



Citylabs 4.0

125592/FO/2019: Erection of a seven storey building comprising flexible Office (Use Class B1a), Research and Development (Use Class B1b) and Educational Space (Use Class D1), together with ground floor ancillary Retail uses (Use Classes A1 and A3), in addition to associated cycle parking, accessible car parking, landscaping, provision of plant and servicing and related access and highway's works, and other associated works (associated advert application reference 125593/AO/2019)

Condition 15a External Mounted Plant

GMI Construction Group Ltd
Carver's Warehouse
77 Dale St
Greater
Manchester
M1 2HG

25/11/24

FAO Andy King

Citylabs 4.0 – L025 - CL4 PC 15A - External Plant

Dear Andy,

As M&E Contractor on the above project we would confirm that the Externally mounted plant, equipment and servicing has been acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 db (L_{aeq}) below the typical background (L_{a90}) level at the nearest noise sensitive location.

Documentation referenced

Caice Acoustics Ltd Attenuator Design Appraisal 100371/99/1/16 Dated 16/02/2024

Attenuator Schedule 100371/Q00003 Dated 16/02/2024

L025-SOL-XX-01.XX-T-O-000001 P01 Stage 5 Acoustic Design Assessment

DESIGN APPRAISAL - Document Ref: 100371/99/1/20 Dated 23/04/2024

Yours Sincerely



Matt Gill

Senior Project Manager



Kng Building Services Ltd
2 Munroe Court
White Rose Office Park
Millshaw Park Lane
Leeds
West Yorkshire
United Kingdom
LS11 0EA

Date: 16 February 2024
Document Ref: 100371/99/1/16
Re: City Labs 4. 0

For the attention of Matt Gill,

Please find attached a carbon copy letter.

Yours faithfully,

Andrew Fountain
Senior Contracts Engineer (Attenuators)

Direct Dial 0118 918 6468
E-Mail andrew.fountain@caice.co.uk

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0118 918 6480
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Caice Acoustic Air Movement Ltd.
Riverside House
3 Winnersh Fields
Gazelle Close
Winnersh
Wokingham
RG41 5QS

Registered office and
head office

Company Registration Number
2790667
VAT Registration Number
GB614683632



Dave Dickinson And Associates Ltd
Ahed House
Dewsbury Road
Ossett
West Yorkshire
United Kingdom
WF5 9ND

Our Reference
100371/99/1/16

Subject
City Labs 4. 0

16 February 2024

For the attention of Andy Parry,

Further to your recent enquiry please find attached the following details for your consideration:

- Design Appraisal
- Attenuator Schedule
- Attenuator Drawings

We hope the attached will be of assistance, however should you require any further information please do not hesitate to contact us.

Yours faithfully,

Andrew Fountain
Senior Contracts Engineer (Attenuators)
Direct Dial 0118 918 6468
E-Mail andrew.fountain@caice.co.uk

Cc:

Matt Gill, Kng Building Services Ltd

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DESIGN APPRAISAL

Project: City Labs 4. 0

Enquiry Data

Our product selections are based on the following information:

- Specification sections : Sol acoustics
- Schedule numbers :
- Drawing numbers : L025-KNG-50-01.ZZ-D-M-50RF01
L025-KNG-57-01.GF-D-M-570001 - P02
L025-KNG-57-01.06-D-M-570601 - P03
L025-KNG-57-01.05-D-M-570501 - C01
L025-KNG-57-01.04-D-M-570401 - P03
L025-KNG-57-01.03-D-M-570301 - P03
L025-KNG-57-01.02-D-M-570201 - P03
L025-KNG-57-01.01-D-M-570101 - P02

Please ensure that this is the correct data and advise of any subsequent revisions as this may affect the performance of our products.

Project Design Criteria

The following noise criteria has been used as the basis of our design appraisal:

Internal:

- NR38 : Office
- NR40 : Labs, Circulation, Toilets

Measured in fully furnished rooms at a distance of 1.5 metres from any grille, diffuser or wall structure, or 1.5 metres above floor level in rooms exceeding 3.0 metres in height.

External:

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0118 918 6470
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enquiries@caice.co.uk
www.caice.co.uk

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- 45dB(A) at a distance of 15 metres from intake and/or discharge openings.

