

Silikal Fillers at a glance:

- SILIKAL® Filler SL** Silica powder-free Silikal Filler for flooring strewn with flakes or quartz
- SILIKAL® Filler Si** Mixture of silica powder and silica sand of various grain sizes for flooring with strewn flakes over 4 mm thickness (approx. 0 – 1.2 mm)
- SILIKAL® Filler SV** Mixture of silica powder and finer silica sand for self levelling layers (1 – 4 mm)
- SILIKAL® Filler QM** Silica powder as fine-filler for thin-poured and roll-applied coatings
- SILIKAL® Filler QS** Silica sand in various grain sizes for scattering, sprinkling, mortar additive or as additional filler for certain coatings
- SILIKAL® Filler FS** Coloured silica (single colours) of same grain size for scattering onto self levelling layers
- SILIKAL® Filler CQ** Coloured silica mixtures, graduated grain sizes, for trowel-smoothed flooring
- SILIKAL® Filler 65** Silikal mortar sand for high-fill SILIKAL® RH 65 resin
- SILIKAL® Filler SG** Sharp-edged, semi-transparent gritting material for a subsequent construction of slip resistance.

This comprehensive range of fillers from Silikal covers all significant applications for industrial flooring. All fillers offered by Silikal are perfectly suited for use with Silikal resins and have been tested exhaustively. All these fillers have proved themselves in practice. Under certain circumstances and further consultation with Silikal, some prefabricated mixtures commonly found in the market can also be used as an alternative. However, the use of non-tested fillers can lead to difficulties in curing or proper levelling, for example.

Main Fields of Application for the fillers:

SILIKAL® Filler SL:

The silica powder-free SILIKAL® Filler SL is designed for use in flooring layers where silica sand or coloured flakes is to be scattered on. The main Silikal resins used in such cases are R 61, R 61 HW and RU 747. Mixtures of these resins with SILIKAL® Filler SL result in well flowing properties where silica grains scattered onto do not sink down to the bottom of the layer. This means that the layer becomes capable for a bigger load from the bottom to top so that small movements within the substrate will not necessarily cause the coating material to tear.

Another application is the manufacturing of a raked flat coat with a proportion of 1 part SILIKAL® RV 368 resin to 2 parts SILIKAL® Filler SL.

SILIKAL® Filler Si:

Can be used in the same way as SILIKAL® Filler SL. SILIKAL® Filler Si, however, has a greater share of rough grain which makes it particularly suitable for coating layers over 4 mm in thickness only. It is applicable in cases where – contrary to Silikal recommendations – work shall be done with a higher filling degree.

SILIKAL® Filler SV:

SILIKAL® Filler SV is designed for use in flooring layers with single-coloured pigmentation or with flakes scattered on them. The main resin which is used in such cases is SILIKAL® R 62 resin. Mixtures of this resin with SILIKAL® Filler SV result in flooring layers with excellent levelling which bind coloured flakes well and maintain a smooth even surface for flooring in single colours. SILIKAL® Filler SV is also used with cold-flexible and impact-resistant SILIKAL® RV 368 resin to create thin poured-on floors.

SILIKAL® Filler QM:

Fine silica powder of 0 – 0.2 mm particle size serves, as an additive to SILIKAL® Filler SV in 1 – 3 mm coatings, to improve the levelling of thin layers of flooring. It can also be used as additive for rolled thin-layer coatings using SILIKAL® RU 727 resin. In this case, it allows layers to be rolled out in even thickness which ensures that materials scattered onto the surface subsequently can be bond well. Also single-coloured rolled coatings will be smooth and track-free. In single-coloured sealings, the addition of SILIKAL® Filler QM results in a smooth, almost trackless surface.

SILIKAL® Filler QS:

- 0.06 – 0.3 mm
- 0.2 – 0.6 mm
- 0.7 – 1.2 mm
- 1.2 – 1.8 mm
- 2 – 4 mm
- 2 – 8 mm
- 8 – 16 mm

Some of these specially fire-dried sands are used for scattering over primers when either an adhesive bridge (full-surface scattering) or an aid to work (loose sprinkling) is required. For this grain sizes of 0.7 – 1.2 mm are primarily used. Grain sizes of 0.06 – 0.3 mm and 0.2 – 0.6 mm are needed in connection with SILIKAL® Filler QM as filler for flooring SILIKAL® RV 368 resin. Grain sizes of 2 – 4 mm, 2 – 8 mm and 8 – 16 mm serve as additives for thicker layers of SILIKAL® Mortar R 17.

