

Application Guide

Cementitious Concrete Repair
MasterCrete Mortars

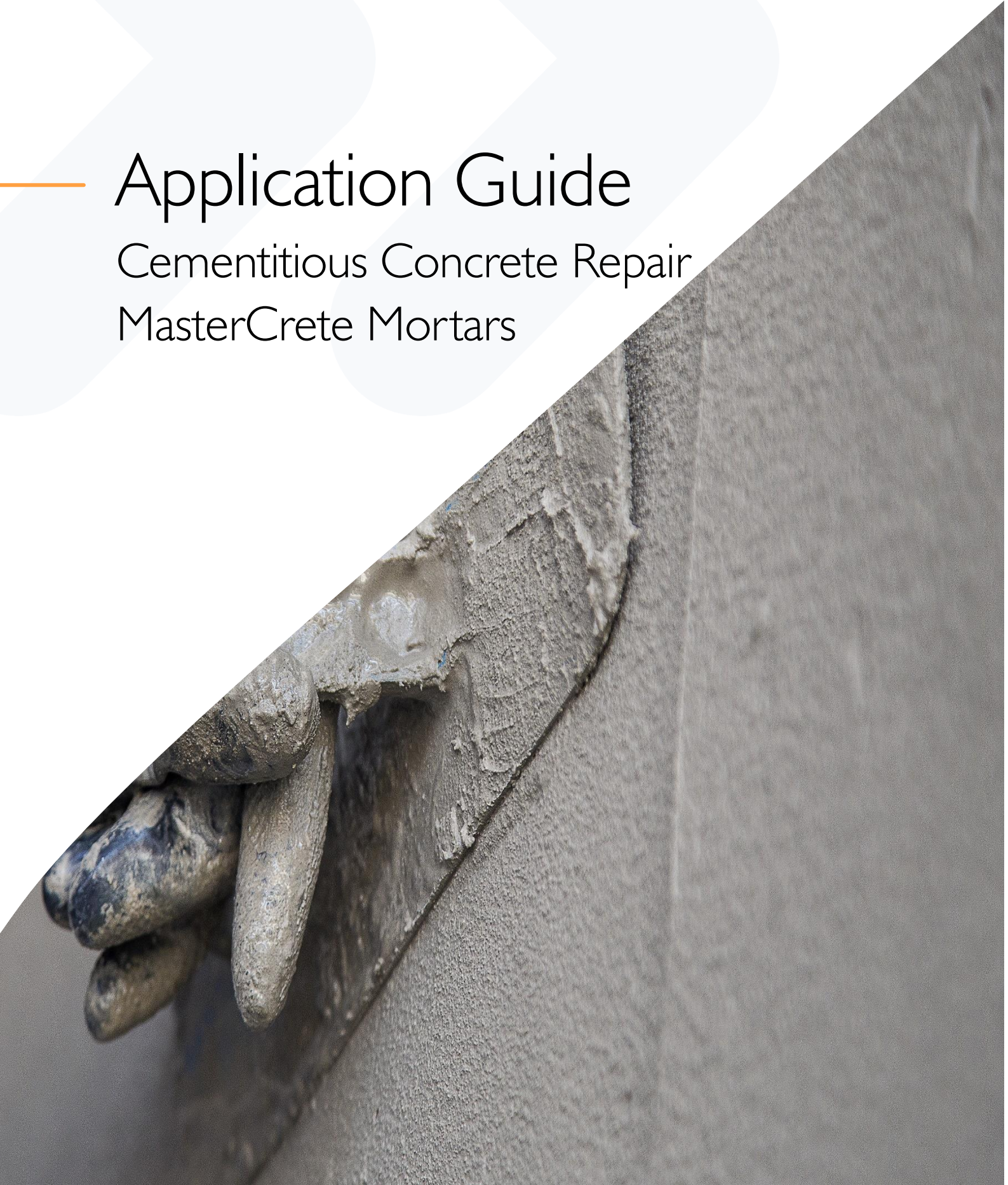


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GENERAL

This application guide applies to the MB Solutions Australia Pty Ltd, concrete repair systems, known as MasterCrete brand family (formerly MasterEmaco). This application guide shall be read in conjunction with all project specifications (including drawings) -by others- and the current material Technical Data Sheets (TDS) and Safety Data Sheets (SDS).

Products Info

Renamed Brand	Formerly as	Size	Water ratio per 20kg bag	Min-max thickness	Yield
MasterCrete PRI 2500	MasterEmaco P 5000ZR	1 & 4L	N/A	WFT: 120microns	8.4 m ² /l
MasterCrete PRI 157	MasterEmaco P 157	20L	1-4L	10mm (as slurry)	20-80L
MasterCrete PRI 5000	MasterEmaco P 5000AP	5Kg	0.22-0.26L/kg	1-2mm	4L
MasterCrete 5135	MasterTop 505	12Kg	1.0L per 2.0L	0-13mm	24L
MasterCrete 5140	MasterEmaco N 5100CI	20Kg	3.0-3.5L	0-3mm	11L
MasterCrete CI 5100	MasterEmaco N 102	20Kg	3.8-4.0L	5-100mm	16L
MasterCrete CI 5200	MasterEmaco N 5200CI	20Kg	3.5-4.0L	3-100mm	13L
MasterCrete CI 5300	MasterEmaco S 5300CI	20Kg	3.8-4.2L	5-75mm	12.4L
MasterCrete 5350	BluCem HB50	20Kg	Trowel: 3-3.5L Pour: 3.5-4L	5-100mm	12.8L
MasterCrete CI 5488	MasterEmaco S 488CI	20Kg	3.0-3.4L	5-50mm	10.5L
MasterCrete LH 5460	BluCem LH60	20Kg	2.4-2.8 L	20-250mm	10L
MasterFlux 881	BluCem HE80 AG	20kg	2.0 - 2.4 L	10-100mm	9.5-9.9L
MasterCrete UW 902	MasterEmaco S 902CI	20Kg	1.0L per 3.0L	20-50mm	11.2L
MasterCrete CAC 620	MasterEmaco S 620	20Kg	2.8-3.2L	10-50mm	11L
MasterCrete CAC 682	MasterEmaco S 682	20Kg	1.8-2.5L	10-150mm	10.2L
MasterCrete CI 820	MasterEmaco S 820CI	20Kg	1.8-2.5L	10-150mm	10.2L
MasterCrete CI 822	MasterEmaco S 822CI	20Kg	1.8-2.5L	10-150mm	10.2L
MasterCrete 855	BluCem HB55	20Kg	2.0-2.4 L	10-150mm	9.4L
MasterCrete FC 545	MasterEmaco T 545	20Kg	1.4L	13-25mm (Neat) 25-150mm (filled)	10

