
1	ECUR F	Extra heavy duty (Emerald)
		Vertical hinged connectors
		Supplied in sets comprising four plates and fasteners Use with straight lengths to form risers or solve minor misalignment problems on site When used with tee bracket, vertical hinged connectors can offset tee branch For technical information, see p. 42
1	ZV F	Medium duty (Topaz)
1	PV F	Heavy duty (Sapphire)
1	EV F	Extra heavy duty (Emerald)
		Articulated risers
		Set comprises three ladder sections and the necessary vertical hinged connectors with fasteners Use to form risers or solve most misalignment problems on site For technical information, see p. 85-86
1	ZAR WF	Medium duty (Topaz)
1	PAR WF	Heavy duty (Sapphire)
1	EAR WF	Extra heavy duty (Emerald)

Pack	Cat. Nos.	Ancillary items (continued)
		Dropout plate
		Supplied with fasteners Use to provide local support for cables as they exit a cable ladder run between rungs For technical information, see p. 87
1	DO WF	All ladder types
		Rail-to-rail dropout brackets
		Supplied in pairs with fasteners Use to attach a vertical run of ladder or tray beneath a horizontal main ladder run For technical information, see p. 88
1	MF	For ladder to ladder connection
		or
		Tray to ladder connection
		Tee brackets
		Supplied in pairs with fasteners Use to create a branch of a straight ladder run For technical information, see p. 89
1	ZTB F	Medium duty (Topaz)
1	PTB F	Heavy duty (Sapphire)
1	ETB F	Extra heavy duty (Emerald)
		Stop ends
		Supplied singly with fasteners. Use to terminate a ladder run, or to fix the end of a run to a vertical surface For technical information, see p. 94
1	ZSW F	Medium duty (Topaz)
1	PSW F	Heavy duty (Sapphire)
1	ESW F	Extra heavy duty (Emerald)

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idth (mm)
F Fini h (hot dip alvani ed a ter manu a ture)
(deep alvani ed) S (tainle teel) E (po der oated)

Swifts cable ladder ancillary items continued and covers

Topaz Sapphire and Emerald



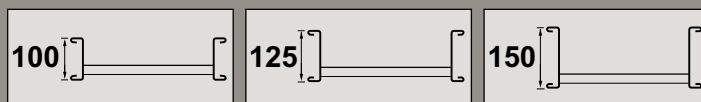
Dimensions and technical information (p. 90-98)

Pack	Cat. Nos.	Ancillary items (continued)	Pack	Cat. Nos.	Covers
		Short reducer brackets Supplied singly with fasteners Use to form a reducer on site Straight reducer – use in pairs Offset reducer – use singly with straight coupler $Y = W - K$ $Y = \frac{W - K}{2}$ <p>W = main ladder mm K = reduced ladder mm</p> <p>To calculate (Y) for straight reducers and offset reducers (see p. 90) For technical information, see p. 90</p> <p>Medium duty (Topaz) Heavy duty (Sapphire) Extra heavy duty (Emerald)</p>			Supplied with clips and fasteners Covers for both closed and ventilated installations are common (except when using inside and outside risers, see below) 600 mm wide and above are overlap jointed for rigidity For technical information, see p. 95-98 Straight covers – 3-0 m Available in 150-900 mm widths Example : To cover a 300 mm wide Z, P or E ladder length with a straight hot dip galvanised cover, ordering code for cover = CV 300 G
1	ZR ^{YF}		1	CV ^{WF}	
1	PR ^{YF}		1	–	Covers for fittings (except risers) To order a cover for a fitting, (except risers) remove first letter of fitting product code (Z, P or E) and add CV before your chosen dimensions Example : Product code = PFB 300 90 600 G Cover code = FB CV 300 90 600 G
1	ER ^{YF}				Riser covers are specific for Z, P or E Inside riser closed covers Medium duty (Topaz) Heavy duty (Sapphire) Extra heavy duty (Emerald)
1	AMB ^{WF}	Ancillary mounting bracket Supplied singly with bracket to ladder fasteners For technical information, see p. 91 All ladder types	1	ZIRC ^{WArF}	
			1	PIRC ^{WArF}	
			1	EIRC ^{WArF}	
1	MP ^F	Ancillary mounting plate Supplied singly with bracket to ladder fasteners For technical information, see p. 92 All ladder types For rung mounting or Side rail mounting	1	ZIRV ^{WArF}	
			1	PIRV ^{WArF}	
			1	EIRV ^{WArF}	
			1	ZORC ^{WArF}	
			1	PORC ^{WArF}	
			1	EORC ^{WArF}	
			1	ZORV ^{WArF}	
			1	PORV ^{WArF}	
			1	EORV ^{WArF}	
1	CSB ^F	Cable support bracket For technical information, see p. 93 Supplied singly with fasteners Cable ties not included			Outside riser closed covers Medium duty (Topaz) Heavy duty (Sapphire) Extra heavy duty (Emerald)
					Outside riser ventilated covers Medium duty (Topaz) Heavy duty (Sapphire) Extra heavy duty (Emerald)

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Swifts cable ladder fasteners

medium duty Topaz heavy duty Sapphire and extra heavy duty Emerald



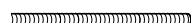
Pack	Cat. Nos.	Fastener sets
50 50	LFGM10P50 LFSM10P50	Comprise M10 coach bolt and flange nut Hot dip galvanised Stainless steel



Fasteners		
Hexagon head setscrews		
Electroplated zinc		
200	SS0616	M6 x 16
200	SS0620	M6 x 20
200	SS0625	M6 x 25
200	SS0630	M6 x 30
200	SS1016	M10 x 16
200	SS1020	M10 x 20
200	SS1025	M10 x 25
200	SS1030	M10 x 30
100	SS1035	M10 x 35
100	SS1040	M10 x 40
100	SS1045	M10 x 45
100	SS1050	M10 x 50
100	SS1060	M10 x 60
100	SS1220	M12 x 20
100	SS1225	M12 x 25
100	SS1230	M12 x 30
100	SS1235	M12 x 35
100	SS1240	M12 x 40
100	SS1250	M12 x 50
Hot dip galvanised		
200	SSG0616	M6 x 16
200	SSG0620	M6 x 20
200	SSG0625	M6 x 25
200	SSG0630	M6 x 30
Flat washers		
Electroplated zinc		
500	FW06	M6
500	FW08	M8
500	FW10	M10
500	FW12	M12
Shakeproof washers		
Electroplated zinc		
400	SW06	M6
400	SW08	M8
400	SW10	M10
400	SW12	M12



Pack	Cat. Nos.	Fasteners (continued)
Hexagon nuts		
Electroplated zinc		
500	HN06	M6
500	HN08	M8
500	HN10	M10
500	HN12	M12
Roofing nuts and bolts		
Electroplated zinc		
200	RB0612	M6 x 12
200	RB0616	M6 x 16
200	RB0620	M6 x 20
200	RB0625	M6 x 25
100	RB0630	M6 x 30
100	RB0640	M6 x 40
100	RB0650	M6 x 50
Hot dip galvanised		
100	RBG0612	M6 x 12
100	RBG0616	M6 x 16
Stainless steel		
100	RB0612S	M6 x 12
100	RB0616S	M6 x 16
100	RB0620S	M6 x 20
Threaded rods		
Electroplated zinc		
1	TR06	M6 x 3 m
1	TR08	M8 x 3 m
1	TR10	M10 x 3 m
1	TR12	M12 x 3 m
Threaded rod connectors		
Electroplated zinc		
1	RC06	M6
1	RC08	M8
1	RC10	M10
1	RC12	M12



Swiftrack channel support system

channels and channel nuts



Typical applications (p. 134-135)
Dimensions and technical information (p. 99-101)
Design notes (p. 112)

Channel and brackets are manufactured to BS 6946 – specifications for metal channel cable support systems for electrical installations and calculations for loading are in accordance with BS 5950 : Part 5 1998 structural use of steelwork in buildings, code of practice for cold formed thin gauge sections

Pack	Cat. Nos.	Single channels - plain
		The standard finish for channel is pre-galvanised mild steel to BS EN 10346 For other finishes add the appropriate suffix G = hot dip galvanised after manufacture to BS EN ISO 1461 S = stainless steel to BS EN 10088 2 grade 1.4404 (equivalent to S316L31) Channels SC210 and SC410 are not available in S finish Examples : SC200 3M G for hot dip galvanised SC400 3M S for stainless steel For technical information, see p. 99
1	SC200 3M	Standard channel 41 x 21 mm, 3 m length
1	SC200 6M	
1	SC400 3M	Light gauge channel 41 x 21 mm, 3 m length
1	SC400 6M	
1	SC210 3M	Back-to-back channel For technical information see p. 100 41 x 83 mm, 3 m length
1	SC410 3M	

Pack	Cat. Nos.	Single channels - slotted
		For technical information, see p. 99
1	SC203 3M	Standard channel 41 x 21 mm, 3 m length 41 x 21 mm, 6 m length
1	SC203 6M	
1	SC403 3M	Light gauge channel 41 x 21 mm, 3 m length
1	SC403 6M	
1	SC213 3M	Channel nuts For use with all channel M12 channel nuts should always be used for maximum load conditions The standard finish for all nuts is zinc plated to BS 3382 : Part 2 For stainless steel, add the suffix S Example : PN101S For hot dip galvanised, add the suffix G Example : PN101G Fasteners : Use hexagon head setscrews (see p. 29) For technical information, see p. 101
1	SC413 3M	

Pack	Cat. Nos.	Back-to-back channel
1	SC401 3M	For technical information see p. 100 41 x 83 mm, 3 m length 41 x 83 mm, 6 m length
1	SC401 6M	

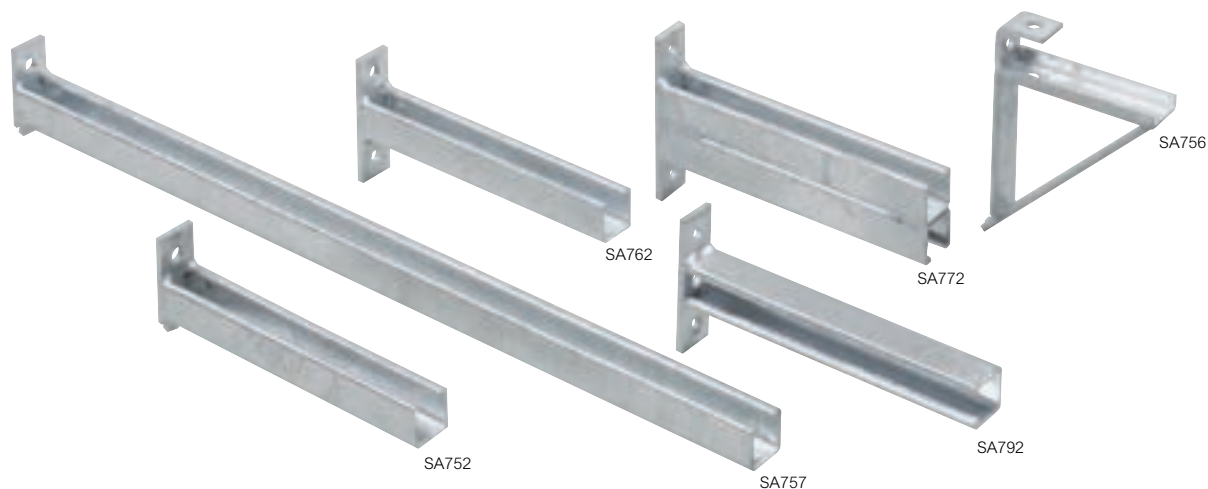
Pack	Cat. Nos.	Channel nuts
		For use with all channel M12 channel nuts should always be used for maximum load conditions The standard finish for all nuts is zinc plated to BS 3382 : Part 2 For stainless steel, add the suffix S Example : PN101S For hot dip galvanised, add the suffix G Example : PN101G Fasteners : Use hexagon head setscrews (see p. 29) For technical information, see p. 101
100	PN061	Long springs For use with 41 mm deep channel M6 M8 M10 M12
100	PN081	
100	PN101	
100	PN121	
100	PN062	Short springs For use with 21 mm deep channel M6 M8 M10 M12
100	PN082	
100	PN102	
100	PN122	
100	PN060	No springs For use on all channel depths M6 M8 M10 M12
100	PN080	
100	PN100	
100	PN120	

Other fasteners and finishes available to special order

Contact us on +44 (0) 845 605 4333

Swiftrack channel support system

cantilever arms



Dimensions and technical information (p. 102-103)

Pack	Cat. Nos.	Cantilever arms
		In addition to the cantilever arms listed, there are many other specialist support brackets for use with cable ladder. These are detailed in the relevant sections in this catalogue.
		Cantilever arms
		Requires only one bolt for quick fixing and is used with open face at the top. For technical information, see p. 102.
1	SA750	150 mm
1	SA751	225 mm
1	SA752	300 mm
1	SA753	450 mm
1	SA754	600 mm
1	SA755	750 mm
1	SA757	900 mm
		Cantilever arms, universal
		Two bolt fixing. Can be used with open face at the top or bottom. For technical information, see p. 102.
1	SA760	150 mm
1	SA761	225 mm
1	SA762	300 mm
1	SA763	450 mm
1	SA764	600 mm
1	SA765	750 mm
1	SA766	900 mm
		Cantilever arms, side
		Two bolt fixing. Can be used with open face on the left or right. For technical information, see p. 102.
1	SA790	150 mm
1	SA791	225 mm
1	SA792	300 mm
1	SA793	450 mm
1	SA794	600 mm
1	SA795	750 mm
1	SA796	900 mm

Pack	Cat. Nos.	Cantilever arms (continued)
		Cantilever arms, double channel
		Two bolt fixing with extra support. Open face top and bottom. For technical information, see p. 102.
1	SA770	150 mm
1	SA771	225 mm
1	SA772	300 mm
1	SA773	450 mm
1	SA774	600 mm
1	SA775	750 mm
1	SA776	900 mm
1	SA756	Cantilever arm bracket
		Used to provide extra support to a horizontal run of channel. For technical information see p. 103.

Non-standard cantilever arms available to special order

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Swiftrack channel support system

framework brackets

90° brackets

Cat. No. SB500	Cat. No. SB501	Cat. No. SB502	Cat. No. SB503	Cat. No. SB504
Cat. No. SB505	Cat. No. SB550	Cat. No. SB551	Cat. No. SB552	Cat. No. SB556

Square and splice plates

Square plates	Splice plate ⁽¹⁾	Splice plate ⁽¹⁾	Splice plate ⁽¹⁾	Splice plate ⁽¹⁾
<p> Cat. Nos. SB506 06 SB506 08 SB506 10 SB506 12 </p> <p> Hole size M6 M8 M10 M12 </p>	<p>Cat. No. SB507</p>	<p>Cat. No. SB508</p>	<p>Cat. No. SB509</p>	<p>Cat. No. SB510</p>

Z brackets

U brackets

Cat. No. SB511	Cat. No. SB513	Cat. No. SB514	Cat. No. SB515

Angle brackets

Obtuse angle brackets	Acute angle brackets
<p> Cat. Nos. SB520 SB524 SB526 SB528 </p> <p> Angle 15° 45° 60° 75° </p>	<p> Cat. Nos. SB532 SB534 SB536 </p> <p> Angle 45° 60° 75° </p>

T plates and brackets

T plate	T plate	T bracket	Cross plate	90° T bracket	45° T bracket
Cat. No. SB554	Cat. No. SB555	Cat. No. SB603	Cat. No. SB603+	Cat. No. SB606 ⁽³⁾	Cat. No. SB607 ⁽³⁾

(1) Splice plates – holes spaced at 45 mm centres

(2) Hole on one side of bracket only

(3) SB606 and SB607 are not available in S (stainless steel) finish

Swiftrack channel support system

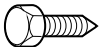
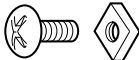
framework brackets continued

Joining brackets and channels			Base plates	
Channel joining bracket 	Joining channel for SC200 channel 	Joining channel for SC400 channel 	Single channel base plate 	Double channel base plate
Cat. No. SB518	Cat. No. SB650	Cat. No. SB651	Cat. No. SB704	Cat. No. SB705
L brackets			Wing brackets	
L bracket 	Right hand L corner bracket 	Left hand L corner bracket 	2 lug wing bracket 	3 lug wing bracket
Cat. No. SB600	Cat. No. SB601 ⁽²⁾	Cat. No. SB602 ⁽²⁾	Cat. No. SB700	Cat. No. SB701
				Angled wing bracket
			Cat. No. SB707 ⁽²⁾	
Gusseted brackets			Shelf brackets	
Single channel gusseted bracket 		Double channel gusseted bracket 		
Cat. No. SB702		Cat. No. SB706		Cat. No. SB703
Beam, window beam and toe beam clamps				
Beam clamp⁽¹⁾ 	Beam clamp⁽¹⁾ 	Window beam clamp⁽¹⁾ 	Window beam clamp⁽¹⁾ 	Beam clamp⁽¹⁾
Cat. No. SC850	Cat. No. SC851	Cat. No. SC852/21	Cat. No. SC852/41	Cat. No. SC852/82
Beam clamp⁽¹⁾ 	Beam clamp⁽¹⁾ 	Toe beam clamp⁽¹⁾ 	Beam clamp⁽¹⁾ 	Beam clamp⁽¹⁾
Cat. No. SC853	Cat. No. SC854	Cat. No. SC856 ⁽⁴⁾	Cat. No. ZC1 ⁽⁶⁾	Cat. No. FL2 ⁽⁵⁾
				Cat. No. SC855
Pipe clamps ⁽⁶⁾			Channel accessories	
	Cat. Nos. SP960 10-14 SP964 17-22 SP965 22-26 SP968 25-35 SP969 32-42 SP972 42-59 SP973 54-65		Cat. Nos. SP975 62-71 SP976 73-83	Channel end caps⁽⁷⁾
				Channel end caps⁽⁷⁾
				Closure strips
				Cat. Nos. SC952 SC953

(1) Indicates inside dimensions (2) SB601, SB602 and SB707 are not available in S (stainless steel) finish
 (3) Beam clamps are supplied with nuts, bolts, cone point screws and U bolts where shown (4) Requires 2 setscrews and channel nuts for fixing (not included)
 (5) Stainless steel finish is not available (6) All pipe clamps are available in pre-galvanised and stainless steel finishes
 (7) For SC400, SC401 and SC403 channels (8) For SC200, SC201 and SC203 channels

Swiftrack channel support systems

standard fixings and fasteners

Hexagon head setscrews			Cone point screws			Hexagon nuts			Electroplated roofing nuts and bolts			Hot dip galvanised roofing nuts and bolts		
														
Pack		Cat. Nos.		Size		Pack		Cat. Nos.		Size				
Hexagon head setscrews						Cone point screws								
ELECTROPLATED ZINC						ELECTROPLATED ZINC								
200	SS0616	M6 x 16	100	CP1035	M10 x 35									
200	SS0620	M6 x 20	STAINLESS STEEL											
200	SS0625	M6 x 25	100	CP1035 S	M10 x 35									
200	SS0630	M6 x 30	Hexagon nuts											
200	SS0820	M8 x 20	ELECTROPLATED ZINC											
200	SS0825	M8 x 25	500	HN06	M6									
200	SS0830	M8 x 30	500	HN08	M8									
200	SS0835	M8 x 35	200	HN10	M10									
200	SS0840	M8 x 40	200	HN12	M12									
200	SS0850	M8 x 50	Roofing nuts and bolts											
200	SS1016	M10 x 16	ELECTROPLATED ZINC											
200	SS1020	M10 x 20	200	RB0612	M6 x 12									
200	SS1025	M10 x 25	200	RB0616	M6 x 16									
200	SS1030	M10 x 30	200	RB0620	M6 x 20									
100	SS1035	M10 x 35	200	RB0625	M6 x 25									
100	SS1040	M10 x 40	100	RB0630	M6 x 30									
100	SS1045	M10 x 45	100	RB0640	M6 x 40									
100	SS1050	M10 x 50	100	RB0650	M6 x 50									
100	SS1060	M10 x 60	HOT DIP GALVANISED											
100	SS1220	M12 x 20	100	RBG0612	M6 x 12									
100	SS1225	M12 x 25	100	RBG0616	M6 x 16									
100	SS1230	M12 x 30	STAINLESS STEEL											
100	SS1235	M12 x 35	100	RB0612 S	M6 x 12									
100	SS1240	M12 x 40	100	RB0616 S	M6 x 16									
100	SS1250	M12 x 50	100	RB0620 S	M6 x 20									
HOT DIP GALVANISED														
200	SSG0612	M6 x 12												
200	SSG0616	M6 x 16												
200	SSG0620	M6 x 20												
200	SSG0635	M6 x 35												

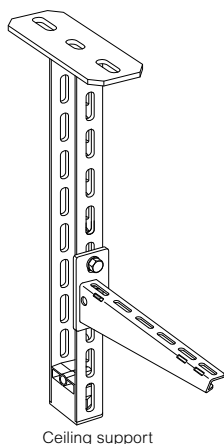
Swiftrack channel support systems

standard fixings and fasteners continued

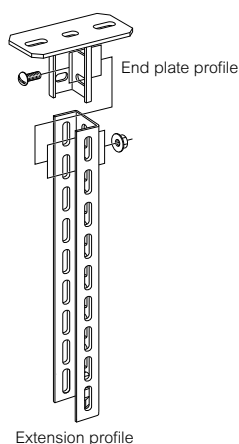
Flat washers	Roofing washers	Penny washers	Shakeproof washers	Tray washers	Threaded rods	Threaded rod connectors	Eye bolts
Pack	Cat. Nos.	Size		Pack	Cat. Nos.	Size	
Flat washers				Threaded rod			
ELECTROPLATED ZINC				ELECTROPLATED ZINC			
500	FW06	M6		3 m	TR06	M6 x 3 m	
500	FW08	M8		3 m	TR08	M8 x 3 m	
500	FW10	M10		3 m	TR10	M10 x 3 m	
200	FW12	M12		3 m	TR12	M12 x 3 m	
Roofing washers				Threaded rod connectors			
HOT DIP GALVANISED				ELECTROPLATED ZINC			
500	RWG06	M6		1	RC06	M6	
Penny washers				1	RC08	M8	
ELECTROPLATED ZINC				1	RC10	M10	
400	PW06	M6 x 25		1	RC12	M12	
400	PW08	M8 x 25		Eye bolts			
400	PW10	M10 x 38		ELECTROPLATED ZINC			
400	PW12	M12 x 40		1	EB06	M6 x 80	
Shakeproof washers				1	EB08	M8 x 80	
ELECTROPLATED ZINC				1	EB10	M10 x 80	
400	SW06	M6					
400	SW08	M8					
400	SW10	M10					
400	SW12	M12					
Tray washers							
ELECTROPLATED ZINC							
400	TW06	M6 x 20					
HOT DIP GALVANISED							
100	TWG06	M6 x 20					

Ceiling support system

heavy duty



Ceiling support



Extension profile

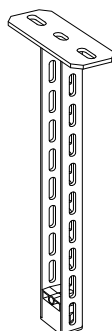


Dimensions and technical information (p. 109)

The dedicated ceiling support system allows for a flexible, multi-tiered approach for single or double sided loads with a maximum cantilever arm width of 700 mm to accept Swifts cable ladders up to 600 mm wide, either lidded or unlidded
Conform to IEC 61537

Support system

Pack	Cat. Nos.	Ceiling supports
		Moment 1% deflection 780 Nm Symmetrical load 6 000 N Including protection end cap Ceiling fixings not included
		Length
1	87665 02	200 mm
1	87665 03	300 mm
1	87665 04	400 mm
1	87665 05	500 mm
1	87665 06	600 mm
1	87665 07	700 mm
1	87665 08	800 mm
1	87665 09	900 mm
1	87665 10	1 000 mm
1	87665 11	1 100 mm
1	87665 12	1 200 mm
1	87665 13	1 300 mm
1	87665 14	1 400 mm
1	87665 15	1 500 mm
1	87665 16	1 600 mm
1	87665 18	1 800 mm
1	87665 20	2 000 mm



Extension profiles

Moment 1 200 Nm
3 000 mm
4 500 mm

Ceiling bracket

Lock to profile with 2 x M10 x 25 mm carriage bolt + washer + hexagon nut
Adjustable between -30° and +30°

End plate profile

Lock to profile with 2 x M10 x 25 mm carriage bolt + washer + hexagon nut

Profile connector

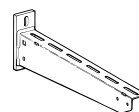
Lock to profile with 4 x M10 x 20 mm hexagon bolt + washer + hexagon nut

Support system (continued)

Cantilever arms

Fix to profile with 1 x M10 x 25 mm carriage bolt + washer + hexagon nut

Pack	Cat. Nos.	Width
1	5572 33	200 mm
1	5572 43	300 mm
1	5572 53	400 mm
1	5572 63	500 mm
1	5572 73	600 mm
1	5573 83	700 mm



For fasteners, see p. 29-30

For technical information, see p. 109

TECHNICAL SPECIFICATIONS



IN THIS SECTION

SWIFTS CABLE LADDER S STEMS

Straight lengths

Medium duty (Topaz)	34
Heavy duty (Sapphire)	35
Extra heavy duty (Emerald)	36
Rung details / diagonal bracing	37

Couplers straight lengths

Straight length to straight length couplers	38-39
Flexible expansion couplers	40
Connectors bendable and vertical hinged	41-42

Pre-fabrication of cable ladder runs

43

Identification and recognition of fittings

43

Couplers fittings

Integral fitting couplers	44
Fitting to fitting couplers	44-45

Fittings

Flat bends	46-49
Inside and outside risers	50-61
Equal and unequal tees	62-68
Branch pieces	69
4 way crosspieces	70-71
Straight and offset reducers	72-73

Supports

Heavy duty cantilever arms	74
Heavy duty trapeze hangers	75
Hanger rod brackets	76
all support brackets	77
90° end connectors	78

Ancillary items

Earth continuity connectors	79
Hold down clips and brackets	80-81
Boltable hold down brackets	82
Boltable angled hold down brackets	83
Dividers - straight / curved	84
Articulated risers	85-86
Dropout plates	87
Rail to rail dropout plates	88
Tee brackets	89
Short reducer brackets	90
Ancillary mounting brackets and plates	91-92
Cable support brackets	93
Stop ends	94

Covers

Straight lengths and fittings	95-98
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SWIFTRACK CHANNEL SUPPORT S STEM

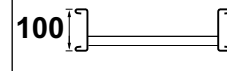
Single channels plain and slotted	99
Back-to-back channels	100
Assembly fasteners and channel nuts	101
Cantilever arms	102-103
Framework brackets	104-107
Beam clamps pipe clamps and accessories	107-108

CEILING SUPPORT S STEM

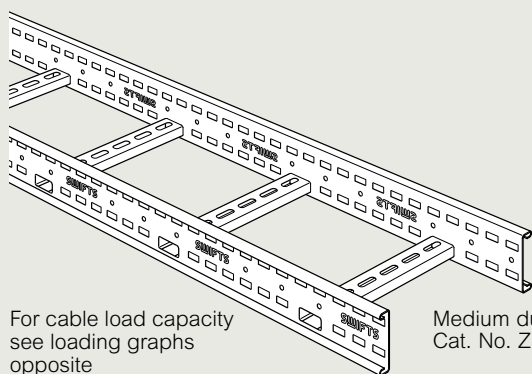
Heavy duty	109
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Swifts straight lengths

medium duty Topaz



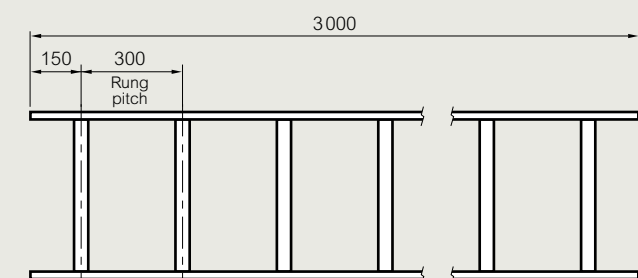
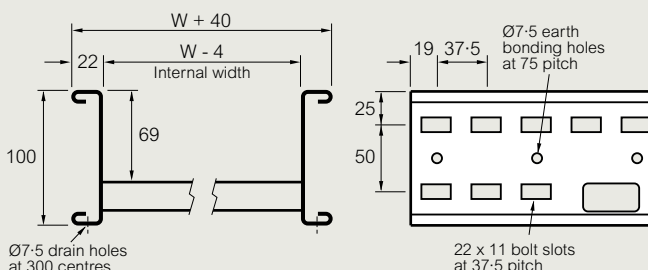
■ Dimensions and weights



For cable load capacity see loading graphs opposite

Medium duty (Topaz)
Cat. No. ZL **W F**

Dimensions



Weights

Width (W)	Cat. Nos.	Weight (kg)
150	ZL 150 F	12.1
300	ZL 300 F	13.4
450	ZL 450 F	14.6
600	ZL 600 F	16.9
750	ZL 750 F	20.3
900	ZL 900 F	22.2

All weights given are in kilograms (kg) and are for a 3 m straight length in hot dip galvanised G finish
To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

Gauge

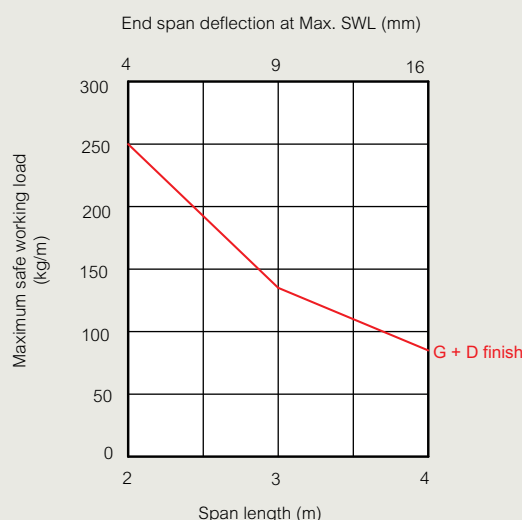
Standard side rail = 1.5 mm

■ Loading graphs

Load tests carried out to BS EN 61537 test type 1 (safety factor 1.7+ and joint in middle of span) or test type 4 (safety factor 1.7+ and joint in middle of span with rung slot over support)

Load tests carried out over 2 m, 3 m and 4 m spans using 3 m lengths
Safe working load should include all cable loads and any other additional loads (e.g. wind, snow)

When installed, inner span deflection will vary depending on joint positions but will typically be about half of test end span deflection shown below



Graph showing safe working load vs span with deflections shown at SWL

■ Finishes

Standard stocked finish :

G Hot dip galvanised after manufacture to BS EN ISO 1461 : 2009

Additional finishes :

- D** Deep galvanised high silicon steel made from BS EN 10025-5 : 2004 Grade S355JOWP
- S** Stainless steel to BS EN 10088 – 2 grade 1.4404 (equivalent to 316L31)
Pickle and passivation is available to special order
- E** Powder coated (to customer's specification)

Sheared steel particularly stainless steel does have relatively sharp edges and protective gloves must be worn during handling

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

All dimensions (mm) are nominal

Rung details : see p. 37

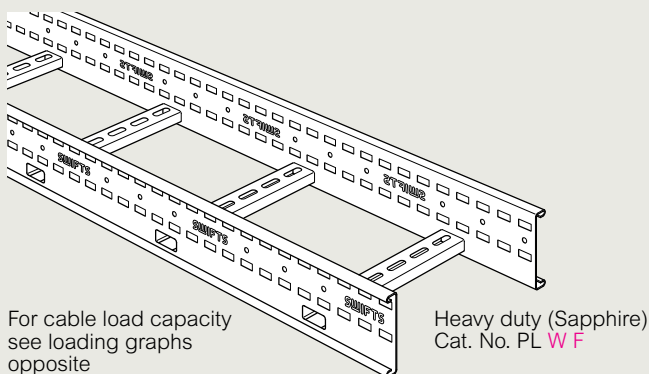
Coupler sets : see p. 38-42

Swifts straight lengths

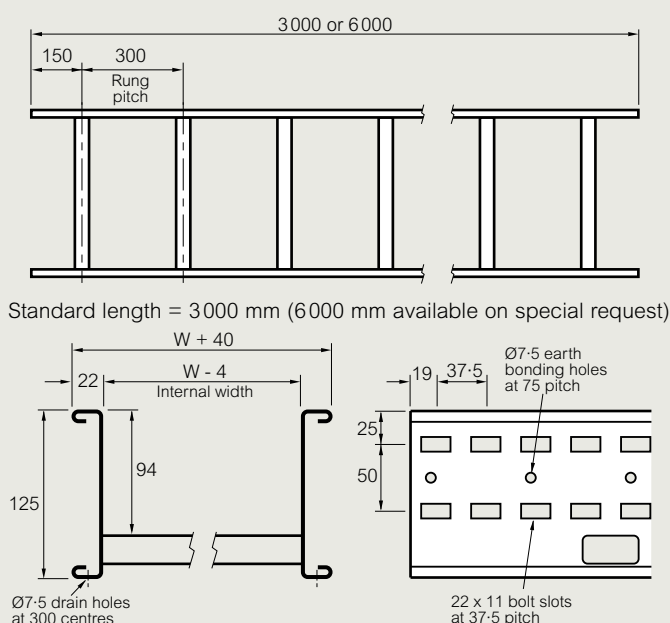
heavy duty Sapphire

125

■ Dimensions and weights



Dimensions



Weights

Width (W)	Cat. Nos.	Weight (kg)
150	PL 150 F	13.8
300	PL 300 F	15.0
450	PL 450 F	16.3
600	PL 600 F	18.5
750	PL 750 F	22.0
900	PL 900 F	23.9

All weights given are in kilograms (kg) and are for a 3 m straight length in hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

Gauge

Standard side rail = 1.5 mm
Non-standard side rail = 2.0 mm

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

■ Loading graphs

Load tests carried out to BS EN 61537 test type 1 (safety factor 1.7+ and joint in middle of span) or test type 4 (safety factor 1.7+ and joint in middle of span with rung slot over support)

Load tests carried out over 3 m, 4 m and 5 m spans using 3 m lengths and 6 m spans using 6 m lengths

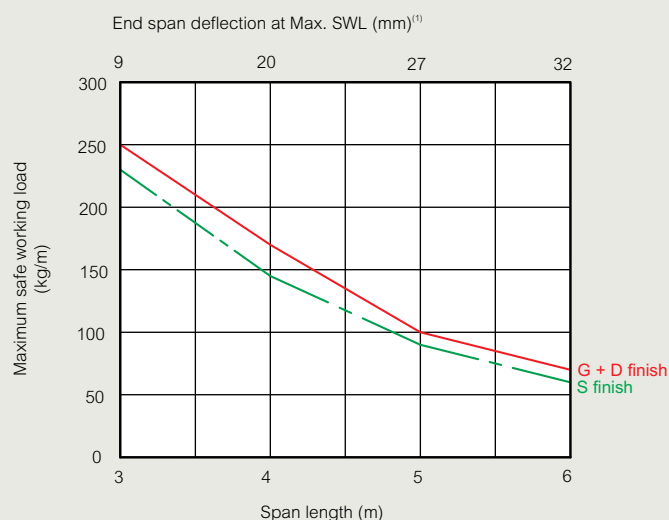
Safe working load should include all cable loads and any other additional loads (e.g. wind, snow)

For spans greater than 5 m : data is for 6 m long ladders only

For spans 5 m and less : data can be used for 3 m or 6 m long lengths

For spans greater than 5 m : ladder is not suitable for use with dynamic loads (e.g. wind, snow)

When installed, inner span deflection will vary depending on joint positions but will typically be about half of test end span deflection shown below



Graph showing safe working load vs span with deflections shown at SWL

(1) Deflections shown for G finish. D and S finish deflections on application, please contact us on +44 (0) 845 605 4333

■ Finishes

Standard stocked finish :

G Hot dip galvanised after manufacture to BS EN ISO 1461 : 2009

Additional finishes :

D Deep galvanised high silicon steel made from BS EN 10025-5 : 2004 Grade S355JOWP

S Stainless steel to BS EN 10088 - 2 grade 1.4404 (equivalent to 316L31)
Pickle and passivation is available to special order

E Powder coated (to customer's specification)



Sheared steel particularly stainless steel does have relatively sharp edges and protective gloves must be worn during handling

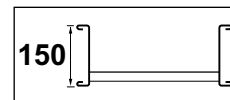
All dimensions (mm) are nominal

Rung details : see p. 37

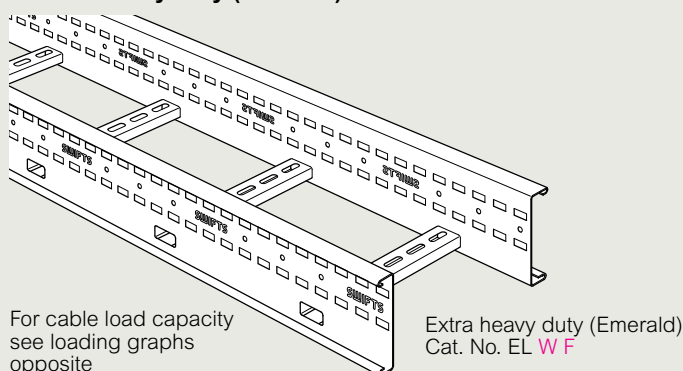
Coupler sets : see p. 38-42

Swifts straight lengths

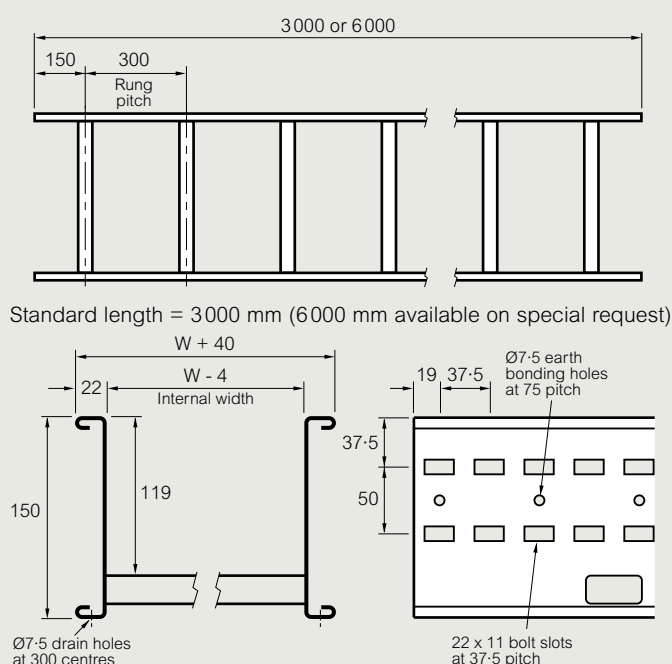
extra heavy duty Emerald



Extra heavy duty (Emerald)



Dimensions



Weights

Width (W)	Cat. Nos.	Weight (kg)
150	EL 150 F	20.7
300	EL 300 F	22.1
450	EL 450 F	23.5
600	EL 600 F	25.0
750	EL 750 F	28.8
900	EL 900 F	30.8

All weights given are in kilograms (kg) and are for a 3m straight length in hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

Gauge

Standard side rail = 2.0 mm

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Loading graphs

Load tests carried out to BS EN 61537 test type 1 (safety factor 1.7+ and joint in middle of span) or test type 4 (safety factor 1.7+ and joint in middle of span with rung slot over support)

Load tests carried out over 3 m, 4 m and 5 m spans using 3 m lengths and 6 m spans using 6 m lengths

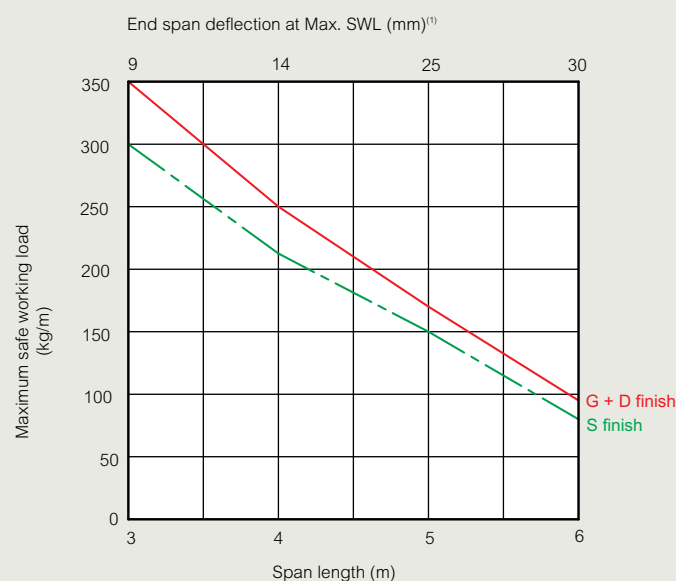
Safe working load should include all cable loads and any other additional loads (e.g. wind, snow)

For spans greater than 5 m : data is for 6 m lengths only

For spans 5 m and less : data can be used for 3 m or 6 m lengths

For spans greater than 5 m : ladder is not suitable for use with dynamic loads (e.g. wind, snow)

When installed, inner span deflection will vary depending on joint positions but will typically be about half of test end span deflection shown below



Graph showing safe working load vs span with deflections shown at SWL

(1) Deflections shown for G finish. D and S finish deflections on application, please contact us on +44 (0) 845 605 4333

Finishes

Standard stocked finish :

G Hot dip galvanised after manufacture to BS EN ISO 1461 : 2009

Additional finishes :

D Deep galvanised high silicon steel made from BS EN 10025-5 : 2004 Grade S355JOWP

S Stainless steel to BS EN 10088 - 2 grade 1.4404 (equivalent to 316L31)

Pickle and passivation is available to special order

E Powder coated (to customer's specification)



Sheared steel particularly stainless steel does have relatively sharp edges and protective gloves must be worn during handling

All dimensions (mm) are nominal

Rung details : see p. 37

Coupler sets : see p. 38-42

Swifts cable ladder rungs

for straight lengths and fittings

Swifts cable ladder systems

diagonal bracing straight lengths

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order

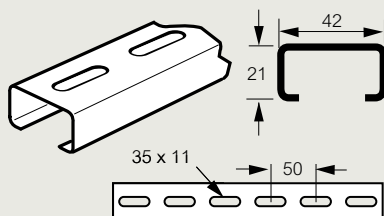
Type 3 is not available in deep galvanised finish

Types 1 and 3 can be supplied in any combination to special order

■ Options and dimensions

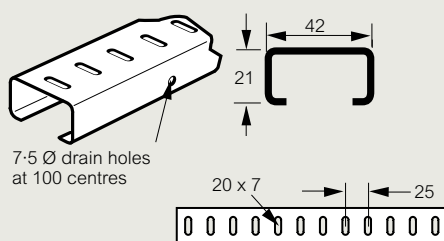
Standard

Type 1

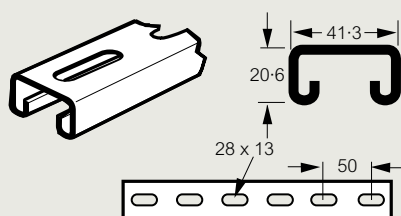


Special order only

Type 2



Type 3



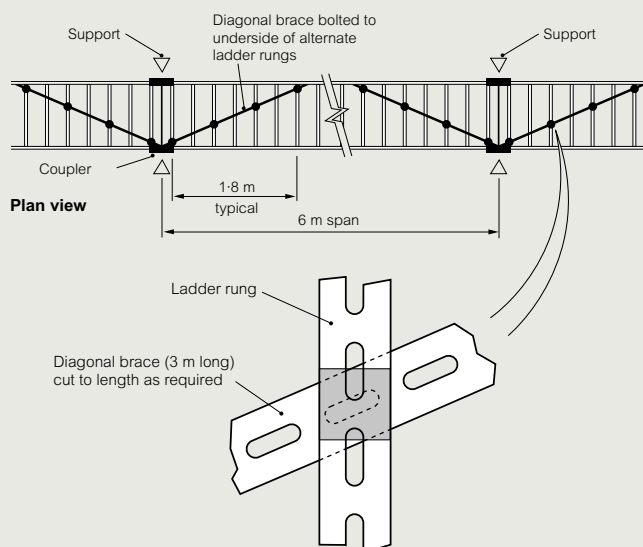
Slot pattern may differ on stainless steel type 3 rungs
Contact us on +44 (0) 845 605 4333

■ Diagonal bracing

The effect of lateral loads on spans over 5 m or 6 m can be much reduced by adding diagonal bracing

Bracing is achieved by fitting a ladder Type 1 rung section, cut to length from a 3 m length supplied, diagonally across the underside of the ladder as shown in the illustration below. Diagonal bracing can be fitted to either heavy duty (Sapphire) or extra heavy duty (Emerald) ladders – medium duty (Topaz) is not suited to these long spans

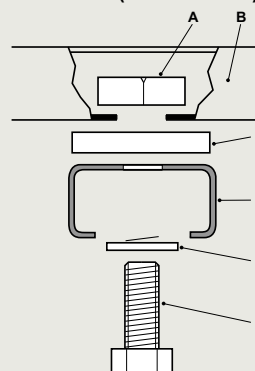
■ Installation (typical)



Couplers are best located over the point of support to provide additional local reinforcement of the ladder side rails. Details on long span installations are given on p. 129

■ Assembly

Fasteners (not included)



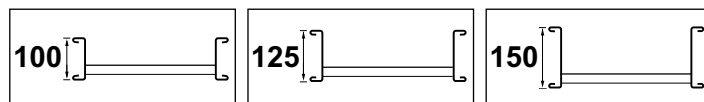
- A M10 Swiftrack channel nut (PN 100)
- B Ladder rung
- C 40 x 40 x 6 square washer, Cat. No. SB506/10
- D Diagonal brace (type 1 rung)
- E M10 form A washer
- F M10 x 25 Grade 8.8 setscrew hot dip galvanised

Fastener finishes

For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

Swifts cable ladder couplers and fasteners

straight length to straight length couplers



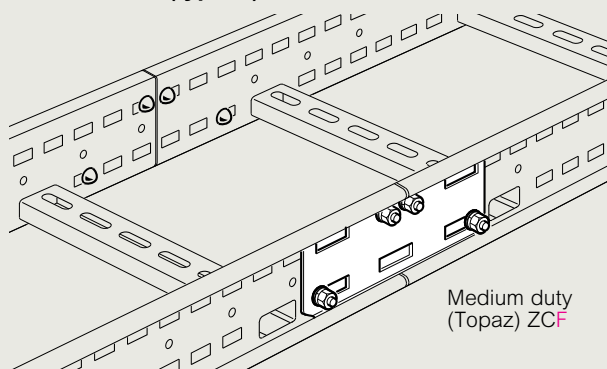
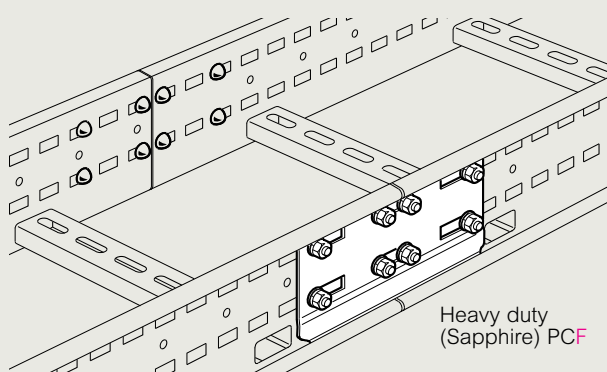
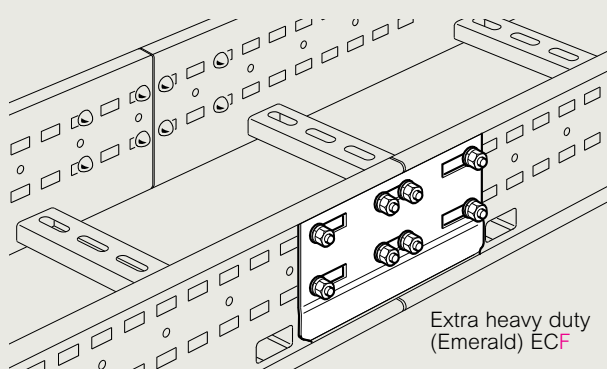
Couplers are used for joining together straight lengths in the medium duty (Topaz), heavy duty (Sapphire) and extra heavy duty (Emerald) ranges

Fittings in these ranges have integral couplers. See p. 44 for more information

Even when ladders are cut to length, the slots in the coupler will always align with the slots in the ladder side rail

Supplied in pairs with the appropriate quantity of fasteners

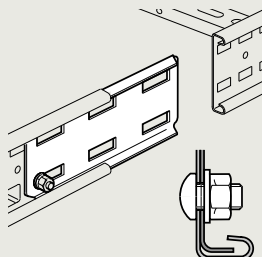
Installation (typical)



Joggles are formed in the bottom of PC and EC couplers to allow easy installation of ladder cut lengths

Assembly

Slide the couplers under the return flanges of one ladder side rail and loosely fit a single fastener to each coupler to hold it in place. Slide the second ladder over both couplers, adjust each coupler position to align the slots with the side rail slots and secure with all fasteners



Note

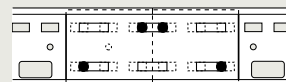
Bolts should be inserted through the side rail first

For location of coupler and position of fasteners, see below

Fastener positioning

Medium duty (Topaz)

Supplied in pairs, with fasteners (4 per coupler)



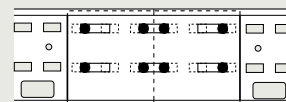
When bolting to cut ends adjust coupler to ensure 4 bolts can be inserted

Note

When connecting straight lengths to straight lengths even when ladder is cut to length, the slots in the coupler will always align with slots in the ladder side rail

Heavy duty (Sapphire) and extra heavy duty (Emerald)

Supplied in pairs, with fasteners (8 per coupler)



When bolting to cut ends adjust coupler to ensure 8 bolts can be inserted

Note

When connecting straight lengths to straight lengths even when ladder is cut to length, the slots in the coupler will always align with slots in the ladder side rail

	Ladder range		
	Topaz	Sapphire	Emerald
Cat. Nos.	ZCF	PCF	ECF
Quantity of fasteners per coupler	4	8	8

When connecting straight lengths to fittings, use fastener sets, see p. 44

For additional types of straight length to straight length couplers and fasteners, see p. 39-42

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

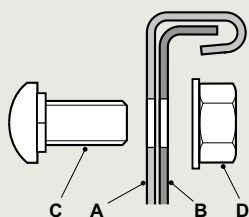
All dimensions (mm) are nominal

Straight lengths : see p. 34-36

Finishes and standards : see p. 34-36

■ Assembly (continued)

Fasteners (included)



- A Side rail
- B Coupler
- C M10 x 20 coachbolt
- D M10 flange nut

**Recommended Torque
Setting (M10): 40Nm**

Fastener finishes

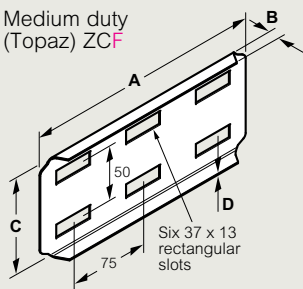
For ladders with G, D and E finishes, fasteners are high tensile Grade 8.8 hot dip galvanised

For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

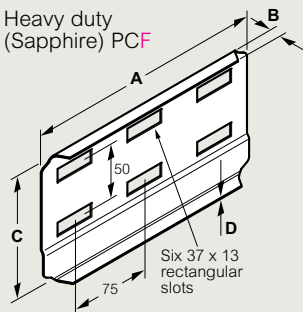
An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333

■ Dimensions and weights

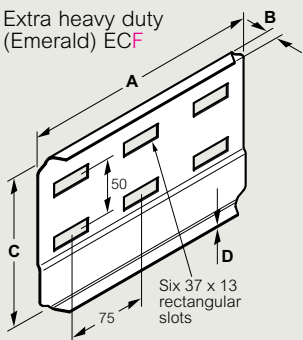
Medium duty
(Topaz) ZC^F



Heavy duty
(Sapphire) PC^F



Extra heavy duty
(Emerald) EC^F



Cat. Nos.	A	B	C	D	Weight (kg)
ZC ^F	220	13	95	1.5	0.6
PC ^F	220	13	119	2.0	1.0
EC ^F	220	13	144	2.0	1.2

Weights

All weights given are in kilograms (kg) and are for a pair of couplers in hot dip galvanised G finish

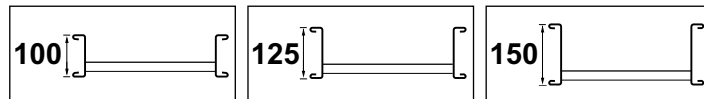
To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

All dimensions (mm) are nominal

Swifts cable ladder couplers and fasteners

flexible expansion couplers



Flexible expansion couplers can be used to :

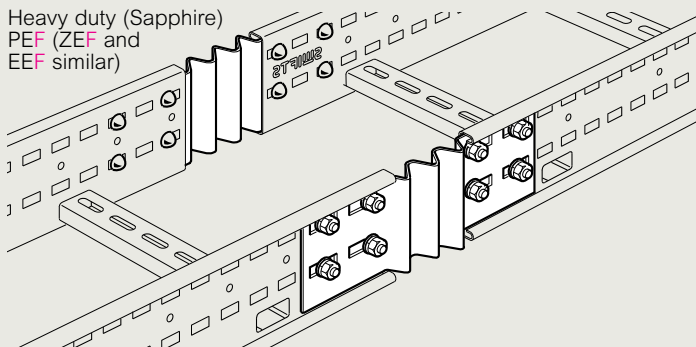
- provide a semi-flexible joint where ladder runs span separate structures between which some relative movement is possible
- provide compensation for changes in the length of a straight cable ladder run due to temperature variations

Supplied in pairs with fasteners

Installation (typical)

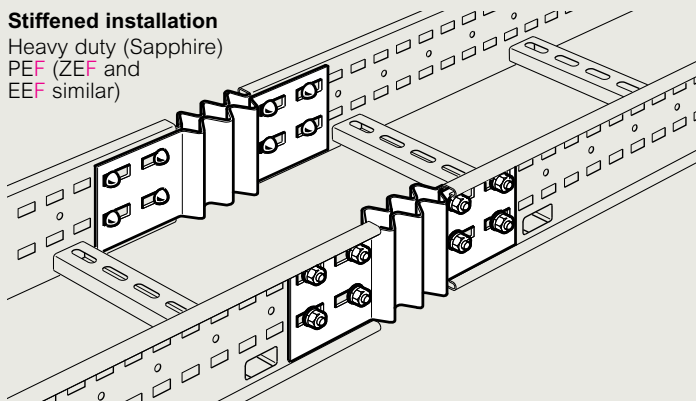
Normal installation

Heavy duty (Sapphire)
PEF (ZEF and
EEF similar)



Stiffened installation

Heavy duty (Sapphire)
PEF (ZEF and
EEF similar)



Flexible expansion couplers should normally be installed with the ridges facing outward, away from the bed of the ladder

If necessary, the stiffness of each joint can be increased by mounting pairs of couplers back-to-back (with one set of ridges facing inwards and the other set facing outwards as shown above) on either side of the cable ladder. The allowance for differential movement remains unchanged (see below)

Note

Rigid support for the cable ladder should be provided on both sides adjacent to each joint

Assembly

Each joint formed by flexible expansion couplers provides for up to 10 mm of linear movement between the two adjacent ladders

To calculate the ideal distance between flexible expansion coupler installations use the formula : $L = \frac{K_S}{T}$

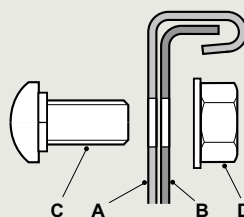
Where : L = distance between flexible expansion couplers, in metres
 K_S = 909 for mild steel, 625 for stainless steel
 T = temperature range (in °C) for which allowance is to be made

Note

Coefficients of linear expansion : mild steel = $11 \times 10^{-6}/^\circ\text{C}$
 stainless steel = $16 \times 10^{-6}/^\circ\text{C}$

Assembly (continued)

Fasteners (included)



- A Side rail
- B Coupler
- C M10 x 20 coachbolt
- D M10 flange nut

Recommended Torque Setting (M10): 40Nm

Fastener finishes

For ladders with G, D and E finishes, fasteners are high tensile Grade 8.8 hot dip galvanised

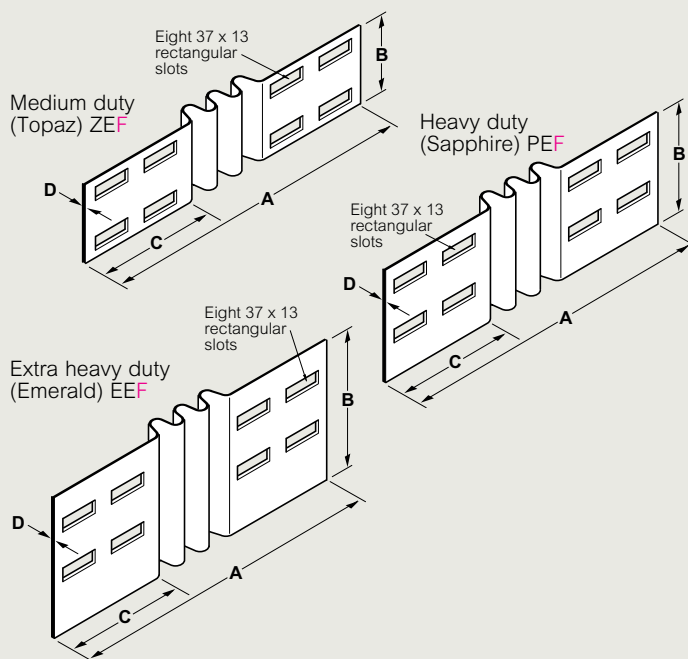
For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333

Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
	ZEF	PEF	EEF
Quantity of fasteners per coupler ⁽¹⁾	4	8	8

(1) for normal installation, or per pair (each side) for stiffened installation

Dimensions and weights



Cat. Nos.	A	B	C	D	Weight (kg)
ZEF	320	84	113.0	1.0	0.6
PEF	317	115	111.5	1.5	1.1
EEF	317	138	111.5	1.5	1.4

Weights

All weights given are in kilograms (kg) and are for a pair of couplers in hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

- Deep galvanised (D) x 1.07
- Stainless steel (S) x 0.94
- Powder coated (E) x 0.97

