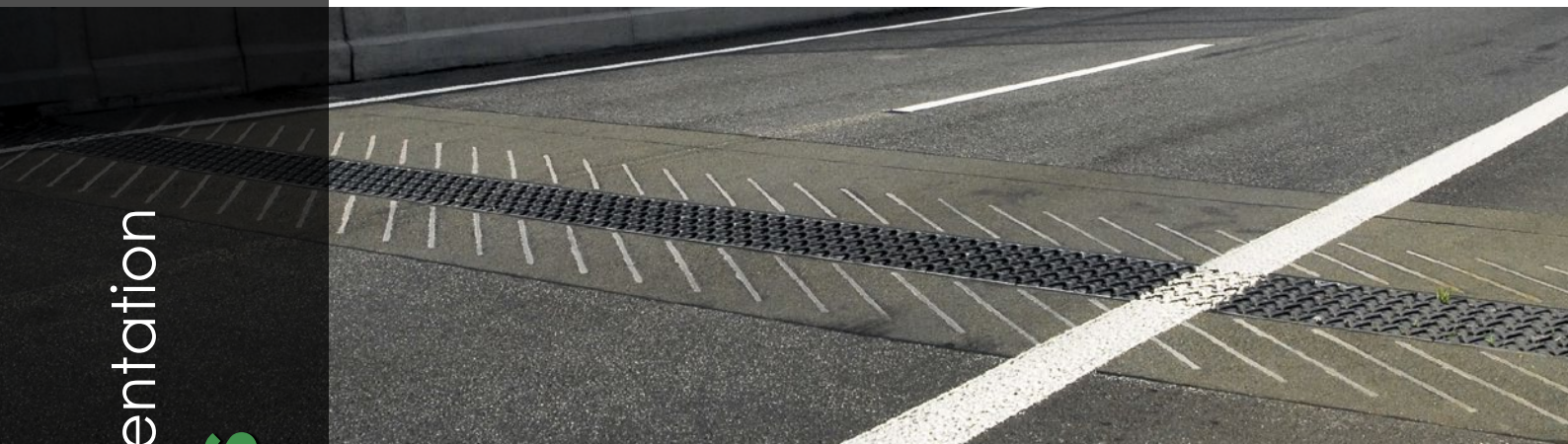


Reactive resin mortar for very strong,
quick repairs in concrete and
engineering works, also for
mortar toppings for bridge bearings



Protecting floors, buildings, infrastructures



Silikal Technical Documentation
Mortar systems

We are here for you...



Silikal, production and headquarters in Mainhausen/Frankfurt am Main

...since over 70 years

For decades we have been working for you on the basis: coming from the practice of screed construction, we decided on developing and manufacturing floor coatings based on synthetic resins back in the early 60's. Numerous research and development projects accompany this path until today. Silikal now operates worldwide and is represented in Germany and Europe as well as on all continents of the world.

...a wide variety of problems

Whether for new buildings, repairs or renovations: our methacrylate resins have proven their worth as heavy-duty floor coatings in industry, commerce and trade, on traffic areas, in public and medical facilities. Furthermore, Silikal's repair mortar systems are used as reliable problem-solvers: to quickly repair breakouts, cracks or holes in concrete, precast concrete parts or screeds, to undergird bridge bearings, to prepare machine foundations or to fix heavy-duty profiles and structural elements. Today, our customers can choose from a variety of MMA, epoxy and PU products and specialties, such as those for waterproofing, filling cracks, road marking, mortar systems, PU concrete, adhesives, tactile guiding systems for the blind and design floors.

...with the right systems

We have the right answer to your floor problem. Fast curing without major interruption of operation, slip resistance levels as required, processing even at very low temperatures, a large selection of colour design options and much more... our product range makes it possible.

... and with a motivated, skilled team

You need advice? That's our strength – challenge us! Every project has its own demands and requirements. Our team knows the problems on site and has worldwide experience in application engineering. Get in touch with us. We will be happy to help whether you're implementing the toughest floor projects or interested in ways to use quick-curing mortar systems.

And if you'd really like to get into the details, the Silikal training centre in Mainhausen will be happy to provide you with extensive and hands-on information.

Rest assured – **we** are always on hand to help, around the clock, even on weekends and bank holidays.



Certified quality and
environmental management systems
Reg. No. 73 100 / 104 663



Certified to
AgBB evaluation scheme for
non-transit indoor spaces



Our systems comply
with the international
HACCP guidelines



Our systems comply
with European
Halal guidelines



CE certification
of in-house
production control
to EN 1504-2
performed by Kiwa GmbH
Polymer Institute

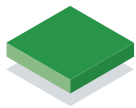
Technical Documentation

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Important Note

The following extremely important and partially complementary data sheets or chapters are included in the technical documentation:

- Data sheet SILIKAL® Hardening Powder
- Data sheet SILIKAL® Additive ZA, low-temperature accelerator for priming
- Special priming data sheet SILIKAL® R 51 (low viscosity) and SILIKAL® RU 380 (adherent priming)
- Information on safety and protection

Mortar Systems Technical Documentation

Introduction

Silikal reactive resins enable surfaces that combine high strength with decorative qualities to be applied in almost all industrial and traffic sectors, as well as permitting the preparation of mortar systems for the quick repair of concrete. Silikal is a well known company specialising in the methacrylate reactive resin sector. Its suitability has been demonstrated on millions of square metres for over 70 years.

Silikal Mortar Systems ...

are different from other mortars and sealing mortars in their rapid setting time, which means the repaired surface can be used approximately one hour after completing the work. This is due to the unique qualities of the binder used: Silikal methacrylate-based reactive resins, which set quickly with little relation to temperature. No other reactive resin mortar (e.g. epoxy resin-based mortars) comes even close to matching the two major qualities of Silikal reactive resin mortars.

Reactive Resins (PMMA) from Silikal ...

... have other significant advantages over other commercial resins, such as epoxy or polyurethane:

- **Fast setting time** of reactive resins, restoring the floor to full strength in a short space of time.
- Setting even at **low temperatures** (in certain conditions, as low as -10 °C or -25 °C), which means they can be applied without difficulty even in winter or in cold chambers.
- **Excellent adherence** to the base and easy to restore.
- The hardened mortar is **physiologically harmless**

Silikal Reactive Resin for Work on Concrete and Quick Repairs

Everyone knows that concrete is repaired with mineral mortars. Normally cement is used as the binder for the sand and other additives, while the mixture is set with water. If required, additives are added to improve specific qualities in the concrete.

Although cement mortars may be applied to moist bases,

- they need temperatures above 0° C to set
- they require long setting times
- and they have limited flexibility and little resistance to wear and aggressive environments.

Surprisingly, most people do not know that concrete can also be repaired using mortars whose mineral additives use synthetic resins and not cement as a binder. They probably think that reactive resins do not have the same properties as concrete, especially in terms of compressive strength. However, the opposite is true in fact, as the strength and general properties of mortars with reactive resin binders are, in certain cases, higher than concrete itself. Naturally, the cost is not the same, so reactive resins are not applied to large surface areas but are mainly used for repair work. Even so, considering the working time saved and the quick recovery of the properties of the floor, the overall cost of repair work is usually lower in such cases.