Application Requirements

Training: All work shall be carried out by adequately trained and skilled applicators/installers, under appropriate supervision.

Safety: Always ensure the appropriate use of adequate PPE (gloves, goggles, long sleeves etc) and comply with all other safety related requirements when applying Master Builders Solutions materials.

Quality Systems: The applicator shall operate under a fully compliant quality system, to ensure the on-site quality of applied material. The applicator shall keep fully documented work records for all works undertaken.

Quality Control: If after application and/or testing, any applied material is deemed as unsatisfactory by the specifying consulting engineer and/or MB Solutions Australia Ltd, it may need to be rectified at the applicator's cost.

Useful documents: MasterCrete Repair Products are used for a variety of concrete repair applications and share some common attributes and often some installation techniques.

For detailed explanations of the mechanisms of concrete deterioration, inspection and interpretation of inspections and repair technologies, several documents should be referred to. Some of these include:

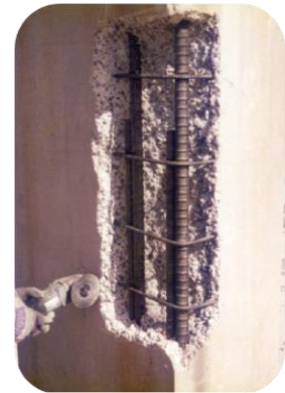
- Standards Australia HB 84:2018 "Guide to concrete repair and protection"
- BS EN 1504-10:2017 "Products and systems for the protection and repair of concrete structures"
- International Concrete Repair Institute, ICRI 310.2R-2013 "Concrete Surface Profile Chips (CSP 1-10)"

APPLICATION- SUBSTRATE

Steel Reinforcement

Steel- Surface Preparation

- All loose material should be removed, and the reinforcing steel exposed to the point where there is no visible rust and a grey surface colour is observed. This indicates that the steel at this point is still passivated and thus you are out of the current corrosion zone.
- The reinforcing steel should be exposed on all sides so that you are able to fit a gloved hand behind the bar.
- If the reinforcing steel has lost a significant amount of its cross-sectional area (approximately 20% is classified as significant) it may need to be replaced or additional steel installed. The replacement should be determined by the engineer, especially in structural applications.
- The steel should be cleaned to an SA Class 2.5 and all rust removed. For small patches this can be done by wire brush. On larger jobs a needle gun or captive grit blasting will be effective. The action of the hydro demolition will clean the steel well and no further preparation would be necessary.



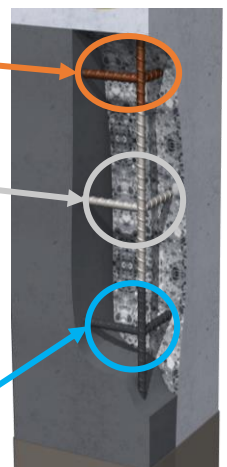
Steel-Priming

- Once the steel has been cleaned it will generally be necessary to prime the steel using **MasterCrete PRI 5000** or **MasterCrete PRI 2500**.
- Priming stops the flash rusting resulting from contact with the moisture in the air.
- **MasterCrete PRI 5000** is an acrylic modified cementitious coating with active corrosion inhibition. Refer to the product section for details on mixing and application methods.

MasterCrete PRI 5000
 Cementitious slurry primer

MasterStrength 2525
 2 comp solvent free
 structural binder (only for
 horizontal applications)

MasterCrete PRI 2500
 Zinc rich epoxy primer



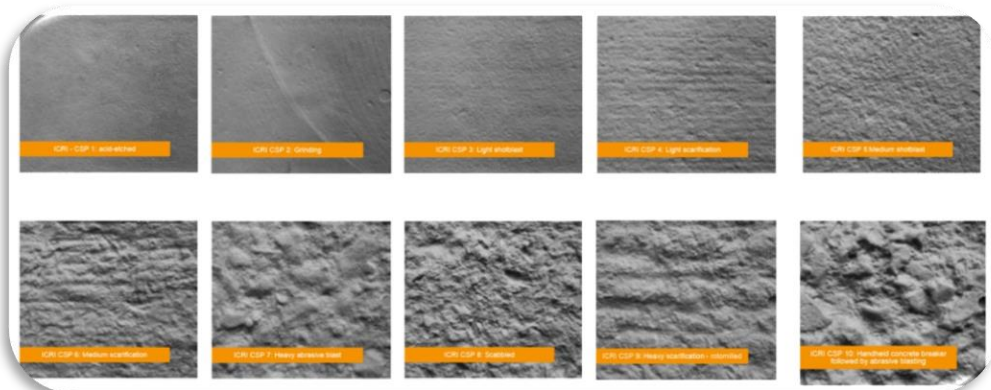
- **MasterCrete PRI 5000** is an orange colour to make a simple visual evaluation of the steel that has been coated.
- This should be allowed to dry for a few hours before application of repair mortars or shotcrete.
- If application of MasterCrete shotcrete was to proceed directly after the hydro demolition, the need for the **MasterCrete PRI 5000** is reduced and could be eliminated without creating any issues with the longevity of the repair.
- The **MasterCrete PRI 2500** is a zinc rich steel primer and the use of this is entirely compatible with any of the MasterCrete repair products. Care must be taken if using a zinc rich primer to ensure none is left on the parent concrete as this will interfere with the bond of the repair mortar.



