



Expect more from your floor.

Reactive resins and polymer concrete for industrial flooring and civil engineering

Silikal methacrylate resin systems



Clean and hygienic ...

- sealed, seamless surface
- resistant to acids, lyes, greases, oils, salts and more
- easy to maintain



Safe ...

- non-slip surfaces
- wear and abrasion-resistant
- resistant to heat and cold



Quick and beautiful ...

- fully load-bearing after 2 hours; no disruption to operations during renovation!
- easy to apply, even at temperatures below zero
- wide selection of attractive colours



Silikal system information

Silikal product information

Silikal general information

Issue MS 2.10 C

February 2013



Silikal methacrylate resin systems
"Body & Soul" fitness centre,
Salach near Stuttgart



Silikal's production and administrative headquarters in Mainhausen, Frankfurt am Main

... as we have been for more than 60 years

We've been doing the basics for you for decades: with a background in screed construction, we decided a good 60 years ago to concentrate on the development and manufacture of floor coatings based on synthetic resins. Our history since then has seen countless research and development projects. Silikal is now active across the world, with branches in Germany and Europe as well as America, Asia and Australia.

... whatever your problems

Whether it's a new construction, repairs or renovation: our methacrylate resins are tried and tested heavy-duty floor coatings for industry, commerce and crafts, on transport surfaces, in public institutions and in medical facilities. Silikal's repair mortar systems are also used as reliable problem-solvers: to ensure the rapid improvement of holes, cracks or ruptures in concrete, prefabricated concrete or screeding, underline bridge bearings, establish machine foundations or fix heavy-duty sections and components in position.

... with the right systems

We have the right answer for your flooring problem. Super-fast curing with no disruption to operations, the exact degree of slip resistance required, processing even at very low temperatures, a large selection of colour design options and much, much more – all thanks to Silikal's product range.

... and with professional staff

Need advice? Delighted – just ask us! Every project has its own demands and requirements. Our staff come from the industry. They are familiar with the problems on site and boast worldwide experience as applications engineers. That's why you should talk to us. We'll be happy to help when it comes to realising even the most difficult flooring projects or the possible uses of rapid-curing mortar systems.

And if you'd really like to get into the details, Silikal's training centre in Mainhausen can provide you with a comprehensive range of practically-oriented information.

One thing you can be sure of: we're always here for you!



Certified Quality and Ecology
Management Systems
Reg. No. 73 100 / 104 663



Certified according
to AgBB evaluation
scheme



Silikal GmbH

✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
@ mail@silikal.de

Silikal methacrylate resin systems

Issue MS 2.10 C

February 2013

Silikal system information – resin systems	Data sheet - Page	
Reactive resins – definition and use		5
Priming – Coating – Sealing	GBV	8
Standard coating systems: overview	USS	9
SILIKAL® coloured flakes	MFC	10
SILIKAL® coloured flakes: examples of usage		11
SILIKAL® FS filler	MFS	12
SILIKAL® FS filler: examples of usage		13
SILIKAL® CQ filler	MCQ	14
SILIKAL® CQ filler: examples of usage		15
SILIKAL® pigment powder	MPP	16
SILIKAL® pigment powder: examples of usage		18

Silikal system information – mortar systems	Data sheet - Page	
Polymer concrete for repairs and civil engineering	MPB	20
Mortar systems: Overview	MMS	21
Mortar systems: Examples of use		22

Silikal general information	Data sheet - Page	
The substrate	DUG	25
Chemical resistance	CBK	28
TüV certificate DIN EN ISO 9001: Quality Management System	MZQ	30
TüV certificate DIN EN ISO 14001: Environmental Management System	MZU	31

What are reactive resins?

Reactive resins have become part and parcel of the construction trade. They are predominantly used in the manufacture of industrial flooring, for sealing or for filling joints. They generally consist of 2 components, are mixed and applied in a liquid state on the construction site and cure in a very short space of time by chemical reaction.

If selected and composed accordingly, reactive resins can provide both high mechanical strengths and very high flexibility and expansion characteristics as well as resistance to chemicals and weathering.

The following are used:

- Epoxy resins (EP)
- Methacrylate resins (MMA)
- Polyurethane resins (PUR)

Silikal products based on EP/PUR resins are described in the corresponding documentation.

Depending on the requirement, they are manufactured in different layer thicknesses, usually 1 – 10 mm (maybe thicker for mortar and screed), in a variety of decorations such as uni-pigmented, with coloured flakes or sand, and in a wide range of slip resistance classes. This requires additional fillers, pigments or other additives.

What are Silikal MMA reactive resins?

Silikal reactive resins are based on acrylic and methacrylic esters. The main component is the methyl methacrylate (MMA). The hardening (polymerisation) of the Silikal reactive resins is achieved by the addition of a hardening powder (peroxide) as the second component; this ensures that the chemical reaction is triggered even at low temperatures below 0 °C and does not itself interfere with the properties of the end product.

The quantity of hardening powder for Silikal reactive resins must therefore be dosed according to a temperature table. Once the hardening process has commenced, it cannot be interrupted.

The prominent benefits at a glance:

- **Curing even at very low temperatures (special formulation down to -25 °C)**
- **Fully load-bearing just 2 hours after laying**
- **Treatable, excellent inter-layer adhesion even on old MMA toppings**
- **Slip resistance classes from smooth to coarse (R9 – R13)**
- **Excellent ageing and weather resistance, no chalking, no embrittlement**
- **Protection against high mechanical and chemical stresses**
- **Decorative surface design**
- **Hygienic and easy to keep clean**

Reactive resin coatings and mortars based on quick-hardening Silikal resins have proven to be ideal for improvements and renovations of concrete floors of all kinds. They are also increasingly being used as polymer concrete in civil engineering.

DIN/EN 1504-2

Our coating systems are certified to DIN/EN 1504-2 with the CE mark. The current test reports can be found on Silikal's website at www.silikal.de (Downloads/Test reports). They are constantly updated and supplemented.

VOC – volatile organic compounds

Products for indoor spaces such as at nurseries, schools, care and medical institutions and retail showrooms have been tested and shown to have particularly low emissions under AgBB test criteria (AgBB = Committee for Health-related Evaluation of Building Products).

Where are Silikal reactive resins used?

Depending on their formulation and binder, in industrial construction Silikal reactive resins can be applied on concrete, cement screed, ceramic tiles and asphalt (interiors). Particularly suitable in all industrial areas, e.g.:

- meat and fish processing
- large kitchens and the beverages industry
- supermarkets and retail areas
- electroplating and chemical plants
- electronics and precision mechanics
- pharmaceuticals
- textile and paper industry
- print shops and mechanical engineering
- automotive construction and vehicle workshops
- agricultural concerns and animal husbandry
- sanitary rooms
- indoor spaces

and also as repair and topping mortar for

- bridge structures
- roadways
- airfields
- multi-storey car parks

and in civil engineering for

- bridge renovation and underlining of bridge bearings
- machinery foundations

What are the definitions for certain layer thicknesses?

