

MasterSeal[®] Systems Engineered sealing and weatherproofing solutions

>>





The MasterSeal[®] range from Master Builders Solutions provides professionals with a comprehensive selection of highquality, elastomeric joint sealants.

Product	Sealant type	Cartridge (290/290/310 ml)	Sausage (600 ml)	Non-Sag / Gun grade	Fluid SL grade	Movement accommodation %	Shore A hardness	100% Modulus MPa	Bastic recovery %	Bongation at treak %
MasterSeal® 121	Acid cure silicone	Y	N	Y	N	± 20	15	0.30	>80	520
MasterSeal® 122	Neutral cure silicone	Y	N	Y	N	± 25	16	0.35	>90	500
MasterSeal® 123NS	Neutral cure pure silicone	Y	N	Y	N	± 25	15	0.35	>90	530
MasterSeal® NP 472	1 component polyurethane	Y	Y	Y	N	± 25	35	0.20²	>85	700
MasterSeal [®] NP 474	1 component polyurethane	Y	Y	Y	N	± 25	45	0.60²	>85	450
MasterSeal® SL 189	Neutral cure silicone	Y	Y	N	Y	+ 50 - 25	15	<0.20	>85	1000
MasterSeal® HY 495	1 component hybrid	Y	Y	Y	N	± 25	25	0.35	>80	350
MasterSeal® 10WB	Acrylic dispersion	Y	N	Y	N	± 7.5	<15	n/a	n/a	200
MasterSeal® 470 (formerly MasterFlex 700)	2 component polysulfide	N	N	Y	Y	± 25	25	0.25	>80	600
MasterSeal [®] CR 460	2 component polyurethane	N	N	N	Y	+ 10 to 20	80	1.80	n.a.	>20

MasterSeal Systems



MasterSeal joint sealants are suitable for applications ranging from everyday use in bathrooms or kitchens to the most demanding industrial, commercial and civil engineering environments.

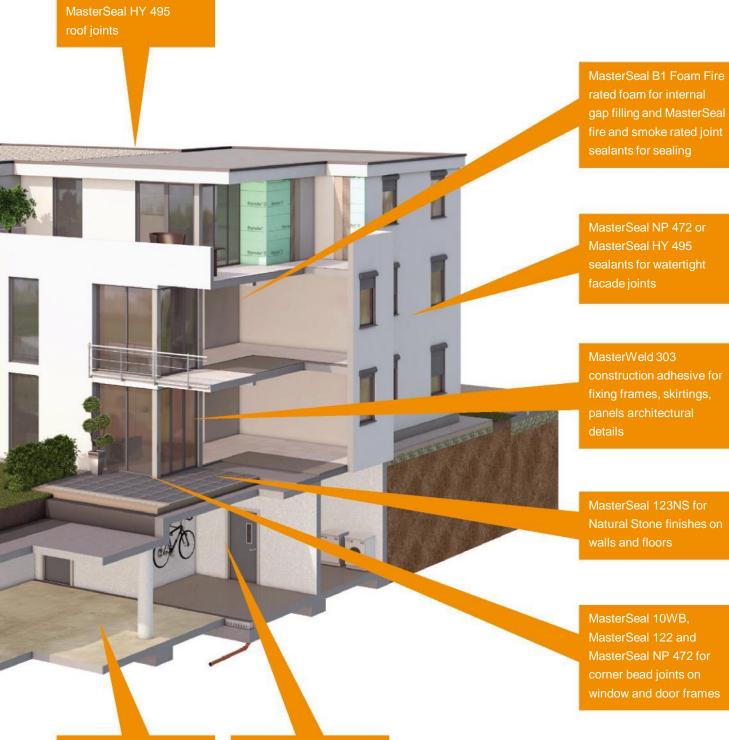
Tensile strength MPa	Chemical resistance	Temperature resistance °C	Cure time mm/day	Facades	Sanitary / tiling	Industrial floors	Roads	Swimming pools	Water immersion	Natural Stone	International Standards
1.31	G	- 40 to +120	2	N	Y	Y	N	N	Y ¹	N	EN15651 Parts 1: F-EXT-INT-CC, 2: G-CC, 3: S S1
1.00	G	- 50 to +120	2	Y	Y	Y	N	Y	Y ¹	N	EN15651 Parts 1: F-EXT-INT-CC 25LM, 2: G-CC 25LM, 3: S XS2
0.96	G	- 50 to +120	2	Y	Y	Y	N	Y ¹	Y ¹	N	EN15651 Parts 1: F-EXT-INT-CC 25LM, 2: G-CC 25LM, 3: S XS2
0.50	G	- 30 to + 70	3	Y	Y	N	N	N	N	Y	ISO11600 F25LM ² ASTM 920, EN 15651 Pt 1 F-EXT-INT-CC F25HM
1.00	G	- 30 to + 70	3	Y	Y	Y	N	N	Ys	Y	ISO11600 HMF, ASTM 920, EN15651Pt 1, 4
0.50	VG	- 40 to + 120	2	Y	N	Y	Y	N	N	N	ISO 11600 HMF, ASTM 920
0.38	VG	- 30 to + 70	2.5	Y	N	Y	Y	N	N	N	EN15651_1: F-EXT-INT-CC 25LM, ISO 11600 F25LM, ASTM 920
0.38	N/A	- 20 to + 75	2	N	N	N	N	N	N	N	EN 15651 Part 1: F-EXT-INT 7,5P
N/A	VG	- 40 to +120	Full	Y	N	Y	Y	N	Y	N	ASTM C920 M 25, BS 5212_ 1 WRAS
1.80	VG	- 30 to + 80	cure 7d	N	Y	Y	N	N	N	N	n/a