Concrete Substrate

Concrete-Surface Preparation

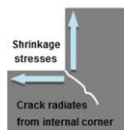
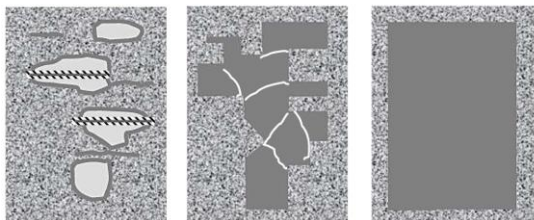
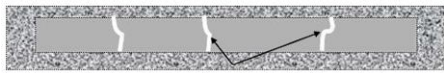
- Preparation of the concrete substrate for concrete repairs generally involves a couple of steps. Preparation will involve removal of the contaminated, cracked and affected concrete to create a suitable profile.



- For the best results, a CSP profile is required, please refer to each product specific TDS.
- The choice of technique will be determined by the size and depth of the patch. Suitable techniques include:
 - Abrasive blasting
 - Jack hammering
 - Ultra high pressure water jetting



- The edges of the patch should be square cut to a depth of 10-20mm or the minimum as specified on the TDS, to prevent any of the repair mortar from being feather edged. Patches should be regular in shape, and it may be necessary to join a number of several small irregular patches to make a single regular patch. This will reduce the risk of cracking in and between patches and the premature failure.



Concrete- Saturated Surface Dry (SSD)

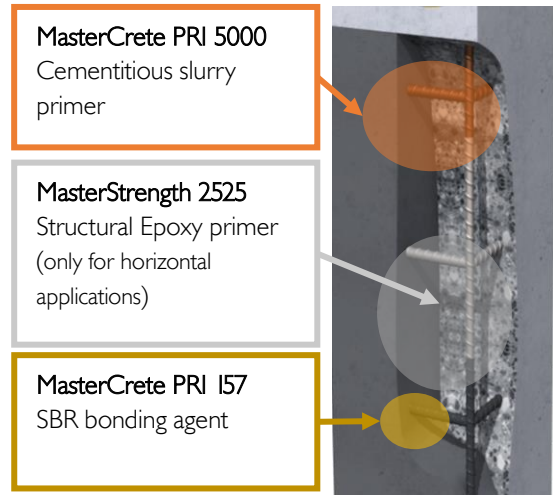
- The concrete substrate should be a saturated surface dry (SSD) substrate, to accept the repair mortars, as a dry substrate will lead to surface cracking and poor bond to the substrate.
- Shotcrete materials like the **MasterCrete CI 820/822**, **MasterCrete CAC 682** and **MasterCrete 855** only require the substrate to be wetted just prior to the beginning of spraying. This is accomplished by spraying just water or a very thin, wet mix, as a slurry coat onto the prepared surface and then continuing with the normal shotcrete.
- The only exception to this is the **MasterCrete FC 545** which chemically bonds with the concrete and does not need a wetted substrate.

Note: a damp substrate will not interfere with the bonding of the **MasterCrete FC 545**.



Concrete- Priming

- **MasterCrete PRI 5000**, as well as being used as a steel primer can be used as a bonding agent for the repair mortar to the concrete. The repair mortar should be applied whilst it is still wet and if it dries out reapplication will be required.
- **MasterCrete PRI 157** is an SBR bonding agent, which can be used when wetting is impractical and should be diluted 1:1 with water and applied generously by brush to the concrete. Apply the repair mortar whilst the **MasterCrete PRI 157** is still tacky.
- Slurry coat of the repair mortar – normally a mixture of 2 parts water and 1-part dry powder of the repair product being used is used to create a slurry coat and apply this to a wetted substrate with a brush and apply the repair mortar whilst still wet. The benefit of this is that the materials are all on site and more can be simply made up as required.
- Epoxy bonding agents are not recommended for vertical and overhead repairs however some specifications may call for this.
- **MasterStrength 1444/1446** are compatible with all the repair mortars.
- Epoxy bonding can also be considered for the **MasterCrete LH 5460** for heavy duty pavement repairs and on horizontal surfaces.
- **MasterStrength 2525** would be the appropriate bonding agent.
- Ensure that the epoxy bonding agent is still tacky before applying any repair mortar.
- Depending upon the delay, either reapply the bonding agent if cross linking is still possible or sand and solvent wipe prior to reapplication.
- In extreme cases, removal of the cured bonding agent may be required before starting again.



APPLICATION- PRODUCTS

MasterCrete PRI 2500- Zinc Rich Epoxy Primer for Steel

Mixing

- Despite being a single-component product, it should be stirred thoroughly before use to ensure proper redistribution of any settled particles.
- Agitate continuously during application.
- The temperature of the paint must be above 15°C, otherwise MasterCoat THI 955 (thinner) may be required to obtain application viscosity (volume of MasterCoat THI 955: 0-3%).