All dimensions (mm) are nominal

Straight lengths : see p. 34-36

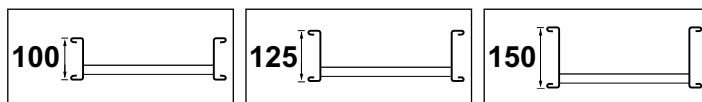
Finishes and standards : see p. 34-36

Key : Replace the letter shown in red with your choice from the following options :

- F = Finish : G (hot dip galvanised after manufacture)
- D (deep galvanised)
- S (stainless steel)
- E (powder coated)

Swifts cable ladder couplers and fasteners

bendable connectors



Bendable connectors can be used for :

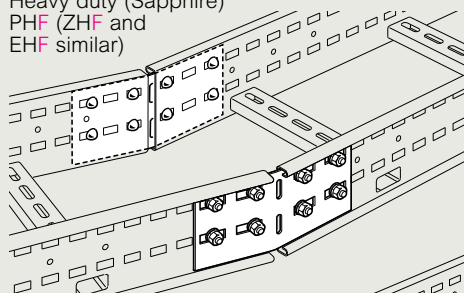
- fabricating fittings on site from cut lengths of cable ladder
- reducing width of a run to the next size down when a properly manufactured reducer is not available
- correcting minor mis-alignment problems
- coupling lengths of ladder to form articulated bends

Bendable connectors are supplied in pairs with fasteners

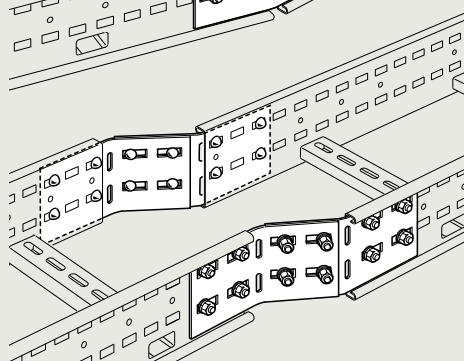
Installation (typical)

Heavy duty (Sapphire)
PHF (ZHF and
EHF similar)

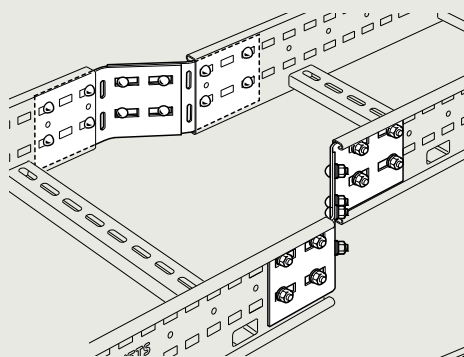
Bending the run



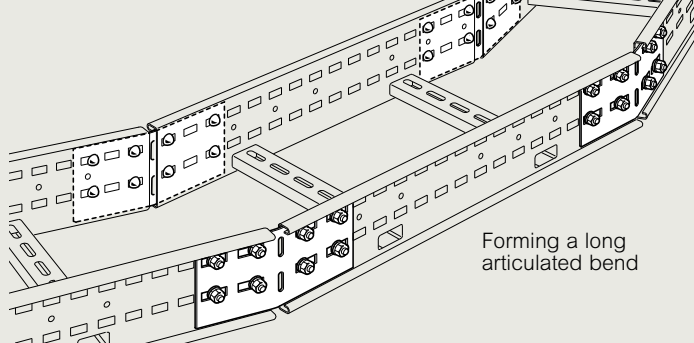
Re-aligning the run



Reducing width of run



Forming a long articulated bend



Note

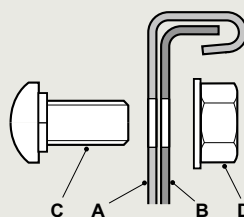
Rigid support for the cable ladder should be provided on both sides adjacent to each joint

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Assembly

Fasteners (included)



- A Side rail
- B Coupler
- C M10 x 20 coachbolt
- D M10 flange nut

Recommended Torque Setting (M10): 40Nm

Fastener finishes

For ladders with G, D and E finishes, fasteners are high tensile Grade 8.8 hot dip galvanised

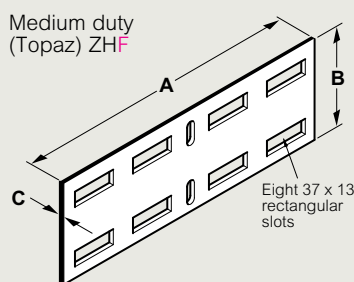
For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333

Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
Quantity of fasteners per connector	4	8	8
per additional connector	2	4	4

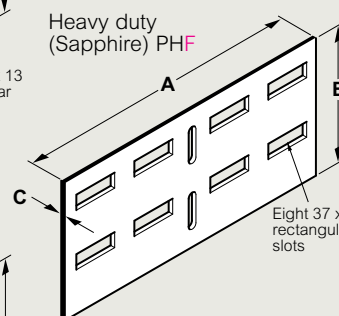
Dimensions and weights

Medium duty
(Topaz) ZHF



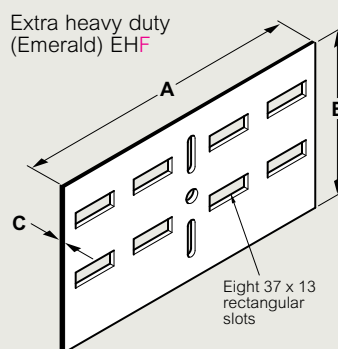
Eight 37 x 13 rectangular slots

Heavy duty
(Sapphire) PHF



Eight 37 x 13 rectangular slots

Extra heavy duty
(Emerald) EHF



Eight 37 x 13 rectangular slots

Cat. Nos.	A	B	C	Weight (kg)
ZHF	250	84	1.5	0.5
PHF	250	115	1.5	0.7
EHF	250	140	1.5	0.8

Weights

All weights given are in kilograms (kg) and are for a pair of couplers in hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

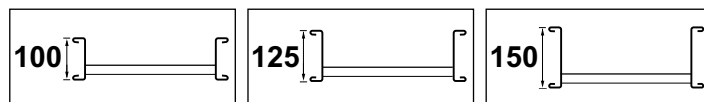
All dimensions (mm) are nominal

Straight lengths : see p. 34-36

Finishes and standards : see p. 34-36

Swifts cable ladder couplers and fasteners

vertical hinged connectors

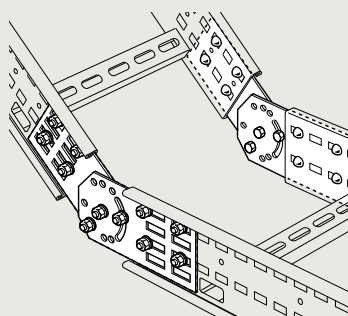


Vertical hinged connectors can be used for :

- fabricating fittings on site from cut lengths of cable ladder
 - solving minor vertical mis-alignment problems
 - coupling articulated risers to adjacent ladders
- Supplied in sets comprising four plates and fasteners

■ Installation (typical)

Heavy duty (Sapphire)
PVF (ZVF and EVF
similar)



■ Assembly

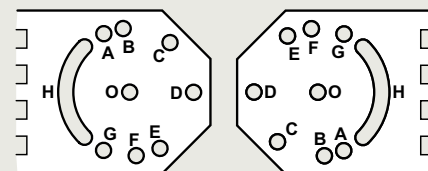
Vertical hinged connectors can either be connected together to form pre-set angles or pre-assembled for adjustment in situ

Assembly to a pre-set angle

- identify the correct outer fixing holes for the required pre-set angle (see table and illustration below)
- insert a fastener through the identified holes in both plates and fit a locking washer and nut but do not fully tighten
Do not insert fasteners through the centre hole first, this makes identification of the outer holes very difficult
- move the two connectors to align the centre holes. Insert a fastener through the holes and fit a locking washer and nut **but do not fully tighten**
- insert a third fastener through a slot in one connector and an aligning hole in the other. Fit a locking washer and nut
- tighten all fasteners

Cat. Nos.	15°	18°	22.5°	30°	45°
ZVF, PVF, EVF	G : C	A : F	E : B	B : G	F : C

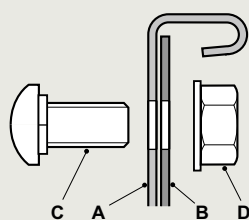
ZVF, PVF, EVF



Pre-assembly for adjustment in-situ

- insert a fastener through the outer hole of both connectors. Fit a locking washer and nut and tighten sufficiently to hold the assembly together while it is carried to the installation position
- fit the assembly to the installed ladders
- insert a second fastener through the slot in one connector and an aligning hole and fit a locking washer and nut
- if possible, insert a third fastener through either the alternate slot and an aligning hole, or two aligning holes. Fit a locking washer and nut
- tighten all fasteners

Connector to ladder fasteners (included)



- A Side rail
- B Connector
- C M10 x 20 coachbolt
- D Flange nut

Key : Replace the letter shown in red with your choice from the following options :

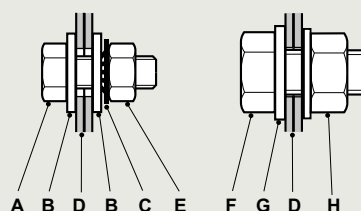
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

■ Assembly (continued)

Connector to connector fasteners (included)

ZVF

PVF, EVF



- A M6 x 16 setscrews
- B M6 washer
- C M6 shakeproof washer
- D Connector
- E M6 nut
- F M10 x 20 setscrews
- G M10 form A washer
- H Flange nut

Recommended Torque Setting (M10): 40Nm

Fastener finishes

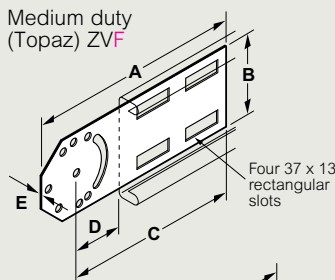
For ladders with G and D finishes, fasteners are high tensile Grade 8.8
For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised
An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333

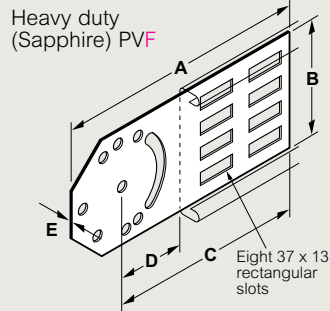
	Ladder range		
	Topaz	Sapphire	Emerald
Cat. Nos.	ZVF	PVF	EVF
Quantity of fasteners per connector to ladder	2 x M10	4 x M10	4 x M10
per connector to connector	3 x M6	3 x M10	3 x M10

■ Dimensions and weights

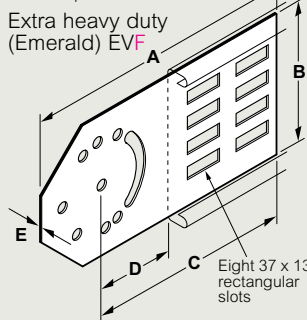
Medium duty
(Topaz) ZVF



Heavy duty
(Sapphire) PVF



Extra heavy duty
(Emerald) EVF



Cat. Nos.	A	B	C	D	E	Weight (kg)
ZVF	212	80	172.0	50.0	1.5	0.8
PVF	250	115	192.5	71.0	2.0	1.5
EVF	270	140	201.0	79.5	2.0	2.0

Weights

All weights given are in kilograms (kg) and are for a set of four plates in hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

- Deep galvanised (D) x 1.07
- Stainless steel (S) x 0.94
- Powder coated (E) x 0.97

All dimensions (mm) are nominal

Articulated risers : see p. 85-86

Finishes and standards : see p. 34-36

Swifts cable ladder systems

pre-fabrication of cable ladder runs

Swifts cable ladder systems

identification and recognition fittings

To assist in the installation of a complete cable ladder run following a centre-line drawing (usually CAD generated), the technical fitting pages for each fitting contain C, X, Y and length dimensions where appropriate, and also diagrams to explain the dimensions

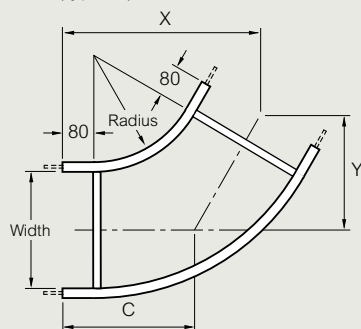
The dimensions help to ensure that fittings are correctly positioned in line with the drawing and make it possible to accurately calculate the installed length of intermediate straight sections. This allows the sections to be cut to length and pre-assembled, making installation in elevated or restricted areas much simpler

A simple layout is illustrated at the bottom of the page to show how available dimensions can be used

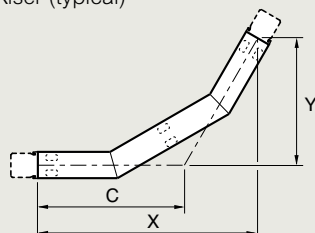
C dimension

The C dimension is given for bends and risers in cable ladder ranges. It is the length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect, as shown below

Bend (typical)

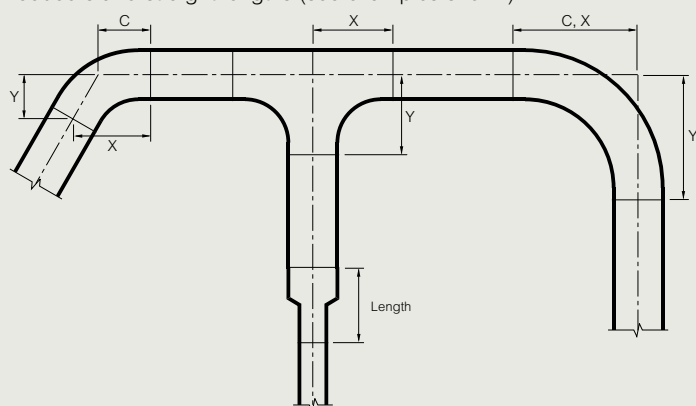


Riser (typical)



X and Y dimensions

X and Y dimensions are given for all cable ladder fittings other than reducers and straight lengths (see examples shown)



Under site conditions it is often difficult to distinguish between different fittings, particularly bends and risers of varying widths and radii. To assist identification, key dimension values are given on each relevant technical fitting page to provide a simple means of differentiating between similar fittings

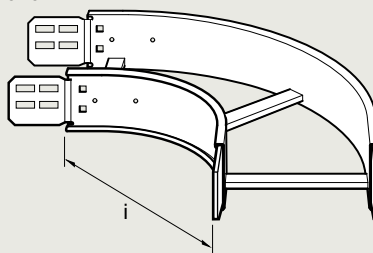
Width

The available widths, or combinations of widths for all fittings are always listed and are a necessity for positive identification

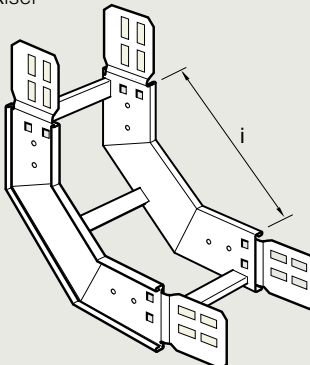
i dimension

This dimension identifies those fittings in the cable ladder ranges which have curved sections or change the direction of the run through varying angles. It is the measurement across the inner curve of the fitting, as shown below, and is a constant for each available radius option

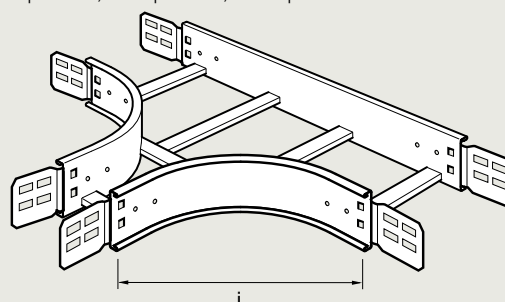
Bend



Riser



Equal tee, unequal tee, crosspiece



X, Y and C dimensions

For cable ladder fittings without an I dimension, the X, Y and C dimensions (where applicable) can be used. These are listed in each relevant technical fitting page and explained on the following page

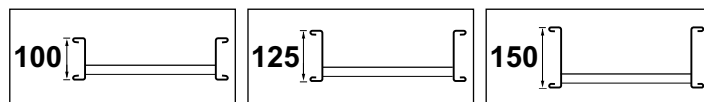
All dimensions (mm) are nominal

Fittings : see p. 46-73

Straight lengths : see p. 34-36

Swifts cable ladder couplers and fasteners

integral fitting couplers and fitting to fitting couplers



■ Integral fitting couplers

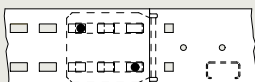
All ladder fittings have integral couplers
For straight length to fitting connections, see below
For fitting to fitting connections, see opposite

■ Assembly

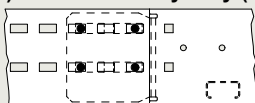
For straight length to fitting connections, use fasteners sets, see table below for number of fasteners required per fitting type
For fitting to fitting couplers, see opposite

Fastener positioning

Medium duty (Topaz)



Heavy duty (Sapphire) and extra heavy duty (Emerald)



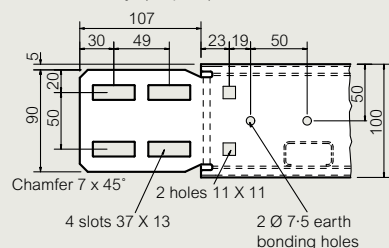
Fastener sets comprise 50 of each of the following : M10 coach bolt and flange nut

Number of fasteners required per fitting type	Topaz	
	Sapphire and Emerald	
Flat bends	8	16
Inside / outside risers	8	16
Reducers	8	16
Tees	12	24
4 way crosspieces	16	32

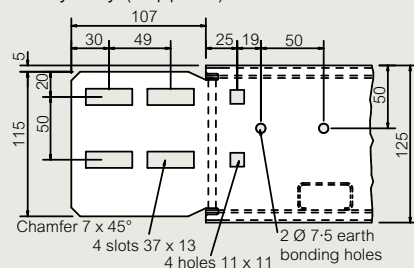
Fastener detail and finishes, see opposite

■ Dimensions

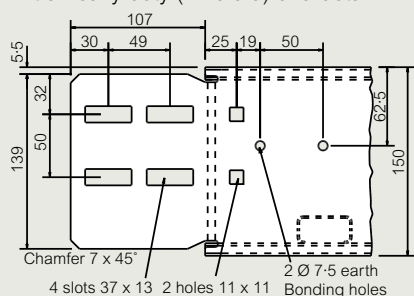
Medium duty (Topaz) end detail



Heavy duty (Sapphire) end detail



Extra heavy duty (Emerald) end detail

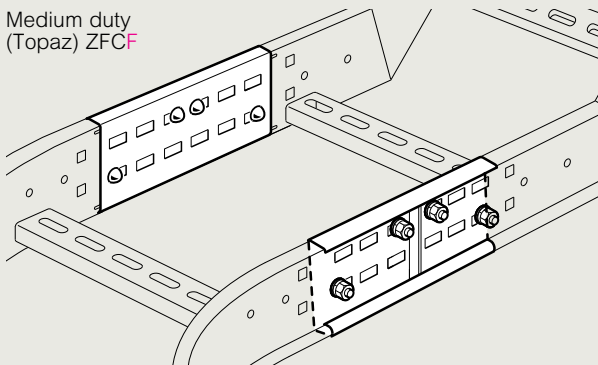


■ Fitting to fitting couplers

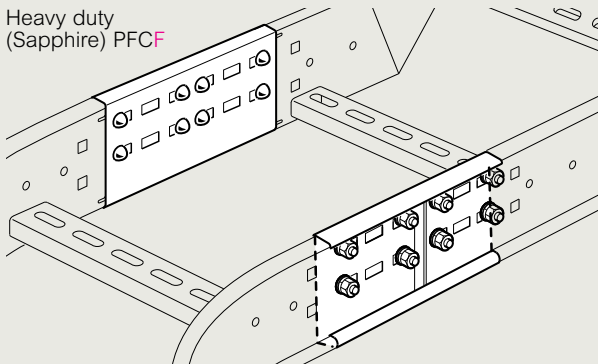
Fitting to fitting couplers are used for joining together cable ladder fittings (bends, tees, risers etc) in the medium duty (Topaz), heavy duty (Sapphire) and extra heavy duty (Emerald) ranges. Fittings in these ranges have integral couplers. See opposite for more information. Supplied in pairs with the appropriate quantity of fasteners

■ Installation (typical)

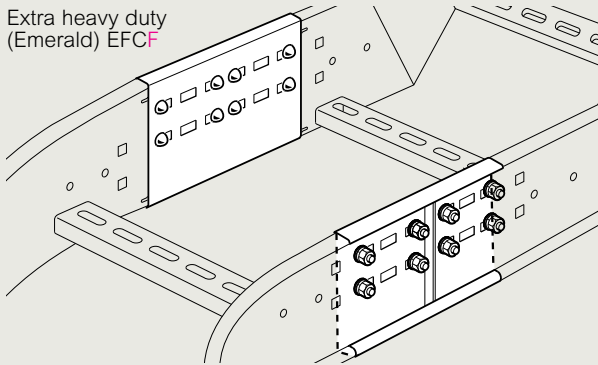
Medium duty (Topaz) ZFC^F



Heavy duty (Sapphire) PFC^F



Extra heavy duty (Emerald) EFC^F



Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

All dimensions (mm) are nominal

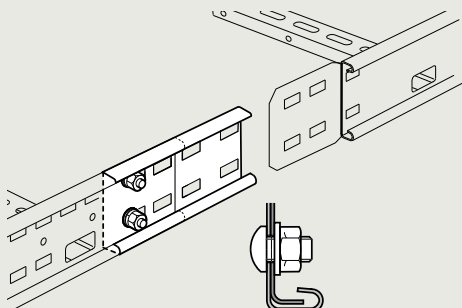
Straight lengths : see p. 34-36

Fittings : see p. 46-73

Finishes and standards : see p. 34-36

■ Assembly

Slide the couplers under the return flanges of one ladder side rail and loosely fit a single fastener to each coupler to hold it in place. Slide the second ladder over both couplers, adjust each coupler position to align the slots with the side rail slots and secure with all fasteners.



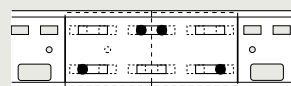
Note

For location of coupler and position of fasteners, see below.

Fastener positioning

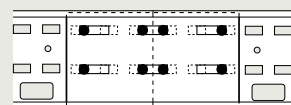
Medium duty (Topaz)

Supplied in pairs, with fasteners (4 per coupler)



Heavy duty (Sapphire) and extra heavy duty (Emerald)

Supplied in pairs, with fasteners (8 per coupler)

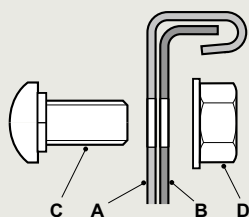


Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
Quantity of fasteners per coupler	4	8	8

Note

When connecting straight lengths to fittings, use fastener sets, see opposite.

Fasteners (included)



- A Side rail
- B Coupler
- C M10 x 20 coachbolt
- D M10 flange nut

Recommended Torque Setting (M10): 40Nm

Fastener finishes

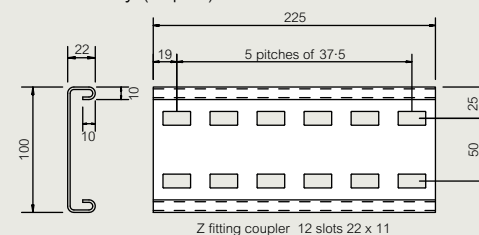
For ladders with G, D and E finishes, fasteners are high tensile Grade 8.8 hot dip galvanised.

For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

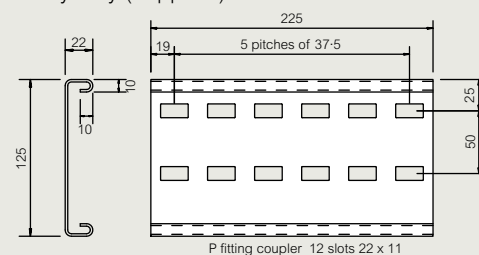
An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333.

■ Dimensions and weights

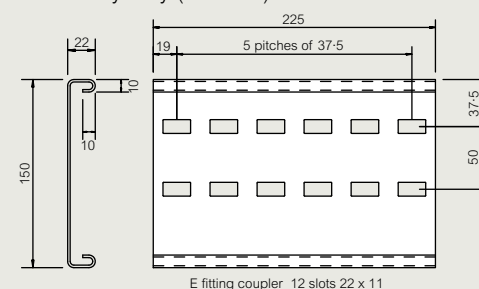
Medium duty (Topaz) ZFCF



Heavy duty (Sapphire) PFCF



Extra heavy duty (Emerald) EFCF



Cat. Nos.	Weight (kg)
ZFCF	0.6
PFCF	1.1
EFCF	1.4

Weights

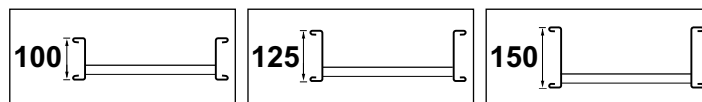
All weights given are in kilograms (kg) and are for a pair of couplers in hot dip galvanised G finish.

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors:

- Deep galvanised (D) x 1.07
- Stainless steel (S) x 0.94
- Powder coated (E) x 0.97

Swifts flat bends

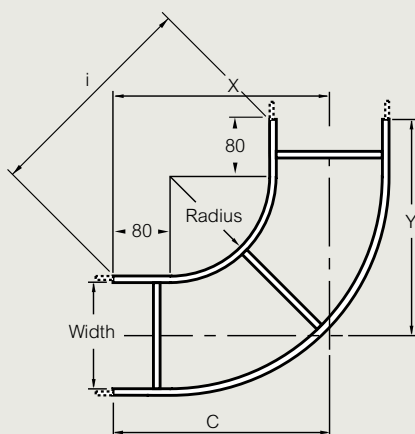
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos.	No. of rungs	Dimensions (mm)				Weight (kg)		
				X	Y	i	C	Topaz	Sapphire	Emerald
150	300	XFB 150 90 300 F	3	453	453	537	453	3.7	4.3	6.3
	450	XFB 150 90 450 F	3	603	603	750	603	4.7	5.4	8.0
	600	XFB 150 90 600 F	4	753	753	962	753	5.7	6.6	9.7
	750	XFB 150 90 750 F	4	903	903	1174	903	6.7	7.7	11.3
	900	XFB 150 90 900 F	4	1053	1053	1386	1053	7.6	8.8	12.9
300	300	XFB 300 90 300 F	3	528	528	537	528	4.6	5.2	7.5
	450	XFB 300 90 450 F	3	678	678	750	678	5.5	6.3	9.1
	600	XFB 300 90 600 F	4	828	828	962	828	6.7	7.7	11.0
	750	XFB 300 90 750 F	4	978	978	1174	978	7.6	8.8	12.6
	900	XFB 300 90 900 F	5	1128	1128	1386	1128	8.8	10.1	14.5
450	300	XFB 450 90 300 F	3	603	603	537	603	5.4	6.1	8.7
	450	XFB 450 90 450 F	4	753	753	750	753	6.7	7.6	10.7
	600	XFB 450 90 600 F	4	903	903	962	903	7.7	8.7	12.3
	750	XFB 450 90 750 F	5	1053	1053	1174	1053	9.0	10.2	14.3
	900	XFB 450 90 900 F	5	1203	1203	1386	1203	9.9	11.3	15.9
600	300	XFB 600 90 300 F	4	678	678	537	678	7.1	8.0	10.8
	450	XFB 600 90 450 F	4	828	828	750	828	8.1	9.1	12.4
	600	XFB 600 90 600 F	5	978	978	962	978	9.6	10.8	14.6
	750	XFB 600 90 750 F	5	1128	1128	1174	1128	10.6	11.8	16.2
	900	XFB 600 90 900 F	5	1278	1278	1386	1278	11.5	12.9	17.8
750	300	XFB 750 90 300 F	4	753	753	537	753	9.0	9.9	12.9
	450	XFB 750 90 450 F	5	903	903	750	903	10.9	11.9	15.5
	600	XFB 750 90 600 F	5	1053	1053	962	1053	11.8	13.0	17.1
	750	XFB 750 90 750 F	5	1203	1203	1174	1203	12.8	14.1	18.7
	900	XFB 750 90 900 F	6	1353	1353	1386	1353	14.6	16.1	21.3
900	300	XFB 900 90 300 F	5	828	828	537	828	11.3	12.3	15.6
	450	XFB 900 90 450 F	5	978	978	750	978	12.3	13.4	17.2
	600	XFB 900 90 600 F	5	1128	1128	962	1128	13.2	14.5	18.9
	750	XFB 900 90 750 F	6	1278	1278	1174	1278	15.3	16.7	21.6
	900	XFB 900 90 900 F	6	1428	1428	1386	1428	16.2	17.8	23.2

Dimensions



Note
Rungs are shown for illustrative purposes only

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish.

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

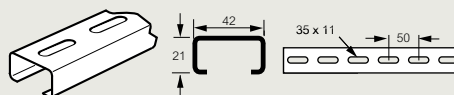
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

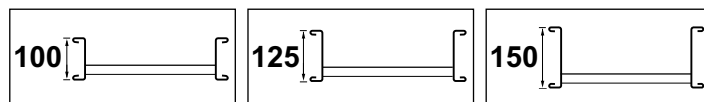
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts flat bends

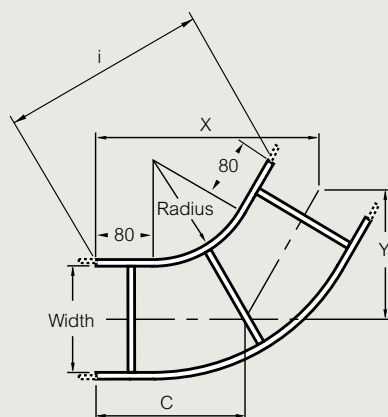
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos.	No. of rungs	Dimensions (mm)				Weight (kg)		
				X	Y	i	C	Topaz	Sapphire	Emerald
150	300	XFB 150 60 300 F	2	443	256	439	296	2.8	3.3	4.9
	450	XFB 150 60 450 F	3	573	331	589	382	3.6	4.1	6.1
	600	XFB 150 60 600 F	3	703	406	739	469	4.2	4.9	7.1
	750	XFB 150 60 750 F	3	833	481	889	555	4.8	5.6	8.2
	900	XFB 150 60 900 F	3	963	556	1039	642	5.5	6.3	9.3
300	300	XFB 300 60 300 F	3	508	294	439	339	3.6	4.1	5.9
	450	XFB 300 60 450 F	3	638	369	589	426	4.2	4.9	7.0
	600	XFB 300 60 600 F	3	768	444	739	512	4.9	5.6	8.0
	750	XFB 300 60 750 F	3	898	519	889	599	5.5	6.3	9.1
	900	XFB 300 60 900 F	4	1028	594	1039	685	6.4	7.3	10.4
450	300	XFB 450 60 300 F	3	573	331	439	382	4.3	4.9	6.8
	450	XFB 450 60 450 F	3	703	406	589	469	4.9	5.6	7.9
	600	XFB 450 60 600 F	3	833	481	739	555	5.6	6.3	8.9
	750	XFB 450 60 750 F	4	963	556	889	642	6.6	7.4	10.4
	900	XFB 450 60 900 F	4	1093	631	1039	728	7.2	8.2	11.5
600	300	XFB 600 60 300 F	3	638	368	439	426	5.3	5.9	8.0
	450	XFB 600 60 450 F	3	768	443	589	512	5.9	6.7	9.1
	600	XFB 600 60 600 F	4	898	518	739	599	7.1	8.0	10.8
	750	XFB 600 60 750 F	4	1028	593	889	685	7.8	8.7	11.8
	900	XFB 600 60 900 F	4	1158	668	1039	772	8.4	9.4	12.9
750	300	XFB 750 60 300 F	3	703	406	439	469	6.6	7.3	9.6
	450	XFB 750 60 450 F	4	833	481	589	555	8.2	9.0	11.6
	600	XFB 750 60 600 F	4	963	556	739	642	8.8	9.7	12.7
	750	XFB 750 60 750 F	4	1093	631	889	729	9.5	10.4	13.8
	900	XFB 750 60 900 F	4	1222	706	1039	815	10.1	11.2	14.8
900	300	XFB 900 60 300 F	4	768	443	439	512	8.6	9.4	11.8
	450	XFB 900 60 450 F	4	898	518	589	598	9.3	10.1	12.9
	600	XFB 900 60 600 F	4	1028	593	739	685	9.9	10.8	14.0
	750	XFB 900 60 750 F	4	1157	668	889	772	10.5	11.6	15.0
	900	XFB 900 60 900 F	5	1287	743	1039	858	12.3	13.4	17.3

Dimensions



Note
Rungs are shown for illustrative purposes only

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish
To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

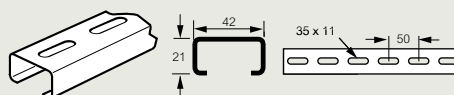
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

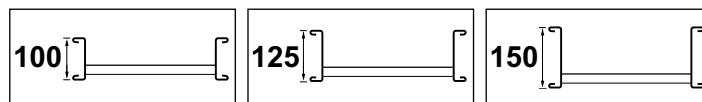
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts flat bends

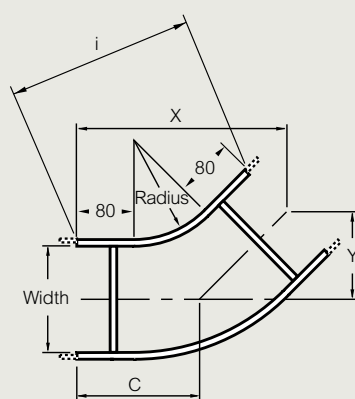
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos.	No. of rungs	Dimensions (mm)				Weight (kg)		
				X	Y	i	C	Topaz	Sapphire	Emerald
150	300	XFB 150 45 300 F	2	400	166	377	235	2.4	2.8	4.2
	450	XFB 150 45 450 F	2	506	210	492	297	2.9	3.4	5.0
	600	XFB 150 45 600 F	2	612	254	607	359	3.4	3.9	5.8
	750	XFB 150 45 750 F	3	719	298	722	421	4.0	4.6	6.7
	900	XFB 150 45 900 F	3	825	342	837	483	4.4	5.1	7.5
300	300	XFB 300 45 300 F	2	453	188	377	266	2.9	3.4	4.8
	450	XFB 300 45 450 F	2	559	232	492	328	3.4	3.9	5.6
	600	XFB 300 45 600 F	3	665	276	607	390	4.1	4.7	6.7
	750	XFB 300 45 750 F	3	772	320	722	452	4.6	5.2	7.5
	900	XFB 300 45 900 F	3	878	364	837	514	5.0	5.8	8.3
450	300	XFB 450 45 300 F	2	506	210	377	297	3.4	3.9	5.5
	450	XFB 450 45 450 F	3	612	254	492	359	4.2	4.8	6.7
	600	XFB 450 45 600 F	3	719	298	607	421	4.7	5.3	7.5
	750	XFB 450 45 750 F	3	825	342	722	483	5.2	5.9	8.3
	900	XFB 450 45 900 F	3	931	385	837	545	5.6	6.4	9.1
600	300	XFB 600 45 300 F	3	559	232	377	328	4.7	5.2	6.9
	450	XFB 600 45 450 F	3	665	276	492	390	5.1	5.7	7.7
	600	XFB 600 45 600 F	3	772	320	607	452	5.6	6.3	8.6
	750	XFB 600 45 750 F	3	878	364	722	514	6.1	6.8	9.4
	900	XFB 600 45 900 F	3	984	407	837	576	6.6	7.4	10.2
750	300	XFB 750 45 300 F	3	612	254	377	359	5.9	6.5	8.4
	450	XFB 750 45 450 F	3	719	298	492	421	6.4	7.0	9.2
	600	XFB 750 45 600 F	3	825	342	607	483	6.9	7.6	10.0
	750	XFB 750 45 750 F	3	931	385	722	545	7.4	8.1	10.8
	900	XFB 750 45 900 F	4	1037	429	837	607	8.8	9.6	12.5
900	300	XFB 900 45 300 F	3	665	276	377	390	6.7	7.3	9.3
	450	XFB 900 45 450 F	3	772	320	492	452	7.2	7.9	10.1
	600	XFB 900 45 600 F	3	878	364	607	514	7.7	8.4	11.0
	750	XFB 900 45 750 F	4	984	407	722	576	9.3	10.1	12.9
	900	XFB 900 45 900 F	4	1090	451	837	638	9.7	10.6	13.7

Dimensions



Note
Rungs are shown for illustrative purposes only

X = length of fitting from each 'end' of centre-line (not including integral coupler)
Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)
i = measurement across the inner curve of the fitting
C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish
To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

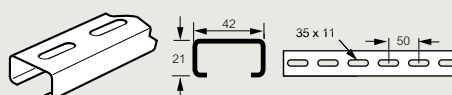
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

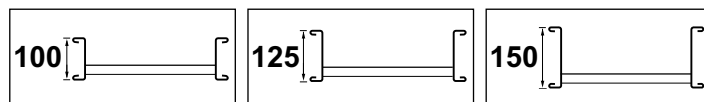
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts flat bends

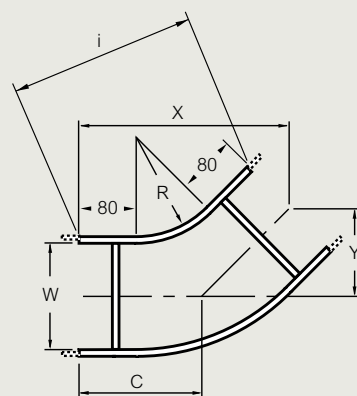
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos.	No. of rungs	Dimensions (mm)				Weight (kg)		
				X	Y	i	C	Topaz	Sapphire	Emerald
150	300	XFB 150 30 300 F	2	336	90	310	180	2.0	2.4	3.5
	450	XFB 150 30 450 F	2	411	110	387	220	2.3	2.8	4.0
	600	XFB 150 30 600 F	2	486	130	465	260	2.7	3.1	4.6
	750	XFB 150 30 750 F	2	561	150	543	301	3.0	3.5	5.1
	900	XFB 150 30 900 F	2	636	170	620	341	3.3	3.8	5.7
300	300	XFB 300 30 300 F	2	373	100	310	200	2.4	2.8	4.0
	450	XFB 300 30 450 F	2	448	120	387	240	2.7	3.2	4.6
	600	XFB 300 30 600 F	2	523	140	465	280	3.1	3.5	5.1
	750	XFB 300 30 750 F	2	598	160	543	321	3.4	3.9	5.6
	900	XFB 300 30 900 F	2	673	180	620	361	3.7	4.3	6.2
450	300	XFB 450 30 300 F	2	411	110	310	220	2.8	3.2	4.5
	450	XFB 450 30 450 F	2	486	130	387	260	3.1	3.6	5.1
	600	XFB 450 30 600 F	2	561	150	465	301	3.5	4.0	5.6
	750	XFB 450 30 750 F	2	636	170	543	341	3.8	4.3	6.2
	900	XFB 450 30 900 F	3	711	190	620	381	4.5	5.1	7.1
600	300	XFB 600 30 300 F	2	448	120	310	240	3.4	3.9	5.3
	450	XFB 600 30 450 F	2	523	140	387	281	3.8	4.2	5.8
	600	XFB 600 30 600 F	2	598	160	465	321	4.1	4.6	6.3
	750	XFB 600 30 750 F	3	673	180	543	361	5.0	5.6	7.5
	900	XFB 600 30 900 F	3	748	201	620	401	5.3	5.9	8.0
750	300	XFB 750 30 300 F	2	486	130	310	260	4.3	4.7	6.2
	450	XFB 750 30 450 F	2	561	150	387	301	4.6	5.1	6.8
	600	XFB 750 30 600 F	3	636	170	465	341	5.9	6.4	8.2
	750	XFB 750 30 750 F	3	711	190	543	381	6.2	6.8	8.8
	900	XFB 750 30 900 F	3	786	211	620	421	6.5	7.1	9.3
900	300	XFB 900 30 300 F	2	523	140	310	281	4.8	5.3	6.9
	450	XFB 900 30 450 F	3	598	160	387	321	6.3	6.8	8.5
	600	XFB 900 30 600 F	3	673	180	465	361	6.6	7.2	9.1
	750	XFB 900 30 750 F	3	748	201	543	401	6.9	7.5	9.6
	900	XFB 900 30 900 F	3	823	221	620	441	7.2	7.9	10.1

Dimensions



Note
Rungs are shown for illustrative purposes only

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

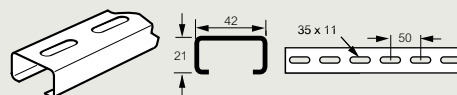
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

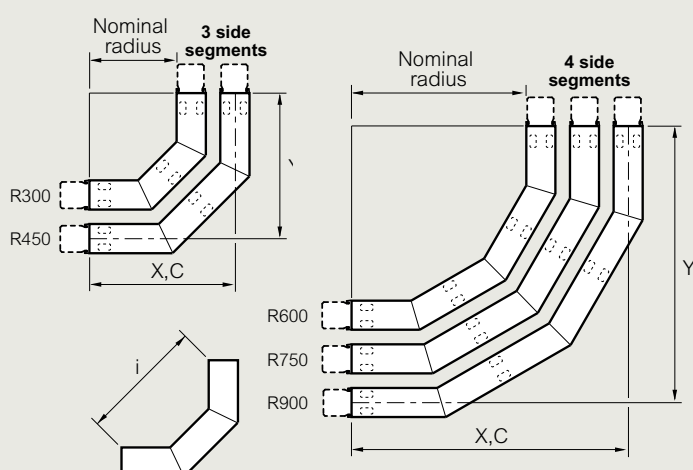
All dimensions (mm) are nominal

■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	ZIR 150 90 300 F	3	350	350	424	350	3.1
	450	ZIR 150 90 450 F	3	500	500	636	500	4.1
	600	ZIR 150 90 600 F	4	650	650	849	650	5.1
	750	ZIR 150 90 750 F	4	800	800	1061	800	6.0
	900	ZIR 150 90 900 F	4	950	950	1273	950	7.0
300	300	ZIR 300 90 300 F	3	350	350	424	350	3.5
	450	ZIR 300 90 450 F	3	500	500	636	500	4.5
	600	ZIR 300 90 600 F	4	650	650	849	650	5.6
	750	ZIR 300 90 750 F	4	800	800	1061	800	6.5
	900	ZIR 300 90 900 F	4	950	950	1273	950	7.5
450	300	ZIR 450 90 300 F	3	350	350	424	350	3.8
	450	ZIR 450 90 450 F	3	500	500	636	500	4.8
	600	ZIR 450 90 600 F	4	650	650	849	650	6.0
	750	ZIR 450 90 750 F	4	800	800	1061	800	7.0
	900	ZIR 450 90 900 F	4	950	950	1273	950	8.0
600	300	ZIR 600 90 300 F	3	350	350	424	350	4.5
	450	ZIR 600 90 450 F	3	500	500	636	500	5.5
	600	ZIR 600 90 600 F	4	650	650	849	650	7.0
	750	ZIR 600 90 750 F	4	800	800	1061	800	7.9
	900	ZIR 600 90 900 F	4	950	950	1273	950	8.9
750	300	ZIR 750 90 300 F	3	350	350	424	350	5.5
	450	ZIR 750 90 450 F	3	500	500	636	500	6.5
	600	ZIR 750 90 600 F	4	650	650	849	650	8.3
	750	ZIR 750 90 750 F	4	800	800	1061	800	9.3
	900	ZIR 750 90 900 F	4	950	950	1273	950	10.3
900	300	ZIR 900 90 300 F	3	350	350	424	350	6.1
	450	ZIR 900 90 450 F	3	500	500	636	500	7.1
	600	ZIR 900 90 600 F	4	650	650	849	650	9.1
	750	ZIR 900 90 750 F	4	800	800	1061	800	10.1
	900	ZIR 900 90 900 F	4	950	950	1273	950	11.0

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute ZIR for ZOR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)
Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)
i = measurement across the inner curve of the fitting
C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

All dimensions (mm) are nominal

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

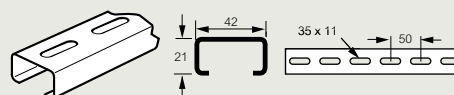
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

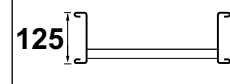
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

Swifts inside and outside risers

heavy duty Sapphire

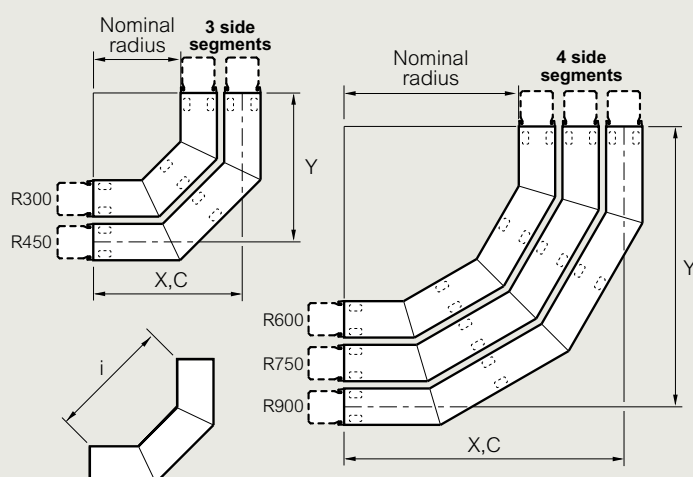


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	PIR 150 90 300 F	3	363	363	424	363	3.7
	450	PIR 150 90 450 F	3	513	513	636	513	4.9
	600	PIR 150 90 600 F	4	663	663	849	663	6.0
	750	PIR 150 90 750 F	4	813	813	1061	813	7.1
	900	PIR 150 90 900 F	4	963	963	1273	963	8.2
300	300	PIR 300 90 300 F	3	363	363	424	363	4.1
	450	PIR 300 90 450 F	3	513	513	636	513	5.2
	600	PIR 300 90 600 F	4	663	663	849	663	6.5
	750	PIR 300 90 750 F	4	813	813	1061	813	7.6
	900	PIR 300 90 900 F	4	963	963	1273	963	8.7
450	300	PIR 450 90 300 F	3	363	363	424	363	4.4
	450	PIR 450 90 450 F	3	513	513	636	513	5.6
	600	PIR 450 90 600 F	4	663	663	849	663	6.9
	750	PIR 450 90 750 F	4	813	813	1061	813	8.1
	900	PIR 450 90 900 F	4	963	963	1273	963	9.2
600	300	PIR 600 90 300 F	3	363	363	424	363	5.1
	450	PIR 600 90 450 F	3	513	513	636	513	6.3
	600	PIR 600 90 600 F	4	663	663	849	663	7.9
	750	PIR 600 90 750 F	4	813	813	1061	813	9.0
	900	PIR 600 90 900 F	4	963	963	1273	963	10.1
750	300	PIR 750 90 300 F	3	363	363	424	363	6.1
	450	PIR 750 90 450 F	3	513	513	636	513	7.3
	600	PIR 750 90 600 F	4	663	663	849	663	9.2
	750	PIR 750 90 750 F	4	813	813	1061	813	10.3
	900	PIR 750 90 900 F	4	963	963	1273	963	11.5
900	300	PIR 900 90 300 F	3	363	363	424	363	6.7
	450	PIR 900 90 450 F	3	513	513	636	513	7.9
	600	PIR 900 90 600 F	4	663	663	849	663	10.0
	750	PIR 900 90 750 F	4	813	813	1061	813	11.1
	900	PIR 900 90 900 F	4	963	963	1273	963	12.2

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute PIR for POR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)
Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)
i = measurement across the inner curve of the fitting
C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

All dimensions (mm) are nominal

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

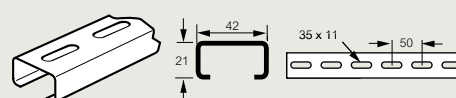
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard

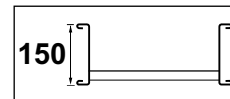


Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

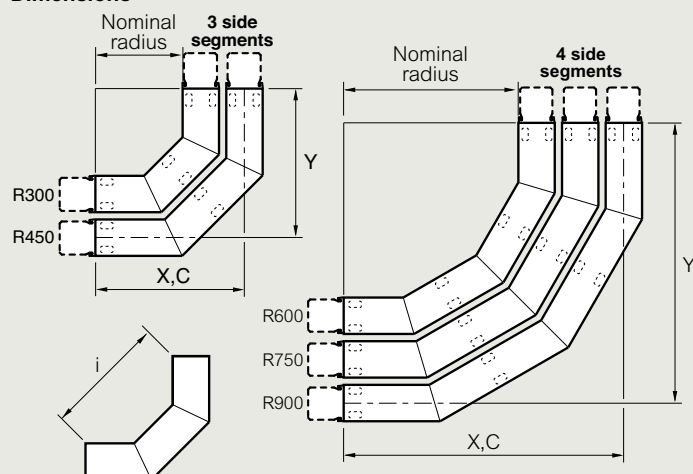


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	EIR 150 90 300 F	3	375	375	424	375	5.5
	450	EIR 150 90 450 F	3	525	525	636	525	7.2
	600	EIR 150 90 600 F	4	675	675	849	675	8.8
	750	EIR 150 90 750 F	4	825	825	1061	825	10.5
	900	EIR 150 90 900 F	4	975	975	1273	975	12.2
300	300	EIR 300 90 300 F	3	375	375	424	375	5.9
	450	EIR 300 90 450 F	3	525	525	636	525	7.6
	600	EIR 300 90 600 F	4	675	675	849	675	9.3
	750	EIR 300 90 750 F	4	825	825	1061	825	11.0
	900	EIR 300 90 900 F	4	975	975	1273	975	12.6
450	300	EIR 450 90 300 F	3	375	375	424	375	6.3
	450	EIR 450 90 450 F	3	525	525	636	525	8.0
	600	EIR 450 90 600 F	4	675	675	849	675	9.8
	750	EIR 450 90 750 F	4	825	825	1061	825	11.5
	900	EIR 450 90 900 F	4	975	975	1273	975	13.1
600	300	EIR 600 90 300 F	3	375	375	424	375	6.9
	450	EIR 600 90 450 F	3	525	525	636	525	8.7
	600	EIR 600 90 600 F	4	675	675	849	675	10.7
	750	EIR 600 90 750 F	4	825	825	1061	825	12.4
	900	EIR 600 90 900 F	4	975	975	1273	975	14.0
750	300	EIR 750 90 300 F	3	375	375	424	375	8.0
	450	EIR 750 90 450 F	3	525	525	636	525	9.7
	600	EIR 750 90 600 F	4	675	675	849	675	12.1
	750	EIR 750 90 750 F	4	825	825	1061	825	13.7
	900	EIR 750 90 900 F	4	975	975	1273	975	15.4
900	300	EIR 900 90 300 F	3	375	375	424	375	8.5
	450	EIR 900 90 450 F	3	525	525	636	525	10.2
	600	EIR 900 90 600 F	4	675	675	849	675	12.8
	750	EIR 900 90 750 F	4	825	825	1061	825	14.5
	900	EIR 900 90 900 F	4	975	975	1273	975	16.2

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute EIR for EOR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)
Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)
i = measurement across the inner curve of the fitting
C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

All dimensions (mm) are nominal

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

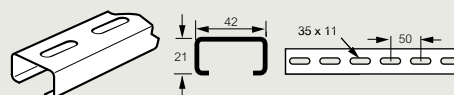
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

Swifts inside and outside risers

medium duty Topaz

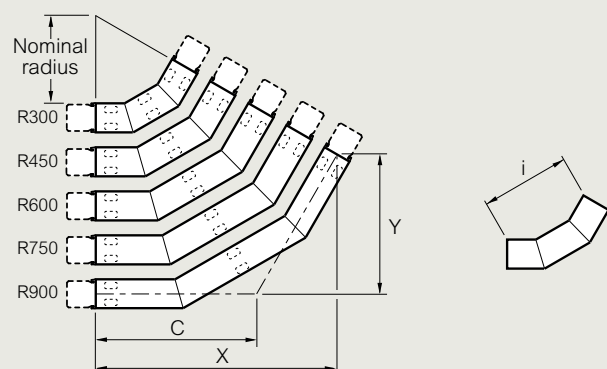
100

■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	ZIR 150 60 300 F	3	303	175	300	202	2.2
	450	ZIR 150 60 450 F	3	433	250	450	289	2.9
	600	ZIR 150 60 600 F	3	563	325	600	375	3.5
	750	ZIR 150 60 750 F	3	693	400	750	462	4.2
	900	ZIR 150 60 900 F	3	823	475	900	548	4.8
300	300	ZIR 300 60 300 F	3	303	175	300	202	2.6
	450	ZIR 300 60 450 F	3	433	250	450	289	3.2
	600	ZIR 300 60 600 F	3	563	325	600	375	3.9
	750	ZIR 300 60 750 F	3	693	400	750	462	4.5
	900	ZIR 300 60 900 F	3	823	475	900	548	5.2
450	300	ZIR 450 60 300 F	3	303	175	300	202	3.0
	450	ZIR 450 60 450 F	3	433	250	450	289	3.6
	600	ZIR 450 60 600 F	3	563	325	600	375	4.3
	750	ZIR 450 60 750 F	3	693	400	750	462	4.9
	900	ZIR 450 60 900 F	3	823	475	900	548	5.5
600	300	ZIR 600 60 300 F	3	303	175	300	202	3.6
	450	ZIR 600 60 450 F	3	433	250	450	289	4.3
	600	ZIR 600 60 600 F	3	563	325	600	375	4.9
	750	ZIR 600 60 750 F	3	693	400	750	462	5.6
	900	ZIR 600 60 900 F	3	823	475	900	548	6.2
750	300	ZIR 750 60 300 F	3	303	175	300	202	4.7
	450	ZIR 750 60 450 F	3	433	250	450	289	5.3
	600	ZIR 750 60 600 F	3	563	325	600	375	6.0
	750	ZIR 750 60 750 F	3	693	400	750	462	6.6
	900	ZIR 750 60 900 F	3	823	475	900	548	7.3
900	300	ZIR 900 60 300 F	3	303	175	300	202	5.2
	450	ZIR 900 60 450 F	3	433	250	450	289	5.9
	600	ZIR 900 60 600 F	3	563	325	600	375	6.5
	750	ZIR 900 60 750 F	3	693	400	750	462	7.2
	900	ZIR 900 60 900 F	3	823	475	900	548	7.8

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute ZIR for ZOR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

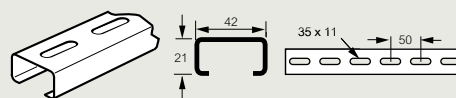
■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37

Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Integral fitting coupler detail : see p. 44

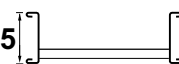
Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts inside and outside risers

heavy duty Sapphire

125

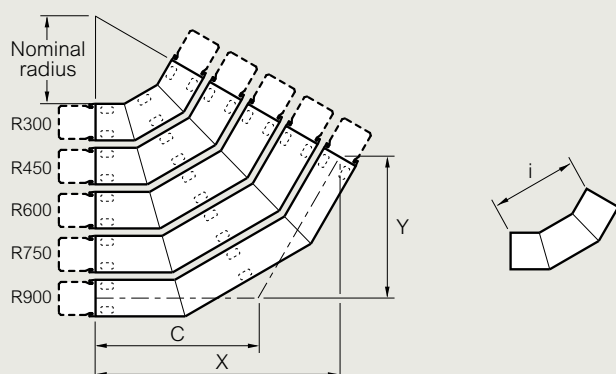


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	PIR 150 60 300 F	3	314	181	300	209	2.7
	450	PIR 150 60 450 F	3	444	256	450	296	3.4
	600	PIR 150 60 600 F	3	574	331	600	382	4.2
	750	PIR 150 60 750 F	3	704	406	750	469	4.9
	900	PIR 150 60 900 F	3	834	481	900	556	5.7
300	300	PIR 300 60 300 F	3	314	181	300	209	3.0
	450	PIR 300 60 450 F	3	444	256	450	296	3.8
	600	PIR 300 60 600 F	3	574	331	600	382	4.5
	750	PIR 300 60 750 F	3	704	406	750	469	5.3
	900	PIR 300 60 900 F	3	834	481	900	556	6.0
450	300	PIR 450 60 300 F	3	314	181	300	209	3.4
	450	PIR 450 60 450 F	3	444	256	450	296	4.1
	600	PIR 450 60 600 F	3	574	331	600	382	4.9
	750	PIR 450 60 750 F	3	704	406	750	469	5.6
	900	PIR 450 60 900 F	3	834	481	900	556	6.4
600	300	PIR 600 60 300 F	3	314	181	300	209	4.1
	450	PIR 600 60 450 F	3	444	256	450	296	4.8
	600	PIR 600 60 600 F	3	574	331	600	382	5.6
	750	PIR 600 60 750 F	3	704	406	750	469	6.3
	900	PIR 600 60 900 F	3	834	481	900	556	7.1
750	300	PIR 750 60 300 F	3	314	181	300	209	5.1
	450	PIR 750 60 450 F	3	444	256	450	296	5.9
	600	PIR 750 60 600 F	3	574	331	600	382	6.6
	750	PIR 750 60 750 F	3	704	406	750	469	7.3
	900	PIR 750 60 900 F	3	834	481	900	556	8.1
900	300	PIR 900 60 300 F	3	314	181	300	209	5.7
	450	PIR 900 60 450 F	3	444	256	450	296	6.4
	600	PIR 900 60 600 F	3	574	331	600	382	7.2
	750	PIR 900 60 750 F	3	704	406	750	469	7.9
	900	PIR 900 60 900 F	3	834	481	900	556	8.7

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute PIR for POR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

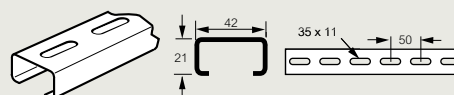
■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available on special order, see p. 37

Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

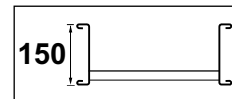
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts inside and outside risers

extra heavy duty Emerald

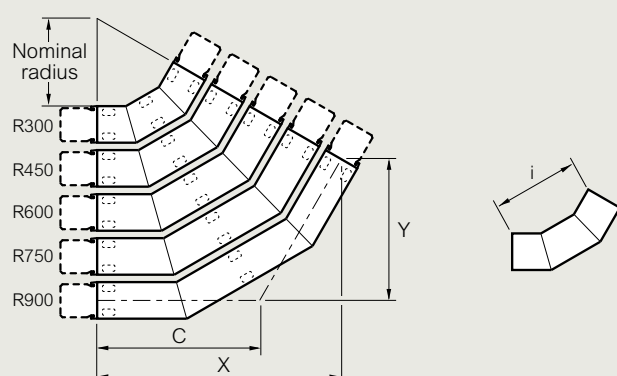


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	EIR 150 60 300 F	3	325	187	300	217	3.9
	450	EIR 150 60 450 F	3	455	262	450	303	5.1
	600	EIR 150 60 600 F	4	585	337	600	390	6.2
	750	EIR 150 60 750 F	4	714	412	750	476	7.3
	900	EIR 150 60 900 F	4	844	487	900	563	8.4
300	300	EIR 300 60 300 F	3	325	187	300	217	4.3
	450	EIR 300 60 450 F	3	455	262	450	303	5.4
	600	EIR 300 60 600 F	4	585	337	600	390	6.5
	750	EIR 300 60 750 F	4	714	412	750	476	7.6
	900	EIR 300 60 900 F	4	844	487	900	563	8.7
450	300	EIR 450 60 300 F	3	325	187	300	217	4.7
	450	EIR 450 60 450 F	3	455	262	450	303	5.8
	600	EIR 450 60 600 F	4	585	337	600	390	6.9
	750	EIR 450 60 750 F	4	714	412	750	476	8.0
	900	EIR 450 60 900 F	4	844	487	900	563	9.1
600	300	EIR 600 60 300 F	3	325	187	300	217	5.4
	450	EIR 600 60 450 F	3	455	262	450	303	6.5
	600	EIR 600 60 600 F	4	585	337	600	390	7.6
	750	EIR 600 60 750 F	4	714	412	750	476	8.7
	900	EIR 600 60 900 F	4	844	487	900	563	9.8
750	300	EIR 750 60 300 F	3	325	187	300	217	6.4
	450	EIR 750 60 450 F	3	455	262	450	303	7.5
	600	EIR 750 60 600 F	4	585	337	600	390	8.6
	750	EIR 750 60 750 F	4	714	412	750	476	9.7
	900	EIR 750 60 900 F	4	844	487	900	563	10.8
900	300	EIR 900 60 300 F	3	325	187	300	217	7.0
	450	EIR 900 60 450 F	3	455	262	450	303	8.1
	600	EIR 900 60 600 F	4	585	337	600	390	9.2
	750	EIR 900 60 750 F	4	714	412	750	476	10.3
	900	EIR 900 60 900 F	4	844	487	900	563	11.4

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute EIR for EOR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

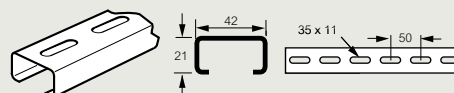
■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37

Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

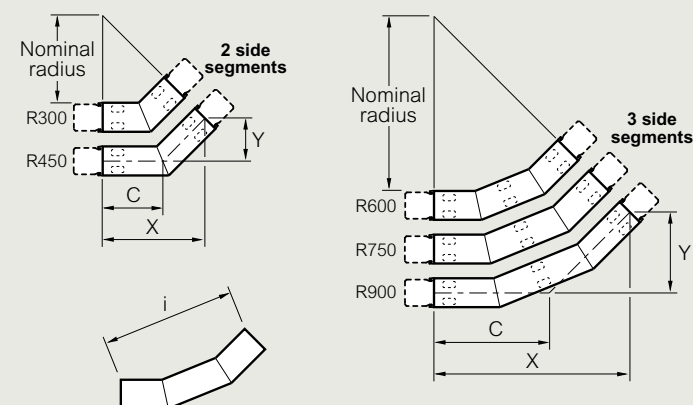
All dimensions (mm) are nominal

■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	ZIR 150 45 300 F	2	247	103	230	145	1.8
	450	ZIR 150 45 450 F	2	354	146	344	207	2.3
	600	ZIR 150 45 600 F	3	460	190	459	269	2.8
	750	ZIR 150 45 750 F	3	566	234	574	331	3.3
	900	ZIR 150 45 900 F	3	672	278	689	394	3.8
300	300	ZIR 300 45 300 F	2	247	103	230	145	2.0
	450	ZIR 300 45 450 F	2	354	146	344	207	2.5
	600	ZIR 300 45 600 F	3	460	190	459	269	3.2
	750	ZIR 300 45 750 F	3	566	234	574	331	3.6
	900	ZIR 300 45 900 F	3	672	278	689	394	4.1
450	300	ZIR 450 45 300 F	2	247	103	230	145	2.2
	450	ZIR 450 45 450 F	2	354	146	344	207	2.7
	600	ZIR 450 45 600 F	3	460	190	459	269	3.5
	750	ZIR 450 45 750 F	3	566	234	574	331	4.0
	900	ZIR 450 45 900 F	3	672	278	689	394	4.5
600	300	ZIR 600 45 300 F	2	247	103	230	145	2.7
	450	ZIR 600 45 450 F	2	354	146	344	207	3.2
	600	ZIR 600 45 600 F	3	460	190	459	269	4.2
	750	ZIR 600 45 750 F	3	566	234	574	331	4.7
	900	ZIR 600 45 900 F	3	672	278	689	394	5.2
750	300	ZIR 750 45 300 F	2	247	103	230	145	3.4
	450	ZIR 750 45 450 F	2	354	146	344	207	3.9
	600	ZIR 750 45 600 F	3	460	190	459	269	5.2
	750	ZIR 750 45 750 F	3	566	234	574	331	5.7
	900	ZIR 750 45 900 F	3	672	278	689	394	6.2
900	300	ZIR 900 45 300 F	2	247	103	230	145	3.8
	450	ZIR 900 45 450 F	2	354	146	344	207	4.3
	600	ZIR 900 45 600 F	3	460	190	459	269	5.8
	750	ZIR 900 45 750 F	3	566	234	574	331	6.3
	900	ZIR 900 45 900 F	3	672	278	689	394	6.8

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute ZIR for ZOR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

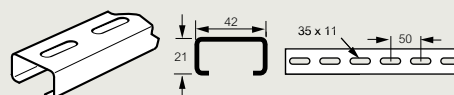
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

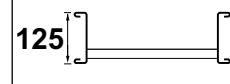
F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

Swifts inside and outside risers

heavy duty Sapphire

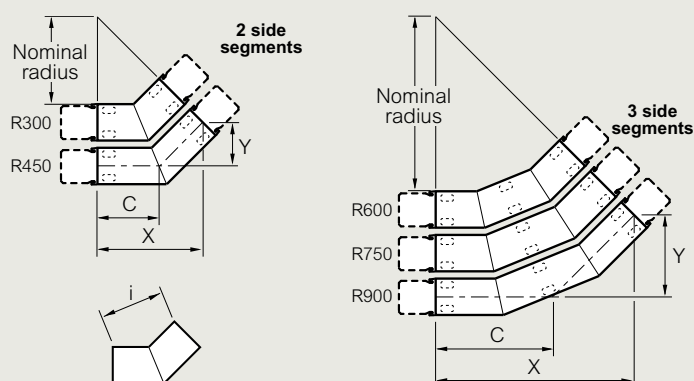


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	PIR 150 45 300 F	2	256	106	230	150	2.1
	450	PIR 150 45 450 F	2	362	150	344	212	2.7
	600	PIR 150 45 600 F	3	468	194	459	274	3.3
	750	PIR 150 45 750 F	3	575	238	574	337	3.9
	900	PIR 150 45 900 F	3	681	282	689	399	4.4
300	300	PIR 300 45 300 F	2	256	106	230	150	2.4
	450	PIR 300 45 450 F	2	362	150	344	212	2.9
	600	PIR 300 45 600 F	3	468	194	459	274	3.7
	750	PIR 300 45 750 F	3	575	238	574	337	4.2
	900	PIR 300 45 900 F	3	681	282	689	399	4.8
450	300	PIR 450 45 300 F	2	256	106	230	150	2.6
	450	PIR 450 45 450 F	2	362	150	344	212	3.2
	600	PIR 450 45 600 F	3	468	194	459	274	4.0
	750	PIR 450 45 750 F	3	575	238	574	337	4.6
	900	PIR 450 45 900 F	3	681	282	689	399	5.1
600	300	PIR 600 45 300 F	2	256	106	230	150	3.1
	450	PIR 600 45 450 F	2	362	150	344	212	3.6
	600	PIR 600 45 600 F	3	468	194	459	274	4.7
	750	PIR 600 45 750 F	3	575	238	574	337	5.3
	900	PIR 600 45 900 F	3	681	282	689	399	5.8
750	300	PIR 750 45 300 F	2	256	106	230	150	3.8
	450	PIR 750 45 450 F	2	362	150	344	212	4.3
	600	PIR 750 45 600 F	3	468	194	459	274	5.7
	750	PIR 750 45 750 F	3	575	238	574	337	6.3
	900	PIR 750 45 900 F	3	681	282	689	399	6.9
900	300	PIR 900 45 300 F	2	256	106	230	150	4.1
	450	PIR 900 45 450 F	2	362	150	344	212	4.7
	600	PIR 900 45 600 F	3	468	194	459	274	6.3
	750	PIR 900 45 750 F	3	575	238	574	337	6.9
	900	PIR 900 45 900 F	3	681	282	689	399	7.4

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute PIR for POR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)
Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)
i = measurement across the inner curve of the fitting
C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

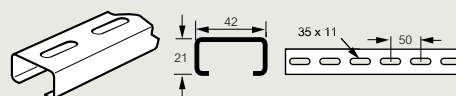
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



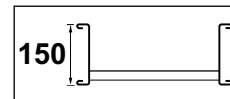
Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

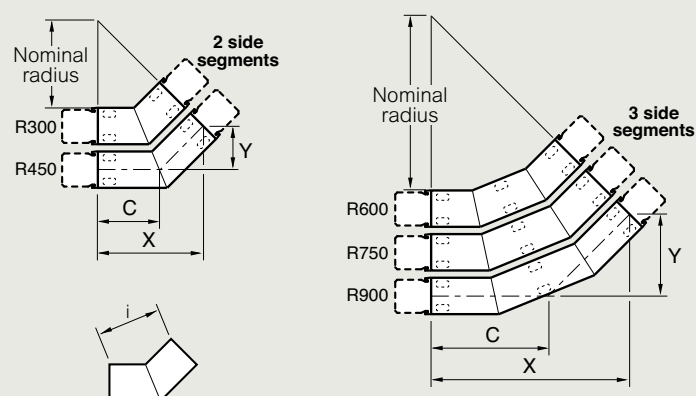


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	EIR 150 45 300 F	2	265	110	230	155	3.2
	450	EIR 150 45 450 F	2	371	154	344	217	4.0
	600	EIR 150 45 600 F	3	477	198	459	280	4.9
	750	EIR 150 45 750 F	3	583	242	574	342	5.7
	900	EIR 150 45 900 F	3	689	286	689	404	6.5
300	300	EIR 300 45 300 F	2	265	110	230	155	3.4
	450	EIR 300 45 450 F	2	371	154	344	217	4.3
	600	EIR 300 45 600 F	3	477	198	459	280	5.2
	750	EIR 300 45 750 F	3	583	242	574	342	6.1
	900	EIR 300 45 900 F	3	689	286	689	404	6.9
450	300	EIR 450 45 300 F	2	265	110	230	155	3.7
	450	EIR 450 45 450 F	2	371	154	344	217	4.5
	600	EIR 450 45 600 F	3	477	198	459	280	5.6
	750	EIR 450 45 750 F	3	583	242	574	342	6.4
	900	EIR 450 45 900 F	3	689	286	689	404	7.2
600	300	EIR 600 45 300 F	2	265	110	230	155	4.1
	450	EIR 600 45 450 F	2	371	154	344	217	5.0
	600	EIR 600 45 600 F	3	477	198	459	280	6.3
	750	EIR 600 45 750 F	3	583	242	574	342	7.1
	900	EIR 600 45 900 F	3	689	286	689	404	7.9
750	300	EIR 750 45 300 F	2	265	110	230	155	4.8
	450	EIR 750 45 450 F	2	371	154	344	217	5.7
	600	EIR 750 45 600 F	3	477	198	459	280	7.3
	750	EIR 750 45 750 F	3	583	242	574	342	8.1
	900	EIR 750 45 900 F	3	689	286	689	404	9.0
900	300	EIR 900 45 300 F	2	265	110	230	155	5.2
	450	EIR 900 45 450 F	2	371	154	344	217	6.0
	600	EIR 900 45 600 F	3	477	198	459	280	7.9
	750	EIR 900 45 750 F	3	583	242	574	342	8.7
	900	EIR 900 45 900 F	3	689	286	689	404	9.5

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute EIR for EOR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

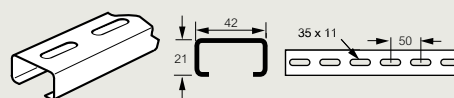
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

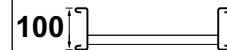
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts inside and outside risers

medium duty Topaz

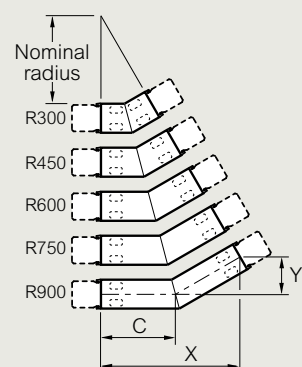


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	ZIR 150 30 300 F	2	175	47	155	94	1.3
	450	ZIR 150 30 450 F	2	250	67	233	134	1.7
	600	ZIR 150 30 600 F	2	325	87	311	174	2.0
	750	ZIR 150 30 750 F	2	400	107	388	214	2.3
	900	ZIR 150 30 900 F	2	475	127	466	255	2.6
300	300	ZIR 300 30 300 F	2	175	47	155	94	1.6
	450	ZIR 300 30 450 F	2	250	67	233	134	1.9
	600	ZIR 300 30 600 F	2	325	87	311	174	2.2
	750	ZIR 300 30 750 F	2	400	107	388	214	2.6
	900	ZIR 300 30 900 F	2	475	127	466	255	2.9
450	300	ZIR 450 30 300 F	2	175	47	155	94	1.8
	450	ZIR 450 30 450 F	2	250	67	233	134	2.2
	600	ZIR 450 30 600 F	2	325	87	311	174	2.5
	750	ZIR 450 30 750 F	2	400	107	388	214	2.8
	900	ZIR 450 30 900 F	2	475	127	466	255	3.1
600	300	ZIR 600 30 300 F	2	175	47	155	94	2.3
	450	ZIR 600 30 450 F	2	250	67	233	134	2.6
	600	ZIR 600 30 600 F	2	325	87	311	174	2.9
	750	ZIR 600 30 750 F	2	400	107	388	214	3.3
	900	ZIR 600 30 900 F	2	475	127	466	255	3.6
750	300	ZIR 750 30 300 F	2	175	47	155	94	3.0
	450	ZIR 750 30 450 F	2	250	67	233	134	3.3
	600	ZIR 750 30 600 F	2	325	87	311	174	3.6
	750	ZIR 750 30 750 F	2	400	107	388	214	3.9
	900	ZIR 750 30 900 F	2	475	127	466	255	4.3
900	300	ZIR 900 30 300 F	2	175	47	155	94	3.4
	450	ZIR 900 30 450 F	2	250	67	233	134	3.7
	600	ZIR 900 30 600 F	2	325	87	311	174	4.0
	750	ZIR 900 30 750 F	2	400	107	388	214	4.3
	900	ZIR 900 30 900 F	2	475	127	466	255	4.6

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute ZIR for ZOR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

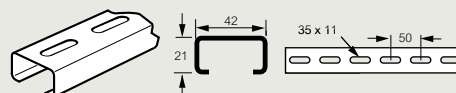
■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37

Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

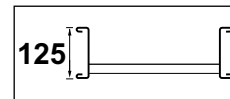
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts inside and outside risers

heavy duty Sapphire

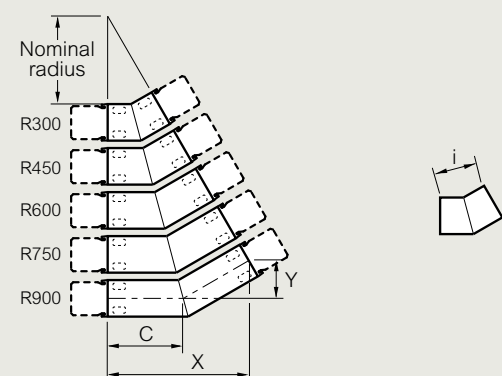


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	PIR 150 30 300 F	2	181	49	155	97	1.6
	450	PIR 150 30 450 F	2	256	69	233	137	2.0
	600	PIR 150 30 600 F	2	331	89	311	178	2.4
	750	PIR 150 30 750 F	2	406	109	388	218	2.8
	900	PIR 150 30 900 F	2	481	129	466	258	3.1
300	300	PIR 300 30 300 F	2	181	49	155	97	1.9
	450	PIR 300 30 450 F	2	256	69	233	137	2.2
	600	PIR 300 30 600 F	2	331	89	311	178	2.6
	750	PIR 300 30 750 F	2	406	109	388	218	3.0
	900	PIR 300 30 900 F	2	481	129	466	258	3.4
450	300	PIR 450 30 300 F	2	181	49	155	97	2.1
	450	PIR 450 30 450 F	2	256	69	233	137	2.5
	600	PIR 450 30 600 F	2	331	89	311	178	2.9
	750	PIR 450 30 750 F	2	406	109	388	218	3.2
	900	PIR 450 30 900 F	2	481	129	466	258	3.6
600	300	PIR 600 30 300 F	2	181	49	155	97	2.6
	450	PIR 600 30 450 F	2	256	69	233	137	2.9
	600	PIR 600 30 600 F	2	331	89	311	178	3.3
	750	PIR 600 30 750 F	2	406	109	388	218	3.7
	900	PIR 600 30 900 F	2	481	129	466	258	4.1
750	300	PIR 750 30 300 F	2	181	49	155	97	3.3
	450	PIR 750 30 450 F	2	256	69	233	137	3.6
	600	PIR 750 30 600 F	2	331	89	311	178	4.0
	750	PIR 750 30 750 F	2	406	109	388	218	4.4
	900	PIR 750 30 900 F	2	481	129	466	258	4.8
900	300	PIR 900 30 300 F	2	181	49	155	97	3.6
	450	PIR 900 30 450 F	2	256	69	233	137	4.0
	600	PIR 900 30 600 F	2	331	89	311	178	4.4
	750	PIR 900 30 750 F	2	406	109	388	218	4.8
	900	PIR 900 30 900 F	2	481	129	466	258	5.1

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute PIR for POR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

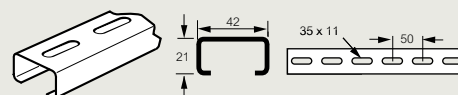
■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37

Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

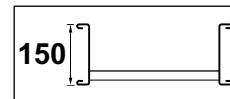
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts inside and outside risers

extra heavy duty Emerald

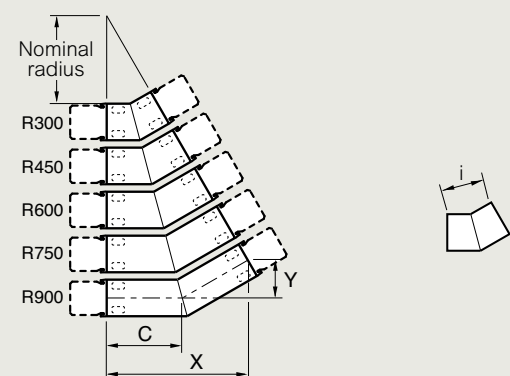


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos. ⁽¹⁾	No. of rungs	Dimensions (mm)				Weight (kg)
				X	Y	i	C	
150	300	EIR 150 30 300 F	2	187	50	155	100	2.4
	450	EIR 150 30 450 F	2	262	70	233	141	3.0
	600	EIR 150 30 600 F	2	337	90	311	181	3.5
	750	EIR 150 30 750 F	2	412	111	388	221	4.1
	900	EIR 150 30 900 F	2	487	131	466	261	4.6
300	300	EIR 300 30 300 F	2	187	50	155	100	2.7
	450	EIR 300 30 450 F	2	262	70	233	141	3.2
	600	EIR 300 30 600 F	2	337	90	311	181	3.8
	750	EIR 300 30 750 F	2	412	111	388	221	4.3
	900	EIR 300 30 900 F	2	487	131	466	261	4.9
450	300	EIR 450 30 300 F	2	187	50	155	100	2.9
	450	EIR 450 30 450 F	2	262	70	233	141	3.5
	600	EIR 450 30 600 F	2	337	90	311	181	4.0
	750	EIR 450 30 750 F	2	412	111	388	221	4.6
	900	EIR 450 30 900 F	2	487	131	466	261	5.1
600	300	EIR 600 30 300 F	2	187	50	155	100	3.4
	450	EIR 600 30 450 F	2	262	70	233	141	3.9
	600	EIR 600 30 600 F	2	337	90	311	181	4.5
	750	EIR 600 30 750 F	2	412	111	388	221	5.0
	900	EIR 600 30 900 F	2	487	131	466	261	5.6
750	300	EIR 750 30 300 F	2	187	50	155	100	4.1
	450	EIR 750 30 450 F	2	262	70	233	141	4.6
	600	EIR 750 30 600 F	2	337	90	311	181	5.2
	750	EIR 750 30 750 F	2	412	111	388	221	5.7
	900	EIR 750 30 900 F	2	487	131	466	261	6.3
900	300	EIR 900 30 300 F	2	187	50	155	100	4.4
	450	EIR 900 30 450 F	2	262	70	233	141	5.0
	600	EIR 900 30 600 F	2	337	90	311	181	5.5
	750	EIR 900 30 750 F	2	412	111	388	221	6.1
	900	EIR 900 30 900 F	2	487	131	466	261	6.7

(1) Cat. Nos. given in the table are for inside risers. For outside risers substitute EIR for EOR

Dimensions



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

C = length of the centre-line from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

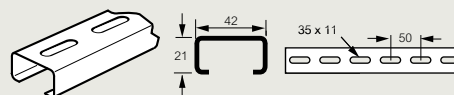
■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37

Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

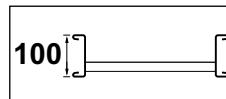
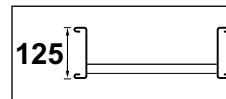
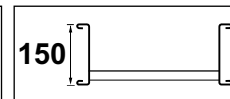
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts e ual tees

medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald

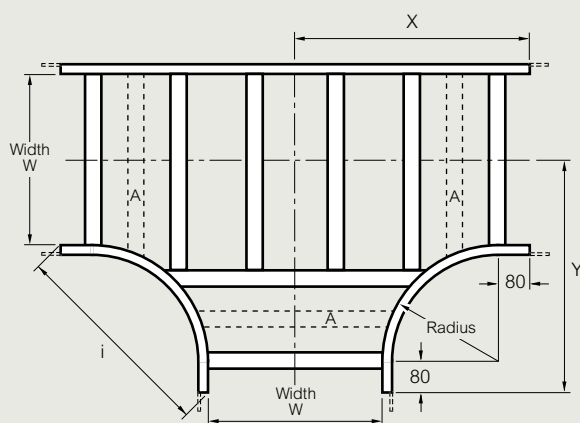


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos.	Dimensions (mm)			Weight (kg)		
			X	Y	i	Topaz	Sapphire	Emerald
150	300	XT 150 300R F	454	454	537	5.8	6.7	9.6
	450	XT 150 450R F	604	604	750	7.5	8.7	12.4
	600	XT 150 600R F	754	754	962	9.8	11.2	15.8
	750	XT 150 750R F	904	904	1 174	11.9	13.5	19.0
	900	XT 150 900R F	1 054	1 054	1 386	13.8	15.7	22.0
300	300	XT 300 300R F	529	529	537	7.0	7.9	11.0
	450	XT 300 450R F	679	679	750	9.0	10.2	14.1
	600	XT 300 600R F	829	829	962	11.6	13.0	17.8
	750	XT 300 750R F	979	979	1 174	13.9	15.5	21.2
	900	XT 300 900R F	1 129	1 129	1 386	16.2	18.1	24.6
450	300	XT 450 300R F	604	604	537	8.4	9.3	12.6
	450	XT 450 450R F	754	754	750	10.7	11.9	16.0
	600	XT 450 600R F	904	904	962	14.4	15.9	20.9
	750	XT 450 750R F	1 054	1 054	1 174	16.3	18.0	23.9
	900	XT 450 900R F	1 204	1 204	1 386	19.0	21.0	27.7
600	300	XT 600 300R F	679	679	537	11.0	12.0	15.4
	450	XT 600 450R F	829	829	750	13.7	15.0	19.2
	600	XT 600 600R F	979	979	962	17.1	18.6	23.8
	750	XT 600 750R F	1 129	1 129	1 174	20.0	21.8	27.7
	900	XT 600 900R F	1 279	1 279	1 386	21.9	23.9	30.8
750	300	XT 750 300R F	754	754	537	13.1	14.2	17.7
	450	XT 750 450R F	904	904	750	16.0	17.3	21.7
	600	XT 750 600R F	1 054	1 054	962	20.9	22.5	27.7
	750	XT 750 750R F	1 204	1 204	1 174	22.8	24.6	30.8
	900	XT 750 900R F	1 354	1 354	1 386	29.0	31.1	38.0
900	300	XT 900 300R F	829	829	537	15.9	17.0	20.8
	450	XT 900 450R F	979	979	750	19.1	20.4	25.0
	600	XT 900 600R F	1 129	1 129	962	23.3	24.9	30.3
	750 ⁽¹⁾	XT 900 750R F	1 279	1 279	1 174	29.8	31.6	37.9
	900 ⁽¹⁾	XT 900 900R F	1 429	1 429	1 386	32.2	34.3	41.4

(1) Supplied in 2 parts for assembly on site

Dimensions



Quantity and spacing of rungs varies with radius and width Nominal pitch = 300. Additional rungs (A) are fitted on tees of 600 radius and above

X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

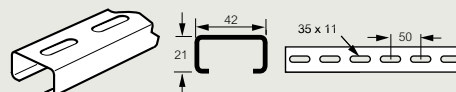
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

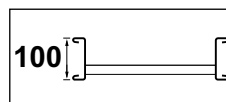
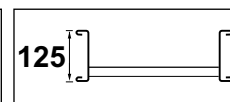
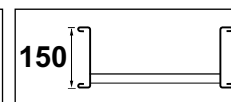
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts unequal tees 150 mm width

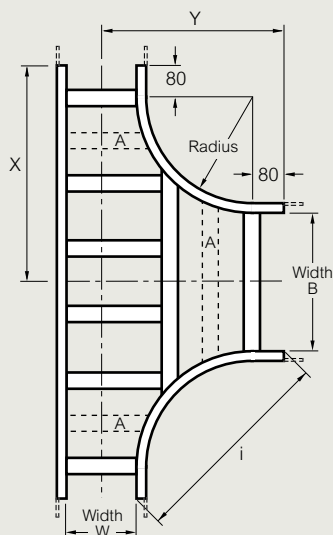
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights – unequal tees 150 mm width

Width (W)	Width (B)	Radius (R)	Cat. Nos.	Dimensions (mm)			Weight (kg)		
				X	Y	i	Topaz	Sapphire	Emerald
150	300	300	XUT 150 300 300R F	528	453	537	6·5	7·4	10·5
		450	XUT 150 300 450R F	678	603	750	8·4	9·6	13·5
		600	XUT 150 300 600R F	828	753	962	10·7	12·1	16·9
		750	XUT 150 300 750R F	978	903	1 174	12·7	14·4	20·1
		900	XUT 150 300 900R F	1 128	1 053	1 386	14·9	16·8	23·3
	450	300	XUT 150 450 300R F	603	453	537	7·2	8·2	11·4
		450	XUT 150 450 450R F	753	603	750	9·1	10·4	14·5
		600	XUT 150 450 600R F	903	753	962	11·8	13·2	18·2
		750	XUT 150 450 750R F	1 053	903	1 174	13·6	15·3	21·1
		900	XUT 150 450 900R F	1 203	1 053	1 386	15·7	17·6	24·3
	600	300	XUT 150 600 300R F	678	453	537	8·1	9·1	12·5
		450	XUT 150 600 450R F	828	603	750	10·1	11·3	15·6
		600	XUT 150 600 600R F	978	753	962	12·8	14·3	19·4
		750	XUT 150 600 750R F	1 128	903	1 174	14·9	16·7	22·6
		900	XUT 150 600 900R F	1 278	1 053	1 386	16·8	18·7	25·6
	750	300	XUT 150 750 300R F	753	453	537	8·9	10·0	13·6
		450	XUT 150 750 450R F	903	603	750	10·9	12·2	16·7
		600	XUT 150 750 600R F	1 053	753	962	14·1	15·6	20·9
		750	XUT 150 750 750R F	1 203	903	1 174	15·9	17·7	23·9
		900	XUT 150 750 900R F	1 353	1 053	1 386	18·1	20·1	27·2
	900	300	XUT 150 900 300R F	828	453	537	9·8	10·9	14·6
		450	XUT 150 900 450R F	978	603	750	11·8	13·2	17·8
		600	XUT 150 900 600R F	1 128	753	962	14·9	16·5	22·0
		750	XUT 150 900 750R F	1 278	903	1 174	17·1	18·9	25·2
		900	XUT 150 900 900R F	1 428	1 053	1 386	19·0	21·0	28·2

Dimensions



Quantity and spacing of rungs varies with radius and width, nominal pitch = 300

Additional rungs (A) are fitted on tees of 600 radius and above

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1·07

Stainless steel (S) x 0·94

Powder coated (E) x 0·97

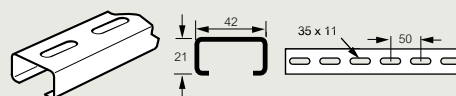
■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37

Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)

F = Finish : G (hot dip galvanised after manufacture)

D (deep galvanised)

S (stainless steel)

E (powder coated)

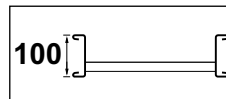
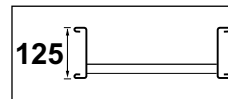
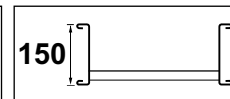
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts unequal tees 300 mm width

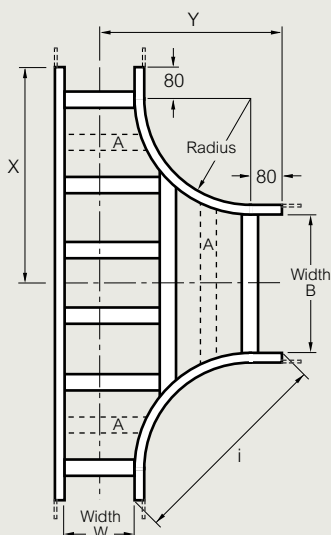
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights – unequal tees 300 mm width

Width (W)	Width (B)	Radius (R)	Cat. Nos.	Dimensions (mm)			Weight (kg)		
				X	Y	i	Topaz	Sapphire	Emerald
300	150	300	XUT 300 150 300R F	453	528	537	6·3	7·2	10·1
		450	XUT 300 150 450R F	603	678	750	8·0	9·1	12·9
		600	XUT 300 150 600R F	753	828	962	10·7	12·1	16·7
		750	XUT 300 150 750R F	903	978	1 174	13·0	14·6	20·1
		900	XUT 300 150 900R F	1 053	1 128	1 386	15·0	16·8	23·2
	450	300	XUT 300 450 300R F	603	528	537	7·7	8·7	11·9
		450	XUT 300 450 450R F	753	678	750	9·8	11·0	15·1
		600	XUT 300 450 600R F	903	828	962	12·9	14·3	19·3
		750	XUT 300 450 750R F	1 053	978	1 174	14·7	16·4	22·2
		900	XUT 300 450 900R F	1 203	1 128	1 386	17·1	19·0	25·7
	600	300	XUT 300 600 300R F	678	528	537	8·7	9·7	13·1
		450	XUT 300 600 450R F	828	678	750	10·8	12·1	16·3
		600	XUT 300 600 600R F	978	828	962	13·9	15·4	20·5
		750	XUT 300 600 750R F	1 128	978	1 174	16·2	18·0	24·0
		900	XUT 300 600 900R F	1 278	1 128	1 386	18·1	20·1	27·0
	750	300	XUT 300 750 300R F	753	528	537	9·5	10·6	14·2
		450	XUT 300 750 450R F	903	678	750	11·6	13·0	17·4
		600	XUT 300 750 600R F	1 053	828	962	15·4	16·9	22·2
		750	XUT 300 750 750R F	1 203	978	1 174	17·3	19·0	25·2
		900	XUT 300 750 900R F	1 353	1 128	1 386	19·7	21·7	28·7
	900	300	XUT 300 900 300R F	828	528	537	10·5	11·6	15·4
		450	XUT 300 900 450R F	978	678	750	12·6	14·0	18·6
		600	XUT 300 900 600R F	1 128	828	962	16·2	17·8	23·3
		750	XUT 300 900 750R F	1 278	978	1 174	18·6	20·4	26·8
		900	XUT 300 900 900R F	1 428	1 128	1 386	20·5	22·6	29·8

Dimensions



Quantity and spacing of rungs varies with radius and width, nominal pitch = 300

Additional rungs (A) are fitted on tees of 600 radius and above

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

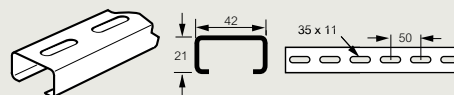
Deep galvanised (D) x 1·07
Stainless steel (S) x 0·94
Powder coated (E) x 0·97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)

F = Finish : G (hot dip galvanised after manufacture)

D (deep galvanised)

S (stainless steel)

E (powder coated)

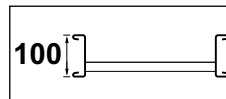
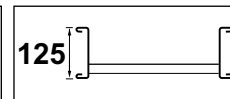
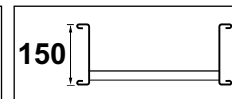
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts unequal tees 450 mm width

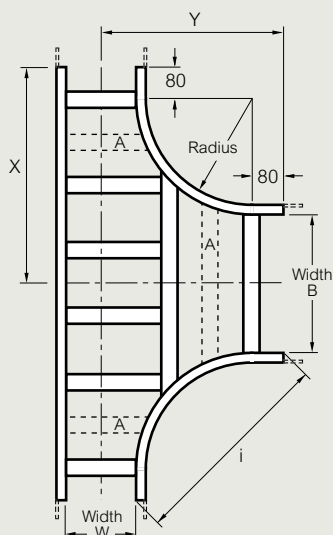
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights – unequal tees 450 mm width

Width (W)	Width (B)	Radius (R)	Cat. Nos.	Dimensions (mm)			Weight (kg)		
				X	Y	i	Topaz	Sapphire	Emerald
450	150	300	XUT 450 150 300R F	453	603	537	7·0	7·9	10·8
		450	XUT 450 150 450R F	603	753	750	8·7	9·8	13·6
		600	XUT 450 150 600R F	753	903	962	12·0	13·4	18·0
		750	XUT 450 150 750R F	903	1053	1174	14·6	16·2	21·7
		900	XUT 450 150 900R F	1053	1203	1386	16·6	18·5	24·8
	300	300	XUT 450 300 300R F	528	603	537	7·6	8·6	11·6
		450	XUT 450 300 450R F	678	753	750	9·9	11·1	15·0
		600	XUT 450 300 600R F	828	903	962	12·9	14·3	19·1
		750	XUT 450 300 750R F	978	1053	1174	15·5	17·1	22·8
		900	XUT 450 300 900R F	1128	1203	1386	18·2	20·1	26·6
	600	300	XUT 450 600 300R F	678	603	537	9·6	10·6	14·0
		450	XUT 450 600 450R F	828	753	750	11·9	13·2	17·5
		600	XUT 450 600 600R F	978	903	962	15·5	17·0	22·1
		750	XUT 450 600 750R F	1128	1053	1174	18·2	19·9	25·9
		900	XUT 450 600 900R F	1278	1203	1386	20·1	22·9	28·9
	750	300	XUT 450 750 300R F	753	603	537	10·4	11·5	15·1
		450	XUT 450 750 450R F	903	753	750	12·8	14·1	18·5
		600	XUT 450 750 600R F	1053	903	962	17·3	18·8	24·1
		750	XUT 450 750 750R F	1203	1053	1174	19·2	21·0	27·1
		900	XUT 450 750 900R F	1353	1203	1386	22·0	24·0	31·0
	900	300	XUT 450 900 300R F	828	603	537	11·6	12·7	16·5
		450	XUT 450 900 450R F	978	753	750	14·0	15·4	20·0
		600	XUT 450 900 600R F	1128	903	962	18·1	19·7	25·2
		750	XUT 450 900 750R F	1278	1053	1174	20·9	22·7	29·0
		900	XUT 450 900 900R F	1428	1203	1386	22·8	24·9	32·1

Dimensions



Quantity and spacing of rungs varies with radius and width, nominal pitch = 300

Additional rungs (A) are fitted on tees of 600 radius and above

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

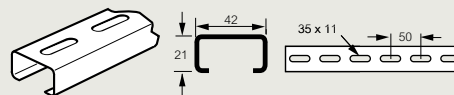
Deep galvanised (D) x 1·07
Stainless steel (S) x 0·94
Powder coated (E) x 0·97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)

F = Finish : G (hot dip galvanised after manufacture)

D (deep galvanised)

S (stainless steel)

E (powder coated)

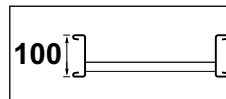
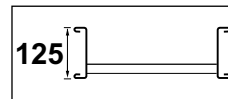
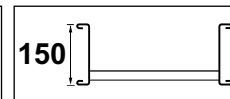
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts unequal tees 600 mm width

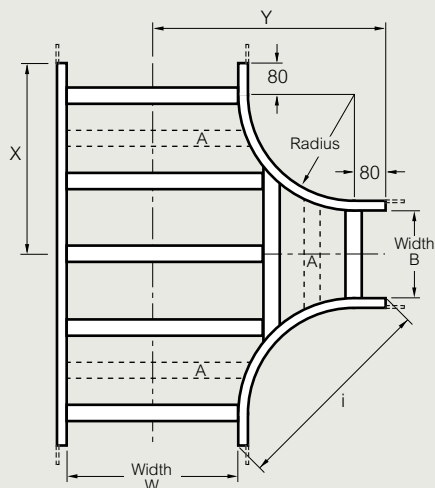
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights – unequal tees 600 mm width

Width (W)	Width (B)	Radius (R)	Cat. Nos.	Dimensions (mm)			Weight (kg)		
				X	Y	i	Topaz	Sapphire	Emerald
600	150	300	XUT 600 150 300R F	453	678	537	8.1	9.0	11.9
		450	XUT 600 150 450R F	603	828	750	9.8	11.0	14.7
		600	XUT 600 150 600R F	753	978	962	13.5	14.8	19.4
		750	XUT 600 150 750R F	903	1128	1174	16.2	17.8	23.3
		900	XUT 600 150 900R F	1053	1278	1386	18.3	20.1	26.5
	300	300	XUT 600 300 300R F	528	678	537	8.7	9.7	12.7
		450	XUT 600 300 450R F	678	828	750	11.4	12.5	16.5
		600	XUT 600 300 600R F	828	978	962	14.3	15.7	20.5
		750	XUT 600 300 750R F	978	1128	1174	17.1	18.8	24.4
		900	XUT 600 300 900R F	1128	1278	1386	20.1	21.9	28.5
	450	300	XUT 600 450 300R F	603	678	537	9.5	10.4	13.7
		450	XUT 600 450 450R F	753	828	750	12.1	13.3	17.4
		600	XUT 600 450 600R F	903	978	962	16.1	17.5	22.5
		750	XUT 600 450 750R F	1053	1128	1174	18.0	19.7	25.5
		900	XUT 600 450 900R F	1203	1278	1386	20.9	22.8	29.5
	750	300	XUT 600 750 300R F	753	678	537	11.8	12.9	16.5
		450	XUT 600 750 450R F	903	828	750	14.6	15.9	20.3
		600	XUT 600 750 600R F	1053	978	962	19.1	20.6	25.9
		750	XUT 600 750 750R F	1203	1128	1174	21.0	22.8	29.0
		900	XUT 600 750 900R F	1353	1278	1386	24.0	26.1	33.1
	900	300	XUT 600 900 300R F	828	678	537	13.3	14.5	18.2
		450	XUT 600 900 450R F	978	828	750	16.1	17.5	22.1
		600	XUT 600 900 600R F	1128	978	962	20.0	21.6	27.0
		750	XUT 600 900 750R F	1278	1128	1174	22.9	24.7	31.1
		900	XUT 600 900 900R F	1428	1278	1386	24.9	27.0	34.2

Dimensions



Quantity and spacing of rungs varies with radius and width, nominal pitch = 300
Additional rungs (A) are fitted on tees of 600 radius and above

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

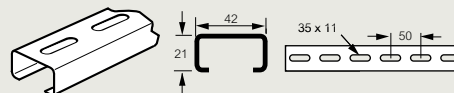
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

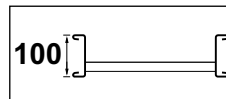
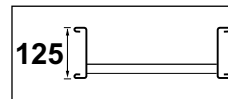
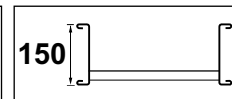
X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

Swifts unequal tees 750 mm width

medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald

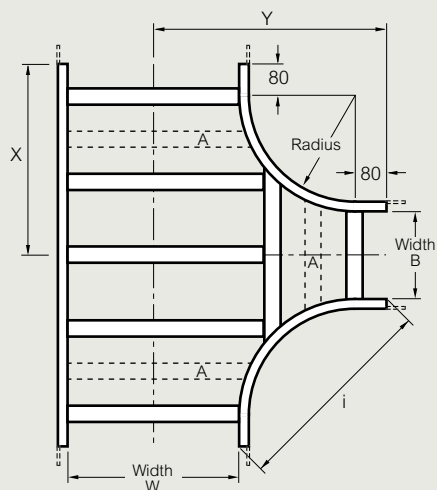


■ Dimensions and weights – unequal tees 750 mm width

Width (W)	Width (B)	Radius (R)	Cat. Nos.	Dimensions (mm)			Weight (kg)		
				X	Y	i	Topaz	Sapphire	Emerald
750	150	300	XUT 750 150 300R F	453	753	537	9·2	10·0	12·9
		450	XUT 750 150 450R F	603	903	750	10·9	12·0	15·8
		600	XUT 750 150 600R F	753	1053	962	14·9	16·3	20·9
		750	XUT 750 150 750R F	903	1203	1174	17·9	19·5	25·0
		900 ⁽¹⁾	XUT 750 150 900R F	1053	1353	1386	23·7	25·5	31·8
	300	300	XUT 750 300 300R F	528	753	537	9·8	10·7	13·8
		450	XUT 750 300 450R F	678	903	750	12·6	13·8	17·7
		600	XUT 750 300 600R F	828	1053	962	15·8	17·2	22·0
		750	XUT 750 300 750R F	978	1203	1174	18·8	20·4	26·1
		900 ⁽¹⁾	XUT 750 300 900R F	1128	1353	1386	24·3	26·2	32·7
	450	300	XUT 750 450 300R F	603	753	537	10·5	11·5	14·7
		450	XUT 750 450 450R F	753	903	750	13·4	14·6	18·7
		600	XUT 750 450 600R F	903	1053	962	17·7	19·2	24·1
		750	XUT 750 450 750R F	1053	1203	1174	19·6	21·3	27·1
		900 ⁽¹⁾	XUT 750 450 900R F	1203	1353	1386	27·5	29·4	36·0
	600	300	XUT 750 600 300R F	678	753	537	12·3	13·3	16·7
		450	XUT 750 600 450R F	828	903	750	15·2	16·4	20·7
		600	XUT 750 600 600R F	978	1053	962	18·8	20·3	25·4
		750	XUT 750 600 750R F	1128	1203	1174	21·8	23·6	29·6
		900 ⁽¹⁾	XUT 750 600 900R F	1278	1353	1386	28·3	30·3	37·1
	900	300	XUT 750 900 300R F	828	753	537	14·8	15·9	19·6
		450	XUT 750 900 450R F	978	903	750	17·7	19·1	23·7
		600	XUT 750 900 600R F	1128	1053	962	21·8	23·4	28·8
		750	XUT 750 900 750R F	1278	1203	1174	24·9	26·7	33·0
		900 ⁽¹⁾	XUT 750 900 900R F	1428	1353	1386	30·2	32·3	39·4

(1) Supplied in 2 parts for assembly on site

Dimensions



Quantity and spacing of rungs varies with radius and width, nominal pitch = 300
Additional rungs (A) are fitted on tees of 600 radius and above

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

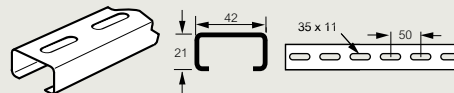
Deep galvanised (D) x 1·07
Stainless steel (S) x 0·94
Powder coated (E) x 0·97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

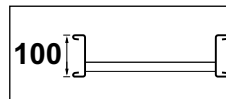
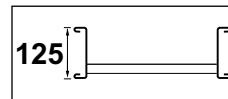
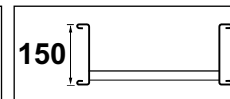
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts unequal tees 900 mm width

medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald

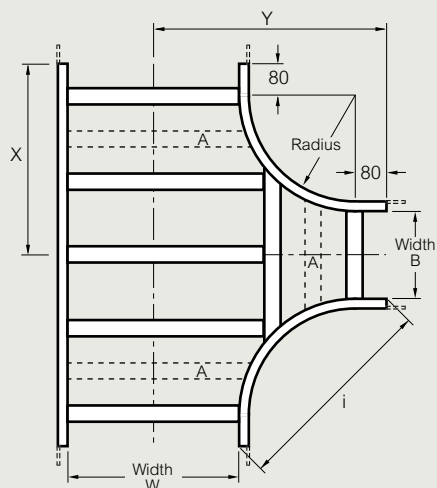


■ Dimensions and weights – unequal tees 900 mm width

Width (W)	Width (B)	Radius (R)	Cat. Nos.	X	Y	i	Weight (kg)		
							Topaz	Sapphire	Emerald
900	150	300	XUT 900 150 300R F	453	828	537	9.9	10.8	13.7
		450	XUT 900 150 450R F	603	978	750	11.6	12.8	16.5
		600	XUT 900 150 600R F	753	1128	962	16.0	17.4	22.0
		750 ⁽¹⁾	XUT 900 150 750R F	903	1278	1174	23.0	24.6	30.0
		900 ⁽¹⁾	XUT 900 150 900R F	1053	1428	1386	25.3	27.2	33.4
	300	300	XUT 900 300 300R F	528	828	537	10.5	11.5	14.5
		450	XUT 900 300 450R F	678	978	750	13.5	14.7	18.6
		600	XUT 900 300 600R F	828	1128	962	16.9	18.3	23.1
		750 ⁽¹⁾	XUT 900 300 750R F	978	1278	1174	23.7	25.3	30.9
		900 ⁽¹⁾	XUT 900 300 900R F	1128	1428	1386	26.0	27.9	34.3
	450	300	XUT 900 450 300R F	603	828	537	11.3	12.2	15.5
		450	XUT 900 450 450R F	753	978	750	14.3	15.5	19.6
		600	XUT 900 450 600R F	903	1128	962	19.0	20.5	25.4
		750 ⁽¹⁾	XUT 900 450 750R F	1053	1278	1174	24.4	26.1	31.8
		900 ⁽¹⁾	XUT 900 450 900R F	1203	1428	1386	29.5	31.4	38.0
	600	300	XUT 900 600 300R F	678	828	537	13.2	14.2	17.6
		450	XUT 900 600 450R F	828	978	750	16.3	17.5	21.8
		600	XUT 900 600 600R F	978	1128	962	20.1	21.6	26.7
		750 ⁽¹⁾	XUT 900 600 750R F	1128	1278	1174	27.9	29.7	35.6
		900 ⁽¹⁾	XUT 900 600 900R F	1278	1428	1386	30.3	32.3	39.1
	750	300	XUT 900 750 300R F	753	828	537	14.0	15.1	18.7
		450	XUT 900 750 450R F	903	978	750	17.1	18.4	22.9
		600	XUT 900 750 600R F	1053	1128	962	22.4	24.0	29.2
		750 ⁽¹⁾	XUT 900 750 750R F	1203	1278	1174	28.6	30.4	36.5
		900 ⁽¹⁾	XUT 900 750 900R F	1353	1428	1386	31.0	33.1	40.0

(1) Supplied in 2 parts for assembly on site

Dimensions



Quantity and spacing of rungs varies with radius and width, nominal pitch = 300
Additional rungs (A) are fitted on tees of 600 radius and above

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

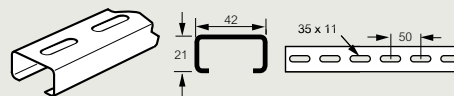
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



X = length of fitting from each 'end' of centre-line (not including integral coupler)

Y = length from each 'end' of the fitting to the point at which the centre-lines intersect (not including integral coupler)

i = measurement across the inner curve of the fitting

Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

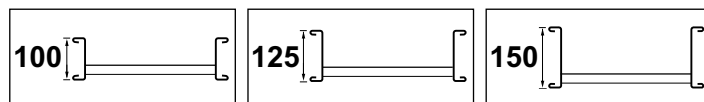
Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

All dimensions (mm) are nominal

Swifts branch pieces

medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald

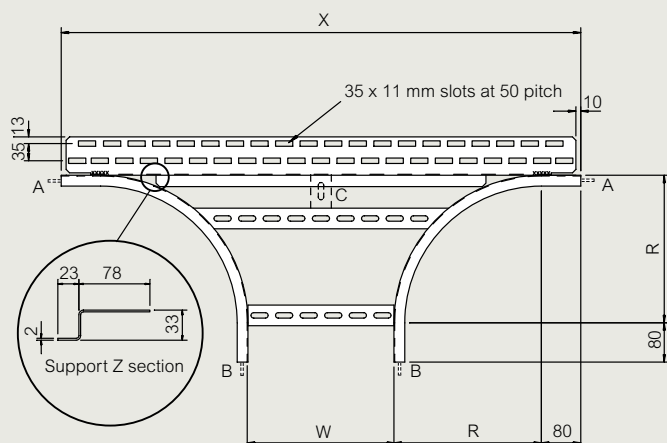


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos.	No of rungs	Dimensions (mm)		Weight (kg)		
				X		Topaz	Sapphire	Emerald
150	300	XB 150 300R F	2	907		4.6	5.1	6.8
300	300	XB 300 300R F	2	1 057		5.4	5.9	7.6
450	300	XB 450 300R F	2 + 1	1 207		6.2	6.7	8.4
600	300	XB 600 300R F	2 + 1	1 357		6.9	7.4	9.1
750	300	XB 750 300R F	2 + 2	1 507		7.7	8.2	9.9
900	300	XB 900 300R F	2 + 2	1 657		8.4	8.8	10.5

Dimensions

300 mm wide branch



A = Special integral coupler

B = Standard integral coupler

R = Radius (300 mm)

W = Width

X = Length of fitting (excluding coupler)

C = Additional rungs on wider branches

Additional rungs are added for extra support :

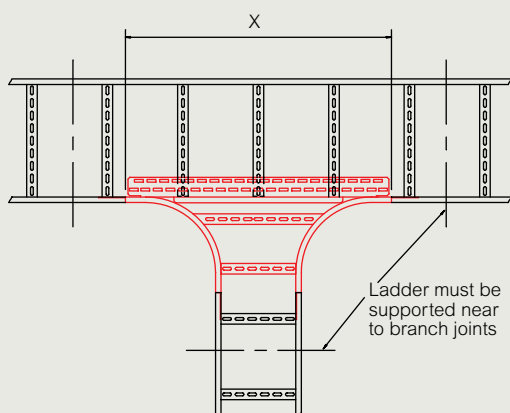
450 mm and 600 mm wide : one additional rung

750 mm and 900 mm wide : two additional rungs

■ Installation and assembly

When mounting branch piece, a section of the ladder side rail must be removed

300 mm wide branch



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)

F = Finish : G (hot dip galvanised after manufacture)

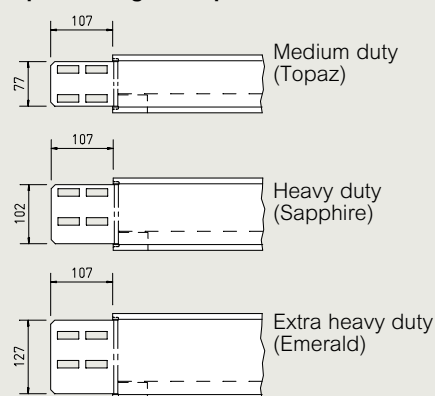
D (deep galvanised)

S (stainless steel)

E (powder coated)

■ Installation and assembly (continued)

Special integral couplers



Special integral couplers (reduced height) are used in position A (left) to allow easy fit up to cut siderail of mating straight length

For standard integral couplers, see p. 44

Fasteners

For fitting integral couplers use M10 coachbolt with flange nut

For fixing support section to rungs of mating ladder use M10 coachbolt with flange nut

Width W	No rung fixings
150	3
300	4
450	4
600	5
750	5
900	6

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish.

