

PRODUCT DATA SHEET

Sikacrete[®]-751 3D

1-part accelerated micro-concrete for 3D printing

PRODUCT DESCRIPTION

Sikacrete[®]-751 3D is a 1-part accelerated micro-concrete for use with 3D concrete printing robot or gantry printers.

USES

For precision concrete printing of 3D objects and components for:

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

CHARACTERISTICS / ADVANTAGES

- Fast absorbing, suitable for continuous and static mixers
- Easy to use, just mix with water
- Adjustable consistency, for temperature variations
- High thixotropic consistency, to maintain shape after extrusion
- Accelerated, for high stacking and building up layers
- A faster setting, for moving objects sooner
- Low shrinkage, to reduce potential for cracking
- Small grain size, for reduced equipment wear
- Optimised grading, for smooth appearance

PRODUCT INFORMATION

Chemical Base	Portland cement, selected aggregates and additive
Packaging	25 kg bag 1000 kg bag
Shelf Life	9 months minimum from date of production
Storage Conditions	The product must be stored in original, unopened and undamaged sealed packaging in dry conditions. For consistent printing quality it is recommended to store the material at temperatures between +10 °C and +25 °C. Always refer to packaging
Appearance / Colour	White powder
Maximum Grain Size	~1 mm
Density	2.14 kg/L

TECHNICAL INFORMATION

Compressive Strength	water addition 14.5 %		(EN 196-1)
	Conditioned 24 h at 20 °C	30 MPa	
	Conditioned 28 d at 20 °C	50 MPa	

Modulus of Elasticity in Compression	Cured 28d at 20°C	31 GPa	(EN 13412)
Flexural Strength	water addition 14.5 %		(EN 196-1)
	Conditioned 24 h at +20 °C	3.5 MPa	
	Conditioned 28 d at +20 °C	10 MPa	

APPLICATION INFORMATION

Yield	~13 litres per 25 kg. This figure is theoretical and does not allow for any lost material during the mixing or pumping process	
Layer Thickness	6–15 mm Layer thicknesses are subject to the equipment and printing procedure and it is recommended to make a test to check suitability	
Product Temperature	Minimum	+10 °C
	Maximum	+25 °C
The material and water temperature plays a significant role in the printing process. Having a constant, or reducing significant variations during application will help maintain a consistent quality of printing.		
Ambient Air Temperature	Minimum	+5 °C
	Maximum	+30 °C
Mixing Ratio	14–15 % water (by weight of powder)	
Pot Life	+10 °C	20 minutes
	+20 °C	15 minutes
	+30 °C	10 minutes
Pot life is based on the temperature of the material after extrusion and indicates when the material is starting to stiffen. Agitating the material during this time will prolong the pot life.		
Initial set time	+ 5 °C	80 minutes
	+20 °C	45 minutes
	+30 °C	35 minutes
Final set time	+5 °C	90 minutes
	+20 °C	60 minutes
	+30 °C	45 minutes

VALUE BASE

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

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

STATIC MIXERS

1. Use a suitable forced action pan mixer for cementitious materials capable of mixing more than a single 25 kg bag per mix.
2. Add the recommended amount of clean water with the powder and mix, check the corners of the mixer for no dry powder. Mix for a minimum of 2 minutes until the material is homogeneously mixed and place the material into the pumping equipment.

CONTINUOUS MIXERS

1. Determine the required printing consistency by adjusting the water addition on the equipment as a flow rate in L/hr.
2. Check the water content using the pan test heating method or microwave technique (according to Aus-

trian Standard).
A typical printing consistency is in the vicinity of 140 to 150 mm in a spread-flow test according to EN 13395-1. For further assistance contact your local Sika technical services department.

APPLICATION

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.

- Use SikaPump® Start-1 to prime pump lines.
- In the event of blockages, rinse equipment and pump lines immediately with clean water
- 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.
- Use warm water at low temperatures and cold water at high temperatures to maintain application performance.
- For operational maintenance, refer to the equipment instructions.

CURING TREATMENT

Discolouration of printed objects

Note: Condensation due to certain curing methods and curing agents may cause some discolouration to the surface appearance.

1. Carry out pre-trials with the chosen curing method or agent.
2. Cure the Product in the prescribed ambient conditions with a minimum of 40% relative humidity to prevent too early drying of printed objects.
3. Do not cure newly printed objects outside in the direct sun or windy conditions.
4. The standard rules of good concreting practice, concerning production and placing must be followed.

CLEANING OF TOOLS

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

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

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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Product Data Sheet

Sikacrete®-751 3D
April 2024, Version 01.01
021404090100000005

Sikacrete-7513D-en-GB-(04-2024)-1-1.pdf