The specifications for the use of reactive resins differ widely. They are determined first and foremost by the mechanical and chemical stress envisaged and by the evenness of the substrate.

In its BEB worksheets, the Bundesverband Estriche und Beläge e.V. (BEB), D-53842 Troisdorf, has defined the type of wearing layers by areas of application as follows:

Impregnation	= KH-1
Sealing 0.1 – 0.3 mm	= KH-2
Coating 0.3 – 2.0 mm	= KH-3
Topping 2.0 – 6.0 mm	= KH-4
Screed from 6.0 mm	= KH-5

You might like to know that our expertise in products and processes is based on intensive research and years of experience. We see it as a particular obligation to advise our customers in writing of all our results. We reserve the right to make technical changes in the course of development. We will help you solve problems at any time - that's what our applications engineers are there for. However, this does not release users from their duty to check whether our information and recommendations are suitable for their purposes. This also applies for the preservation of third-party property rights and for applications and processes that are not expressly indicated by us in writing. Our liability in the event of damage will be limited to substitute performance to the same extent. Our "General Terms of Sale and Supply" otherwise apply.

Impregnations and sealants

Impregnation is the pore-filling saturation of absorbent substrates with low-viscosity, easily penetrative reactive resins or synthetic resin solutions. It is performed in order to strengthen surfaces of industrial floors, enhance their resistance and prevent the dust that is formed through abrasion (BEB worksheet KH-1). Sealants are transparent or coloured coats of synthetic resins that may or may not contain solvents. They are applied in order to improve the mechanical resilience of industrial floors and prevent the formation of dust through abrasion, facilitate their cleaning and maintenance, prevent the ingress of oils, greases and other contaminants into the substrate and enhance their appearance by providing colour (BEB worksheet KH-2). The resistance of impregnated or sealed substrates to mechanical stress is determined by the firmness of the substrate, the material properties and the thickness of the film of sealant that is applied. The low film thickness and the danger of mechanical damage must be taken into consideration when assessing resistance to chemical attack.

Coatings

Coatings are coverings of solvent-free reactive resins that are generally filled with fillers and coloured with pigments. Their layer thicknesses are 0.3 – 2 mm (BEB worksheet KH-3). They are applied in order to achieve greater mechanical resilience than is possible with sealants and to give industrial floors a non-porous, dust-free surface that looks good and can be cleaned and maintained with little effort. Decorative surfaces can also be produced with mixtures of coloured flakes and transparent binders.

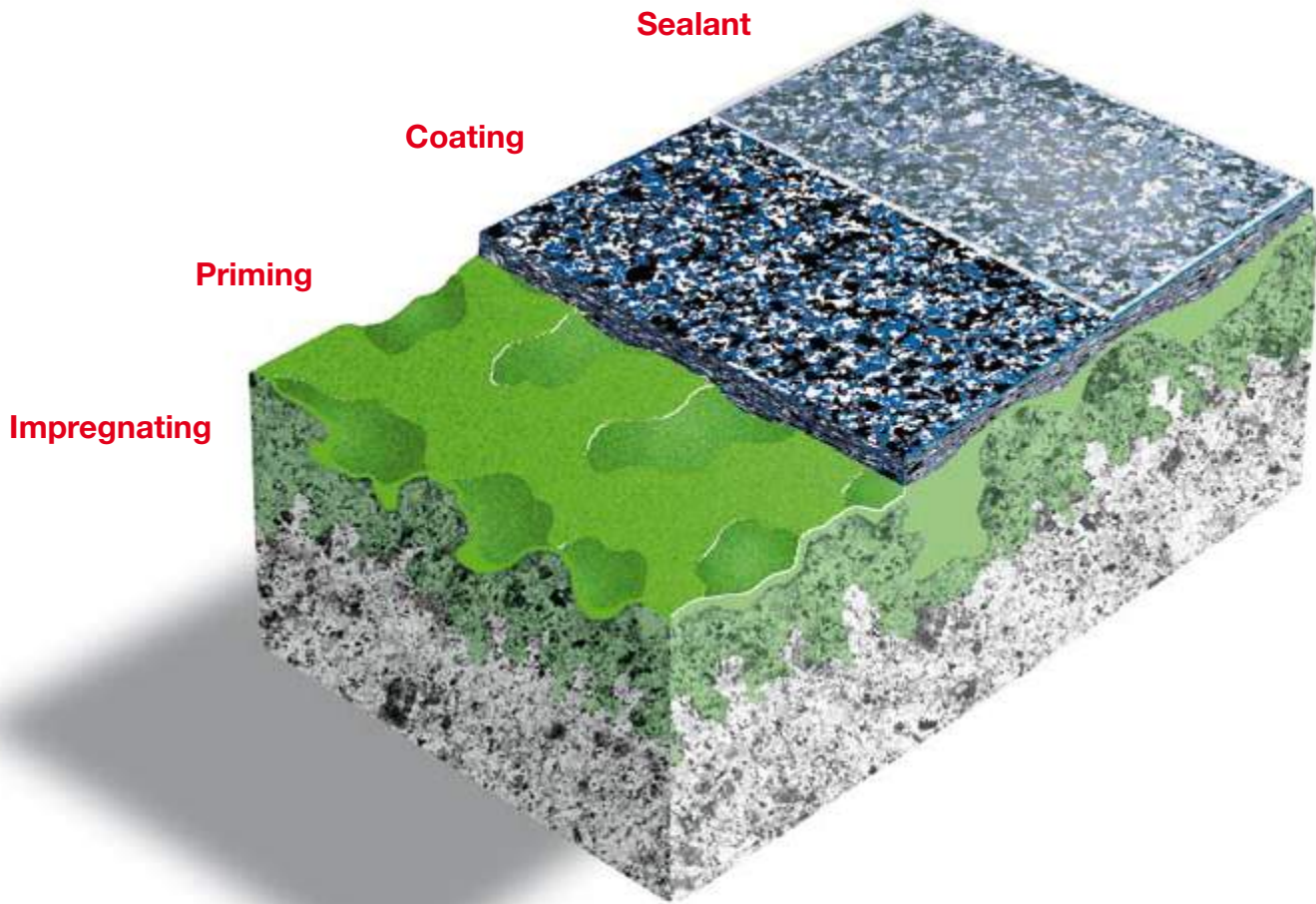
Toppings

Toppings are coverings of solvent-free reactive resins that are generally mixed with fillers. They are either designed to be self-levelling or can be applied by knife or trowel. Self-levelling toppings are usually coloured with pigments. Toppings that can be applied by knife or trowel are generally manufactured from transparent reactive resins with natural or coloured quartz. Decorative toppings with little susceptibility to soiling can be produced by mixing coloured quartz accordingly. As the thickness of toppings is generally 2 – 6 mm, they are used primarily to protect the substrate against chemical attack and heavy mechanical stresses (BEB worksheet KH-4).