Notes(Recommended): Y=Yes, N=No, 1 = tiled swimming pools, 2= @ 23°C, 3= with primer.



Whatever the project: residential, industrial, commercial or institutional, small or large, new build or refurbishment, MasterSeal and MasterWeld[™] system from Master Builders Solutions, will help you complete your project on time and on budget. The majority of these products will be stocked by your local Master Builders Solutions professional distributor partners offering local service, supply and technical support.





MasterSeal NP 474 trafficable joint sealant for garage and workshop floors MasterSeal GP Foam for fixing and gap filling of window and door frames



Silicones for kitchens, bathrooms, swimming pools and other wet areas

The MasterSeal range of silicone joint sealants offer the highest performance for a wide range of applications:

Features and benefits

- High percentage polymer contents: provide low shrinkage, tenacious bond and durable, long lasting performance.
- Antifungal formulation: prevents unsightly fungal and algae growth to maintain appearance.
- Excellent bond on most substrates: means no primers needed.
- High chemical resistance: easily withstands all household cleaners.
- Excellent UV resistance: can be used internally and externally.
- High movement accommodation factors: easily accepts building movements without stress on bond lines or substrates.
- Wide color range: to match MasterTile tile grouts, ceramic and natural stone coverings and metallic furnishings and finishes.

Special properties

MasterSeal 122: neutral cure ensures odorless installation and ability to be used on cement, concrete and other alkaline substrates. High polymer content allows use in tiled swimming pools.

MasterSeal 123NS: 100% silicone odorless, formula to eliminate staining on Natural and Reconstituted Stone floor and wall coverings.





MasterSeal Systems



MasterSeal 122 with MasterTile tile adhesives and grouts: the ideal engineered solution for tiled swimming pools

Application Product	Acid aure	Neutral cure	Domestic and Industrial kitchens	Bathrooms and wet rooms	Aluminum, metal, PVC, wood	Concrete, brickwork, renders	Window and door frames	Glazing top seals	Natural Stones wall and floor tiles	Swimming pools
MasterSeal 121	Y	Ν	Y	Y	Y	N	Y	У	N	У
MasterSeal 122	N	Y	Y	Y	Y	Y	Y	Y	у	Y
MasterSeal 1 23NS	N	Y	Y	Y	Y	У	у	у	Y	у

Color Product	Clear	(RAL ^e 9010)	Black	Light Ivory (RAL 1015)	Concrete Grey (RAL 7004)	Light Grey (RAL 7035)	Mahogany Brown (RAL 8016)	Bronze (RAL 1036)
MasterSeal 121	Y	ΥΥΥ			Y	Y	Y	Y
MasterSeal 122	Y	Y	Y	to order	Y	to order	to order	to order
MasterSeal 1 23NS	Ν	Y	Y	Y	Y	N	N	Ν

Y = Yes (Recommended)

y = yes (but better alternatives available)



Polyurethane and hybrid polymer joint sealants for building facades and civil structures

MasterSeal (formerly known as Masterflex) polyurethane single component joint sealants in cartridges, or economic 600ml sausages, have been the mainstay of architectural and engineering joint sealing for the past 20 years combining proven performance and reliability.

