

Removal of Paint, Pointing & Brick Replacement Trials – Piccadilly Warehouses



This documentation has been produced by WJ Structures Ltd in relation to Piccadilly Warehouse – 11 Bloom Street. WJ Structures Ltd are undertaking numerous samples to surfaces and were asked to undertake the cleaning of brickwork, timber beams, steel beams, repointing, brick repair and brick replacement.

The paint being removed in the sample areas is noted not to be lead based paint, however, some areas within the scheme at Piccadilly Warehouse's are known to be lead based. Therefore, all works are to be undertaken in line with The Control of Lead at Work Regulation 2002 (CLAW).

These works are also to be undertaken in compliance with the Health and Safety at Work Act 1974, The working at height regulations act 2005, Construction design management regulations 2015 and Control of Substances Hazardous to Health Regulations 1998.

General Scope of Cleaning Methods Used:

- DOFF Integra (External – Not yet complete).
- TORC
- Microstrip (Sat)

General Scope of Samples:

- Masonry
- Timber Beams
- Steel Beams
- Pointing
- Brick Repair and Replacement

These cleaning methods are used to undertake the removal of:

- Paint (Lead Based)
- Carbon Build Up
- Paint Residue
- Plaster Residue
- Limescale

Lead Based Paint Areas

Note: Refer to separate Paint Toxicity Survey report and drawings for specific details of leadtoxin levels throughout the building.

Note: High levels of lead toxin have been detected throughout original ironwork / metalwork / brickwork coatings and throughout original painted joinery.

Lead paint removal must be undertaken by either approved chemical paint softeners / strippers / poulticing or wet abrasive slurry blast methods or other approved industry approved methods, but not by any dry abrasive method.

WJ Structures Ltd will detail the methods in the removal of lead-based paint and associated cleaning works. All works must be approved by the main contractor prior to commencing. The main contractor has a duty to liaise with CA and local authority in relation to the proposed works.

WJ Structures Ltd are experienced in the removal of lead-based paints on listed buildings and heritage sites and ensure that care is taken to not damage the substrate whilst also ensuring the works are strictly in accordance with current legislation and guidelines. Detailed method statements and risk assessment are carried out by WJ Structures Ltd to outline the environmental/control measures, along with ensuring that air testing, control of lead residue and personal protection measures are in place. All operatives undertaking the works must be blood tested for lead contamination levels and a decontamination unit must be on utilised on site. Further health and safety details on working with lead can be obtained by WJ Structures site team or by calling the office on 01940 684772.

Sample Cleaning Methods Proposed/Undertaken

WJ Structures were tasked with finding a cleaning method that could be undertaken safely but that did not compromise the safety of the operatives undertaking the works. WJ Structures Ltd believe it is not possible to have one cleaning method that will suffice for all substrates, and propose the following three methods to be utilised throughout the project. It is the responsibility of the main contractor to instruct WJ Structures Ltd on which samples to proceed with after their discussion with the local authority, client, and CA. Please see details below of samples proposed.

DOFF

DOFF

What is DOFF?

The DOFF Integra is a market leading, expertly engineered system that utilises a normal water supply to remove some of the more resistant forms of unwanted matter from a range of surfaces. The DOFF Integra is an advancement of the original DOFF Standard, providing greater ease of operation - eg improved manoeuvrability, quick release of modular components, digital displays and easy loading.

The water supply is fed via a pump into a hot-box where it is rapidly heated to temperatures of up to 150°C. The heated water is then fed through high temperature heat resistant hoses to the special nozzle at a rate of between 3 to 5 litres per minute.

Once cleaned, the surface dries within minutes which prevents any long-term damage as a result of trapped moisture.



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DOFF

What is the DOFF most effective in removing?

Paint coatings (most oil and plastic types)
 Certain types of graffiti
 Bird or vermin fouling
 Algae, moss, and fungi
 Wax coatings
 Chewing gum
 Bitumen, Oil, Grease and many others, all without causing any damage or disfiguring the substrate.

What surfaces should I use the DOFF on?

We recommend the DOFF for use on surfaces such as brick, stone, concrete, tiled (glazed and encaustic), wood, faience and terracotta. It is a useful sterilisation tool for kitchens, toilets, swimming pools, hospitals and factories.

Where can I use DOFF?

DOFF can be used in Building restoration, Industry, Food production, Hygiene control, Hospitals, Factories, Transport & vehicle depots, Workshops etc.

How does DOFF work?

A normal water supply is taken through the pump into the Hotbox, where a range of temperatures of up to 150° C can be achieved. The low volume of super heated water and steam (5 litres per minute) is then fed through heat resistant hoses to special nozzles where a genuine 150° C is delivered. The surface being cleaned does not suffer any damaging pressure, thermal shock or deep saturation and dries within minutes. A range of different lances and nozzles are available.