Toppings are laid without pores, making them easier to clean and meeting the high hygiene requirements that prevail in the food industry in particular.

Screeds

Screeds are coverings of solvent-free reactive resins that are in principle laid with fillers, quartz sands and pigments, where applicable. They are produced as mortar and applied either with a knife (trowel) or with the levelling board. Their minimum thickness is 6 mm; screed thicknesses are generally 8 – 15 mm (BEB worksheet KH-5). Screeds made of reactive resin achieve high resistances to mechanical stresses and good chemical resistance if they are produced with a liquid-tight structure. Their main areas of use are therefore industrial floors that are exposed to high to extremely high stresses or of which a particular chemical resistance under significant mechanical stresses is required.



Silikal system information

Issue MS 2.10 C

February 2013

Data sheet GBV

Page 1 of 1

Silikal GmbH

✉ Ostring 23






☎ +49 (0) 61 82 / 92 35-0

🌐 www.silikal.de

D-63533 Mainhausen

☎ +49 (0) 61 82 / 92 35-40

@ mail@silikal.de

System	Name	Substrate	Decoration
	<p>Thin coating</p> <p>Base: SILIKAL® RU 727 resin</p> <p>Universal, rollable thin coating, 1 – 2 mm, smooth or slip-resistant, indoor use</p>	<p>Concrete</p> <p>Cement screed</p> <p>Asphalt</p> <p>Metal</p>	<p>Pigmented</p> <p>Coloured flakes</p> <p>Coloured sand</p>
	<p>Wet areas</p> <p>Base: SILIKAL® R 61 resin</p> <p>Slip-resistant, self-levelling coating, 4 – 6 mm, for wet areas, indoor use</p>	<p>Concrete</p> <p>Cement screed</p> <p>Tiles</p>	<p>Pigmented</p> <p>Coloured sand</p>
	<p>Dry areas</p> <p>Base: SILIKAL® R 62 resin</p> <p>Smooth or slightly slip-resistant coating, 2 – 4 mm, self-levelling for dry-use areas, indoor use</p>	<p>Concrete</p> <p>Cement screed</p> <p>Tiles</p> <p>Asphalt</p>	<p>Pigmented</p> <p>Coloured flakes</p>
	<p>Heavy-duty, refrigeration and outdoor areas</p> <p>Base: SILIKAL® RV 368 resin</p> <p>Smooth or slip-resistant, impact-resistant self-levelling coating, 4 – 7 mm, for cold stores and for high mechanical stresses, indoors and outdoors</p>	<p>Concrete</p> <p>Cement screed</p> <p>Tiles</p> <p>Asphalt</p> <p>Metal</p>	<p>Pigmented</p> <p>Coloured flakes</p> <p>Coloured sand</p>
	<p>Indoor spaces</p> <p>Base: SILIKAL® R 53 / R 63 / R 73 resins</p> <p>Smooth or slip-resistant, easy flowing coating, 3 – 4 mm, tested and approved under the AgBB evaluation scheme</p>	<p>Concrete</p> <p>Cement screed</p>	<p>Pigmented</p> <p>Coloured flakes</p> <p>Coloured sand</p>

Silikal EP/PUR systems - see separate documentation.

Silikal GmbH

✉ Ostring 23
 ☎ +49 (0) 61 82 / 92 35-0
 🌐 www.silikal.de

D-63533 Mainhausen
 ☎ +49 (0) 61 82 / 92 35-40
 @ mail@silikal.de

Silikal system information

Issue MS 2.10 C

February 2013

Data sheet USS

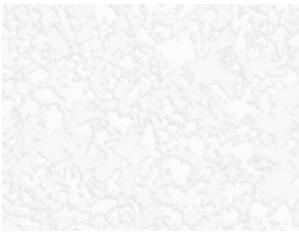
Page 1 of 1

SILIKAL® coloured flakes

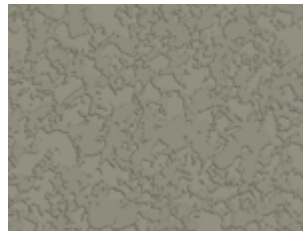
One colour, size 3 and 1



Expect more from your floor.



Silikal KF 1



Silikal KF 2



Silikal KF 3



Silikal KF 4



Silikal KF 5



Silikal KF 6



Silikal KF 8



Silikal KF 10



Silikal KF 11



Silikal KF 12



Silikal KF 13



Silikal KF 14



Silikal KF 15



Silikal KF 16



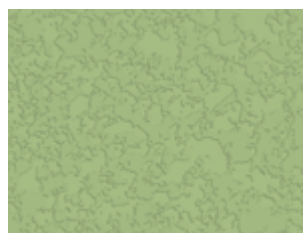
Silikal KF 17



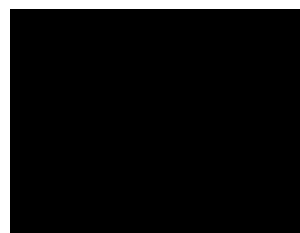
Silikal KF 18



Silikal KF 19



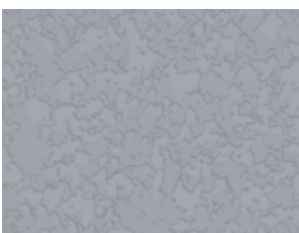
Silikal KF 20



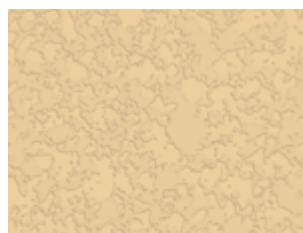
Silikal KF 21



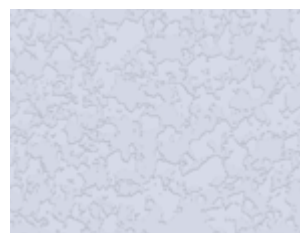
Silikal KF 23



Silikal KF 24



Silikal KF 25



Silikal KF 26



Silikal KF 30

The shades shown here are guidelines only. For printing reasons they may not be exactly the same as the original colours. We reserve the right to make changes.