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07

Stainless steel (S) x 0.94

Powder coated (E) x 0.97

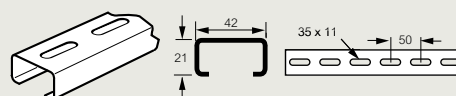
■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37

Type 1 can be supplied in any combination to special order

Type 1 standard



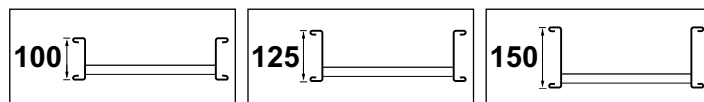
All dimensions (mm) are nominal

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

Swift way crosspieces

medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald

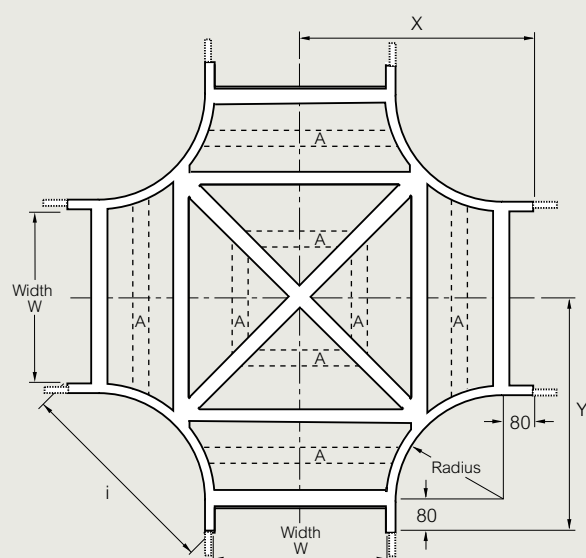


■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos.	Dimensions (mm)			Weight (kg)		
			X	Y	i	Topaz	Sapphire	Emerald
150	300	XX 150 300R F	454	454	537	7.8	8.9	12.3
	450	XX 150 450R F	604	604	750	10.2	11.6	16.1
	600	XX 150 600R F	754	754	962	13.6	15.2	20.8
300	300	XX 300 300R F	529	529	537	9.4	10.4	13.9
	450	XX 300 450R F	679	679	750	12.1	13.5	18.0
450	300	XX 450 300R F	604	604	537	11.2	12.2	15.7
	450	XX 450 450R F	754	754	750	14.5	15.9	20.3
600	300	XX 600 300R F	679	679	537	14.0	15.1	18.5
750	300	XX 750 300R F	754	754	537	16.9	18.0	21.4

Crosspieces in larger width/radius combinations are supplied in two identical halves for on-site assembly. Information on dimensions and weights, together with assembly details, are given opposite

Dimensions



Additional rungs (A) are fitted to large radius crosspieces

X = length of fitting from each 'end' of centre-line
(not including integral coupler)

Y = length from each 'end' of the fitting to the point at
which the centre-lines intersect
(not including integral coupler)

i = measurement across the inner curve of the fitting

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07

Stainless steel (S) x 0.94

Powder coated (E) x 0.97

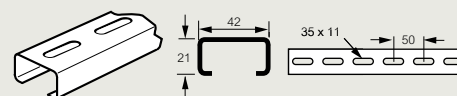
■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37

Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)

F = Finish : G (hot dip galvanised after manufacture)

D (deep galvanised)

S (stainless steel)

E (powder coated)

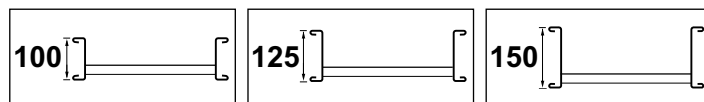
All dimensions (mm) are nominal

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

Swifts way crosspieces - piece units

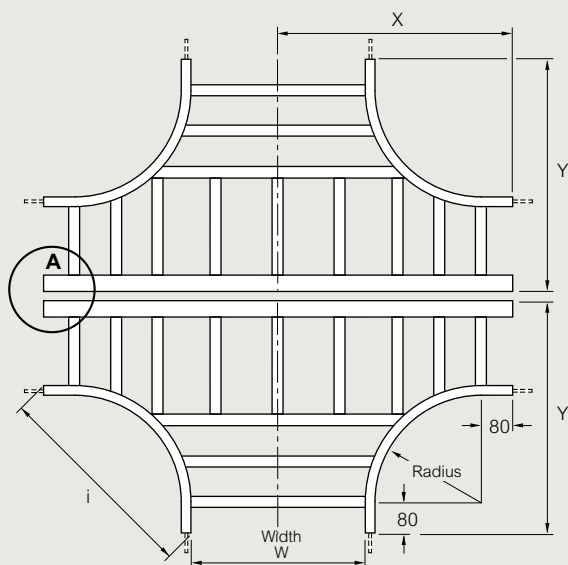
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights

Width (W)	Radius (R)	Cat. Nos.	Dimensions (mm)			Weight (kg)		
			X	Y	i	Topaz	Sapphire	Emerald
150	750	XX 150 750R F	904	904	1 174	20·8	22·7	29·3
	900	XX 150 900R F	1 054	1 054	1 386	24·5	26·7	34·4
300	600	XX 300 600R F	829	829	962	15·9	17·6	23·1
	750	XX 300 750R F	979	979	1 174	23·3	25·2	31·8
	900	XX 300 900R F	1 129	1 129	1 386	27·3	29·5	37·2
450	600	XX 450 600R F	904	904	962	22·3	23·9	29·5
	750	XX 450 750R F	1 054	1 054	1 174	25·7	27·6	34·3
	900	XX 450 900R F	1 204	1 204	1 386	29·8	32·0	39·7
600	450	XX 600 450R F	829	829	750	16·6	18·0	22·5
	600	XX 600 600R F	979	979	962	25·1	26·8	32·3
	750	XX 600 750R F	1 129	1 129	1 174	29·3	31·2	37·8
	900	XX 600 900R F	1 279	1 279	1 386	33·5	35·7	43·4
750	450	XX 750 450R F	904	904	750	22·0	23·3	27·8
	600	XX 750 600R F	1 054	1 054	962	29·4	31·0	36·6
	750	XX 750 750R F	1 204	1 204	1 174	32·9	34·9	41·5
	900	XX 750 900R F	1 354	1 354	1 386	37·6	39·9	47·5
900	300	XX 900 300R F	829	829	537	19·0	20·0	23·5
	450	XX 900 450R F	979	979	750	25·7	27·1	31·6
	600	XX 900 600R F	1 129	1 129	962	32·1	33·7	39·3
	750	XX 900 750R F	1 279	1 279	1 174	37·2	39·1	45·7
	900	XX 900 900R F	1 429	1 429	1 386	42·5	44·7	52·4

Dimensions



Assembly detail for two piece units - detail A, see opposite

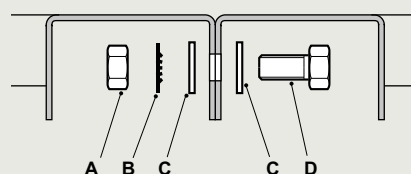
X = length of fitting from each 'end' of centre-line
(not including integral coupler)

Y = length from each 'end' of the fitting to the point at
which the centre-lines intersect
(not including integral coupler)

i = measurement across the inner curve of the fitting

Assembly detail for two piece units - detail A (opposite)

(Fasteners included)



- A M6 nut
- B Shakeproof washer
- C Flat washer
- roofing washers for G and D
- form A for S
- D M6 x 16 set screw

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

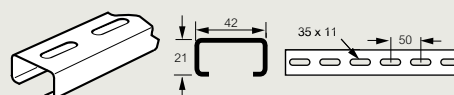
- Deep galvanised (D) x 1·07
- Stainless steel (S) x 0·94
- Powder coated (E) x 0·97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

- X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
- F = Finish : G (hot dip galvanised after manufacture)
- D (deep galvanised)
- S (stainless steel)
- E (powder coated)

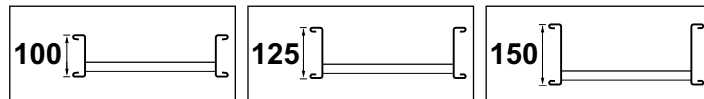
All dimensions (mm) are nominal

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

Swifts straight reducers

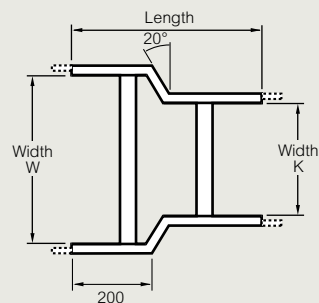
medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



■ Dimensions and weights

Width (W)	Width (K)	Cat. Nos.	Length	Weight (kg)		
				Topaz	Sapphire	Emerald
300	150	XSR 300 150 F	450	2.5	3.0	4.4
450	150	XSR 450 150 F	450	2.9	3.4	4.9
	300	XSR 450 300 F	450	2.8	3.2	4.6
600	150	XSR 600 150 F	500	3.5	4.1	5.8
	300	XSR 600 300 F	450	3.2	3.7	5.2
	450	XSR 600 450 F	450	3.1	3.6	5.0
750	150	XSR 750 150 F	500	4.1	4.7	6.5
	300	XSR 750 300 F	500	4.0	4.5	6.3
	450	XSR 750 450 F	450	3.7	4.2	5.7
	600	XSR 750 600 F	450	3.7	4.2	5.5
900	150	XSR 900 150 F	500	4.7	5.3	7.4
	300	XSR 900 300 F	500	4.4	5.0	6.8
	450	XSR 900 450 F	500	4.3	4.8	6.6
	600	XSR 900 600 F	450	4.1	4.6	6.1
	750	XSR 900 750 F	450	4.2	4.7	6.1

Dimensions



Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

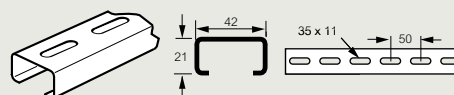
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : **Z** (Topaz), **P** (Sapphire), **E** (Emerald)
F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

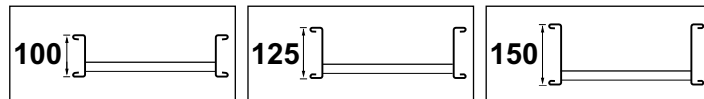
All dimensions (mm) are nominal

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

Swifts offset reducers

medium duty Topaz heavy duty Sapphire
and extra heavy duty Emerald



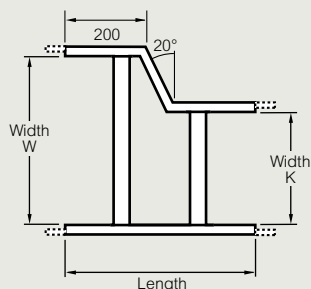
■ Dimensions and weights

Width (W)	Width (K)	Cat. Nos. ⁽¹⁾	Length	Weight (kg)		
				Topaz	Sapphire	Emerald
300	150	XLR 300 150 F	450	2.7	3.1	4.6
450	150	XLR 450 150 F	500	3.2	3.7	5.4
	300	XLR 450 300 F	450	2.9	3.4	4.8
600	150	XLR 600 150 F	550	3.9	4.4	6.3
	300	XLR 600 300 F	500	3.6	4.1	5.8
	450	XLR 600 450 F	450	3.3	3.7	5.2
750	150	XLR 750 150 F	600	4.6	5.3	7.4
	300	XLR 750 300 F	550	4.3	4.9	6.8
	450	XLR 750 450 F	500	4.0	4.6	6.2
	600	XLR 750 600 F	450	3.9	4.3	5.7
900	150	XLR 900 150 F	650	5.2	5.9	8.3
	300	XLR 900 300 F	600	4.9	5.6	7.7
	450	XLR 900 450 F	550	4.6	5.2	7.1
	600	XLR 900 600 F	500	4.5	5.0	6.6
	750	XLR 900 750 F	450	4.4	4.8	6.3

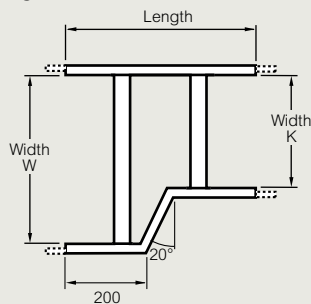
(1) Cat. Nos. given in the table are for left hand reducers. For right hand reducers substitute XLR for XRR

Dimensions

Left hand reducer



Right hand reducer



Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

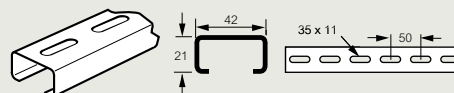
Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

■ Rung details

Type 1 rungs are used as standard

Type 2 and 3 are only available to special order, see p. 37
Type 1 can be supplied in any combination to special order

Type 1 standard



Key : Replace the letter shown in red with your choice from the following options :

X = Ladder type : Z (Topaz), P (Sapphire), E (Emerald)
F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

All dimensions (mm) are nominal

Integral fitting coupler detail : see p. 44

Fitting to fitting coupler sets : see p. 45

Swifts cable ladder supports

heavy duty cantilever arms

Heavy duty cantilever arms enable horizontal runs of cable ladder to be mounted to vertical steel, concrete or masonry surfaces or to Swiftrack channel. They are suitable for use with all cable ladder ranges and are available in six sizes to accommodate all ladder widths

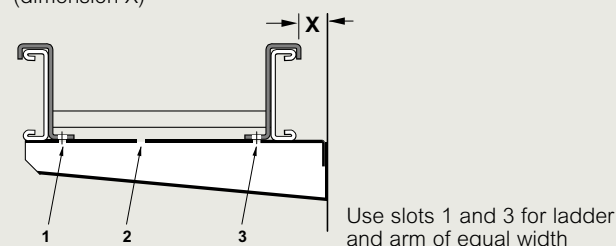
Cable ladder can be fitted to cantilever arms in two alternative positions without the need for drilling (see below). Appropriate slots are provided to ensure that the arm does not protrude beyond the ladder side rail for safety

Supplied singly without fasteners

■ Installation (typical)

Normal installation

Using cantilever arm and ladder of equal widths enables the ladder side rail to be positioned close to the vertical wall or support (dimension X)

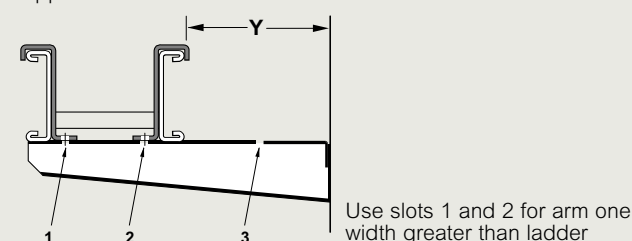


Clearance installation

Using cantilever arm one width greater than ladder increases the distance between the ladder side rail and vertical wall (dimension Y). This allows easy access to coupler fasteners and cover clips (if fitted)

Note

If covers are fitted the minimum clearance to the vertical support face (dimension X) must be 30 mm. However, for access to fit cover clips a larger clearance (i.e. dimension Y) is required when the vertical support is a solid face



Ladder range	X	Y
Topaz	60	210
Sapphire	60	210
Emerald	60	210

■ Assembly

Fixing cantilever arms to vertical supports

Mounting holes for M12 fasteners are provided in the end plates ; two for 150 mm – 300 mm and three for 450 mm – 900 mm

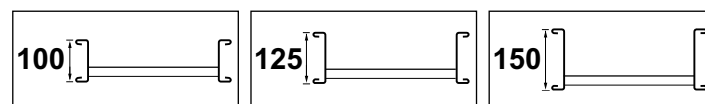
When fixing to Swiftrack channel use M12 bolts, washers and channel nuts

Fixing ladder to cantilever arms

All heavy duty cantilever arms have slots in the top flange for attaching hold down brackets and slots in the side flanges for attaching bolttable angled hold down brackets

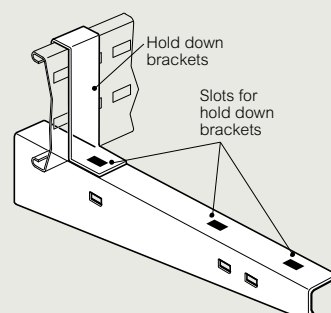
Each bracket can be used exclusively or a combination of both, as required

Insulated hold down brackets can be used to attach ladder to cantilever arms if required



Fixing ladder to cantilever arms (continued)

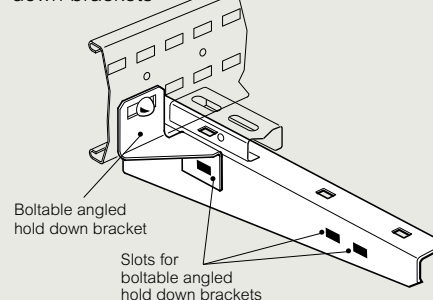
Hold down brackets



Cat. Nos.	Recommended safe working load kgF ⁽¹⁾	
	Arm fixed to rigid surface	Arm fixed to Swiftrack
HCA 150 F	300	250
HCA 300 F	350	250
HCA 450 F	400	300
HCA 600 F	500	350
HCA 750 F	600	400
HCA 900 F	700	450

(1) Per cantilever arm for load uniformly distributed across the complete arm, when ladder fixed to arm using Swifts hold down brackets, see p. 81. Safety factor : 2

Bolttable angled hold down brackets

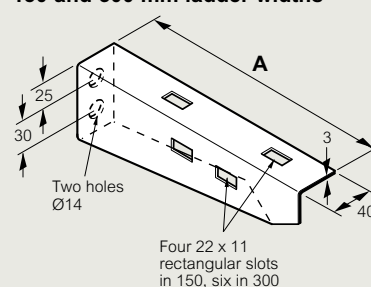


For hold down bracket, see p. 81

For bolttable angled hold down bracket, see p. 83

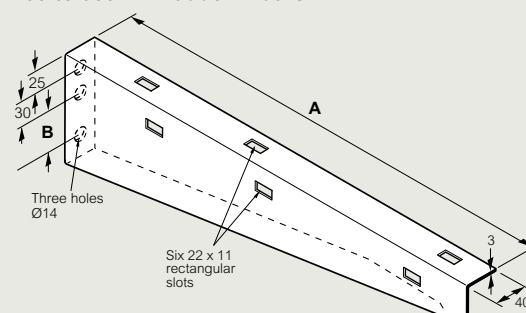
■ Dimensions and weights

150 and 300 mm ladder widths



Ladder Width	A	B	Weight (kg)
150	250	–	1.0
300	400	–	1.6
450	550	45	2.5
600	700	95	3.6
750	850	145	4.9
900	1000	195	6.5

450 to 900 mm ladder widths



Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

All dimensions (mm) are nominal

Swiftrack channel support : see p. 99-108

Hold down brackets : see p. 81

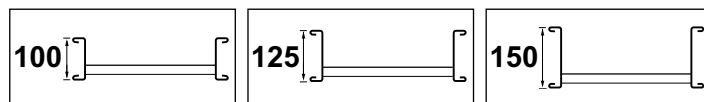
Bolttable angled hold down brackets : see p. 83

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

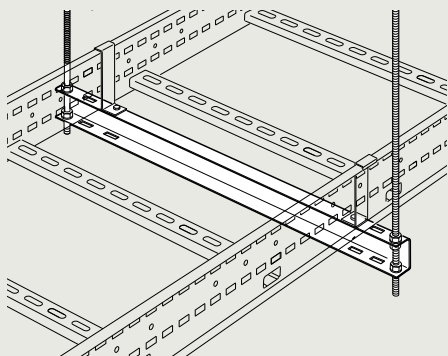
Swifts cable ladder supports

heavy duty trapeze hangers



Heavy duty trapeze hangers are suitable for use with all cable ladder ranges. They enable all widths of ladder to be supported from overhead M12 threaded rods hung from ceiling brackets, Swiftrack support system or from beam clamps attached to joists or steel beams. Supplied singly without fasteners.

■ Installation (typical)

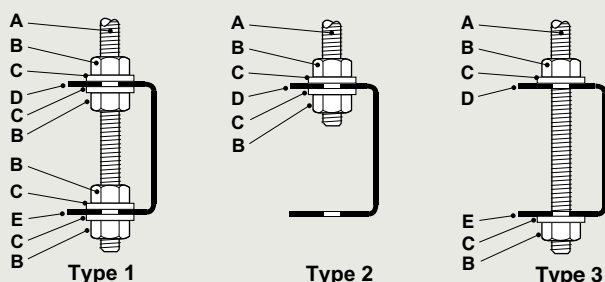


■ Assembly

Fixing trapeze hangers to threaded rods

There are three alternative methods of fixing trapeze hangers to threaded rods as shown below. The recommended safe working load for each width and method of fixing is given in the table (below)

- A M12 threaded rod
- B M12 nut
- C Washer
- D Upper flange
- E Lower flange



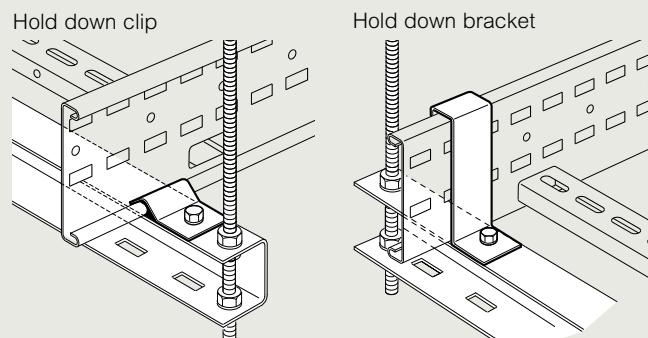
Cat. Nos.	Recommended safe working load kgf ⁽¹⁾		
	Type 1	Type 2	Type 3
HTH 150 F	400	240	120
HTH 300 F	400	240	120
HTH 450 F	400	240	120
HTH 600 F	500	300	150
HTH 750 F	500	300	150
HTH 900 F	500	300	150

(1) Per trapeze hanger for load uniformly distributed across complete hanger
Safety factor : 2

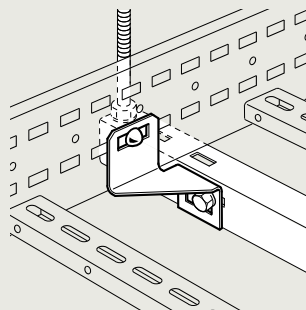
■ Assembly (continued)

Fixing ladder to trapeze hangers

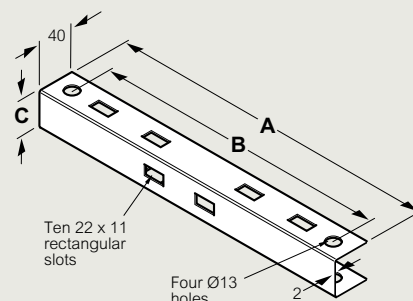
All trapeze hangers are provided with fixing slots correctly positioned to accept any of Swifts hold down brackets or clips without the need for drilling. The slots will accept all cable ladder ranges. Insulated versions of hold down clips and brackets are available, see p. 80-81



Boltable angled hold down bracket



■ Dimensions and weights



Ladder Width	A	B	C	Rod size	Weight (kg)
150	350	310	40	M12	0.7
300	500	460	40	M12	0.9
450	650	610	50	M12	1.3
600	800	760	60	M12	1.8
750	950	910	70	M12	2.2
900	1100	1060	80	M12	2.8

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

- Deep galvanised (D) x 1.07
- Stainless steel (S) x 0.94
- Powder coated (E) x 0.97

All dimensions (mm) are nominal

Swiftrack channel support : see p. 99-108

Hold down clips : see p. 80

Hold down brackets : see p. 81

Key : Replace the letter shown in red with your choice from the following options :

- F = Finish : G (hot dip galvanised after manufacture)
- D (deep galvanised)
- S (stainless steel)
- E (powder coated)

Swifts cable ladder supports

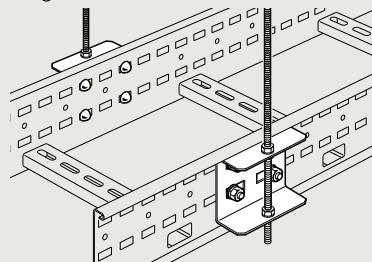
hanger rod brackets

Hanger rod brackets are an effective way of supporting any width of cable ladder off studding without the need for special trapeze hangers or cut lengths of channel.

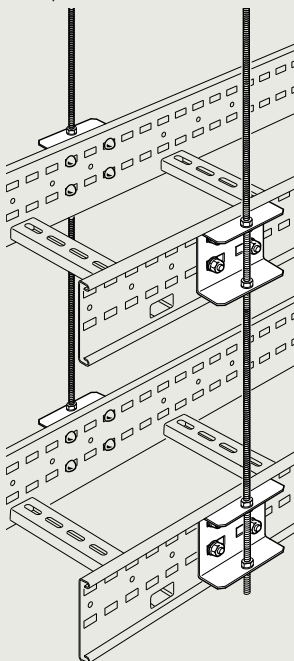
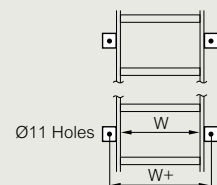
They are particularly useful when space to the sides of a ladder run is restricted or where maximum headroom is required below a ladder run. Hanger rod brackets are available for all ladder ranges and supplied in pairs with bracket to ladder fasteners.

■ Installation (typical)

Single level installation



Multiple level installation



Cat. Nos.	Centre distance between fixing holes
ZRB F	W+66
PRB F	W+66
ERB F	W+66

When hanger rod brackets are fitted to ladder, covers cannot be used

■ Assembly

Brackets can be used with either M10 or M12 threaded rod.

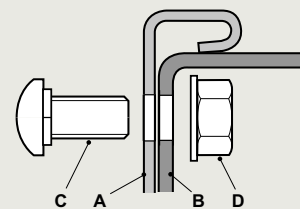
Fixing bracket to ladder

Brackets are fixed directly to the outside of the ladder siderail as shown. The slots in the side rail and the bracket provide sufficient movement to align the bracket with the threaded rod.

Fixing bracket to threaded rod

Four nuts and washers are used to fix each bracket to the threaded rod. This ensures the stability of the support and also optimises the safe working load.

Bracket to ladder fasteners (included)



- A Side rail
- B Bracket
- C M10 x 20 coachbolt
- D M10 flange nut

Fastener finishes

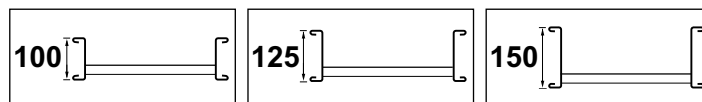
For ladders with G, D and E finishes, fasteners are high tensile Grade 8.8 hot dip galvanised.

For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised. An alternative material for fasteners may be required depending on the installation environment – contact us on +44 (0) 845 605 4333.

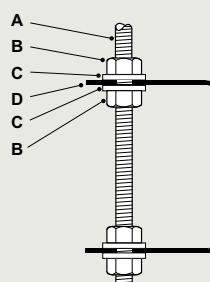
Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)



■ Assembly (continued)

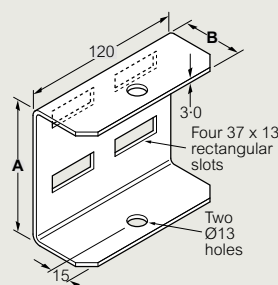
Bracket to threaded rod fasteners (not included)



- A M10 or M12 threaded rod
- B Hanger rod bracket
- C M10 or M12 form A washer
- D M10 or M12 nut

	Ladder range		
	Topaz	Sapphire	Emerald
Cat. Nos.	ZRB F	PRB F	ERB F
Quantity of fasteners per bracket	4	4	4

■ Dimensions and weights



Cat. Nos.	A	B	Weight (kg)
ZRB F	80	48	0.9
PRB F	104	48	1.0
ERB F	127	48	1.1

Weights

All weights given are in kilograms (kg) and are for a pair of brackets in hot dip galvanised G finish.

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

- Deep galvanised (D) x 1.07
- Stainless steel (S) x 0.94
- Powder coated (E) x 0.97

■ Safe working loads

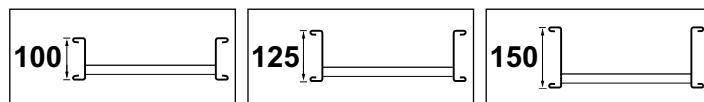
The safe working load of all brackets is 400kg per pair of brackets.

When several levels of ladder are mounted on the same threaded rods in a multiple level installation, it is important to ensure that the total load on any pair of rods does not exceed the safe working load of the rods or their attachment points.

All dimensions (mm) are nominal.

Swifts cable ladder supports

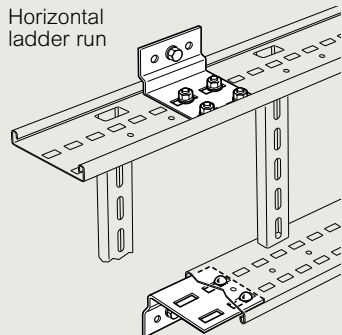
wall support brackets



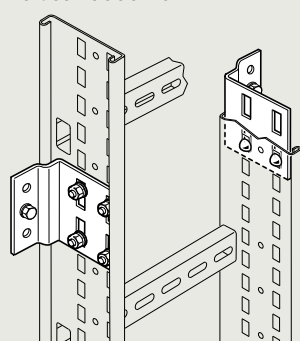
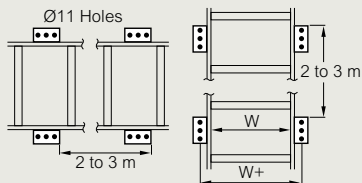
Wall support brackets are an effective way of fixing any width of ladder, running either vertically or horizontally, to a vertical support. These brackets can be mounted onto Swiftrack channel, structural steelwork or directly to a wall using M10 bolts (not included). Wall support brackets are available for all ladder ranges and supplied in pairs with bracket to ladder fasteners.

■ Installation (typical)

Horizontal ladder run



Vertical ladder run



Cat. Nos.	Centre distance between fixing holes
ZRB F	W + 106
PRB F	W + 106
ERB F	W + 106

■ Assembly

Holes are provided for M10 setscrews – length and finish to suit application.

Fixing brackets to supports

Only one fastener is needed to attach each bracket to its support; three attachment holes are provided to give flexibility when positioning the ladder run.

Fixing brackets to ladder – vertical runs

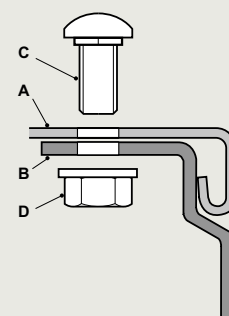
When installing ladder runs vertically, the full quantity of fasteners must be used to attach each bracket to the ladder.

Fixing brackets to ladder – horizontal runs

When installing ladder runs horizontally it is often easiest to mount the lower brackets to the support, lift the ladder into position then mount the upper brackets. This procedure is especially useful for single person installation.

■ Assembly (continued)

Bracket to ladder fasteners (included)



- A Side rail
- B Bracket
- C M10 x 20 coachbolt
- D M10 flange nut

Fastener finishes

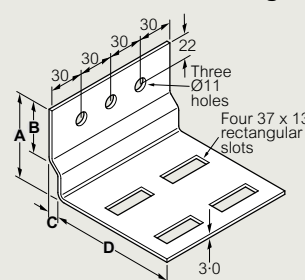
For ladders with G, D and E finishes, fasteners are high tensile Grade 8.8 hot dip galvanised.

For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

An alternative material for fasteners may be required depending on the installation environment – contact us on +44 (0) 845 605 4333.

	Ladder range		
	Topaz	Sapphire	Emerald
Cat. Nos.	ZWSB F	PWSB F	EWSB F
Quantity of fasteners per bracket	4	4	4

■ Dimensions and weights



Cat. Nos.	A	B	C	D	Weight (kg)
ZWSB F	75	42	9-0	86-0	0-8
PWSB F	75	42	9-0	111-0	1-0
EWSB F	75	42	9-0	123-5	1-0

Weights

All weights given are in kilograms (kg) and are for a pair of brackets in hot dip galvanised G finish.

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors:

- Deep galvanised (D) x 1-07
- Stainless steel (S) x 0-94
- Powder coated (E) x 0-97

■ Safe working loads

Vertical ladder runs

For a vertically mounted ladder installation, the maximum safe working load is 300 kg per pair of wall support brackets.

Horizontal ladder runs

For a horizontally mounted ladder installation, the wall support brackets should be pitched at 2-3 m intervals so that the limiting factor for safe working load is the span between brackets and the ladder width rather than the brackets.

Key : Replace the letter shown in red with your choice from the following options :

- F = Finish : G (hot dip galvanised after manufacture)
- D (deep galvanised)
- S (stainless steel)
- E (powder coated)

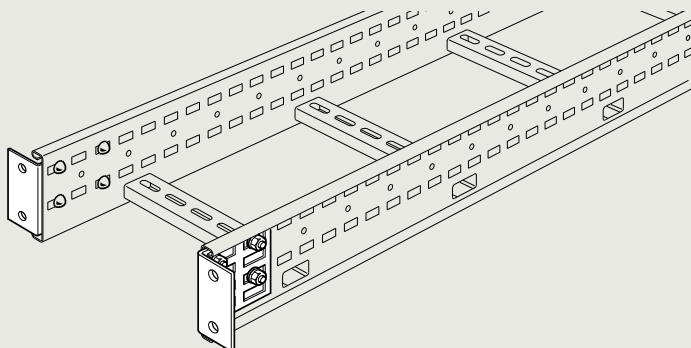
All dimensions (mm) are nominal.

Swiftrack channel support : see p. 99-108

Swifts cable ladder supports end connectors

90° end connectors are used to fix the end of a cable ladder run to a vertical surface (steel, concrete or masonry)
Supplied in pairs with bracket to ladder fasteners

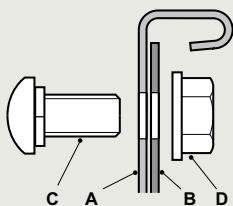
■ Installation (typical)



Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
Quantity of fasteners per bracket	4	4	4

■ Assembly

Connector to ladder fasteners (included)



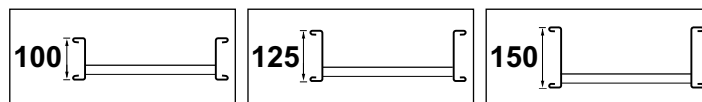
- A Side rail
- B Bracket
- C M10 x 20 coachbolt
- D M10 flange nut

Fastener finishes

For ladders with G, D and E finishes, fasteners are high tensile Grade 8.8 hot dip galvanised

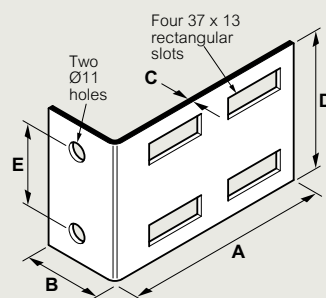
For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333

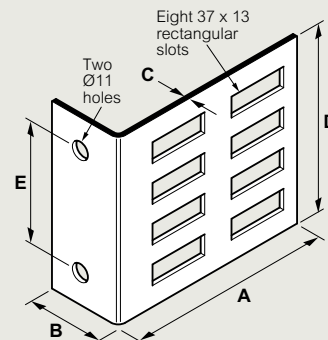


■ Dimensions and weights

Medium duty (Topaz) ZB^F



Heavy duty (Sapphire) PB^F and extra heavy duty (Emerald) EB^F



Cat. Nos.	A	B	C	D	E	Weight (kg)
ZB ^F	127	47	1.5	84	50	0.3
PB ^F	127	47	2.0	115	75	0.5
EB ^F	127	47	2.0	140	75	0.7

Weights

All weights given are in kilograms (kg) and are for a pair of connectors in hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised	(D) x 1.07
Stainless steel	(S) x 0.94
Powder coated	(E) x 0.97

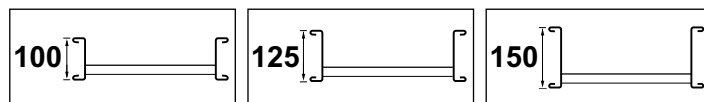
Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

All dimensions (mm) are nominal

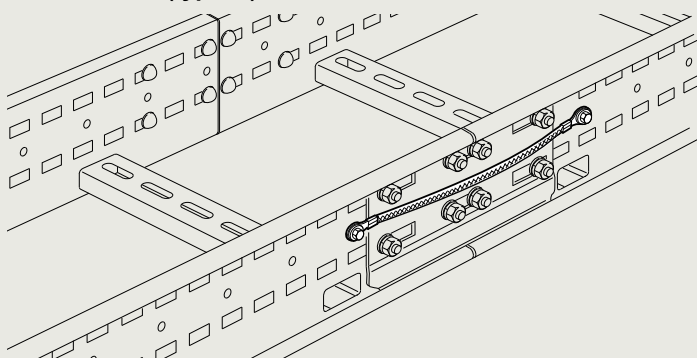
Swifts cable ladder ancillary items

earth continuity connector



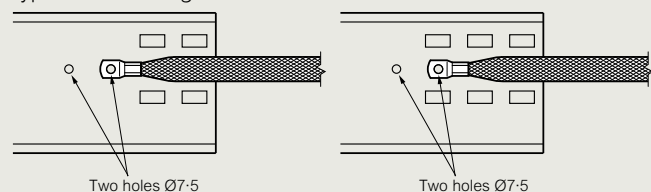
If a supplementary bonding conductor for equipotential earthing is required, straight lengths and fittings in all Swifts ladder ranges have fixing holes provided to accommodate a flexible earth continuity connector. On straight lengths, fixing holes are pitched every 75 mm to avoid the need for drilling if the ladder is cut. When used with galvanised or stainless steel finish ladder, the lug of the earth continuity connector is fixed directly to the ladder side rail. Finish : electro tinned copper. The earth continuity connector has a current capacity rating of 100 Amps. Supplied in bagged quantities of ten with fasteners.

■ Installation (typical)



■ Assembly

Typical ladder length ends

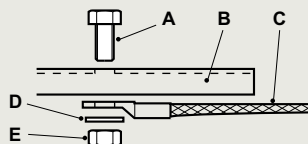


Attach the earth continuity connector to either hole, depending on coupler position.

Fasteners (included)

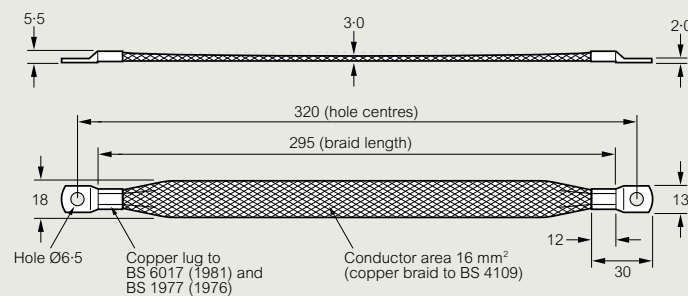
Two fasteners per connector

G, D, S and E finishes



- A M6 x 10 Brass setscrew (BS 3692)
- B Ladder side rail
- C Earth continuity connector
- D Brass form A washer 1.6 x 12.5 x 6.4 (BS4320)
- E M6 Brass nut (BS 3692)

■ Dimensions



Key : Replace the letter shown in red with your choice from the following options :

- F = Finish : **G** (hot dip galvanised after manufacture)
- D** (deep galvanised)
- S** (stainless steel)
- E** (powder coated)

All dimensions (mm) are nominal

Swifts cable ladder ancillary items

hold down clips and insulated hold down clips

Hold down clips are used for fixing cable ladder to trapeze hangers, Swiftrack channel or other flat support surfaces. They are fitted on the outside of the ladder rail

Supplied singly without fasteners

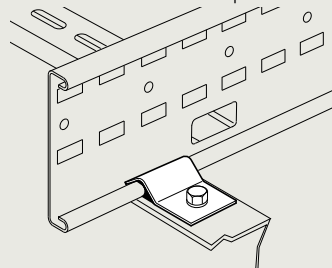
Supplied with the required nylon insulating pad, bush and washer

Insulated versions for stainless steel ladder are available on request, for details contact us on +44 (0) 845 605 4333

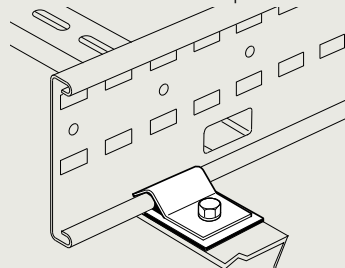
	Ladder range Cat. Nos.		
	Topaz	Sapphire	Emerald
Standard hold down clip	ZFF	PFF	EFF
Insulated hold down clip	ZF INF	PF INF	EF INF

■ Installation (typical)

Standard hold down clip



Insulated hold down clip



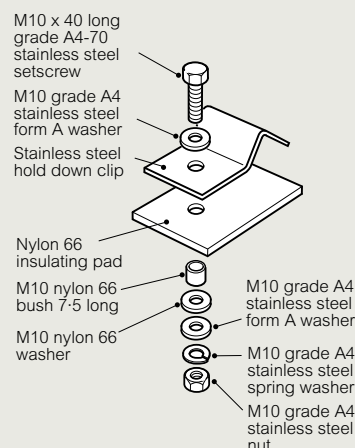
■ Assembly

Insulated hold down clips are assembled as shown (typical) with the nylon pad, bush and washer providing the required insulation

Standard hold down clips are assembled in the same way, but without the insulating parts (bold type – see below)

Use M10 screw, nut and washers to suit the application (not included)

Use fasteners illustrated – only those shown in bold type are included



Fixing hold down clips to supports

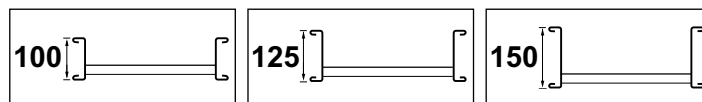
All types of support from the Swifts range are provided with correctly positioned fixing holes to accept hold down clips without drilling. The table contains data on fixing hole spacing required when attaching hold down clips to other supports

Cat. Nos.	Centre distance between fixing holes X
ZFF	W + 95
PFF	W + 95
EFF	W + 95

W = ladder width

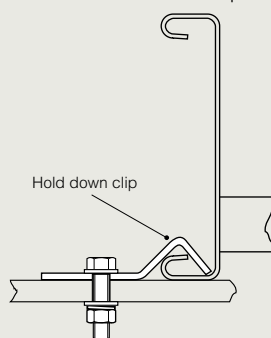
Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

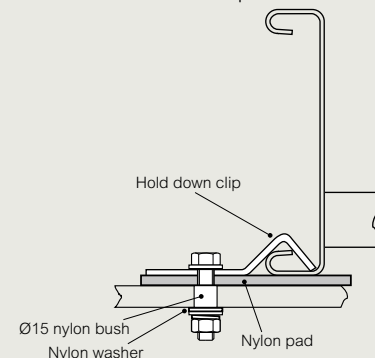


■ Assembly (continued)

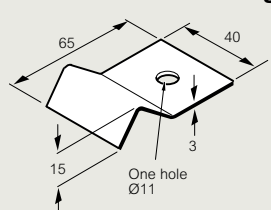
Standard hold down clip



Insulated hold down clip



■ Dimensions and weights



Cat. Nos.	Weight (kg)
ZFF	0.069
PFF	0.069
EFF	0.069

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
 Stainless steel (S) x 0.94
 Powder coated (E) x 0.97

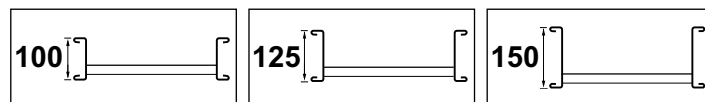
All dimensions (mm) are nominal

Trapeze hangers : see p. 75

Swiftrack channel support : see p. 99-108

Swifts cable ladder ancillary items

hold down brackets and insulated hold down brackets



Hold down brackets are used for fixing cable ladder to cantilever arms, trapeze hangers, Swiftrack channel or other flat support surfaces. They can be fitted on the inside or the outside of the ladder rail

When used with other items from the Swifts range refer to the relevant product page for specific orientation details

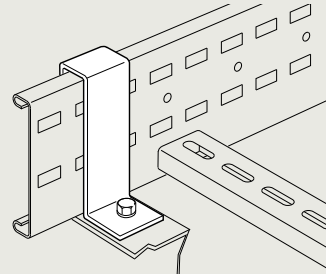
Supplied singly without fasteners

Insulated versions for stainless steel ladder are available, contact us on +44 (0) 845 605 4333

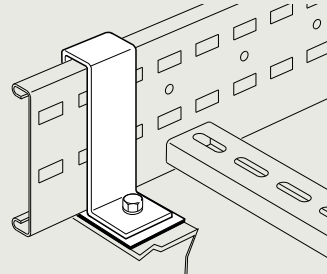
Insulated hold down brackets are supplied with the required nylon insulating pad, bush and washer

■ Installation (typical)

Standard hold down bracket



Insulated hold down bracket



	Ladder range		
	Topaz	Sapphire	Emerald
Standard hold down bracket	ZJF	PJF	EJF
Insulated hold down bracket	ZJ INF	PJ INF	EJ INF

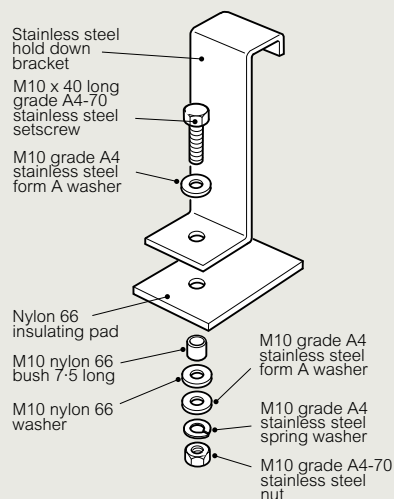
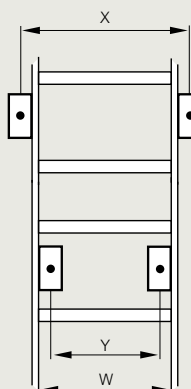
■ Assembly

Insulated hold down brackets are assembled as shown (typical) with the nylon pad, bush and washer providing the required insulation.

Standard hold down brackets are assembled in the same way, but without the insulating parts (bold type – see below)

Use M10 screw, nut and washers to suit the application (not included)

Use fasteners illustrated – only those shown in bold type are included



Fixing hold down brackets to supports

All types of support from the Swifts range are provided with correctly positioned fixing holes to accept hold down brackets without drilling. The table contains data on fixing hole spacing required when attaching hold down brackets to other supports

Cat. Nos.	Centre distance between fixing holes	
	inside ladder Y	outside ladder X
ZJF	W – 44	W + 80
PJF	W – 44	W + 80
EJF	W – 44	W + 80

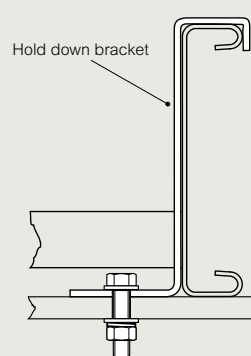
W = ladder width

Key : Replace the letter shown in red with your choice from the following options :

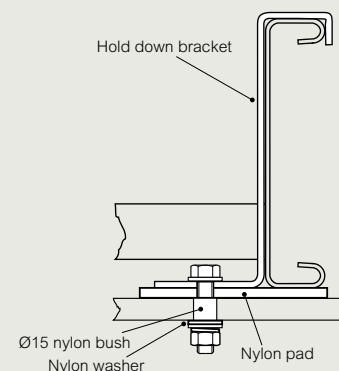
F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

■ Assembly

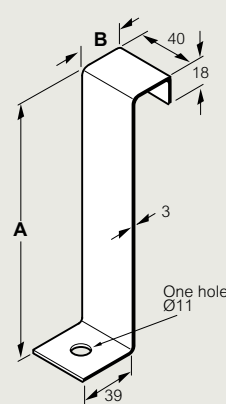
Standard hold down bracket



Insulated hold down bracket



■ Dimensions and weights



Cat. Nos.	A	B	Weight (kg)
ZJF	103	31	0.16
PJF	128	31	0.19
EJF	153	31	0.22

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
 Stainless steel (S) x 0.94
 Powder coated (E) x 0.97

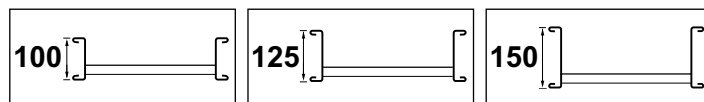
All dimensions (mm) are nominal

Cantilever arms : see p. 74

Swiftrack channel support : see p. 99-108

Swifts cable ladder ancillary items

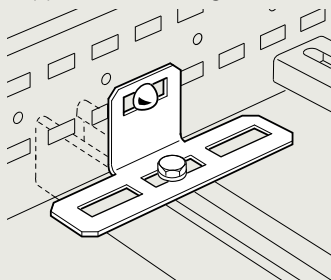
boltable hold down brackets



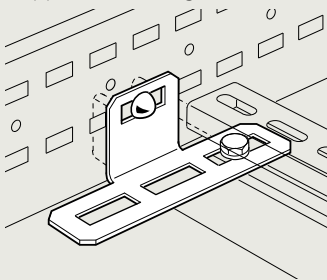
Boltable hold down brackets enable all ranges of cable ladder to be secured to either Swiftrack or fabricated structural steel supports. Brackets can be fitted wherever supports are available along the length of the ladder and fit to the inside of the ladder side rails thus minimising the total width required. Supplied singly with bracket to ladder fasteners.

■ Installation (typical)

Support between rungs



Support under rungs



■ Assembly

When attaching boltable hold down brackets to fabricated structural steel supports, the spacing between fixing holes should be $W - 64$ mm, where W is the ladder width.

Bracket to ladder fasteners (included)

Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
	ZNF	PNF	ENF
Quantity of fasteners per bracket	1	1	1

M10 x 20 coachbolt
M10 flange nut

Fastener finishes

For ladders with G, D and E finishes, fasteners are high tensile Grade 8.8 hot dip galvanised.

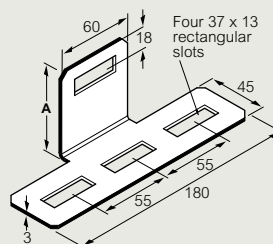
For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

An alternative material for fasteners may be required depending on the installation environment, for details contact us on +44 (0) 845 605 4333.

Bracket to support fasteners (not included)

Slots are provided for M10 setscrews – length to suit application.

■ Dimensions and weights



Cat. Nos.	A	Weight (kg)
ZNF	43.0	0.1
PNF	68.5	0.2
ENF	80.5	0.3

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish.

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors:

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

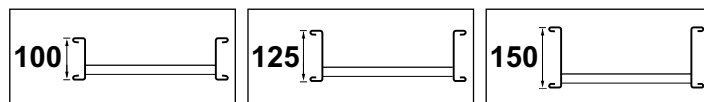
Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

All dimensions (mm) are nominal.

Swifts cable ladder ancillary items

boltable angled hold down brackets



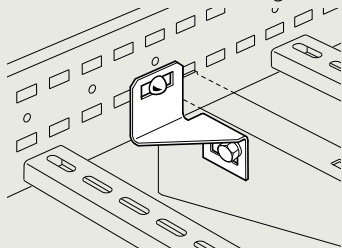
Boltable angled hold down brackets enable the Swifts ranges of cable ladder to be secured to Swifts heavy duty cantilever arms and trapeze hangers. Brackets can be fitted wherever supports are available along the length of the ladder and fit to the inside of the ladder side rails thus minimising the total width required

Boltable angled hold down brackets are supplied in handed pairs with bracket to ladder fasteners

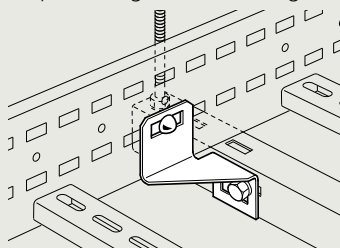
For fixing cable ladder to Swiftrack channel or structural steel supports use boltable hold down bracket, see p. 82

■ Installation (typical)

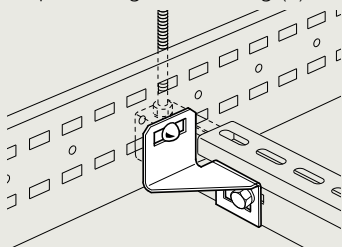
Cantilever arm between rungs



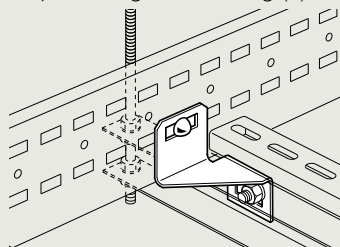
Trapeze hanger between rungs



Trapeze hanger under rung (1)



Trapeze hanger under rung (2)



■ Assembly

Bracket to ladder fasteners (included)

Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
ZPF		PPF	EPF
Quantity of fasteners per bracket	1	1	1

M10 x 20 coachbolt

M10 flange nut

Fastener finishes

For ladders with G, D and E finishes, fasteners are high tensile Grade 8.8 hot dip galvanised

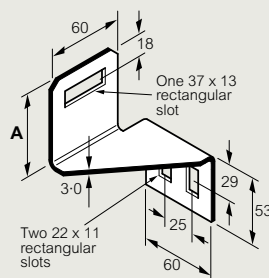
For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

An alternative material for fasteners may be required depending on the installation environment, for details contact us on +44 (0) 845 605 4333

Bracket to support fasteners (not included)

Slots are provided for M10 setscrews – length to suit application

■ Dimensions and weights



Cat. Nos.	A	Weight (kg)
ZPF	43.0	0.4
PPF	68.0	0.4
EPF	80.5	0.6

Weights

All weights given are in kilograms (kg) and are for a pair of brackets in hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised	(D) x 1.07
Stainless steel	(S) x 0.94
Powder coated	(E) x 0.97

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

All dimensions (mm) are nominal

Cantilever arms : see p. 74

Trapeze hangers : see p. 75

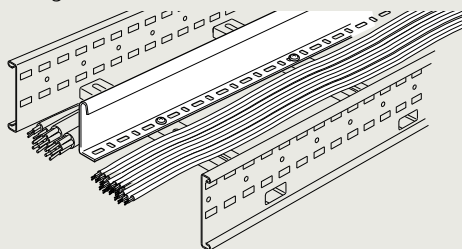
Swifts cable ladder ancillary items

straight and curved dividers

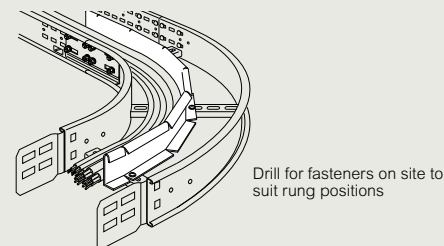
Straight dividers are used, along with curved dividers, to physically separate different types or groups of cable within one cable ladder run. Straight dividers are supplied in 3 m lengths with fasteners. Curved dividers are supplied in 1 m lengths with fasteners. Straight dividers with G finish are for use on ladder runs with G or D finishes. Curved dividers with G finish are for use on ladder runs with G or D finishes.

■ Installation (typical)

Straight divider



Curved divider



■ Assembly

Fasteners for straight dividers (included)

G and E finish dividers

M6 x 12 roofing bolt
M6 nut
M6 roofing washers (2 off)

S finish dividers

M6 x 12 pan head screw
M6 form A washer
M6 square washer
M6 nut

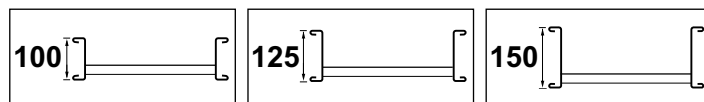
Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
ZDVF	PDVF	EDVF	
Quantity of fasteners per 3.0 m length	10	10	10

Fastener finishes

For ladders with G and D finishes, fasteners are galvanised or zinc plated.

For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

For ladders with E finish, the choice of material for fasteners will depend on the installation environment - contact us on +44 (0) 845 605 4333.



■ Assembly (continued)

Fasteners for curved dividers (included)

G and E finish dividers

M6 x 12 roofing bolt
M6 nut
M6 roofing washers (2 off)

S finish dividers

M6 x 12 pan head screw
M6 form A washer
M6 square washer
M6 nut

Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
ZCURF	PCURF	ECURF	
Quantity of fasteners per 1.0 m length	4	4	4

Fastener finishes

For ladders with G and D finishes, fasteners are galvanised or zinc plated.

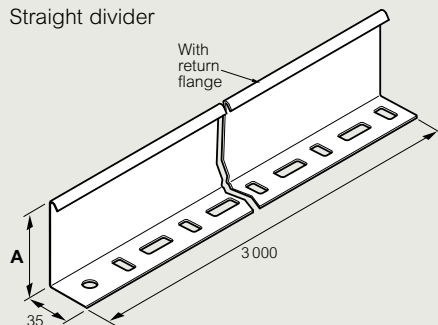
For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

For ladders with E finish, the choice of material for fasteners will depend on the installation environment - contact us on +44 (0) 845 605 4333.

■ Dimensions and weights

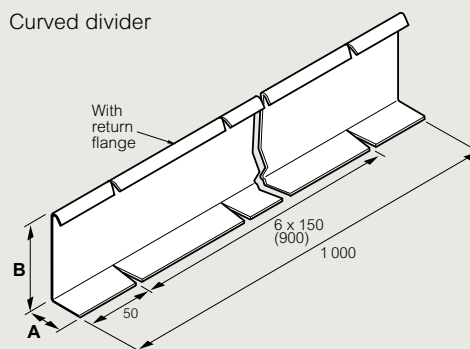
For use with all ladder types of G, D, S and E finishes.

Straight divider



Cat. Nos.	A	Weight (kg)		
		G	Finish S	E
ZDVF	68	2.7	2.5	2.6
PDVF	93	4.0	3.7	3.9
EDVF	118	4.7	4.4	4.5

Curved divider



Cat. Nos.	A Finish G and S	B	Weight (kg)		
			G	Finish S	E
ZCURF	25	68	1.1	1.0	1.0
PCURF	25	93	1.3	1.2	1.2
ECURF	25	118	1.6	1.5	1.5

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)
S (stainless steel)
E (powder coated)

All dimensions (mm) are nominal.

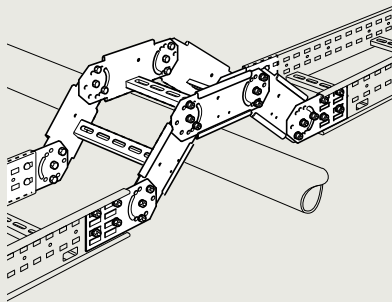
Swifts cable ladder ancillary items

articulated risers

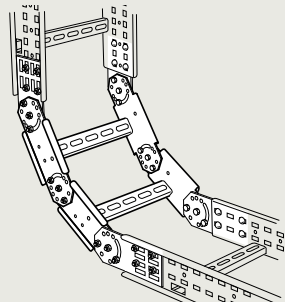
One or more articulated riser sets can be used to solve most misalignment problems on site or can be used to form risers. Each set comprises three articulated riser sections, and the necessary vertical hinged connectors with fasteners. Connect together to form pre-set angles or pre-assembled for adjustment on site using the holes / slots shown.

■ Installation (typical)

Articulated riser set bridging obstructions on site



Two articulated riser sections used as a riser



Rigid support for the cable ladder should be provided on both sides adjacent to each vertical hinged connector joint.

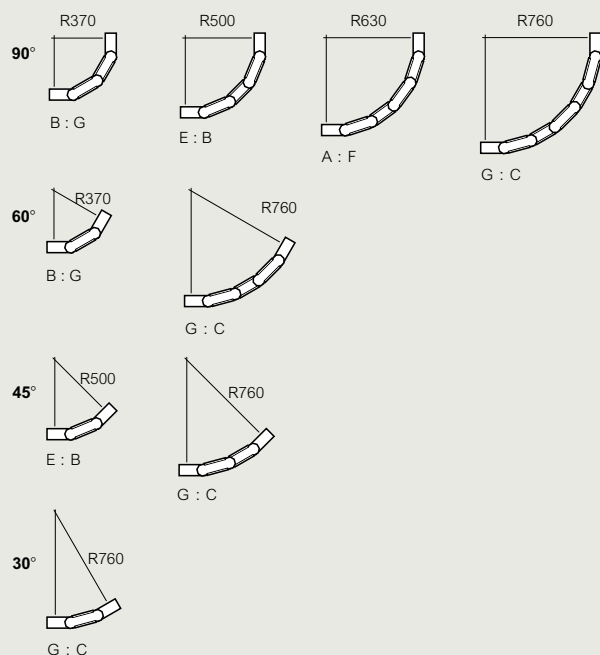
■ Assembly

Pre-set angles and radii

The diagrams below show the number of articulated riser sections needed to form a given angle and radius.

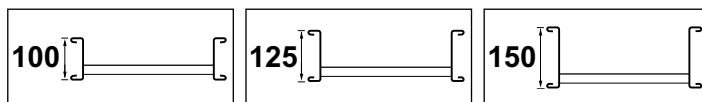
1. Identify the correct fixing holes.
2. Stand each component part on its side in its assembled position, overlapping the joint alternately. At every upper joint insert a fastener through the identified outer holes but do not fully tighten. Do not insert fasteners through the centre hole first, this makes identification of the outer holes very difficult.
3. Adjust the assembly to align the centre holes of each joint. Fit fasteners but do not fully tighten.
4. At each joint, insert a third fastener through the slot and corresponding hole.
5. Tighten all fasteners.
6. Turn the whole assembly over and repeat steps 1 to 5.

Section required for a given angle



Key : Replace the letter shown in red with your choice from the following options :

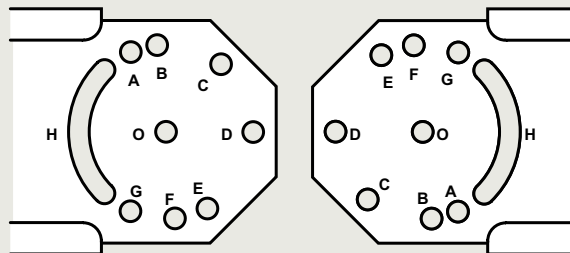
F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)



■ Assembly (continued)

Pre-assembly for adjustment in-situ

1. Lay out the required number of articulated riser sections and vertical hinged connectors, overlapping each joint alternately as shown above.
2. At each joint align the centre holes in each component and insert a fastener sufficiently tight to hold the assembly together and carry it to the installation position.
3. Fit the vertical hinged connectors to the ladder, see p. 42.
4. Adjust the position of each section until the desired path is achieved and tighten the centre fastener at each joint.
5. Insert two additional fasteners at each joint and tighten all fasteners.

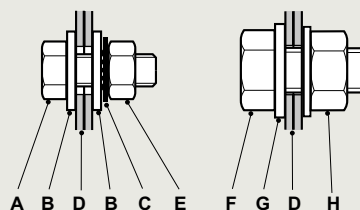


Cat. Nos.	Weight (kg)				
	15°	18°	22.5°	30°	45°
ZARF, PARF, EARF	G : C	A : F	E : B	B : G	F : C

Fasteners (included)

Medium duty
(Topaz) ZAR

Heavy duty (Sapphire) PAR
Extra heavy duty (Emerald) EAR



A M6 x 16 setscrews
B M6 washer
C M6 shakeproof washer
D Connector
E M6 nut
F M10 x 20 setscrews
G M10 form A washer
H Flange nut

Recommended Torque Setting (M10): 40Nm

Fastener finishes

For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

For ladders with E finish, the choice of material for fasteners will depend on the installation environment - contact us on +44 (0) 845 605 4333.

Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
ZARF, PARF, EARF			
Quantity of fasteners per riser to riser joint	3 x M6	3 x M10	3 x M10

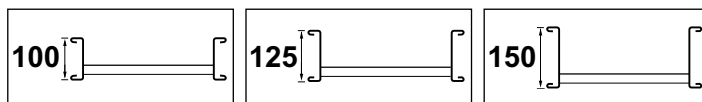
For quantity of fasteners for vertical hinged connectors, see p. 42.

All dimensions (mm) are nominal.

Vertical hinged connectors : see p. 42

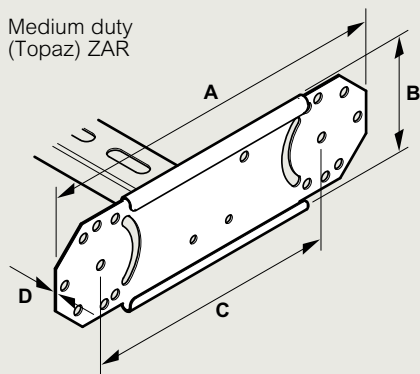
Swifts cable ladder ancillary items

articulated risers continued

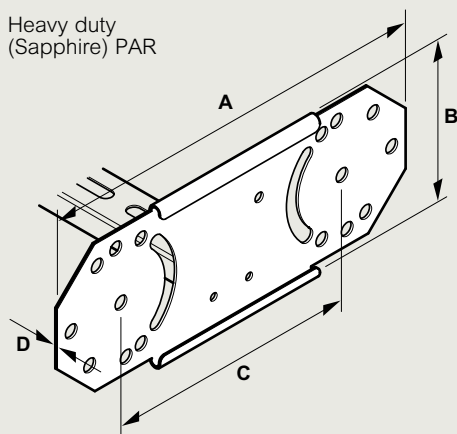


■ Dimensions and weights

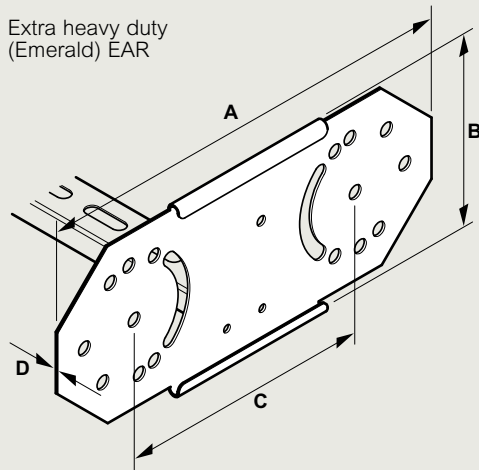
Medium duty
(Topaz) ZAR



Heavy duty
(Sapphire) PAR



Extra heavy duty
(Emerald) EAR



Cat. Nos.	Dimensions (mm)			
	A	B	C	D
ZAR^F	280	90	200	1·5
PAR^F	315	127	200	2·0
EAR^F	338	150	200	2·0

■ Dimensions and weights (continued)

Weights

All weights given are in kilograms (kg) and are for a single articulated riser section in a hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1·07

Stainless steel (S) x 0·94

Powder coated (E) x 0·97

Cat. Nos.	150	300	Weight (kg)		750	900
			450	600		
ZAR^F	0·8	1·0	1·1	1·3	1·6	1·8
PAR^F	1·5	1·6	1·8	1·9	2·2	2·4
EAR^F	1·8	2·0	2·1	2·3	2·6	2·8

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)

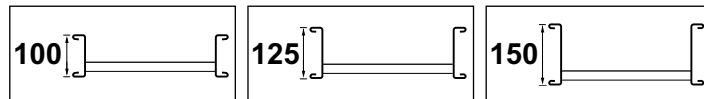
D (deep galvanised)

S (stainless steel)

E (powder coated)

Swifts cable ladder ancillary items

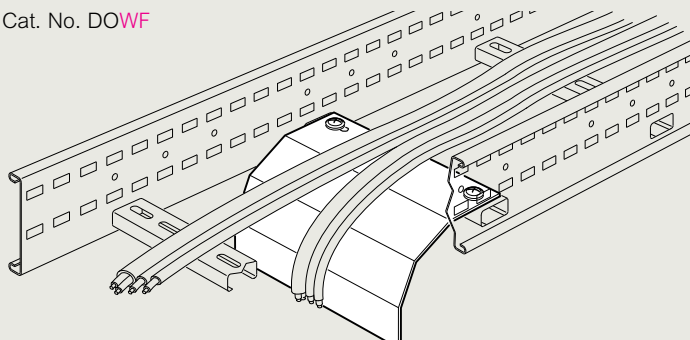
dropout plates



Dropout plates are designed to provide local support to cables as they exit a cable ladder run by passing between the rungs. Supplied singly with fasteners.

■ Installation (typical)

Cat. No. DOWF



■ Assembly

Fasteners (included)

Two fasteners per plate up to 450 mm wide
Three fasteners per plate 600 mm wide and above

G and D finishes

M6 x 12 roofing bolt
M6 roofing washers (2 off)
M6 nut

S finish

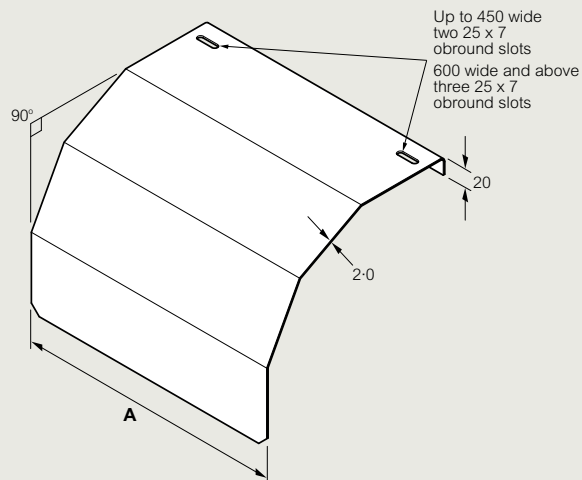
M6 x 12 pan head screw
M6 form A washer
M6 square washer
M6 nut

Fastener finishes

For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

For ladders with E finish, the choice of material for fasteners will depend on the installation environment - contact us on +44 (0) 845 605 4333

■ Dimensions and weights



Ladder width (w)	A	Weight (kg)
150	130	0.8
300	280	1.7
450	430	2.7
600	580	3.6
750	790	4.5
900	880	5.5

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
Stainless steel (S) x 0.94
Powder coated (E) x 0.97

Key : Replace the letter shown in red with your choice from the following options :

W = Width (mm) 150, 300, 450, 600, 750, 900

F = Finish : G (hot dip galvanised after manufacture)

D (deep galvanised)

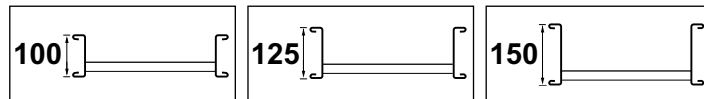
S (stainless steel)

E (powder coated)

All dimensions (mm) are nominal

Swifts cable ladder ancillary items

rail to rail dropout brackets

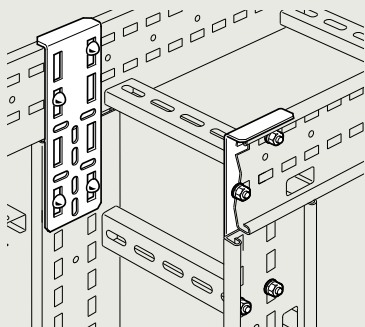


Rail to rail dropout brackets are used to attach a vertical cable ladder run beneath a horizontal main ladder run of the same width, or to attach a vertical cable tray run beneath one side rail of a horizontal main ladder run
Supplied in pairs with fasteners

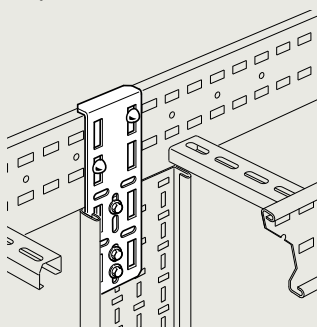
■ Installation (typical)

Cat. No. MF

Ladder to ladder connection



Tray to ladder connection



■ Assembly

Note

Unless the connecting vertical ladder or tray is properly supported at a lower position it must be considered as a point load imposed on the main ladder run, any implications of which must be properly considered

Bracket to ladder fasteners (included)

Recommended Torque Setting (M10): 40Nm

Five fasteners per bracket

M10 x 20 coach bolt

M10 flange nut

Fastener finishes

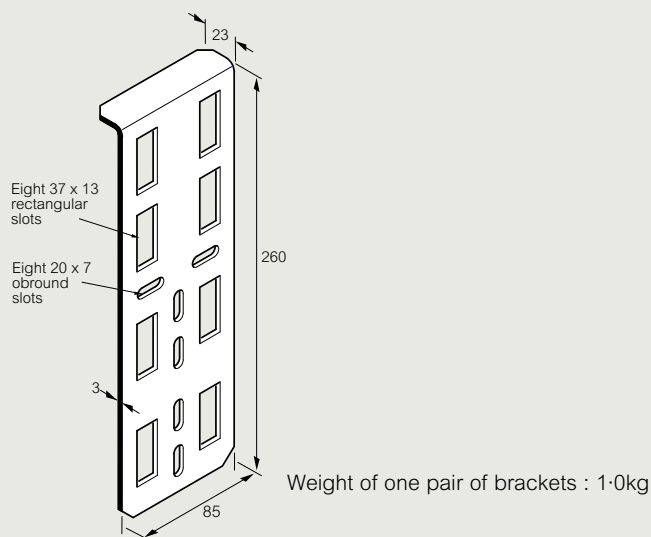
For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

For ladders with E finish, the choice of material for fasteners will depend on the installation environment - contact us on +44 (0) 845 605 4333

Bracket to tray fasteners (not included)

M6 nuts and bolts (roofing or pan head)

■ Dimensions and weights



Weights

All weights given are in kilograms (kg) and are for a pair of brackets in hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07

Stainless steel (S) x 0.94

Powder coated (E) x 0.97

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : G (hot dip galvanised after manufacture)

D (deep galvanised)

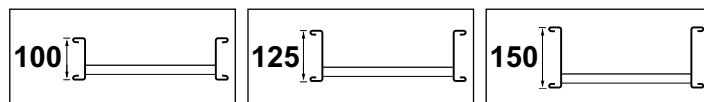
S (stainless steel)

E (powder coated)

All dimensions (mm) are nominal

Swifts cable ladder ancillary items

tee brackets



Tee brackets are a versatile means of carrying out the installation of a branch off a main cable ladder run. The branch can be installed at any position along the main run of ladder without cutting or drilling, making this approach particularly useful for installing a new branch onto an existing installation.

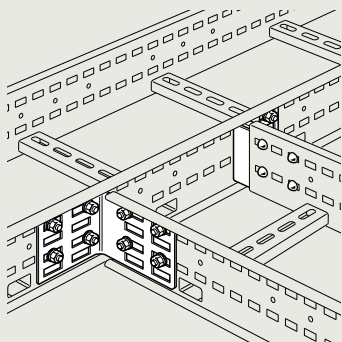
The branch ladder may be the same type and width as the main run or it may be a lighter type and / or a narrower width.

The branch ladder can be installed in either a horizontal or vertical position (as shown below). However, with the use of bendable or hinged connectors (shown on p. 41-42) any orientation of the ladder is possible.

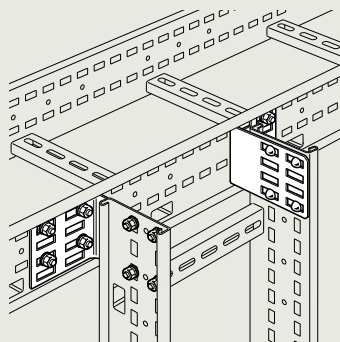
Supplied in pairs with fasteners.

Installation (typical)

Horizontal connection



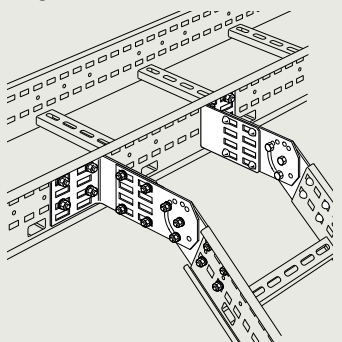
Vertical connection



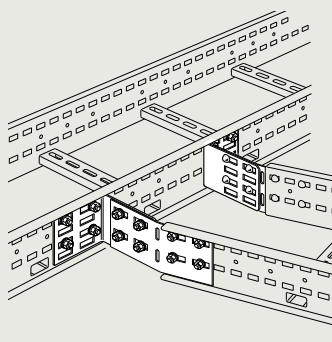
Main ladder run	Permitted ladder branch		
	Topaz	Sapphire	Emerald
Topaz	ZTB F	—	—
Sapphire	ZTB F	PTB F	—
Emerald	ZTB F	PTB F	ETB F

Tee brackets when used with bendable connectors or vertical hinged connectors are an economical and fast way of coping with unforeseen problems as they arise during installation.

Tee brackets used with vertical hinged connectors



Tee brackets used with bendable connectors



Note

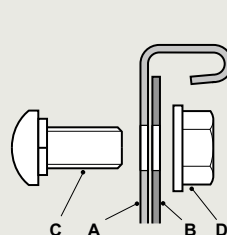
Rigid support for the main ladder run should be provided immediately adjacent to the installed position of the branch. The cable loading on the branch should be treated as a point load applied unevenly to the main ladder run and the implications of this must be properly considered.

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

Assembly

Bracket to ladder fasteners (included)



- A Side rail
- B Bracket
- C M10 x 20 coachbolt
- D M10 flange nut

	Topaz	Ladder range Sapphire	Emerald
Cat. Nos.	ZTB F	PTB F	ETB F
Quantity of fasteners per bracket	8 x M10	8 x M10	8 x M10

Recommended Torque Setting (M10): 40Nm

Fastener finishes

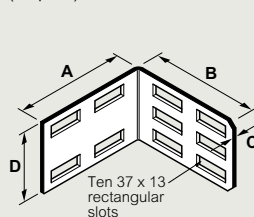
For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised.

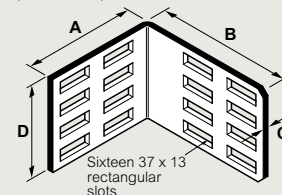
An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333.

Dimensions and weights

Medium duty
(Topaz) ZTB **F**



Heavy duty
(Sapphire) PTB **F** and
extra heavy duty
(Emerald) ETB **F**



Cat. Nos.	A	B	C	D	Weight (kg)
ZTB F	125	125	2.0	78	0.5
PTB F	125	155	3.0	103	1.0
ETB F	125	155	3.0	103	1.0

Weights

All weights given are in kilograms (kg) and are for a pair of brackets in hot dip galvanised G finish.

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07
 Stainless steel (S) x 0.94
 Powder coated (E) x 0.97

All dimensions (mm) are nominal.

Bendable connectors : see p. 41

Vertical hinged connectors : see p. 42

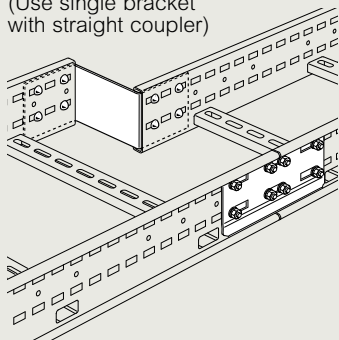
Swifts cable ladder ancillary items

short reducer brackets

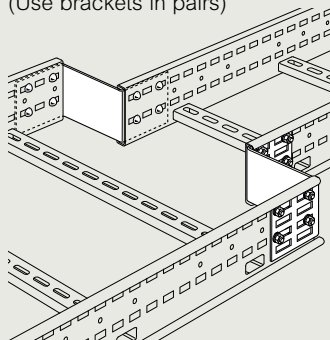
Short reducer brackets can be used with all cable ladder ranges to provide a simple and economical way of forming a reducer on site. A single bracket can be used with a straight coupler to form either a left hand or right hand offset reducer, whereas two brackets are used to form a straight reducer. In the same way, short reducer brackets can be used to convert an equal tee into an unequal tee. Six sizes of bracket are available to fit each ladder range, providing a full range of reductions from 75 mm to 750 mm. Brackets can be fitted to the end of a full or cut ladder length without the need for drilling. When fitted to a cut length, the bracket provides a safe edge. Supplied singly with fasteners.

■ Installation (typical)

Offset reducer
(Use single bracket with straight coupler)



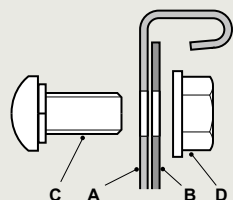
Straight reducer
(Use brackets in pairs)



Ladder cut ends must have a minimum clear length of 150mm before the first rung when fitting short reducer brackets. Rigid support for the cable ladder should be provided on both sides adjacent to each joint.

■ Assembly

Fasteners (included)



- A M10 x 20 coachbolt
- B Bracket
- C Side rail
- D M10 flange nut

Cat. Nos.	Ladder range		
	Topaz	Sapphire	Emerald
Quantity of fasteners per bracket	4	8	8

Recommended Torque Setting (M10): 40Nm

Fastener finishes

For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised.

An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333.

Key : Replace the letter shown in red with your choice from the following options :

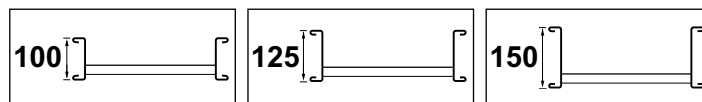
Y = Ladder width reduction

F = Finish : **G** (hot dip galvanised after manufacture)

D (deep galvanised)

S (stainless steel)

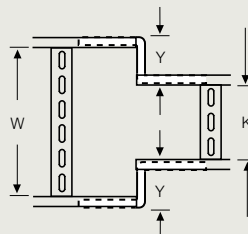
E (powder coated)



■ Ordering details

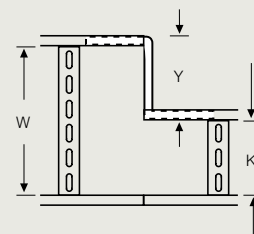
Supplied singly with fasteners
Use to form a reducer on site

Straight reducer
– use in pairs



Offset reducer

– use singly with straight coupler



Use the following calculations to establish ladder width reduction. This measurement (Y), can then be inserted into relevant Cat. Nos. to show bracket size required (see p. 23).

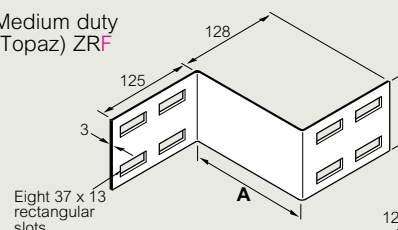
Offset reducer **Straight reducer**

$$Y = W - K \qquad Y = \frac{W - K}{2}$$

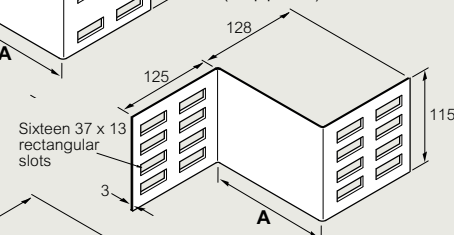
W = main ladder mm
K = reduced ladder mm

■ Dimensions and weights

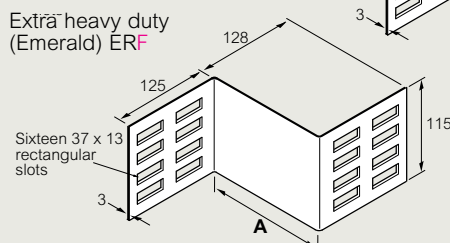
Medium duty
(Topaz) **ZR^F**



Heavy duty
(Sapphire) **PR^F**



Extra heavy duty
(Emerald) **ER^F**



Ladder width difference	A	Weight (kg)		
		ZR	PR	ER
75	78	0.6	0.7	1.0
150	153	0.7	0.8	1.1
300	303	1.0	1.2	1.5
450	453	1.3	1.5	2.0
600	603	1.7	1.9	2.4
750	753	2.0	2.3	2.9

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish.

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07

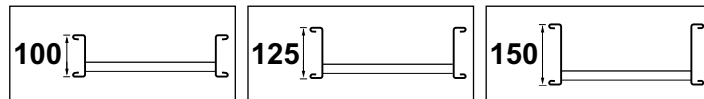
Stainless steel (S) x 0.94

Powder coated (E) x 0.97

All dimensions (mm) are nominal

Swifts cable ladder ancillary items

ancillary mounting brackets

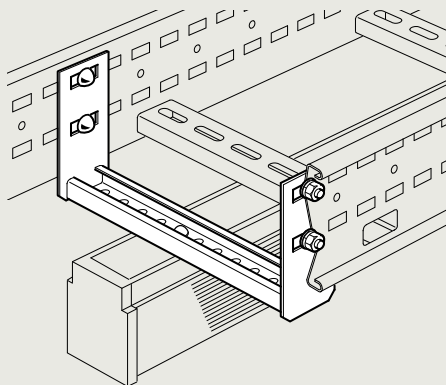


Ancillary mounting brackets are designed to enable ancillary equipment to be mounted to horizontal or vertical cable ladder runs and can be used singly to support small items, or any number can be used for larger or heavier items
Slots for M6 fasteners are provided for mounting ancillary items
Supplied singly with bracket to ladder fasteners

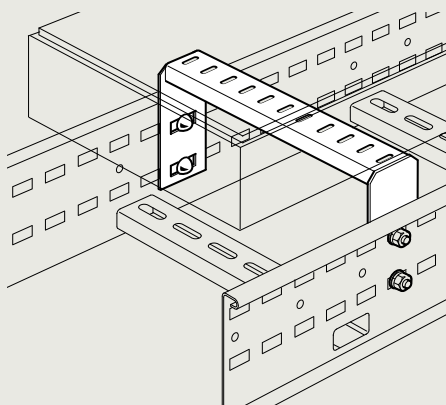
■ Installation (typical)

Cat. No. AMB **WF**

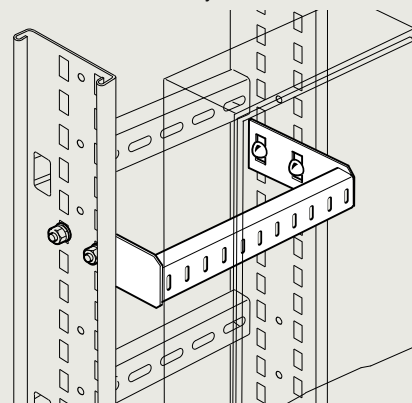
For services below



For services above



For services vertically



■ Assembly

Bracket to ladder fasteners (included)

Four fasteners per bracket

Recommended Torque Setting (M10): 40Nm

M10 x 20 coachbolt

M10 flange nut

Fastener finishes

For ladders with G and D finishes, fasteners are high tensile Grade 8.8

For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

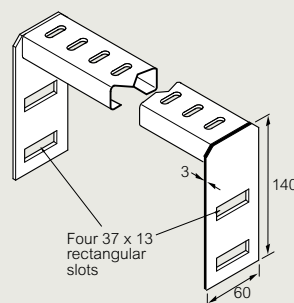
For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised

An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333

Bracket to ancillary fasteners (not included)

Slots are provided for attaching ancillary items

■ Dimensions and weights



Ladder width (w)	Weight (kg)
150	0.6
300	0.7
450	0.8
600	1.0
750	1.4
900	1.6

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07

Stainless steel (S) x 0.94

Powder coated (E) x 0.97

Key : Replace the letter shown in red with your choice from the following options :

W = Width (mm) 150, 300, 450, 600, 750, 900

F = Finish : **G** (hot dip galvanised after manufacture)

D (deep galvanised)

S (stainless steel)

E (powder coated)

All dimensions (mm) are nominal

Swifts cable ladder ancillary items

ancillary mounting plate

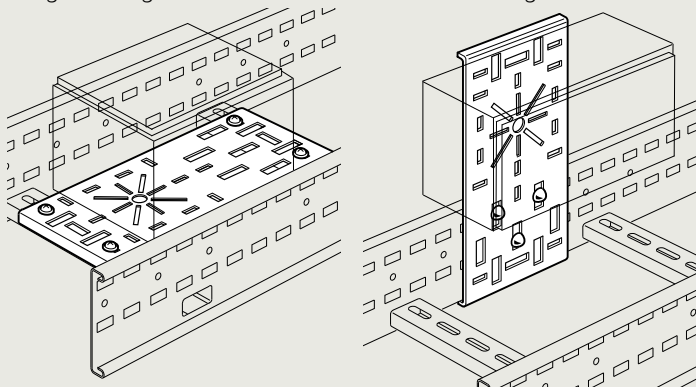
Ancillary mounting plates are used for mounting small and lightweight items of ancillary equipment to cable ladder runs and can be fitted to bridge adjacent rungs on all cable ladder ranges, or fixed perpendicularly to the inside of a side rail
Supplied singly with plate to ladder fasteners

■ Installation (typical)

Cat. No. MP **F**

Rung mounting

Side rail mounting



■ Assembly

Plate to ladder fasteners (included – see opposite for positioning)

Four fasteners per plate for fixing position A

Three fasteners per plate for fixing position C

Recommended Torque Setting (M10): 40Nm

A

M10 x 20 coachbolt

M10 flange nut

C

M10 x 20 coachbolt

M10 flange nut

Fastener finishes

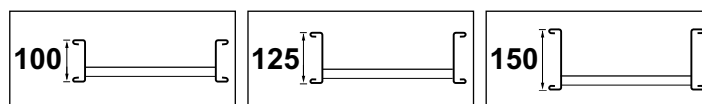
For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised

An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333

Plate to ancillary fasteners (not included)

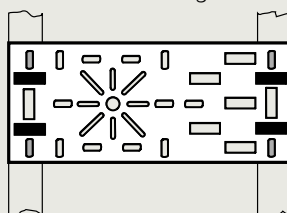
Slots are provided for attaching ancillary items



■ Assembly (continued)

Rung fixing position (A)

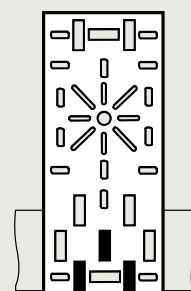
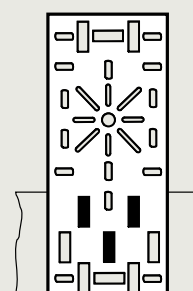
All ladder ranges



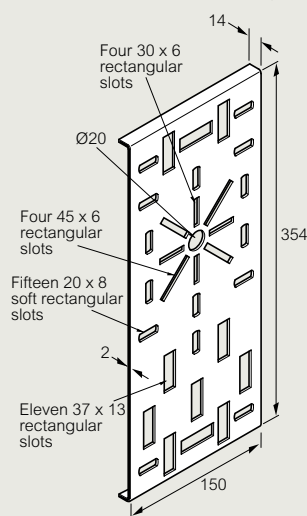
Side rail fixing positions (C)

Medium duty (Topaz)

Heavy duty (Sapphire) and
extra heavy duty (Emerald)



■ Dimensions and weights



Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1.07

Stainless steel (S) x 0.94

Powder coated (E) x 0.97

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)

D (deep galvanised)

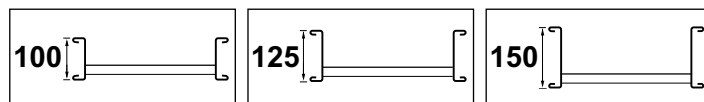
S (stainless steel)

E (powder coated)

All dimensions (mm) are nominal

Swifts cable ladder ancillary items

cable support bracket

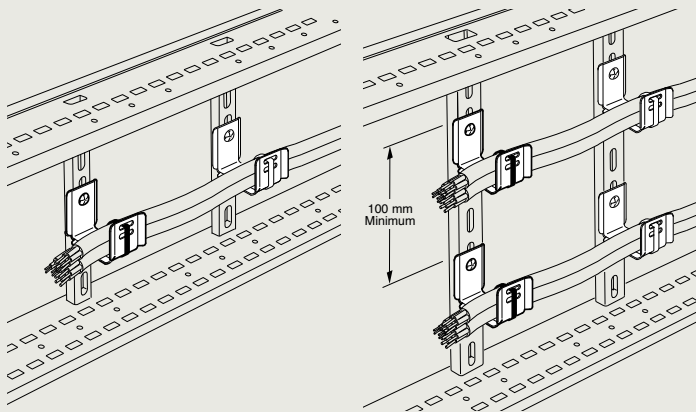


Cable support brackets are designed for use with all cable ladder ranges when the ladder is installed with the rungs vertical. Several brackets can be fitted to each rung at a minimum spacing of 100 mm. The maximum recommended cable loading is 30 kg per bracket.

Supplied singly with fasteners but without cable ties.

■ Installation (typical)

Cat. No. CSB **F**



■ Assembly

Fasteners (included)

One fastener per bracket

G and D finishes

M6 x 12 roofing bolt
M6 roofing washers (2 off)
M6 nut

S finish

M6 x 12 pan head screw
M6 form A washer
M6 square washer
M6 nut

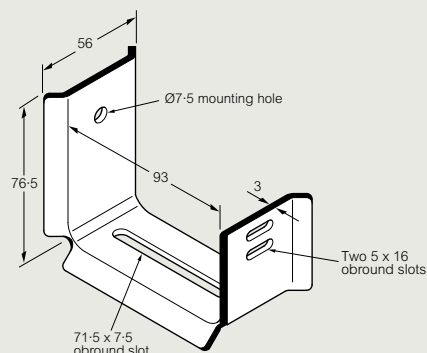
Fastener finishes

For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised.

An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333.

■ Dimensions and weights



Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish.

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors:

Deep galvanised	(D) x 1.07
Stainless steel	(S) x 0.94
Powder coated	(E) x 0.97

Key : Replace the letter shown in red with your choice from the following options :

F = Finish : **G** (hot dip galvanised after manufacture)
D (deep galvanised)
S (stainless steel)
E (powder coated)

All dimensions (mm) are nominal

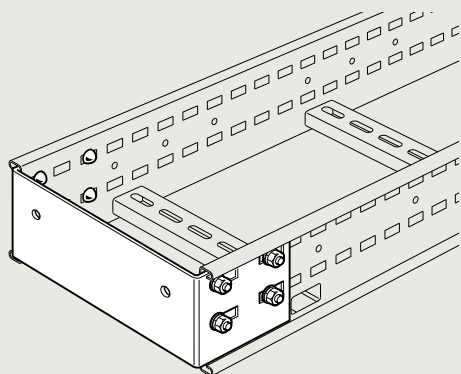
Swifts cable ladder ancillary items

stop ends

Stop ends provide both a neat method of terminating a cable ladder run and also an alternative to the use of 90° connectors for fixing the end of a cable ladder run to a vertical surface (steel, concrete or masonry)

Supplied singly with stop end to ladder fasteners

■ Installation (typical)



	Topaz	Ladder range		
		Sapphire	Emerald	
Cat. Nos.	ZSWF	PSWF	ESWF	
Quantity of fasteners per bracket	8	8	8	

■ Assembly

Stop end to ladder fasteners (included)

Recommended torque setting (M10) : 40Nm

M10 x 20 coachbolt

M10 flange nut

Fastener finishes

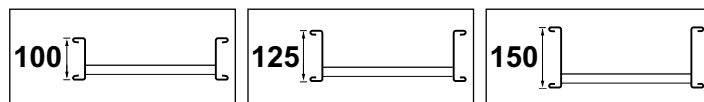
For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised

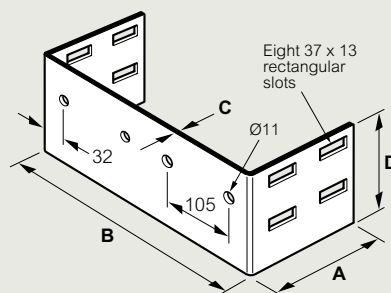
An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333

Stop end to support fasteners (not included)

Holes are provided for M10 setscrews – length and finish to suit application



■ Dimensions and weights



Additional holes for ladder widths 600 and over

Cat. Nos.	Topaz (ZS)					Sapphire (PS)					Emerald (ES)				
	A	B	C	D	Wt (kg)	A	B	C	D	Wt (kg)	A	B	C	D	Wt (kg)
150	127	154	2·0	84	0·4	127	154	2·0	115	0·6	127	154	2·0	140	0·6
300	127	304	2·0	84	0·6	127	304	2·0	115	0·9	127	304	2·0	140	1·0
450	127	454	2·0	84	0·7	127	454	2·0	115	1·2	127	454	2·0	140	1·9
600	127	604	2·0	84	0·9	127	604	2·0	115	1·4	127	604	2·0	140	1·7
750	127	754	2·0	84	1·0	127	754	2·0	115	1·7	127	754	2·0	140	2·0
900	127	904	2·0	84	1·2	127	904	2·0	115	2·0	127	904	2·0	140	2·4

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised (D) x 1·07

Stainless steel (S) x 0·94

Powder coated (E) x 0·97

Key : Replace the letter shown in red with your choice from the following options :

W = Width (mm) 150, 300, 450, 600, 750, 900

F = Finish : **G** (hot dip galvanised after manufacture)

D (deep galvanised)

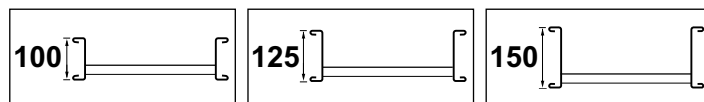
S (stainless steel)

E (powder coated)

All dimensions (mm) are nominal

Swifts cable ladder ancillary items

covers for straight lengths



Medium duty (Topaz), heavy duty (Sapphire) and extra heavy duty (Emerald) use the same covers and closed / ventilated clips

Covers can be installed either by resting directly on the ladder side rails (closed covers) or raised above the side rails providing a gap for air to circulate (ventilated covers)

Covers up to 450 mm wide have a flat top surface and are simply butt-jointed together. Covers 600 mm wide and above are overlapped and bolted together to increase their rigidity. Covers 750 and 900 mm wide have a stiffener fitted along the joint for added rigidity

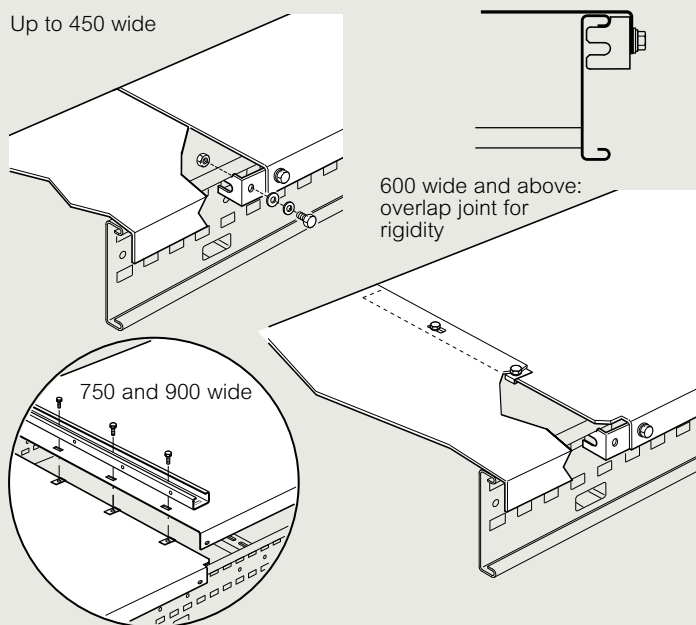
All covers are 3 m in length and supplied with six cover clips and associated fasteners

For ordering information, see p. 23

Installation (typical)

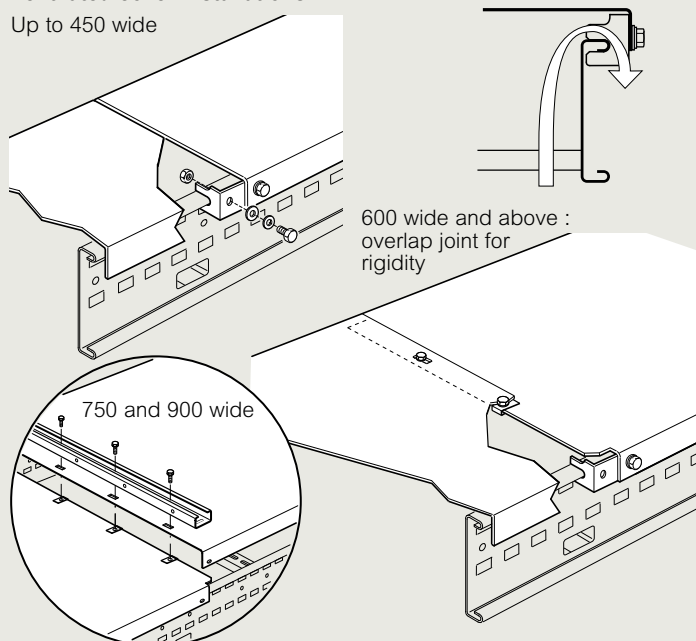
Closed cover installations

Up to 450 wide



Ventilated cover installations

Up to 450 wide



Key : Replace the letter shown in red with your choice from the following options :

W = Width (mm) 150, 300, 450, 600, 750, 900

F = Finish : G (hot dip galvanised after manufacture)

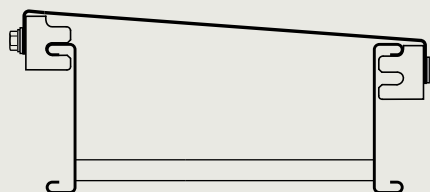
D (deep galvanised)

S (stainless steel)

E (powder coated)

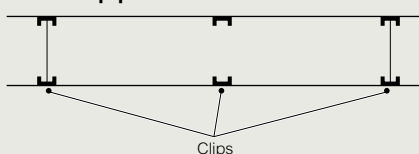
Installation (typical) (continued)

Lid in run-off position



Assembly

Cover clip positions

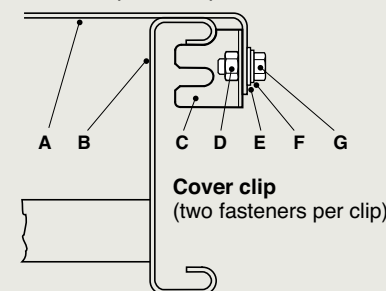


Clips are fitted to the inside of both cover side flanges as shown; the end clips provide anchorage for the joined ends of adjacent covers

Note

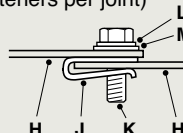
Covers can not be used when hanger rod brackets are fitted to ladder

Fasteners (included)

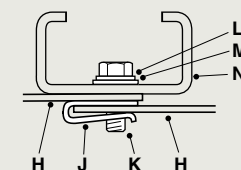


- A Cover
- B Side rail
- C Cover clip
- D M8 nut
- E M8 form A washer
- F Spring washer
- G M8 x 16 setscrew
- H Cover
- J 'U'-shape retaining nut
- K M6 x 16 setscrew
- L M6 form A washer
- M Spring washer
- N Stiffener

Overlap joint on 600 wide (two fasteners per joint)



Overlap joint on 750 and 900 wide (four fasteners per joint)



Fastener finishes

For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470

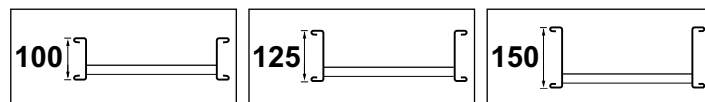
For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised

An alternative material for fasteners may be required depending on the installation environment, for details contact us on +44 (0) 845 605 4333

All dimensions (mm) are nominal

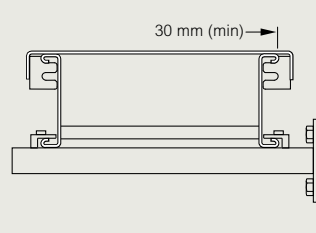
Swifts cable ladder ancillary items

covers for straight lengths continued



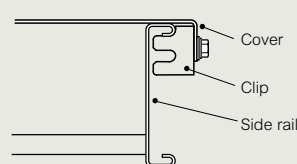
■ Assembly (continued)

Covers



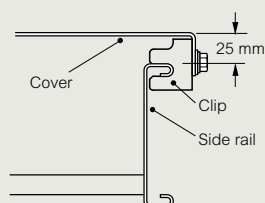
General

Before fitting the covers ensure a minimum clearance of 30 mm between the ladder and the vertical support face. For access to fit cover clips a larger clearance is required when the vertical support is a solid face



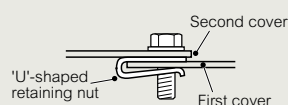
Closed covers

Place each cover over the ladder side rails and push the clip under the side rail return flanges before fitting and tightening the fasteners



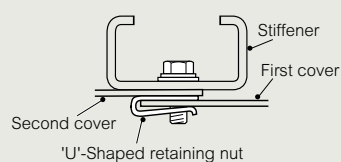
Ventilated covers

Slide the clips over the top return flange of the ladder side rails and place the cover over the clips. Fit and tighten the fasteners



Wide covers – 600 mm and above

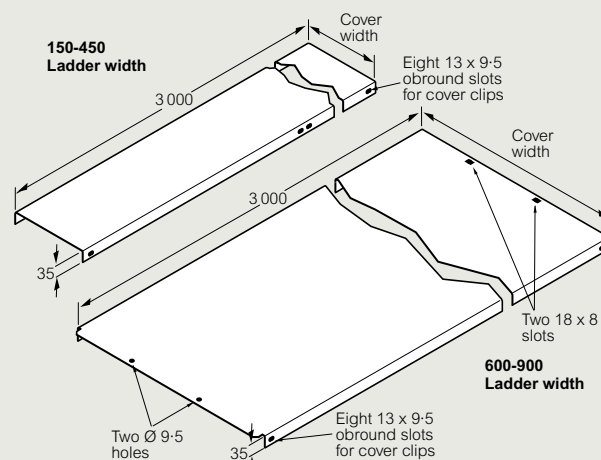
For wider covers with overlapped joints, fit the first cover as above. Push the 'U' shaped retaining nuts over the holes in the overlap tongue. Fit the second cover with its straight end overlapping the tongue on the first cover. Insert fasteners and secure



700 and 900mm wide covers

For covers fitted with a stiffener, assemble the covers as described above and place the stiffener on to the top cover along the joint. Insert fasteners and secure

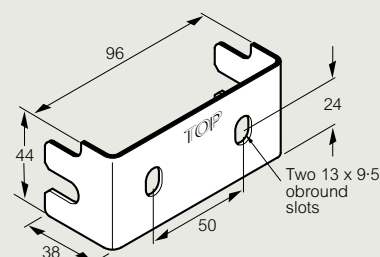
■ Dimensions and weights – covers



Widths 750 and 900 have two additional 18 x 8 slots and Ø 9.5 holes to accept stiffener for added rigidity

Ladder width (w)	Cover width	Weight (kg)
150	232	11.0
300	382	16.6
450	532	22.2
600	682	28.0
750	832	33.6
900	982	39.3

■ Dimensions and weights – clips



Weight: 0.5 kg per 4 clips

Weights

All weights given are in kilograms (kg) and are for hot dip galvanised G finish

To obtain the appropriate component weight in other finishes, multiply the given weight by the following factors :

Deep galvanised	(D) x 1.07
Stainless steel	(S) x 0.94
Powder coated	(E) x 0.97

Key : Replace the letter shown in red with your choice from the following options :

W = Width (mm) 150, 300, 450, 600, 750, 900

F = Finish : G (hot dip galvanised after manufacture)

D (deep galvanised)

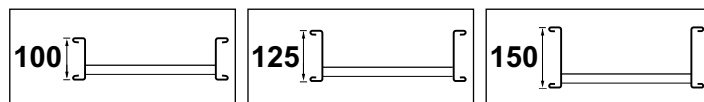
S (stainless steel)

E (powder coated)

All dimensions (mm) are nominal

Swifts cable ladder ancillary items

covers for fittings



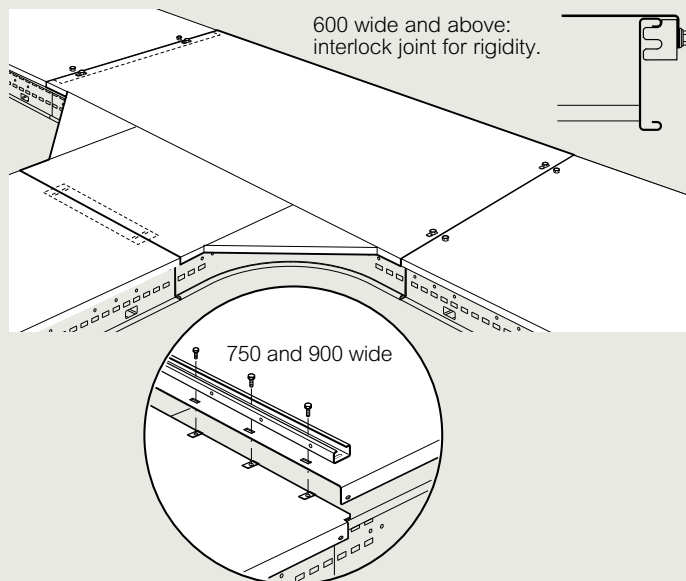
Covers are supplied to fit all fittings in the medium duty (Topaz), heavy duty (Sapphire) and extra heavy duty (Emerald) cable ladder ranges. Covers can be installed either by resting directly on the fitting side rails (closed covers) or raised above the side rails providing a gap for air to circulate (ventilated covers).

Covers for fittings up to 450 mm wide are simply butt-jointed together. Covers 600 mm wide and above are overlapped and bolted together to increase their rigidity. Covers 750 and 900 mm wide have a stiffener fitted along the joint for added rigidity.

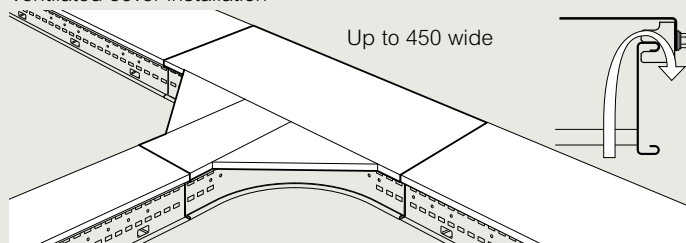
All covers are supplied with the appropriate number of fasteners.

Installation (typical)

Closed cover installation



Ventilated cover installation



To order a cover for a fitting, (except risers) remove first letter of fitting product code (Z, P or E) and add CV before your chosen dimensions. Example : Product code = PFB 300 90 600 G

Cover code = FB CV 300 90 600 G

Riser covers are specific for Z, P or E

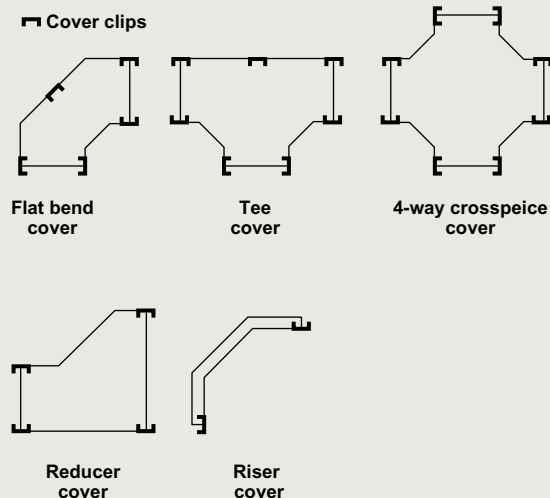
For risers :

Ladder range		Topaz	Sapphire	Emerald
Inside risers	Closed covers	ZIRC	PIRC	EIRC
Cat. Nos.	Ventilated covers	ZIRV	PIRV	EIRV
Outside risers	Closed covers	ZORC	PORC	EORC
Cat. Nos.	Closed covers	ZORC	PORC	EORC

Assembly

Cover clip positions

Clips are fitted to the inside of cover side flanges as shown ; the end clips provide anchorage for the joined ends of adjacent covers.

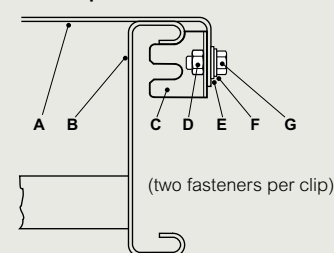


Note

Covers can not be used when hanger rod brackets are fitted to ladder.

Fasteners (included)

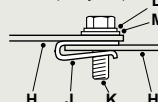
Cover clip



- A Cover
- B Side rail
- C Cover clip
- D M8 nut
- E M8 form A washer
- F Spring washer
- G M8 x 16 setscrew
- H Cover
- J 'U'-shape retaining nut
- K M6 x 16 setscrew
- L M6 form A washer
- M Spring washer
- N Stiffener

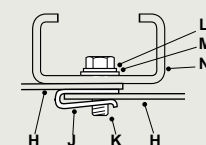
Overlap joint on 600 wide

(two fasteners per joint)



Overlap joint on 750 and 900 wide

(two fasteners per joint)



Fastener finishes

For ladders with G and D finishes, fasteners are galvanised or zinc plated. For ladders with S finish, fasteners are corrosion resistant stainless Grade A470.

For ladders with E finish, the fasteners are Grade 8.8 hot dip galvanised.

An alternative material for fasteners may be required depending on the installation environment - contact us on +44 (0) 845 605 4333.

Key : selecting for ancillary items and covers. Replace the letters shown in **red** with your choice from the following options :

W = Widths : 150, 300, 450, 600, 750, 900

Y = Ladder width reduction **A** = Angle (°) : 90 or 45

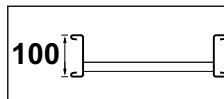
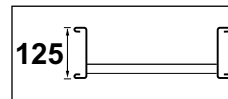
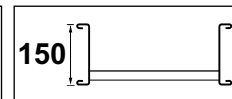
F = Finish : **G** (hot dip galvanised after manufacture), **D** (deep galvanised) **S** (stainless steel), **E** (powder coated)

r = Radius (mm) : 300, 600

All dimensions (mm) are nominal

Swifts cable ladder ancillary items

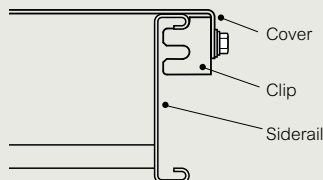
covers for fittings continued



■ Assembly

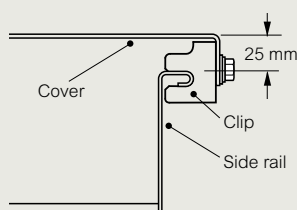
Closed covers

To fit covers as closed, fit the cover over the fitting side rails and place the cover clips in position under the side rail return flanges. Fit and tighten the fasteners



Ventilated covers

To fit the covers as ventilated, slide the clips over the top return flanges of the side rails and place the cover over the clips. Fit and tighten the fasteners.



Joining covers

When wide (600 mm or over) covers are fitted, the fitting cover may join to either end of a straight length cover

If the straight cover has an overlap tongue, push 'U'-shaped retaining nuts over the holes in the tongue. Fit the fitting cover in position overlapping the tongue. Insert fasteners through both covers and the retaining nuts and tighten the fasteners

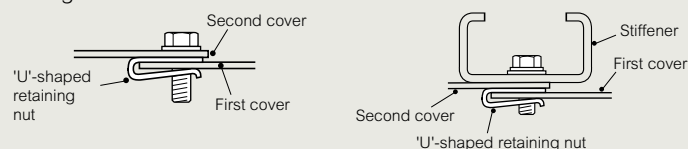
For 750 and 900 mm wide covers place the stiffener on to the top cover along the joint before inserting the fasteners

If the straight cover has not got an overlap tongue, fit four 'U'-shaped retaining nuts over the holes in a joint strip and position the strip under the butt-joint between covers. Insert fasteners through each cover and the two aligning holes in the joint strip and tighten the fasteners

For fitting a stiffener (covers 750 and 900 mm wide) refer to paragraph above

Note

It may be necessary to drill holes in the straight cover if it has been cut to length



■ Dimensions and weights – covers

For information on dimensions and weights for specific fitting covers, contact us on +44 (0) 845 605 4333

Refer to p. 96 for cover clip dimensions and weights

Key : selecting for ancillary items and covers. Replace the letters shown in **red** with your choice from the following options :

W = Widths : **150, 300, 450, 600, 750, 900**

Y = Ladder width reduction **A** = Angle (°) : **90** or **45**

F = Finish : **G** (hot dip galvanised after manufacture), **D** (deep galvanised) **S** (stainless steel), **E** (powder coated)

r = Radius (mm) : **300, 600**

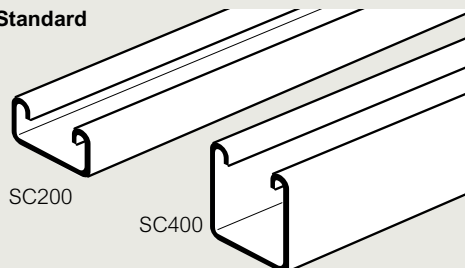
All dimensions (mm) are nominal

Swiftrack channel lengths single channels plain and slotted

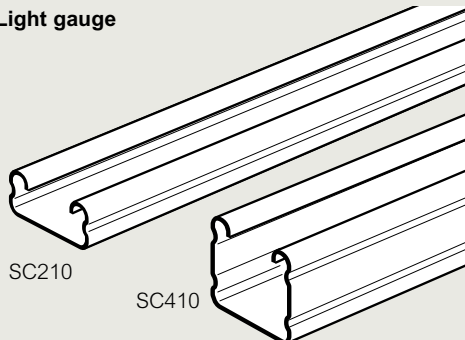
Single channels – plain

Single channels are available in standard and light gauge options in 3 and 6 m lengths, supplied singly
Standard channels are cold rolled to BS 6946 from 2.5 mm pre-galvanised mild steel to BS EN 10346 : 2009 Grade S250GD + Z275
Light gauge channels are cold rolled from 1.5 mm pre-galvanised mild steel to BS EN 10346 : 2009 Grade S250GD + Z275
All single channels are designed to accept channel nuts, see p. 101

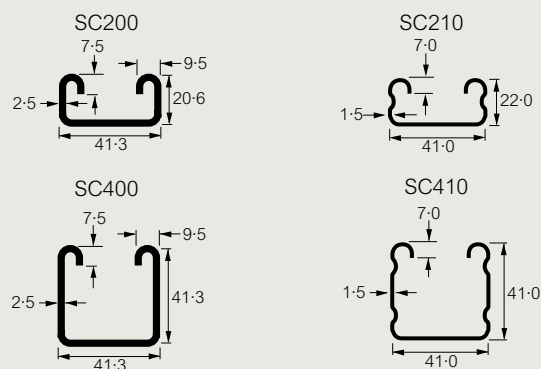
Standard



Light gauge



Dimensions and weights



	Cat. Nos.		Weight (kg) per m
	3 m long	6 m long	
Standard Channel	SC200 3M	SC200 6M	1.8
	SC400 3M	SC400 6M	2.6
Light gauge Channel	SC210 3M	SC210 6M	1.2
	SC410 3M	SC410 6M	1.7

Cat. Nos. given are for standard finish single channel
For alternative finishes, see opposite

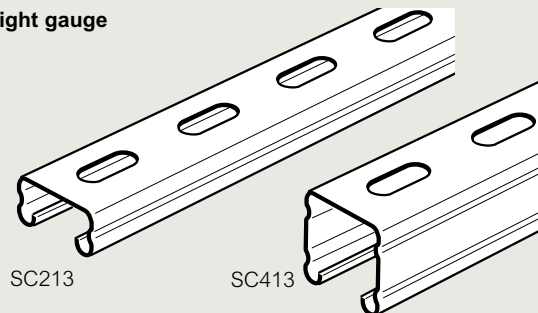
Single channels – slotted

Slotted channels are available in standard and light gauge options in 3 and 6 m lengths, supplied singly
Swiftrack channels conform to BS 6946

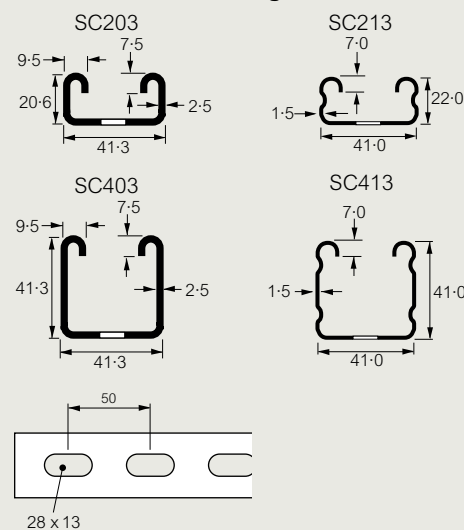
Standard



Light gauge



Dimensions and weights



Slot pattern may differ on stainless steel channels

	Cat. Nos.		Weight (kg) per m
	3 m long	6 m long	
Standard Channel	SC203 3M	SC203 6M	1.8
	SC403 3M	SC403 6M	2.6
Light gauge Channel	SC213 3M	SC213 6M	1.2
	SC413 3M	SC413 6M	1.7

Cat. Nos. given are for standard finish single channel
For alternative finishes see below

Weights

All weights given are in kilograms (kg) based on nominal thickness and are for pre-galvanised finish

For weights in alternative finishes contact us on +44 (0) 845 605 4333

Finishes and standards

Standard finish :

Pre-galvanised mild steel to BS EN 10346 : 2009 Grade S250GD + Z275 finish (structural grade)

Alternative finishes :

G Hot dip galvanised after manufacture to BS EN ISO 1461

S Stainless steel to BS EN 10088 : 2005 Grade 1.4404 (equivalent to S316L31)

All dimensions (mm) are nominal

Swiftrack channel lengths

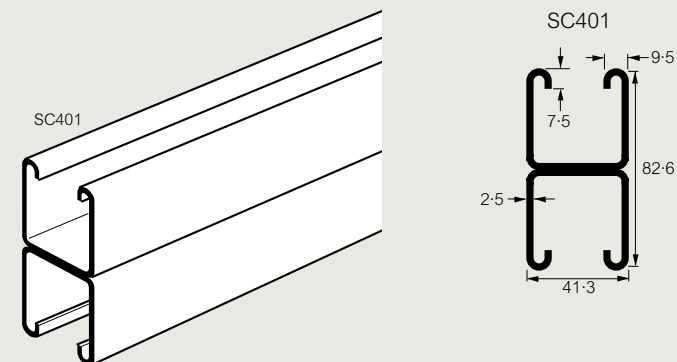
back-to-back channels and section properties

■ Back-to-back channels

Back to back channels are available in 3 and 6 m lengths, supplied singly

Back-to-back channels are formed by spot welding together two finished single channels at 150 mm centres under controlled conditions to BS EN 1993-1-3 : 2006. All welds and spot welds are suitably protected

■ Dimensions and weights



	Cat. Nos.		Weight (kg) per m
	3 m long	6 m long	
Back-to-back channel	SC401 3M	SC401 6M	5.3

Cat. Nos. given are for standard finish back-to-back channel
For alternative finishes see below

Weights

All weights given are in kilograms (kg) based on nominal thickness and are for pre-galvanised finish

For weights in alternative finishes contact us on +44 (0) 845 605 4333

■ Finishes and standards

Standard finish :

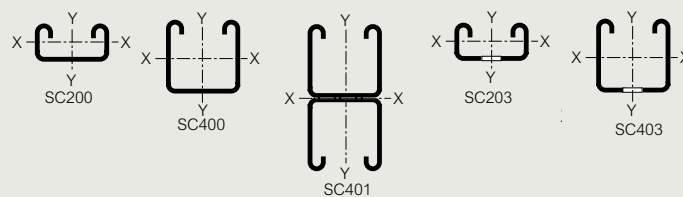
Pre-galvanised mild steel to BS EN 10346 : 2009 Grade S250GD + Z275 finish (structural grade)

Alternative finishes :

G Hot dip galvanised after manufacture to BS EN ISO 1461

S Stainless steel to BS EN 10088 : Grade 1.4404 (equivalent to S316L31)

■ Section properties



Cat. Nos.	Wt (kg/m)	A (mm ²)	I_{xx} (mm ⁴)	Z_{top} (min mm ³)	Z_{bottom} (max mm ³)	r_{xx} (mm)	I_{yy} (mm ⁴)	r_{yy} (mm)
SC200	1.8	219	10 779	862	1 330	7.1	49 776	15.1
SC203	1.6	219	8 960	794	961	6.4	49 318	15.0
SC400	2.6	322	67 157	2 857	3 772	14.5	88 783	16.6
SC401	5.3	645	339 300	8 215	8 215	23.0	177 566	16.6
SC403	2.4	322	57 221	2 645	2 909	13.3	88 325	16.5

Wt = weight of section (kg/m)

A = cross-sectional area (mm²)

I_{xx} = moment of inertia = second moment of area (mm⁴)

Z_{top} = section modulus about xx axis (mm³)

Z_{bottom} = section modulus about xx axis (mm³)

r_{xx} = radius of gyration (mm)

I_{yy} = moment of inertia = second moment of area (mm⁴)

r_{yy} = radius of gyration (mm)

xx = about xx axis

yy = about yy axis

All dimensions (mm) are nominal

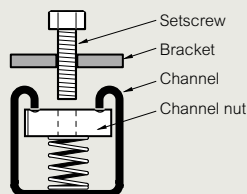
Swiftrack brackets : see p. 104-107

Swiftrack channel support system assembly

■ Assembly

Fasteners for single (plain and slotted) and back-to-back channel supplied separately

Fixing brackets to Swiftrack channel



Standard fasteners for Swiftrack are high tensile hexagon head setscrews to BS 3692-8.8, these being zinc plated to BS 3382 : Part 2. Most standard Swiftrack brackets are made from 5 or 6 mm gauge steel. The use of too long a fastener will prevent proper tightening because the bolt end will foul the bottom of the channel before the head tightens down on the fitting. When fastening brackets other than Swiftrack, longer bolts may be required if the bracket thickness is greater than 8 mm.