TECHNICAL SPECIFICATION

DOFF INTEGRA

Power Supply Consumption	230 volt 50 hz 13 amp or 6.5 Kva (generator), 50 hz 30 amp or 6.5 Kva (generator), 115 volt 60 hz 30 amp or 6.5 Kva (generator), 110v 50hz 30 amp or 6.5Kva (generator)			
Water Consumption	Min 3, max 5 litres per minute. Use only clean cold water supply - if bowser or other, consult our technical team for advice			
Maximum Operating Pressure	100 bar 1450 psi			
Temperature Range	30°C to 150 °C			
Maximum Water Input temp.	30 °C			
Dry Weight kg	89 (hotbox) + 34.5 (pump) = when loaded 123.5			
Measurement mm	Length	Width	Height	
	Pump	500	282	310
	Hotbox	680	630	1030
	When pump loaded length = 960			
Export Packing mm	1020	820	1150	

Doff Recovery System



The advertisement features a large background image of a Gothic cathedral's interior. In the foreground, a man in a dark jacket is using a long, flexible lance connected to a blue cylindrical vacuum unit labeled 'DOFF' and 'STONEHEALTH'. The lance is being used to clean a stone wall. The vacuum unit has a black top with a control panel and a blue body with the 'DOFF' logo in red. The background image is partially obscured by a blue diagonal banner containing text.

DRS
DOFF RECOVERY SYSTEM

Unique and Technically Advanced Water and Steam Extraction System for the DOFF and DOFF Integra.

The DOFF Recovery System (DRS) is a specialist ancillary to the DOFF system, for internal cleaning works or for use in areas where water and steam recovery is an issue.

It has a stainless steel hooded lance combined with a high-grade silicone sealing interface which extracts all steam, water and debris to a specially developed vacuum unit via heavy-duty, high-temperature hoses. The DRS comes with enough high-temperature hose to safely clean and recover up to 20 metres from the DOFF system whilst the wastewater is filtered and automatically pumped out of the vacuum leaving any heavy debris within the vacuums built-in catch tank.

The DRS can be supplied in 230 volt 50/60hz and 110 volt 50/60hz. Options of either a short head or long head (for floors).

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Structures
Restoring the past. Building the future.

TORC



What is Torc?

The TORC system's most distinctive feature is its revolutionary modulised nozzle, which creates a gentle swirling vortex utilising low volumes of water, fine inert granulate and air. When in the hands of a competent person the results that are produced are probably the most sensitive and efficient methods of cleaning masonry.

The TORC system supersedes and offers additional benefits as well as other improvements over the original Jos system which Stonehealth introduced into the UK back in the 1980s.

The innovative TORC nozzle is available in a range of different sizes and types which can be selected for cleaning and removing unwanted matter from many various surfaces including large areas of ashlar or fine detailed stone carvings without damaging the substrate.



Not a blasting system,
it has sensitive controls.



Air cooler - built-in pump.



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What is TORC most effective in removing?

Carbon sulphation
Lime & cement based paints
Paint and plaster residues
Some old oil based paints
Bitumen (if oxidised)
Limescale
Efflorescence

What surfaces should I use the TORC on?

It is most effective in removing carbon pollutants and other unwanted matter from stone, brick, terracotta, ceramic tiles, glass, faience and concrete; also oxidation and sulphation from bronze, brass, copper, and anodised aluminium.

How TORC works?

The TORC is supplied in the basic sizes: 'TORC' and the 'TORC Studio'. The TORC Head is modularised into separate components which results in an efficient and gentle swirling vortex using less water and granulate, without losing a patina if appropriate. The TORC has a removable nose section allowing choice of 5, 7, 9, 11 or 13mm apertures. Plus a 5mm parallel version, for detailed cleaning.

Some of the notable buildings where the TORC system has been used within the UK:

Buckingham Palace and other Royal Palaces
Canterbury & many other Cathedrals
Westminster Abbey
Hampton Court, Tower of London & other historic Royal Palaces
Oxford & Cambridge University buildings
St. Pancras, other mainline and underground stations
Harrods store
Marine Barracks & other buildings in Portsmouth Historic Dockyard
Norwich Castle

TECHNICAL SPECIFICATION

TORC SYSTEM

Power Supply Consumption	The standard version needs no electrical power but if the auxiliary pump is required 110/115/230 volt 50&60hz 13/16 amp 2 Kva (generator)			
Water Consumption	Max 60 litres per hour			
Ambient Temperature	Do not use below 5 degrees Centigrade (41 degrees Fahrenheit)			
Dry Weight kg	200kgs standard, if auxiliary pump is used + 40kgs			
Measurements mm		Length	Width	Height
	Pressure Pot	540	560	880
	Air Cooler	450	740	550
	Pump (elec.) if used	600	310	340
Export Packing mm		1020	820	1030
Compressed air volume required	125 cfm (3540 litres per minute)			