As previously mentioned, the binder in Silikal mortar is the reactive resin “methylmethacrylate” and certain other major reagents, and use sand with a special grain size as aggregate. This mortar, with such extraordinary properties, was invented by Silikal over 45 years ago and is still a unique and unbeatable product when it comes to repairing concrete surfaces or parts, especially under difficult conditions. Currently, no other comparable mortars have such a short setting time - even at low temperature - or such excellent properties in comparison with mineral mortars.

The Silikal mortar systems consists of the filler, presented in 15-kg bags, and the corresponding hardening liquid in 2-litre cans (SILIKAL® R 17) resp. 3-litre cans (SILIKAL® R 15/R15L). Once both components have been mixed, a pourable mass is produced for coating the area under repair. For repairing vertical or inclined surfaces, we have developed the Silikal R 17 “thixotropic” mortar system. Naturally, (as with all other repair materials), the base needs to be properly prepared to obtain high-quality repairs. Optimum adherence requires priming. A suitable primer can be found in the “Silikal Primer Table for MMA floor coatings”. A single packing unit of SILIKAL® R 17 can be used to repair a surface of approx. 1 m² with a layer approx. 1 cm thick.

Silikal R 17 reactive resin mortar is also available in a number of special preparations:

- **SILIKAL® R 17-thix for applications on inclines or when modelling edge excavations and coving**
- **SILIKAL® R 17 (-25 °C) for extremely low temperatures (as low as -25 °C) e.g. in deep freezers**

Mortar Systems Technical Documentation

Introduction

Silikal reactive resin mortar can be used even for layers of thickness > 25 mm by incorporating medium- or large-grain aggregate (gravel). Surfaces made using Silikal reactive resin mortar enable flooring to be laid at a later stage to provide different decorative effects. Silikal reactive resin mortar has been tested and certified for a number of different applications.

Summary of main characteristics:

- Fast setting (approx. 1 hour)
- Usable at low temperatures as low as -10 °C (special grade -25 °C)
- Easy to handle
- Harder than concrete itself
- Impermeable to liquids
- More resistant to chemical agents
- Totally weather-resistant
- Excellent wear-resistance
- Hot-water resistant
- Resistant to de-icing salt and frost
- Flexibilised types can also be used on asphalt in outdoor areas

Main applications of Silikal reactive resin mortar:

- Repairing floors without long-term interruptions to service
- Furring of train tracks and rails
- Building of traffic islands
- Kerb stone repair
- Surface covering for extreme load conditions
- Repairing bridge pillars
- Bridge bearings for rail and road pillars
- Repairing pedestrian walkways
- Repairing stairs and platform edges
- Ramps and levelling work in bridges and buildings
- Fixing metal components and beams
- Foundations for machinery and steel structures
- Repairing joints and edges
- Filling in potholes
- Precast polymer concrete parts

In general, the indications given in the current version of the general technical documentation as well as this “Mortar Systems” technical documentation should be observed.

Updating service

The latest versions of this technical documentation and the general technical documentation are available from the Silikal web site at “www.silikal.de”.

SILIKAL® mortar areas of application

Road construction and traffic areas



A2 Motorway, Hamm-Uentrop/Germany:
Construction of transverse drainage channels



Car park "Altlohrtor", Koblenz/Germany:
Renovation of ramps



A11 Motorway/Germany:
Bridge cap and walk way renovation



A45 Motorway near Solms/Germany:
Repair and implantation of joint profiles



A4 Motorway near Düren/Weisweiler/Germany:
Concrete slab edge repair

SILIKAL® mortar areas of application

Road construction and traffic areas



K 106 by-road, Neuwied-Niederbieber/Germany:
Kerb of a traffic island stuck to the asphalt with SILIKAL® R 17



Repairing the kerbs with
SILIKAL® R 17



Metro station stairs in Venloer street,
Cologne/Germany: Repairing the steps



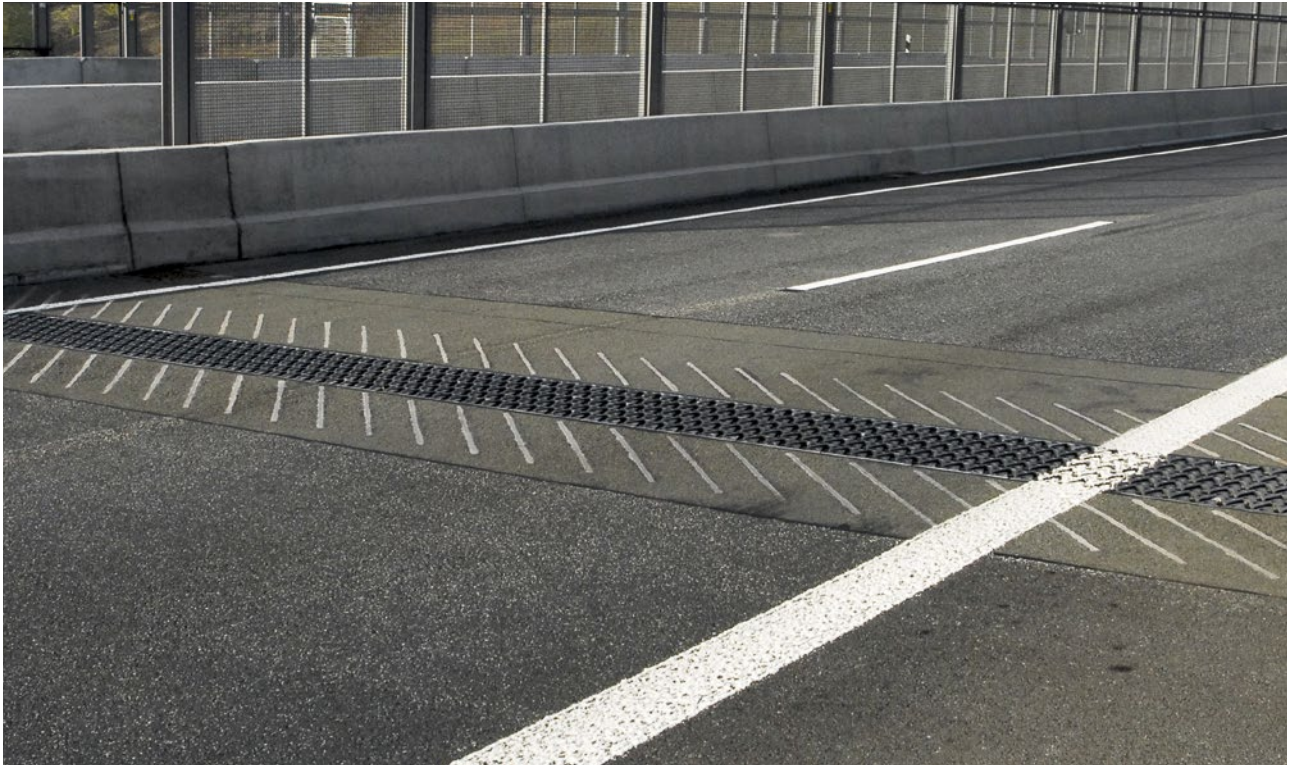
Car park airport, Stuttgart/Germany:
Kerb stone stuck to concrete with
SILIKAL® R 17-thix