In the absence of a specified external noise criteria we have used the above as a provisional criteria, enabling us to undertake preliminary calculations. We would recommend that you seek approval of this criteria from your client and the local Environmental Health Department.

Plant Noise Data

Our calculations are based on the fan manufacturer's sound power level data excluding their stated measurement tolerance. If required we can reselect the attenuators taking into account this tolerance but our price will increase accordingly.

Attenuator Selection

The attenuators have been selected to achieve the design criteria as listed previously. The following noise paths have been taken into account:

- Primary fan noise transmission through the ductwork distribution system to internal occupied areas via grills/diffusers.
- Fan noise transmission through the ductwork distribution system to external areas, via the intake and discharge openings (where attenuators are proposed).
- Crosstalk noise transmission between adjacent rooms via the ductwork distribution system in areas (where crosstalk attenuators are proposed).

Attenuator Location

To comply with BS EN ISO7235:2009, all our attenuator pressure losses are stated assuming laminar inlet and outlet airflow. Where unfavourable inlet and outlet conditions exist, allowance should be made in the system pressure for increased attenuator resistances. Please be aware that actual resistances measured across attenuators installed in poorly designed ductwork arrangements can be 3-4 times higher than that shown on our schedules.

Where attenuators are located outside the building, we would suggest that they are treated to the same specification as any associated external ductwork.

Acoustic Treatment to ductwork

Where attenuators are located in plantroom areas, it is good design practice to acoustically lag the ductwork from the attenuator to the point at which the duct penetrates and exits the plantroom structure. This is particularly appropriate in noisy plantrooms, to reduce the possibility of noise re-entry into the duct on the "quiet" side of the attenuator.

It is not recommended that main plant attenuators be installed in or above areas with specified noise design criteria. If this situation is unavoidable, then additional acoustic treatment (such as double skinning of attenuators) may be required in order to achieve a satisfactory noise climate.

Radiated Noise from Equipment Casings and Ductwork

Where mechanical equipment is located in or above areas with specified noise criteria, it is essential that the level of noise radiated from the equipment casings is controlled to an appropriate level.

As radiated noise levels from plant and equipment are not affected by in-duct attenuation, additional acoustic treatment (such as bulkheads or enclosures) may be required in order to achieve a satisfactory noise climate.



The responsibility for achievement of criteria due to noise radiation from equipment casings should be placed upon the relevant manufacturers. The manufacturers should be issued with sufficient design information to enable them to underwrite the acoustic performance of their products relative to this particular application.

Attenuators will only reduce duct borne fan noise via the distribution grilles, which is the extent of our responsibility and therefore acoustic lagging maybe required between the equipment casing and attenuators. Any such lagging should also include the casing of the attenuator.

Ductwork Systems

To reduce the possibility of airflow generated noise exceeding the specified design criteria, good design practice (with reference to DW/144, HVAC and CIBSE recommendations) should be adopted when considering ductwork geometry and fittings.

Ductwork configurations that promote turbulent airflow must be avoided, particularly in close proximity to acoustically critical components such as attenuators, grilles, diffusers, dampers etc. In some cases, excessive resistances arising from poor ductwork design may prevent ventilation systems from achieving their full design duty.

Dampers should be installed as far away from air terminals as possible, and used only for fine trimming. Where major reductions in airflow or pressure are required, then fan speed reduction or system design should be considered.

Ductwork Velocities

With consideration to acoustics, the following guide duct velocities (m/s) should be adhered to where possible:

Description	NR40	NR35	NR30	NR25
Riser	9.0	7.5	6.0	5.0
Main Branch (above ceiling)	6.0	5.0	4.0	3.0
Grille	3.0	2.5	2.0	1.5
Diffuser	2.5	2.0	1.5	1.0
Stub duct (above ceiling)	4.0	3.0	2.0	1.5

