Construction

Sikagard®-680 S

Protective coating for concrete

Product Description

Sikagard®-680 S is a one part solvent containing coating, based on methacrylic resins resistant to weathering, alkalis and ageing. It is available in clear and coloured grades for use on mineral substrates including concrete and other cementitious surfaces

Sikagard®-680 S protects concrete against aggressive atmospheric influences and promotes a self-cleaning effect on the treated surfaces. It does not adversely influence the characteristic texture of the concrete.

Sikagard®-680 S complies with the requirements of EN 1504-2 as protective coating.

Uses

Sikagard®-680 S is used for protection and enhancement of concrete and other cementitious materials on building and infrastructures elements

Sikagard®-680 S clear glaze is a colourless material drying to a glossy coat, suitable as refresher and protective coating for exposed aggregate concrete

Sikagard®-680 S top coat is a top coating, drying to a mat finish, available in a large number of decorative standard and almost unlimited special colour shades.

- √ Suitable for protection against ingress (Principle 1, method 1.3 of EN 1504-9),
- √ Suitable for moisture control (Principle 2, method 2.3 of EN 1504-9)
- √ Suitable for increasing the resistivity (Principle 8, method 8.3 of EN 1504-9)

Characteristics / Advantages

- Sikagard®-680 S provides excellent weather resistance and is based on a methacrylic resin with fast evaporating solvents
- Due to its quick drying properties, the coating is rain resistant within a short time
- Almost no change in the texture characteristics of the concrete surface
- Sikagard®-680 S protects the concrete against aggressive atmospheric influences, which can penetrate into the concrete in the form of salts or gases
- Very high diffusion resistance against carbon dioxide and, therefore reduces considerably the rate and depth of carbonation of the concrete
- Water vapour permeability is not adversely affected
- Dirt pick up is reduced and the concrete is no longer discoloured by rain
- Suitable for sealing of green concrete in civil engineering works

Tests

Approval / Standards

Report Nr.:A 2216/C1 dated 22. 11. 1990, IBAC Aachen

Report Nr.:A 3026/B2 dated 14. 06. 1996, IBAC Aachen

Report Nr.:P 3132-1 dated 27. 08. 2003, Polymer Institute

This system is registered as product a system according to ZTV-ING part 3, section 4

Product Data

Form

Appearance / Colours	Clear Glaze: clear liquid Top Coat: can be supplied in almost any colour shade
Packaging	Clear Glaze: 20 kg pail Top Coat: 30 kg pails

Storage

Storage Conditions / Shelf-Life	36 months from date of production if stored properly in undamaged and unopened original sealed packaging in cool and dry conditions. Protect from direct sunlight and frost.

Technical Data

Chemical Base	Acrylate resin in solvent
Density	Clear Glaze: ~ 0.9 kg/l (at +20℃) Top Coat: ~ 1.4 kg/l (at +20℃) Dependent on colour shade, small variations are possible.
Solid Volume	Top Coat: ~ 45%
Flash Point	Clear Glaze: +25℃ Top Coat: +30℃
Layer Thickness	Minimum required dry thickness to achieve full durability characteristics (CO_2 diffusion, adhesion after thermal cycling, etc.) = 101 microns. Maximum required thickness not to go beyond the H_2O equivalent air thickness of 5 m = 290 microns.

Carbon Dioxide Diffusion Coefficient (μCO_2)

Dry film thickness	d = 130 µm
Equivalent air layer thickness	$S_{D,}\ CO_2$ = 429 m
Diffusion coefficient CO_2	$\mu CO_2 = 3.3 \times 10^6$
Requirements for protection	$S_D\ CO_2 \geq 50$ m

Water Vapour Diffusion Coefficient (μH_2O)

Dry film thickness	d = 140 µm
Equivalent air layer thickness	$S_{D,}\ H_2O$ = 2.4 m
Diffusion coefficient H_2O	$\mu H_2O = 1.8 \times 10^4$
Requirements for breathability	$S_{D,}\ H_2O \leq 5$ m

System Information

System Structure

Sikagard®-680 S Clear Glaze:

As protection and enhancement of exposed aggregate concrete:
2 x Sikagard®-680 S Clear Glaze

Sikagard®-680 S Top Coat:

In normal situation:
2 x Sikagard®-680 S Top Coat

When using bright yellow and red colour shades:
3 x Sikagard®-680 S Top coat

When combined with hydrophobic impregnation priming coats:
1 - 2 x Sikagard®-702 W or Sikagard®-700 S
2 x Sikagard®-680 S Top Coat

Application Details

Consumption

Approx. consumption per application kg/m² per coat

Product	Per coat
Sikagard®-680 S Clear Glaze	~ 0.15 kg/m²
Sikagard®-680 S Top Coat	~ 0.20 kg/m²

Substrate Preparation

Exposed concrete without existing coating:

The surface must be dry, sound and free from loose and friable particles.
Suitable preparation methods are steam cleaning, high pressure water jetting or blastcleaning.
New concrete must be at least 28 days old.