South bus station of the "Franz-Josef Strauss" airport,
Munich/Germany:
Repairing drainage channels

SILIKAL® mortar areas of application

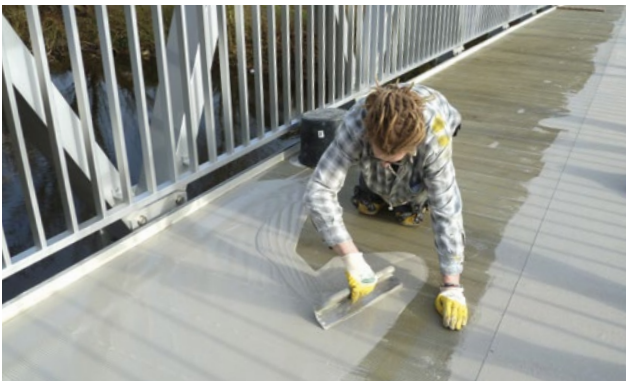
Road construction and traffic areas



A38 Motorway near Breitenworbis/Germany: Joint rip profile installation



B42 Interstate Road/Germany:
Underlayment of steel construction



Wied-Bridge, Waldbreitbach/Germany:
Surface coating of an aluminium pedestrian bridge



River Rhine Bridge near Wesel/Germany:
Underlayment of hand rail columns

SILIKAL® mortar areas of application

Bridge bearings



New railway bridge construction in Hannover-Ohedamm/Germany:
Bridge bearings



A6 Motorway Bridge, Massholdertal/Germany:
New bridge bearings



Metropolitan viaduct, Berlin/Germany, Sterndamm:
repairing bridge bearings



New railway bridge construction in Grafenwöhr/Germany:
Bridge bearings

SILIKAL® mortar areas of application

Industrial facilities



CORUS aluminium rolling mill, Koblenz/Germany:
Repairing traffic areas



Top:
MHP Mannesmann
Präzisionsrohr GmbH, Hamm/Germany:
Repairing pot holes



Left:
Fahrzeugwerke Faymonville AG, Billingen/Belgium:
Repairing expansion joints



Forwarder warehouse, Kassel/
Germany:
Renovation of a loading ramp

SILIKAL® mortar areas of application

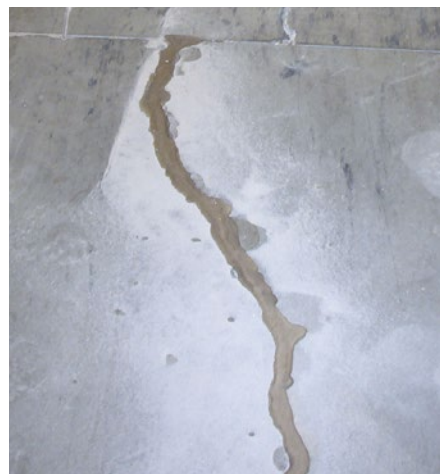
Industrial facilities



Metro AG, Essen/Germany:
Renovation of expansion joints
in a warehouse



May Werke GmbH & Co. KG,
Erftstadt-Köttingen/Germany:
Renovation of expansion joints



Crack grouting /
renovation of
floor areas



Figure on top:
Deutsche See GmbH & Co. KG,
Bremerhaven/Germany:
Repair of floor areas in cold store
house with SILIKAL® R 17 with no
disruption to operation (-25 °C)

Left:
Rheingas AG, Brühl/Germany:
Repairing sliding gate

SILIKAL® mortar areas of application

Airports



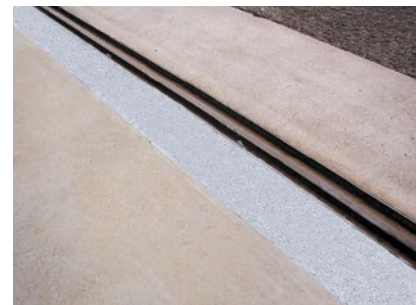
Mannheim Airport/Germany:
Repairing hangar floors



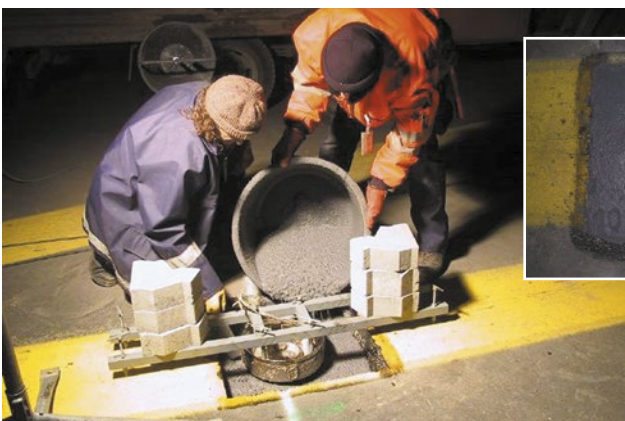
Nato Airbase Geilenkirchen/Germany:
Gutter renovation



Top, left:
Leipzig/Halle Airport/Germany:
Repairing concrete, runways and
taxiways



Mannheim Airport/Germany:
Laying foundations of sliding door rails



Nordrhein-Westfalen Airport/Germany:
Replacing and installing embedded runway lights without
air-traffic interruption



Nordrhein-Westfalen Airport/Germany:
Sealing cable ducts with asphalt-
coloured SILIKAL® R 17

SILIKAL® mortar areas of application

Rail construction



Railway track Düsseldorf-Wuppertal/Germany:
Installation of steel columns



Railway track Koblenz-Bonn/Germany:
Underlayment of steel columns for noise protection



Deutsche Bahn AG,
Braunschweig railyard/Germany:
Renovation of track storage



Expect more from your floor.