Fixing ladder to Swiftrack channel

Use M10 x 16 mm high tensile hexagon head setscrews

■ Channel nuts

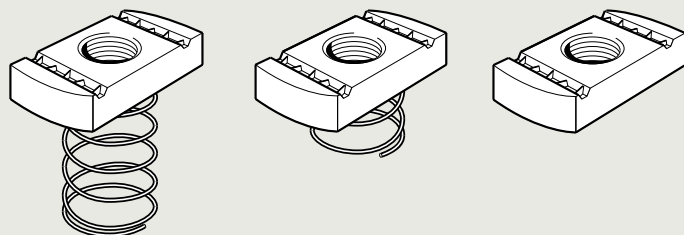
Channel nuts are for use with all channels and are supplied in packs of 100. For maximum load capacity M12 channel nuts should always be used.

Channel nuts conform to BS 6946

Long spring

Short spring

No spring

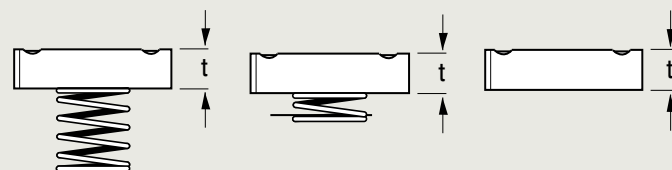


■ Dimensions and weights

Long spring

Short spring

No spring



The safe working loads for zinc plated channel nuts only

Slip M10 : 3.0kN

M12 : 3.5kN

Pullout M10 : 6.0kN

M12 : 8.0kN

Safety Factor 3 when tested to BS 6946

Torque Tightened to M10 : 5.5 kgf.m (40ftlb)

M12 : 7.0 kgf.m (50ftlb)

	Cat. Nos.	Thread size	Depth of channel	t	Weight (kg) per 100
Long spring	PN061	M6	41	6.0	3.0
	PN081	M8	41	6.0	3.0
	PN101	M10	41	8.0	3.7
	PN121	M12	41	10.0	4.5
Short spring	PN062	M6	21	6.0	2.9
	PN082	M8	21	6.0	2.9
	PN102	M10	21	8.0	3.6
	PN122	M12	21	8.0	4.4
No spring	PN060	M6	ALL	6.0	2.8
	PN080	M8	ALL	6.0	2.8
	PN100	M10	ALL	8.0	3.5
	PN120	M12	ALL	10.0	4.3

Weights

All weights given are in kilograms (kg) based on nominal thickness, and are for zinc plated finish. For weights in stainless steel finish contact us on +44 (0) 845 605 4333

Note

Cat. Nos. given are for standard finish channel nuts, for alternative finish, see below

■ Finishes and standards

Standard finish

Zinc plated to BS 3382

G Hot dip galvanised after manufacture to BS EN ISO 1461

Alternative finish

S Stainless steel to BS EN 10088 : Grade 1.4404 (equivalent to S316L31)

All dimensions (mm) are nominal

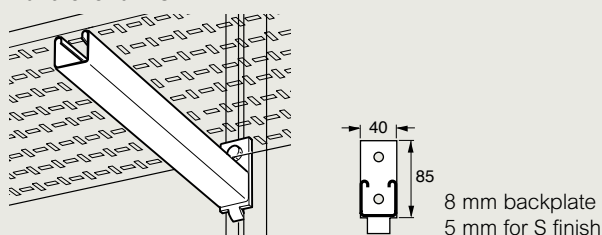
Swiftrack channel support system

cantilever arms

Cantilever arms are supplied singly without fasteners
Cantilever arms conform to BS 6946

■ Dimensions and weights

Cantilever arms



Cat. Nos.	Unit weight (kg)	Arm length (mm)	Maximum uniformly distributed load (kgf) ⁽¹⁾	Max. point load at outer end (kgf) ⁽¹⁾
SA750	0.64	150	350 ^{(2) (3)}	303
SA751	0.85	225	350 ⁽³⁾	198
SA752	1.03	300	304	152
SA753	1.42	450	202	101
SA754	1.81	600	150	75
SA755	2.20	750	110	55
SA757	2.60	900	90	45

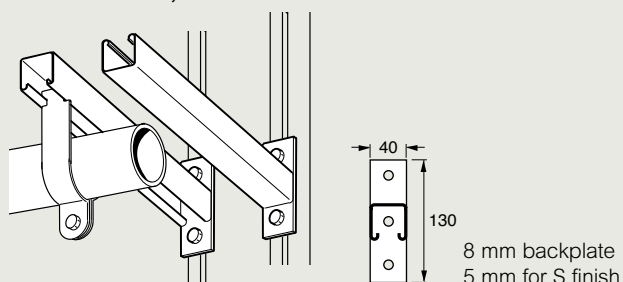
Values assume the ladder or other loading medium is rigidly fixed to cantilever arm

(1) Based upon a load factor of 1.6 for hot dipped galvanised unrestrained condition as specified in BS EN 1993-1-3 : 2006

(2) Slip limits loading capacity

(3) Load limit is 50%

Cantilever arms, universal



Cat. Nos.	Unit weight (kg)	Arm length (mm)	Maximum uniformly distributed load (kgf) ⁽¹⁾	Point load at outer end (kgf) ⁽¹⁾
SA760	0.64	150	700 ⁽²⁾	350
SA761	0.85	225	456	228
SA762	1.03	300	350	175
SA763	1.42	450	230	115
SA764	1.81	600	170	85
SA765	2.20	750	136	68
SA766	2.60	900	110	55

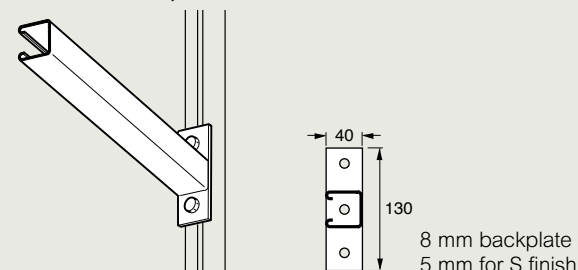
Values assume the ladder or other loading medium is rigidly fixed to cantilever arm

(1) Based upon a load factor of 1.6 for hot dipped galvanised unrestrained condition as specified in BS EN 1993-1-3 : 2006

(2) Load limit is 50%

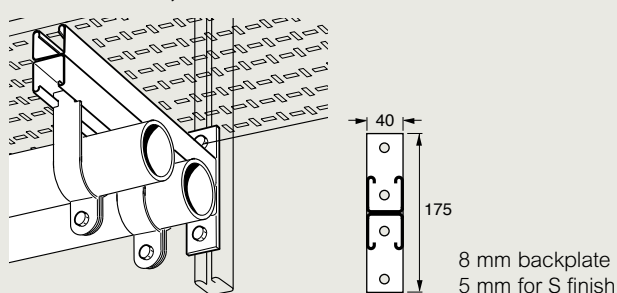
■ Dimensions and weights (continued)

Cantilever arms, side



Cat. Nos.	Unit weight (kg)	Arm length (mm)
SA790	0.64	150
SA791	0.85	225
SA792	1.03	300
SA793	1.42	450
SA794	1.81	600
SA795	2.20	750
SA796	2.60	900

Cantilever arms, double channel



Cat. Nos.	Unit weight (kg)	Arm length (mm)	Maximum uniformly distributed load (kgf) ⁽¹⁾	Point load at outer end (kgf) ⁽¹⁾
SA770	1.14	150	700 ⁽²⁾⁽³⁾	648
SA771	1.68	225	700 ⁽²⁾⁽³⁾	420
SA772	2.02	300	650	325
SA773	2.90	450	430	215
SA774	3.78	600	320	160
SA775	4.66	750	250	125
SA776	5.60	900	200	100

Values assume the ladder or other loading medium is rigidly fixed to cantilever arm

(1) Based upon a load factor of 1.6 for hot dipped galvanised unrestrained condition as specified in BS EN 1993-1-3 : 2006

(2) Slip limits loading capacity

(3) Load limit is 50%

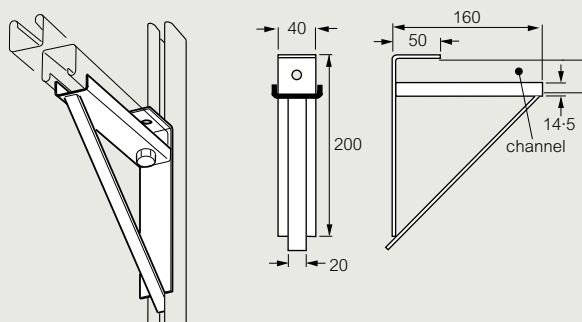
All dimensions (mm) are nominal

Swiftrack channel support system

cantilever arms continued

■ Dimensions and weights (continued)

Cantilever arm bracket SA 756



Horizontal arm section from 3 mm steel only
Weight each (kg) : 1.13

Weights

All weights given are in kilograms (kg) based on nominal thickness and standard finish

Loads

Maximum uniformly distributed loads for individual cantilever arms are given with the illustrations in this catalogue. However, should the loading not be uniform then the safe limit can be obtained by calculating the bending moment produced by the intended loads and comparing this with the maximum permissible bending moment for the relevant arm

45 kgf.m for SA750 – SA755 and SA757

52 kgf.m for SA760 – SA766

95 kgf.m for SA770 – SA776

To obtain the bending moment resulting from any point load, multiply the size of the load by its distance from the inner end of the arm (see illustration A)

If several point loads exist then the total bending moment will be the sum of the individual bending moment produced by each point load (see illustration B)

If some part of the total load applied to an arm is uniformly distributed along a section of the arm only, then this part load can be treated as a point load acting at the mid-point of that section of arm to which it is applied (see illustration C)

Illustration A

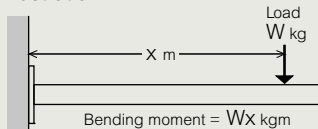


Illustration B

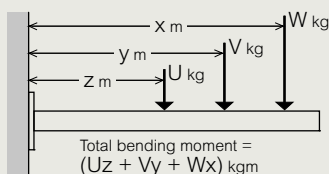
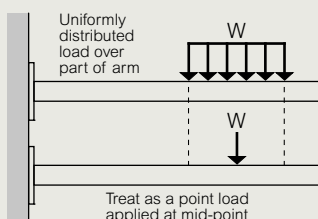


Illustration C



Values assume the ladder or other loading medium is rigidly fixed to cantilever arm

Stainless steel cantilever arms

Loads are 60% of those given in the tables, except for those marked (3), in the tables opposite, where the limit is 50%

■ Finishes and standards

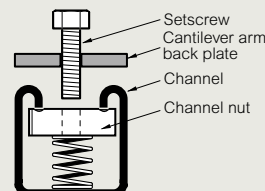
The standard finish for all cantilever arms is hot dip galvanised steel to BS EN ISO 1461

Stainless steel to BS EN 10088 : Grade 1.4404 (equivalent to S316L31) is also available as an alternative where applicable

■ Assembly

Fasteners (not included)

Cantilever arms to Swiftrack channel



Standard fasteners for Swiftrack are high tensile hexagon head setscrews to BS 3692-8.8, these being zinc plated to BS 3382: Part 2. Most standard Swiftrack brackets are made from 5 or 6 mm gauge steel. Standard cantilever arm backplates are made from 8 mm gauge steel. The use of too long a fastener will prevent proper tightening because the bolt end will foul the bottom of the channel before the head tightens down on the fitting.

When fastening brackets other than Swiftrack, longer bolts may be required if the bracket thickness is greater than 8 mm

Channel type	Backplate thickness	Recommended fasteners
Deep channel SC400 series	6-8 mm 5-6 mm	M10 or M12 x 35 M10 or M12 x 25
Shallow channel SC200 series	7-8 mm 5-6 mm	M10 or M12 x 25 M10 or M12 x 20

Swiftrack channel support system

framework brackets

All framework brackets are manufactured to BS 6946 from steel which complies with BS EN 10025 Grade S275JRC and are supplied singly. Channel nuts and setscrews are not supplied with brackets, therefore must be ordered separately

■ Dimensions and weights

Made from 5 or 6 mm thick steel unless otherwise stated
Brackets are 40 mm wide and have 14 mm diameter holes to accept M12 (or smaller) setscrews
All bend radii are 5 mm unless otherwise stated

Weights

All weights given are in kilograms (kg) based on nominal thickness and are for hot dip galvanised finish. For weights in stainless steel finish contact us on +44 (0) 845 605 4333

Loads

All loads are for hot dip galvanised brackets fixed with M12 setscrews and M12 zinc plated channel nuts. Loads for stainless steel brackets are available on request - contact us on +44 (0) 845 605 4333

Minimum Yield Stress of material is 275 N/mm²

Only M10 or M12 channel nuts and bolts should be used for the attachment of load-bearing brackets

In most cases the mode of failure will be slippage of the bracket along the channel. However there are few channel/bracket combinations where the maximum load is dependant upon the strength of the bracket itself

■ Finishes and standards

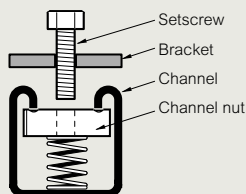
The standard finish for all framework brackets and beam clamps is hot dip galvanised steel to BS EN ISO 1461

Stainless steel to BS EN 10088 : Grade 1.4404 (equivalent to S316L31) is also available as an alternative where applicable. To order stainless steel finish add **S** to the end of the standard catalogue number
For example : SB500**S**

■ Assembly

Fasteners (not included)

Fixing brackets to Swiftrack channel



Standard fasteners for Swiftrack are high tensile hexagon head setscrews to BS 3692-8.8, these being zinc plated to BS 3382 : Part 2
The use of too long a fastener will prevent proper tightening because the bolt end will foul the bottom of the channel before the head tightens down on the fitting

When fastening brackets other than Swiftrack, longer bolts may be required if the bracket thickness is greater than 8 mm

For channel nuts, see p. 101

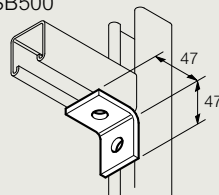
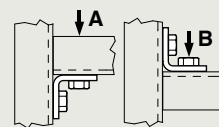
Channel type	Backplate thickness	Recommended fasteners ⁽¹⁾
Deep channel SC400 series	6 mm and 8 mm 5 mm and 6 mm	M10 or M12 x 35 mm ⁽²⁾ M10 or M12 x 20 mm
Shallow channel SC200 series	7 mm and 8 mm 5 mm and 6 mm	M10 or M12 x 25 mm ⁽²⁾ M10 or M12 x 20 mm

(1) The use of too long a fastener will prevent proper tightening because the bolt end will foul the bottom of the channel before the head tightens down on the fitting

(2) When fastener brackets other than Swiftrack, longer bolts may be required if the bracket thickness is greater than 8 mm

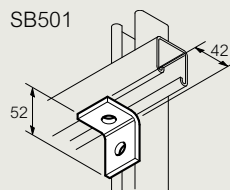
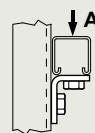
■ 90° brackets

SB500



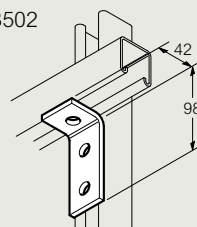
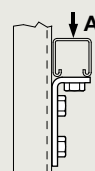
Maximum load on each bracket with both ends supported : A = 350kgf. B = 174kgf
Unit weight (kg) : 0.125

SB501



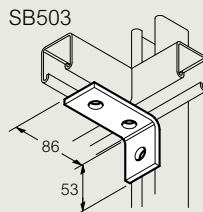
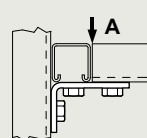
Maximum load on each bracket :
A = 180kgf
Unit weight (kg) : 0.125

SB502



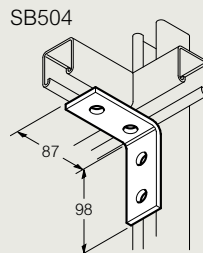
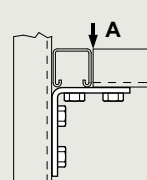
Maximum load on each bracket :
A = 230kgf
Unit weight (kg) : 0.191

SB503



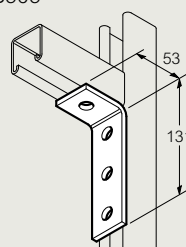
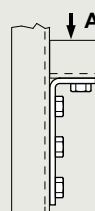
Maximum load on each bracket with both ends supported : A = 120kgf
Unit weight (kg) : 0.191

SB504



Maximum load on each bracket :
A = 120kgf
Unit weight (kg) : 0.257

SB505



Maximum load on each bracket :
A = 300kgf
Unit weight (kg) : 0.257

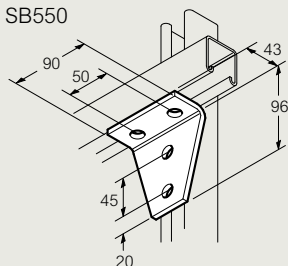
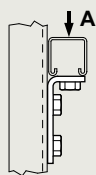
All dimensions (mm) are nominal

Swiftrack channel support system

framework brackets continued

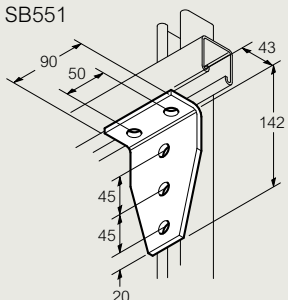
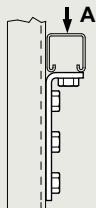
■ 90° brackets (continued)

SB550



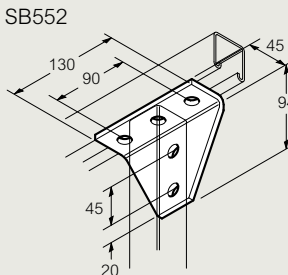
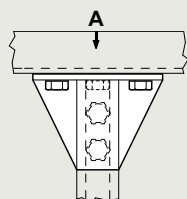
Maximum load on each bracket :
A = 600kgf
Unit weight (kg) : 0.359

SB551



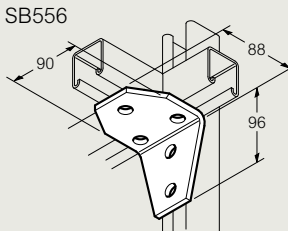
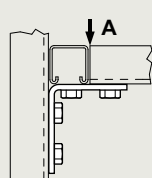
Maximum load on each bracket :
A = 600kgf
Unit weight (kg) : 0.516

SB552



Maximum load on each bracket :
A = 700kgf. 5mm thick.
Unit weight (kg) : 0.488

SB556

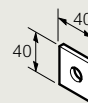


Maximum load on each bracket with
both ends supported : A = 260kgf
Unit weight (kg) : 0.478

■ Square plates and splice plates

Square plates

Cat. Nos.	Fasteners	Unit weight (kg)
SB50606	M6	0.063
SB50608	M8	0.062
SB50610	M10	0.061
SB50612	M12	0.058

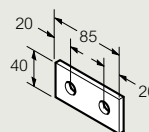


Use as location plate when attaching any special fitment which will not sit across both channel sides

Splice plates

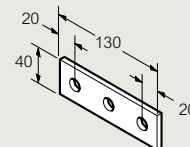
Holes spaced at 45 mm centres

SB507



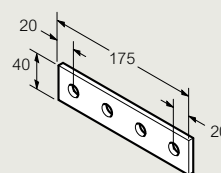
Unit weight (kg) : 0.125

SB508



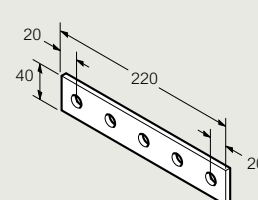
Unit weight (kg) : 0.191

SB509



Unit weight (kg) : 0.257

SB510

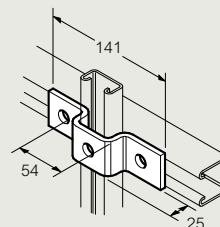


Unit weight (kg) : 0.323

■ U and Z brackets

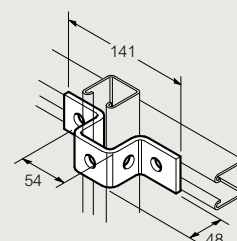
U bracket

SB514



Unit weight (kg) : 0.243

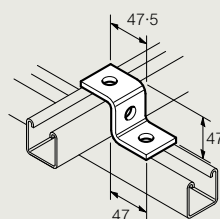
SB515



Hole on one side of bracket only
Unit weight (kg) : 0.307

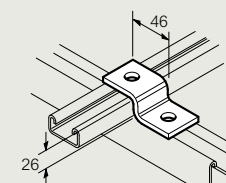
Z bracket

SB511



Unit weight (kg) : 0.179

SB513



Unit weight (kg) : 0.150

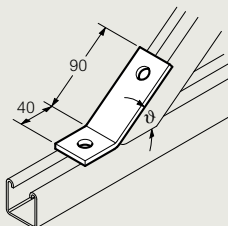
All dimensions (mm) are nominal

Swiftrack channel support system

framework brackets continued

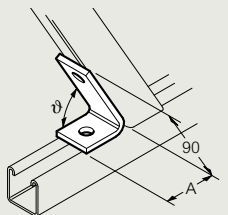
Angle brackets and plates

Obtuse angle brackets



Cat. Nos.	Angle θ	Unit weight (kg)
SB520	15	0.197
SB524	45	0.197
SB526	60	0.197
SB528	75	0.197

Acute angle brackets

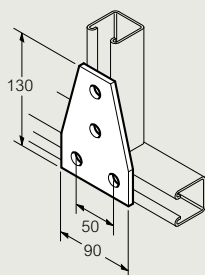


Cat. Nos.	Angle θ	A (mm)	Unit weight (kg)
SB532	45	65	0.237
SB534	60	46	0.197
SB536	75	46	0.197

T brackets and plates

T plate

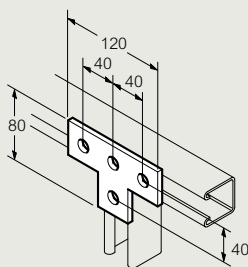
SB554



Unit weight (kg) : 0.359

T bracket

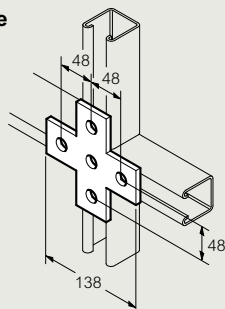
SB603



Unit weight (kg) : 0.233

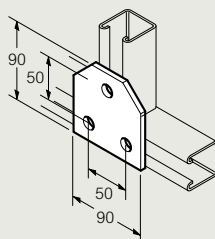
Cross plate

SB603+



Unit weight (kg) : 0.35
Not available in S finish

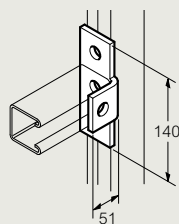
SB555



Unit weight (kg) : 0.284

90° T bracket

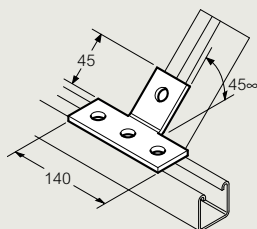
SB606



Unit weight (kg) : 0.32
Not available in S finish

45° T bracket

SB607

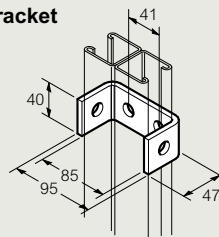


Unit weight (kg) : 0.32
Not available in S finish

Joining brackets and channels

Joining bracket

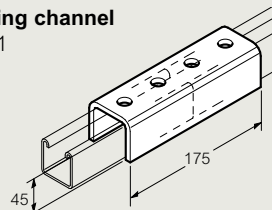
SB518



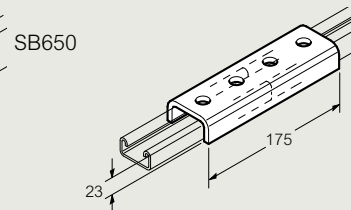
Unit weight (kg) : 0.249

Joining channel

SB651



For SC400 channel. 45 mm deep
Unit weight (kg) : 0.85

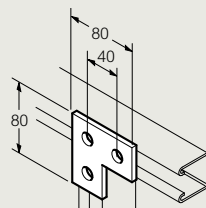


For SC200 channel. 23 mm deep
Unit weight (kg) : 0.55

L brackets

L bracket

SB600

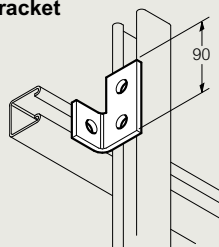


Unit weight (kg) : 0.163

Left hand

L corner bracket

SB602

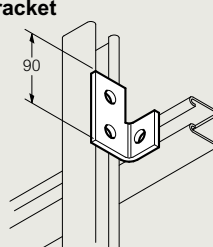


Unit weight (kg) : 0.27
Not available in S finish

Right hand

L corner bracket

SB601



Unit weight (kg) : 0.27
Not available in S finish

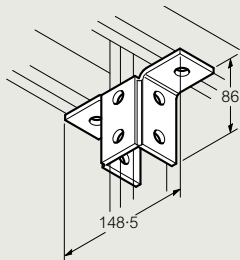
All dimensions (mm) are nominal

Swiftrack channel support system

framework brackets continued and beam clamps

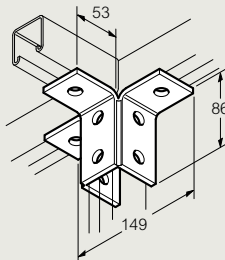
Wing brackets and shelf brackets

2 lug wing bracket
SB700



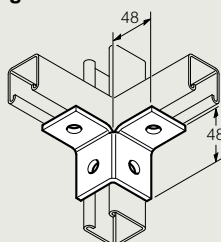
Unit weight (kg) : 0.492

3 lug wing bracket
SB701



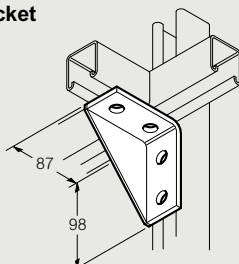
Unit weight (kg) : 0.581

Angled wing bracket
SB707



Unit weight (kg) : 0.250
Not available in S finish

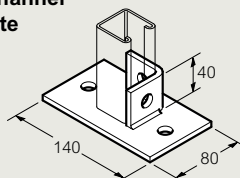
Shelf bracket
SB703



Gusset only, 3 mm thick
Unit weight (kg) : 0.369

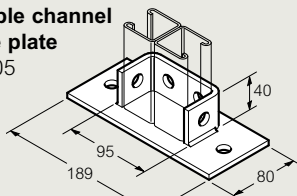
Base plates and gusseted brackets

Single channel base plate
SB704



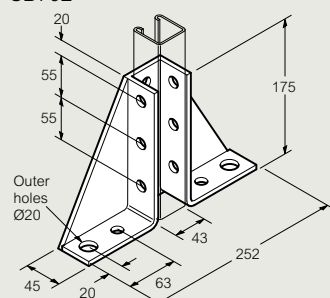
Distance between hole centres :
100 mm
Unit weight (kg) : 0.618

Double channel base plate
SB705



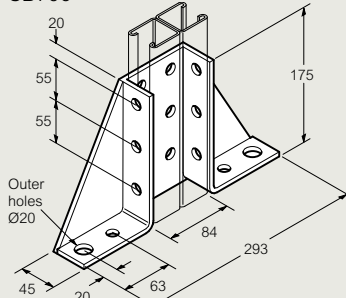
Distance between hole centres :
149 mm
Unit weight (kg) : 0.848

Single channel gusseted bracket
SB702



Unit weight (kg) : 1.848

Double channel gusseted bracket
SB706



Unit weight (kg) : 2.118

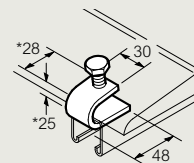
Beam clamps

Beam clamps are supplied singly
Nut, bolts, cone point screws and U bolts where shown are included
Beam clamps conform to BS 6946

Dimensions and weights

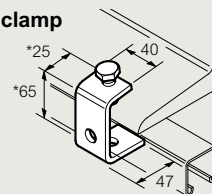
All weights given are in kilograms (kg) based on nominal thickness and are for hot dip galvanised finish unless otherwise stated. For weights in stainless steel finish contact us on +44 (0) 845 605 4333

Beam clamp
SC850



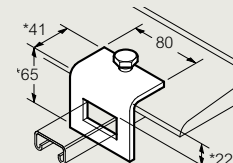
6 mm
Maximum load : 400kgf/pair
Use in pairs
Not available in S finish
Unit weight (kg) : 0.117

Beam clamp
SC851



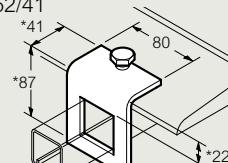
6 mm
Maximum load : 200kgf
Unit weight (kg) : 0.208

Window beam clamp
SC852/21



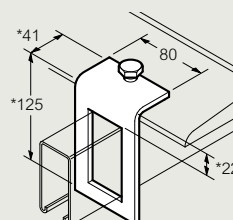
6 mm
For 21 mm channel
Maximum load : 475kgf/pair
Use in pairs
Unit weight (kg) : 0.37

Window beam clamp
SC852/41



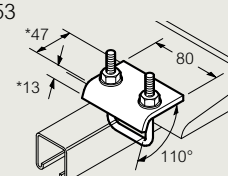
6 mm
For 41 mm channel and
21 mm back-to-back channels
Maximum load : 475kgf/pair
Use in pairs
Unit weight (kg) : 0.52

Window beam clamp
SC852/82



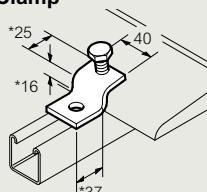
6 mm
For 41 mm
back-to-back channels.
Maximum load : 375kgf/pair
Use in pairs
Not available in S finish
Unit weight (kg) : 0.56

Beam clamp
SC853



Maximum load : 900kgf/pair
Use in pairs
Unit weight (kg) : 0.30

Beam Clamp
SC854



6 mm
Maximum load : 350kgf/pair
Use in pairs
Unit weight (kg) : 0.17

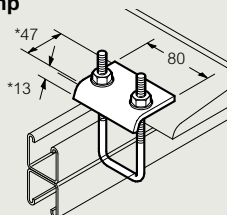
(*) Inside dimensions (mm)

Swiftrack channel support system

beam clamps pipe clamps and channel accessories

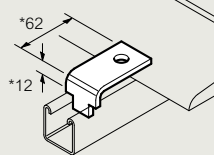
■ Beam clamps (continued)

Beam clamp SC855



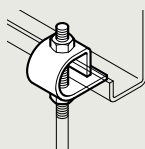
Maximum load : 900kgf/pair
Use in pairs
Unit weight (kg) : 0.308

Toe beam clamp SC856



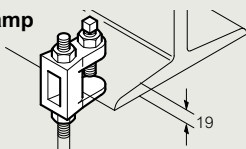
6 mm
Maximum load : 400kgf/pair
Use in pairs
Requires 2 setscrews and channel nuts for fixing (not included)
Unit weight (kg) : 0.179

Beam Clamp ZC1



Maximum load : 25kg
Use M10 Rod
Zinc plated to BS 3382: Part 2
Unit weight (kg) : 0.10

Beam Clamp FL2



Maximum load : 240kg
Use M10 Rod
Zinc plated to BS 3382: Part 2
Not available in S finish
Unit weight (kg) : 0.15

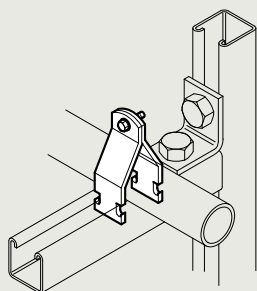
■ Pipe clamps

Supplied singly
Nuts and bolts where shown are included
Pipe clamps conform to BS 6946

Dimensions and weights

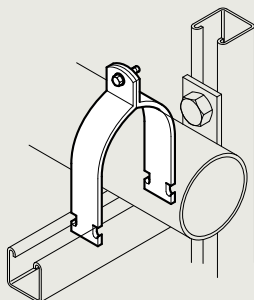
All weights given are in kilograms (kg) based on nominal thickness and are for hot dip galvanised finish unless otherwise stated. For weights in stainless steel finish contact us on +44 (0) 845 605 4333

SP960 - SP973



Cat. Nos.	Pipe diameter (mm)	Unit weight (kg)
SP960	10-14	0.06
SP964	17-22	0.08
SP965	22-26	0.09
SP968	25-36	0.10
SP969	32-42	0.11
SP972	42-59	0.13
SP973	54-65	0.15

SP975 - SP976



Cat. Nos.	Pipe diameter (mm)	Unit weight (kg)
SP975	62-71	0.16
SP976	73-83	0.17

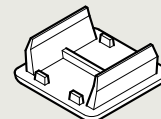
■ Channel accessories

Channel accessories conform to BS 6946

Dimensions and weights

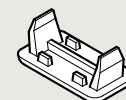
All weights given are in kilograms (kg) based on nominal thickness and are for hot dip galvanised finish unless otherwise stated. For weights in stainless steel finish contact us on +44 (0) 845 605 4333

Channel end caps	
Cat. Nos.	Finish
SC950B	black
SC950W	white



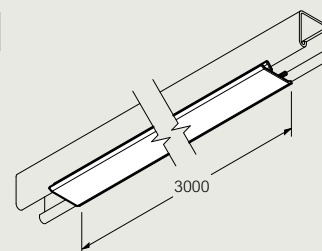
For SC400, SC401 and SC403 channels
Supplied in packs of 100
Weight per 100 (kg): 0.9

Channel end caps	
Cat. Nos.	Finish
SC951B	black
SC951W	white



For SC200, SC201 and SC203 channels
Supplied in packs of 100
Weight per 100 (kg) : 0.9

Closure strips	
Cat. Nos.	Finish
SC952	plastic
SC953	metal



Standard length 3 metres
Unit weight (kg) : SC952 : 0.4
SC953 : 1.0

■ Finishes and standards

The standard finish for pipe clamps is pre-galvanised steel to BS EN 10327 – grade DX51D and Z275 finish
Stainless steel to BS EN 10088 : Grade 1.4404 (equivalent to S316L31) is also available as an alternative

All dimensions (mm) are nominal

Ceiling support system

heavy duty

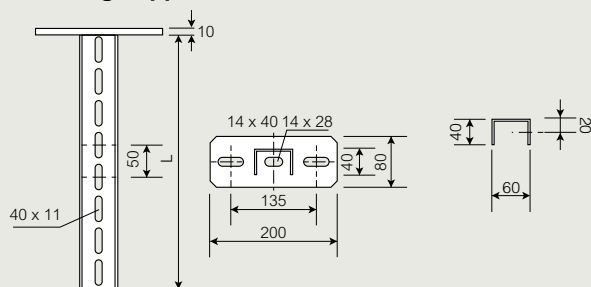
The dedicated ceiling support system allows for a flexible, multi-tiered approach for single or double sided loads with a maximum cantilever arm width of 700 mm to accept Swifts cable ladders up to 600 mm wide, either lidded or unlidded

Ceiling fixings are not included

Cantilever arms will accept the following maximum width items :

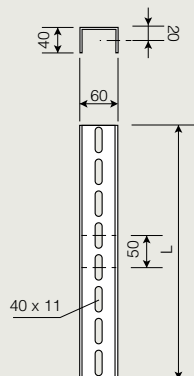
Cat. Nos.	Width (mm)	
557233	200	150 mm unlidded ladder
557243	300	150 mm lidded or unlidded ladder
557253	400	300 mm lidded or unlidded ladder
557263	500	450 mm unlidded ladder
557273	600	450 mm lidded ladder
557383	700	600 mm lidded or unlidded ladder

Ceiling supports



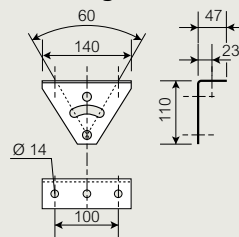
Ceiling supports		
Cat. Nos.	Weight (kg)	Load (kn)
8766502	1.318	6
8766503	1.630	6
8766504	1.942	6
8766505	2.254	6
8766506	2.566	6
8766507	2.878	6
8766508	3.190	6
8766509	3.502	6
8766510	3.814	6
8766511	4.126	6
8766512	4.438	6
8766513	4.750	6
8766514	5.062	6
8766515	5.374	6
8766516	5.686	6
8766518	6.310	6
8766520	6.934	6

Extension profiles



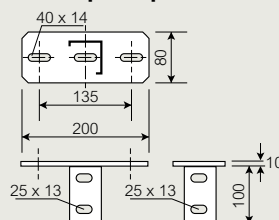
Extension profiles	
Cat. Nos.	Weight (kg)
8766530	9.600
8766545	14.400

Ceiling bracket



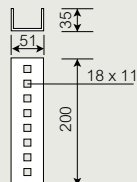
Ceiling bracket	
Cat. No.	Weight (kg)
8766550	0.500

End plate profile



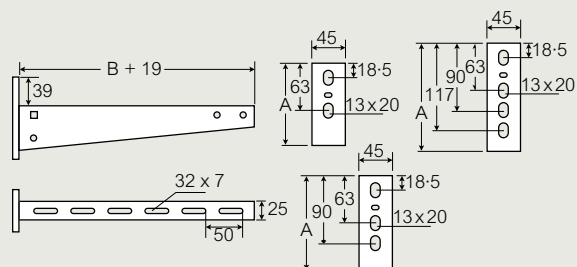
End plate profile	
Cat. No.	Weight (kg)
8766560	0.970

Profile connector



Profile connector	
Cat. No.	Weight (kg)
8766570	0.418

Cantilever arms



100 – 400 back plate = 4 mm
500 – 700 back plate = 6 mm

Cantilever arms				
Cat. Nos.	Weight (kg)	Load (kn)	A (mm)	B (mm)
557233	0.335	3	103	200
557243	0.464	3	111	300
557253	0.637	3	121	400
557263	0.782	3	128	500
557273	1.110	3	138	600
557383	1.438	3	146	700

Finish

G S235J hot dip galvanised steel to BS EN ISO 1461

For further technical information,
please contact us on +44 (0) 845 605 4333

All dimensions (mm) are nominal

DESIGN NOTES



IN THIS SECTION

Selecting the right finish

Preventing corrosion	
- Chemical corrosion	112
- Electrochemical corrosion	112
- Galvanic Series	113
- The merits of Zinc	114-115
- Common corrosion situations	116
Suitability of finishes	
- Metallic finishes	116-117
- Organic finishes	116-117

Finishes

British standards	118
Hot dip galvanised (G)	119
Deep galvanised (D)	119
Pre-galvanised (PG)	120
Stainless steel (S)	120
Powder coated (E)	121

Installation of services

Cable ladder systems	
- Design factors to consider	122-128
- Recommended support locations	125-126
- 6 m lengths over long spans	128-129
- Loading graphs	130-131

Structural support characteristics

Structural characteristics	
- Cable ladder	132
- Beams	132-133
- Columns	133
- Definition	133
Designing a support system	
- Ceiling to floor applications	134
- Ceiling mounted applications	135
- Wall mounted applications	135
- Floor mounted applications	135
Swiftrack channel support	
- Channels	136
- Channel nuts	136
- Framework brackets	136
- Fasteners	136
- Cantilever arms	137
- Maximum safety recommended loadings	137
- Channels used as beams	138
- Channels used as columns	138
- Fully restrained and unrestrained loads	138
- Beam loads	139

Packaging handling storage and safety

Export packaging	140
Handling and storage	141
Safety during installation phase	141

Relevant British European and International Standards

142-143

Selecting the right finish

IN THIS SECTION...

Preventing corrosion

- . Chemical corrosion
- . Electrochemical corrosion
- . Galvanic Series
- . The merits of Zinc
- . Common corrosion situations

Suitability of finishes

- . Metallic finishes
- . Organic finishes

Preventing corrosion

In planning any cabling or support installation the choice of an appropriate corrosion resistant finish is always a key issue at the specification stage ranking alongside installation time and load carrying ability. However unlike these other factors which are only of importance during the installation phase the correct choice of finish has long term implications and is crucial for ensuring the longevity (and aesthetics) of the complete installation in order to meet with the client's expectations.

Since future maintenance of any support system is virtually impossible it is vital that the finish specified for the equipment is capable of providing lifetime protection from corrosion within the intended environment - ideally with some margin of safety.

The following pages give information on how corrosion occurs and supporting technical data on the standard construction materials and surface finishes available within each range of products supplied by Legrand. Contact our technical team on 44 (0) 845 605 4333 for further information.

Corrosion occurs on all metals to some extent. With some such as stainless steel its effects are usually only slight but even then the presence of certain chemicals or physical contact with other metals may cause rapid corrosion. It is therefore important to consider every aspect of the environment surrounding any intended installation in order to choose a material or finish which will minimise the risk of damage to the support system through the effects of corrosion.



Chemical corrosion

Few metals will suffer corrosion damage in a dry unpolluted atmosphere at a normal ambient temperature. Unfortunately such environments are exceptional and atmospheric pollutants are likely to be present to some degree in most situations where support systems will be installed. Thus mild chemical corrosion is normal in almost all situations and useful information on the types of material or choices of finish which will inhibit and control this are given within the following pages.

Any support installation which will be situated in an area where higher concentrations of chemicals exist must receive more detailed consideration in order to select a finish which provides the best combination of initial cost and expected life. To assist in this tables on page 117 give guidance on the suitability of the standard materials and finishes used for support systems in the presence of those chemicals most commonly found within industry. More detailed information is available upon request please contact us on 44 (0) 845 605 4333.

Electrochemical corrosion

When two dissimilar metals are in contact and become damp it is possible for corrosion to be induced in one of the metals. Such corrosion may progress rapidly and cause considerable damage so it is important to consider and if necessary take steps to eliminate this process occurring.

Electrochemical (or electrolytic) corrosion takes place because the two different metals each behave as electrodes and the moisture as the electrolyte in a simple battery - as with any battery the resulting flow of current will cause corrosion of the anode. The likely effects of this reaction can be predicted using the Galvanic Series.

Galvanic Series

Even when two dissimilar metals are in moist contact electrochemical corrosion need not necessarily take place. Its likelihood depends upon the potential difference between the two metals this can be obtained by taking their respective values from the chart below and subtracting one from the other.

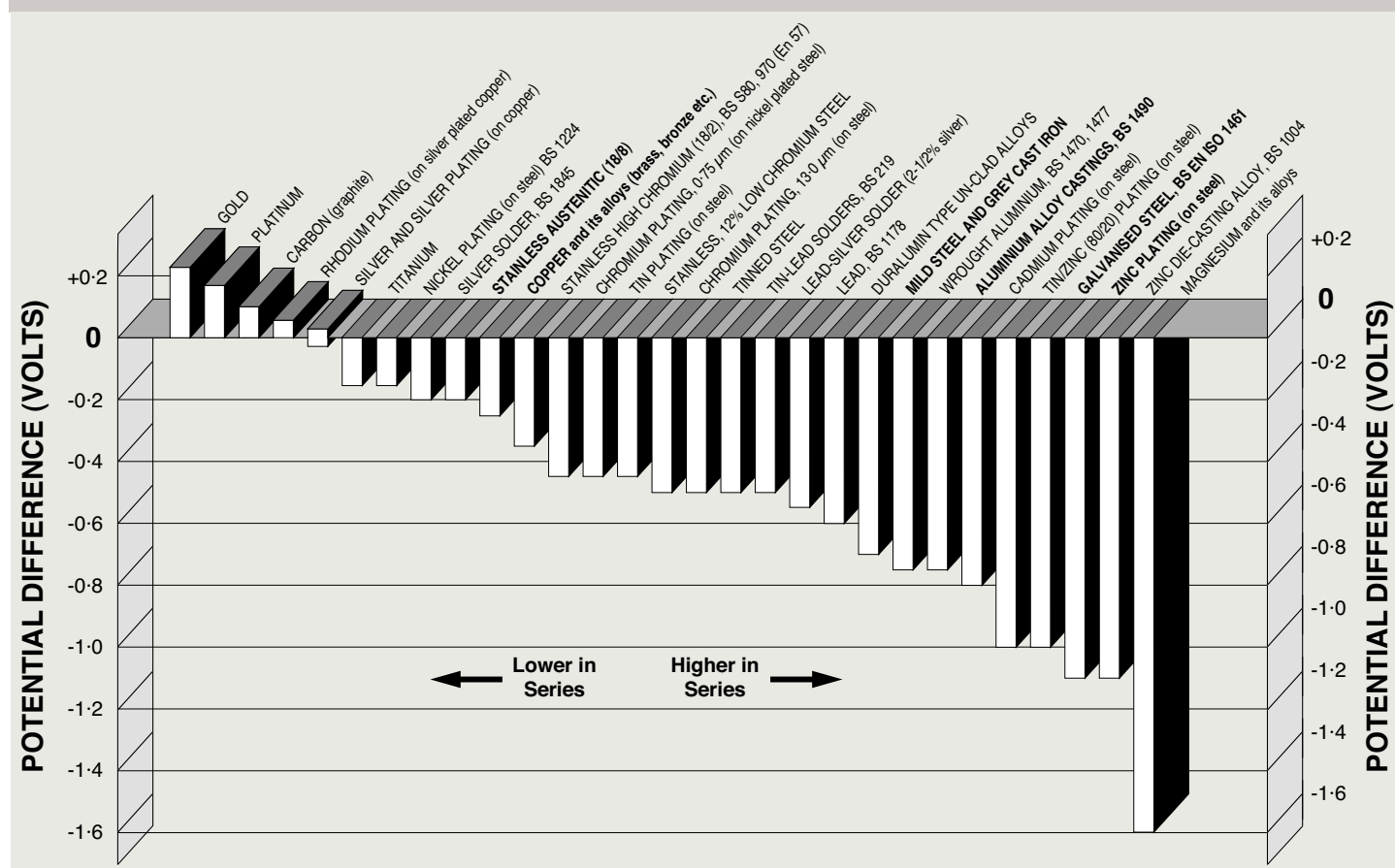
When the potential difference is less than the values given in the table to the right corrosion is unlikely to occur.

Environment	Maximum Potential Difference
Marine and outdoor	0.3 volts
Indoor	0.5 volts
Indoor hermetically sealed (dry)	No restriction ⁽¹⁾

(1) With no moisture to act as the electrolyte no electrochemical corrosion can take place

If corrosion does take place the metal which is higher in the Series (to the right) will be corroded in preference to that which is lower in the Series (to the left).

Galvanic Series chart



The Galvanic Series illustrates the potential difference between a section of metal and a Calomel electrode when both are immersed in sea water at 25 °C. This chart contains most commonly used engineering or plating metals.

If corrosion does take place the metal which is higher in the series (to the right) will be corroded in preference to that which is lower in the series (to the left).

If the affected metal has a small surface area in relation to its counterpart it will be corroded very aggressively and any sacrificial protection it provides may be short-lived. If on the other hand it has a large surface area in comparison to its less reactive counterpart some minor corrosion may take place at points of contact but the process is likely to reach equilibrium rapidly so that any further reaction is insignificant.

If from consideration of this Series excessive corrosion does appear likely then the risk can be largely eliminated by insulating the dissimilar metals from one another breaking the electrical path between them. A layer of paint on either surface is usually sufficient to achieve this.

The merits of Zinc

The Galvanic Series does show why zinc is such a useful corrosion resistant coating for mild steel.

Firstly it forms an impervious zinc barrier around the steel coating it with a metal whose own rate of chemical corrosion is both low and predictable in most situations.

Secondly if the coating is damaged at any point (e.g. at a cut edge) the zinc surrounding the damaged area becomes the anode of the electrolytic cell and is sacrificially corroded away very slowly in preference to the underlying steel. This ensures the strength of the steel structure remains unaffected.

Because zinc appears near the top of the Galvanic Series it will act as a sacrificial anode in relation to most other metals thus its relatively low cost and the ease with which it can be applied as a galvanised coating on steel means that it continues to be the most commonly specified protective finish for support systems.

Life expectancy of zinc coatings

The resistance of galvanising to atmospheric corrosion depends on a protective film which forms on the surface of the zinc. When the steel is withdrawn from the galvanising bath the zinc has a clean bright shiny surface. Over time the appearance will change to a dull grey patina as the surface reacts with oxygen water and carbon dioxide in the atmosphere. A complex but tough stable and protective layer is formed which adheres to the zinc. Contaminants in the atmosphere affect the nature of this protective film.

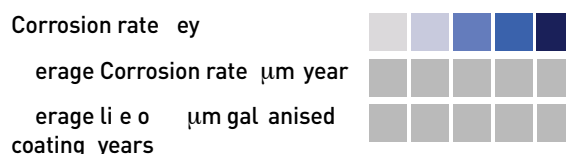
The most significant contaminant which will accelerate the corrosion rate of zinc is sulphur dioxide (SO₂) and it is the presence of SO₂ which largely controls the atmospheric corrosion of zinc.

The Galvanizers Association has undertaken significant research based upon the positioning of reference canisters placed throughout the UK and the Republic of Ireland to establish background corrosion rates for 10 km square grids which has resulted in the formation of The Zinc Millennium Map.

For most sites on this map an average hot dip galvanised coating will last between 40 to 100 years highlighting the potential for significant financial savings when galvanising is specified. However with the correct use of the map specific locations can be analysed for average zinc corrosion rates per year.

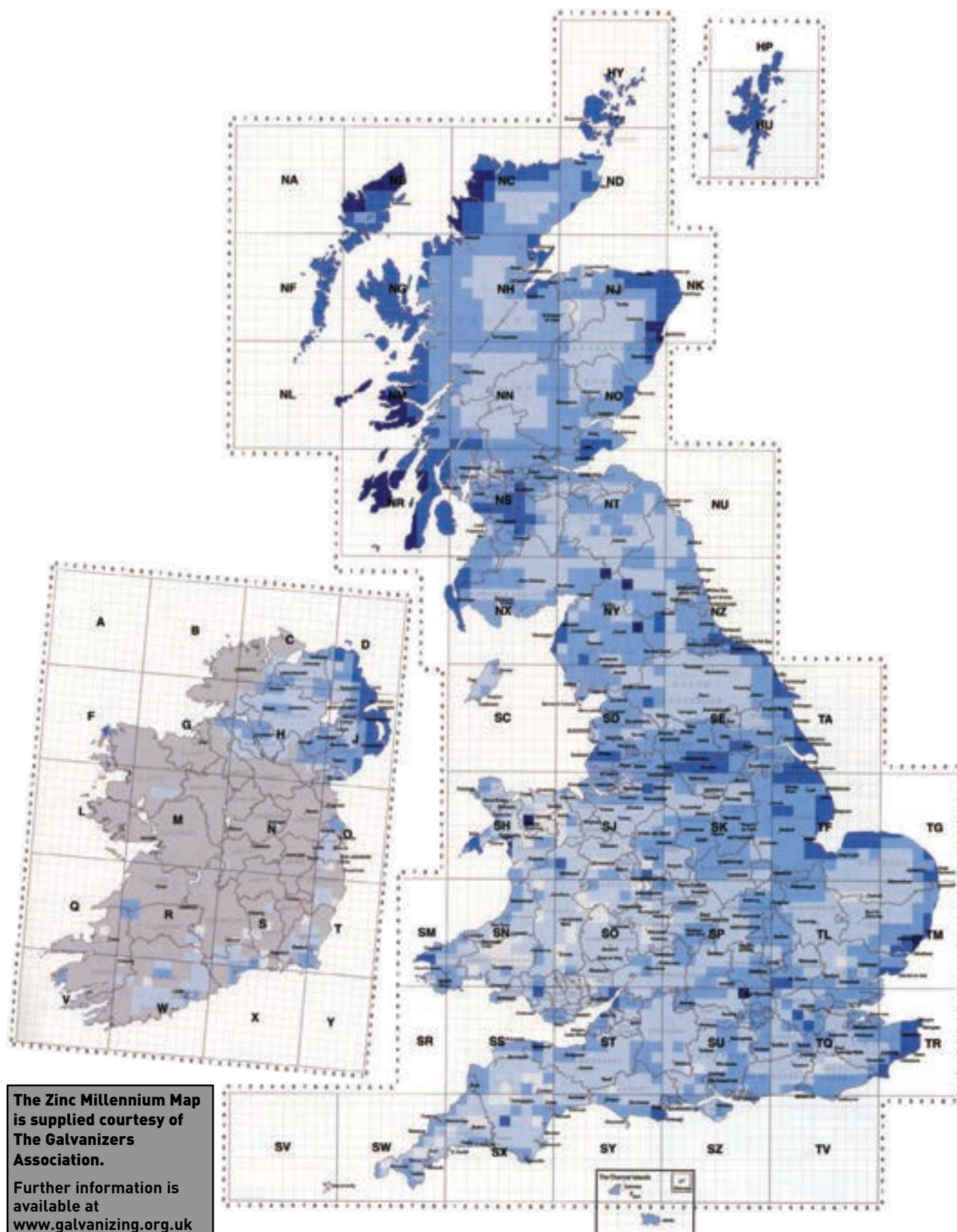
The Zinc Millennium Map

The definitive geographical guide to the different corrosion levels of galvanised steel products used in the construction industry



Please note this is an average background corrosion rate for zinc. For further information please contact the Galvanizers Association.

BS EN ISO general corrosion effects and life expectancy for zinc coated products																
Corrosivity category	Corrosion rate of	Environment - interior	Environment - exterior	Pollution level	Zinc coating thickness	Coating life years										
						10	20	30	40	50	60	70	80	90	100	
C1	< 0.1 Very low	Warm, dry, no pollution		0	PG (Z275) = 19 microns											> 100
					G = 55 microns											> 100
					D = 110 microns											> 100
C2	0.1 to 0.7 Low	Unheated, low condensation, low pollution	Temperate, rural, urban with low pollution	<5	PG (Z275) = 19 microns	<div></div>										> 100
					G = 55 microns											> 100
					D = 110 microns											> 100
C3	0.7 to 2 Medium	Moderate condensation & pollution eg food processing plants	Temperate, urban with medium pollution, mild coastal	5 to 30	PG (Z275) = 19 microns	<div></div>										> 100
					G = 55 microns											
					D = 110 microns											
C4	2 to 4 High	High condensation, high pollution eg chemical or industrial plants,	Temperate, urban with high pollution, industrial, coastal	30 to 90	PG (Z275) = 19 microns	<div></div>										
					G = 55 microns											
					D = 110 microns											
C5	4 to 8 Very high	Very high condensation & industrial pollution, eg mines	Temperate, very high pollution, industrial & high salinity coastal	90 to 250	PG (Z275) = 19 microns	<div></div>										
					G = 55 microns											
					D = 110 microns											
CX	8 to 25 Extreme	Permanent condensation & high pollution	Very high pollution, extreme industrial, coastal & offshore with occasional salt	>250	PG (Z275) = 19 microns	<div></div>										
					G = 55 microns											
					D = 110 microns											



Common corrosion situations

Finally the most common occurrences of contact between dissimilar metals within support systems are :

- a. here stainless steel components are being fixed to a carbon steel structure
 - b. here galvanised or zinc plated components are being fixed onto a stainless steel support system
 - c. here copper components (e.g. copper tubing or MICC cable) are being installed onto a galvanised steel support system
- In relation to these three sets of conditions the following comments apply :

i Stainless steel mild steel

This situation has been the subject of much consideration and debate over recent years particularly in the offshore energy industry.