SILIKAL® Filler FS:

SILIKAL® Filler FS is a coloured silica sand of one grain fraction (e.g. 0.4 – 0.8 mm or 0.7 – 1.2 mm) which is designed to be scattered onto self levelling coatings in order to achieve an anti-slip surface. The individual colours can be mixed and matched as favored.

SILIKAL® Filler CQ:

SILIKAL® Filler CQ is a multicoloured, ready-to-use sand mixture. The various grain fractions are pre-mixed in a way that a mixture with SILIKAL® R 61 or R 61 HW resins is perfectly suited for trowel application.

Exact mixing ratios and applications can be found in the Silikal technical documentation.

SILIKAL® Filler 65:

SILIKAL® Filler 65 is specially designed for high-fill SILIKAL® RH 65 resin. The mortar made of SILIKAL® RH 65 resin can be used as a screed for adjusting surfaces of 5 – 20 mm thickness. In certain areas of up to approx. 0.5 m², the thickness can be increased to 50 mm. When in doubt, it is recommended to make a test in advance. SILIKAL® Filler 65 is to be used with SILIKAL® RH 65 resin only.

SILIKAL® Filler SG:

SILIKAL® Filler SG is a sharp-edged gritting material on a hard mineral basis which is semitransparent and used primarily for the subsequent improvement in the slip resistance of smooth floor coatings on a Methacrylate basis. To be considered can be coloured flakes, smooth self levelling systems respectively used up colour sand linings, which receive a new, slip resistant and translucent sealing with this system. SILIKAL® Filler SG is especially characterized by its high natural hardness. It is different to normal quartz sand as the surface is broken and sharp edged, so that a better imbedding in the resin takes place and the peaks lead to a higher slip resistance. The colour of the grain itself is thereby bright to opaque so that underlying coloured decoration such as coloured flakes or coloured sand still comes into one's own. The grain size is available in the sizes 0.6 – 0.8 mm and 1.0 – 1.4 mm and allows thereby stages of slip resistance of approx. R 11 – R 12.

The surface of old and used up Methacrylate coatings need to be pre-treated according to the regulations for the preparation of an underground, e.g. by grinding, cleaning and drying. It is understood, that the appearance of the new surface can only correspond to a cleaned and pre-treated surface. This applies particularly then, when coloured sand and surfaces with coloured flakes needs to be blasted or grinded.

The favoured sealing is rolled up colourless in a minimum quantity of 400 g/m², and SILIKAL® Filler SG is scattered evenly up to the maximum quantity of 1 kg/m². It needs to be guaranteed that the grain is not applied fully covering, since otherwise the underlying decoration shows no advantage anymore. After the scattering an additional sealing layer (approx. 400 – 500 g/m²) is applied.

SILIKAL® Filler SG is especially qualified for coatings with flakes as a new construct.

Fillers

The physical properties and the application of coating compounds, toppings and mortars are determined to a large extent by the nature, condition and particle size of the fillers.

All recipes and recommended mixtures for the various coating systems have been prepared on the basis of Silikal's many years of experience. Fillers which Silikal recommends as finished mixes or fractions have been tested for their suitability and approved. If commercial products of other suppliers are used, these must be examined for suitability and approved by Silikal. This applies not only for the condition of an individual filler, but for the mix recipe as a whole, including the binder.

Fillers essentially consist of mineral rock in the form of sand, chippings or flour. Quartz is an ideal filler in any form, as it not only has high strength but is also resistant to chemicals and colour-neutral. The disadvantage is that increased safety measures are required in order to avoid the formation of dust. Calcite, chalk and barite are only interesting as flour, since their coarse particles are very easily destroyed under stress.

The outer form of the filler also has a noticeable influence on the development of the coating mass. Self-levelling systems must always contain a certain quantity of floury filler as well as a graded curve of different, round-shaped sands of varying particle sizes. Trowel-smoothed toppings, on the other hand, must not contain any flour as otherwise the mass will very quickly adhere to the laying device. As coarse particles, chippings require more binder than round particles and do not lend themselves to smoothing either, since the surface keeps coming apart when being scraped. At the same time, though, chippings increase slip resistance when used simply as sand to sprinkle in.

Fillers must be fire-dried since moisture reduces particle adhesion, causes the coating mass to quickly become thixotropic (poor flow) and encourages the formation of white patches. Strewing sand, whether round particles or chippings, must be free of dust, i. e. the particle size spread must be very narrow as finer particles act like a separating layer for the subsequent top coat. Certain limits in the lower particle size apply for sprinkling. The 0.7 – 1.2 mm fraction is preferred in every case. For those binders which have a high reactivity, e. g. SILIKAL® RU 727, a strewing grain of 0.3 – 0.8 mm is also permitted.