Silikal Primer Table for MMA floor coatings

Overview

The primer layer on absorbing substrates (screed, concrete) is applied to fill up pores until the substrate is saturated and sealed off. On non-absorbing substrates (tiles, metal) the primer provides the perfect bonding between coating and substrate. Our primer table below is a guidance what primer should be used on different substrates:

Substrates	SILIKAL® R 51	SILIKAL® R 52	SILIKAL® R 53	SILIKAL® R 59	SILIKAL® RU 380	SILIKAL® R 54 + SILIKAL® Additive M	SILIKAL® Porfil RE 40	
Dry cementitious substrates; residual moisture ≤ 4 % CM	X	X	X		X			
Cementitious substrates with increased residual moisture ≤ 5 % CM and/or damp cementitious substrates						X		
Critical residual moisture and/or high rising dampness							X	
Anhydrite and magnesite screeds								not suitable as a substrate
Mastic asphalt screeds (indoor) strength class IC 10 or IC 15					X			
Tiles/ceramic toppings					X			
Metal/steel surfaces				X	X			
Wooden surfaces								please contact our technical department
PVC/vinyl flooring								not suitable as a substrate
Natural stone								bonding and adhesion test required
Acrylic (2K, BPO hardened)	X	X	X		X			
Epoxy resin (EP)								bonding and adhesion test required
Polyurethane (PU)								bonding and adhesion test required
Polyurethane cement								please contact our technical department

Legal Notes

The information provided in our Silikal primer table is based on our experience and is given to the best of our knowledge. Silikal cannot be held liable and provides no guarantee in connection with the primer table. Responsibility for the inspection and preparation of the subfloor in accordance with the data sheets and technical documentation is carried by the application company. Any necessary adaptation of the primer to specific conditions of use is to be performed at the responsibility of the planner and/or the application company. It may not be possible to use the described primer in each individual building project. Relevant specialist knowledge is vital for the processing of methacrylate resins. Taking part in Silikal training is a minimum requirement.



SILIKAL® R 51 (-25 °C)

Reactive primer for cementitious substrates at low temperatures

Properties

- Low viscosity
- High penetration capacity
- Fast curing even at temperatures from -11 °C to -25 °C

Area of application

- Primer resin for concrete and cement screed for use at low temperatures, e.g. in cold storage rooms, freezer rooms and deep-freeze warehouses

Hardener dosages

Temperature	SILIKAL® BPO % by weight *	Pot life approx. min.	Hardening time approx. min.
0 °C	7.0	12	60
-25 °C	7.0	20	120

* The amount of SILIKAL® BPO is always calculated with reference to the amount of resin.

Advice on application

- Before being applied, SILIKAL® R 51 (-25 °C) must be chilled to 0 °C or lower.
- SILIKAL® BPO must be stirred in until it is fully dissolved (approx. 2 minutes) and the mixture must be used immediately.
- The mixture must be applied such that it forms a film. If the mixture penetrates in the substrate, it must be reworked wet in wet.
- Puddling must be avoided during application.
- Curing and adhesion tests must generally be performed.
- Always use primers as clear resin – they should never be filled or pigmented.
- **If working in refrigerated rooms, we recommend that you work in tents with an extraction unit. The extracted air must be led outside. Warm air coming in from outside will lead to condensation of air humidity, which will in turn cause poor adhesion to the substrate. For that reason the incoming air should also be chilled.**

Guideline recipe

No.	Component	Guideline recipe (% by weight)	Comment	Batch for 10 litre bucket
1	SILIKAL® R 51 (-25 °C)	100 %		10 kg
	Total:	100 %	Average consumption: 400 g/m²	10 kg
2	SILIKAL® BPO	7 % with ref. to no. 1		See "Hardener dosages" table for quantities



SILIKAL® R 51 (-25 °C)

Reactive primer for cementitious substrates at low temperatures

Characteristics as delivered

Property	Approx. value
Viscosity, +20 °C	60 – 80 mPa · s
Density, +20 °C	0.98 g/cm ³
Application temperature	0 °C to -25 °C

CE marking

09	
SILIKAL GmbH Ostring 23 · 63533 Mainhausen www.silikal.com	
R51 (-25 °C)-001	
EN 13813:2002	
Synthetic resin screed for application in buildings	
Reaction to fire	E ₁
Release of corrosive substances	SR
Wear resistance	≤ AR1
Bond strength	≥ 1.5
Impact resistance	≥ IR 4

09	
SILIKAL GmbH Ostring 23 · 63533 Mainhausen www.silikal.com	
System-D-001	
EN 1504-2:2004 1119	
ZA.1d(1.3), ZA.1f(5.1) and ZA.1g(6.1)	
Synthetic resin screed for application in buildings	
Detailed declaration of performance: www.silikal.com	



Other applicable documents

SILIKAL® BPO
General notes
Safety data sheets

Data sheet BPO
Technical documentation MMA
All used Silikal products

The information in this data sheet replaces all previous information about the product and its application. The application instructions as well as the technical data of the product are only guidelines. The buyer is responsible for the application and claims of third parties.

Silikal Product Information

Data sheet SILIKAL® R 51 (-25 °C)
Page 2 of 2

Issue Mortar 4,00A – April 2024



Silikal GmbH

Ostring 23 · 63533 Mainhausen · Germany
Phone: +49 (0) 61 82 / 92 35-0
mail@silikal.de · www.silikal.de



SILIKAL[®] R 52

Reactive primer for cementitious substrates

Properties

- Medium viscosity
- Medium penetration capacity

Area of application

- Primer resin for concrete and cement screed

Hardener dosages

Temperature	SILIKAL [®] BPO % by weight *	Pot life approx. min.	Hardening time approx. min.
+5 °C	6.0	15	50
+10 °C	5.0	15	40
+20 °C	3.0	12	35
+30 °C	2.0	12	30

* The amount of SILIKAL[®] BPO is always calculated with reference to the amount of resin.

Advice on application

- SILIKAL[®] BPO must be stirred in until it is fully dissolved (approx. 1 minute) and the mixture must be used immediately.
- The mixture must be applied such that it forms a film. If the mixture penetrates in the substrate, it must be reworked wet in wet.
- Curing and adhesion tests must generally be performed.
- Puddling must be avoided during application.
- Always use primers as clear resin – they should never be filled or pigmented.

Guideline recipe

No.	Component	Guideline recipe (% by weight)	Comment	Batch for 10 litre bucket
1	SILIKAL [®] R 52	100 %		10 kg
	Total:	100 %	Average consumption: 400 g/m²	10 kg
2	SILIKAL [®] BPO	2 – 6 % with ref. to no. 1		See “Hardener dosages” table for quantities



Characteristics as delivered

Property	Approx. value
Viscosity, +20 °C	300 mPa · s
Density, +20 °C	0.98 g/cm ³
Application temperature	+5 °C to +30 °C

CE marking

09	
SILIKAL GmbH Ostring 23 · 63533 Mainhausen www.silikal.com	
R52-001	
EN 13813:2002	
Synthetic resin screed for application in buildings	
Reaction to fire	E ₁
Release of corrosive substances	SR
Wear resistance	≤ AR1
Bond strength	≥ 1.5
Impact resistance	≥ IR 4

09	
SILIKAL GmbH Ostring 23 · 63533 Mainhausen www.silikal.com	
System-C-001	
EN 1504-2:2004 1119	
ZA.1d(1.3), ZA.1f(5.1) and ZA.1g(6.1)	
Synthetic resin screed for application in buildings	
Detailed declaration of performance: www.silikal.com	



Other applicable documents

SILIKAL® BPO	Data sheet BPO
General notes	Technical documentation MMA
Safety data sheets	All used Silikal products

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Silikal Product Information

Data sheet SILIKAL® R 52
Page 2 of 2

Issue Mortar 4,00A – April 2024



Silikal GmbH

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Phone: +49 (0) 61 82 / 92 35-0
mail@silikal.de · www.silikal.de



SILIKAL® RU 380

Reactive primer for absorbent and non-absorbent substrates

Properties

- Medium viscosity
- Medium penetration capacity and good adhesion

Area of application

- Universal primer resin for both cementitious substrates and non-absorbent substrates

Hardener dosages

Temperature	SILIKAL® BPO % by weight *	Pot life approx. min.	Hardening time approx. min.
-10 °C	4.5	35	80
0 °C	3.0	32	60
+10 °C	2.0	18	55
+20 °C	1.5	12	45
+30 °C	1.0	10	40

* The amount of SILIKAL® BPO is always calculated with reference to the amount of resin.