MICROSTRIP CLEANING (MICROSTRIP (SAT))

THE SURFACE FINISHING EQUIPMENT GROUP

SALES – SERVICE – HIRE
TRAINING – INSTALLATION

NORTH EAST BRANCH

**Hogg Blasting
& Finishing Equipment Ltd**
Washington, UK. NE37 1PR

Tel. 0191 415 3030
info@hoggblasting.com

NORTH WEST BRANCH

**Abraclean Ltd and
Jedtec Finishing Equipment**
Stockport, UK. SK5 7PP

Tel: 0161 480 8087
sales@abraclean.co.uk

- Shot Blasting Equipment
- Paint Spraying Equipment
- Powder Coating Equipment
- Fixed Extraction Booths
- Mobile Dust Extraction
- Personal Protection Equipment
- Shot Blasting Abrasives
- Spares and Consumables
- Plural Component Systems

Ercon Finishing Systems
Willenhall, UK. WV13 2JW

Tel. 01902 601 312
sales@erconfinishing.com

- Complete Finishing Plants
- Design engineers and CAD
- Industrial Ovens
- Conveyors
- Pre-treatment systems
- Electroplating Systems



Surface Finishing
Equipment Group

SAT Blast Wet Blast System



SAT Blast in
operation on brick
and metal

SAT Blast
Machine shown
without hoses
(to left)



The versatile Satblast is a fully saturated wet blasting system which offers a modern solution for environmentally friendly blast cleaning. The Satblast has been developed to provide controllable abrasive cleaning power which is ideal for dustless blasting of all surfaces including stone, concrete, brick and steel. It is also effective in removing rubberised paints and bitumen.

FEATURES :

- Operates at fully adjustable pressures from 20-100psi.
- Low water volume - Blasts with a mist not a water jet.
- Fixed fill of water and abrasive, no constant water supply required.
- The unit can operate at very low pressure for stone, brick and concrete cleaning avoiding water ingress into cracks and crevices and eliminating damage to the surface of the bricks etc.
- The unit also operates at high pressure for powerful blasting and cleaning to provide a key on steel and concrete.
- The Satblast is a fully pneumatically operated unit and is available in an ATEX version for use in hazardous areas such as the offshore and Oil and Gas industries.
- Can be used with a variety of medias.
- Often uses less abrasive when compared to dry blasting alternatives.
- 'Dust Free' operation protects your operatives and passers by from dust inhalation. No dry dust ingress into adjoining properties.
- Fully CE marked - conforms to the protection requirements relating to the Safety of Machinery 2006/42/EC by the application of standards EN ISO 12100 Parts 1 and 2: 2003 and EN ISO 12141: 2007
- Can be used as a dry blast system.
- Often improves production rates.

www.sfeg.co.uk

Data Sheet DS-6

THE SURFACE FINISHING EQUIPMENT GROUP

SALES – SERVICE – HIRE
TRAINING – INSTALLATION

NORTH EAST BRANCH

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Surface Finishing
Equipment Group

SAT Blast Wet Blast System

TYPICAL USES :

- Concrete - at low pressure for cleaning and washing away corrosive salts and / or in concrete repair at higher pressures for exposing aggregate, removing surface coatings and removing rust from Rebar.
- Stone - at low pressure for gentle cleaning and graffiti removal.
- Brick - at low pressure for gentle cleaning or removal of masonry paint.
- Timber - at low pressure for stripping paint from hard woods.
- Fibreglass - at low pressure for paint

MODELS :

MODELS AND SPECIFICATIONS			
Model	Capacity	ATEX Approved	Dry Weight
SATB 50 Mk II	50kg	No	120kg
SATB100 Mk II	100kg	No	190kg
SATB50 Mk II - Atex	50kg	Yes	130kg
SATB100 Mk II - Atex	100kg	Yes	200kg

STANDARD PACKAGE INCLUDES :

- Satblast Unit, with Water Separator
- 10m Hose Set, with Silicon Nitride Blast Nozzle
- Operator Face Shield and Ear Defenders.

The above package can be tailored to your specific requirements.

TYPICAL AIR CONSUMPTION:

175 – 225 cfm - this varies on nozzle size / condition, blast pressure, and hose lengths.

RECOMMENDED ABRASIVE MEDIA:

This system is designed for use with FINE media in a saturated form such as :-

- Garnet.
- Fine Mineral Slags such as Stone Grit Fine/Extra Fine
- Silica-Free Sand Grade Media such as ABRABLAST FINE
- Olivine

NOT SUITABLE - medium or coarse grits / mineral slags, OR metallic abrasives.

Notes :

This product only provides correct and safe performance when used in accordance with manufacturer's instructions.

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Data Sheet DS-6

Samples

Trial panels were undertaken by WJ Structures Ltd on the different substrates required, these trial panels are documented in the pictures below with a small description of method used for each trial.

