

PRODUCT DATA SHEET

Sikacrete[®]-731 3D

1-PART MICRO-CONCRETE FOR 3D PRINTING

DESCRIPTION

Sikacrete[®]-731 3D is a 1-part micro-concrete for use with 3D robot or gantry printers.
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

Fast absorbing

- Suitable for continuous and static mixers

1-part

- Mix with water
- Adjustable consistency

Low viscosity

- For easy pumping

Thixotropic consistency

- Maintains shape after extrusion
- Good buildability

Fast setting

- For building up layers
- Print line stability and accuracy
- Printing at angles
- Moving objects sooner

Low shrinkage

- Good crack resistance

Optimised grading

- For smooth appearance
- Reduced equipment wear
- Good durability

Watertight / Low water penetration

PRODUCT INFORMATION

Composition	Portland cement, selected aggregates and additives
Packaging	25 kg bag, 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	White powder
Maximum grain size	~1 mm

TECHNICAL INFORMATION

Compressive strength	<u>+25 °C</u>	<u>1 day</u>	<u>7 days</u>	<u>28 days</u>	(EN 196-1)
	W/P=0.16 (4 L water per 25 kg bag)	~15 N/mm ²	~25 N/mm ²	~30 N/mm ²	
Service temperature	+100 °C max.				

APPLICATION INFORMATION

Fresh mortar density	~2.10 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	~10 – 50 mm (subject to trials)
Ambient air temperature	+5 °C min. / +45 °C max.
Mixing ratio	14 – 16% 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.
- It is recommended to use SikaPump® Start-1 to prime pump lines
- 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

Static Mixers (Small volume quantities)

Mix with an electric single or double paddle mixer (<500 rpm) or using a forced action mixer capable of mixing 2 to 3 bags at a time. Add the recommended amount of clean water in a suitable mixing container. Stir slowly, add the powder to the water and mix thoroughly for a minimum of 3 minutes. Add more water during the mixing time if necessary to the maximum specified amount to achieve a smooth consistent mix. If necessary and before pumping, let the material stand to allow the air bubbles from entrained air to finish. Stir gently if required.

Continuous Mixer (High volume quantities)

The mixing ratio shall be determined using a pan test heating method or microwave technique (according to Austrian Standard) to determine the equivalent flowrate/m³ on the equipment. Contact Sika Technical Services for additional information.

APPLICATION

Pumping and printing is usually a continuous process. The application specifics of the extrusion and printing speed must be optimised between the mixer, pump, pump line length and printer head.

CLEANING OF EQUIPMENT

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

LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for exact product data and uses.

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.

Sika Gulf B.S.C. (c)

Tel: +973 177 38188
Email: info@bh.sika.com
Sika Kuwait Cons. Mat. & Paints Co WLL
Tel: +965 22 282 296
Email: sika.kuwait@kw.sika.com
Web: gcc.sika.com

Sika UAE LLC

Sika MB Construction Chemicals LLC
Sika International Chemicals LLC
Tel: +971 4 439 8200
Email: info@ae.sika.com
Web: gcc.sika.com

Sika Saudi Arabia Limited

Riyadh / Jeddah / Dammam / Rabigh
Tel: +966 11 217 6532
Email: info@sa.sika.com
Web: gcc.sika.com

Sika LLC - Oman

Master Builders Solutions LLC
(part of Sika)
Tel: +968 22 826 500
Email: info@om.sika.com
Web: gcc.sika.com



ISO 9001, 14001, 45001 – SGS
- Sika UAE LLC
- Sika International Chemicals LLC
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ISO 9001, 14001 – SGS
- Sika Saudi Arabia Limited
ISO 9001, 14001 – TÜV
- Sika MB Construction Chemicals LLC
- Master Builders Solutions LLC

All products are supplied under a management system certified to conform to the requirements of the quality, environmental and occupational health & safety standards ISO 9001, ISO 14001 and ISO 45001.



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March 2024, Version 02.02
021404090100000007