Silikal system information

Issue MS 2.10 C

February 2013

Data sheet MFC

Page 1 of 1

Silikal GmbH

✉ Ostring 23

☎ +49 (0) 61 82 / 92 35-0

🌐 www.silikal.de

D-63533 Mainhausen

☎ +49 (0) 61 82 / 92 35-40

@ mail@silikal.de

SILIKAL® coloured flakes

Examples of use



Sports hotel in Katschberg, Austria



Tool shop in Mainz, Germany



Multiscreen cinema in Albstadt near Stuttgart, Germany



Orthodontic practice in Offenbach/Main, Germany



Cheese dairy in Körmend, Hungary

Silikal GmbH

✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

📍 D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
✉ mail@silikal.de

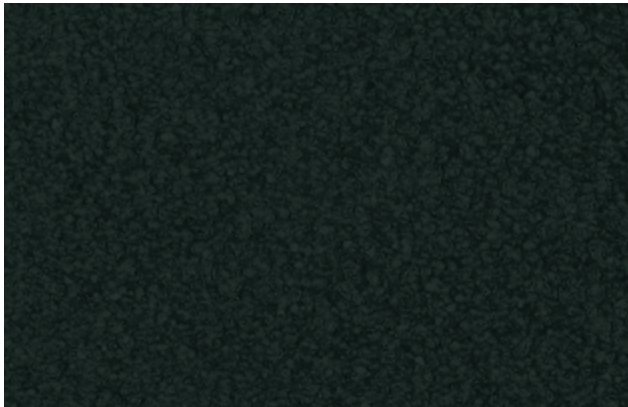
Silikal system information

Issue MS 2.10 C

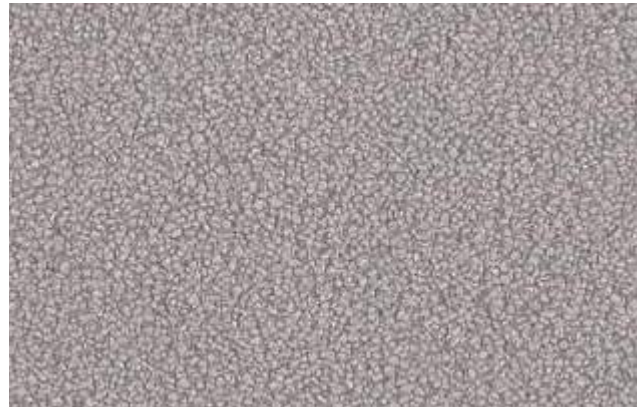
February 2013

SILIKAL® FS filler

One colour, for dry penetration toppings
Grain size 0.4 – 0.8 mm and 0.7 – 1.2 mm



Silikal® FS filler, black



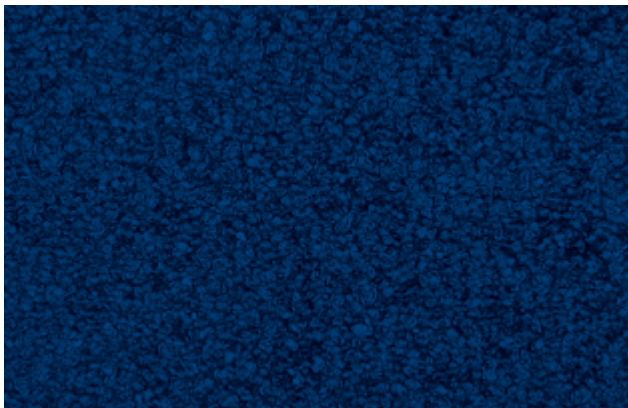
Silikal® FS filler, silver grey



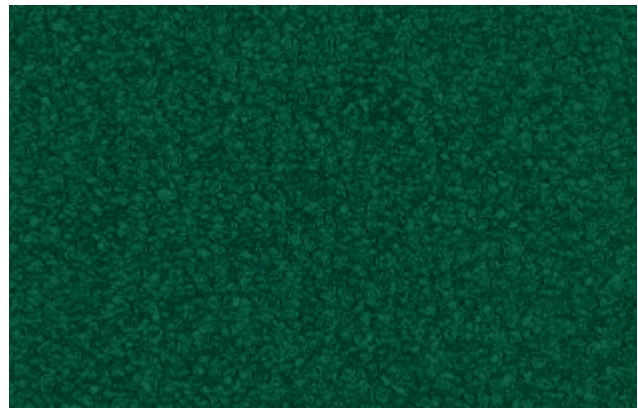
Silikal® FS filler, light grey



Silikal® FS filler, maize yellow



Silikal® FS filler, ultramarine blue



Silikal® FS filler, dark green



Silikal® FS filler, oxide red

The shades shown here are guidelines only. For printing reasons they may not be exactly the same as the original colours. We reserve the right to make changes.

Silikal system information

Issue MS 2.10 C

February 2013

Data sheet MFS

Page 1 of 1

Silikal GmbH

✉ Ostring 23

☎ +49 (0) 61 82 / 92 35-0

🌐 www.silikal.de

D-63533 Mainhausen

☎ +49 (0) 61 82 / 92 35-40

@ mail@silikal.de

SILIKAL® FS filler

Examples of use



Golf club in Idstein-Wörsdorf, Germany



Hotel kitchen in Kitzbühl, Austria



Horse clinic in Großwallstadt, Germany



Fruit juice bottling plant in Grünsfeld, Germany



Dairy

Silikal GmbH

✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
✉ mail@silikal.de

Silikal system information

Issue MS 2.10 C
February 2013

SILIKAL® CQ filler

Multicoloured, for smoothable toppings

Grain size 0.3 – 1.8 mm



Expect more from your floor.



SILIKAL® CQ filler no. 1



SILIKAL® CQ filler no. 2



SILIKAL® CQ filler no. 3



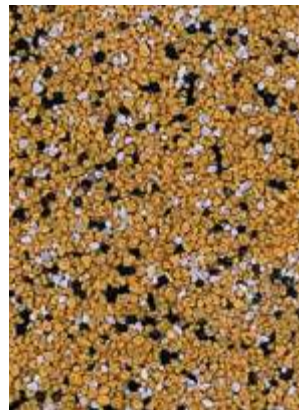
SILIKAL® CQ filler no. 4



SILIKAL® CQ filler no. 5



SILIKAL® CQ filler no. 6



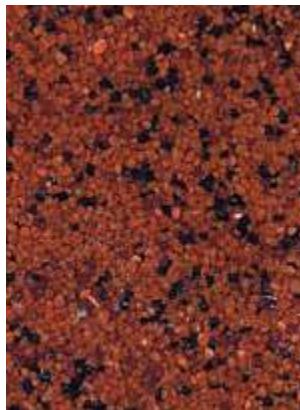
SILIKAL® CQ filler no. 7



SILIKAL® CQ filler no. 8



SILIKAL® CQ filler no. 9



SILIKAL® CQ filler no. 10



SILIKAL® CQ filler no. 11



SILIKAL® CQ filler no. 12

The shades shown here are guidelines only. For printing reasons they may not be exactly the same as the original colours. We reserve the right to make changes.