Masonry

BEFORE



TORC



MICROSTRIP



Summary

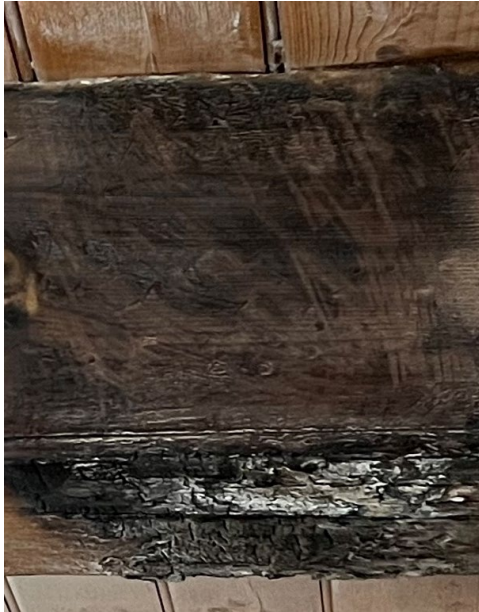
WJS believe there isn't a great deal of difference between the Microstrip and Torc Clean. Both have ensured arises and detail of brick have been kept and little to no face of the brick has been cleaned off. The microstrip was the fastest of the 2 operations. Therefore, on a cost and programme basis, we would recommend the use of the microstrip cleaning, should it be accepted by the conservation officer.

Torc – Utilised at 60 PSI – Heavy mist of water – Media used was Dolomite.

Microstrip – Utilised at 40-50 PSI – Light mist of water – Media was Fine Crushed Medium.

Existing Timber (Charred)

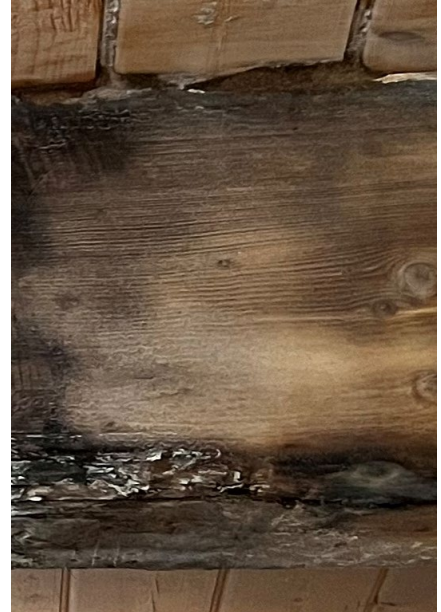
BEFORE



TORC



MICROSTRIP



Summary

WJS believe the TORC cleaning method produced a better finish than the microstrip. The TORC cleaning system has removed all charred timber without damaging the grain of the wood. The microstrip cleaning method started to damage the grain of the timber and struggled to remove the charred timber. The microstrip sample was stopped immediately when damage occurred to the timber, hence the small sample area pictured.

Torc – Utilised at 50 PSI – light mist of water – Media used was Dolomite.

Microstrip – Utilised at 50 PSI – Light mist of water – Media was Fine Crushed Medium.

Existing Timber

BEFORE



TORC



MICROSTRIP



Summary

WJS believe the TORC cleaning method struggled to remove the painted timber beams due to the number of layers of paint present. The TORC cleaning system started to damage the grain of the timber. The sample was stopped immediately, hence the small sample area. The microstrip cleaning method removed all layers of paint without damaging the timber. Therefore, we would propose this cleaning method is used.

Torc – Utilised at 60 PSI – light mist of water – Media used was Dolomite.

Microstrip – Utilised at 40-50 PSI – Light mist of water – Media was Fine Crushed Medium.

Steel Beams

BEFORE



TORC



MICROSTRIP



Summary

WJS undertook samples to the cast iron columns, both the TORC and microstrip were utilised and capable of removing the paint from the columns. The microstrip was quicker at removing the paint than the TORC cleaning system.

Torc – Utilised at 70 PSI – v.light mist of Water – Media used was Dolomite.

Microstrip – Utilised at 70 PSI – v.Light mist of water – Media was Fine Crushed Medium.

Pointing Samples

NHL 3.5



NHL 2



Hot lime & lime-based brick repair



Brick Replacement – Cheshire Blend



Pointing, brick repair & replacement summary.

Sample 1 – NHL 3.5

Ratio 2:1:1.

2 Leighton Buzzard Sand.

1 Nosterfield (Washed River Sand).

1 NHL 3.5 (Data Sheet attached).

Finish – Brushed.

Sample 2 – Hot Lime

Ratio 2:1:1.

2 Leighton Buzzard Sand.

1 Nosterfield (Washed River Sand).

1 Hot Lime (Data Sheet attached).

Finish – Brushed.