Attenuator Schedule

City Labs 4. 0

Schedule Date
16/02/2024
Caice Reference
100371/Q00003

Notes

1. All products shall be supplied by Caice or equal and approved, as per their file reference 100371, contact Dawn Southwell on dawn.southwell@caice.co.uk or call 07395 886832.
2. The Contractor shall order the attenuators scheduled below, and shall send finalised drawings and equipment noise levels to the attenuator supplier to check the selections prior to manufacture.
3. The attenuator supplier shall then undertake acoustic calculations to ensure that the attenuators achieve the specified noise criteria, based upon the finalised information.
4. A Technical Submittal comprising acoustic calculations and a finalised schedule of attenuators shall then be issued to the Consultant for final approval.
5. If an alternative attenuator supplier is proposed then the Contractor shall allow for them to undertake witnessed tests to prove their claimed insertion loss performance in a UKAS accredited BS EN ISO 7235: 2009 test facility, for two sample units. This shall be undertaken prior to order.
6. Pressure losses are stated in accordance with ISO 7235, which is based on laminar airflow conditions. The system designer shall make allowance for increased attenuator pressure losses where turbulent airflow conditions exist on the attenuator entry or exit.
7. Unless stated otherwise all attenuators shall be constructed as follows: Galvanised sheet steel casings with 30mm profile flanges that are fully compliant with DW/TM1 at a high pressure rating (+2000/-750Pa). Profile flanges shall be compatible with Doby, Mez & Metu flanging systems. Elements shall be installed in the vertical plane, with side elements provided as standard, and all elements shall have aerodynamic inlet and outlet fairings. Element facings shall be constructed from expanded galvanised steel mesh with fibre glass tissue bonded to the inner face. Mineral wool infill shall be overpacked to minimise voids due to settlement. Attenuator ends shall be protectively wrapped, and all attenuators shall be delivered to site on pallets and individually labelled.

Product Reference	Product Description	Product Code	Width	Dimensions (mm) Height	Length	Volume (m³/s)	Pressure Loss (Pa)	Quantity	Features
ATT-01	AHU01 SUPPLY	Rectangular SG01V/3C/L/S	1200	900	1800	5.23	35	1	Rectangular attenuator
ATT-02	AHU01 EXTRACT	Rectangular SG01V/3C/L/S	1200	900	1800	5.75	33	1	Rectangular attenuator
ATT-03	AHU01 EXHAUST	Rectangular SG01V/3C/L/S	1200	900	900	5.23	35	1	Rectangular attenuator
ATT-04	AHU01 FAI	Rectangular SG01V/3C/L/S	1200	900	900	5.75	28	1	Rectangular attenuator
ATT-05	AHU02 EXTRACT	Rectangular SG01V/3C/L/S	1100	900	1800	4.91	37	1	Rectangular attenuator
ATT-06	AHU02 SUPPLY	Rectangular SG01V/3C/L/S	1100	900	1800	4.91	37	1	Rectangular attenuator

Attenuator Schedule

City Labs 4. 0

Schedule Date

16/02/2024

Caice Reference

100371/Q00003

Product Reference	Product Description	Product Code	Width	Dimensions (mm) Height	Length	Volume (m³/s)	Pressure Loss (Pa)	Quantity	Features
ATT-07	AHU02 FAI	Rectangular SG01V/3C/L/S	1100	900	900	4.91	32	1	Rectangular attenuator
ATT-08	AHU02 EXHAUST	Rectangular SG01V/3C/L/S	1100	900	900	4.91	32	1	Rectangular attenuator
ATT-09	AHU03 EXTRACT	Rectangular SG01V/3C/L/S	1200	1000	1800	6.87	31	1	Rectangular attenuator
ATT-10	AHU03 SUPPLY	Rectangular SG01V/3C/L/S	1200	1000	1800	6.97	32	1	Rectangular attenuator
ATT-11	AHU03 FAI	Rectangular SG01V/3C/L/S	1200	1000	900	6.97	33	1	Rectangular attenuator
ATT-12	AHU03 EXHAUST	Rectangular SG01V/3C/L/S	1200	1000	900	6.87	32	1	Rectangular attenuator
ATT-13	AHU04 EXHAUST	Rectangular SG01H/3C/L/S	1200	900	900	5.70	28	1	Rectangular attenuator & Horizontal elements
ATT-14	AHU04 FAI	Rectangular SG01V/3C/L/S	1200	1200	900	7.94	30	1	Rectangular attenuator
ATT-15	AHU04 EXTRACT	Rectangular SG01V/3C/L/S	1200	900	1800	5.70	32	1	Rectangular attenuator
ATT-16	AHU04 SUPPLY	Rectangular SG01V/3C/L/S	1200	1200	1800	7.94	35	1	Rectangular attenuator
ATT-17	AHU05 EXHAUST	Rectangular SG01V/3C/L/S	850	500	900	2.62	35	1	Rectangular attenuator
ATT-18	AHU05 FAI	Rectangular SG01V/3C/L/S	850	500	900	2.62	35	1	Rectangular attenuator
ATT-19	AHU05 EXTRACT	Rectangular LG02H/3C/L/S	850	500	1800	2.62	32	1	Rectangular attenuator, Unit delivered in 2 sections, split in length & Horizontal elements
ATT-20	AHU05 SUPPLY	Rectangular LG02H/3C/L/S	850	500	1800	2.62	32	1	Rectangular attenuator, Unit delivered in 2 sections, split in length & Horizontal elements

