FUNCTIONAL FILLERS
FOR COATINGS

Sillitin
aktiSil
Sillikolloid
aktiFit
SilFit

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PRODUCTS

Sillitin  Sillikolloid
Standard products (natural, untreated fillers).
Differ in brightness and particle size distribution.

puriss
Created by a downstream process. The extremely low portion of oversized particles is reduced even more and the dispersion properties improved.

aktiSil

Silfit
Calcined products based on SILLITIN. A downstream thermal process gives the product additional application advantages as a functional filler.

aktiFit
An activated SILFIT produced through surface treatment with special silanes.
Classic Neuburg Siliceous Earth is a natural combination of corpuscular, cryptocrystalline and amorphous silica and lamellar kaolinite: a loose mixture impossible to separate by physical methods. As a result of natural aging, the silica portion exhibits a round grain shape and consists of aggregated cryptocrystalline primary particles of about 200 nm diameter which are coated partially opallike. Such a unique structure is responsible for a relatively high specific surface area and oil absorption, which result, besides rheological activity, also in a whole range of application properties.
Basically speaking, our entire production process is a process of separation – because only about 30% of the raw earth extracted are a usable fine product. A particularly structure-conserving process separates the fine product from sand and sundry stones and rock. In the first step the raw material is dispersed in water and thus separated from gravel fractions. This is followed by the hydrocyclone unit which separates the sand fractions and sorts the fine particles into different particle sizes. The slurry obtained is then concentrated and the water removed in filter presses. Finally, the natural gas powered turbine dryers remove the remaining moisture. The slurry is then pulverized and stored for further processing.
The particle size distribution, color value graphs and overview tables below show the physical properties and chemical composition of the Neuburg Siliceous Earth. The most significant differentiating characteristics are the particle size distribution and color neutrality.

Neuburg Siliceous Earth is available in four different particle fractions.

The measuring method for this particle size distribution is based on the Fraunhofer analysis of diffraction spectra. The analyses were performed with the Mastersizer S, a laser device from Malvern Instruments.
In addition, classic Neuburg Siliceous Earth is available in different shades and colors ranging from yellow to off-white to white depending on the particle size distribution.
# NEUBURG SILICEOUS EARTH

## Sillitin Sillikolloid – PRODUCT CHARACTERISTICS

<table>
<thead>
<tr>
<th>PRODUCT CHARACTERISTIC</th>
<th>UNIT</th>
<th>TESTING METHOD</th>
<th>SILLITIN V 85</th>
<th>SILLITIN V 88</th>
<th>SILLITIN N 82</th>
<th>SILLITIN N 85</th>
<th>SILLITIN N 87</th>
<th>SILLITIN Z 86</th>
<th>SILLITIN Z 89</th>
<th>SILLIKOLLOID P 87</th>
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<td>%</td>
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<td>7/2.5</td>
<td>7/2.5</td>
<td>7/2.5</td>
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<td>7/2.5</td>
<td>7/2.5</td>
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<td>1.55</td>
<td>1.55</td>
<td>1.55</td>
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<td>Water solubility %</td>
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<td>Acid solubility %</td>
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<td>%</td>
<td>DIN 51001 (XRF)</td>
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<td>8</td>
<td>12</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>14</td>
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<tr>
<td>Al₂O₃</td>
<td>%</td>
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<td>&lt; 1</td>
<td>&lt; 1.5</td>
<td>&lt; 1</td>
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<tr>
<td>Fe₂O₃</td>
<td>%</td>
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<td></td>
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<tr>
<td>Cryptocrystalline silica</td>
<td>%</td>
<td>based on X-ray diffraction pattern analysis combined with Rietveld</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
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<td>20</td>
<td>20</td>
<td>25</td>
<td>25</td>
<td>30</td>
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<td>Kaolinite</td>
<td>%</td>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Other minerals</td>
<td>%</td>
<td></td>
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<td>5</td>
<td>5</td>
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<td>5</td>
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</tbody>
</table>

The values shown in the table are to be considered as guidelines only.
Material specifications for each product are binding and are available on our website www.hoffmann-mineral.com.
**puriss – PRODUCTS WITH IMPROVED DISPERSION PROPERTIES**

Our puriss products are produced by a downstream process.

