METHODOLOGY

Concrete repair using dura.rep FR

how to with a.b.e.®

dura.®rep FR mortar with **dura.®bond GP** primer shall be used for vertical or overhead concrete surfaces to be repaired in one or more layers, each layer 10 - 80 mm thick vertically, 10 - 50 mm thick overhead, where 22 - 25 N/mm² compressive strength and resistance to carbon dioxide and chlorides is required. The minimum depth for repair shall be 10 mm.

PRIMING CONCRETE

The prepared substrate shall be thoroughly wetted with clean water to totally satisfy absorption and any standing or excess water shall be removed.

The concrete primer shall be **dura.®bond GP** acrylic emulsion which shall be worked firmly into the damp substrate with a short-bristle brush to achieve a film intimate with the contact area for immediate repair.

Single repair areas larger than 0.5 m² shall be part primed to commence and thereafter progressively in maximum 0.5 m² adjacent bays as application of the repair mortar proceeds.

The repair mortar shall be applied whilst the **dura.®bond GP** is tacky.

Repairs to concrete subject to permanent immersion shall be primed with **epidermix 345** 'Slow- set' which shall be worked firmly into the damp substrate with a short-bristle brush to achieve a film intimate with the contact area for immediate repair.

If the primer dries before the mortar is applied, the area shall be re-primed once.

MIXING REPAIR MORTAR

Before mixing the repair mortar the contractor shall ensure that sufficient and correct areas for reinstatement are prepared and ready to receive repair mortar.

Only mixes using complete bags of **dura.®rep FR** shall be allowed and part bag mixes not permitted.

The mixing shall be carried out strictly in accordance with current product instructions for use and only with appropriate mixing equipment.

The mixing water shall be potable quality and the carefully measured quantity of water for the required mix shall be placed into the mixing container before the **dura.®rep FR**.

The **dura.®rep FR** shall be added to the mixing water and in no circumstances shall more water be added than the maximum volume stated for each bag.

MIXING WARNING

As with other 'one pack' repair mortars **dura.®rep FR** may exhibit satisfactory handling characteristics even though inadequately mixed. This will result in a significantly lower level of performance or possible failure. It is therefore essential that mixing instructions are strictly adhered to with particular emphasis on the quantity of water used and the time of the mixing operation.

APPLICATION OF REPAIR MORTAR

Only fully integrated mixes of **dura.®rep FR** at the required consistency and workability shall be used.

Immediately following mixing the repair mortar shall be applied by gloved hand or trowel to the prepared and primed surface of the substrate paying particular attention to packing behind and between the reinforcement and thorough compaction overall.

dura.®rep FR shall be applied in accordance with current instructions for use. It may be applied in one operation by building up to the required profile in wet-on-wet layers between 10 - 80 mm vertically and 10 - 50 mm overhead. Thicker sections may be achieved by building up in wet- on-dry layers, where each layer shall be wavy-line scratch keyed with a comb, cured with **dura.®bond GP**, allowed to dry throughout and re-primed at the time of application of subsequent layers.

In hot, humid, coastal situations and in heavy industrial areas ensure that the interval between successive layers is kept to a minimum. This is to prevent possible contamination of the surface of the preceding layer with air-borne contaminants, resulting in possible inter-coat adhesion failure and reduced product performance. In the event that delays are unavoidable, wash down the surface thoroughly with clean water before proceeding with the following coating.

Sagging of the repair mortar is not acceptable and if occurring, all the material of the affected repair shall be completely removed prior to re-priming and refilling in two or more applications of mortar supported by formwork if required.

If formwork is used it shall be pre-treated with a varnish to prevent moisture absorption from the repair mortar. Special care shall be taken to ensure that the positioning of the formwork allows for compaction of and does not result in voids within the repair mortar.

After applying sufficient mortar to achieve a level flush with or slightly proud of the surrounding surface the **dura.®rep FR** shall be finished by striking off with a straight edge and trowelled/floated depending upon circumstances.

Repair mortar shall not be applied when the ambient or substrate temperature is below 5 °C or above 35 °C nor at an ambient temperature of 5 °C on a falling thermometer. The applied repair mortar shall always be protected from freezing whilst drying.

CURING

Details of the methods of curing shall be submitted to the Contract Administrator for approval.

Curing techniques shall be instigated immediately following application of repair mortar to any given area. Large areas (0.5 m² at a time) shall be cured as trowelling progresses without waiting for completion of the whole area.

dura.®bond GP may be low pressure spray applied as a curing membrane. In fast drying conditions it will be necessary to supplement this with polyethylene sheet taped around its edges. Note: **dura.®bond GP** is compatible with the **dura.®cote** range of surface coatings and does not require removal prior to application of a **dura.®cote** material. Other curing membranes will require removal prior to further surface treatment.

During application and curing all work shall be protected against direct strong sunlight.

SURFACE COATING FOR IMMERSED CONDITIONS - dura.®flex SURFACE COATING

dura.®flex is a two-component polymer modified cementitious coating, developed for use as an internal coating for potable water retaining structures such as water storage reservoirs and water towers.