Note: Too much thinner will result in lower sag resistance and slower

Placement

- Substrate temperature must be at least 5°C during surface preparation, application and curing and at least 3°C above dew point. Relative humidity should not exceed 85%.
- MasterCrete PRI 2500 must be applied promptly onto a dry steel surface following the completion of preparation work, but always within a 3 hrs timeframe.
- Apply a full coat of MasterCrete PRI 2500 using a suitable brush, ensuring thorough coverage of exposed steel reinforcing bars.
- Allow the coat to fully dry before proceeding. If uncertainty arises regarding the achievement of a continuous coating, apply a second coat as soon as the first one is completely dry, typically between 30 minutes and 1 hour (refer to overcoating table).
- Avoid leaving primed surfaces exposed to the elements for longer than necessary before applying MasterCrete repair materials and as soon as the MasterCrete PRI 2500 is fully dry.
- A smaller brush is generally more suitable for this task to prevent splashing the primer over concrete surfaces and reducing risk of de-bonding between the cementitious repair mortar and the concrete substrate.
- Overcoating interval for MasterCrete PRI 2500 when top coating with itself or compatible topcoats or Concrete Repair Material:



Interval/Curing	5 °C	15 °C	25 °C	35 °C
Min	4/5hrs	3/4hrs	2hrs	1 hr
Max*			2months	

Note: MasterCrete PRI 2500 offers protection to steel under clean interior exposure conditions for several months. In non-aggressive exterior environments, a maximum interval of 14 days is acceptable, while in industrial and/or marine environments, this interval should be minimized as much as practically feasible.

MasterCrete PRI I 57- SBR Primer for Concrete and Mortars

Mixing

- Stir well before addition to mortar mixes. Mortars should be mixed in a pan type mixer or by means of a low-speed mixer (300-600rpm) with a helical paddle.
- Hand mixing is not recommended.

Placement

- As bonding slurry (priming), apply a slurry onto the still damp substrate, with a stiff brush.
- The mortar must be placed wet-on-wet. If the slurry does dry, a further slurry coat must be applied.
- As renderings and repair mortars (to vertical surfaces); after brushing the bonding slurry onto the prepared surface, apply immediately MasterCrete PRI I 57 mortar in average thickness of 10mm, as thicker layers tend to sag. However, several layers can be applied in quick succession.
- If thicker layers are applied, suitable formwork has to be used.
- As screed and toppings (to horizontal surfaces); always place screed, topping or patching mortar onto the still wet bonding slurry.
- Use low water-cement ratio for thick layers of mortar.
- Depending on use and exposure of the flooring mortar, premix the mixing water with MasterCrete PRI I 57 in ratio of 1-part MasterCrete PRI I 57 to 1-4 parts of water by volume:

Application	Sand (kg)	Cement (kg)	MCrete PRI I 57 (L)	Water (L)	Yield (mm ²)
Topping or large overlays	21	7	2.5	1.25	10-12
Concrete & Masonry Repairs	21	7	3.8		10-12
Setting & Grouting Pavers & Stone	21	7	3.8		10-12
Levelling concrete	12	6	3.8		3
Plaster & Stucco	12	6	1	3	5-7
Bond slurry	7	7	3.8		0.170-0.2

MasterCrete PRI 5000- Acrylic Modified Cementitious Bonding Slurry

Mixing

- In a suitable container, mix MasterCrete PRI 5000 with a paddle mounted on a slow-speed drill or by hand, until a smooth, thick consistency is achieved.
- Mixing water needed: 0.22 to 0.26 liters per kg of powder, depending upon consistency required.
- Leave to stand for approx. 5 minutes and re-mix briefly before use.
- Adjust the consistency with water when required but without exceeding the maximum water demand.

Placement

- Substrate and ambient temperatures must be a minimum of +5°C and a maximum of +35°C. The minimum temperatures must be maintained during application and for at least 24 hours thereafter for optimum curing of the product.
- As a reinforcement primer: Apply the mixed material in an even layer at least 1mm thick (approx. 1.5kg/m²) to the full circumference of the prepared reinforcement using a soft paint brush.
- When the first coat has hardened sufficiently, (approx. 30-90minutes) apply a second coat also 1mm thick. It is important that this second layer has sufficiently hardened before the repair mortar is applied.
- When applying the repair mortar by hand this can be done after approximately 2 hours. However, when spraying a repair mortar, the priming coat must be left to dry completely (min. 8 hours @ 20°C).
- As a bonding slurry: Work the mixed material well into the prepared and pre-soaked, damp surface by using a suitable brush. Typical application rates are 2-3kg per m². Apply the repair mortar wet in wet. Never allow the slurry bond coat to dry out.



MasterCrete 5135- Thin Layer Fairing Mortar

Mixing

- The mixing ratio is two parts powder to one part water by volume to preferred consistency.
- In a clean mixing container pour approximately enough powder to place in 20 minutes.
- Add water while slowly mixing with a margin trowel or Jiffy mixer. Vigorously mix to a smooth, lump-free consistency.
- To mix an entire bag, use approximately 6.4 litres water with a 12 kg unit.
- Mechanical mixing with a portable drill and Jiffy mixer at low RPM (300-600) will produce a creamier (fluffy) and smoother consistency.

NOTE: Mechanical mixing with a portable drill and Jiffy mixer at low RPM (300-600) will produce a creamier (fluffy) and smoother consistency.

Placement

- Priming is not required except for SSD (saturated surface dry).
- MasterCrete 5135 does not require a minimum thickness. Use the least amount of material to achieve the desired surface smoothness.
- Steel trowel to desired thickness and finish, making sure product is properly keyed into subfloor substrate.
- Apply enough pressure to fill all voids and defects. Feather out where a seamless interface is desired.
- MasterCrete 5135 may be applied from featheredge to 13 mm in thickness.
- Pot life is 15 to 20 minutes at 21°C. Pot life will vary with ambient and substrate temperature.
- When setting in the pail, MasterCrete 5135 may be re-tempered only through remixing.

Note: DO NOT RETEMPER WITH ADDITIONAL WATER.

MasterCrete 5140- Lightweight Trafficable Repair Mortar

Mixing

- Use only full bags and damaged or opened bags should not be used.
- Pour water approximately 3.5 litres of water into a suitable pail and add the powder whilst mixing continuously until a homogeneous, lump-free mix is obtained.
- Adjust water to give a suitable consistency dependent on ambient temperature and relative humidity.
- In hot and dry climates, slightly higher amounts of water may be necessary, the contrary in cold and humid climates.
- Use a low-speed stirrer (300-600) with an upward mixing helical mixing paddle to entrap as little air as possible.

