

BETEC[®] 150 HS

High sulphate resistant micro-concrete

Product description

BETEC[®] 150 HS is a C₃A-free, cement based, volume stable high sulphate resistant micro-concrete with low initial and high final strength development.

BETEC[®] 150 HS stands out by controlled volume expansion and offers maximum durability and applicability.

Advantages

- Balanced strength development for durable and reliable structural connections, statically and dynamically load bearing.
- Compressive strength class C55/67 with modulus of elasticity ca. 31,000 MPa
- Freeze/ thaw resistant according to CDF-method (exposure class XF4).
- Compact mortar matrix due to self-compacting and controlled volume expansion.
- Penetration depth of water under pressure < 1 mm according to EN 12390-8.
- Declaration of performance according to EN 1504 part 3
- Declaration of performance according to EN 1504 part 6

Certificates

- Declaration of performance according to EN 1504 part 3 / System 2+
- Declaration of performance according to EN 1504 part 6 / System 2+

Areas of Application

All grouting applications where superior applicability, high performance and durable connections are required and where sulphate resistance is required:

- Grouting of machine foundation, in sewage treatment facilities.
- Grouting of bridge bearings and bridge support structure
- Grouting of machines and industrial equipment
- Grouting of rails and sleepers.
- Grouting of bucket foundations.
- Grouting of pipe penetrations and lead-in areas in water and sewage treatment facilities.

Product Properties

Technical Data/Properties(*)

BETEC® 150 HS		
Property	Unit	Value ⁽¹⁾
Grain size	[mm]	0-5
Application thickness	[mm]	> 15
Consistency	[-]	High flowable
Free flow slump	[mm]	≥ 600
Water addition <small>according to required consistency and/ or temperature conditions</small>	[l /25 kg]	3.0 – 3.2
Workability time	[min]	~ 90
Application temperature <small>(Powder, water and environment)</small>	[°C]	+5 to +35
Shrinkage	[%o]	≤ 0.6
Expansion	[Vol-%]	≥ 0.1
Fresh mortar density	[kg/dm ³]	~ 2.3
Yield (25kg bag)	[dm ³]	~ 12
Calculation quantity	[kg/m ³]	2010
Penetration depth of water under pressure ⁽⁵⁾	[mm]	< 1
Pull-off values	[MPa]	≥ 2.0
Strength development	[-]	slow
Early strength class after 24 h	[-]	C
	[MPa]	≥ 10
Compressive strength ⁽²⁾⁽³⁾	[MPa]	
24 h		~ 13
28 d		~ 75
Compressive strength class	[-]	C 55/67
Modulus of elasticity	[MPa]	~ 31.000
Exposure classes ⁽⁴⁾	[-]	X0, XC1-XC4, XD1-XD3, XS1-XS3, XA1-XA3, XF1-XF4
Shelf life	12 month Stored under cover, clear of the ground, protected from all sources of moisture and frost..	
Packaging	Bags of 25 kg with plastic liner. 40 bags per pallet (1000 kg)	
Appearance	Grey powder	

(1) Typical values in production control. All tests were executed under a conditioned temperature of 21 °C and 65% RH.

(2) The illustrated compressive strengths are measured with 100x100x100 mm³ cubes.

(3) At +5 °C material and surrounding temperatures the micro-concrete achieves ~9 MPa after 46 hours.

(4) According to EN 206-1:2001

(5) According to EN 12390-8.

Application

1. Preparation of Substrate

- Substrate preparation has to be according EN 1504-10 part 7.
- The substrate has to be free from dirt, grease, laitance, loose concrete, loose particles or layers which could adversely affect adhesion.
- Remove all damaged concrete and prepare substrate by sand or grid blasting, high pressure water jetting, or other methods until base concrete is exposed, offering sufficient roughness (bond) and open pores.
- The substrate must be pre-wetted with clean water until saturated. The substrate should be damp, but without free standing water.
- The substrate must be frost-free and have a cohesion of minimum 1.5 MPa.

2. Mixing

- The product has to be mixed using a suitable forced action mixer (400–600 rpm). The mixing head must be completely immersed in the powder.
- Add 4/5 of the required quantity of water into the mixer and mix for 2 minutes. Add the remaining quantity of water. The water content can be varied to obtain the desired consistency. Never use more than the maximum water quantity. Mix for an additional 2 minutes until a lump-free, homogeneous mixture is obtained.
- The mixing time depends on the type of mixer. 4 minutes is the minimum.
- The mixture must be allowed to rest to release air entrapped during mixing.
- Once the grout is ready mixed, apply immediately. Do not prepare more material than can be used within the open time of the material.
- When the grout starts to set, remix but never add more water.

3. Application

- The material is always poured or pumped from one side or corner in one continuous application. A dense and non-absorbent formwork is necessary. To prevent air entrapment, sufficient ventilation holes must be provided.
- Do not vibrate.
- When grouting large areas, apply the grout by using worm/screw pumps.

4. Curing

- After treatment has to be according EN 13670 in combination with DIN EN 1045-3.
- In warm or windy conditions protect the applied material from dehydration by mist-spraying with clean water or protective tarpaulins until the initial set has taken place.
- In cold conditions cover with insulated tarpaulin, polystyrene or other insulating material. Protect surfaces against frost and rain until final set has taken place.

- In cold, humid or unventilated areas it can be necessary to allow for a longer curing period, or to introduce forced air movement to avoid condensation. Never use dehumidifiers during the curing period or within 28 days after application.
- Formwork should not be removed for at least 48 hours.
- The after-treatment should be at least 5 days.
- The after-treatment should take place as soon as possible, at the latest when the material surface starts to set.
- As an alternative to the conventional treatment methods, suitable curing agents can be used to prevent rapid water loss.

5. Cleaning and maintenance

- Mixing and application equipment should be cleaned immediately with clean water. Hardened material needs to be removed mechanically.

6. Special remarks

- Cementitious materials can lead to incompatibilities under certain conditions in combination with non-ferrous metals (such as aluminium, copper, zinc).
- Low temperatures reduce flow and delay the early strength development. High temperatures accelerate the strength development and decrease the open time of the material.
- Depending on geometry and application thickness, reinforcement steel can be necessary.
- Lateral grouting overhang should be kept as low as possible (approx. 20–50mm).

Health and Safety

BETEC® 150 HS is a product based on cement and can therefore cause burns to skin and eyes, which should be protected during use. Wear gloves and protective eye shields. Wearing a dust mask is advised. Treat splashes to eyes and skin immediately with clean water. Consult a doctor when irritation continues. If accidentally ingested, drink water and consult a doctor. Users must comply with all risk and safety phrases. MSDS's can be obtained from GCP Germany GmbH. GISCODE ZP1.

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