Sample 3 – NHL 2

Ratio 2:1:1.

2 Leighton Buzzard Sand.

1 Nosterfield (Washed River Sand).

1 NHL 3.5 (Data Sheet attached).

Finish – Brushed

Sample 4 – Brick Repair

Lime Based Repair mortar – (Data sheet attached).

Sample 5 – Brick Replacement

Data sheet attached, brick used was Cheshire blend, produced by Imperial bricks.

Sample 6 – Brick replacement Pointing

Ratio 2:1:1.

2 Leighton Buzzard Sand.

1 Washed Sand (Crown Farm Quarry) Hansons.

1 NHL 3.5 (Data Sheet attached).

Finish – Brushed.

Summary

The existing / original internal mortar sampled by Sandberg is a non-hydraulic lime-based mix with natural sand fine aggregate. The mix proportions by volume of two samples taken from the first and second floors were 1:2.3 and 1:2.9 respectively. This is deemed to be the original bedding mortar. Without a specific named specification / supplier for the original lime/sands used, we have proposed a hot lime mix - this is the closest match to the original non-hydraulic lime based on what material is currently available to us and it has been used on other projects.

From a visual perspective, in terms of colour, texture and finish, the NHL 3.5 and NHL 2 are very similar to the existing worked appearance. The finish using the hot lime mix is not as desirable as the others. Notwithstanding the finished appearance, due to the extent of inherent dampness in the existing masonry, the use of a non-hydraulic lime mortar for re-pointing purposes may actually be inappropriate due to the length of time it would take to carbonate and set.

Based on the visual presentation of the completed samples, WJS would recommend using the NHL 3.5 mortar mix. This mortar will remain breathable and flexible, the materials are readily available, and it will be more practical to use in this particular application. We have used this mortar successfully to the approval of the conservation officer in similar environments on other listed / heritage buildings.

TECHNICAL INFORMATION



NATURAL HYDRAULIC LIME LIMELITE

Product Data Sheet

PRODUCT DESCRIPTION

Tarmac Limelite is a range of Natural Hydraulic Limes conforming to EN 459-1. The following products are available:

Tarmac Limelite NHL 3,5: A moderately hydraulic lime suitable for general-purpose use for mortar/ pointing/ rendering of most masonry types.

Tarmac Limelite NHL 5: An eminently hydraulic lime suitable for use in masonry pointing, capping, foundations, seal defences and new build construction.

Our products contain no additives, mineral additions or Portland cement and are quality assured to EN 459-1: Natural Hydraulic Limes with independent third-party certification. They also carry a CE Mark.

APPLICATIONS

Tarmac Limelite Natural Hydraulic Lime can be used for both the conservation and renovation of historic buildings, and in new build applications.

Mortars made with natural hydraulic lime gain strength by a combination of hydraulic setting and carbonation. The lower strength and greater permeability of natural hydraulic lime mortars when compared with cement-based mortars is particularly suitable for repairs to older buildings and for traditional style new build.

Natural hydraulic lime mortars have good workability and plasticity and can accommodate some differential movement within the building.



Natural Hydraulic Lime used for pointing new build construction



Historic internal wall repaired with Natural Hydraulic Lime mortar

MORTARS

Typical hydraulic mortar mixes and their applications are shown below:

Mortar Mix Proportions (By Volume)			
NHL 3.5: Sand	Typical Application	NHL 5: Sand	Typical Application
1:1	-Walls below DPC -Chimneys -Earth retaining walls	1:1	Submerged masonry
1:2	-External walls -Copings and cappings -Parapets and sills	1:2	-Walls below DPC -Chimneys -Earth retaining walls
1:3	-Facing to solid construction	1:3	-Copings and cappings -Parapets and sills
1:4	-Internal walls	1:3-4	-Walls above DPC

RENDERS

The selection of suitable render mixes, whilst following the guidance for mortars, must also consider the nature of the substrate to which the render will be applied. The type of sand used will also affect the final finish obtained. Guidance on selection of mixes for different substrates is given below:

Render Mix Proportions NHL 3.5:Sand (By Volume)		
Substrate	Basecoat	Finish Coat
Weak or porous (soft brick)	1:2	1:2.5
Medium strength	1:2.5	1:2.5
Impervious or dense brick	1:2.5	1:3
Plasterwork	1:2	1:3

Note: As a general rule, each successive coat should be weaker and/or thinner as you move away from the substrate

Render Mix Proportions NHL 5:Sand (By Volume)		
Substrate	Basecoat	Finish Coat
Weak or porous (soft brick)	-	-
Medium strength	1:3	1:3
Impervious or dense brick	1:2.5	1:3
Plasterwork	-	-

Note: As a general rule, each successive coat should be weaker and/or thinner as you move away from the substrate

BATCHING AND MIXING

Sand

Sand for lime mortars and renders should be sharp sand, clean and well graded, free of clay or silt. Building (soft) sands, or sands containing clay and silt, can cause excessive shrinkage.