Note: Do not mix MasterCrete CI 5140 with additional cement, sand or aggregate.

Placement

- Priming is not required.
- Apply the well-mixed MasterCrete 5140 without delay to the prepared damp surface with a spatula or trowel; thin layers may be applied with a brush.
- A minimum temperature of 7°C is essential.
- Layers up to a maximum of 3mm per coating can be applied.
- Depending on the finish desired, treat the surface of MasterCrete 5140 after it starts to set with a foam or sponge trowel.
- A 20kg bag of MasterCrete 5140 mixed with 3 – 3.5 litres of water yields: 11 litres (0.011 m³), therefore material requirement is 5.5kg/m² @ 3mm thickness.



MasterCrete CI 5100- Lightweight RI Repair Mortar

Mixing

- Use only full bags and damaged or opened bags should not be used.
- Add 3.8 to 4.0 litres mixing water (clean, potable water only) to a clean mixing container.
- Accurately measure the mixing water and hold back approximately 10% so that the consistency can be adjusted to the required slump.
- Mix MasterCrete CI 5100 with a suitable paddle attached to a powerful, slow speed electric drill for 3 minutes until a lump free, plastic consistency is achieved.
- Use stiffer consistency for overhead and vertical patching application and softer more creamy consistency for use as a levelling coat at 5mm thick.
- Allow the mortar to rest for 2 - 3 minutes and then remix briefly, adjusting the consistency as required.

Placement

- The prepared substrate should be pre-soaked, preferably for 24 hours, but at least 2 hours before applying MasterCrete CI 5100.
- The surface must be mat damp, but without standing water.
- For improved build thicknesses or when working on large areas, apply bond or contact layer of the MasterCrete CI 5100 mortar. Alternatively, a bonding coat of MasterCrete PRI 5000 can be applied.
- Always apply MasterCrete CI 5100 mortar wet-in-wet onto the bond or contact layer.
- The minimum temperatures must be maintained during application and for at least 12 hours thereafter for optimum curing of the product.
- MasterCrete CI 5100 can be hand or trowel applied. Apply mixed product directly to the prepared damp substrate or wet on wet onto the primed surface.
- A thin scrape coat or contact layer before building up to the required thickness, wet on wet, will improve the wet adhesion and cohesion of the mortar.
- Apply to the desired layer thickness of 5mm to max. 100 mm.
- Smoothing with a trowel or finishing by float or sponge can be done as soon as the mortar has begun to stiffen, typically after approximately 45 - 60 minutes at 20°C.
- MasterCrete CI 5100 can be over-coated, after 7 days, with MasterShield AC150 or 160 as required.

Note: At lower temperatures and/or higher humidity these times will be extended.

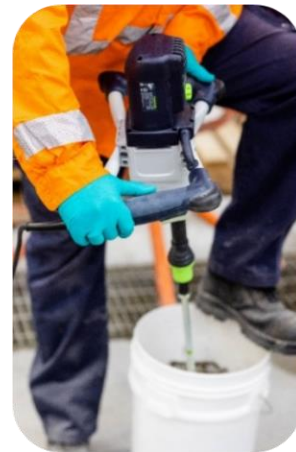


MasterCrete CI 5200- Lightweight Fast Setting R2 Repair Mortar

Mixing

- Use only full bags and damaged or opened bags should not be used.
- Add 3.5 to 4.0 litres mixing water (clean, potable water only) to a clean mixing container.
- Accurately measure the mixing water and hold back approximately 10% so that the consistency can be adjusted to the required slump.
- Mix MasterCrete CI 5200 with a helical paddle attached to a slow speed (300-600 rpm) mixer or in a forced action pan mixer for 3 minutes until a lump free, plastic consistency is achieved.
- Allow the mortar to rest for 2 - 3 minutes and then remix briefly, adjusting the consistency as required.

Note: Never exceed the maximum water demand.



Placement

- The prepared substrate should be pre-soaked, preferably for 24 hours, but at least 2 hours before applying MasterCrete CI 5200.
- The surface must be saturated surface dry, but without standing water.
- For improved build thicknesses or when working on large areas, apply bond or contact layer of the MasterCrete CI 5200 mortar. Alternatively, a bonding coat of MasterCrete PRI 5000 can be applied.
- MasterCrete CI 5200 can be hand or trowel applied.
- Apply mixed product directly to the prepared damp substrate or wet on wet onto the primed surface.
- A thin scratch coat or contact layer (a slurry coat of the MasterCrete CI 5200) before building up to the required thickness, wet on wet, will improve the wet adhesion and cohesion of the mortar.
- Apply to the desired layer thickness of 3 to max. 100 mm.
- One 20kg bag mixed with 3.8L of water will yield approximately 13 litres of mortar.
- Smoothing with a trowel and finishing by float or sponge can be done as soon as the mortar has begun to stiffen, typically after approximately 45 - 60 minutes at 20°C.
- MasterEmaco N 5200CI can be over-coated, after approximately 4 hours, with MasterShield AC anti-carbonation coatings as required.

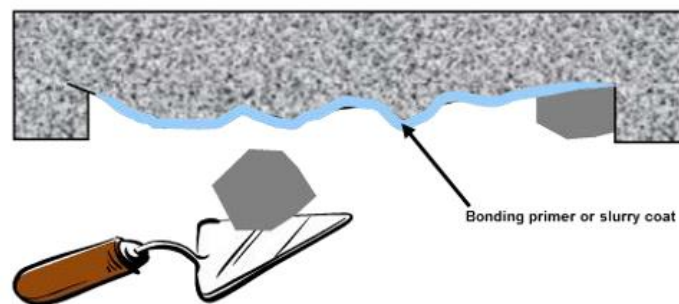
Note: At lower temperatures and/or higher humidity these times will be extended.

