Hybrid polyurethane-cement material for anti-slip floors

Description of the system	A multi-component coloured floor system based on polyurethane emulsion, modified hardener for active fillers and pigment paste.
Scope of application	MASTERCEM is intended for use in areas exposed to medium-to-high mechanical loads, high chemical loads and abrasion.
System Properties	• It is characterised by a anti-slip, matte sealed surface with high wear resistance. • Typical floor thickness from 5-9 mm • High chemical resistance. • High mechanical resistance. • Typical applications are found in the food industry. • Intended for use by experienced contractors.

System Construction/Product Information	
Mastercem MCP (Primary Layer)	**Consumption**
	0.4 kg/cm^2
	Packaging (33.8 kg)
Component A – polyurethane emulsion	9.4 kg
Component B – modified hardener	9.4 kg
Component C – active filler	15.0 kg
Mastercem MC 100 (Structural Layer)	**Consumption**
	4.0 kg/cm^2
	Packaging (63.90 kg)
Component A – polyurethane emulsion	9.5 kg
Component B – modified hardener	9.5 kg
Component C – active filler	15.0 kg
Quartz sand 0.8-1.2 mm	14.2 kg
Pigment Paste	1.5 kg
Mastercem MTC (varnish)	**Consumption (36.84 kg)**
	1,25 kg/^{2}
	Packaging
Component A – polyurethane emulsion	9.42 kg
Component B – modified hardener	9.42 kg
Component C – active filler	15.0 kg
Component D – pigment paste	3.0 kg

Storage conditions	
Component A	12 months from the date of production. **Protect against frost.**
Component B	12 months from the date of production. **Protect against frost.**
Component C	6 months from the date of production. **Protect against moisture.**
Quartz sand 0.8-1.2 mm	24 months from the date on the packaging. **Protect against moisture.**
Pigment Paste	12 months from the date of production. **Protect against frost.**
The products should be stored in original and undamaged factory-sealed packaging, in dry conditions at temperatures between +5ºC and + 30ºC.	

Technical characteristics	
Adhesion compliant with PN EN 13892-8: 2004	3.1 [mPa]
Hardness SH A according to ASTM D 2240	≥ 90
Hardness SH D according to ASTM D 2240	≥ 45
Bending strength according to PN EN 13892-2:2004	12.7 [N/mm^2]
Compressive strength according to PN EN 13892-2:2004	37.4 [N/mm^2]
Hygiene tests	Complies
Classification for reaction to fire according to PN EN 13501-1:2019-02	B_{fl}-s1
Water permeability compliant with PN EN 1062-3: 2008	0.0045 U=0.0005 [kg/m^{2}h$^{0.5}$]
Steam permeability compliant with PN EN ISO 7783: 2012	0.291 U=0.012 [g/m^{2}d]
Carbon dioxide permeability according to PN EN 1062-6: 2003 Method A	0.216 U=0.004 [g/m^{2}d]
Curing time (at 20°C):	
Pedestrian traffic	24 h
Full load	After 4 days

Additional requirements
In addition, the product complies with the requirements of PN EN 13813:2002