- The extremely low residue of > 40 µm is significantly reduced even more
- Reduction of abrasivity of this product series. Protection of user’s processing equipment (e.g. mixers, tools and airless spray nozzles)
- The puriss products are the number one choice for all non-water-based formulas thanks to the excellent dispersion properties. They are especially recommended for solvent-free systems like polyester, epoxy and polyurethane as well as for corresponding UV coatings. The use of puriss products even in water-based formulas is of an advantage in particular in the case of critical dispersion conditions
- **puriss** products are especially suitable for thin layers

**DISPERSION PROPERTIES IN ESTER PLASTICIZER**

Stirred with blade mixer 1200 rpm, 20% filler concentration, grain size (Hegman gauge) ≤ 20 µm
This special filler is made by treating the surface of Neuburg Siliceous Earth with chemical agents, mostly silanes.

The AKTISIL types have largely functional groups that enable covalent bonds or intensive interaction with the polymer matrix and produce special effects:

Control and improvement of thin-film coating properties like wetting, viscosity, yield point, reaction rate, hardness, adhesion, abrasion resistance, water absorption, water resistance, transparency, corrosion protection and chemical resistance.

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>BASIC MATERIAL</th>
<th>TREATED WITH</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AKTISIL VM 56</td>
<td>SILLITIN Z 86</td>
<td>Vinyl silane</td>
<td>Primers, clear and pigmented coatings with low requirements for color neutrality, radically cured systems like UV coatings etc.</td>
</tr>
<tr>
<td>AKTISIL VM 56/89</td>
<td>SILLITIN Z 89</td>
<td>Vinyl silane</td>
<td>As AKTISIL VM 56, but for higher color neutrality requirements and slightly improved dispersion</td>
</tr>
<tr>
<td>AKTISIL MAM</td>
<td>SILLITIN V 88</td>
<td>Methacrylic silane</td>
<td>Primers, clear and pigmented coatings with high requirements for color neutrality, very easily dispersible, very good matting effect and abrasion resistance, radically cured systems like UV wood coatings etc.</td>
</tr>
<tr>
<td>AKTISIL MAM-R</td>
<td>SILLITIN V 85</td>
<td>Methacrylic silane</td>
<td>Similar to AKTISIL MAM, but with lower requirements for color neutrality</td>
</tr>
<tr>
<td>AKTISIL EM</td>
<td>SILLITIN Z 86</td>
<td>Epoxy silane</td>
<td>Primers, clear and pigmented coatings with low requirements for color neutrality, anti-corrosion coatings</td>
</tr>
<tr>
<td>AKTISIL AM</td>
<td>SILLITIN Z 86</td>
<td>Amino silane</td>
<td>Primers, clear and pigmented coatings with low requirements for color neutrality, powder coatings, OEM primer-surfacer water-based and anti-corrosion coatings</td>
</tr>
<tr>
<td>AKTISIL MM</td>
<td>SILLITIN Z 86</td>
<td>Mercapto silane</td>
<td>Primers, clear and pigmented coatings with low requirements for color neutrality, water-based anti-corrosion coatings</td>
</tr>
<tr>
<td>AKTISIL WW</td>
<td>SILLITIN V 88</td>
<td>Paraffin</td>
<td>Matting agent in dispersion-based coatings with good resistance to water and stains, preferably for mat clear coatings for wood</td>
</tr>
<tr>
<td>AKTISIL PF 777</td>
<td>SILLITIN Z 86</td>
<td>Alkyl silane</td>
<td>Rheology control, strongly shear thinning, thixotropic, high yield point/stability/non-sagging, very good adhesion, anti-corrosion coatings, adhesion primer (also water-based), generally hydrophobic coatings</td>
</tr>
</tbody>
</table>

1 hydrophobic product, non-reactive

Technical data sheets and material specifications for the above-mentioned products are available on our website www.hoffmann-mineral.com.
# AKTISIL - PRODUCT CHARACTERISTICS