MasterCrete CI 5300- High Build, Mid-Strength R3 Repair Mortar

Mixing

- Use only full bags and damaged or opened bags should not be used.
- Add 3.8 to 4.2 litres mixing water (clean, potable water only) to a clean mixing container.
- Accurately measure the mixing water and hold back approximately 10% so that the consistency can be adjusted to the required slump.
- Mix MasterCrete CI 5300 with a helical paddle attached to a slow speed (300-600 rpm) mixer or in a forced action pan mixer for 3 minutes until a lump free, plastic consistency is achieved.
- Allow the mortar to rest for 2 - 3 minutes and then remix briefly, adjusting the consistency as required.

Note: Never exceed the maximum water demand.



Placement

- The prepared substrate should be pre-soaked, preferably for 24 hours, but at least 2 hours before applying MasterCrete CI 5300.
- The surface must be saturated surface dry, but without standing water.
- To obtain extra strong bonding, the damp substrate can be primed with a slurry brush coat of MasterCrete CI 5300 (2 parts powder to 1 part water) or MasterCrete PRI 157 or alternatively, MasterCrete PRI 5000 can also be applied as the bonding slurry.
- The minimum temperatures must be maintained during application and for at least 24 hours thereafter for optimum curing of the product.
- MasterCrete CI 5300 can be hand, trowel or spray applied. Apply mixed product directly to the prepared damp substrate or wet in wet onto the primed surface.
- A thin scrape coat or contact layer before building up to the required thickness, wet on wet, will improve the wet adhesion and cohesion of the mortar, especially in case of hand application.
- Apply to the desired layer thickness of 5 to max 75 mm and level using a screeding beam, trowel or wooden board. Can be applied in thicker layers in smaller patches or where additional reinforcement is present.
- Smoothing with a trowel or finishing by float or sponge can be done as soon as the mortar has begun to stiffen.

MasterCrete 5350- High Build, Mid-Strength Fast Setting R3 Repair Mortar

Mixing

- Use only full bags and damaged or opened bags should not be used.
- For Trowel applied, add 3.0 to 3.5 litres and for Form and Pour applied, add 3.5-4.0 litres mixing water (clean, potable water only) to a clean mixing container.
- Accurately measure the mixing water and hold back approximately 10% so that the consistency can be adjusted to the required slump.
- Mix MasterCrete 5350 using a high shear mechanical mixer for at least 3 minutes.
- Add enough water to achieve the desired consistency within the water ratio limits specified.

Note: Do not mix more material than can be placed in 15 minutes.

Placement

- Work small amounts of mixed MasterCrete 5350 into the primed or dampened surface. Do not exceed 40mm of thickness in any wet layer.
- Roughen the surface between each layer and wait until initial set or all latent heat has dissolved prior to application of next layer.



MasterCrete CI 5488- High Strength Trowel Application R4 Repair Mortar

Mixing

- Use only full bags and damaged or opened bags should not be used.
- Add 3.0 to 3.4 litres mixing water (clean, potable water only) to a clean mixing container.
- Pour minimum required water into a suitable mixer and add **MasterCrete CI 5488** rapidly and continuously while mixing.
- Use low speed drill with suitable helical paddle (jiffy) or by pan mixer. Hand mixing of **MasterCrete CI 5488** is not recommended to avoid the introduction of excessive amounts of water.
- Mix for 3-4 minutes or until a lump free, homogeneous mortar is obtained.
- Add extra water, if necessary, until the required consistency is obtained and mix again for 2 - 3 minutes.
- The amount of water to be added is highly dependent on ambient temperature and relative humidity. In hot and dry climates, slightly higher amounts of water may be necessary, the contrary in cold and humid climates.
- Allow the mortar to rest for 2 - 3 minutes and then remix briefly, adjusting the consistency as required.

Placement

- No special primer is required. To obtain extra strong bonding, the damp substrate can be primed with a slurry brush coat of MasterCrete CI 5488 (2 parts of powder to 1 part of water). However, several layers can be applied in quick succession. If thicker layers are applied, suitable formwork has to be used. The minimum temperatures must be maintained during application and for at least 12 hours thereafter for optimum curing of the product.
- No special primer is required. To obtain extra strong bonding, the damp substrate can be primed with a slurry brush coat of MasterCrete CI 5488 (2 parts of powder to 1 part of water).
- However, several layers can be applied in quick succession. If thicker layers are applied, suitable formwork has to be used.
- MasterCrete CI 5488 can either be sprayed or trowelled.
- If necessary, a wooden float may be used to level the surface.
- The final surface may be smoothed as desired by a wooden, plastic or synthetic sponge trowel.
- Trowelling after the spray application may start only when the mortar has set, that is, when fingers do not sink beneath the surface, but mark it lightly.



MasterCrete LH 5460- Deep Pour Flowable Micro Concrete

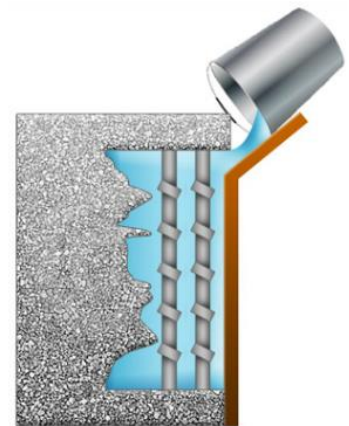
Mixing

- Use only full bags and damaged or opened bags should not be used.
- Add 2.4 to 2.8 litres mixing water (clean, potable water only) to a clean mixing container.
- MasterCrete LH 5460 is best mixed with a bird cage style mixer to give a fluid consistency.
- The mix water's temperature should be kept as low as possible to prevent the grout from hydrating too rapidly.
- In some cases it may be necessary to cool the material or the mix water to keep the temperature as low as possible.
- Measure and place 85% of the specified volume of potable water to the high shear mixing vessel. And add MasterCrete LH 5460 powder.
- High-shear mixing can add 1 to 2°C per minute of mixing. To minimise this effect, add all ingredients to the mixer as quickly as possible and minimise prolonged batch-mixing procedures.
- Following addition of all powder, mix for 1 - 2 minutes or until uniform consistency then add final 15% of potable water.
- More or less water may be added within the ratio limits specified.