Features and Benefits:

MasterSeal NP 472 and MasterSeal NP 474 Excellent adhesion on most surfaces without primer.

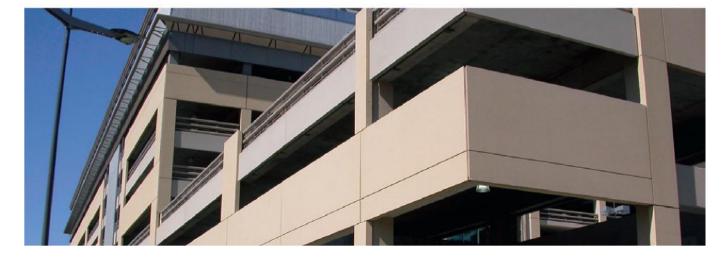
- Excellent non-sag properties suitable for vertical and overhead joints.
- Single component: easy to use.
- Very good UV, weathering and ageing resistance, color stability, provide high durability and long service
- life. Can be painted over with water based paints. Very low residual tackiness means reduced dirt and dust
- pick-up.

Special benefits of MasterSeal NP 472

- Lower modulus which reduces stresses on the adhesive bond line, therefore suitable for substrates with weak tensile strength and joints subject to rapid movement caused by sudden and/or constant temperature changes.
- For low temperatures: retains flexibility and movement capability.

- Special benefits of MasterSeal NP 474
 Higher modulus and Shore A hardness gives improved abrasion resistance for use in horizontal traffic situations. High pick and vandal resistance for use in prisons, schools
- and other public spaces.
- Improved water resistance for use in water tanks, irrigation channels, etc.







Hybrid polymer systems: latest technology

 The latest generation of single component, thixotropic, low modulus, hybrid polymer joint sealant with exceptional properties for movement and construction joints in highrise buildings.

Features and benefits: MasterSeal HY 495

- Exceptional adhesion, even to damp substrates without primer.
- Exceptional UV, weathering and ageing resistance and color stability compared to polyurethane sealants.
- Excellent tolerance to moisture: eliminates bubble formation experienced by other sealant types on damp substrates, or because of high atmospheric humidity during application (a problem experienced by polyurethane sealants).



MasterSeal joint sealants were used in the Besiktas football stadium, Istanbul

										C	Color	
Application / Color Product	Primer needed	Expansion and construction joints	Precast panels	Tilt up construction	Floors / traffic joints	Low strength substrates	Moisture tolerance	Reservoirs, water tanks	V. Low isocyanate	Concrete Grey (RAL 7004)	Off white (RAL 1015)	White (RAL 9010)
MasterSeal NP 472	N ¹	Y	Y	Y	у	Y	N	N	Ν	Y	Y	Y
MasterSeal NP 474	N ¹	Y	Y	Y	у	N	N	Y²	N	Y	Y	Y
MasterSeal HY 495	N ¹	Y	Y	Y	Y	Y	Y	У	Y	Y	Y	Y

Notes:

1 = on most substrates



Industrial and special situations

Require joint sealants to withstand challenging conditions such as heavy traffic, fire resistance, chemical spillage, fuel and solvent attack. The MasterSeal range provides proven formulations for these environments.

Typical areas of use and main requirements

- Factories and warehouses: abrasion and chemical resistance.
- Food and beverage manufacturing and chemical plants: hygiene and chemical resistance.
- Airports, taxiways and hangars: jet fuel resistance and certification.
- Concrete and asphalt roads: high movement and low modulus.
- Fuel station forecourts: fuel resistance.