Water

Mixing water should be clean and potable. Adding too much water should be avoided as it leads to a reduced strength and an open structure susceptible to frost attack.

Batching

Mortars and renders containing natural hydraulic lime should always be batched by volume using batch boxes.

Mixing

Sufficient mixing is required to ensure that the lime is uniformly dispersed throughout the mortar or render. Mechanical mixing is preferred and mixing times should be significantly longer than for cement-based mortar.

The workability of the mortar improves with increased mixing time (however, avoid over mixing in hot weather). Allowing the mortar to stand in the mixer drum for a short period of time (10-15 mins), before a final remixing will also improve workability.

USE OF ADMIXTURES AND ADDITIONS

Many proprietary admixtures (especially air-entraining admixtures) can be used successfully in natural hydraulic lime mortars. However, attention should be paid to the admixture manufacturers instructions and trial mixes are always recommended.

The use of proprietary admixtures with natural hydraulic lime is not usually necessary as the workability and frost resistance of mortars or renders based on natural hydraulic lime is usually adequate for most applications.

In certain circumstances however, the addition of materials such as pozzolans or ground blastfurnace slag may be used to increase the mortar strength. The addition of Blue Circle Hydralime (hydrated lime) can also be used to improve the plastic properties of the mortar and/or reduce its strength. Trial mixes are always recommended.

STORAGE

Natural Hydraulic Lime should be stored in unopened bags clear of the ground in cool dry conditions and should be stacked in a safe and stable manner.

Information on the maximum storage period can be found on the bag.

Pure and Natural Hydraulic Lime (NHL 2) Product Data

St Astier Natural Hydraulic Limes (NHL)

Conforms to European Norm EN 459 and BS 459

Strength factor: 2 (Feebly hydraulic)

Residue @ 0.09 mm: 5%

Density (volumetric weight) : typical 500 gr. / litre

Available (free) lime Ca(OH)₂ after slaking: 50-55%

Packing: 25kg. Bags

Contains no additives

Whiteness index: 76

Surface cover (cm² per gram): 11000

Expansion : < 1mm

Residue of quick lime after slaking: <1%

Shelf life: 8-12 months kept sealed and dry

MORTARS	Compressive strength - N/mm ²				Elasticity Moduli (Mpa)		
MIX RATIO	EN459*	1 : 2	1:2.5	1 : 3	1 : 2	1 : 2.5	1 : 3
7 DAYS		0.62	0.53	0.47			
28 DAYS	2.00*	1.48	1.36	1.25	9025	9800	9000
6 MONTHS		3.84	3.00	2.88	12600	12030	11800
12 MONTHS		4.00	2.90	2.90	12515	12030	11900
24 MONTHS		4.25	3.00	2.75	13375	12000	11750
Consumption for 1m ³ of mortar (kg. +/- 10%)		280	224	168			

* EN/BS 459 (mortar ratio 1:1 by volume with ISO 679 Sand)

Mixing: can be mixed in cement mixers.

Application by spray gun: possible. Please consult us.

Working temperatures: not below 8°C or above 30°C. Make sure that high suction materials are thoroughly dampened before application. Avoid rapid drying due to high temperatures or strong winds by curing with a light water mist several times a day if necessary. Protect from frost, rain, direct sun and strong wind

See "Protecting Lime Mortar".

SUITABLE FOR LATH WORK/INJECTION/GROUTING: see relevant sheets.

Reworking: possible within 24 hours.

Mortar composition

MASONRY/POINTING: 1 VOLUME OF NHL 2 : 2 VOLUMES OF SAND

Choose well graded sands (3mm: 75microns).

See also Applications & Good Working Practices - [Sands for Lime Mortars](#)

RENDERING:

On earth or friable supports, after preparation and cleaning, dampen with a 1:20 solution of NHL2/water applied in 2 coats.

A. Scratch coat (3 - 4 mm) 3 VOLUMES OF NHL 2 5 VOLUMES OF SAND

This coat is applied by casting on to a still damp but not over saturated support and is left as cast to provide good keying.

B. Undercoat (15-20 mm) 1 VOLUME OF NHL 2 2 VOLUMES OF SAND

Can be applied in 2 passes of min. 1cm. Second pass only after first is reasonably dry.

C. Finishing (5mm) 1 VOLUME OF NHL 2 2.5 VOLUMES OF SAND

The dosage / thickness may vary in accordance with the desired finish and the sand used. In smooth floated finishes if very fine sands containing clay are used the binder (NHL) quantity will be reduced.

For further Guidance, contact your St Astier Distributor.