Attenuator Schedule

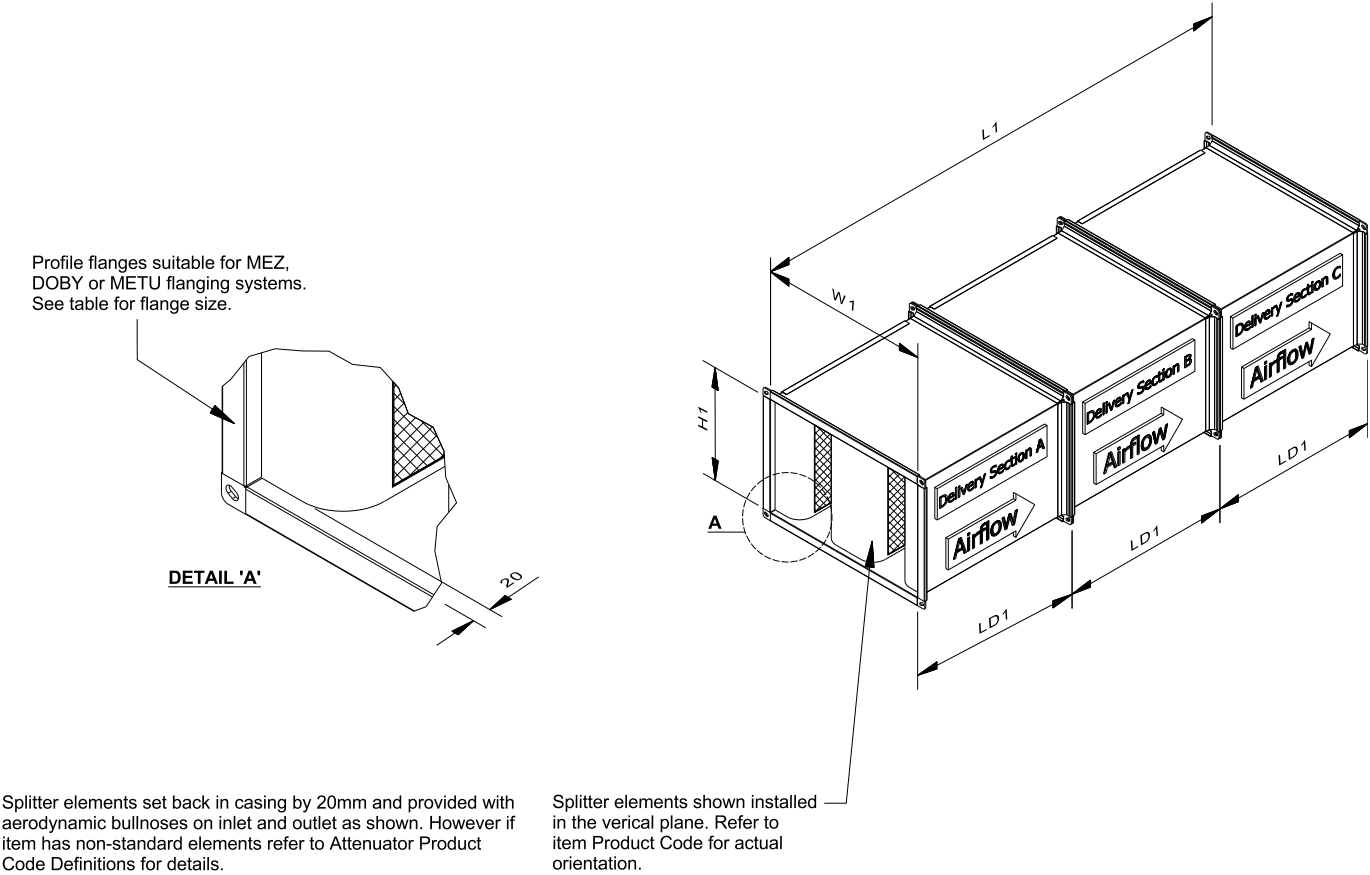
City Labs 4. 0

Schedule Date
16/02/2024
Caice Reference
100371/Q00003

Product Reference	Product Description	Product Code	Width	Dimensions (mm) Height	Length	Volume (m³/s)	Pressure Loss (Pa)	Quantity	Features
ATT-21	AHU06 SUPPLY	Rectangular SG01V/3C/L/S	550	1000	1800	3.31	34	1	Rectangular attenuator
ATT-22	AHU06 EXTRACT	Rectangular SG01V/3C/L/S	550	1000	1800	3.31	34	1	Rectangular attenuator
ATT-23	AHU06 FAI	Rectangular LG01H/3C/L/S	800	800	900	3.31	27	1	Rectangular attenuator & Horizontal elements
ATT-24	AHU06 EXHAUST	Rectangular LG01H/3C/L/S	800	800	900	3.31	27	1	Rectangular attenuator & Horizontal elements
ATT-25	TEF/01 LANDLORD EXT	Rectangular LG01V/3C/L/S	400	400	1200	0.75	31	1	Rectangular attenuator
ATT-26	TEF/01 LANDLORD EXH	Rectangular LG01V/3C/L/S	400	400	900	0.75	29	1	Rectangular attenuator
ATT-27	TEF/02 LANDLORD EXT	Rectangular LG01V/3C/L/S	600	600	1200	1.97	36	1	Rectangular attenuator
ATT-28	TEF/02 LANDLORD EXH	Rectangular LG01V/3C/L/S	600	600	900	1.97	34	1	Rectangular attenuator

SG Splitter Attenuator with Profile Flanges

City Labs 4. 0 (100371/Q00003)