Application	
Preparation of the substrate	The concrete substrate should be strong, it is allowed to apply on wet concrete (up to 15%) clean, slightly rough, with open pores, made in accordance with building standards. All impurities such as: cement milk, dust, oil, grease marks, fragments that are loose, unbound or poorly attached to the substrate, and old coatings should be removed. The average tensile strength of the concrete, measured by the pull-off method, should not be less than 1.5 MPa. The mature concrete must be ground. The required time for maturing of concrete, cement, and repair materials must be observed. Uneven substrates can cause variations in the thickness of the Mastercem layer, which will directly affect the properties of the entire floor.
Preparation of materials and application method - anti-slip system	Particular materials included in the Mastercem system should be prepared for application in accordance with the data given below: **Mastercem MCP (Priming layer) -** All components of the primer have been prepared in such a way that they do not require special measuring. They should only be mixed together in the correct order. Component A, component C and component B should be added one after the other to a suitable container. All this should be mixed with a high-speed mixer with a dispersing disc. (When preparing small portions, the individual components should be properly weighed.) The colour of the mixed mass should be uniform. After mixing, spread the material using a height-adjustable squeegee. The laid-out material is sprinkled with 0.8-1.2 mm quartz sand in a quantity of 1.0 kg/m^2. After the coating has hardened, vacuum off the loose sand. **Mastercem MC 100 (Structural layer)** - All components of the structural layer have been prepared in such a way that they do not require special measuring. They should only be mixed together in the correct order. One by one, component A should be added to a suitable container, followed by pigment paste, then component C, 0.8-1.2 mm quartz aggregates and component B. All this should be mixed with a high-speed mixer with a dispersing disc. (When preparing small portions, the individual components should be properly weighed.) The colour of the mixed mass should be uniform. After mixing, lay out the material using a gauge rake specially adapted to the desired thickness. After the material has been laid out it should be deaerated with a spiked roller and sprinkled with 0.8-1.2 mm quartz sand in the amount of 8.0 kg. After the coating has hardened, vacuum off the loose sand. **Mastercem MTC (Varnish)-** the sealing layer is mixed in the same way as the previous two, paying attention to achieving a uniform colour of the mass. The varnish is spread with a rubber Anza roller by scraping the material over the stones and then evening out the coating obtained with a velour roller.

Application conditions	
The substrate temperature must be min. 3°C from the dew-point temperature.	
Minimum ambient temperature	+5^{0}C
Minimum substrate temperature	+5^{0}C
Maximum substrate and ambient temperature	+30^{0}C
Temperature of the material before application	From +10^{o}C to +30^{o}C. Above this temperature, the material is not suitable for laying due to the fast reaction of the components.
Maximum relative humidity	80%

Application data - smooth system (thickness approx. 6.0 mm)			
Order of application	**Number of layers**	**Layer type**	**Material name**
1	1	Primer	Mastercem MCP- 0,4 kg/m^2
2	1	Sprinkles	Quartz Sand 0.8-1.2 mm 1 kg/m^2
3	1	Wear layer	Mastercem MC 100 - 4.0 kg/m^2
4	1	Sprinkles	Quartz sand 0.8-1.2 mm 8 kg/m^2
5	1	Varnish	Mastercem MTC-1.25 kg/^{2}

Comments and recommendations	
Health and safety conditions	The materials included in the system should be used by trained teams of contractors. Use eye protection, respiratory protection and skin protection during work. When working in confined or enclosed spaces, and during drying, adequate ventilation must be provided. Detailed information on hazards is contained in the Material Safety Data Sheets of particular products available on request. ***After complete hardening, the coating is neutral to health and the environment.***
Storage conditions for system components	Unhardened products and their components should not enter the sewage system, soil or groundwater. It is essential to harden the residual materials. Hardened materials must be disposed of according to local regulations.
Technical Support	It is recommended to consult the producer's technical advisor before using the system to ensure that the material and/or system are used correctly.
Final remarks	These specifications are based on trials and laboratory tests. The practical results of the measurements may differ from those provided, due to circumstances beyond the control of Sicon. All information is given in good faith and takes into account current knowledge and experience. The producer indicates that the colour of the finished floor may vary. This phenomenon does not indicate a defect in the floor or reduced technical specifications. Possible discolouration may occur due to the way the work and drying are performed. It is recommended that particular

	areas be covered from batches of material from one production run. The product documentation is general information, appropriate under certain conditions. It is recommended that the purchaser carry out an application test, and performs appropriate checking measurements, under specific construction environmental conditions prior to large-scale application of the product. The flooring in these areas should be assessed and accepted by the investor/principal. The supplier has no influence on the types of application, application methods or execution conditions on the site, therefore these instructions may not be held responsible for the end result of the application. Recommendations of Sicon's associates that deviate from the information in the technical sheet are mandatory only if they are confirmed in writing. Release Date: 09/2020 All previously issued sheets of the MASTERCEM system shall expire on the date of issue of this sheet.