(e.g Sika Monotop 620 Sikagard®-720 EpoCem® etc.) can be used – refer to the respective product data sheet. Allow a curing time of at least 4 days before coating (except when the EpoCem is used, then coating can be applied within 24 hours).

Exposed concrete with existing coating:

Existing coatings must be tested to confirm their adhesion to the substrate - adhesion test average > 1.0 N/mm² with no single value below 0.7 N/mm². – refer to the relevant Method Statement for more details or BS EN 1504 -2

Inadequate adhesion:
Existing coatings must be completely removed by suitable methods and the substrate must be sufficiently sound and suitable to be coated as above.

Adequate adhesion:
Thorough cleaning of all surfaces by means of steam cleaning or high pressure water jetting. Normally, Sikagard®-680 S can be applied on existing coating without any priming - It is recommended to carry out adhesion testing on a small scale prior to full scale operations.

Note: Existing water-based coating, even well adhering, must be removed completely prior to apply Sikagard®-680 S

Application Conditions / Limitations

Substrate Temperature	+5℃ min. / +35℃ max.
Ambient Temperature	+5℃ min. / +35℃ max.
Relative Air Humidity	< 85%
Dew Point	Temperature must be at least 3℃ above dew point

Application Instructions

Mixing

Sikagard®-680 S is supplied ready for use. Stir thoroughly prior to application.

Application Method / Tools

On very absorbent and/or porous substrate, it is recommended to add about 50% of Sikagard®-680 S Clear Glaze to the first coat of Sikagard®-680 S Top Coat in order to strengthen the substrate and to reduce the risk of a patchy appearance.

Sikagard®-680 S (Clear Glaze and Top Coat) can be applied by brush or short-piled lambskin roller.

The top coat can also be applied by airless spray:
Spray pressure 150 bars, nozzle bore 0.38 - 0.66 mm, spray angle 50 - 80°.

Cleaning of Tools

Clean all tools and application equipment with Sika Thinner C immediately after use. Hardened / cured material can only be removed mechanically.

Waiting Time / Overcoating

Waiting time between coats:

Substrate temperature	Time
+10°C	8 hours
+20°C	5 hours
+30°C	3 hours

Note: Refresher coats of Sikagard®-680 S can be applied without priming if the existing coating has been thoroughly cleaned.

Notes on Application / Limitations

Do not apply when there is:

- Expected rain
- Relative humidity > 85%
- Temperature below +5°C and/or below dew point

For lightweight concrete façade, we recommend a crack bridging intermediate coat such as Sikagard®-550 W Elastic.

In marine environments or if the concrete surface is exposed to splashes of de-icing salts, an impregnation of Sikagard®-702 W Aquaphob or Sikagard-700 S is recommended as water repellent primer.

On fair faced and precast concrete without adequate pore filler (e.g. Sika® MonoTop®- 620 or Sikagard® -720 EpoCem®, bubbles may occur if the application is carried out during rising temperatures.

The system is fully resistant for all normal atmospheric exposures and rainfall etc.

Splashed water containing de-icing salts or sea water may cause a loss of gloss and colour shade variation. However the protective performances are not adversely affected.

Curing Details

Curing Treatment

Sikagard®-680 S does not require any special curing but must be protected from rain for at least 1 hour at +20°C (dust dry in 30 minutes at +20°C).

Applied Product ready for use

Full cure: ~ 5 days at +20°C

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.

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.

Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

Legal Notes

Construction

CE Labelling

The harmonised European standard EN 1504-2 “Products and systems for the protection and repair of concrete structures – Definitions, requirements, quality control and evaluation of conformity – Part 2 Surface protection system for concrete” specifies the requirements for coatings to be used to protect concrete structures (either building or civil engineering structures).

Coatings used as concrete protection fall under this specifications – they need to be CE-labelled as per Annex Za, table Za.1d & 1e, conformity 2+ and 3 and fulfil the requirements of the given mandate of the Construction Product Directives (89/106/EC).

CE	
0921	
Sika Deutschland GmbH Factory Number 2017 Kornwestheimer Staβe 103-107 70439 Stuttgart, Germany 08	
0921-CPD-2017 EN 1504-2 Surface protection products Protective coating	
Permeability to CO_2	S_D > 50 m
Permeability to water vapour	S_D < 5 m (class I)
Capillary absorption and permeability to water	ω < 0,1 kg/m².h^{0,5}
Adhesion Strength by pull-off test	≥ 1,0 (0,8) N/mm²
Reaction to fire after application	Class E
Dangerous substances comply with 5.3	

EU Regulation 2004/42

VOC - Decopaint Directive

According to the EU-Directive 2004/42, the maximum allowed content of VOC (Product category IIA / **i** type **sb**) is 600 (Limit 2010) for the ready to use product.

The maximum content of **Sikagard®-680 S** is < 500 g/l VOC for the ready to use product.

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