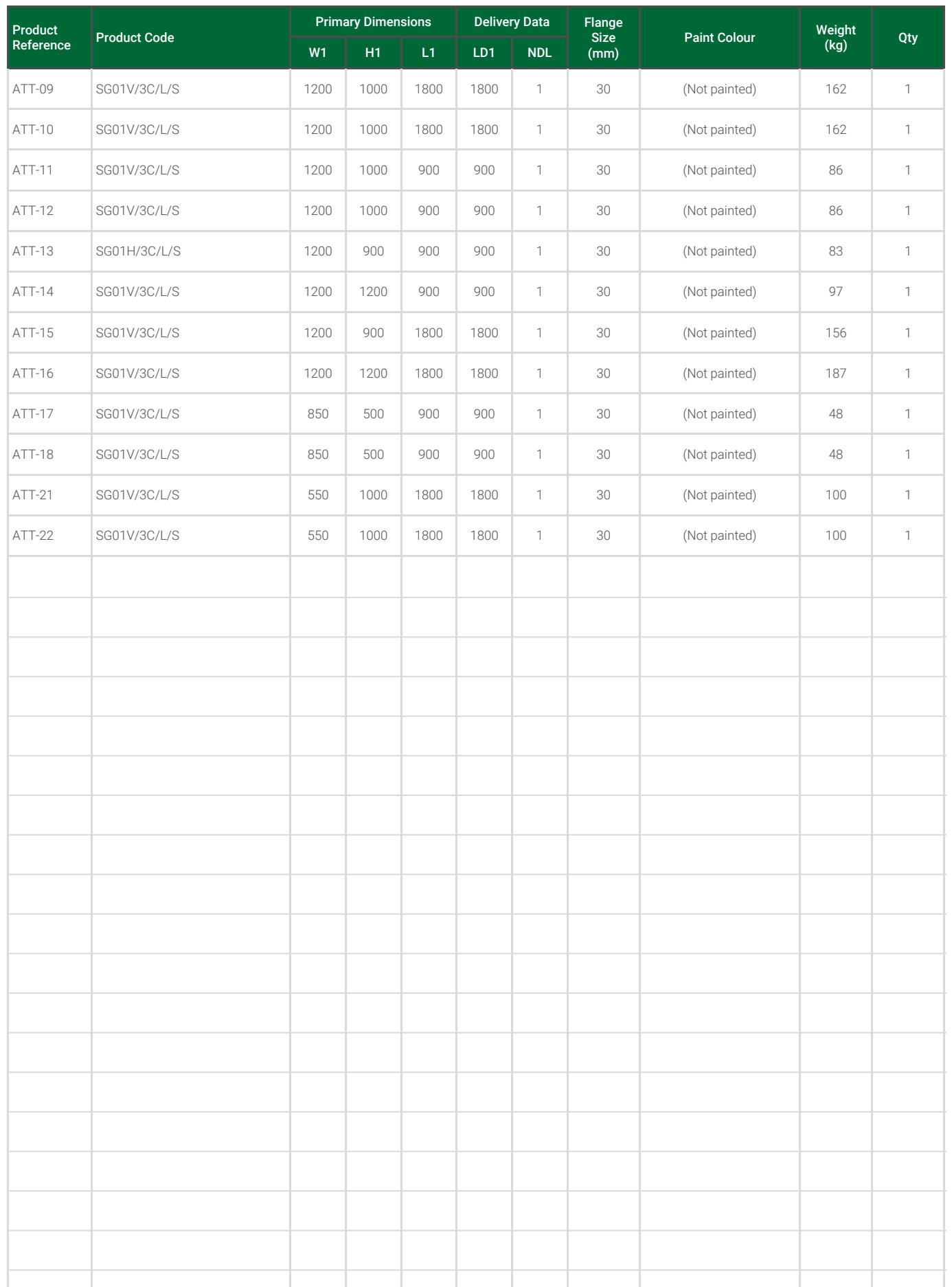


Notes

- Assembly of multiple piece items must be in accordance with the delivery section and airflow label layouts, typically as shown opposite. Assembly by others.
- Where LD1 exceeds 1250 each delivery section has an intermediate central flange.
- See NDL in table below for number of delivery sections in length per item.
- Nuts, bolts, flange clamps and gasket between flanges by others.
- Tolerances on W1 & H1 +/- 2mm.
- All dimensions in mm.
- Identification labels stating Product Reference and Description provided on all delivery sections.
- Attenuators may be delivered in 1, 2, 3 or 4 sections in length (3 shown).
- Delivery section and airflow labels only provided on multiple piece items.
- W1 and H1 dimensions are inside case.
- Tolerances on LD1 +/- 3mm.

Product Reference	Product Code	Primary Dimensions			Delivery Data		Flange Size (mm)	Paint Colour	Weight (kg)	Qty
		W1	H1	L1	LD1	NDL				
ATT-01	SG01V/3C/L/S	1200	900	1800	1800	1	30	(Not painted)	161	1
ATT-02	SG01V/3C/L/S	1200	900	1800	1800	1	30	(Not painted)	156	1
ATT-03	SG01V/3C/L/S	1200	900	900	900	1	30	(Not painted)	94	1
ATT-04	SG01V/3C/L/S	1200	900	900	900	1	30	(Not painted)	81	1
ATT-05	SG01V/3C/L/S	1100	900	1800	1800	1	30	(Not painted)	153	1
ATT-06	SG01V/3C/L/S	1100	900	1800	1800	1	30	(Not painted)	153	1
ATT-07	SG01V/3C/L/S	1100	900	900	900	1	30	(Not painted)	79	1
ATT-08	SG01V/3C/L/S	1100	900	900	900	1	30	(Not painted)	79	1

City Labs 4.0 (100371/Q00003)