Product descriptions, features and benefits: MasterSeal SL 189

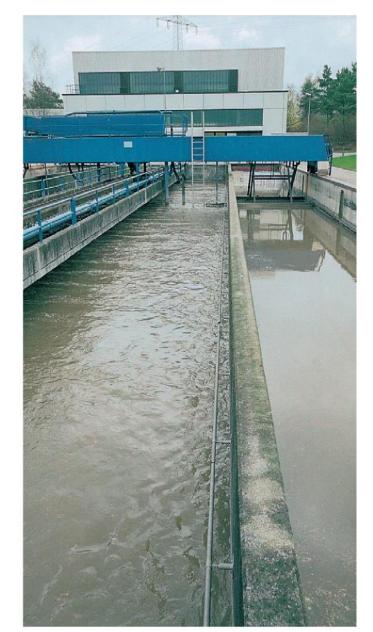
- Single component, self leveling silicone supplied in
- cartridges for simple, problem free installation.
- Ultra low modulus and high movement capability for use on
- asphalt as well as concrete joints.
- Very high fuel resistance for use on airport taxiways, hardstandings and hangars.

MasterSeal 470 (formerly MasterFlex 700)

- 2 component, high grade polysulfide with >25 year track record in harsh environments and climates.
- Non-sag gun, and pouring grade versions available for vertical and horizontal joints.
- Very good chemical resistance e.g. wastewater facilities.

MasterSeal CR 460

- Special, 2 component formulation with exceptional chemical resistance for use in food, beverage and pharmaceutical industries.
- Color matched to 7 standard colors of Ucrete floor systems.





Product	No. of components	Primer needed	Expansion joints	Construction joints	Concrete floor / traffic joints	Fuel resistance	High chemical resistance 3	Wastewater treatment	Airport taxi areas and hangars	Asphalt roads and surfaces	Use with Ucrete floors	Colors available
MasterSeal SL 189	1	N ¹	Y	Y	Y	Y	У	Ν	Y	Y	N	Grey
MasterSeal 470	2	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Grey
MasterSeal CR 460	2	Y	y²	Y	Y	N	Y	Y	N	N	Y	73

Notes:

1 = On most substrates

 $2 = Limited movement (\pm 20\%)$

3 = See Ucrete product data sheets or contact Master Builders Solutions representative

Fire and acoustic rated sealants for compartmentation / passive fire protection¹

A very special range of products, with acoustic, flame and fire retardant properties, used as part of passive fire protection systems in buildings and structures. Full details of the products can be found in the separate product data sheets and brochure.

MasterFlame JS 110: Single component, acrylic plasto/ elastic sealant with sound reducing, and fire and smoke retardant properties (120 minutes). MasterFlame JS 125: Single component, elastic, weatherproof, 240 minute fire rated silicone sealant for joints up to 50 mm wide.

MasterFlame JS 225: Graphite filled, high pressure exerting, intumescent joint sealant which owing to its very high expansion properties is able to close penetration voids in case of fire.

Note 1: Due to local registration restrictions these products may not be available in your country. Contact your local Master Builders Solutions representative for clarification.



MasterSeal Systems



All structures move. Correct design of joints allows controlled movement to occur while retaining the weather and watertight functionality of the structure. Movement occurs as a result of long term shrinkage of concrete, settlement, loading, vibration, and impact, but, the most important source of movement, results from temperature change. Even the best quality joint sealants, applied by trained installers will fail if joints are not correctly designed.

Joint design (1): joint width

The Engineer must decide on:

- the number of joints,
- the spacing and location of joints,
- the width of the joints.

This will be based on the following criteria:

- the amount of movement expected,
- aesthetic and practical considerations of the particular project,
- the movement capability of the joint sealant to be specified.

Calculation of thermal movement of a building or structural element

The linear movement of a building component due to temperature change is calculated using:



 Δ L = Resulting change in length

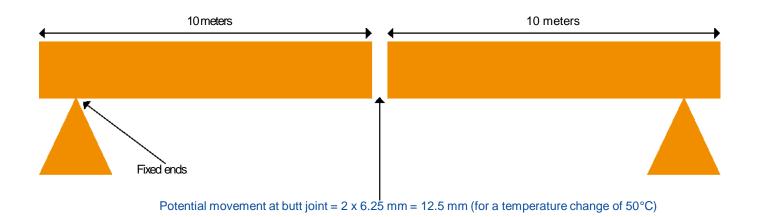
 α = Coefficient of Thermal Expansion of the material (Typically concrete = ± 12.5 x 10⁻⁶ m/m)

L₀= Original length of the building element

 Δ T = Net change of temperature in the element

Example: Consider 2 concrete elements each 10 m long (see diagram below). Extreme temperatures: -5°C winter, +45°C in summer. Therefore, the movement is calculated using the equation above, as:

Movement calculation for each element: $12.5 \times 10^{-6} \times 10 \times 50 = 6.25$ mm



Note: Master Builders Solutions take no responsibility for design of joints. This information is provided as a guide only.