Silikal system information

Issue MS 2.10 C

February 2013

Data sheet MCQ

Page 1 of 1

Silikal GmbH

✉ Ostring 23

☎ +49 (0) 61 82 / 92 35-0

🌐 www.silikal.de

D-63533 Mainhausen

☎ +49 (0) 61 82 / 92 35-40

@ mail@silikal.de

SILIKAL® CQ filler

Examples of use



Slaughterhouse
in Imst, Tyrol



Large bakery
in Groß-Gerau,
Germany



Hotel kitchen in Merano, South Tyrol



Car dealership in Offenbach, Germany

Silikal GmbH

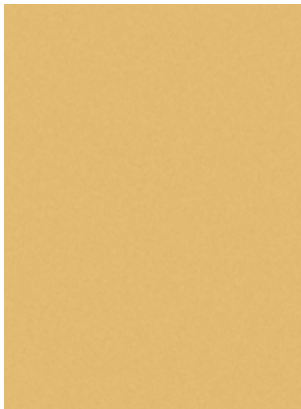
✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
@ mail@silikal.de

Silikal system information

Issue MS 2.10 C

February 2013



approx. RAL 1002



approx. RAL 1011



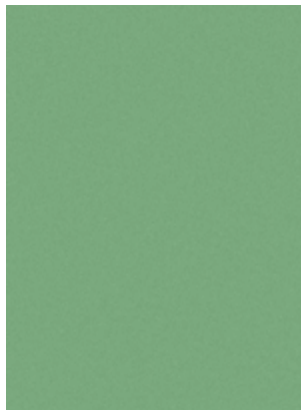
approx. RAL 1020



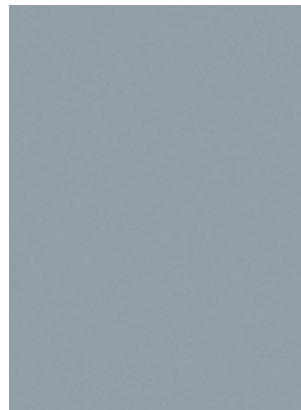
approx. RAL 3011



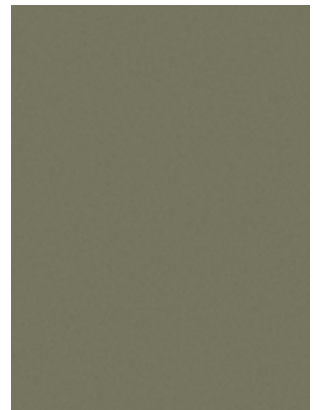
approx. RAL 6002



approx. RAL 6021



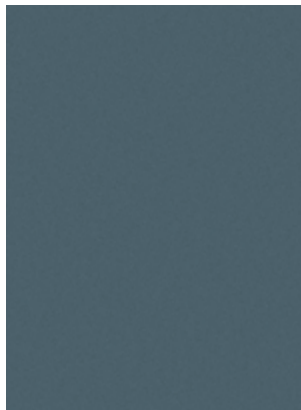
approx. RAL 7001



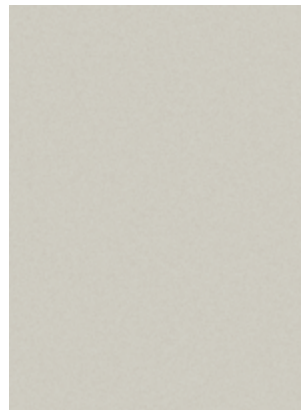
approx. RAL 7023



approx. RAL 7030



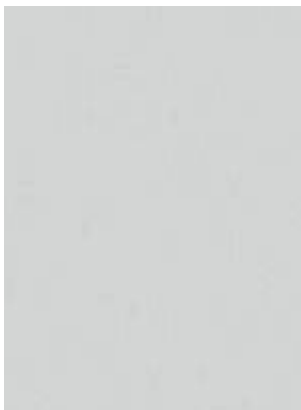
approx. RAL 7031



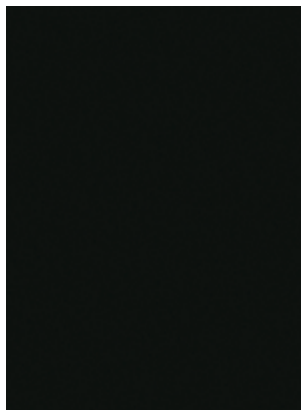
approx. RAL 7032



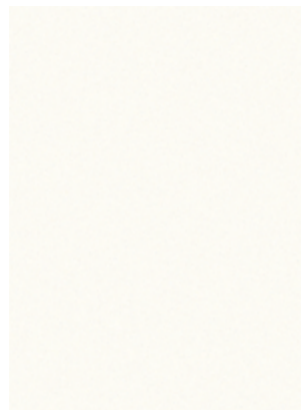
approx. RAL 7033



approx. RAL 7035



approx. RAL 9004



approx. RAL 9010

The shades shown here are guidelines only. For printing reasons they may not be exactly the same as the original colours. We reserve the right to make changes.

Silikal system information

Issue MS 2.10 C

February 2013

Data sheet MPP

Page 1 of 2

Silikal GmbH

✉ Ostring 23

☎ +49 (0) 61 82 / 92 35-0

🌐 www.silikal.de

D-63533 Mainhausen

☎ +49 (0) 61 82 / 92 35-40

@ mail@silikal.de



approx. RAL 1004



approx. RAL 1023



approx. RAL 3003



approx. RAL 3009



approx. RAL 3020



approx. RAL 5002



approx. RAL 5010



approx. RAL 5015



approx. RAL 6011

The shades shown here are guidelines only. For printing reasons they may not be exactly the same as the original colours. We reserve the right to make changes.

SILIKAL® pigment powder

Examples of use



Metalworks
in Fellbach, Germany



Large bakery in Mainhausen, Germany



Winery in Dürnstein, Austria



Warehouse



Chemical production



Paper mill
in Allschwil, Switzerland

Silikal system information

Issue MS 2.10 C

February 2013

Silikal GmbH

✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
@ mail@silikal.de

SILIKAL® pigment powder

Examples of use



Metalworks in Hamburg, Germany



Print shop in Ötztal-Bahnhof, Austria

Dairy farm in Neustadt, Austria

Silikal GmbH

✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
✉ mail@silikal.de

Silikal system information

Issue MS 2.10 C

February 2013

Repairs

Reactive resin mortars have proven their worth for repairs to concrete surfaces in both structural and civil engineering. Silikal reactive resin mortars consist of a premixed powder component, which already contains fine fillers, pigments, quartz sands and hardener components, and a low-viscosity reactive resin. These two components are mixed on site to form an easy-flowing mortar. Dry gravel aggregates from a grain size of 2 mm can be added on site as well to serve as an additional filler for corresponding installation depths.