Hardener dosages in connection with 0.3 weight % SILIKAL® Additive M*

Temperature	SILIKAL® BPO % by weight *	Pot life approx. min.	Hardening time approx. min.
-10 °C	5.5	35	80
0 °C	4.0	32	60
+10 °C	3.0	18	55
+20 °C	2.5	12	45
+30 °C	2.0	10	40

* The amount of SILIKAL® BPO and SILIKAL® Additive M is always calculated with reference to the amount of resin.

Advice on application

- SILIKAL® BPO must be stirred in until it is fully dissolved (approx. 1 minute) and the mixture must be used immediately.
- The mixture must be applied such that it forms a film. If the mixture penetrates in the substrate, it must be reworked wet in wet.
- Puddling must be avoided during application.
- SILIKAL® Additive M further supports adhesion. 0.3% by weight SILIKAL® Additive M, calculated with reference to the amount of resin, can be added. This also requires the addition of SILIKAL® BPO to be increased by 1% by weight.
- Curing and adhesion tests must generally be performed.
- Always use primers as clear resin – they should never be filled or pigmented.

Guideline recipe, primer

No.	Component	Guideline recipe (% by weight)	Comment	Batch for 10 litre bucket
1	SILIKAL® RU 380	100 %		10 kg
	Total:	100 %	Average consumption: 400 g/m²	10 kg
2	SILIKAL® BPO	1 – 4.5 % with ref. to no. 1		See “Hardener dosages” table for quantities



Guideline recipe, thin coat

No.	Component	Guideline recipe (% by weight)	Comment	Batch for 10 litre bucket
1	SILIKAL® RU 380	65 %		6.5 kg
2	SILIKAL® Filler QM	30 %		3.0 kg
3	SILIKAL® Pigment	5 %		0.5 kg
	Total:	100 %	Average consumption: approx. 600 g/m²	10 kg
4	SILIKAL® BPO	1 – 4.5 % with ref. to no. 1		See “Hardener dosages” table for quantities

Characteristics as delivered

Property	Approx. value
Viscosity, +20 °C	200 mPa · s
Density, +20 °C	0.99 g/cm³
Application temperature	-10 °C to +30 °C

CE marking

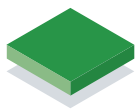
CE	CE
09	09
SILIKAL GmbH Ostring 23 · 63533 Mainhausen www.silikal.com	SILIKAL GmbH Ostring 23 · 63533 Mainhausen www.silikal.com
RU380-001	System-Küche-Alternativ-001
EN 13813:2002	EN 1504-2:2004 1119
Synthetic resin screed for application in buildings	ZA.1d(1.3), ZA.1f(5.1) and ZA.1g(6.1)
Reaction to fire	Synthetic resin screed for application in buildings
Release of corrosive substances	
Wear resistance	
Bond strength	
Impact resistance	
E ₁	
SR	
≤ AR1	
≥ 1.5	
≥ IR 4	
	Detailed declaration of performance: www.silikal.com



Other applicable documents

SILIKAL® BPO	Data sheet BPO
SILIKAL® Filler QM	Data sheet FQM
SILIKAL® Pigment	Data sheet PIG
SILIKAL® Additive M	Data sheet Additive M
General notes	Technical documentation MMA
Safety data sheets	All used Silikal products

The information in this data sheet replaces all previous information about the product and its application. The application instructions as well as the technical data of the product are only guidelines. The buyer is responsible for the application and claims of third parties.



SILIKAL® R 15

Flexibilised reactive resin mortar for repairs and screed outdoors

Properties

- Adjusts to slight substrate movements
- Elasticity also prevents shrinkage cracks
- High compressive strength ($> 35 \text{ N/mm}^2$)
- Good self-levelling
- Processing time / hardening time at $+20 \text{ °C}$:
15 min / 35 min

Area of application

- Reactive resin mortar for asphalt and concrete repairs outdoors

Guide for application and calculation

Coating thickness in mm	SILIKAL® R 15	Quantity in kg	Quantity in ltr.	Quantity in ltr. fixed volume
5 – 30	SILIKAL® R 15 Hardener SILIKAL® R 15 Powder	3 15 18	3 11	9
20 – 80	SILIKAL® R 15 Hardener SILIKAL® R 15 Powder SILIKAL® Filler QS 2 – 8 mm	3 15 5 23	3 11 3	11
>80	Install in layers			

Advice on application

- First add hardener liquid, then slowly stir in the powder component, then (as required) add Silikal® Filler QS and stir for approx. 2 minutes until an homogeneous mortar is created, then use immediately.
- The minimum layer thickness is 5 mm – not extendable to zero.
- Do not use any fillers other than those named in the table “Guide for application and calculation”.
- Note: For indoor applications, the Silikal® R 15I mortar can be used, which is also flexibilised (data sheet on request).
- In order to avoid substrate detachment, the layer thickness should be limited to 20 mm per installation position for areas $>1 \text{ m}^2$ due to curing shrinkage.

Characteristics as delivered

Property	Approx. value
Viscosity, $+20 \text{ °C}$	60 mPa · s
Density, $+20 \text{ °C}$	0.98 g/cm ³
Application temperature	0 °C to $+35 \text{ °C}$



Other applicable documents

SILIKAL® Filler QS	Data sheet FQS
General notes	Technical documentation MMA
Safety data sheets	All used Silikal products

The information in this data sheet replaces all previous information about the product and its application. The application instructions as well as the technical data of the product are only guidelines. The buyer is responsible for the application and claims of third parties.

Silikal Product Information

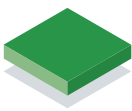
Data sheet SILIKAL® R 15
Page 1 of 1

Issue Mortar 4,00A – April 2024



Silikal GmbH

Ostring 23 · 63533 Mainhausen · Germany
Phone: +49 (0) 61 82 / 92 35-0
mail@silikal.de · www.silikal.de



Properties

- Adjusts to slight substrate movements
- Elasticity also prevents shrinkage cracks
- High compressive strength ($> 35 \text{ N/mm}^2$)
- Good self-levelling
- Processing time / hardening time at $+20 \text{ }^\circ\text{C}$:
15 min / 35 min

Area of application

- Reactive resin mortar for asphalt and concrete repairs outdoors

Guide for application and calculation

Coating thickness in mm	SILIKAL® R 15I	Quantity in kg	Quantity in ltr.	Quantity in ltr. fixed volume
5 – 30	SILIKAL® R 15I Hardener SILIKAL® R 15I Powder	3 15 18	3 11	9
20 – 80	SILIKAL® R 15I Hardener SILIKAL® R 15I Powder SILIKAL® Filler QS 2 – 8 mm	3 15 5 23	3 11 3	11
>80	Install in layers			

Advice on application

- First add hardener liquid, then slowly stir in the powder component, then (as required) add Silikal® Filler QS and stir for approx. 2 minutes until an homogeneous mortar is created, then use immediately.
- The minimum layer thickness is 5 mm – not extendable to zero.
- Do not use any fillers other than those named in the table “Guide for application and calculation”.
- In order to avoid substrate detachment, the layer thickness should be limited to 20 mm per installation position for areas $>1 \text{ m}^2$ due to curing shrinkage.