The minimum theoretical joint width is calculated based on the calculated movement and the movement capability of the joint

sealant: Minimum theoretical joint width = (100 / Movement capability %) x calculated movement

Therefore, in the above example, and using MasterSeal NP 472 with a movement capability of $\pm 25\% = 50\%$ total movement capability

Minimum theoretical joint width = (100/50) x 12.5 = 25mm

But, beware, this theoretical minimum calculation can cause significant problems if we do not consider the temperature at the time of the installation of the joint sealant, and the ACTUAL size of the joint at this time!

Consider, as an example, if the structure is built in spring at a temperature of 10°C, with the 25 mm joint width as calculated. But the sealant is not installed until late summer when the ambient temperature is then 40°C. Both the concrete elements will have expanded by 3.25 mm and the joint will have closed by 7.5 mm to an actual width of 17.5 mm. Most of the potential movement of the joint will be as the concrete shrinks over winter time to -5°C. This 45°C temperature change will cause the joint gap to widen by 11.25 mm.

11.25 mm as a percentage of 17.5 mm = 64.3% movement far greater than the 25% movement capability in expansion of the sealant which could, over time lead to cohesive or adhesive failure either in the sealant or substrate.

For these reasons, use of a Safety factor of 2 is recommended when designing joint widths (or use twice as many joints, if aesthetics allow).

Joint design (2): joint depth

In tiling applications the minimum industry standard joint dimensions are 6 mm x 6 mm. In all other cases, practical installation difficulties mean that minimum joint widths are 8 - 10mm. At these widths the depth equals the width.

However,

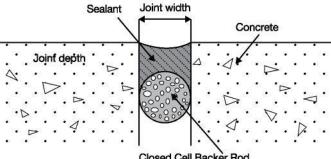
for joints > 12 mm wide the joint depth should equal 0.5 x width.

NB: Applying sealants too deep is a major cause of adhesive and cohesive joint failure due to the excessive stresses created!

Joint Design (3): avoid 3 sided adhesion!

An essential part of joint design is to ensure that the sealant does not adhere to the base of the joint. This so called 3 sided adhesion prevents the sealant from moving as it should, and is a major, a common cause of joint sealant failures.





Closed Cell Backèr Rod Compressed approximately 25% prevents adhesion to base of joint



Joint installation and trouble shooting

Sealant Installation (basics)

Ensure all joint faces are clean, sound and free from any material which may hinder adhesion! Use primer where necessary.

1. Insert backer rod to control depth of sealant: N.B. for joints >12 mm wide, depth = $0.5 \times$ width.

2. Mask joint for best results.

3. Prime joint faces (only where necessary – see product technical data sheets).

4. Cut nozzle of cartridge or sealant gun at 45° to match width of joint and fill.

5. Tool joint to create optimum concave shape. Before sealant cures, removing masking tape.

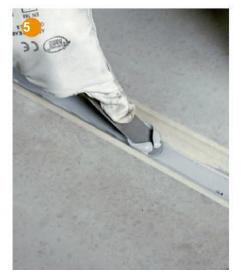












Problem	Primary cause	Other causes					
Adhesive failure at bond line (photo 1)	Inadequate surface preparation: poor bond	Poor joint design: too narrow for movement. Sealant applied too deep, or 3 sided adhesion					
Cohesive failure in sealant (photo 2)	3 sided adhesion due to no bond breaker rod	Joint sealant applied too deep or inadequate movement capability of sealant					
Cohesive failure in substrate	Modulus of sealant too high for weak substrate	3 sided adhesion due to no bond breaker rod or inadequate movement capability of sealant					
Crocodile skin cracking (photo 3)	Age hardening due to poor UV resistance, poor quality or low polymer content						
Multiple longitudinal cracking (photo 4)	gitudinal cracking (photo 4) Excessive shrinkage in sealant due to low polymer content and/or excessive plasticizers and solvents						





Glossary of terms

Substrates

The composition of the building material. Adhesion properties of sealants vary on different substrates. Primers might be required to assure good adhesion. The correct

preparation and repair of substrates are essential for the sealant durability.