The striking features of reactive resin mortars are:

- permanent bond with the existing concrete
- excellent frost resistance
- easy to mix and process
- rapid curing even at temperatures below freezing

The main areas of application for reactive resin mortars for repairs and renovation are:

- industrial flooring of all kinds
- prefabricated concrete parts
- bridge bearing underlinings
- roads and motorways
- airports, including runways and landing strips
- pavement renovation

The main products used are: Silikal R 7 and Silikal R 17, and as a primer Silikal R 51.

Civil engineering

Reactive resin mortars and concretes have been proving their worth as a repair mortar for damaged concrete for more than two decades. Since the physical properties of reactive resin mortars and concretes have been demonstrated not only in recent tests but now also in long-term trials (> 25 years), their use in civil engineering has been growing as confidence in them has risen. This includes the use of reactive resin mortars in tunnelling and bridge construction, for instance, where mortars are exposed to high permanent stresses under bearing loads. The pictures on the following pages illustrate some of the most common uses of reactive resin mortars in civil engineering at the moment and offer ideas for further applications.

You might like to know that our expertise in products and processes is based on intensive research and years of experience. We see it as a particular obligation to advise our customers in writing of all our results. We reserve the right to make technical changes in the course of development. We will help you solve problems at any time - that's what our applications engineers are there for. However, this does not release users from their duty to check whether our information and recommendations are suitable for their purposes. This also applies for the preservation of third-party property rights and for applications and processes that are not expressly indicated by us in writing. Our liability in the event of damage will be limited to substitute performance to the same extent. Our "General Terms of Sale and Supply" otherwise apply.

System	Name
SILIKAL® R 17 mortar	Reactive resin mortar for concrete repairs and screeds
SILIKAL® R 7 mortar	Hard reactive resin mortar for floorings
SILIKAL® R 16 mortar	Reactive resin mortar for rapid concrete repairs

Special formulations:

SILIKAL® R 17-fine mortar

If the basic mortar mix is too coarse for finer concrete work, we recommend that you use SILIKAL® R 17-fine powder instead, but only from a minimum layer thickness of 2 mm. In this case, the necessary quantity of SILIKAL® R 17 hardener is about 2.7 – 3.0 litres per 15 kg of fine powder.

SILIKAL® R 17 (–25 °C) mortar

For repair work in cold areas (cold stores, winter season), you can use this more accelerated SILIKAL® R 17 mortar. However, this must only be applied at temperatures from –10 °C to –25 °C and must be cooled down to at least 0 °C before being applied. The special formulation relates to hardeners and powders.

SILIKAL® R 17-thix mortar

If laying on inclines or when modelling edge excavations and coving, we recommend that you use SILIKAL® R 17-thix hardener, but at the same mixing ratio, due to the thixotropic formulation.

Special shades

The standard shade is roughly RAL 7030 medium grey. If sealed batches and minimum quantities are purchased, special shades are available on request.

CE conformity

SILIKAL® R 17 mortar has a CE mark certifying compliance with screed standard DIN EN 13813. We would be happy to provide various test reports on request.



Installation of the lateral drainage channels in a motorway



Renovation of the bridge bearings of a motorway bridge



Renovation of the bridge abutment of an urban railway bridge



Renovation of flooring in a rolling mill

Silikal system information

Issue MS 2.10 C

February 2013

Silikal GmbH

✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
@ mail@silikal.de



Angled kerbs adhered to asphalt with SILIKAL® R 17 mortar for a pedestrian crossing



Renovation of kerbstones with SILIKAL® R 17 mortar



Picture above and left:
Concrete renovation on the landing strip and taxiway of a civil airport



Improvement of the flooring in a cold store in continuous operation with SILIKAL® R 17 (-25 °C) mortar



Silikal methacrylate resin systems
Abel fish smoke-house,
Habbrügge near Bremen

General

If the long durability of coatings (toppings, sealants etc.) and a good bond with the substrate are to be achieved, it is essential that the latter is inspected, assessed and prepared beforehand.

The most common causes of deficient workmanship, defects and complaints result from failure to observe these requirements.

Under the guidelines and worksheets A80 of the AGI, Arbeitsgemeinschaft Industriebau e.V., Ebertplatz 1, 50668 Cologne, and KH0 – KH6 of the BEB, Bundesverband Estriche und Beläge e.V., Industriestraße 19, 53842 Troisdorf, the substrate must be firm for all treatments, free of loose constituents and impurities and free of any dust and oil. Moreover, the substrate must not have had any post-treatment or contain any additive agents or additives that have a negative effect on the bond or the hardening action of the reactive resin to be applied.

According to German construction contract procedures, one of the services of the contractor is to inspect the substrate for its suitability for application of the prescribed topping. He must inform the customer in writing of any objections to the way the work is to be executed if this does not correspond to the condition of the substrate.

Inspection of the substrate

Moisture

After being laid, cement screeds and concrete surfaces cannot be coated until they have a household moisture of about 4 %. This is not normally the case before 28 days. Under certain climatic conditions (e.g. sub-tropical to tropical weather), restrictions with regard to the possible achievable household moisture may be required. The substrate must also be sufficiently sealed against ground water and rising damp (capillary moisture), e.g. through a gravel-filter layer or a horizontal barrier (film). Hydrophobic concrete and hydrophobic screeds do not offer protection against moisture penetration because they let in vapour. Moisture can be measured by means of a kiln sample, CM device and with suitable electronic measuring devices. However, the CM unit offers the most reliable figures. Rising damp can be inspected by sticking a thick polyethylene film down over an area of about 1 m² in size. If the covered area turns dark within 24 hours through the formation of condensation, rising damp is present. Special primers such as SILIKAL® Porfil RE 40 can also help against moisture.

Firmness

The substrate must be sufficiently firm because coatings and toppings, despite their own high inherent strength, cannot offer any load distribution due to the low layer thickness. The compressive strength of concrete and composite screeds can usefully be determined using a bounce hammer (known in German as a Schmidt hammer). The surface hardness can be checked by scratching with a steel nail or performing a pull-off test with the tensile bond test device. For industrial floors, the compressive strength should be at least 25 N/mm², the pull-off strength at least 1.5 N/mm².

Adhesion test

Before any work on cleaned floors is started, a sufficient number of adhesion tests at various locations must always be carried out. Tensile bond testing devices (e.g. Schenk-Trebel, Herion) have proven to be useful in this regard. As adhesive for the tensile bond punch we recommend SILIKAL® RI/21 tensile bond adhesive. Should no testing device be available, it is nevertheless recommended that at least a quick test is performed. This can be done using SILIKAL® R 51 resin mixed with hardening powder. Half of the resin is used to form a primer film. The remaining resin is mixed with sand (0.7 - 1.2 mm) to form a viscous mortar which is then applied to about half the primed surface to a depth of approx. 3 mm. After hardening sufficiently not to be sticky, the manual samples are chiselled off with a hammer and chisel. The surface of the substrate must adhere fully to the reactive resin coat and show a particular fracture of the upper zone of the substrate. The primed surface must be cured without being sticky and it must not be possible to detach it by scratching using a knife or screwdriver.