Note: Do not mix more material than can be placed in 30 minutes.

Placement

- The minimum temperatures must be maintained during application and for at least 12 hours thereafter for optimum curing of the product.
- MasterCrete LH 5460 may be pumped or poured from the mixing bucket and trowelled onto the prepared surface.
- Do not exceed the maximum application thicknesses specified for any wet layer.
- The formwork should be watertight and sturdy. The forms should be treated with a form release agent like MasterFinish RL 211 or 222 to ensure they can be easily removed.
- When possible pre-wet the substrate before pumping or pouring the mortar into the form.
- Ensure that excess water is drained prior to filling form with mortar.
- Saturated surface dry or bonding agent should be considered where practical.
- Keep forms on until the material has reached the desired strength and cure the material after removal of forms.
- MasterCrete LH 5460 are mostly used in horizontal excavations and the surrounding concrete becomes the form.
- Move the material to the desired places with a trowel and finish off the surface profile required.
- MasterCrete LH 5460 will set relatively quickly and finishing off should be done as quickly as possible.

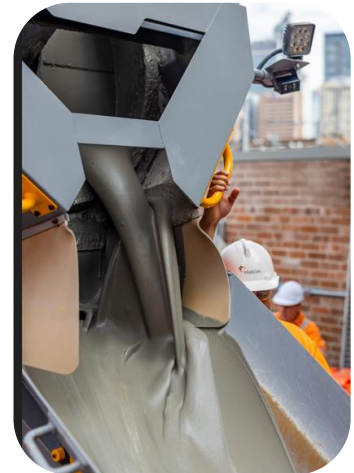


MasterFlux 88I - Deep Pour, High Early Strength Flowable Micro Concrete

Mixing

- MasterFlux 88I is a micro concrete and therefore best mixed using tumble style agitators.
- Add 2.0 to 2.4 litres mixing water (clean, potable water only) to a clean mixing container.
- Measure and place 80% of the specified volume of potable water to the high shear mixing vessel.
- Start mixer and slowly add MasterFlux 88I powder.
- If powder addition is too fast then large lumps will form and final mix will be slow reaching uniform consistency.
- Following addition of all powder, mix for 1 - 2 minutes or until uniform consistency then add final 20% of potable water.
- More or less water may be added within the ratio limits.

Note: Do not mix more material than can be placed in 20 minutes.



Placement

- Once MasterFlux 88I has been mixed, you need an effective placement method to deliver it to the area of application.
- MasterFlux 88I may be poured or pumped into place. Do not exceed the maximum application thicknesses specified in the data sheet for any wet layer.
- MasterFlux 88I is a micro concrete and therefore best mixed using tumble style agitators.
- It is also best to pour or pump shorter distances using concrete pumps.
- Prior to placing MasterFlux 88I, rinse the mixer and charge the pump hopper with sufficient water to flush and cool the pump and all grout lines thoroughly.
- Check to ensure that all lines and hoses are clear and unobstructed. Once it is mixed, it is important to keep it agitated continuously prior to pumping. If the grout is allowed to sit then it will 'gel' and may become more difficult to pump, or otherwise set earlier than expected.
- Once the site is ready for grout placement, commence pumping. It is important to pump continuously and avoid the formation of cold joints.
- Following completion, dispose of excess production material in consideration of the environment.

MasterCrete UW 902- Rapid Setting Underwater Repair Mortar

Mixing

- Use potable water only.
- Water requirements vary depending on temperature, humidity and the consistency desired.
- Mixing three volumes of MasterCrete UW 902 with approximately one volume of water will give a stiff plastic consistency.
- Place MasterCrete UW 902 into container and add half the water, mix quickly with a short handled trowel, add extra water as required until no white streaks are present to get the desired plastic consistency.
- Mix only small batches at one time, as MasterCrete UW 902 must be placed within 5 minutes of mixing.

Note: Do not re-temper material which has begun to stiffen - discard material which has lost its plasticity.

Placement

- The MasterCrete UW 902 should be shaped quickly into spheres of about cricket ball size and applied as soon as possible.
- When applying MasterCrete UW 902 to eroded piles, the MasterCrete UW 902 "ball" should be centered in the cavity firmly, and quickly smoothed out from the Centre to the sides with both hands, using "forward and sideways" pressure, molding to appropriate shape and thickness.
- When applying underwater, place freshly mixed "balls" of MasterCrete UW 902 into a wire basket and lower steadily to diver.
- Where there is wave action or turbulence in the water, it is advisable to press the MasterCrete UW 902 firmly in place for a moment or so before smoothing it out to shape.



MasterCrete CI 820- General Purpose Shotcrete with Corrosion Inhibitor

MasterCrete CI 822- Shotcrete for Cathodic Protection

MasterCrete 855-Premium Shotcrete for Cathodic Protection

MasterCrete CAC 682- CAC Shotcrete for Aggressive Environments

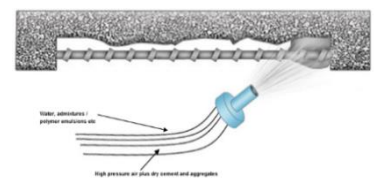
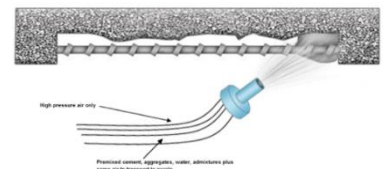
Mixing

- These materials are applied via a dry shotcrete machine and the water is added at the nozzle and controlled by the shotcrete operator.
- Increasing the water will reduce the rebound and dust creation.
- For wet applications, add MasterCrete 855 to potable water in a clean vessel using a high shear mechanical mixer for at least three minutes. Do not mix more material than can be placed in 15 minutes. Add enough water to achieve the desired consistency within the water ratio limits (2.0 – 2.4 litres per 20kg).