Elastic recovery

This test measures a sealant's recovery after it has been extended for a certain length and time. The results represent the percentage recovery in relation to the length of extension. High percentage recovery show that a sealant experiences less permanent plastic deformation and retains its flexibility and functionality over time.

Movement capability

This is the key parameter in the selection process for a joint sealant. Defines the capacity of a sealant to be stretched or compressed as a percentage to its original size. A sealant will show within these limits no permanent deformation through compression and extension.

100% Modulus (E-Modulus)

Measures the force necessary to stretch a standard sample to twice its original length. Materials with high modulus require greater force to achieve a certain elongation. On weak substrates such as masonry or EIFS panels, the high stresses generated by higher modulus sealants often cause cohesive failure in the substrate, or adhesive failure at the bond line on stronger substrates such as concrete. temperatures, when materials become stiffer, and even greater force is necessary to achieve elongation, or when the substrates to be sealed are too weak, low modulus sealants should be used. N.B. Modulus data from different manufacturers can only be compared when identical test methods have been used, as sample size, thickness and rates of extension all affect the results obtained!

Elongation at break

Indicates the maximum possible elongation a sealant can withstand before rupture. In practical terms, this is not relevant as joints are never designed to move this far!

Durability

Sealants are exposed to a large variety of environments. Characteristics such as resistance against UV, weather, abrasion, vandalism, traffic and chemicals are all important criteria for choice.



The following material technologies are commonly used in joint sealants for the construction industry

Silicones

Versatile material used in a wide range of applications characterized by excellent UV resistance and bond to most substrates without primers. Widely used in structural glazing applications but these specialist materials are not included in the MasterSeal range.

Two main types of general purpose silicone sealant exist:

- Acetoxy, or acid cure sealants, are recognizable by the smell of vinegar produced during cure. They are best suited for uses in kitchens or bathrooms with tiling or sanitary ware. They cannot be used on cement based or other alkaline substrates.
- Neutral cured silicones are odorless during cure, and are excellent general purpose materials adhering strongly to most substrates without primer. Wide areas of use including, for the better formulations, swimming pools. They exhibit excellent tolerance to a very wide range of temperatures in service. 100% silicones formulated without extenders or plasticizers are especially used with sensitive substrates susceptible to staining.

Polyurethanes

For many years the workhorse sealant and adhesive material for construction and industrial applications. With good performance characteristics in all fields, they are used in a very wide range of situations.

Hybrid materials

The latest technology, combining the best features of silicone and polyurethane polymers in one polymer. They exhibit excellent adhesion characteristics and UV resistance, and high tolerance to dampness, without formation of bubbles, which is a known limitation of polyurethanes. Two terms are widely used in the industry:

- MS polymer (Modified silicone)
- SPUR or StPUR (silane or silicone terminated polyurethane).

These are essentially the same technology.

Polysulfides

Long established with a proven track record in the sealant market with excellent resistance to fuel and chemicals.







Tapes and waterstops for watertight joints

The MasterSeal range of engineered solutions for watertight joints from Master Builders Solutions includes a comprehensive range of ancillary products. Here we provide a brief introduction to these technologies.

MasterSeal 940

Internally and externally placed, high grade PVC waterstops for expansion and construction joints provide impervious physical barriers to the passage of water. Used for compartmentalization in deep basements, lift shafts, floor slabs on grade, reservoirs, watertanks etc.



MasterSeal 910 / MasterSeal 911

Hydrophobic, water swelling waterbar for all types of construction joints, applied with with a modified silicone, hybrid adhesive. Modified vinyl polymers which swell and fill even small crevices to block the passage of water. Simple to install, they offer an economic, yet effective alternative to PVC waterstops.