Whilst Legrand can supply kits of components (including according to the circumstances insulating pads sleeves for fasteners or insulating coatings) the latest metallurgical advice from both the manufacturers of stainless steel and other bodies is that these metals are sufficiently close together in the Galvanic Series for any electrolytic effects to be ignored in normal offshore environments. One exception is when a small mild steel (or galvanised mild steel) component is in direct contact with a large mass of stainless steel.

It is now accepted that the application of a simple paint coating to one of the juxtaposed surfaces will provide sufficient insulation to break the electrical circuit effectively eliminating any problems.

ii Small galvanised components on stainless steel

The zinc coating will provide very limited protection to its underlying steel because of the rapidity with which it will erode away. Once exposed the base steel (often a fastener) will be aggressively corroded causing unsightly staining of the stainless steel and premature failure to the component. In the case of fasteners such failure could be catastrophic to the installation so appropriate stainless steel fasteners should always be used with a stainless steel support system.

iii Copper on zinc

If copper is laid directly onto a galvanised surface the zinc will rapidly erode. Thus MICC cable should always have an insulating sheath if it is to be installed on galvanised cable ladder.

Suitability of finishes

Metallic finishes

The table on the following page outlines the suitability of metallic finishes under a variety of conditions. The following notes apply to the data :

1. Hard water promotes the formation of a stable protective film on a hot dip galvanised coating.
2. Salt spray testing should not be used on galvanised coatings the data provided by such accelerated weathering tests is misleading and inaccurate on this finish since the formation of the protective film (patina) is prevented from forming under the artificial conditions.
3. No information is available on the resistance of galvanised coatings to contact with this type of oil. However in general terms galvanised coatings are resistant to oil-based products.
4. Resistant provided that the oil is stable free from acidity and of mineral origin.
5. Under immersed conditions contact with this chemical is not recommended and over-coating with a paint or powder system is necessary. When this chemical is an airborne aerosol the coating performance depends on various factors specific to the particular application. Corrosion rates will be high and if condensation is likely to be heavy and its pH value is outside the range pH5 - pH12.5 then overpainting or coating of the galvanising is normally recommended.

If the galvanised surface is frequently washed by fresh water and allowed to periodically dry out then the level of corrosion will be less severe.

Organic finishes

Refer to the table on the following page for information on the suitability of organic finishes under a variety of conditions.

Suitability of metallic finishes

		Stainless steel		Stainless steel		Pre gal anised steel		Hot dip gal anised steel		Deep gal anised steel		Aluminium		
ENVIRONMENTS	Fresh water	✓		✓		×		✓	see note	✓	see note			
	Salt spray test	✓		✓		×		✓	see note	✓	see note	✓		
	Polluted marine environment	✓		×		×		✓		✓		O		
SOLVENTS	Acetone	✓		✓				✓		✓		✓		
	Petroleum gasoline	✓		✓				✓		✓		✓		
	Trichloroethylene	✓		✓				✓		✓				
	Glycerine	✓		✓				✓		✓				
	Ethyl chloride	✓		✓				✓		✓		O		
OILS	Linseed oil	✓		✓		O	see note	O	see note	O	see note			
	Penetrating oil	✓		✓		O	see note	O	see note	O	see note			
	Lubricating oil	✓		✓		O	see note	O	see note	O	see note			
ACIDS	Sulphuric acid	×		×		O	see note	O	see note	O	see note	×		
	Conc Sulphuric acid	✓	×	at high temp	✓	×	at high temp	O	see note	O	see note	✓	×	above 60°C
	Hydrochloric acid	×		×		O	see note	O	see note	O	see note	×		
	Nitric acid	✓		✓		O	see note	O	see note	O	see note	✓		
	Phosphoric acid	✓		×		O	see note	O	see note	O	see note	×		
	Acetic acid	✓		✓		O	see note	O	see note	O	see note			
	Tartaric acid	✓		O		O	see note	O	see note	O	see note	×		
	Citric acid	✓		✓	×	at high temp	O	see note	O	see note	O	see note	×	
	Ascorbic acid	✓		×		O	see note	O	see note	O	see note			
ALKALINES	Caustic soda sodium hydroxide	✓		×		O	see note	O	see note	O	see note			
	Caustic soda	✓		×		O	see note	O	see note	O	see note	×		
	Ammonia	O		O		O	see note	O	see note	O	see note			

✓ probably suitable • × probably unsuitable • O not investigated • no alternative

For notes to see left hand page

Suitability of organic finishes

		polyester		polyester epoxy coating		C coating		polyester		vinylester		C	
ENVIRONMENTS	fresh water	✓		✓		✓		✓		✓		✓	
	Salt spray test	✓		✓	hours	✓	hours	O		O		✓	
	polluted marine environment	✗		✗		✗		✗		✓		✗	
SOLVENTS	acetone	✗		✓		✗		✗		✗		✗	
	petroleum gasoline	✓		✓		✓	✗ above C	✓	✗ above C	✓		✓	✗ above C
	trichloroethylene	✗		✓		✗		✗		✗		✗	
	glycerine	✓		✓		✓	✗ above C	✓		✓		✓	✗ above C
	ethyl chloride	✗		✓		✗		✗		✗		✗	
OILS	linseed oil	✓		✓		✓	✗ above C	✓		✓		✓	✗ above C
	penetrating oil	✓		✓		✓	✗ above C	✓		✓		✓	✗ above C
	lubricating oil	✓		✓				✓	✗ above C	✓			
ACIDS	Sulphuric acid	✓		✓		✓	✗ above C	✓		✓		✓	✗ above C
	Conc. Sulphuric acid	✗		✗		✗		✗		✓		✗	
	hydrochloric acid	✓		✓		✓	✗ above C	✓	✗ above C	✓		✓	✗ above C
	nitric acid	✗		✓	✗ above C	✓	✗ above C	✗		✓	✗ above C		
	phosphoric acid	✓		✓		✓	✗ at high temp	✓		✓		✓	✗ above C
	acetic acid	✓		✓		✗		✓		✓			
	tartaric acid	✓		✓		✓	✗ above C	✓		✓		✗	
	Citric acid	✓		✓		✓		✓		✓		✓	✗ above C
	ascorbic acid	✓		✓		✓		✓	✗ above C	✓		✓	✗ above C
ALKALINES	Caustic soda sodium hydroxide	✓		✓		✓		✗		✓		✓	✗ above C
	Caustic soda	✓		✓		✓	✗ above C	✗		✗			
	ammonia	✓		✓		✓		✗		✓	✗ above C	✓	✗ above C

✓ probably suitable • × probably unsuitable • O not investigated • no alternative

Finishes

IN THIS SECTION...

1. British standards
2. Hot dip galvanised (G)
3. Deep galvanised (D)
4. Pre-galvanised (PG)
5. Stainless steel (S)
6. Powder coated (E)

Available on cable ladder and Swiftrack support systems

1 British standards

Legrand ensures that all of the materials used during the construction and finishing of their products conform to the relevant standards, a full list of which is provided on see p. 142. In particular, the relevant standards for steel are :

Finish	Product	Current standard/grade
G	Ladder less than 1.5mm thick	BS EN 10130 : 2006 Grade DC01
G	Ladder 1.5mm and thicker	BS EN 10111 : 1998 Grade 1.0332 / BS EN 10025 : 2004 Grade S275JRC
G	Swiftrack channel	BS EN 10025 : 1993 Grade S235JRC ($Y_s = 250\text{N/mm}^2$ min)
G	Swiftrack brackets	BS EN 10025 : 2004 Grade S275JRC
PG	Swiftrack channel	BS EN 10346 : 2009 Grade S250GD + Z275
D	Ladder	High silicon steel to BS EN 10025-5 : 2004 Grade S355JOWP / Corten A*
S	Ladder and Swiftrack	BS EN 10088 : 2005 Grade 1.4404 (equivalent to S316L31)

Finishes :

G = hot dip galvanised after manufacture
PG = pre-galvanised
D = deep galvanised
S = stainless steel
E = powder coated

* Depending on availability of raw materials



Heavy duty (Sapphire) length shown in G finish
See p. 16



Heavy duty (Sapphire) bend shown in G finish
See p. 16



Swiftrack channel support shown in PG finish
See p. 25

■ Hot dip galvanised G

Hot dip galvanising after manufacture is an excellent economical protective finish used on support systems in many industrial and commercial applications.

Background

The galvanised coating is applied as a final manufacturing process by immersing a steel component (after various pre-treatments) in a large bath of molten zinc the zinc forms an alloy with the steel substrate and protects the steel from corrosion in two ways.

Firstly the zinc coating surrounds the base steel with a total tough physical barrier preventing corrosion of the steel by the surrounding atmosphere. Secondly if steel does become exposed e.g. at a cut edge the zinc coating acts as a sacrificial anode and will be gradually corroded in preference to the underlying steel. Corrosion products from the zinc will also be deposited onto the steel effectively re-sealing the surface and maintaining the integrity of the barrier.

The life of a zinc coating is directly proportional to its thickness but in different environments this life does vary. However because hot dip galvanising has been used for many years its life in diverse environments has been well established. The most comprehensive guide to the design life of protective systems in different environments is contained in BS EN ISO 12944-5 : 2007 Paints and varnishes and BS EN ISO 14713 : 2009

Parts 1 2 - zinc coatings . In the presence of certain atmospheric pollutants (such as sulphur dioxide in industrial areas) or when installed in an aggressive coastal or marine environment the rate of dissipation of the zinc will be accelerated however in most situations hot dip galvanising remains an extremely effective and economical corrosion resistant finish.

Specification

BS EN ISO 1461 provides the specification for a hot dip galvanised coating. Heavier gauges of steel will usually take up a thicker coating of zinc than lighter gauges so the standard defines the coating for different steel gauges in terms of the weight of zinc per square metre of surface area. Ensuring compliance with this standard is obviously important. Unfortunately it is not reasonable to use this weight principle for checking the coating weight on components which have already been galvanised as it involves calculating the surface area then weighing a component destructively removing the coating by chemical means and then re-weighing the component. It is therefore usual to measure instead the coating thickness (which can be done non-destructively using magnetic or electronic instruments) at a number of points on the surface of a component. The coating thicknesses given in the standard and their equivalent coating weights are shown in table 1.

Table 1
Galvanising standard BS EN ISO 1461 :
Minimum average zinc thickness

Steel thickness	Minimum average zinc thickness microns
Less than 1.5 mm	45
1.5 mm and thicker up to 3 mm	55
3 mm and thicker but less than 6 mm	70
6 mm and thicker	85

Note

For threaded and very small components which are spun galvanised thinner coatings are used as recommended by BS EN ISO 1461.

It is important to distinguish between hot dip galvanised after manufacture to BS EN ISO 1461 and less precise descriptions such as galvanised mill galvanised or even the term hot dip galvanised when used without reference to any standard. Mill galvanised steel is frequently used as an alternative finish for many support system components (see pre-galvanised steel p. 120) and is available from Legrand but this material does have a much thinner zinc coating which renders it unsuitable for exposed applications.

Suggested specification text : All components should be hot dip galvanised after completed manufacture to the requirements of BS EN ISO 1461.

■ Deep galvanised D

A deep galvanised finish has all of the characteristics of hot dip galvanising but with a much thicker coating of zinc. This gives 2-3 times the life of the standard hot dip galvanised (BS EN ISO 1461) finish.

Background

The life of a galvanised coating depends very much upon the degree of pollution of the surrounding atmosphere in an industrial or marine environment corrosion of the zinc may take place at double or treble the rate which would occur in an inland environment. Thus if heavy atmospheric pollution or aggressive conditions exist in the vicinity of an installation it is well worth considering the benefits provided by deep galvanising.

Since this finish is produced in the same basic process as normal hot dip galvanising the initial cost premium of the material is relatively low however the site installation costs will remain unchanged. Therefore for a relatively modest premium on the overall installed cost the life of the installation can be increased dramatically.

Specification

Although the appropriate British Standard for deep galvanising is BS EN ISO 1461 (the same as for hot dip galvanising after manufacture) the process requires the use of steel containing a slightly higher proportion of silicon often referred to as high silicon steel. When galvanising normal mild steel the process effectively ceases after a short immersion time in the galvanising bath giving depending on the gauge of the steel the coating thicknesses laid down within BS EN ISO 1461. However with silicon bearing steels the chemistry of the galvanising process changes resulting in the zinc coating continuing to increase in thickness as long as the steel remains immersed in the zinc.

Coatings up to three times as thick as the minimum requirements of BS EN ISO 1461 are both possible and practical to achieve. However the most cost effective coating thickness is usually twice the thickness required by BS EN ISO 1461.

■ Pre-galvanised PG

A zinc coating can be economically applied to steel sheet immediately after its manufacture the result pre-galvanised steel (to BS EN 10346) can be an attractive bright material which is suitable for non-arduous environments.

Background

Pre-galvanised (or mill galvanised) steel is produced by unwinding steel coil and passing it continuously through a bath of molten zinc and then past air jets to remove excess zinc from the surface. The process is closely controlled to produce a thin even and ripple-free zinc coating with very few imperfections.

Because this pre-galvanised steel coil must then be cut to shape during subsequent manufacture of support equipment the edges of the finished components will have no zinc coating this aspect together with the relatively light zinc coating provided by the process make pre-galvanised services supports suitable for indoor non-corrosive environments (particularly where an aesthetically attractive appearance is important) but unsuitable for humid indoor or outdoor applications.

Specification

For steel for Swiftrack channel steel grade is BS EN 10346 : 2009 Grade S250GD Z275

■ Stainless steel S

For all practical purposes most stainless steel services supports can be regarded as maintenance free and suffering no corrosion. Inevitably there is a relatively high price to pay for these attractive properties but in aggressive environments or where the cost or inconvenience of gaining subsequent maintenance access is prohibitive this initial cost premium may well be justified.

Background

Stainless steel contains a high proportion of chromium (usually at least 17 %) and the steel's remarkable immunity to corrosive attack is conferred by the chromium-rich oxide film which occurs naturally on its surface. This invisible film is not only inert and tightly bonded to the surface it also re-forms quickly if the surface is damaged in any way.

The fire resistance of stainless steel is particularly noteworthy tests have demonstrated that stainless steel cable supports can be expected to maintain their integrity for considerable periods even when exposed to direct flame temperatures exceeding 1 000 °C. This may be an important consideration where the electrical circuits being supported provide for emergency power or control systems.

Stainless steel is also used where hygiene is a major consideration. Its advantages in such applications are again its excellent resistance to the various chemicals and washes which are frequently used for cleaning purposes and the smoothness of surface (depending on the finish specified) which minimises the soiling or contamination that can take place.

Specification

Many grades of stainless steel are available but the one generally used in aggressive marine environments is BS EN 10088 Grade 1-4404 (equivalent to S316L31 BS 1449: Part 2). This grade has improved corrosion resistance (particularly in the presence of chlorides) and high temperature strength. It is much used in the chloride-laden marine conditions which exist on offshore installations and in coastal regions.

For less aggressive environments BS EN 10088 Grade 1-4301 (equivalent to 304 BS 1449: Part 2) is the normal grade. This grade offers good corrosion resistance in internal applications and also has a good aesthetic quality often used in the dairy and food industries. Final finishes with mechanical brushing or polishing are often used to provide a good looking and robust surface finish.

Pickling and passivation

A stainless steel surface will have excellent corrosion resistance due to the chromium oxide layer on the surface of the product.

With some stainless steels however the surface areas can become subject to corrosion due to the depletion of chromium during welding or the introduction of iron during a machining process (not applicable to most cable management products).

Where a uniform appearance is important after carrying out welding processes it is often specified that all surfaces should be pickled and passivated to remove the smoke stain from the welding process. Also where extreme corrosion resistance is called for this process may help to remove crevice corrosion from around the welding area. Experience has shown that this is not normally necessary for the majority of cable management products.

Pickling

The pickling process involves the article being immersed in a blend of acids which dissolve iron and iron oxides which adhere to or are embedded in the surface of the stainless steel. These acids cause a removal of the surface layer of between 1 and 3 microns. The article is finally rinsed with water to complete this stage of the process.

Passivation

Passivation of the stainless steel will occur naturally after pickling when the oxygen in the air will react with the surface of the steel to form a passive chromium oxide layer. However it is usual for this passivation process to be speeded up by immersing the article in a nitric acid or other passivating agent.

Pickle and passivation is available as a special order finish for more information please contact us on 44 (0) 845 605 4333.

Electropolishing

In various industries such as food pharmaceutical and electronics there is a requirement for easier cleaning and reduced bacterial growth on the surface of the stainless steel. This increased surface smoothness is achieved by a process called electropolishing.

Electropolishing is in principle a reversal of the electroplating process. The article is submerged in a special acid electrolyte and a DC current passed into the article and through the electrolyte. This process removes the high spots from the surface micro roughness leaving a surface which is bright and smooth.

■ Powder coated E

Powder coated finishes give excellent protection against scratches as they are normally between 50 - 100 harder than the equivalent wet paint finishes.

They are available in a wide range of colours and can have matt or various gloss finishes. In addition to the aesthetic qualities powder coating are available in various grades to cope with different site conditions. Grades are produced to cope with exterior applications where there can be high levels of ultra violet light or low smoke and fume applications for fire risk areas such as occur in tunnels.

Because powder coated finishes are inherently resilient and resistant to chemical or corrosive attack these finishes are frequently used for protection only where there is no aesthetic requirement.

Background

The process of powder coating is carried out by applying the electrostatically charged powder to the article and then passing the article into an oven where the powder is baked onto the surface of the article.

The application of the powder and the associated stoving can vary with different types of finish so the careful control of the process is required.

Specification

With such a wide variety of types of powder available it is necessary to specify in addition to the colour what the finish is required to do.

The colour can be specified by BS or RAL number or by exact colour match if a sample of the colour is provided. The required gloss level should also be given.

The usual finish is for aesthetic indoor use but if other qualities are required they should be clearly indicated at the outset as the powder cost and application cost can vary considerably between different types of powder.

Epoxy coated

Epoxy coatings are based on thermo-setting epoxy resins and give a very hard durable finish suitable for internal applications. Epoxy coatings are usually quite thin but they have good chemical resistance with excellent adhesion and coating flexibility.

Polyester epoxy mix

Some modern coating developments consist of both polyester and epoxy. These give properties which are very suitable for use with cable support systems. The finish is thick and fairly soft and gives good protection to the cables being installed. The coating has strong adhesive properties and in cases of fire is halogen free with low smoke and fume characteristics. There are many types and grades of these materials and when using them advice should be sought from our technical sales support team please contact us on 44 (0) 845 605 4333.

Architectural powder coatings

These powder coatings are formulated to meet the particular requirements of exterior environments. They are inherently resilient and resistant to damage and chemical or corrosive attack providing maximum protection to the substrate. When subjected to high levels of ultra violet light present within sunlight the coatings have excellent gloss retention and resistance to chalking. These coatings would normally be applied over a galvanised finish.

Installation of services

IN THIS SECTION...

Cable ladder systems

- Design factors to consider
- Cable ladder m lengths over long spans
- Loading graphs

Cable ladder systems

Cable ladder systems are intended for the support of a combination of cables electrical equipment and/or communication system installations. Where necessary cable ladder systems may be used for the segregation of cables.

Note : these systems are designed for use as supports for cables and not as enclosures giving full mechanical protection.

These systems are covered by BS EN 61537.

■ Design factors to consider

Consideration should be given to the following factors when undertaking the design of a support system although some of these (e.g. snow/wind loads) may not be relevant to every installation.

- Distributed loads** eg. cables pipes
- Point loads**
- Snow wind and external forces**
- Safety factor**
- Deflection**
- Spacing of supports**
- Location of couplers**
- Installation of cables within a support system**
- Earth protection**
- Electromagnetic compatibility EMC**
- Thermal expansion and contraction**

The following sections provide a wealth of useful information on each of these design aspects.

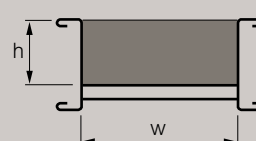
i Distributed loads

Before commencing the design process for a new installation it is usual to consider whether future changes in the pattern of demand for building services will impose increased loading requirements on the support system. If so it is good design practice to allow both the physical space and sufficient load carrying capacity for the future addition of 25% more cables or other loading medium.

Estimation of cable loads

If full details of the cabling layout are available then the likely cable load can be calculated using either manufacturer's published information or the tables of cable weights and diameters which are given opposite. However it is often necessary to select a ladder design in the absence of accurate information on the likely cable load. To assist this selection process a useful approach can be to choose a likely size of ladder and then to estimate the maximum cable weight which is capable of being contained within it. This estimate may be arrived at using the following guide :

Max. cabling capacity (kg/m) = cable laying area (m²) x 2800



Cable laying area

Cable laying area (m²) = w (m) x h (m)

Applicable to cable ladder

Note : this formula only provides an estimate of the maximum load which can be physically contained within a ladder. The ability of that ladder to support such a load depends upon the spacing of its supports.

Cable weights and diameters

Tables 1 and 2 below give typical weights and diameters (D) for PVC sheathed steel wire armoured cables with stranded copper conductors.

Tables 3 and 4 give typical weights and diameters for PVC sheathed unarmoured stranded copper power cables. Cables with LPE (cross linked polyethylene) insulation are usually slightly lighter so the information given may also be used for these cables too.

For all other types of cable (e.g. paper insulated cable or cable with aluminium conductors) refer to the cable manufacturer's catalogue for details and guidance.

Values show approx weight and diameter of typical cables.

D Overall cable diameter.

Table 1 C armoured power control cables to BS 6843

Nominal area of conductor mm ²	core		core		core	
	g/m	in mm	g/m	in mm	g/m	in mm
0.3	0.3	12.3	0.3	12.8	0.4	13.5
0.4	0.4	13.6	0.4	14.1	0.5	15.0
0.5	0.5	15.1	0.5	15.8	0.7	17.8
0.6	0.6	16.5	0.7	18.0	0.9	19.2
0.9	0.9	20.1	1.0	21.2	1.2	22.8
1.0	1.0	21.9	1.2	23.1	1.7	26.3

Table 2 C insulated and sheathed circular surface wiring

Nominal area of conductor mm ²	core		core		core	
	g/m	in mm	g/m	in mm	g/m	in mm
0.1	0.1	7.7	0.1	8.2	0.1	9.1
0.1	0.1	9.2	0.2	9.7	0.2	10.6
0.2	0.2	10.2	0.3	11.0	0.3	12.6
0.2	0.2	12.0	0.3	12.8	0.4	14.2
0.4	0.4	14.6	0.5	15.6	0.7	17.4
0.6	0.6	16.9	0.7	18.0	0.9	20.0

able C unarmoured stranded copper po er cables to S

om area o conductor mm	core		core		core	
	g m	in mm	g m	in mm	g m	in mm
	0 7	18 4	1 0	20 4	1 3	22 7
	0 9	20 0	1 3	22 4	1 7	25 0
	1 2	22 2	1 7	25 4	2 3	28 6
	1 7	24 6	2 4	28 4	3 1	32 2
	2 3	28 2	3 3	33 1	4 3	37 2
	2 8	30 9	4 0	36 0	5 3	40 6
	3 5	34 1	4 9	39 7	6 5	45 0
	4 2	37 8	6 1	44 1	8 0	49 8
	5 5	43 2	8 0	49 6	10 6	56 2
	7 0	47 2	9 7	55 0	13 2	62 5
	8 5	53 2	12 6	61 4	16 7	69 6

able C armoured stranded copper po er cables to S

om area o conductor mm	core		core		core	
	g m	in mm	g m	in mm	g m	in mm
	1 3	23 0	1 7	25 1	2 1	27 5
	1 6	24 8	2 1	27 3	2 6	30 0
	2 0	27 2	2 6	30 5	3 5	34 8
	2 5	29 5	3 6	34 8	4 5	38 4
	3 5	34 4	4 6	39 1	5 9	43 3
	4 1	37 1	5 5	41 9	7 5	48 1
	4 9	40 2	7 0	47 2	8 8	52 3
	6 3	45 1	8 4	51 4	10 7	57 5
	7 8	50 5	10 7	57 3	13 5	63 9
	9 3	55 4	12 7	62 6	16 4	69 9
	11 3	60 8	15 7	68 8	21 3	78 8

ii Point loads

Point loads may consist of permanent equipment such as lighting luminaires, junction boxes or other switchgear, or temporary loads such as commissioning equipment or installation personnel (but see Safety during the installation phase page 141).

Analysis of uniformly distributed loads (such as cables or pipes) is relatively simple but analysing the effect of a point load is quite complex, fortunately a simple alternative approach is available.

Firstly, one makes the reasonable assumption that the point load will be situated in the worst position at mid-span. The force this point load imposes can then be taken as equivalent to that imposed by a load of twice its value uniformly distributed along the span. Thus the point load can be converted to the equivalent uniformly distributed load which is then added to other UDLs to produce one total uniform load.

ample

Point load = 30 kg

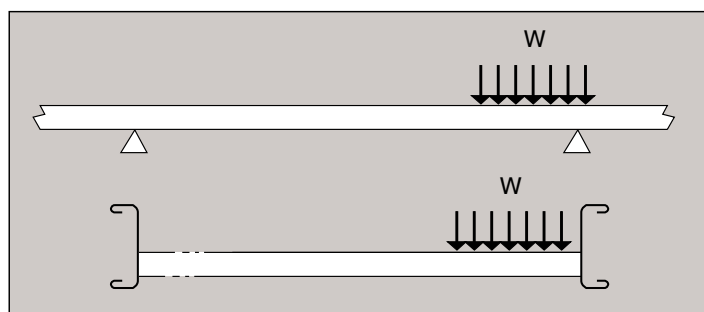
Support spacing = 3 m

UDL = 100 kg/m

e ui alent to oint oad otal	g point load		
	g m	g m	g m

The suitability of a ladder to carry this total load can then be considered using the loading graph information (see p. 131).

Although this treatment does assume the point load will be in the worst case position, the installer should, given discretion, always position any point load as close as possible both to a support and to either side flange, minimising the stress on the installation, as per the following illustration.



Single spans

For single spans the loading capability is also severely reduced. In this circumstance the safe working load (S_L) should, as a simple rule, be reduced to half that indicated by the loading graphs on p. 131, and there must be no joint in the span.

This derating of the loading capacity for either single spans or point loads depends to some extent upon the ladder type and the intended span. If therefore the design calculations indicate this aspect is critical, more detailed information should be sought from Legrand, contact us on 44 (0) 845 605 4333.

iii Snow, wind and external forces

The loading graphs on p. 131 show the maximum safe working steady load for each type of support system. If the system is outdoors and must also sustain snow, ice, wind or other variable forces, these must also be taken into account at the design stage.

Appropriate design data for UK weather conditions is given in British Standard BS EN 1991, see p. 142.

For snow and ice the appropriate extra weight as indicated by these standards must be added to the weight of the cable (and any point loads) to give a total working load; this should then be compared with the safe working load (S_L) for the ladder using the graphs in this document.

The horizontal force imposed by a wind is proportional to the vertical surface area of the installation, so particular care must be taken where cable ladder will be mounted on edge. Here, high winds are likely, large spans should be avoided.

High winds can also create a strong lifting force on ladder or covers, and this too must be borne in mind when installing covers in exposed locations. Ideally, covers should not be installed temporarily; they should only be installed after the electrical installation has been completed and they must be properly secured immediately.

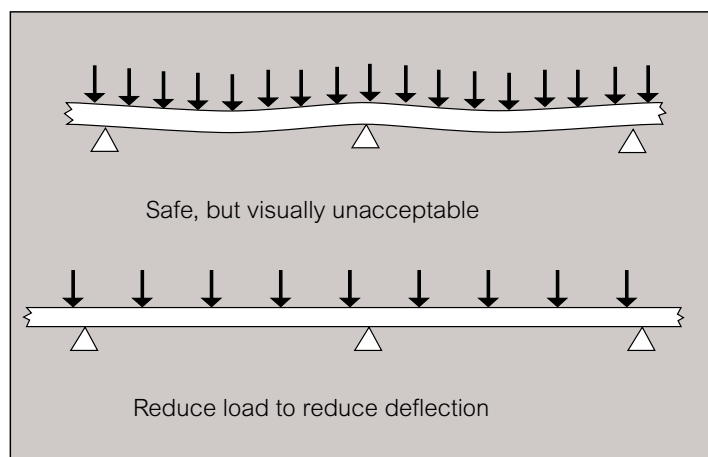
iv Safety factor

To arrive at a safe working load (S_L) for each type of equipment, Legrand test their products to find the ultimate failure load. The S_L is obtained by dividing the load before failure by a factor of 1.7 minimum.

This safety factor may need to be increased by the designer depending upon the circumstances. For example, if the support system is expected to be subjected to aggressive abuse, a safety factor as high as three or more may be used. Such treatment is, however, the exception, and care should be taken not to over-design the system by using an unnecessarily high safety factor.

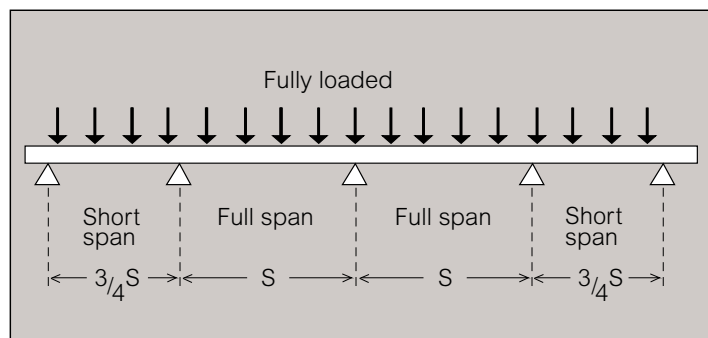
v Deflection

The deflection of a cable ladder under load is not directly related to its strength but it is obviously of aesthetic importance. For this reason, it may be necessary to estimate the likely deflection whilst designing an installation, especially if it will be in a highly visible location. Experience has shown that in order to maintain a degree of deflection which is subjectively acceptable to the eye, the load on the cable ladder will often be restricted to well below its safe maximum.



vi Spacing of supports

Services support installations are usually considered as multi-span arrangements but it is important to recognise that the loading capability of the system is not uniform from end-to-end. The strength of the two end spans in any run is much lower than that of intermediate spans even when the ends are rigidly fixed. In many situations the end spans will be more lightly loaded anyway if however they are not and the installation will be fully loaded from end-to-end then it is recommended that the support spacing of both end spans should be reduced to no more than three quarters that of intermediate spans. However it is not a mandatory requirement but is both useful and advisable.



Sometimes the necessary support spacing may be dictated by the nature of the building fabric. If however the designer has discretion over the spacing of supports the loading graphs can be used to maximise this distance. This will reduce the number of support components and fixings that will be required thus reducing the overall cost of the installed system.

Supports or cable ladder

Cable ladder installations are usually designed with a significantly longer spacing between supports 2 to 4 metres being a typical span distance.

Support fittings

Cable ladder fittings must always be provided with local support. The illustrations on pages 125 to 126 give recommended support positions.

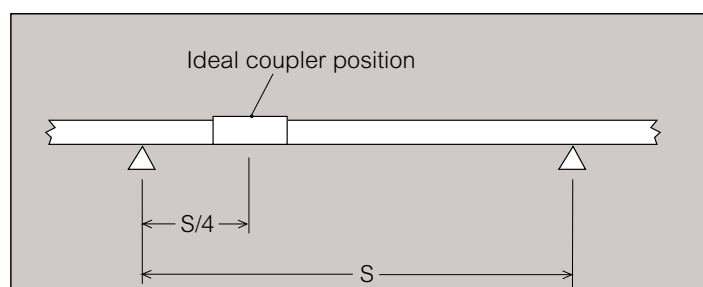
vii Location of couplers

In practice it is often impossible to pre-determine where the couplers will be located within a straight run of cable ladder. However it is well worth making some effort to roughly plan their position during the early stages of installation.

The worst positions for the couplers is at mid-span. At these locations they will suffer the greatest stress. A mid-span joint should be particularly avoided on the end spans of an installation to minimise deflections.

The best position for joints in a continuous installation is on quarter of the span distance on either side of each point of support.

However for 6 m spans using 6 m ladders the best position for the joints is on the supports (refer to section 2 on page 128).

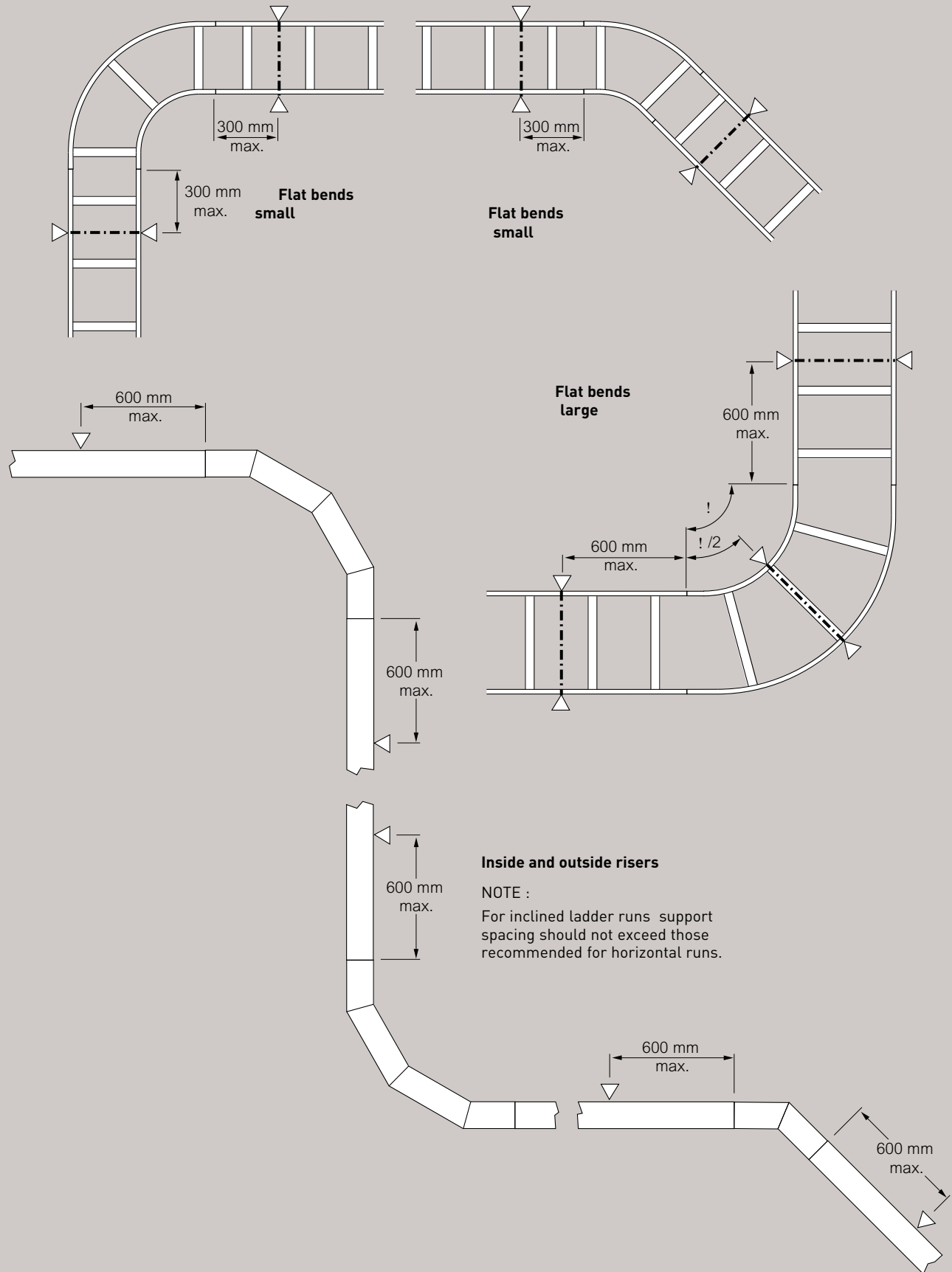


Loading graphs

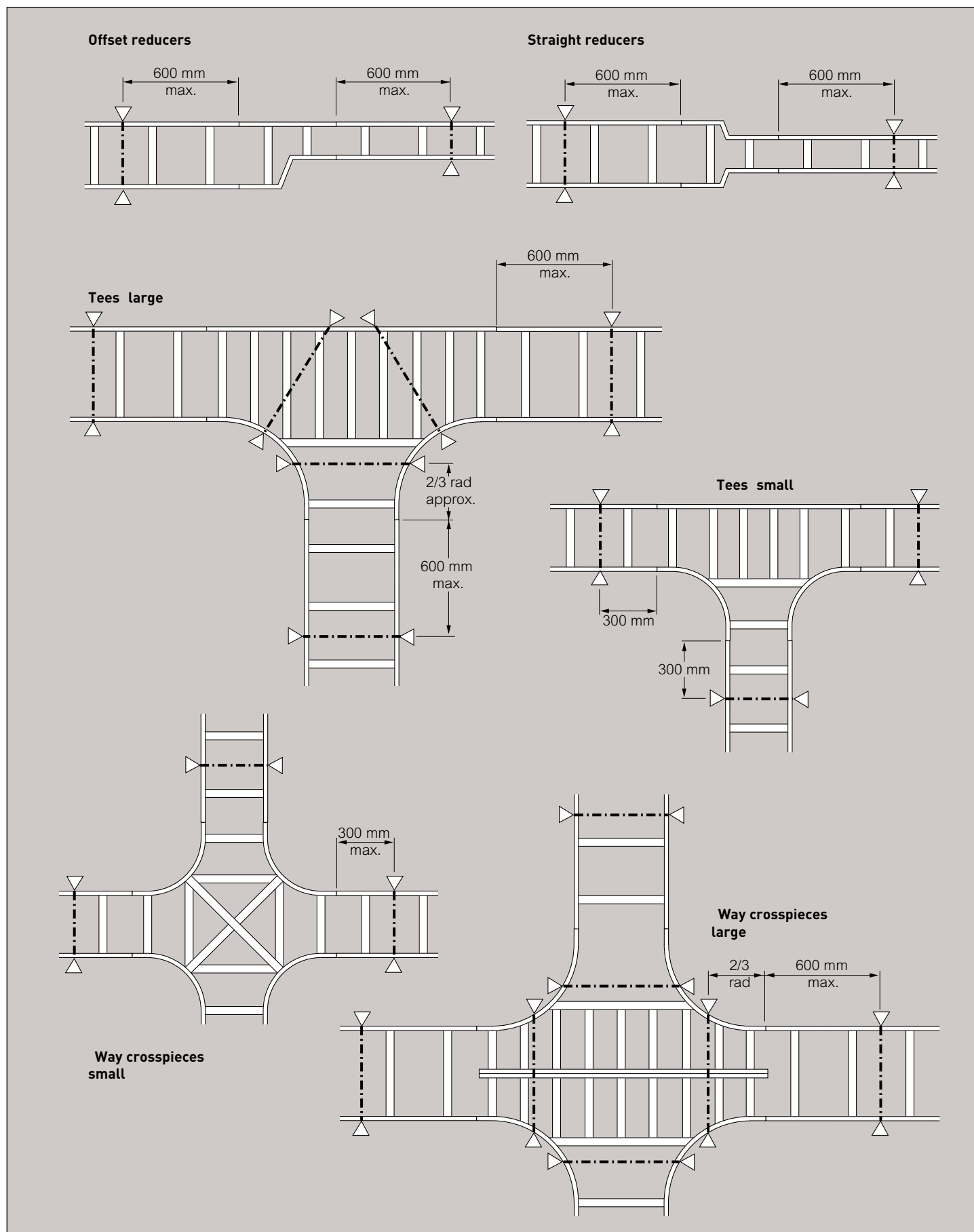
Refer to loading graphs on page 131.

Recommended support locations cable ladder

Large ladder widths or radius 600 mm and above
Small sizes below 600 mm



Recommended support locations cable ladder continued



viii Installation of cables within a support system

Detailed guidance concerning the selection and use of appropriate electric cables is available from cable manufacturers' relevant standards (both British Standards and European Cenelec Standards) and the Wiring Regulations. However the following general comments may also be helpful.

Cables are designed for continuous operation within a range of ambient temperatures. Attention must be paid to the ventilation arrangements to ensure that the maximum temperature is not consistently exceeded. Where cable routings pass through enclosed ducts it is important to ensure that the ducts are large enough to avoid overheating.

Cable support spacing

Cables must either be continuously supported or supported at intervals which are no more than those given in Table 5 below. Cables should not themselves be used as a support or as a restraint for other loads.

Table 5

Cable diameter mm	Support spacing mm	
	Horizontal	Vertical
Up to 10	250	400
10 to 16	300	400
16 to 25	350	450
25 to 35	400	550

(1) From horizontal through to 60° inclination

(2) From 60° inclination (30° from vertical) through to vertical

Installation of cables to cable ladder

In addition to cable ties or strapping, steel, aluminium or moulded cleats are also frequently used. Alternative rung slot patterns are available to suit the various fixing options.

Minimum bending radius of cables

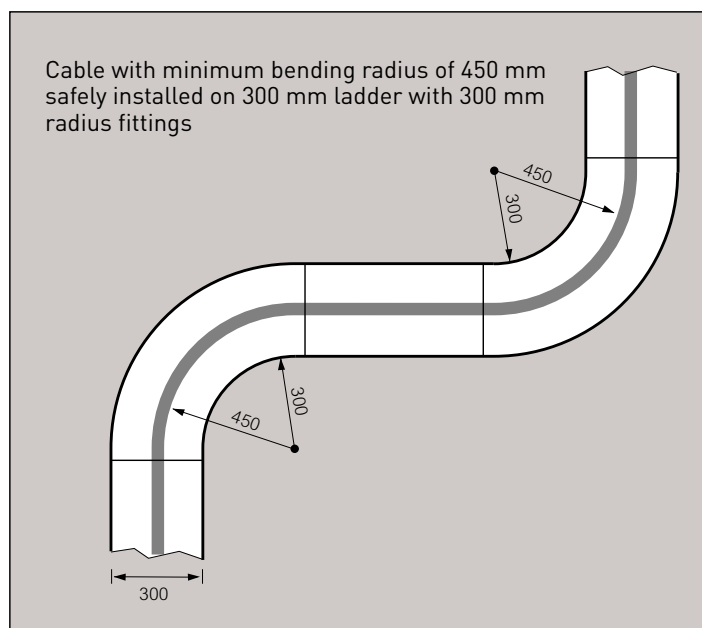
All cables have a minimum bending radius beyond which they should not be bent either during handling or when finally installed. Details of the minimum bending radius for various types of cable are given in Table 6 below.

Table 6

Type of cable mm	Minimum bending radius cable diameter
Unarmoured cable D ≤ 10 mm	3D
Unarmoured cable 25 mm D ≤ 10 mm	4D
Unarmoured cable D ≤ 25 mm	6D
Armoured cable to BS 5467 BS 6346 and BS 6724 (LSF cables)	8D

Radius of fittings

On a cable support system the size and type of cables must be considered to ensure that the radius of the support fittings exceeds the minimum bending radius of the cables themselves. The table above gives a general guide to these minimum values but wherever possible a larger installation radius should be used. Cables must not be accidentally bent to a tighter radius during installation. If only one or two large cables are being installed on a flat ladder installation (without risers) then it may be possible to use smaller radius fittings by ensuring these cables are always positioned along the centre of the ladder.



ix Earth protection

Cable ladder is deemed to provide continuous support to any cables installed upon it but because it is not completely enclosed it does not offer mechanical protection. For this reason unsheathed single insulated power cables should not be installed on ladder. All cables should have some mechanical protection in the form of PVC sheathing, steel wire armouring or a copper covering (MICC). Where moisture may be present, copper covered cables must also be PVC sheathed to avoid electrochemical corrosion between the copper and the cable support system.

Cable ladder can be specifically designed to act as a circuit protective conductor (CPC) which connects exposed conductive parts of equipment to the main earth terminal and will thereby provide some protection against electric shock. For this to be acceptable the cross-sectional area of the cable support must exceed a value obtained by calculation, the formula for this calculation being given in Regulation 543-01-03 of the Wiring Regulations BS 7671. This formula takes into account the fault current of the circuit, the nature of the cables themselves and the operating time of the disconnecting device used to protect against excessive currents. Other features, such as protection of the support system against mechanical damage and corrosion (to ensure the CPC remains intact), visual identification that the support system is being used as a CPC and the impedance of the circuit must also be considered by a competent electrical engineer before ladder can be used as a CPC.

If armoured cables (with an integral CPC) are installed on a ladder and the support system is not being used as a protective conductor, then it is generally considered as a metal part which is neither extraneous nor exposed. Continuity is not an issue in this situation. Normal ladder assembly methods are adequate and BS 7671 (the Wiring Regulations) impose no requirement for continuity of such metal parts unless they are being used as a protective conductor.

If unarmoured cables are installed on a ladder installation which is not being used as a protective conductor, consideration should be given to the possibility of damage to these cables, causing the ladder to become live and hence the need to earth the support system.

The continuity of properly fixed ladder joints is such that earth continuity connectors (bonding connectors) are not necessary for any general ladder application; however, in special locations or hazardous areas (as described in BS 7671: Section 6) earth continuity connectors may be required, subject to consideration by a competent electrical engineer.

x Electromagnetic Compatibility EMC

In normal use cable ladder is considered as passive in respect of electromagnetic influences. The installation of current carrying media may cause emissions and these media may also be influenced by electromagnetic signals from elsewhere but the degree of influence will depend on the nature of the installation and the apparatus connected to the system.

A draft technical report IEC1000-S-1 provides details of the cable separation required according to the type of signal being considered and the IEE Guidance Note No.1 provides further information on the subject of EMC. However as a basic principle if power and signal cables can be run separately on different ladders then this will significantly reduce any possibility of one electrical circuit having any undesirable influence upon another.

xi Thermal expansion and contraction

In locations where large variations in temperature are anticipated the design of the support system should make allowance for changes in the length of the support system due to the expansion and the contraction of the metal.

For cable ladder Swifts flexible couplers provide for 10 mm of linear movement between adjacent ladders. They should be installed instead of standard couplers at regular intervals with their spacing being determined using the following formula :

$$\frac{L}{K_s T}$$

where:

- L Distance between flexible couplers in metres
- K_s 909 for mild steel or 962 for stainless steel
- T Range of temperature variation (in Celcius degrees) for which allowance is to be made

For information the relevant coefficients of linear expansion are :

- Mild steel $11 \times 10^{-6} / ^\circ\text{C}$
- Stainless steel $10.4 \times 10^{-6} / ^\circ\text{C}$

When expansion couplers are used the ladder must be supported either side of the joint.

■ Cable ladder m lengths over long spans

The maximum acceptable deflection for cable ladder is normally considered to be 1/200th of the span distance. However when cable ladder is to be installed on long spans of 5 m or 6 m the limiting factor which determines the loading capacity is the maximum allowable stress in the ladder side rails rather than the deflection. Deeper side rails can withstand higher stresses and for this reason 125 mm deep Sapphire or 150 mm deep Emerald ladder should be used for long spans. The use of 3 m ladder lengths is not recommended for long spans.

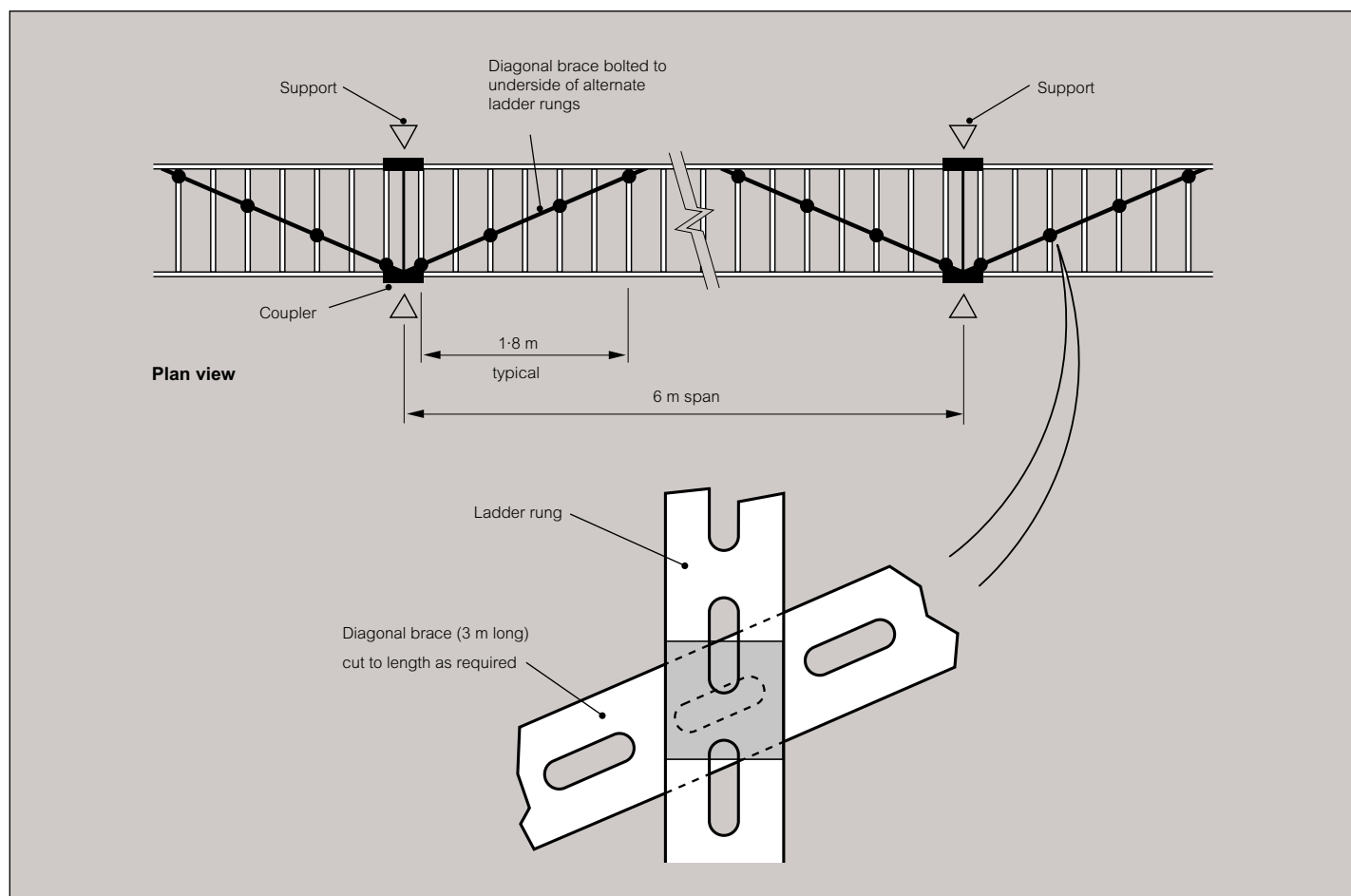
The end span of any installation cannot safely support the same maximum load as the inner spans. If therefore the applied cable load is uniform from one end of a run to the other then it is advisable to incorporate at the design stage some reduction in the length of the two end spans. If using 6 m ladders over 6 m spans with joints on supports then end span reduction will require cut lengths.

The designer should also endeavour to provide supports which are wider than normal 80-100 mm is ideal on a long span installation. This reduces the local stresses at the contact footprint where the full weight of the installation is carried by the bottom flange of the ladder. On most ladder installations it is good practice to locate the couplers within the span where the bending moments are lowest. However on 6 m spans the couplers should be located directly over the points of support as this will also provide additional local reinforcement of the ladder side rails.

For external installations a maximum ladder width of 600 mm is recommended in order to reduce the possible effect of wind and snow these being exaggerated on longer spans. On cable ladder installed internally these unpredictable loads are less of a problem. Nevertheless they cannot be totally disregarded as the careless application of temporary loads to one side rail of a fully loaded system (e.g. a carelessly placed access ladder) can be potentially damaging.

Care is also needed with regard to any dynamic loads which may cause oscillations in long ladder spans this is much less likely after the cables have been installed as their stiffness (especially with larger cables) will heavily dampen the system and reduce any tendency for oscillations to develop.

The effect of lateral loads can be much reduced by adding diagonal bracing to the cable ladder (see illustration). See p. 37 for further details.



The loading proposed for any cable support system must be carefully checked against the information provided to ensure the integrity of the complete installation. The suitability of the support brackets their spacing and their strength should be checked using the information given in this document. The method used to fix the support system back to the structure is equally important and must be checked for structural safety.

These loading graphs are based on cable support systems which run across multiple spans with the imposed load uniformly distributed. The user should ensure that allowance is made for any snow wind or other external loads within these total loadings. Appropriate design data for these is provided by British Standard BS EN 1991 see p. 142.

■ Use of loading graphs

Provided the relevant graph line lies above the intersection of the load/span lines the proposed arrangement is acceptable. (See the illustration opposite). The deflection will often be less than 1/200th of the span and in most cases it will be less than 1/360th of the span. However where point loads will be imposed or where there are short runs with three spans or less the deflection will increase and the safe working loads (S_{WL}) may need to be reduced from the values given.

Further information on this subject is given on pages 122 to 124.

These graphs should not be extrapolated to longer spans than shown nor should they be used for situations where the bed of the ladder is vertically orientated. In exposed situations the use of long spans requires particularly careful consideration see page 128. Any further information on loads and deflections for such circumstances should be sought from Legrand contact us on +44 (0) 845 605 4333.

The values given in this document have been obtained from extensive testing of our cable support equipment. They are given as a guide so that their customers may use Legrand's products to the best advantage they are nevertheless average figures which are given in good faith but without accepting any liability in contract tort or otherwise in the event of different performance by equipment which is actually supplied.

The cable support systems in this document are not designed for use as walkways or to support personnel during cable installation.

Loading graphs

The loads shown on all graphs are the safe recommended maximum loads that can be applied and must include wind snow and any other external forces in addition to the cable load. The graphs show the maximum load for ladder installed at a support spacing within its recommended range.

When the graph line is above the intersection of the required load and span lines the support equipment is suitable for use within those load and span conditions.

The graphs shown are for hot dip galvanised finish with an indication of stainless steel where applicable.

Load tests carried out to BS EN 61537 test type 1 (safety factor 1.7 and joint in middle of span) or test type 4 (safety factor 1.7 and joint in middle of span with rung slot over support).

Load tests for medium duty (Topaz) carried out over 2 m, 3 m and 4 m spans using 3 m lengths.

For heavy duty (Sapphire) and extra heavy duty (Emerald) cable ladder load tests carried out over 3 m, 4 m and 5 m spans using 3 m lengths and 6 m spans using 6 m lengths.

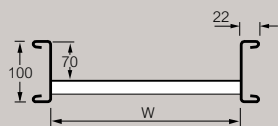
For spans 5 m and less : data can be used for 3 m or 6 m lengths

For spans greater than 5 m : data is for 6 m lengths only.

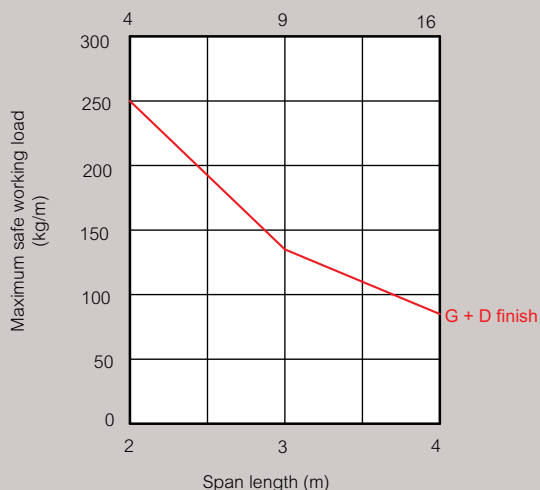
For spans greater than 5 m : ladder is not suitable for use with dynamic loads (e.g. wind snow).

When installed inner span deflection will vary depending on joint positions but will typically be about half of test end span deflection shown on following page.

Medium duty Topaz

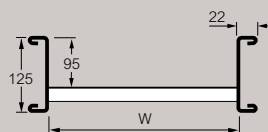


End span deflection at Max. SWL (mm)

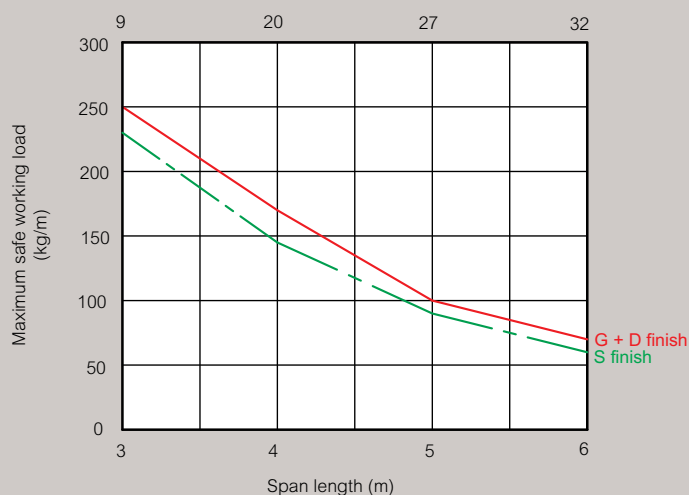


Graph showing safe working load vs span with deflections shown at SWL

Heavy duty Sapphire



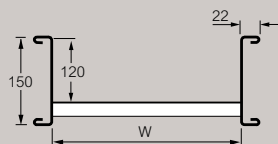
End span deflection at Max. SWL (mm)⁽¹⁾



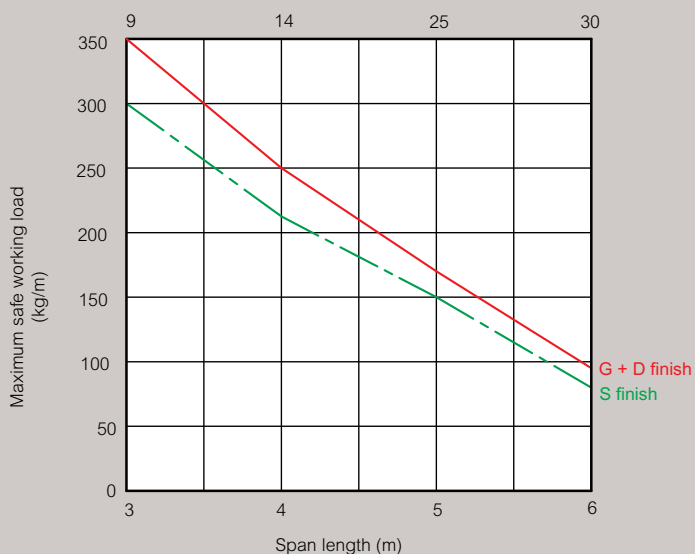
Graph showing safe working load vs span with deflections shown at SWL

(1) Deflections shown for G finish. D and S finish deflections on application, please contact us on +44 (0) 845 605 4333

Extra heavy duty Emerald



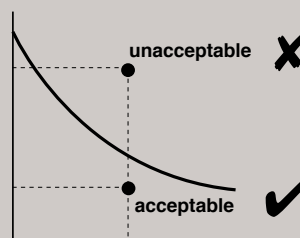
End span deflection at Max. SWL (mm)⁽¹⁾



Graph showing safe working load vs span with deflections shown at SWL

(1) Deflections shown for G finish. D and S finish deflections on application, please contact us on +44 (0) 845 605 4333

Example



Structural support characteristics

including channel support systems

IN THIS SECTION...

