BUILDING TRUST

PRODUCT DATA SHEET

Sikacrete®-3701 3D

(formerly MasterFlow® 3D 100)

2/3-PART MICRO-CONCRETE FOR 3D PRINTING

DESCRIPTION

Sikacrete®-3701 3D is low shrinkage 3D Printing mortar. Sikacrete®-3701 3D, when mixed with water and Sika® Plastocrete®-3701 3D, forms a well-pumpable thixotropic mix, which when combined with SikaRapid®-3701 3D at the print head, achieves high values of compressive and flexural strength in a short time. Suitable for use in hot and tropical climatic conditions.

USES

For concrete printing of 3D objects and components for:

- Buildings
- Civil engineering structures
- Molds and forms
- Art, craft and visual displays
- Interior and exterior use

FEATURES

- High initial and final strength ensures durability and safety in various conditions.
- Maintains good workability which enables proper application even when printing long sections at high ambient temperatures.
- High adhesion to steel which increases the level of cohesion between the mixture and the reinforcement.
- Can be used with different types of 3D Printers by adjusting the dosage of Sika® Plastocrete®-3701 3D and SikaRapid®-3701 3D

PRODUCT INFORMATION

Composition	Portland cement, selected aggregates and additives
Packaging	25 kg and 1500 kg bag
Shelf life	6 months from date of production
Storage conditions	The product must be stored in original, unopened and undamaged sealed-packaging in dry conditions at temperatures between +5°C and +30°C. Always refer to packaging.
Appearance and colour	Light grey powder
Maximum grain size	~0.5 mm

TECHNICAL INFORMATION

Compressive strength	**+25 °C**	**1 day**	**28 days**	(EN 196-1)
	W/P = 0.17 + 1 % SikaRapid®-3701 3D	~25 N/mm²	~50 N/mm²	
Flexural-strength	~7 N/mm² (28 d / 25°C)			(EN 196-1)
Water penetration under pressure	~22 mm			(EN 12390-8)

APPLICATION INFORMATION

Fresh mortar density	~2.2 kg/l
Yield	~13 litres per 25 kg This figure is theoretical and does not allow for any additional material due to surface porosity, surface profile, variations in level or wastage etc.
Layer thickness	~5 – 50 mm (subject to trials)
Ambient air temperature	+5°C min. / +45°C max.
Mixing ratio	16 – 18 % water (by weight of powder)

BASIS OF PRODUCT DATA

All technical data stated in this Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

IMPORTANT CONSIDERATIONS

- 3D concrete printing is a manufacturing process using mixing, pumping and robotic placement to apply the printed concrete. All these factors play a significant role in achieving optimal results of the finished concrete component and therefore pre-trials and tests must be carried out before final manufacturing of the finished components.
- In the event of blockages, rinse equipment and pump lines immediately with clean water.
- Sika is not responsible for deviated performances due to external circumstances beyond our control.
- Continuously monitor the pot life of the mixed material.
- Do not allow mixed material to stand in warm temperatures.
- Keep pump lines wetted and cool.
- Condition the material between 15°C – 25°C for a minimum 24 hours before use.
- Use warm water at low temperatures and cold water at high temperatures to maintain application performance.
- Condensation due to certain curing methods and curing agents may cause some discoloration to the surface appearance.

ECOLOGY, HEALTH AND SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

MIXING

We recommend mixing Sikacrete®-3701 3D mechanically, for example with a continuous mixer. As the mixture is thixotropic, we do not recommend mixing with a drill fixed with a stirrer or a mixer with a forced circulation. The mixing process may vary depending on the mixing equipment used, however, it is advisable to start by setting a higher dose of water on the continuous mixer and gradually reducing it to the desired initial fluidity. Discard any mixture that has not been used within 30 minutes.
The plasticizer Sika® Plastocrete®-3701 3D should be added to the mixing water to ensure a homogeneous mix is obtained.

APPLICATION

For the application of Sikacrete®-3701 3D, it is necessary to pump the mixture using a screw pump for cement-based mixtures. The selected pump should ensure an uninterrupted supply of application material. The pump should be equipped with a pressure limiter to prevent the pressure from exceeding 2 MPa; all hoses and couplings used should be tested under this pressure before starting the process.

Before application, it is essential to cool the hoses and pre-lubricate them; however, before starting the application, the liquid used for this purpose must be blown out or expelled from the hoses.
In a typical arrangement, the inlets for the application material should be at the lowest point and the outlets at the highest point. The consistency of the injection mixture at the outlet should be checked before starting printing work.
SikaRapid®-3701 3D should be used as an accelerator for set ups which can accommodate an accelerator at the printer head. For more information about which accelerator would be more appropriate, please consult our Sika technical department.

CURING TREATMENT

When printing, it is recommended to cure the finished printed element with a suitable Sika® Antisol® curing agent.

CLEANING OF EQUIPMENT

Clean all tools and application equipment with water immediately after use. Hardened material can only be removed mechanically.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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