The total dry film thickness (dft) shall be not less than 1.8 mm and shall be capable of providing CO^2 diffusion resistance equivalent to not less than 125 mm of 30 MPa concrete cover (Taywood method using Klopfer's criteria). It shall provide protection against chloride ingress showing no measurable ingress after 400 days immersion under accelerated testing conditions (Taywood Method).

USE

For application to prepared backgrounds of reinforced and pre-cast concrete and masonry where it is required to minimise ingress of chlorides, CO^2 and water, whilst permitting moisture vapour transmission from the structure.

SURVEY

Areas recently prepared overall with **dura.®rep** repair mortars in accordance with **a.b.e.®** specification will present a surface suitable to directly receive a coating.

Areas where the previous works have not taken account of the need to prepare the overall surface to receive a coating (small patch repairs) shall be the subject of an inspection identifying the background character, nature and surface presentation.

Information shall be provided to the Contract Administrator detailing the areas for surface coating and the degree of preparation proposed together with techniques to be employed. The technical approval of the Contract Administrator shall be obtained prior to commencement.

SURFACE PREPARATION

All surfaces which are to receive the coating must be free from oil, grease, wax, dirt or any other form of foreign matter that might affect adhesion. Good quality concrete surfaces can be cleaned using a high pressure water jet. Poor quality, friable, or contaminated concrete may require grit blasting.

Spalled surfaces or those containing large blow holes, cracks and other such defects should be repaired using a suitable **dura.®rep** repair mortar.

If the surface contains small blow holes, typically less than 3 mm wide, or cracks no wider than 300 µm, the coating can be applied directly on to the substrate without the need for a repair mortar.

Only the specified areas shall be coated; where protection/masking is required, dependent upon the method of application, it shall be provided and installed to the approval of the Contract Administrator.

MIXING

Pour the liquid component (5 L) from the plastic container into a plastic or metal drum having a volume of at least 20 litres. Gradually add the powder component (20 kg) to the liquid whilst mixing with a propeller agitator attachment on a slow speed drill (400 - 600 rpm unloaded). Continue mixing, constantly moving the agitator around the drum, until a lump free consistency is achieved. Mixing is continued for a minimum of 3 minutes, stopping at least once to scrape any unmixed powder from the side of the drum into the mixture.

APPLICATION

The prepared substrate shall be thoroughly wetted with clean water to totally satisfy absorption and any standing or excess water shall be removed. In very porous substrates, particularly in hotter climates, saturate the surface, leave for 1 - 2 hours, then saturate again. Ensure excess water is removed before proceeding.

The material shall not be applied when the ambient or substrate temperature is below 5 °C or 5 °C on a falling thermometer. The applied coating shall always be protected from rain and frost whilst drying.

The coating can be applied by soft bristled brush, medium haired roller or steel trowel. A special spray unit has been developed by **a.b.e.®** for large contracts. Consult your local **a.b.e.®** representative.

The first coat should be applied at a minimum wet film thickness of 1 mm. Monitor the coating thickness during application at regular intervals using a wet film comb gauge. Care must be taken to check that all blow holes and other imperfections are filled during application. If not, this can be done while the coating is still wet by using a dry sponge. If the coating has dried before these imperfections are found they can be filled using fresh material.

Allow to cure for a minimum of 4 hours @ 20 °C/50% RH. This time can be reduced substantially in hotter climates.

All the mixed material should be used within 45 minutes of mixing. In hot, humid, coastal situations and in heavy industrial areas ensure that the interval between successive coatings is kept to a minimum. This is to prevent possible contamination of the surface of the preceding coating with air-borne contaminants, resulting in possible inter-coat adhesion failure and reduced coating performance. In the event that delays are unavoidable, wash down the surface thoroughly with clean water before proceeding with the following coating.

The second coat should also be applied at a minimum wet film thickness of 1 mm. Monitor the coating thickness during application at regular intervals using a wet film comb gauge. Pre-dampening of the surface is not necessary when applying the second coat.

FINISHING

To produce a smooth finish or to repair film defects use either a steel trowel, caulking tool or hard sponge. This should be done immediately after application, otherwise the coating may drag or tear.

When using a hard sponge it should be dry or very slightly damp. A wet sponge should not be used as this will cause polymer to come to the surface of the coating that causes an unsightly white streaky effect.

CURING

Under normal conditions of application, no curing is required.

EQUIPMENT NEEDED

- Heavy duty Festo mixer with helical mixing head.
- Pan Mixer Suitable 25 litre containers.
- Steel trowel.
- Steel float.
- Spatula.

IMPORTANT NOTE

This data sheet is issued as a guide to the use of the product(s) concerned. Whilst **a.b.e.® Construction Chemicals** endeavours to ensure that any advice, recommendation, specification or information is accurate and correct, the company cannot - because **a.b.e.®** has no direct or continuous control over where and how **a.b.e.®** products are applied - accept any liability either directly or indirectly arising from the use of **a.b.e.®** products, whether or not in accordance with any advice, specification, recommendation, or information given by the company.

FURTHER INFORMATION

Where other products are to be used in conjunction with this material, the relevant technical data sheets should be consulted to determine total requirements.