Placement

- Special pumping and mixing equipment are required for MasterCrete 855 which can be applied by either wet or dry spraying. Various models of batch mixers and continuous mixers are available for use. It is important to match your application's specifics with the capabilities of the mixer and pump. Master Builders Solutions are able to recommend the right mixer for your project.
- **For wet spraying applications** rinse the mixer and charge the pump hopper with sufficient water to flush and cool the pump and all grout lines thoroughly. Check to ensure that all lines and hoses are clear and unobstructed. Once grout is mixed, it is important to keep it agitated continuously prior to pumping.
- MasterCrete CI 820, MasterCrete CI 822, MasterCrete CAC 682 and MasterCrete 855 are applied via a dry shotcrete machine and the water is added at the nozzle and controlled by the shotcrete operator.
- **For dry spraying applications**, empty the dry powder directly into the hopper and adjust water and air at the nozzle for suitable consistency.
- Adjusting the water will influence the rebound and dust creation.
- Following completion, dispose of excess production material in consideration of the environment. Carefully wash out machinery and surrounding areas.



MasterCrete FC 545- Fastest Setting Trafficable Repair Mortar

Mixing

- WATER CONTENT IS CRITICAL. A 20kg bag of MasterCrete FC 545 mixed with a maximum 1.4 liters of water.
- Add all the water to a clean bucket and add the MasterCrete FC 545 and mix for approximately 1 to 1 ½ minutes and place.
- Use neat material for patches less than 25mm in depth. Do not use MasterCrete FC 545 for patches less than 13mm deep.
- For deeper patches, MasterCrete FC 545 must be extended by adding up to 12kg of properly graded, dust-free, hard, rounded aggregate.
- Do not use calcareous aggregate made from soft limestone. Test aggregate for fizzing with 10% HCl. If fizzing occurs, aggregate is unsuitable for use with MasterCrete FC 545.
- Do not add sand, fine aggregate or Portland cement to MasterCrete FC 545.
- MasterCrete FC 545 gives off ammonia fumes when mixed with water and care should be taken to provide adequate ventilation.
- MasterCrete FC 545 is slightly acidic once mixed with water and will mark aluminum, galvanized metals and glass so care should be taken to avoid contact.

Note: The material becomes alkaline once it hardens.



Placement

- MasterCrete FC 545 when mixed is a high slump mortar and cannot be placed vertically unless behind a form.
- Surface carbonation inhibits chemical bond, so application must be done shortly after preparation of the substrate.
- Apply an indicator (phenolphthalein) to the prepared surface to determine if carbonation is present (carbonated concrete will show no colour and non-carbonated concrete will show up pink)
- Into a dry recently prepared excavation pour the MasterCrete FC 545 into the void to be filled and move into place with a trowel.
- The substrate should not be wet, nor bonding agents used as the MasterCrete FC 545 chemically bonds with the concrete.
- MasterCrete FC 545 has a short open time and will generate significant heat during the hardening process.
- MasterCrete FC 545 does not require any curing.



CURING

- All cementitious materials will benefit from curing and if possible, the use of a curing compound is advised, such as **MasterKure 404**.
- This is often impractical due to the requirement for the application of subsequent coatings and in this case, the use of wet hessian or plastic should be considered.
- Thinner applied mortars such as the **MasterCrete CI 5100, CI 5200** need protection to reduce the risk of surface crazing from premature drying.

OVERVIEW

Master Builders Solutions provides comprehensive construction solutions designed to enhance the performance, durability, and longevity of infrastructure projects. Our innovative range of products ensures that projects meet the highest standards of quality and reliability.

Along with innovative products, customers also receive on-site and technical support from the Master Builders Solutions team of experts. By diagnosing the underlying cause of deterioration, our specialists develop the most suitable repair strategy to prevent further damage and deliver lasting protection. Our civil infrastructure solutions are tailored to meet the specific needs of the construction industry in ANZ, delivering consistent results for a wide range of applications.

Other products application guide

- MasterCrete: "Cementitious Concrete Repair" Application Guide
- MasterStrength & MasterFill ER: "Epoxy crack repair" Application Guide
- MasterFill PR: "PU injection systems" Application Guide
- MasterStrength LAM/FIB/BAR/ANC: "CFRP structural strengthening" Application Guide
- MasterJoint CHR: "Joint sealants" Application Guide
- MasterJoint 910: "Hydro-swelling waterbars for construction joints" Application Guide
- MasterJoint 930: "FPO tape for joint waterproofing" Application Guide
- MasterFlux: "Cementitious grouts" Application Guide
- MasterFlux ER: "Epoxy grouts" Application Guide
- MasterShield AKS: "Chemical resistant HDPE liner" Application Guide
- MasterShield CHR 360: "Chemical resistant Novalac coating" Application Guide
- MasterShield AC: "Anti-carbonation coatings" Application Guide
- MasterShield CI: "Impregnants and corrosion inhibitors" Application Guide
- MasterShield CP: "Galvanic cathodic protection systems" Application Guide
- MasterGeo: "Geotechnical Soil nails and anchors" Application Guide

Disclaimer

Application Guide for Cementitious Concrete Repair V2 1224

STATEMENT OF RESPONSIBILITY

The technical information and application advice given in this MB Solutions Australia Pty Ltd publication are based on the present state of our best scientific and practical knowledge. As the information herein is of a general nature, no assumption can be made as to a product's suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by law. The user is responsible for checking the suitability of products for their intended use and for ensuring that the application and use of the product is in accordance with the manufacturer's guidelines and recommendations.

NOTE

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