MasterSeal 909 / MasterSeal 901

Re-injectable flexible PVC hose system for waterproofing construction and cold joints in critical situations where it can replace conventional PVC waterstops. Joints can be sealed by injecting MasterSeal 901 low viscosity resin after water testing, before backfilling and even after structures have settled and problems appear during the life cycle of the structure.



MasterSeal 930

Elastic, resilient, chemical resistant tape fixed with high grade solvent free epoxy adhesive paste, ideal for the sealing of irregular and wide movement joints in a wide range of applications such as reservoirs, watertanks, irrigation channels, waste water storage.



MasterTile WP Tapes

Elastic, tape system used to ensure watertight connections at wall/floor joints and around penetrations in bathrooms and other wet rooms. Used with the Master Builders Solutions system solution for watertight bathrooms.



MasterSeal 955 FLASHSEAL

Aluminized, UV resistant self adhesive bitumen tape for general purpose, instant, waterproofing repairs.





Master Builders Solutions

Master Builders Solutions

The Master Builders Solutions brand brings all of expertise together to create chemical solutions for new construction, maintenance, repair and renovation of structures. Master Builders Solutions is built on the experience gained from more than a century in the construction industry.

The know-how and experience of a global community of construction experts form the core of Master Builders Solutions. We combine the right elements from our portfolio to solve specific construction challenges. We collaborate across areas of expertise and regions and draw on the experience gained from countless construction projects worldwide. We at Master Builders Solutions leverage global technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make more successful and drive sustainable construction.

Market leading products are developed from technically advanced formulations, optimized for the harsh environmental conditions found in the Middle East.

Our Comprehensive Portfolio

- >> Concrete admixtures
- >> Cement additives
- Chemical solutions for underground construction
- >> Waterproofing solutions
- >> Sealants
- >> Tile fixing systems
- >> Concrete repair and protection solutions
- >> Performance grouts
- >> Performance flooring solutions
- >> Wall systems
- Fire protection systems





Master Builders Solutions for the Construction Industry

MasterAir® Complete solutions for air entrained concrete

MasterBrace® Solutions for concrete strengthening

MasterCast® Solutions for the manufactured concrete product industry

MasterCem® Solutions for cement manufacture

MasterEase® Solutions for reducing concrete viscosity

MasterEmaco® Solutions for concrete repair

MasterFinish® Solutions for formwork treatment

MasterFlame® Complete firestopping solutions

MasterFlow® Solutions for precision grouting

MasterFiber® Comprehensive solutions for fiber reinforced concrete **MasterGlenium®**

Solutions for hyperplasticized concrete

MasterInject® Solutions for concrete injection

MasterKure® Solutions for concrete curing

MasterLife® Solutions for enhanced durability

MasterMatrix® Advanced rheology control solutions for self-consolidating concrete

MasterPel® Solutions for water tight concrete

MasterPolyheed® Solutions for mid-range concrete

MasterPozzolith® Solutions for water-reduced concrete

MasterProtect® Solutions for concrete protection

MasterRheobuild® Solutions for high strength concrete MasterRoc® Solutions for underground construction

MasterSeal® Solutions for waterproofing and sealing

MasterSet® Solutions for set control

MasterTile® Solutions for tile fixing system

MasterTop® Solutions for industrial and commercial floors

MasterWeld® Adhesive solutions for construction

Master X-Seed® Advance addelerator solutions for concrete

Ucrete® Flooring solutions for harsh environments

Contact Information:

Head Office

Al-Othman Business Tower 14th Floor, King Saud Road, Al Qashlah, Dhahran 34232, P.O. Box 1884, Al Khobar 31952 Tel: +96613 8538600, 13812 1140 Fax : +966 13 832 8671, 13 812 1822

Riyadh Sales Office Tel.:+966 11 2790971 / 72 Fax : +966 11 279 0970

www.master-builders-solutions.com/en-sa enquirycc.saudi@mbcc-group.com

Registered Office / Factory

P.O. Box 1884 Al-Khobar 31952 , Road No. 58, Hail Street , 2nd Industrial City, Dammam, KSA

Tel.:+966 13 812 1140 Fax:+966138121822

Jeddah Sales Office Tel: +966 12 639 4799 12 639 5702 Fax : +966 12 639 4934