If the amount of material is exceeded or the graded curve is not observed, hardening problems will occur. The same applies for fillers which are surface-treated (e. g. have been made hydrophobic).

Coloured quartz

Coloured quartz of other suppliers must be analysed, particularly in respect of its resistance to MMA and water. You must also ensure that epoxy-coated sands, for instance, do not contain any of these amine hardeners, which can cause hardening problems when Silikal methacrylic resins are used. More or less the same applies for water-emulsifiable binders. You may need to approach another supplier. Other binder top coats such as sodium silicate, dispersants or soluble polymers must not be used under any circumstances. Coloured quartz from Silikal (SILIKAL® Filler FS or CQ) has been adequately tested and is sufficiently suitable.

Coloured flakes

Coloured flakes can likewise tend to cause hardening problems, depending on the binders used. Again, no disruptive pigments (carbon black) or water-based binders may be used. We therefore recommend that you use only tested coloured flakes from Silikal. (☞ Please refer to the separate leaflet “Colour Concepts”)

Pigments

The pigments (coloured powder) used for pigmentation are predominantly inorganic. They are stirred into the resin together with the fillers. You must ensure that the dispersant contains no lumps. This applies particularly for mixtures which do not contain sand as coarse particles, e. g. top coats.

The quantity to add depends on the type of pigment and the desired coat thickness. 2 – 5 % is adequate for coatings above 2 mm. On the other hand, at least 10 % pigment is required for thin roll-on formulations of 0.5 mm. Pigments must also be absolutely dry.

SILIKAL® Pigment Powders are tested and can be supplied in many standard RAL shades.

(☞ Please refer to the separate leaflet “Colour Concepts”)

Carbon black is not suitable as a black pigment, as it leads to hardening problems. The same applies for grey shades which contain black pigment alongside titanium dioxide as the white pigment.

We advise you not to use untested pigment powders, as these may lead to incompatibility with Silikal resins, e. g. curing problems.

Other advice

Metal bronze or tinsel can be used in certain conditions. You should consult us on a case-by-case basis.

Metal powders are structured in roughly the same way as bronze and can lead to interesting technical effects. Aluminium powder or aluminium grit in particular is worth considering, as it enables thermal conductivity to be drastically improved. Mortars almost entirely made up of aluminium can take on the function and appearance of metal in thermal applications. The electrical properties, e. g. conductivity ability or electrostatic behaviour, can also be enhanced.

Fly ash or hollow glass beads are suitable for some applications under certain conditions. More details are available on request.

Glass beads can be used in the same way as quartz sand. Stirred into the mixture, they improve the flow of a compound. Sprinkled into the surface, they improve light reflection in the dark (floor and road markings). Because of their very smooth surface, however, glass beads should be silanised in order to ensure better adhesion to the methacrylic resin as well. Reflective coats made from glass beads must not be covered with sealant.

Thixotropic agents, also referred to as anti-flow additives, prevent flowing away on vertical surfaces or on gradients. These are stirred in with filler and pigment in the recommended quantities until the desired effect of thixotropy has been achieved. Over-dosing can lead to the greater inclusion of air pores, so that hardening will suffer. This is particularly the case with amorphous silicates. Micronised textile fibres are thus more suitable. We recommend SILIKAL® TA 1 or TA 2 anti-flow additive.

Fabric and fibres made from glass, carbon or textile can either be worked physically into the coat or stirred into the mass as macerated fibres. Fine fibres, regardless of their basis, enhance viscosity and perform the function of an anti-flow additive from a certain point. Smaller quantities of longer fibres increase mechanical strength. Carbon fibres improve electrical conductivity. Gauze fabric, on the other hand, must be sufficiently open to allow the spaces to be completely filled with resin. Fibres and fabric should not contain any organic finish, as this can result in hardening problems.

Structural steel is suitable for inlaying in any form. Whether as a mat or rods, the same effects as for reinforced concrete are achieved. Because of its nature, only a thick, highly filled mortar (e. g. SILIKAL® R 17 reactive resin mortar) is suitable if a stable structure is to be achieved. Nevertheless, you must ensure that there is a sufficient coat above it. Dowel pins can also be used to achieve a non-positive anchoring in concrete constructions; this improves the mechanical anchoring of the mortar. They can, of course, also be used horizontally at critical points in a structure, e. g. in doorways, for heavy-duty areas or if there is a risk of poor adhesion to the substrate.