Characteristics as delivered

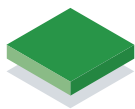
Property	Approx. value
Viscosity, $+20 \text{ }^\circ\text{C}$	100 mPa · s
Density, $+20 \text{ }^\circ\text{C}$	0.98 g/cm ³
Application temperature	0 °C to $+30 \text{ }^\circ\text{C}$



Other applicable documents

SILIKAL® Filler QS	Data sheet FQS
General notes	Technical documentation MMA
Safety data sheets	All used Silikal products

The information in this data sheet replaces all previous information about the product and its application. The application instructions as well as the technical data of the product are only guidelines. The buyer is responsible for the application and claims of third parties.



Properties

- High compressive strength (75 N/mm²)
- High tensile strength in bending (17 N/mm²)
- Low shrinkage
- Wear-resistant
- Good self levelling properties
- Processing time / hardening time at +20 °C: 15 min / 1 h

Area of application

- Reactive resin mortar indoors and outdoors

Guide for application and calculation

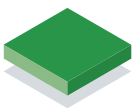
SILIKAL® R 17	Amount in kg	Quantity in ltr.	Quantity in ltr. fixed volume	Minimum layer thickness in mm
a) SILIKAL® R 17 Powder SILIKAL® R 17 Hardener	15.00 1.85 <u>16.85</u>	11.50 2.00	8.50	6
b) SILIKAL® R 17 Powder SILIKAL® R 17 Hardener SILIKAL® Filler QS 2 – 8 mm	15.00 1.85 8.00 <u>24.85</u>	11.50 2.00 5.00	11.60	25
c) SILIKAL® R 17 Powder SILIKAL® R 17 Hardener SILIKAL® Filler QS 2 – 8 mm SILIKAL® Filler QS 8 – 16 mm	15.00 1.85 3.00 12.00 <u>31.85</u>	11.50 2.00 1.90 7.50	14.25	50

Advice on application

- First add hardener liquid, then slowly stir in the powder component, then (as required) add SILIKAL® Filler QS and stir for roughly 2 minutes until an homogeneous mortar is created, then use immediately.
- The minimum layer thickness is 6 mm – not extendable to zero.
- Do not use any fillers other than those named in the table “Guide for application and calculation”.
- Note: If priming must be performed at temperatures between -11 °C and -25 °C, the special product SILIKAL® R 51 (-25 °C) can be used (data sheet on request).

Characteristics as delivered

Property	Approx. value
Viscosity, +20 °C	1 mPa · s
Density, +20 °C	0.93 g/cm ³
Application temperature	-10 °C to +35 °C



Special formulations

SILIKAL® R 17 (-25 °C)

For repair work in cold areas (cold stores, winter season), you can use this more accelerated SILIKAL® R 17.

However, this should only be applied at temperatures ranging from -10 °C to -25 °C and must be cooled down to at least 0 °C before being applied. The special formulation relates to hardener liquid and powder.

SILIKAL® R 17-thix

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

CE marking

CE	
05	
SILIKAL GmbH	
Ostring 23 · 63533 Mainhausen	
DOP: www.silikal.com	
R17-001	
EN 13813:2002	
SR-C70-F15-B2,0-IR4-AR0,5-B _{II} -s1	
Synthetic resin screed	
for application in buildings	
Flexural strength	> 17 N/mm ²
Compressive strength	> 75 N/mm ²
Bond strength	B 2.0
Impact resistance	IR 0.4
Reaction to fire	B _{II} -s1



Other applicable documents

SILIKAL® Filler QS	Data sheet FQS
General notes	Technical documentation MMA
Safety data sheets	All used Silikal products

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General processing notes

Foreword

Please observe the following notes on applying the Silikal MMA (methyl methacrylate) coating safely and as intended.

The coating should be planned with care. The construction site must therefore be assessed thoroughly. Check the features on site and the structural conditions and also determine the impact of weather and the environment. In addition, the intended chemical, thermal and mechanical stress on the flooring system needs to be respected. Furthermore the occupational health and safety regulations, employers' liability insurance association regulations and other requirements which specify a particular floor topping design (e.g. anti-slip, electric conductivity, food hygiene regulations) may need to be met.

The "general processing notes" are the product of our many years of experience and are adapted to the processing requirements of our Silikal products.

Interior ventilation

While processing the products, ensure that there is sufficient ventilation to enable the occupational health and safety limits to be observed. Good ventilation also helps the floor coating to cure effectively. Detailed safety notes are given in the section **"Information on safety and protection"**.

Despite ventilation, an odour will be detectable around the area of the coating work. We recommend informing other craftsmen, residents and neighbours in good time. An information sheet template is available from us.

Work in food and feed companies

To eliminate the risk of contamination by the coating substances (whether this involves methyl methacrylate resin, epoxy resin, polyurethane resin or other coating substances), all food and feed products and their packaging should be relocated before the coating work.

Temperature influences

The pot life and curing time of MMA resins are largely determined by the temperature of the substrate to be coated. It is also important to take into account the temperature of the resins and the fillers at the time of processing depending on their previous storage conditions (for example: warm, if they were in the sun or cold, if they were stored in frosty conditions). Please observe the temperature specifications given in the product data sheets, particularly when dosing curing agent and during the coating process.

MMA coatings behave similarly to thermoplastics, i.e. they become softer when warm and harder when cold. Reactive resin coatings can be exposed to stress as follows (taking into account the temperature-dependent pressure resistance):

	Permanent temperature	Short-term, e.g. for cleaning purposes, full heat penetration must be avoided!
Systems B and C	0 °C to +60 °C	Up to +80 °C
System D	-25 °C to +45 °C	Up to +60 °C

All parameters must be observed on a case-by-case basis. For example, the increasing softness at higher application temperatures can result in greater dirt absorption, skid marks, sprinkling sand being impressed (reducing non-slip properties), sinking of sharp-edged shelf units or pallet bases etc.. On the positive side, an increase in crack bridging, impact resistance and substrate adhesion is observed at elevated application temperatures.



Coating thickness

The minimum and maximum thicknesses of each Silikal system must be observed (see system data sheets). If coatings are too thin, this can disrupt the curing process. Coatings which are too thick, on the other hand, can become too hot while curing because of the exothermic reaction, resulting in bulge, breaking off or the coating remaining sticky or soft.