Pretreatment of the substrate

Evenness

Thin layers of reactive resin cannot make up for unevenness in the substrate. Nor can unevenness be compensated for by filling with Silikal reactive resins. It may be necessary to apply a Silikal topping to a greater depth.

Contamination

Reactive resins will not adhere well to contaminated substrates, if at all. That is why, depending on the type of contamination, the surface must be cleaned wet or dry until all the pores are open. Oily and greasy substrates can be cleaned by means of special cleaners with the use of scrubbing machines, high-pressure jets or flame descalers. Flame descalers are recommended for the cleaning of substrates contaminated with chemicals and substrates which have been treated with evaporation-inhibiting sprays. Substrates to which paint, bitumen or tar are stuck are cleaned by milling or blasting.

Soft and detachable constituents

Cementitious grout, cement flakes, mortar residue and all surface constituents which do not adhere firmly and indissolubly to the substrate must be removed by chiselling, milling, blasting or grinding before the first reactive resin is applied.

Absorbency

For reactive resins to anchor themselves firmly on the surface of concrete or mortar, their primer must penetrate into the capillary/pore structure of the substrate, which must be correspondingly absorbent. A particularly high absorbency indicates that the substrate has little strength. It is therefore essential that it is primed until saturated.

Cracks

On cement-bonded substrates "spidery" surface cracks have no detrimental effects on reactive resin applications; however, they may need to have several coats of primer resin. Continuous shrinkage cracks can be sealed up non-positively by filling with Silikal reactive resins if the shrinkage of the substrate is eliminated. Settling cracks and other cracks resulting from structural movements are not generally bridged by reactive resin coatings; they must be resealed on a case-by-case basis.

Joints

Joints with a low tendency to move must be taken over. They should run straight, be evenly wide and have firm sides. Damages to the sides of joints must be improved with Silikal reactive resin mortar. The joint is then sealed with SILIKAL® F 10 resin.

In most cases, rigid joints can be filled and coated over after priming. Expansion joints must not be filled and coated over, though.

Hollows

Hollow areas, particularly those which have cracks, must be filled with Silikal reactive resin.

Special advice on standard structural substrates

Concrete

The surface of cement concrete generally has a fine layer of mortar (cementitious grout) which, because of its low strength and adhesion to the substrate, has to be removed before any reactive resin is applied. The suitable methods for doing so depend on the condition of the substrate: milling, sandblasting, shot-peening or flame descaling.

Cement screeds

Cement screeds, particularly hard-aggregate screeds, can have such a dense surface that reactive resin primers can scarcely penetrate. The pores of this surface may need to be opened up, e.g. by blasting. In cement screeds, the cementitious grout must be removed by milling or blasting. Hard-aggregate screeds can, in the most advantageous cases, be roughed up by shot-peening. In any case, it is essential that the primer closes up the pores.

Manual samples should be taken first.

Anhydrite and magnesite screeds

Anhydrite and magnesite screeds are not resistant to moisture. In the case of reactive resin top coats which are impermeable to water vapour, moisture penetration through the rear and through adjacent elements must be reliably excluded. The risk not only that the coating will loosen given deficient sealing but also that these screeds themselves will be destroyed in their upper zones is great.

Toppings which are impermeable to water vapour on anhydrite and magnesite screeds have not performed well in practice.

Mastic asphalt screeds

Because of their considerable reaction to fluctuations in temperature, mastic asphalt screeds should only be coated in indoor areas. Coatings should only be laid with flexible reactive resins because mastic asphalt can deform or lose its strength under stress and under fluctuating temperatures. It is absolutely essential that the adhesion and the strength of the substrate is analysed.

Ceramic toppings

Ceramic toppings must be firmly bonded with the substrate. In order to achieve sufficient adhesion between reactive resins and ceramic toppings, their surface may need to be mechanically roughed (e.g. by sandblasting) under some circumstances (adhesion test!). SILIKAL® RU 727 resin must be used as the primer on ceramic substrates along with SILIKAL® M additive bonding agent.

Metals

As non-absorbent substrates, metal substrates must be prepared in accordance with standard DIN EN ISO 12944-4 to SA 2 1/2 and pretreated with a special primer. SILIKAL® RU 727 resin with the addition of SILIKAL® M additive bonding agent is used to this end. Metal substrates should only be coated with flexible reactive resins. We recommend that you consult Silikal.

The data contained in the following table apply for room temperature (approx. +20 °C) and are provided as a guide only. Given the large number of recipes in practical use - e.g. in cleaning and disinfection - and the possible interactions where several chemicals are used at one location, it is not possible to offer any overall or individual guarantee. The chemical resistance of a coating is also influenced by the fillers and pigments that are used. For these reasons, it is essential that you do your own tests as each case arises.

Under some circumstances chemicals may lead to discolouration, but without attacking the material.

You must also remember that the aggressiveness of acids and other chemicals can increase as the temperature rises. It is also possible that acids on the ground will change concentration through evaporation or the absorption of moisture, making them tend to react more aggressively.

The stresses that occur in practice are often associated with greater and longer temperature stresses and can therefore lead to deviating results under some circumstances. You are welcome to contact Silikal's Application Technology department if you have any questions on this subject.

Test medium	SILIKAL®	SILIKAL®	SILIKAL®	Test medium	SILIKAL®	SILIKAL®	SILIKAL®
	Resin RU 727, R 62, R 81	Resin R 71, R 72	Resin RE 77		Resin RU 727, R 62, R 81	Resin R 71, R 72	Resin RE 77
Alkalies:				Solvent:			
Ammonia 10 %	+	+	+	Acetone	-	-	O
Ammonia 25 %	O	O	+	Benzene	-	-	+
Ammonia, alcoholic	O	O	O	Benzine, 2 star	+	+	+
Caustic potash solution 10 %	+	+	+	Butanol	-	-	+
Caustic potash solution 50 %	+	+	+	Butyl ether	-	-	O
Caustic soda solution 10 %	+	+	+	Cellulose thinner	-	-	O
Caustic soda solution 50 %	+	+	+	Chloroform	-	-	-
Milk of lime (calcium hydroxide)	+	+	+	Cyclohexane	+	+	+
Acids:				Dibutyl phthalate	O	O	+
Acetic acid 10 %	+	+	-	Diesel oil/heating oil	+	+	+
Acetic acid 25 %	+	+	-	Diocetyl phthalate	O	O	+
Acetic acid 30 %	O	+	-	Ethyl acetate	-	-	O
Acetic acid 80 %	-	-	-	Ethyl alcohol 10 %	O	+	+
Boric acid 3 %	+	+	+	Ethyl alcohol 96 %	-	-	+
Chromic acid 20 %	+	+	-	Glycerine	O	+	+
Chromic acid 40 %	O	+	-	Heptane	+	+	+
Citric acid 30 %	+	+	+	Hexane	+	+	+
Fatty acid (tall oil fatty acid)	O	O	+	Isopropyl alcohol	-	O	+
Formic acid 10 %	+	+	-	Kerosine	+	+	+
Formic acid 30 %	-	O	-	Methanol	-	-	O
Hydrofluoric acid max. 7 %	+	+	+	Methylene chloride	-	-	-
Lactic acid 30 %	+	+	O	Monochlorobenzene	O	O	+
Nitric acid 10 %	+	+	O	n-propyl acetate	-	-	O
Nitric acid 30 %	O	O	O	Perchloroethylene	O	O	-
Nitric acid, conc. (65 %)	-	-	-	Petrol, 4 star	-	O	+
Oxalic acid 10 %	+	+	O	Petroleum	O	+	+
Phosphoric acid 40 %	+	+	+	Phenol	O	O	O
Phosphoric acid, conc. (85 %)	O	O	O	Styrol	O	O	O
Salic acid 10 %	+	+	+	Synthetic resin thinner	-	-	O
Salic acid, conc. (36 %)	+	+	+	Toluol	-	-	O
Sulphuric acid 30 %	+	+	+	Trichloroethylene	-	-	-
Sulphuric acid 50 %	O	+	O	Turpentine	+	+	+
Sulphuric acid 80 %	-	-	O	White spirit	+	+	+
				Xylol	-	-	O