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WOMERSLEYS LTD

HYDRAULIC HOT LIME MORTARS

TECHNICAL DATASHEET

February 2016

Procedure	Result
Mix Ratio by Volume	1: Quicklime - 4 : Sand + Pozzolan
Compressive Strength @ 7 Days (dry bar)	2.01 Nmm ²
Compressive Strength @ 28 Days (dry bar)	5.37 Nmm ²
Compressive Strength @ 28 Days (saturated bar)	3.10 Nmm ²
Flexural Strength @ 28 Days	0.44 Nmm ²
Carbonation Depth @ 28 Days	≤1mm
Water Absorption @ 28 Days	W0 (mean of 2.04 kg/m ² .min ^{0.5})
Compressive Strength @ 84 Days (dry bar)	5.59 Nmm ²
Compressive Strength @ 84 Days (saturated bar)	3.56 Nmm ²
Flexural Strength @ 84 Days	0.45 Nmm ²
Carbonation Depth @ 84 Days	≤2mm
Dry Mortar Density	1617.8 Kg m ³
Thermal Conductivity	0.67 W/mK (P= 50%, tabulated)
Vapour Permeability @ 28 Days	0.672 g/h.m ² .mmHg
Water Vapour Diffusion Coefficient	15/35μ (tabulated)
Max Aggregate Size	4mm
Reaction to Fire	Euroclass A1
Bond Strength	0.15 Nmm ² (tabulated)
Durability	<i>Until a European Standard method of test is available, the freeze/thaw resistance shall be evaluated and declared to the provisions valid in the intended place of use of the mortar.</i>
Content of Chlorides	NPD – mortar is not intended for reinforced masonry

This mortar after slaking and mixing to consistency has an open time of approximately 24-36 Hours @ 20°C, however lower temperatures will increase the open time. In temperatures below 10°C; do not use this mortar later than 48 hours after mixing with water. Do not use below 5°C.

This mortar should be protected with hessian and adequately cured to keep from drying back for a bare minimum of 5 days after application using light mist spray or similar; however we would recommend protection and curing regime occurs for 8 days or longer.

All tests were performed as per EN998-2:2010 in accordance with the relevant section of EN1015, under an ISO9001:2015 assessed Factory Production Control system.

Womersleys Ltd

Low Mill Lane, Ravensthorpe Industrial Estate, Dewsbury, West Yorkshire, WF13 3LN
Manufactured and tested exclusively for Womersleys Ltd at Cornish Lime Company Brims Park, Old Callywith Road, Bodmin, Cornwall, PL31 2DZ

B083 - Nosterfield (Fine)

Sand (Mixed)

Typical Aggregate properties				Typical Chemical Analysis		
Bulk Density	Oven Dried	2.59	EN 1097-6	Iron	% as Fe_2O_3	1.2
	Saturated Surface Dry	2.61		Calcium	% as CaO	14.74
	Apparent	2.66		Silicon	% as SiO_2	64.86
Water Absorption		1.0 %	EN 1097-6	Magnesium	% as MgO	0.56
Aggregate Abrasion Value (AAV)		N/A	EN1097-8	Aluminum	% as Al_2O_3	1.87
Polished Stone Value (PSV)		N/A	EN1097-8	Phosphorus	% as P_2O_5	0.08
Los Angeles Coefficient (LA)		N/A	EN1097-2	Titanium	% as TiO_2	0.08
Moisture Deval Coefficient (M_{DC})		N/A	EN1097-1	Potassium	% as K_2O	0.34
Sulfate Soundness		N/A %	EN1267-2	Sodium	% as Na_2O	<0.01
Free Soluble Chloride		0.001 %	EN1744-1	Loss on Ignition @ 1000C		
Free Soluble Sulphate		<0.01 %	EN1744-1			
Total Soluble Sulphate		0.04 %	EN1744-1	Additional Information :		
Free Sulfur		0.04 %	EN1744-1			
Iron Dioxide Content		26.2 %	EN196-21	Ten percent Fines Value		N/A
Linear Shrinkage		0.039 %	EN1367-4	Modified ten percent Fines Value		N/A
Resistance to Breakage		NPD Mpa	EN1926		Uncompacted	Compacted
Proportion of Crushed/Broken Surfaces		NPD %	EN13383-1	Bulk Density 10mm		
Resistance to Freeze Thaw		NPD %	EN13383-2	Bulk Density 20mm		
Water Absorption		NPD %	EN13383-2	Bulk Density 4/20mm		
Brand		None	EN13383-2	Bulk Density Fine Agg	2.01	2.21
Resistance to Fragmentation (Track Ballast)		NPD	EN1097-2			
Resistance to Wear (Track Ballast)		NPD	EN1097-2			

Prepared By :



