

MasterRoc HCA 20

Chemical, cement hydration control admixture

Material Description

The manufacture and use of shotcrete has traditionally been linked to many drawbacks.

Shotcrete mixes are high performance materials and their useful life is only a few hours. Long transportation and storage times as well as work interruptions in the shotcrete process cause quality loss, decreased productivity and wasted material. **MasterRoc HCA 20** is the adoption of Delvo technology - a major breakthrough by Master Builders Solutions in concrete technology - for shotcrete.

MasterRoc HCA 20 is a unique chemical admixture that controls the dynamics of cement hydration, suspending the process. Using one of Master Builders Solutions' shotcrete accelerators, the hydration process can be reactivated hours or even days later.

MasterRoc HCA 20 conforms to AS 1478 Type Re.

Characteristics and Benefits

- Batched wet or dry, shotcrete mixes remain fresh for up to 3 days
- Fully flexible delivery options for manufactured shotcrete
- No cleaning of pumps or pipes during work interruptions, for up to 24 hours
- Complete use of wet and dry mixes
- Interruptions and storage do not affect fresh shotcrete properties
- Expensive bagged material can be replaced by economical job site mixes
- Considerable reduction of rebound and dust
- Reduced waste disposal and irritation to humans.
- Simpler and lower risk construction program by enabling better scheduling and easier planning
- Time and cost-saving through better allocation of material, equipment and manpower
- Considerable savings of overall construction costs and financing
- **MasterRoc HCA 20** stabilised shotcrete mixes exhibit the properties of fresh shotcrete for 3 to 72 hours without loss of quality

- **MasterRoc HCA 20** provides total flexibility from batching through delivery and storage for application of wet or dry mixes

Properties

When **MasterRoc HCA 20** is dispensed into wet or dry mixes at the batching plant, the hydration process is fully stabilised by forming a protective barrier around the cement particles. This barrier prevents cement from achieving initial setting. Shotcrete accelerators when added into the spraying nozzle break up the protective barrier and accelerate the hydration process. Please consult your Master Builders Solutions Technical Sales Representative for the most appropriate shotcrete accelerator for your purposes.

Application

MasterRoc HCA 20 is suitable for all fields of wet or dry shotcrete. The principal applications are:

- Tunnelling and mining
- Temporary protection or final linings of e.g. roads, railways, city tubes, mines, hydropower projects and sewer tunnels
- Engineered structures
- Temporary protection or final wall of e.g. working pits and construction slopes
- Repair of concrete structures
- Injection suspensions

MasterRoc HCA 20 is a liquid admixture for wet or dry shotcrete mixes, stabilising setting and hardening. In comparison to traditional retarders, **MasterRoc HCA 20** controls hydration of all cement minerals (C3S, C3A, C2S, C4AF and Gypsum).

Material Constitution

Cement: Fresh, standard Portland cement should always be used because the reaction property is reduced with cement storage time. Preliminary tests are recommended for all cements but particularly those with high sulphate resistance and blended cements.

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Consumption of MasterRoc HCA 20

The recommended dosage of **MasterRoc HCA 20** for 3 to 72 hours stabilisation is between 0.2 - 2.0% of the binder weight. The specific dosage for wet or dry mixes will depend on the mix design, type of cement used, ambient temperature and the stabilisation time required.

Direction for mixing/dosing of MasterRoc HCA 20 with dry mix shotcrete

Premix natural humid aggregates with cement. The water content should be between 3-5% of the mixture weight. With too dry material, i.e. material with a humidity of less than 3% by weight, water should be added first in order to reach this level. Add the required quantity of **MasterRoc HCA 20** into the mixer, by hand or with a dosage device, while mixing and mix for another 2-3 minutes.

The **MasterRoc HCA 20** should be added slowly (not all at one time). When evenly distributed over the dry material (e.g. by spraying), mixing time can be saved.

Direction for mixing/dosing of MasterRoc HCA 20 with wet mix shotcrete

MasterRoc HCA 20 should be added to concrete at the initial stage of batching just after the initial batch water, it can be added in conjunction with the superplasticisers.

In case there are unexpected delays or interruptions on site, a later addition of 0.6-1.0% **MasterRoc HCA 20** to wet mix concrete is possible to bridge the anticipated time delay, as long as this is done before any hydration occurs.

Note: Both dry and wet mixed concrete containing **MasterRoc HCA 20** are to be kept out of direct sunlight and free from frost to prevent them from drying out.

Dosage

The quantities of **MasterRoc HCA 20** to be added are between 0.2 - 0.6% by weight of binder for a workability time of about 3 hours, to 2% by weight of binder for a workability time of about three days (wet process).

Packaging

MasterRoc HCA 20 is supplied in 1000 litre pallecons.

Storage & Shelf Life

Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame. Protect from direct sunlight. Store protected against freezing. **MasterRoc HCA 20** has a storage life of 12 months.

Precautions

For the full health and safety hazard information and how to safely handle and use this product, make sure that you obtain a copy of the Safety Data Sheet (SDS) from our office or website.

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Disclaimer

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