Test medium	SILIKAL®	SILIKAL®	SILIKAL®
	Resin RU 727, R 62, R 81	Resin R 71, R 72	Resin RE 77
Water and aqueous solutions:			
Anti-freeze (glycol-based)	O	+	+
Chlorine water	+	+	+
Formaldehyde 37 %	+	+	O
Hydrogen peroxide 30 %	+	+	O
Hydrogen peroxide 80 %	O	O	-
Sea water	+	+	+
Sodium chloride 5 %	+	+	+
Sodium chloride, saturated	+	+	+
Sodium hypochlorite 15 %	+	+	+
Sodium carbonate (soda)	+	+	+
Soap solution	+	+	+
Tap water	+	+	+
Urea/urine	+	+	+
Waste water (sewage)	+	+	+
Water, deionised	+	+	+
Water +80 °C	O	O	+
Drinks:			
Beer	+	+	+
Brandy 40 % vol.	O	+	+
Grape juice	+	+	+
Lemonade	+	+	+
Milk	+	+	+
Vegetable juice	+	+	+
Wine	+	+	+
Oils and greases:			
Animal fats	+	+	+
Blood	+	+	+
Castor oil	+	+	+
Crude oil	+	+	+
Cutting oil	O	O	+
Hydraulic oil (e.g. Skydrol B 500)	O	O	O
Linseed oil	+	+	+
Mineral oil	+	+	+
Olive oil	+	+	+
Vegetable fats	+	+	+

Test medium	SILIKAL®	SILIKAL®	SILIKAL®
	Resin RU 727, R 62, R 81	Resin R 71, R 72	Resin RE 77
Cleaning agents:			
Ammonia solution	+	+	+
Chlorine bleach 15 %	+	+	+
Detergent water	-	-	-
FEWA®	+	+	+
PERSIL®	+	+	+
PRIL®	+	+	+
P3	+	+	O
P3 ASEPTO®	+	+	O
REI®	+	+	+
Sagrotan® 5 %	O	O	+
Soap water	+	+	+
TOLO®	+	+	+

Evaluation		
+	Resistant	Preliminary testing shows that the coating material may be permanently stressed with this medium.
O	Limited resistance	Permanent stress is not possible, because lengthy action could lead to significant softening or swelling. Transient stresses (approx. 1 – 2 hours) are possible.
-	Not resistant	Damage could occur even under brief stress.

Silikal GmbH

✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
@ mail@silikal.de

Silikal general information

Issue MS 2.10 C

February 2013

Data sheet CBK

Page 2 of 2

TÜV
PROFI
CERT

CERTIFICATE

Management system as per
DIN EN ISO 9001:2008

Evidence of conformity with the above standard(s) has been furnished
and is certified in accordance with TÜV PROFICERT procedures for




Silikal GmbH
Ostring 23
D-63533 Mainhausen

scope

**Development and sales of reactive resins
and polymer concrete for industrial floors
and engineering**

Certificate registration No. 73 100 663
Audit Report No. 4216 3776
Valid until 2012-08-20
First certification 1999-09-23




Darmstadt, 2010-08-24
Certification body of TÜV Hessen
- Head of Certification body -

Page 1 of 2.

This certification was conducted in accordance with the TÜV PROFICERT auditing and certification procedures and is subject to regular surveillance audits. Verifiable under www.tuev-club.de. Original certificates contain a glued on hologram.
TÜV Technische Überwachung Hessen GmbH, Rüdelsheimerstr. 119, D-64285 Darmstadt, Tel. +49 6151/600331

Silikal general information

Issue MS 2.10 C

February 2013

Data sheet MZQ

Page 1 of 1

Silikal GmbH

✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
@ mail@silikal.de

TÜV
PROFI
CERT

CERTIFICATE

Management system as per
DIN EN ISO 14001:2009

Evidence of conformity with the above standard(s) has been furnished
and is certified in accordance with TÜV PROFICERT procedures for




Silikal GmbH
Ostring 23
D-63533 Mainhausen

scope

**Development and sales of reactive resins
and polymer concrete for industrial floors
and engineering**

Certificate registration No. 73 104 663
Audit Report No. 4216 3776
Valid until 2013-08-23
First certification 2001-02-27




Darmstadt, 2010-08-24
Certification body of TÜV Hessen
- Head of Certification body -

Page 1 of 2.

This certification was conducted in accordance with the TÜV PROFICERT auditing and certification procedures and is subject to regular surveillance audits. Verifiable under www.tuev-club.de. Original certificates contain a glued on hologram.
TÜV Technische Überwachung Hessen GmbH, Rüdelsheimerstr. 119, D-64285 Darmstadt, Tel. +49 6151/600331

Silikal GmbH

✉ Ostring 23
☎ +49 (0) 61 82 / 92 35-0
🌐 www.silikal.de

D-63533 Mainhausen
☎ +49 (0) 61 82 / 92 35-40
@ mail@silikal.de

Silikal general information

Issue MS 2.10 C

February 2013

Data sheet MZU

Page 1 of 1



Expect more from your floor.

Silikal GmbH

Reactive resins and polymer
concrete for industrial floors
and civil engineering projects

✉ Ostring 23

D-63533 Mainhausen

☎ +49 (0) 61 82 / 92 35 -0

☎ +49 (0) 61 82 / 92 35 -40

🌐 <http://www.silikal.de>

@ mail@silikal.de