Hard or flexible

For outdoor applications and for highly resilient floors which are exposed to shock, impact and substantial movements, elastic systems are normally used. Hard systems, on the other hand, are preferred for floors subject to high static loads, scratch resistance and chemical resistance. Soft and hard coatings can be combined. In general, the softer coatings are laid on the primer, followed by medium-elasticity coatings as a wearing surface and the hard coatings on top as top coat. An extremely hard coating must never be laid on top of an extremely soft coating, as this could cause hairline cracks in the surface, in particular if thermal stresses (hot water or outdoor applications) and mechanical pressure point loads occur. Soft systems or systems with medium-elasticity are more likely to become soiled and have skid mark problems. Extremely hard types, however, are prone to flaking if the coatings are too thick.

Scratch slurry

To level out minor irregularities, structured surfaces or deep cavities, a scratch slurry is recommended. The smoothing compound is produced on the basis of a coating resin, in conjunction with a Silikal filler and possibly a little anti-flow additive (see data sheet of the main coat resins or membrane resins) and scratched onto the primed and slightly sanded (e.g. SILIKAL® Filler QS 0.7 mm – 1.2 mm) surface. The trowel must be applied back and forth repeatedly in both directions to ensure that deeper cavities are fully closed.

Primers

Substrates must in general be primed in a film-forming and pore-filling manner in a single work step. If the primer resin is fully absorbed by the substrate, a second primer layer must be applied before the primer cures, using a “wet on wet” technique. Puddling must always be avoided. The primer can be pre-spread with a rubber slider and rolled evenly with a paint roller. To assist with work for the following coatings, the primer can be scattered in an open (slightly) manner before it cures with SILIKAL® Filler QS 0.7 – 1.2 mm.

Top coats

Silikal main coats must always be sealed in one or two work steps such that they form a film. Paint rollers with medium hair length are suitable for this (it is essential that they are lint-free). The rubber slider can be used to pre-spread initially, and then the paint roller can be used to roll the layer on in crosswise movements. The roller should cover large distances at a time, ideally perpendicular to the direction of work to avoid contact point marks. If the paint roller is used for too long or too late, curing may be disrupted or visual defects may occur. It must be ensured that the coating thickness is even – puddling must always be avoided. Hard top coats must never be rolled directly onto highly elastic main coats. In such cases, a slightly elasticised intermediate layer must be rolled on, as thermal movements could otherwise cause hairline cracks in the top coat, for example.

Important note regarding top coats

If different production batches of a Silikal top coat are used, minor differences in colour or shine may occur within a surface. We therefore recommend sealing the entire surface with material from the same production batch; this applies both to the resins and to the pigment and hardening powder used. If it is not possible to work with material from only one batch for any reason, the material from different batches should be mixed together, bearing in mind the applicable amount ratios. Exact observance of the mixing ratio and the stirring time when pigmenting the binder and the subsequent addition of the hardening powder will ensure that colour variations within a surface are kept to a minimum.



General processing notes

Coatings (0.3 – 2 mm)

Self-levelling coatings are applied with a smoothing trowel, blade trowel or coating knife. This is followed by reworking with a top coat.

Toppings (2.0 – 6.0 mm)

Toppings are generally slightly thicker coatings. The information stated previously regarding coatings also applies to toppings. Smoothable coatings require particular manual skill if trowel marks are to be avoided. The desired coating thickness needs to be roughly pre-smoothed with a blade and manually compacted and smoothed with a smoothing trowel.

Screed, mortar, stopper mass

Because of their liquid consistency, Silikal mortars are self-compacting and almost self-levelling. A scraper and a smoothing trowel are all that is needed for laying. Depths of over 10 mm are filled with SILIKAL® R 17. Irregularities of 2 to 10 mm, on the other hand, can be levelled out on the basis of suitable Silikal main coat resins with the addition of Silikal fillers. Please consult Silikal for the mixing ratios – we can then investigate your specific needs precisely.

Decorations

To design the colour of a Silikal floor, various products are available such as pigments (SILIKAL® Pigment), coloured flakes (SILIKAL® Flakes), coloured sands (SILIKAL® Filler FS/FM) and decorative layers. Please refer to the individual system data sheets and Silikal brochures for more information.

Non-slip surfaces

Outdoor areas or wet rooms often require non-slip properties. In accordance with the guidelines of the "Berufsgenossenschaftliche Institut für Arbeitssicherheit" [German Employers' Insurance Association Institute for Occupational Safety], the non-slip properties are categorised under various non-slip classes, prefixed with the letter "R". The specifications of our test certificates must be taken into account in this regard.

The displacement space "V" refers to the volume (cavity) remaining between the sole of the shoe and the flooring system.

Special note regarding scattered toppings

Silikal generally recommends using filler particle size 0.7 – 1.2 mm for scattering. If finer sizes are used, there is a risk of disrupted curing under unfavourable conditions. However, if finer sand, such as SILIKAL® Filler QS 0.2 – 0.6 mm or 0.3 – 0.8 mm, is used nevertheless, we recommend increasing the amount of SILIKAL® BPO by roughly 0.5 – 1 % above the amount in the corresponding tables of the resin that the sand is to be scattered in. It is also important to ensure even scattering, as pile formation may cause the resin to be sucked upwards, resulting in an uneven surface. We strongly recommend contacting Silikal for a consultation before using fine scattering fillers.

Mixing

Because of their low viscosity, all Silikal systems can be stirred together with a powerful cordless electric mixer (ATEX* guidelines must be observed) in a sufficiently large mixing container in compliance with occupational health and safety and other regulations. Storage, particularly at low temperatures, can cause partial quantities of dissolved paraffins to separate out at the resin surface. It is therefore absolutely essential to stir all Silikal resins before use.

* ATEX = explosion-protection directives of the European Union (abbreviation of the French ATmosphères EXplosibles).

Tool cleaning

Simple cleaning in a non-cured state should be performed in accordance with occupational health and safety and other regulations, ideally with organic solvents based on an ester or ketone (e.g. acetone or SILIKAL® MMA Cleaner). Before further use, solvent residue must be wiped away. Solvents must not be used to dilute mixtures.



General notes

To effectively apply coatings and toppings, it is vital to achieve a good connection with the substrate. It is therefore essential to check the substrate for suitability and to prepare it for the subsequent coating. The substrate must be suitable for the particular coating, it must be sufficiently firm, free from dust and loose parts and free from any contamination such as oil. Furthermore, the substrate must not have undergone any treatment or received any additions or additives which would negatively affect the bonding or the curing process of the reactive resin to be applied. According to German construction contract procedures, the contractor's services include testing the substrate for its suitability for application of the prescribed topping. The contractor must inform the client of any reservations regarding the planned type of design in written form without delay if it does not correspond to the characteristics of the substrate.