Christopher Abbott
Technical Systems Manager

Date of Issue : 27 February 2017



TECHNICAL INFORMATION

BRICK NAME	CATEGORY 8 COMPRISING OF: Georgian Reclamation Georgian Reclamation Cheshire
BRICK TYPE	Through colour clay handmade brick
SPECIFICATION	Manufactured to BS EN 771-1
SIZE*	65 x 228 x 108mm
DIMENSIONAL TOLERANCE:	T1
RANGE:	RM
COMPRESSIVE STRENGTH	Mean - 30 N/MM ²
WATER ABSORPTION	Mean - 11%
SOLUBLE SALT CLASSIFICATION	S2
PACKAGING	Shrink wrapped on wooden pallets in packs of 525 (Georgian, Reclamation Georgian) 500 (Reclamation Cheshire)
PACK SIZE; LxWxH	1100 x 1100 x 1100mm Approx.
PACK WEIGHT	1.8 Tonnes Approx.
USAGE	Always mix from several packs, working vertically down the blades, not horizontally across the tops of the packs
SAMPLES	Samples will be supplied on request
DURABILITY	F2
PERFORMANCE	The recommendations of good practice made in the relevant British Standards regarding design and workmanship must be fully observed. Liability cannot be accepted for the performance of the product if used outside our recommendations. Guidance on the use of these bricks in specific situations is readily available from us.

*Individual bricks may vary dimensionally; this is a natural characteristic of fired clay bricks and is catered for in the relevant European Standard.





Stone Repair Mix: Brick and stone repair and imitation mortar



Womersley's Stone Repair Mix is a mortar for recreating and patch repairing bricks and natural stones in a wide range of colours. Contour can be carved, sanded, dressed and shaped like stone to give a uniquely convincing look and feel.

Availability

In 1 /5/10/ 24kg tubs. All colours are made to order.

Consumption

Approximately 1.7kg of dry mortar is required per litre. A 25 kg bag yields around 15 litres.

Storage

Store in a dry place free from damp and drafts. Use within 6 months.

Handling and cleaning

Wear suitable PPE, including gloves, dust mask and goggles. Do not breathe the dust. Wash any dust or mixed materials off skin straight away with plenty of clean water. Wash tools with clean water.

Surface Preparation

Remove any loose or friable masonry, and any contamination. Stone or bricks which are heavily salt contaminated may not be suitable. Highly porous backgrounds should be primed the day before with a gritty brush on primer. Ensure the background is suitable for supporting the weight of the new material (10mm of Contour over 1m² weigh approx. 20kg). Brass armatures or stainless-steel lath may be required to support the mix.

Mixing

Mix in a drum mixer or by paddle mixer, avoid creating excessive dust. Carefully add the powder to clean water, using no more than 6 litres per 25kg bag. Mix for between 2 and 5 minutes until a

workable consistency is achieved. Do not re-work. Do not use in temperatures less than 3°C or over 25°C.

Application

Lightly damp the background, before applying with a hawk and trowel. Womersley's Stone Repair Mix should be used for patching or creating "blocks" of stone or brick effect. Never apply in a continuous coat as a render. Coats should be a minimum of 6mm and no more than 40mm. For multiple coats key each coat and apply green on green.

For carved or cut back finishes apply the mix slight beyond the finished levels. As the mortar hardens it will become possible to cut and carve it back. A wide range of tools and techniques are suitable, and trials should be made.

Our stone mix may also be run in situ for small repairs using traditional techniques.

Casting

Pour into a mould prepared with mould release oil, using vibration to remove air bubbles and allow to set. It is not suitable for very large cast pieces.

Curing

Prevent from drying out too rapidly, covering with hessian or mortar fleece if necessary. Protect from frost for at least 7 days.

Fixing

Enrichments and other pieces can be fixed mechanically or adhesively to facades. If fixed at height, bond tests or pull out tests will be necessary and should be arranged at the design stage. Please ask Womersley's for further information if required.

General Guidance

This information is for general guidance only and is not a specification. Conduct trials before commencing work.

Manufactured by

Lime Green Products Ltd

Monitoring/Recording of Works

Please note example panels will be used as benchmarks for WJ Structures Ltd operatives to work towards. These benchmark panels are to be recorded on site using this document. WJ Structures Ltd are happy for this report to be used as the basis of said report, with an addendum to the report for 'passed off Samples by CA, Main Contractor and Local Authority'.

Note – For the avoidance of doubt, it is worth noting that WJ Structures Ltd Operatives are instructed to notify management staff if discoloration, stains, uncovering of historic signage/heritage items, unexpected water ingress/dust, damage to substrate or any other unexpected occurrence takes place.

Documentation Details:

'I confirm that I have gained the information from WJS operatives on site and visual inspected the works prior to writing this report.'

Name: Lloyd Jolley

Address: 132-134 Chapel Street, Leigh, Greater Manchester, WN7 3PB

Email Address: Lloyd@structures.co.uk

Date this report was produced: 03/03/2022

Customers Name: Beach D&B Developments Ltd