Structural characteristics

- . Cable ladder
- . Beams
- . Columns
- . Deflection

Designing support systems

- . Ceiling to floor applications
- . Ceiling mounted applications
- . Wall mounted applications
- . Floor mounted applications

Swiftrack channel support

- . Channels
- . Channel nuts
- . Framework brackets
- . Fasteners
- . Cantilever arms
- . Maximum safe recommended loadings
- . Channels used as beams
- . Channels used as columns
- . Fully restrained and unrestrained loads
- . Beam loads

Structural characteristics

Cable ladder

On many occasions cable ladder is installed in circumstances where it will only ever carry a light cable load possibly just one or two cables and its main role is to physically secure and protect its contents. In these situations it is often the inherent ruggedness or the aesthetics of the ladder design which bear most heavily on the specification decision. However when a support system is required to be more heavily loaded it is useful to have a knowledge of the theoretical aspects of rudimentary structural design in order to ensure that the completed system does fulfil its purpose with the greatest safety and economy.

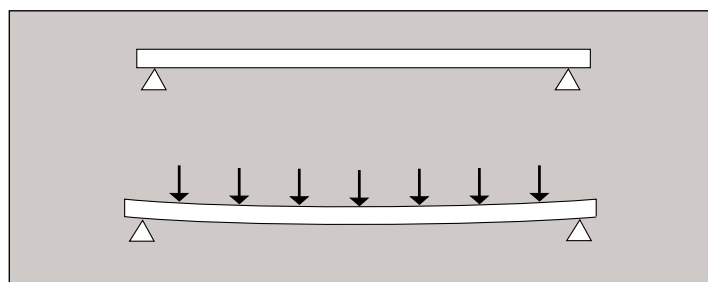
Beams

Any installed ladder system can be considered structurally as a loaded beam four basic beam configurations may be found in a typical installation :

- Simple beam
- Fixed beam
- Continuous beam
- Cantilever beam

Simple beam

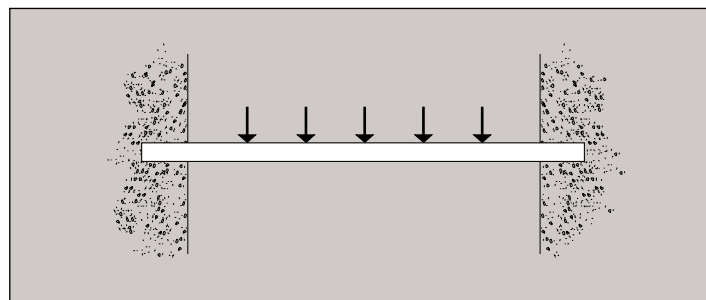
A single length of cable ladder mounted on but not fastened to two supports represents a simple beam which will bend as any load is applied to it with the supports offering no restraint to this bending.



This simple arrangement is fairly onerous and does not realistically model many real-life installations thus the load/deflection information given in this document is based upon more typical multi-span configurations which incorporate joints too. However if an unjointed single span does actually occur the safe working load (S_L) can as a practical guide be taken as 1/2 of that indicated by the loading graphs.

Fixed beam

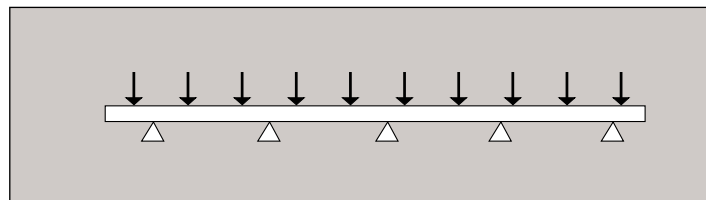
A fixed beam arrangement is a single structural member with both ends fastened rigidly to supports. Compared with a simple beam this degree of restraint does significantly increase the ability of the beam to carry loads but it is unlikely that cable ladder can in practice be secured sufficiently rigidly to be considered as a fixed beam.



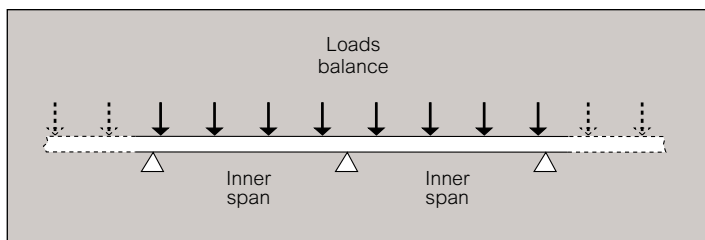
However in the context of a complete ladder system the main importance of the fixed beam configuration is that some appreciation of its properties along with those of a simple beam arrangement will assist the designer to understand the more complex behaviour of a continuous multi-span cable ladder installation.

Continuous beam

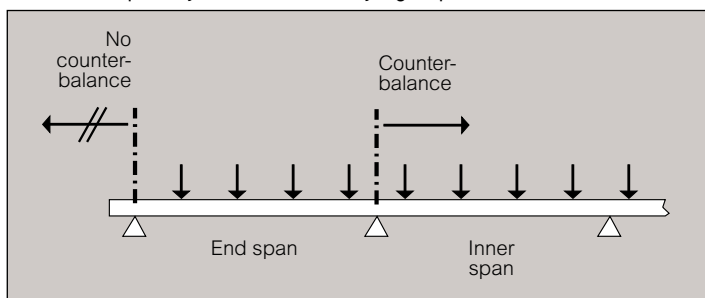
A typical multi-span ladder installation behaves largely as a continuous beam and the greater the number of spans the closer the similarity. However in practice a run must contain joints and it can also never be considered of infinite length so it is important to appreciate how its characteristics do vary from span to span and how these variations should be taken into account when designing the installation.



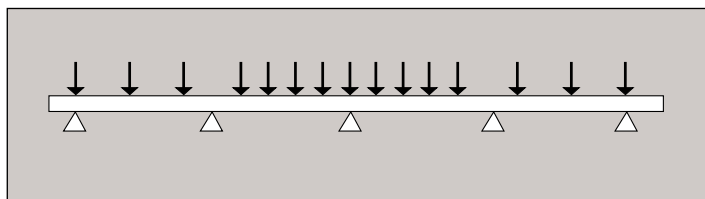
When a run of cable ladder is loaded uniformly from end to end the load on each span is effectively in balance with the loads on the adjacent spans.



This causes the inner spans to behave substantially as fixed beams imparting to them a considerable load carrying ability. However the two end spans of the installation are not so counterbalanced thus they perform more akin to simple beams with consequently lower load carrying capabilities.



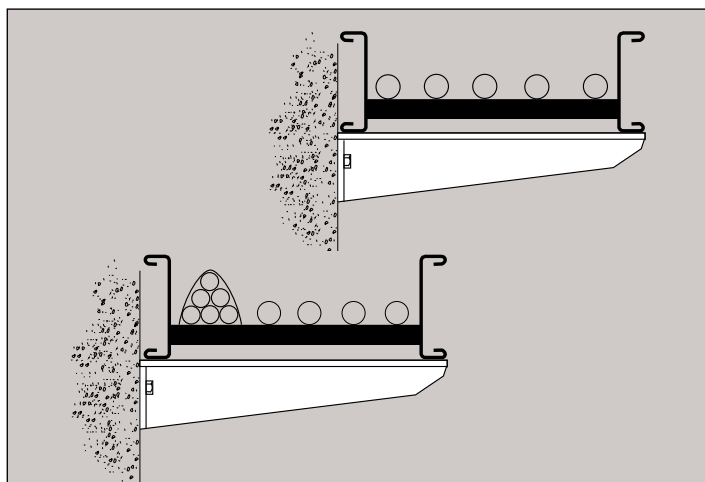
However if this is not the case the support spacing on the two end spans should advisably be reduced to $3/4$ of the intermediate spans in order to compensate (see page 124 spacing of supports).



Cantilever beam

This type of arrangement most commonly occurs with the brackets which are used to support cable ladder these being fixed to the structure at one end only.

For cable ladder installations it is usual to consider the cable load to be uniformly distributed along the length of the cantilever arm (i.e. across the width of the ladder) however if cables will be bunched then their combined weight effectively acts as a point load on the arm so the bunch should ideally be laid nearest the supported inner end.



Columns

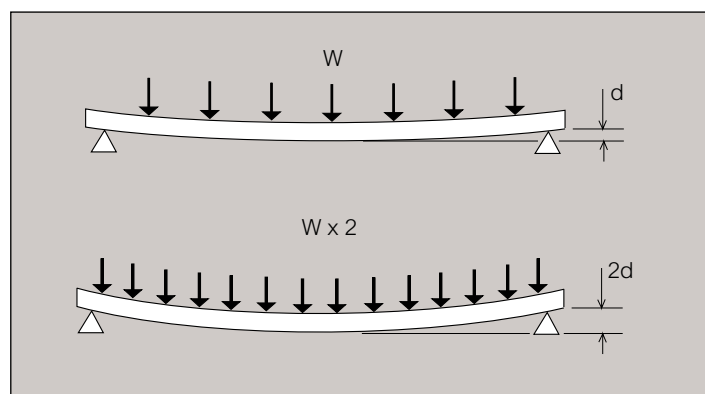
Any vertically arranged component whether ladder or channel acts structurally as a column however it is not usual to consider ladder in this way because it is not designed for this purpose. Swiftrack channel sections in both single and multiple configurations are however frequently arranged as vertical columns and the properties of these sections are both consistent and well known making them suitable for an analytical approach to be used.

The downward load which can be applied to the end of a column is proportional to the compressive strength of the material from which it is made but will reduce as the column gets longer. However there are few real applications where no loads are applied from other directions and since the effects of such loads are very significant it is important to consider the totality of the intended structure rather than focus simplistically only on the loads applied down the column.

Proper structural analysis must take detailed account of any side forces or eccentric loads caused by cantilever arms or other brackets fixed to the vertical channel. Such calculations must be carried out by a qualified engineer. The necessary data on the structural properties of the various channel sections is given on page 134 Designing support systems.

Deflection

As discussed earlier (page 123 Deflection) the deflection of a ladder under load is not directly related to its strength. However deflection is directly proportional to the applied load so doubling the load will double the consequent deflection.



Any point load will have a magnified effect upon deflection. For a point load placed at mid-span (the worst position) the deflection will be approximately double that caused by the same load uniformly distributed along the span although this value will vary depending upon the coupler and support positions.

Designing support systems

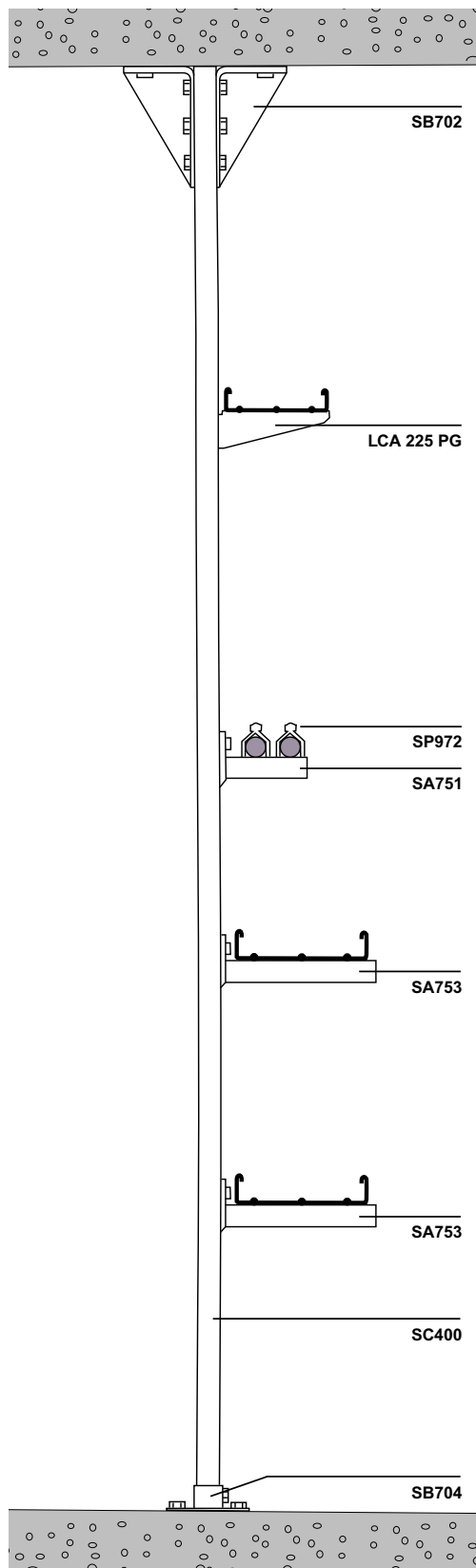
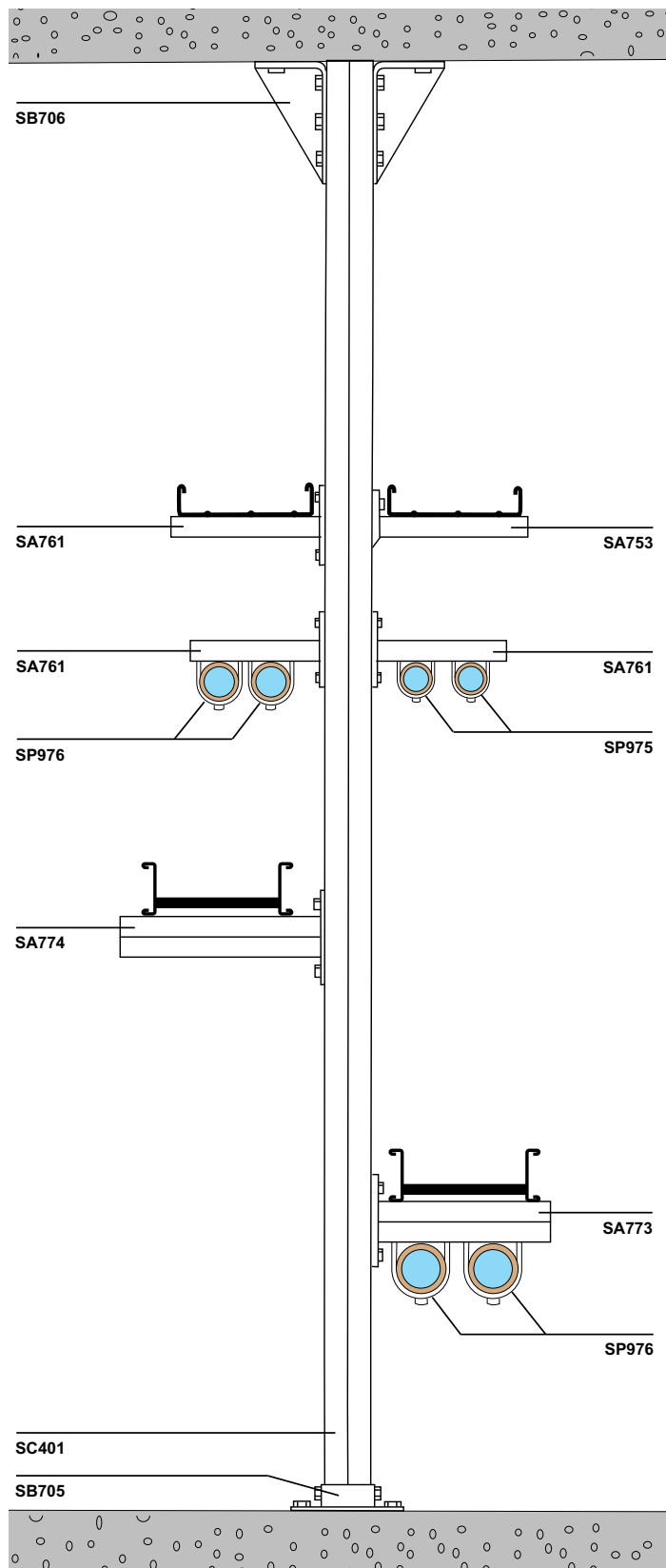
Swiftrack channel support system includes a range of versatile components which link together to provide support for any building services including tray ladder trunking piping sprinkler systems and heat/ventilation ducting. Assembled on site without welding Swiftrack can be broken down into various elements. Each element needs to be checked to ensure the following :

It can safely support the loads being imposed upon it (see p. 138-139)

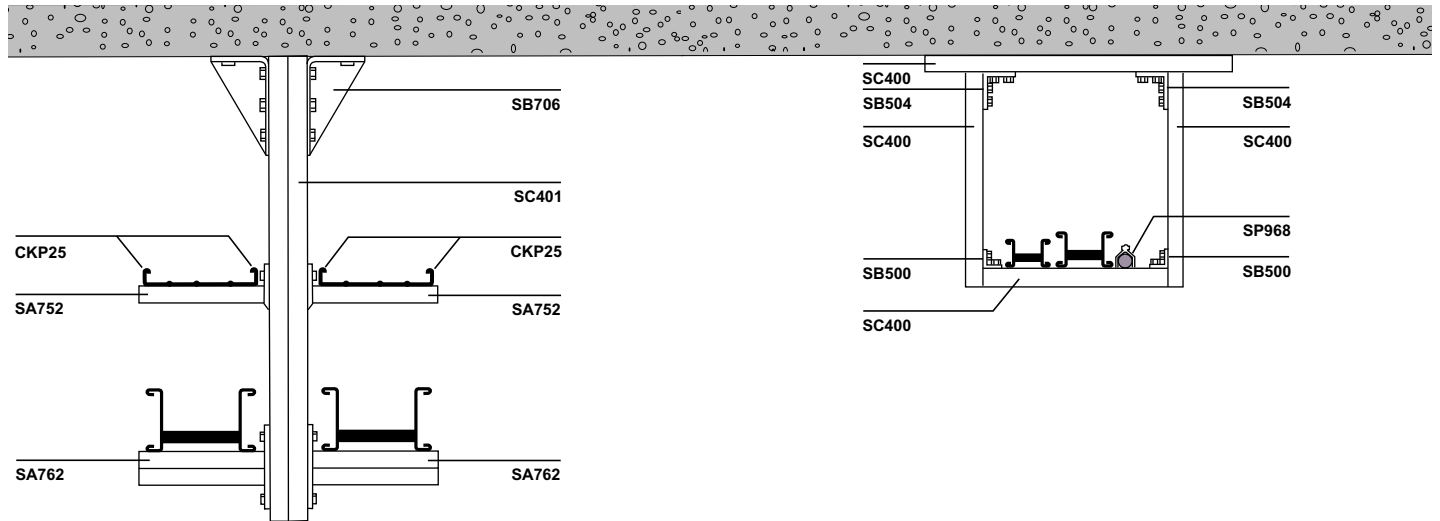
The proposed fixing to adjacent elements can also support the required loads (see p. 138)

Conforms to BS 6946

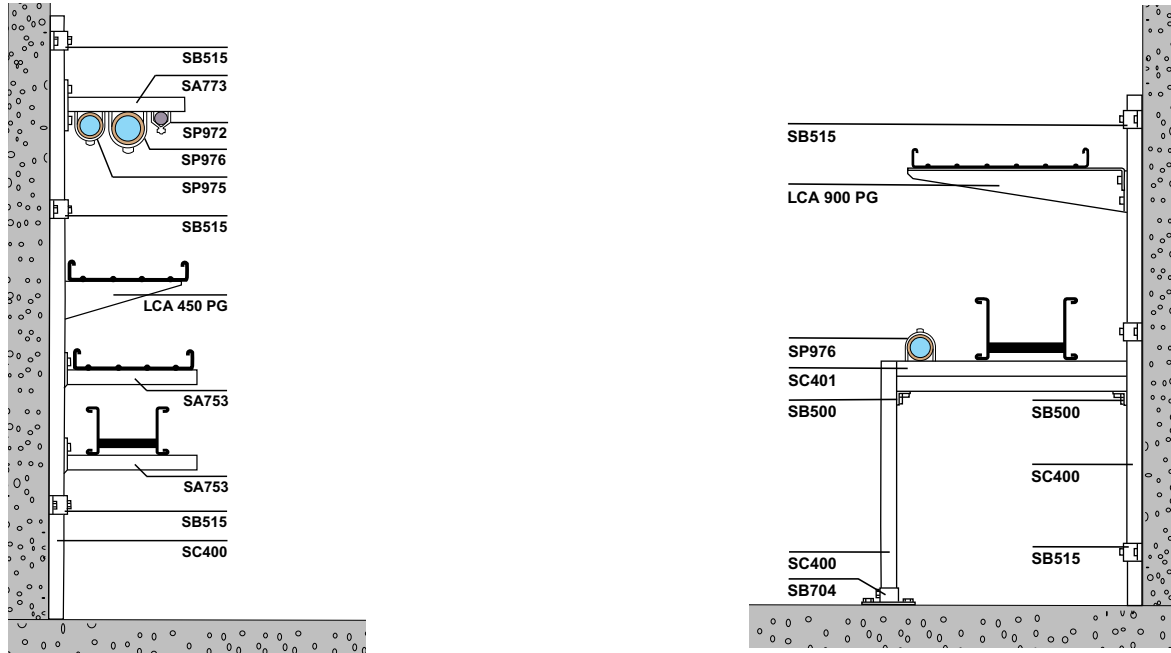
Ceiling to floor applications



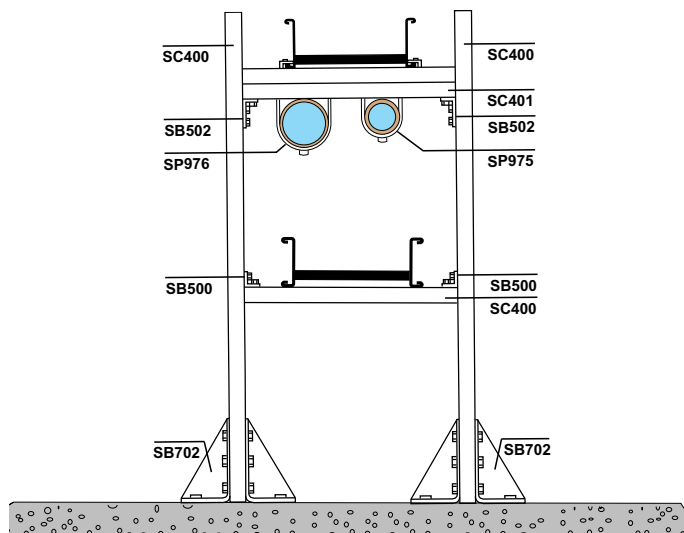
Ceiling mounted applications



Wall mounted applications



Floor mounted applications



Swiftrack channel support

Channels

Standard channels are cold rolled to BS 6946 from 2.5 mm pre-galvanised mild steel to BS EN 10346 : 2009 grade S250GD Z275

Light gauge channels are cold rolled from 1.5 mm pre-galvanised mild steel to BS EN 10346 : 2009 grade S250GD Z275

Back to back channels are formed by spot welding together two finished single channels at 150 mm centres under controlled conditions to BS EN 1993-1-3 : 2006. All welds and spot welds are suitably protected

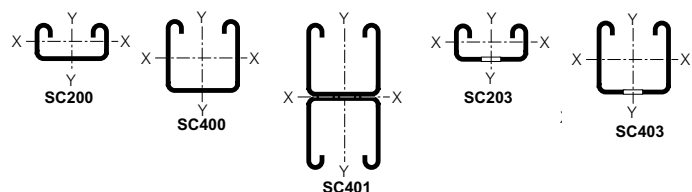
The standard lengths for single or multiple channels are 3 m and 6 m

Minimum yield strength σ_s : 250N/mm²

Minimum ultimate strength : 350N/mm²

Minimum design strength P_y : 250N/mm²

Section properties



Cat	Wt g/m	mm	mm	top min mm	blm ma mm	r mm	yy mm	r ^{yy} mm
SC	1.8	219	10779	862	1330	7.1	49776	15.1
SC	1.6	219	8960	794	961	6.4	49318	15.0
SC	2.6	322	67157	2857	3772	14.5	88783	16.6
SC	5.3	645	339300	8215	8215	23.0	177566	16.6
SC	2.4	322	57221	2645	2909	13.3	88325	16.5

t	weight of section (kg/m)
A	cross-sectional area (mm ²)
I _{xx}	moment of inertia second moment of area (mm ⁴)
Z _{top}	section modulus about xx axis (mm ³)
Z _{bottom}	section modulus about xx axis (mm ³)
r _{xx}	radius of gyration (mm)
I _{yy}	moment of inertia second moment of area (mm ⁴)
r _{yy}	radius of gyration (mm)
xx	about xx axis
yy	about yy axis

Channel nuts

The safe working loads for zinc plated channel nuts only.

Slip M10 : 3.0kN

M12 : 3.5kN

Pullout M10 : 6.0kN

M12 : 8.0kN

Safety Factor 3 when tested to BS 6946

Torque tightened to : M10 : 5.5 kgf.m (40 ftlb)

M12 : 7 kgf.m (50 ftlb)

Framework brackets

Brackets are manufactured to BS 6946.

Unless otherwise stated brackets are made from 5 or 6 mm thick steel to BS EN 10025 Grade S275 RC.

Material properties

Minimum yield strength : 275 N/mm²

Maximum loads

Maximum loads for individual brackets are given with the illustrations on pages 104 to 107. In most cases the mode of failure will be slippage of the bracket along the channel. However there are few channel/bracket combinations where the maximum load is dependent upon the strength of the bracket itself. Only M10 or M12 channel nuts and bolts should be used for the attachment of load-bearing brackets.

Fasteners

Fixing brackets and supports to Swiftrack channel

Standard fasteners for Swiftrack are high tensile hexagon head setscrews to BS 3692-8.8 these being zinc plated to BS 3382 : Part 2.

Channel type	Fitting thickness	Recommended fastener
Deep channel series	6 mm and 8 mm 5 mm and 6 mm	M10 or M12 x 35 mm M10 or M12 x 20 mm
Shallow channel series	7 mm and 8 mm 5 mm and 6 mm	M10 or M12 x 25 mm M10 or M12 x 20 mm

(1) The use of too long a fastener will prevent proper tightening because the bolt end will foul the bottom of the channel before the head tightens down on the fitting

(2) When fastener brackets other than Swiftrack longer bolts may be required if the bracket thickness is greater than 8 mm

Fixing ladder to supports

Use M10 high tensile hexagon head setscrews. Screws should be 20 mm long for shallow channel and 35 mm long for deep channel.

Cantilever arms

Maximum uniformly distributed loads for individual cantilever arms are given on page 102. However should the loading not be uniform then the safe limit can be obtained by calculating the bending moment produced by the intended loads and comparing this with the maximum permissible bending moment for the relevant arm.

45 kgf.m for SA750 - SA755 and SA757

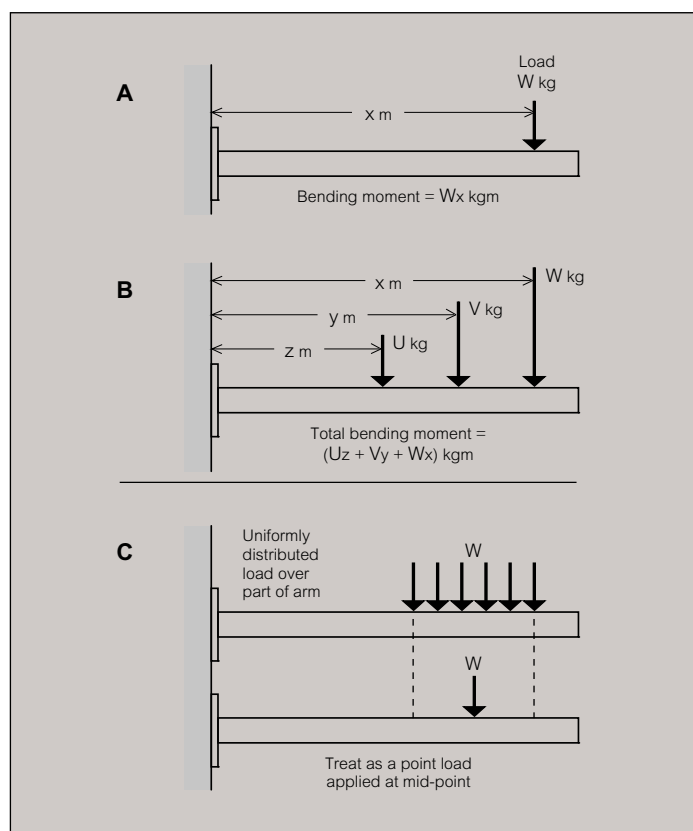
52 kgf.m for SA760 - SA766

95 kgf.m for SA770 - SA776

To obtain the bending moment resulting from any point load multiply the size of the load by its distance from the inner end of the arm (see illustration A).

If several point loads exist then the total bending moment will be the sum of the individual bending moment produced by each point load (see illustration B).

If some part of the total load applied to an arm is uniformly distributed along a section of the arm only then this part load can be treated as a point load acting at the mid-point of that section of arm to which it is applied (see illustration C).



Note

Assumes loads are rigidly fixed to cantilever arms in such a way as to prevent the arms from twisting.

Maximum safe recommended loadings

(Based upon a load factor of 1.6 for hot dip galvanised unrestrained condition as specified in BS EN 1993 1-3 : 2006)

Cantilever arms

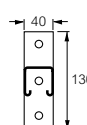
Cat os	nit eight g	rm length mm	a imum uni ormly distributed load g	oint load at outer end g
S	0 64	150	350 ⁽¹⁾	303
S	0 85	225	350 ⁽¹⁾	198
S	1 03	300	304	152
S	1 42	450	202	101
S	1 81	600	150	75
S	2 20	750	110	55
S	2 60	900	90	45



Values assume the ladder or other loading medium is rigidly fixed to cantilever arm

Cantilever arms universal

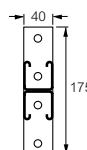
Cat os	nit eight g	rm length mm	a imum uni ormly distributed load g	oint load at outer end g
S	0 64	150	700 ⁽¹⁾	350
S	0 85	225	456 ⁽¹⁾	228
S	1 03	300	350	175
S	1 42	450	230	115
S	1 81	600	170	85
S	2 20	750	136	68
S	2 60	900	110	55



Values assume the ladder or other loading medium is rigidly fixed to cantilever arm

Cantilever arms double channel

Cat os	nit eight g	rm length mm	a imum uni ormly distributed load g	oint load at outer end g
S	1 14	150	700 ⁽¹⁾	648
S	1 68	225	700 ⁽¹⁾	420
S	2 02	300	650	325
S	2 90	450	430	215
S	3 78	600	320	160
S	4 66	750	250	125
S	5 60	900	200	100



Values assume the ladder or other loading medium is rigidly fixed to cantilever arm

Note

The loads for stainless steel cantilever arms are 60% of those given in the tables except those marked (1) where the limit is 50%.

Cantilever arm loads detailed in the tables above are for M12 screws and channel nuts.

Assumes loads are rigidly fixed to cantilever arms in such a way as to prevent the arms from twisting.

■ Channels used as beams

The maximum safe load for a channel can be calculated knowing the strength of the steel (yield stress). Alternatively if the appearance of the channel under load is considered important then its deflection can be kept within visually acceptable limits.

Deflection limitations may render a lower recommended loading than that calculated from the strength of the steel.

Thus the two alternative approaches are:

- 1) To apply a maximum mid-span deflection of 1/200th of the span.
- 2) To place no limit on deflection and to apply a maximum load derived from calculations which include both the minimum yield stress of the steel and a safety factor (1.6).

Details of the maximum recommended uniformly distributed and point loads under both of these conditions are given in the table on page 139 these are provided for both restrained and unrestrained conditions (see opposite) and they apply to the worst situation of a simple single span only.

If in practice loads are neither uniformly distributed across the complete beam nor imposed at mid-span only it is still possible to use a safe approximation and assess the suitability of a channel section. Do this by assuming that all loads are point loads imposed at mid-span only and then consider the point load data in the table. This approximation will render a cautious result which is nevertheless sufficient in most cases to show that a channel is satisfactory.

However if it does yield an unsatisfactory result check with Legrand as the degree of inherent caution is such that the design may still be safe. Legrand will be pleased to recheck your calculations using your intended loadings.

The data provided in the table on page 139 is calculated in accordance with BS 5950 Part 5.

■ Channels used as columns

It is rare that any loads will be applied only to the end of a vertical column most practical loading conditions involve the use of brackets and fittings attached to the open side of the channel. Loads applied in this way will produce a combined axial force down the column and a bending force on the side of the column which will reduce the allowable maximum load. The effects of such eccentric loadings should be carefully checked in accordance with standard design practice as given in BS 5950 Part 5.

Legrand will be pleased to give further advice and assistance on request.

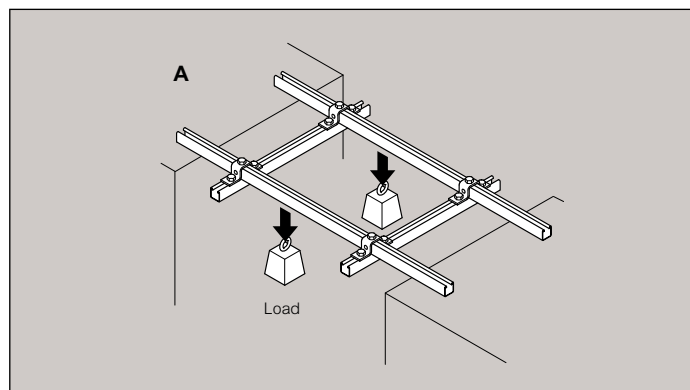
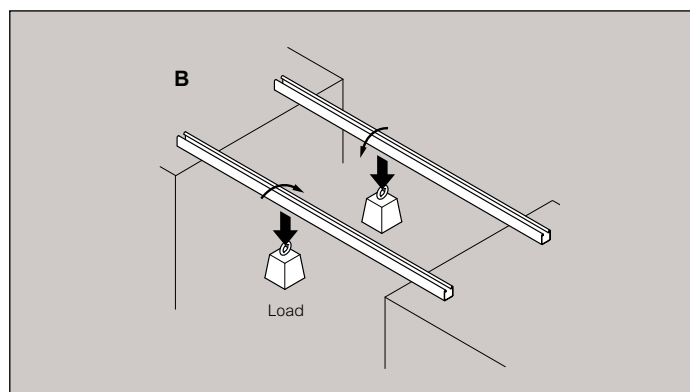
■ Fully restrained and unrestrained loads

There are two alternative approaches to providing information on the structural strength of channel section used as beams.

Data is sometimes given on the basis of a fully restrained condition which assumes that the channel section is in some way completely prevented from twisting under load (see illustration A). Alternatively data may be given on the basis of an unrestrained condition which assumes that because no channel is perfect placing it under load may result in some twisting taking place even though the ends of the channel are firmly secured (see illustration B).

Because the channel is constrained to remain in the optimum position data given on a fully restrained basis will for larger spans suggest that a far higher load can be applied than with the unrestrained condition.

Both alternative sets of data are given in the table on page 139 however unless positive intermediate restraint is applied to completely prevent any twisting it is recommended that the data for unrestrained channels given in the table opposite should normally be used.



Beam loads

Cat. Nos.	Distance between supports m	Laterally unrestrained condition				Fully laterally restrained condition			
		Safe maximum loads		Maximum deflection of span		Safe maximum loads		Maximum deflection of span	
		Uniformly distributed across span kgf	Point load at mid-span kgf	UD load kgf	Point load at mid-span kgf	Uniformly distributed across span kgf	Point load at mid-span kgf	UD load kgf	Point load at mid-span kgf
SC	0 20	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽¹⁾	700 ⁽¹⁾
SC	0 20	687	343	687 ⁽¹⁾	343 ⁽¹⁾	687	343	687 ⁽¹⁾	343 ⁽¹⁾
SC	0 20	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽¹⁾	700 ⁽¹⁾
SC	0 40	700 ⁽²⁾	561	700 ⁽²⁾	561 ⁽¹⁾	700 ⁽²⁾	561	700 ⁽¹⁾	561 ⁽¹⁾
SC	0 40	343	171	343 ⁽¹⁾	171 ⁽¹⁾	343	171	343 ⁽¹⁾	171 ⁽¹⁾
SC	0 40	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽¹⁾	700 ⁽¹⁾
SC	0 60	700	374	747 ⁽¹⁾	374 ⁽¹⁾	747	374	700 ⁽¹⁾	374 ⁽¹⁾
SC	0 60	226	113	226 ⁽¹⁾	113 ⁽¹⁾	228	114	228 ⁽¹⁾	114 ⁽¹⁾
SC	0 60	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700 ⁽²⁾	700	700 ⁽¹⁾	700 ⁽¹⁾
SC	0 80	543	271	543 ⁽¹⁾	271 ⁽¹⁾	560	280	560 ⁽¹⁾	280 ⁽¹⁾
SC	0 80	164	82	134	82 ⁽¹⁾	170	85	134	84
SC	0 80	700 ⁽²⁾	700	700 ⁽²⁾	700 ⁽¹⁾	700 ⁽²⁾	700	700 ⁽¹⁾	700 ⁽¹⁾
SC	1 00	419	210	419 ⁽¹⁾	210 ⁽¹⁾	447	223	447 ⁽¹⁾	223 ⁽¹⁾
SC	1 00	126	63	85	53	136	68	85	53
SC	1 00	700 ⁽²⁾	548	700 ⁽²⁾	548 ⁽¹⁾	700 ⁽²⁾	582	700 ⁽¹⁾	582 ⁽¹⁾
SC	1 20	336	168	336 ⁽¹⁾	168 ⁽¹⁾	371	186	371 ⁽¹⁾	186 ⁽¹⁾
SC	1 20	101	50	58	36	113	56	58	36
SC	1 20	700 ⁽²⁾	440	700 ⁽²⁾	440 ⁽¹⁾	700	484	700 ⁽¹⁾	484 ⁽¹⁾
SC	1 40	275	138	271	138 ⁽¹⁾	317	159	271	159 ⁽¹⁾
SC	1 40	83	41	42	26	96	48	42	26
SC	1 40	700	361	700 ⁽¹⁾	361 ⁽¹⁾	700	414	700 ⁽¹⁾	414 ⁽¹⁾
SC	1 60	230	115	206	115 ⁽¹⁾	277	139	206	129
SC	1 60	69	35	31	19	83	42	31	19
SC	1 60	604	302	604 ⁽¹⁾	302 ⁽¹⁾	700	362	700 ⁽¹⁾	362 ⁽¹⁾
SC	1 80	194	97	162	97 ⁽¹⁾	245	123	162	101
SC	1 80	59	29	23	15	73	37	23	15
SC	1 80	510	255	510 ⁽¹⁾	255 ⁽¹⁾	641	321	641 ⁽¹⁾	321 ⁽¹⁾
SC	2 00	165	83	130	81	220	110	130	81
SC	2 00	51	25	18	11	66	33	18	11
SC	2 00	434	217	434 ⁽¹⁾	217 ⁽¹⁾	575	288	575 ⁽¹⁾	288 ⁽¹⁾
SC	2 20	142	71	106	66	199	100	106	66
SC	2 20	44	22	14	9	59	29	14	9
SC	2 20	371	186	371 ⁽¹⁾	186 ⁽¹⁾	521	261	521 ⁽¹⁾	261 ⁽¹⁾
SC	2 40	123	61	87	55	182	91	87	55
SC	2 40	38	19	11	7	53	27	11	7
SC	2 40	319	160	319 ⁽¹⁾	160 ⁽¹⁾	476	238	460	238 ⁽¹⁾
SC	2 60	107	53	73	46	167	83	73	46
SC	2 60	33	17	8	5	49	24	8	5
SC	2 60	276	138	276 ⁽¹⁾	138 ⁽¹⁾	436	219	389	219 ⁽¹⁾
SC	2 80	94	47	61	38	154	77	61	38
SC	2 80	29	15	6	4	45	22	6	4
SC	2 80	240	120	240 ⁽¹⁾	120 ⁽¹⁾	405	202	333	202 ⁽¹⁾
SC	3 00	82	41	52	33	143	71	52	33
SC	3 00	25	13	4	3	41	21	4	3
SC	3 00	209	105	209 ⁽¹⁾	105 ⁽¹⁾	376	188	286	179

Column loads

Maximum axial column load ⁽⁴⁾		
Section	Column height m	kgf
SC	0 20	6325
SC	0 20	4279
SC	0 20	11475
SC	0 40	6217
SC	0 40	3850
SC	0 40	11375
SC	0 60	5982
SC	0 60	2879
SC	0 60	11041
SC	0 80	5640
SC	0 80	1867
SC	0 80	10621
SC	1 00	5102
SC	1 00	1253
SC	1 00	10035
SC	1 20	4346
SC	1 20	891
SC	1 20	9193
SC	1 40	3549
SC	1 40	664
SC	1 40	8088
SC	1 60	2872
SC	1 60	513
SC	1 60	6889
SC	1 80	2345
SC	1 80	408
SC	1 80	5792
SC	2 00	1938
SC	2 00	332 ⁽³⁾
SC	2 00	4874
SC	2 20	1625
SC	2 20	276 ⁽³⁾
SC	2 20	4131
SC	2 40	1381
SC	2 40	233 ⁽³⁾
SC	2 40	3534
SC	2 60	1186
SC	2 60	199 ⁽³⁾
SC	2 60	3051
SC	2 80	1030
SC	2 80	172 ⁽³⁾
SC	2 80	2658
SC	3 00	902
SC	3 00	150 ⁽³⁾
SC	3 00	2335

Note to tables

(1) Based on a limited deflection of $\frac{1}{200}$ the safe maximum load value is given which will give a deflection of $\frac{1}{200}$

(2) Limited by slip on a single bolt connection each end

(3) For columns the limiting slenderness ratio of 180 is exceeded at the length indicated

(4) It should be noted that maximum axial column loads are supplied for guidance only. It is unlikely that columns will be loaded with axial load only. Most practical load conditions will involve the use of brackets and fittings attached to the column. Loads applied in this way will produce both axial load and bending on the columns which will reduce the allowable maximum load

The above loads have been treated as imposed loads in accordance with BS 5950 Part 5 and

accordingly a load factor of γ_{f1} has been assumed. Should the loads to be applied be of a permanent nature it may be appropriate to use a load factor of γ_{f1} 4. This would lead to an increase in the load capacity provided that capacity is not limited by bolt slip or deflection

loads given in the chart are for pre galvanized channels to S 260 grade S 260 manufacturing channel increases the strength of the steel and this increase has been allowed for in the data as recommended in S 260 Part 5 channels are subsequently hot dip galvanized the stresses created during manufacture are relieved by the heat of the process thereby negating the strength enhancement here for or hot dip galvanized channels the loads in the chart should be reduced by between 10% and 20% depending on the section reduction will provide a conservative maximum load value for all types of hot dip galvanized channel

All loads are for brackets fixed with setscrews and not for plated channel nuts

Packaging handling storage and safety

IN THIS SECTION...

Export packaging

Handling and storage

Safety during installation phase

Export packaging

Safe handling

All Legrand products can be supplied packed appropriately for any mode of shipment.

The various packing options are illustrated below.

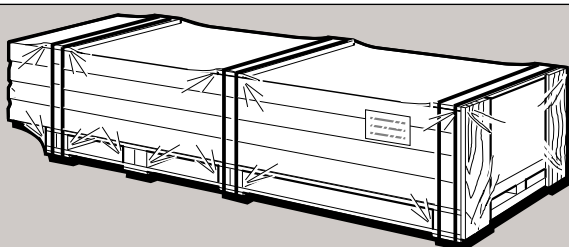
Further details and packing recommendations are available from Legrand contact us on 44 (0) 845 605 4333.

Even when appropriately packed it is most important that equipment is correctly loaded.

All equipment must be properly secured against movement during transit otherwise damage may occur during the journey.

Containerised seafreight

Straight lengths

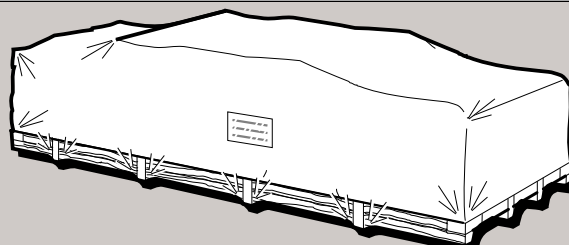


The specially designed wooden framework enables lifting of the pallet by fork lift vehicle from either side or one end only. It is also designed to prevent insertion of the forks between components which will cause damage.

Equipment is steel strapped to the wooden framework. If required the complete assembly is shrink wrapped in heavy duty polythene.

Shipping marks are applied to meet with contract requirements.

Cable ladder and support system accessories



The specially designed wooden framework enables lifting of the pallet by fork lift vehicle from either side or one end only. It is also designed to prevent insertion of the forks between components which will cause damage.

Equipment is steel strapped to the wooden framework. The complete assembly is shrink wrapped in heavy duty polythene.

Shipping marks are applied to meet with contract requirements.

Non-containerised seafreight road or airfreight

Straight lengths



Equipment is steel strapped onto a wooden base.

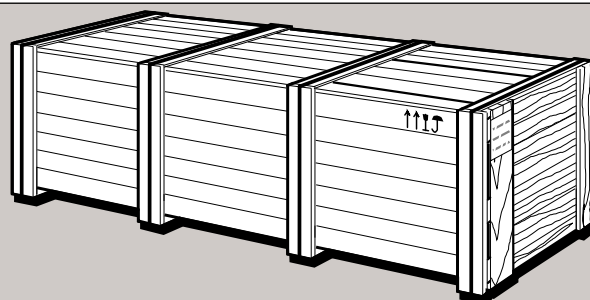
If required the complete assembly is shrink wrapped in heavy duty polythene.

Shipping marks are applied to meet with contract requirements.

Specialised packing

Legrand can also supply equipment packed in wooden crates or wooden cases for shipment to destinations where transhipment or rough handling en route is likely or where transport over rough terrain is anticipated.

Wooden casing



Equipment is steel strapped in suitable stacks.

Stacks are then tightly packed within a case constructed from close wooden boards with no gaps.

Wooden crating



Equipment is steel strapped in suitable stacks.

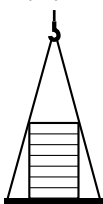
Each stack is then shrink wrapped in heavy duty polythene. Stacks are then tightly packed within a wooden crate.

Handling and storage

Safe handling

Site deliveries will only be made provided suitable mechanical handling equipment is available on site.

The delivered material must be treated with care. Lifting must only be carried out from the sides and lifting forks must pass below a complete stack. Forks must never be inserted into the end of the stack (unless goods are packed in special containerisation crates see Export Packaging on page 140) this practice is likely to cause the safety limits of most lifting vehicles to be exceeded and will certainly cause damage to the equipment being lifted.



For offloading by crane suitable lifting beams should be inserted from side to side beneath a stack and these must be sufficiently long to avoid undue pressure on the edges of the bottom components.



The tensioned banding used for securing bundles of equipment during transport is not suitable for lifting purposes. When cutting this banding appropriate eye protection must be worn to avoid injury.



Sheared steel (particularly pre-galvanised or stainless steel) does have relatively sharp edges and protective gloves must be worn during handling.

Storage

Most support equipment is supplied with a corrosion resistant finish (often hot dip galvanising) which will once the equipment is erected and open to the air have a service life of many years. However if hot dip galvanised equipment is allowed to become wet whilst stacked awaiting installation the finish can quickly suffer from unsightly staining and powdering on the surface. This is known as wet storage stain (see below) and the effects are particularly exaggerated if products are left in back to back contact.

It is therefore essential that all support system equipment is stored in a dry unheated environment and that the following precautions are observed to prevent deterioration on site :

- Any outer packaging should be removed from stacks immediately following delivery before the goods are placed in store.
- Store all support equipment under cover in dry unheated premises. Do not leave any uncovered part-used stacks lying outside for long periods.
- If stacks of equipment have become wet they must be re-stacked as soon as possible with wooden battens inserted between components to allow air to circulate.
- If no undercover storage is available then equipment should be re-stacked as in (c) immediately following delivery and a simple shelter using polythene or a tarpaulin should be erected over the stored equipment to protect it from rain. This covering should not be laid directly onto the stack as air must be allowed to circulate through and around the stored goods.
- Inspect stored goods regularly to ensure that moisture has not penetrated into the stacks.
- Do not store the delivered material where people will walk across it.

Wet storage stain

Failure to comply with the above storage conditions may result in galvanised material being quickly disfigured by wet storage stain. Fortunately this problem is rarely serious and (unless the poor storage conditions have continued unchecked for several months) it has no significant effect on the long term corrosion resistance of the finish. Where equipment has been affected by wet storage stain the unsightly marking will usually become much less prominent and will often disappear completely within months of installation.

Safety during installation phase

Site safety

Heavy duty cable ladders are designed for rugged conditions and can withstand some abuse. However they are not designed or intended for use as walkways or scaffolds and proper working platforms or temporary access scaffolding must be provided for the use of installation personnel.

Control of hazardous substances



Legrand cable management support systems will have a surface coating of either zinc light oil or a plastic material depending upon the specified finish.



If any welding of equipment is carried out these substances can give rise to fumes and so appropriate ventilation must be provided to ensure the exposure of the operator is kept below the statutory limits.



The current occupational exposure limits for zinc oxide fumes published by the U.K. Health & Safety Executive are 10mg/m³ for short term exposure and 5mg/m³ for long term exposure.

Relevant British European and International standards

Standard Type	BS No	Part	Title
BS			Specification for resistance spot welding of uncoated and coated low carbon steel.
BS EN			Zinc and zinc alloys. Primary zinc.
BS EN ISO			Hot dip galvanised coatings on fabricated iron and steel articles specifications and test methods.
BS			Coatings on metal fasteners. Specification for electroplated zinc coatings
BS EN ISO			Metallic and other inorganic coatings. Electroplated coatings of zinc with supplementary treatments on iron or steel
BS EN ISO			Mechanical properties of corrosion resistant stainless steel fasteners. Part 1 Bolts Screws and Studs.
BS EN ISO			Mechanical properties of corrosion resistant stainless steel fasteners. Part 2 Nuts.
BS			ISO metric precision hexagon bolts screws and nuts. Specification.
BS			Specification for metal washers for general engineering purposes. Metric series.
BS			Specification for approval testing of welders when welding procedure approval is not required. Fusion welding of steel.
BS			Structural use of steelwork in building.
BS			Chromate conversion coatings on electroplated zinc and cadmium coatings.
PD			Commentary on corrosion at bimetallic contacts and its alleviation.
BS			Specification for metal channel cable support systems for electrical installations.

Standard Type	BS No	Part	Title
BS			Requirements for electrical installations. IEE Wiring Regulations. Seventeenth Edition.
BS EN ISO			Quality management systems - fundamentals and vocabulary.
BS EN ISO			Quality management systems - requirements.
BS EN ISO			Quality management systems - guidelines for performance improvements.
BS EN			Hot rolled products of structural steels. Technical delivery conditions for non alloy structural steels.
BS EN			Hot rolled products of structural steels. Technical delivery conditions for structural steels with improved atmospheric corrosion resistance.
BS EN			Stainless steels. Part 1: List of stainless steels.
BS EN			Stainless steels. Part 2: Technical delivery conditions for steel sheet/plate and strip of corrosion resisting steels for general purposes.
BS EN			Stainless steels. Part 3: Technical delivery conditions for semi-finished products bars rods wire sections and bright products of corrosion resisting steels for general purposes.
BS EN			Continuously hot-dip coated steel flat products. Technical delivery conditions.
BS EN ISO			Paints and varnishes - Corrosion protection of steel structures by protective paint systems. Part Protective paint systems.
BS EN ISO			Zinc coatings. Guidelines and recommendations for the protection against corrosion of iron and steel in structures. General principles of design and corrosion resistance.
BS EN ISO			Hot dip galvanising. Guidelines and recommendations for the protection against corrosion of iron and steel in structures. General principles of design and corrosion resistance.
IEC			Cable Tray systems and cable ladder systems for cable management.
BS EN		.	Eurocode 1 : Action on structures. General actions : snow loads
BS EN		.	Eurocode 1 : Action on structures. General actions : wind loads
BS EN		.	Eurocode 3 : Design of steel structures. General rules. Supplementary rules for cold-formed members and sheeting.

Cat. Nos.	Page No.	Cat. Nos.	Page No.	Cat. Nos.	Page No.	Cat. Nos.	Page No.	Cat. Nos.	Page No.	Cat. Nos.	Page No.
		EL450F	18	PL900F	16	SA773	26	SC852/21	28	ZCURF	22
		EL600F		PLFEB	21	SA774		SC852/41		ZDV F	
		EL750F		PLR KF	17	SA775		SC852/82		ZEF	21
5572 33	31	EL900F		PN060	25	SA776		SC853		ZFB ArF	14
5572 43		ELR KF		PN061		SA790		SC854		ZFCF	
5572 53		ENF	21	PN062		SA791		SC855		ZFF	21
5572 63		EOR ArF	18	PN080		SA792		SC856		ZHF	
5572 73		EORC ArF	23	PN081		SA793		SC950B		ZIR ArF	14
5572 83		EORV ArF		PN082		SA794		SC950		ZIRC ArF	23
		EPF	21	PN100		SA795		SC951B		ZIRV ArF	
		ERBF	20	PN101		SA796		SC951		Z F	21
		ER F	23	PN102		SB500	27	SC952		ZL150F	14
		ERR KF	19	PN120		SB501		SC953		ZL300F	
87665 02	31	ESR KF		PN121		SB502		SP960		ZL450F	
87665 03		ES F	22	PN122		SB503		SP964		ZL600F	
87665 04		ETBF		PNF	21	SB504		SP965		ZL750F	
87665 05		ET rRF	19	POR ArF	16	SB505		SP968		ZL900F	
87665 06		EUT BrRF		PORC ArF	23	SB50606		SP969		ZLR KF	15
87665 07		EVF	22	PORV ArF		SB50608		SP972		ZNF	21
87665 08		E SBF	20	PPF	21	SB50610		SP973		ZOR ArF	14
87665 09		E rRF	19	PR F	23	SB50612		SP975		ZORC ArF	23
87665 10				PRBF	20	SB507		SP976		ZORV ArF	
87665 11				PRR KF	17	SB508		SS0616	24	ZPF	21
87665 12		F		PSR KF		SB509		SS0620		ZR F	23
87665 13				PS F	22	SB510		SS0625		ZRBF	20
87665 14		FL2	28	PTBF		SB511		SS0630		ZRR KF	15
87665 15		F 06	24	PT rRF	17	SB513		SS0820	29	ZSR KF	
87665 16		F 08		PUT BrRF		SB514		SS0825		ZS F	22
87665 18		F 10		PVF	22	SB515		SS0830		ZT rRF	
87665 20		F 12		P 06	30	SB518	28	SS0835		ZTB F	
87665 30				P 08		SB520	27	SS0840		ZUT BrRF	15
87665 45				P 10		SB524		SS0850		ZVF	22
87665 50		H		P 12		SB526		SS1016	24	Z SBF	20
87665 60				P SBF	20	SB528		SS1020		Z rRF	15
87665 70		HCA F	20	P rRF	17	SB532		SS1025			
		HN06	24			SB534		SS1030			
A		HN08		R		SB536	27	SS1035			
		HN10	24			SB550		SS1040			
AMB F	23	HN12				SB551		SS1045			
		HTH F	20			SB552		SS1050			
						SB554		SS1060			
C						SB555		SS1220			
		L				SB556		SS1225			
						SB600	28	SS1230			
CSBF	23	LFGM10P50	14			SB601		SS1235			
CP1035	29	LFSM10P50				SB602		SS1240			
CP1035S						RB0625		SS1250			
CV F	23					RB0630	27	SSG0612	29		
		M				RB0640		SSG0616	24		
						RB0650		SSG0620			
D		MF	22			RBG0612		SSG0625			
		MPF	23			RBG0616	28	SSG0630			
DO F	22					RC06		SSG0635	29		
						RC08		S 06			
		P				RC10		S 08			
						RC12		S 10			
E						R G06	30	S 12			
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EB08		PB 300R	17	S						TR06	24
EB10		PCF								TR08	
EBF	20	PCURF	22			SA750	26			TR10	
EB 300R	19	PDVF				SA751		SC2003M		TR12	
ECF	18	PFCF	16			SA752		SC2006M		T 06	30
ECURF	22	PEF	21			SA753		SC2033M		T G06	
EDVF		PFB ArF	16			SA754		SC2036M			
EEF	21	PF F	21			SA755		SC2103M			
EFB ArF	18	PHF				SA757		SC2133M			
EFCF		PIR ArF	16			SA760		SC4003M			
EFF	21	PIRC ArF	23			SA761		SC4006M			
EHF		PIRV ArF				SA762		SC4013M			
EIR ArF	18	P F	21			SA763		SC4016M		Z	
EIRC ArF	23	PL150F	16			SA764		SC4033M			
EIRV ArF		PL300F				SA765		SC4036M		ZAR F	22
		PL450F				SA766		SC4103M		ZB 300R	15
E F	21	PL600F				SA770		SC4133M		ZC1	28
EL150F	18	PL750F				SA771		SC850	28	ZCF	14
EL300F						SA772		SC851			

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