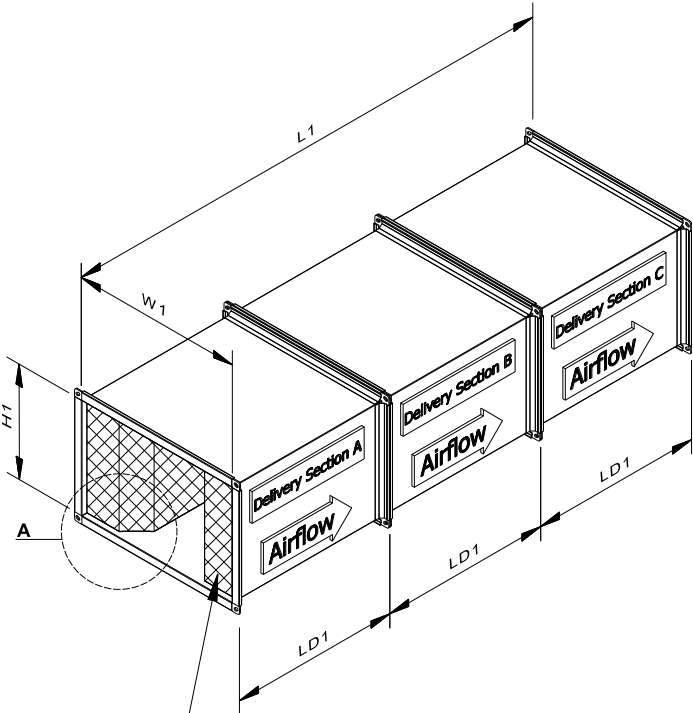
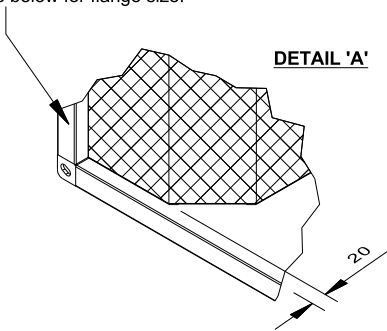


LG Lining Attenuator with Profile Flanges

City Labs 4. 0 (100371/Q00003)



Profile flanges suitable for MEZ, DOBY or METU flanging systems. See table below for flange size.



Lining elements set back in casing by 20mm and provided with aerodynamic fairings on inlet and outlet as shown. However if item has non-standard elements refer to Attenuator Product Code Definitions for details.

Lining elements shown installed in the vertical plane. Refer to item Product Code for actual orientation.

Notes

- Assembly of multiple piece items must be in accordance with the delivery section and airflow label layouts, typically as shown opposite. Assembly by others.
- Where LD1 exceeds 1250 each delivery section has an intermediate central flange.
- See NDL in table below for number of delivery sections in length per item.
- Nuts, bolts, flange clamps and gasket between flanges by others.
- Tolerances on W1 & H1 +/- 2mm.
- All dimensions in mm.
- Identification labels stating Product Reference and Description provided on all delivery sections.
- Attenuators may be delivered in 1, 2, 3 or 4 sections in length (3 shown).
- Delivery section and airflow labels only provided on multiple piece items.
- W1 and H1 dimensions are inside case.
- Tolerances on LD1 +/- 3mm.

Product Reference	Product Code	Primary Dimensions			Delivery Data		Flange Size (mm)	Paint Colour	Weight (kg)	Qty
		W1	H1	L1	LD1	NDL				
ATT-19	LG02H/3C/L/S	850	500	1800	900	2	30	(Not painted)	75	1
ATT-20	LG02H/3C/L/S	850	500	1800	900	2	30	(Not painted)	75	1
ATT-23	LG01H/3C/L/S	800	800	900	900	1	30	(Not painted)	45	1
ATT-24	LG01H/3C/L/S	800	800	900	900	1	30	(Not painted)	45	1
ATT-25	LG01V/3C/L/S	400	400	1200	1200	1	30	(Not painted)	26	1
ATT-26	LG01V/3C/L/S	400	400	900	900	1	30	(Not painted)	21	1
ATT-27	LG01V/3C/L/S	600	600	1200	1200	1	30	(Not painted)	41	1
ATT-28	LG01V/3C/L/S	600	600	900	900	1	30	(Not painted)	32	1

Product Code Definitions

City Labs 4.0

Quotation Date
16/02/2024
Caice Reference
100371/Q00003

Attenuator



Code Section	Code	Definition
Model	L	Rectangular attenuator with LINING elements
	S	Rectangular attenuator with SPLITTER elements
Material	G	Standard gauge galvanised sheet steel
Delivery Sections	01	Number of sections delivered to site
Element Type	V	Elements installed in the vertical plane
	H	Elements installed in the horizontal plane
Pressure Rating	3	High pressure (+2000/-750Pa)
End Connections	C	30mm profile flanges (profile flanges are compatible with Doby, Mez & Metu flanges)
Packing	L	Lightweight pallet wrapping on casing ends (EG/IG units are palletised and wrapped on the pallet)
Optional Features	S	Side elements (for EG/IG units these are supplied with steel backing)