Testing the substrate

Moisture

Cement screeds and concrete surfaces are only ready for coating after installation when they have reached an equilibrium moisture level of roughly 4 %. This is generally not the case until 28 days after installation. Restrictions in terms of potentially achievable equilibrium moisture levels may be necessary under certain climate conditions. The substrate must also be adequately sealed against groundwater and rising damp (capillary moisture), for example by means of a gravel filter layer or horizontal barrier (film). Waterproof concrete and waterproof screed do not provide protection against moisture penetration, as they are vapour-permeable. Moisture measurements can be performed with kiln-drying samples, CM devices and suitable electronic measurement equipment. The CM device provides the most reliable values, however. Rising damp can be checked by affixing a leak-proof polyethylene film over an area of roughly 1 m². If the covered area becomes dark in colour within 24 hours as the result of condensation, rising damp can be assumed. Measuring the moisture of the substrate before coating work is commenced is absolutely necessary and essential.

Firmness

The substrate must be sufficiently firm as coatings and toppings cannot perform any load-distribution function despite their high intrinsic strength because of their low coating thickness. The pressure resistance of concrete and compound screeds can be determined appropriately with a bounce hammer. The pressure resistance should be at least 25 N/mm² for industrial floors.

Adhesion test

A sufficient number of adhesion tests must be performed at various points on the cleaned surface of the substrate before coating/topping work is commenced. Tensile bond testing devices with test plates have proven useful in this context. As adhesive for the tensile bond punches, we recommend SILIKAL® R 92. As pre-test, a rapid test can be performed. This test is carried out with the Silikal primer resin which will be used later on (SILIKAL® BPO added in accordance with applicable curing agent table). Half of the primer resin is used as a film-forming primer. The rest of the resin is used to create an even more viscous mortar with sand (0.7 – 1.2 mm) and applied to roughly half of the primed surface with a thickness of roughly 3 mm. Once it has hardened with no remaining tackiness, the manual sample is chiselled off with a hammer and chisel. The top of the substrate must adhere to the primer resin layer across its entire surface and must have a grain fracture in the upper zone of the substrate. The primed surface must be cured with no remaining tackiness and must not detach when scratched with a knife or screwdriver. We expressly point out that this rapid test does not substitute the tensile bond test with appropriate equipment.

Pretreating the substrate

Evenness

Reactive resin coatings cannot level out irregularities in the substrate. Irregularities can be levelled out with slurry (see **"General processing notes"**, section **"Scratch slurry"**). For very deep and large irregularities, a mortar levelling layer may be needed.

Contamination

Reactive resins have little or no adherence to soiled substrates. For this reason, any type of contamination, i.e., dry or wet, must be removed so that all pores are fully open. Oily and greasy substrates can be cleaned with special cleaning agents, with the use of scrubbing machines, high-pressure jets and flameblasting. For substrates contaminated with chemicals and for substrates which have been treated with evaporation-inhibiting sprays, we recommend flameblasting as a cleaning method. Substrates soiled with paint, bitumen or tar can be cleaned by milling or sandblasting. We strongly recommend having this cleaning performed by specialist companies.



The substrate

Soft and detachable components

Cement slurries, cement bowls, mortar residue and all surface components which are not firmly and inseparably attached to the substrate must be chiselled, milled, sandblasted or ground off before the first application of reactive resin.

Absorbency

To allow reactive resins to firmly anchor to the surface of concrete or mortar, their primer needs to penetrate into the capillary/pore structure of the substrate, so the substrate needs to be sufficiently absorbent. Particularly high substrate absorbency is a sign of low firmness. It is then vital to prime the substrate until saturation such that it forms a film. For non-absorbent substrates, it is essential to use a primer with an adhesive effect.

Cracks

In the case of cement-bound substrates, spider-web-like surface cracking has no negative effects on the reactive resin; it is likely, however, that more primer resin will be needed. Cracks which are constantly progressing cannot be sealed in a force-locking manner, as new cracks are likely to occur. If the cracks are sealed flexibly, it must be checked that a coating/topping can be applied, and how the coating/topping would need to be structured.

Cracks which are no longer changing can be sealed in a force-locking manner with a suitable Silikal resin.

Joints

Joints need to be incorporated, even those with little tendency to move. They should form a straight line, have a uniform width and firm joint edges. Damage to the joint edges should be improved with Silikal reactive resin mortar. Rigid joints can be filled and covered with a coating after priming in most cases. Structural expansion joints always need to be incorporated and must not be filled or covered with a coating.

Cavities

Surfaces laid on a hollow framework, particularly those with cracks, must be removed and be filled with Silikal mortar after priming with Silikal primer resin.

Special note regarding common building substrates

Concrete

Cement concrete generally has a fine mortar layer on its surface (cement slurries), which needs to be removed before any coating is applied because of its low firmness and low adhesion to the substrate. Suitable methods for this are, depending on the nature of the substrate: milling, sandblasting, shotblasting and flameblasting.

Cement screeds

Cement screeds, particularly hard aggregate screeds, can have surfaces which are so dense that reactive resin primer can hardly penetrate at all. The pores of these surfaces must be opened, for example by sandblasting. In the case of cement screeds, the cement slurries must be removed by milling or sandblasting. Hard aggregate screeds can be roughened by shotblasting.

Anhydrite and magnesite screeds

Anhydrite and magnesite screeds are not moisture resistant. In the case of reaction coatings/toppings which are impermeable to water vapour, the risk of moisture penetration from the rear and adjacent structural elements must be reliably eliminated. There is a major risk not only of the coating detaching in the case of inadequate sealing but also of these screeds themselves being destroyed. For these reasons, we advise against coating with Silikal MMA systems.



Mastic asphalt screeds

Mastic asphalt screeds should only be coated in indoor areas as they react substantially to temperature fluctuations. Coatings should only be applied with flexible reactive resins, as mastic asphalt can deform or lose its firmness under load and under fluctuating temperatures. A test of the hardness class according to DIN EN 13813 is essential (only hardness classes IC 10 and IC 15 can be coated). The surface of mastic asphalt screeds, particularly if they have been relaid, must be free from bitumen films (we expressly draw your attention to the section **"Testing the substrate"**, subsection **"Adhesion test"**).

Ceramic toppings

Ceramic toppings must be firmly bonded with the substrate. To achieve sufficient adhesion on ceramic toppings with reactive resins, their surface may need to be pre-treated by means of mechanical roughening (e.g. sandblasting) (perform adhesion test!). Ceramic substrates must be primed with an adhesive Silikal primer. If the adhesion tests reveal that adhesion is inadequate, the adhesion may be improved by adding SILIKAL® Additive M.

Metals

According to the Swedish standard SIS 05 5900, SA 2.5 (Near White Blast Cleaning), prepared metal substrates are non-absorbent and need to be treated with a special adhesive primer. SILIKAL® R 59 is used for this. Metal substrates should only be coated with flexible reactive resins. We recommend consulting with Silikal.



Silikal – reactive resin mortar for quick repairs



We analyse problems and solve them – contact us for advice and support. Directly "on site", hands-on, friendly and, of course, reliable.

Get in touch. We will gladly provide information – free of charge and without obligation.



Protecting floors, buildings, infrastructures

Silikal

Reactive resins and polymer concrete
for industrial floors and civil engineering

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Expect more from your floor.