

TECHNICAL INFORMATION

TOPROC HR (HEAT RESISTANT)

A high performance, heat resistant readymix concrete

PRODUCT DESCRIPTION

Toproc HR is a concrete designed as a high performance alternative to special heat resistant materials, such as those utilising high calcium aluminate cement and slag aggregate. Toproc HR is not intended as a direct alternative to heat resisting materials, but it provides a far more cost-effective solution in many applications where heat resistance is required.

APPLICATIONS

- Foundry floors
- Molten metal splash areas
- Hot material storage areas
- Steel works
- Heavy industrial

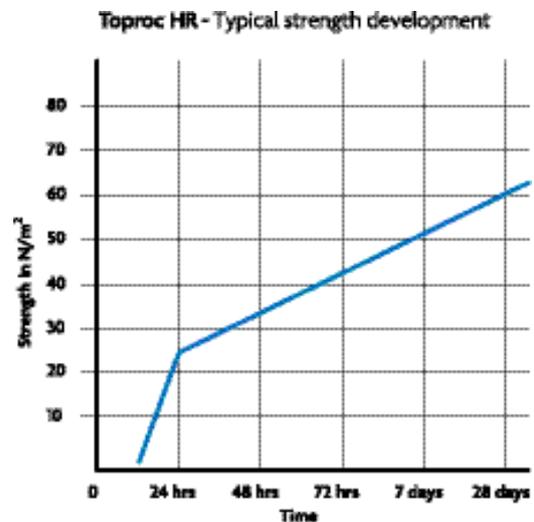
KEY FEATURES OF TOPROC HR

FRESH CONCRETE

- Easy to pump
- One pass finishing
- Less prone to segregation
- Increased cohesion
- Virtually no bleeding

HARDENED CONCRETE

- High early compressive strength
- Improved ultimate compressive strength
- Improved durability
- Low permeability
- Low water/cement ratio
- Improved heat resistance



24 HOUR COMPRESSIVE STRENGTH

Toproc HR typically achieves a 24 hour compressive strength of 25N/mm² but can typically achieve in the range of 30–40N/mm².

28 DAY COMPRESSIVE STRENGTH

Toproc HR typically achieves a 28 day compressive strength of 60N/mm² but can typically achieve in the range of 75–90N/mm².

PERMEABILITY/DURABILITY

Due to its very cohesive nature, Toproc HR allows very little, if any bleed water to migrate to the surface. Combined with a dense micro structure it results in a concrete with low permeability. The effectiveness of concretes to resist the ingress of water, gases, chloride/sulfate solutions and aggressive liquids depends to a high degree on their impermeability. As a consequence, the low permeability of Toproc HR helps slow the ingress of these substances when compared to a typical RC32/40 concrete. This, combined with a very low water/cement ratio, means Toproc HR will improve the concrete's durability to a variety of conditions, in particular variances in temperature.

HEAT RESISTANCE

Toproc HR is suited for any application where a heat resistant concrete is required and a conventional concrete will not meet these demands. The main factor affecting concrete in fire is spalling. This is due to water in the concrete heating up and generating damaging steam pressure leading to spalling. The polypropylene micro fibres within Toproc HR help reduce spalling by forming pressure-relieving pathways for the steam vapour. However, under extreme temperatures the surface of Toproc HR may spall.

DRYING SHRINKAGE

Plastic Shrinkage - Toproc is more susceptible to plastic shrinkage cracking due to the lack of bleed water. While the polypropylene fibres in the concrete will help, correct curing is essential (see curing). Long-term Drying Shrinkage - similar to that of conventional concrete.

PUMPABILITY

Toproc HR can be pumped more easily than conventional concretes as the inclusion of tailored admixtures improves the pumpable properties. Toproc HR is typically delivered at an S3 consistence.

PLACING, COMPACTING AND FINISHING

The cohesive nature of Toproc HR means that it releases very little, if any bleed water. The lack of bleeding means that finishing can commence immediately after compaction has been completed without having to wait for bleed water to evaporate. If a power floated finish is not required then a 'one pass finish' can be employed to significantly speed up construction time.

Toproc HR can be vibrated by any of the conventional means but, as with all concretes, it is essential that Toproc HR is vibrated fully to ensure good compaction.

Toproc HR can be finished in a similar manner to conventional concrete, except that wooden equipment (beams and floats) may drag on the surface.

Toproc HR can be laser screeded, however, we suggest the use of a reputable flooring contractor whose operators are familiar with the product and system.

Toproc HR can be power floated as normal, however, correct curing is essential (see curing section).

EARLY ACCESS

Due to its high early strength Toproc HR can be lightly trafficked after 24 hours, however, if abrasion resistance is paramount it is preferable to leave the concrete for at least three days preferably seven days prior to trafficking as abrasion resistance develops over time. Curing is still essential so a suitable high efficiency curing membrane should be considered.

CURING

As with all concretes, proper curing is essential to ensure that all the benefits of Toproc HR are achieved. It is essential that curing should start as soon as possible, ideally within 10-15 minutes of placing to reduce the probability of plastic shrinkage cracking.

If a power floated finish is required, appropriate curing of the concrete is recommended during the interval between initial floating and application of the final trowelled finish with either a curing membrane or sheeting. A reapplication of the curing membrane after the final power trowelling is also recommended. All normal curing methods are acceptable, but the most effective curing is best achieved by using spray-on curing membranes such as 90% efficiency resin based compounds or acrylic sealers, as these can be applied earlier in the construction process.

AVAILABILITY

All Toproc products are readily available across the UK from Tarmac's network of readymix concrete plants. The concrete is delivered to site in conventional readymix concrete trucks at a consistence suitable for the application, but generally at a higher consistence than conventional concrete. This together with Toproc's unique properties, makes Toproc easier to pump, place, pour etc. Tarmac offers a unique information and advisory service for all applications and types of concrete to assist users and specifiers of concrete to solve problems and optimise the benefits available from Tarmac's unique range of special products.

PHYSICAL PROPERTIES

All physical properties stated for Toproc products are approximate due to local variations in the naturally occurring constituent materials. Please refer to the Technical Services Department for precise values. This information is based on our considerable experience with these products and is given with the best of intentions to assist customers in obtaining the best performance from our products. Tarmac cannot accept any liability or responsibility of any kind (including liability for negligence) for the design of any concrete component or structure or for problems caused by the acts or omissions of third parties or by poor site practices.

BESPOKE FORMULATIONS

In the past where the need has arisen to formulate a product to meet a specific application, Tarmac has worked alongside customers to achieve design requirements. Toproc HR can also incorporate macro fibres within the mix.

Please contact Tarmac's customer helpline with your specific requirements on +44 (0)800 1 218 218 or email toproc@tarmac.com

TYPICAL SPECIFICATION STATEMENT

The concrete shall be Tarmac Toproc HR in accordance with B58500-2

The maximum aggregate size and consistence shall be agreed between the specifier and Tarmac.

The concrete shall be placed, compacted and cured in accordance with current good practice, the specification for the contract and any additional requirements of Tarmac.

PRECAUTIONS OF USE

SAFETY

There is a real danger of contact dermatitis or serious burns if skin comes into contact with wet cement mixes such as fresh concrete, mortar or screed. Wear suitable protective clothing and eye protection. Where skin contact occurs either directly or through saturated clothing, wash immediately with soap and water. For eye contact, immediately wash out eyes thoroughly with clean water. If swallowed wash out mouth and drink plenty of water.

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