<table>
<thead>
<tr>
<th>PRODUCT CHARACTERISTIC</th>
<th>UNIT</th>
<th>TESTING METHOD</th>
<th>AKTISIL VM 56</th>
<th>AKTISIL VM 56/89</th>
<th>AKTISIL MAM</th>
<th>AKTISIL MAM-R</th>
<th>AKTISIL EM</th>
<th>AKTISIL AM</th>
<th>AKTISIL MM</th>
<th>AKTISIL WW</th>
<th>AKTISIL PF 777</th>
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<tr>
<td>Brightness Y</td>
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<td>DIN 53 163/measuring geometry d/8°</td>
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<td>76</td>
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<td>Brightness Z</td>
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<td>85</td>
<td>85</td>
<td>80</td>
<td>76</td>
<td>82</td>
<td>77</td>
<td>81</td>
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<tr>
<td>Particle size D₉₀ / D₉₇</td>
<td>µm / µm</td>
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<td>10.0</td>
<td>2.0</td>
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<td>18.0</td>
<td>4.0</td>
<td>18.0</td>
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<td>Density / Bulk density</td>
<td>g/cm³ / g/cm³</td>
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<td>0.32</td>
<td>2.6</td>
<td>0.32</td>
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<td>2.6</td>
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<td>9</td>
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</table>

1 not specified

The values shown in the table are to be considered as guidelines only. Material specifications for each product are binding and are available on our website www.hoffmann-mineral.com.
Our calcined products are based on SILLITIN Z 86. Subjected to a downstream thermal process it produces our calcined products SILFIT and AKTIFIT.
CALCINED NEUBURG SILICEOUS EARTH

There are three calcined Neuburg Siliceous Earth products available:

- Basic product SILFIT Z 91
- Two surface-treated products:
  - AKTIFIT AM treated with amino silane
  - AKTIFIT VM treated with vinyl silane

All calcined products have a particle size that approaches that of the uncalcined basic material SILLITIN Z 86.

The measuring method for this particle size distribution is based on the Fraunhofer analysis of diffraction spectra. The analyses were performed with the Mastersizer S, a laser device from Malvern Instruments.
With regard to the CIELAB color values L*, a* and in particular b*, the calcined products are significantly brighter and more color neutral than the basic material.

Untreated
treated with amino silane
treated with vinyl silane
## Calcined Neuburg Siliceous Earth

### Silfit Aktifit - Product Characteristics

| Product Characteristic | Unit | Testing Method | Silfit Z 91 | Aktifit AM | Aktifit VM
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Basic material</td>
<td></td>
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<td>Sillitin Z 86</td>
<td>Silfit Z 91</td>
<td>Silfit Z 91</td>
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<td>Silanized with</td>
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<td>Untreated</td>
<td>Amino silane</td>
<td>Vinyl silane</td>
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<td>Color values</td>
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<td>acc. to CIELAB</td>
<td>94.5 ± 0.1</td>
<td>94.5 ± 0.1</td>
<td>93 ± 0.1</td>
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<tr>
<td>Particle size</td>
<td>µm</td>
<td>ISO 13320-1</td>
<td>2.0</td>
<td>2.0</td>
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<tr>
<td>Residue</td>
<td>&gt; 40 µm</td>
<td>mg/kg</td>
<td>DIN ISO 787 part 18</td>
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<td>Volatile matter at 105 °C</td>
<td>%</td>
<td>DIN ISO 787 part 2</td>
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<td>Oil absorption</td>
<td>g/100 g</td>
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<td>55</td>
<td>55</td>
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<td>Silica hardness/calcined kaolinite Abrasivity</td>
<td>mg</td>
<td>acc. to Mohs</td>
<td>7/4.5</td>
<td>7/4.5</td>
<td>7/4.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>acc. to Einlehner</td>
<td>35</td>
<td>100</td>
<td>n. a. ²</td>
</tr>
<tr>
<td>Refractive index n</td>
<td></td>
<td>sin α/sin β</td>
<td>1.55</td>
<td>1.55</td>
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</tr>
<tr>
<td>Water solubility</td>
<td>%</td>
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</tr>
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<td>Acid solubility</td>
<td>%</td>
<td>DIN 53 770 (0.1 n HCl)</td>
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<td>pH value</td>
<td></td>
<td>DIN ISO 787 part 9</td>
<td>6.5</td>
<td>9</td>
<td>n. a. ²</td>
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<tr>
<td>Chemical Analysis:</td>
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<td>DIN 51001 (XRF)</td>
<td>88</td>
<td>88</td>
<td>88</td>
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<tr>
<td>SiO₂</td>
<td>%</td>
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<td>13</td>
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<tr>
<td>Al₂O₃</td>
<td>%</td>
<td>DIN 51001 (XRF)</td>
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<td>&lt; 1</td>
<td>&lt; 1</td>
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<tr>
<td>Fe₂O₃</td>
<td>%</td>
<td>DIN 51001 (XRF)</td>
<td>based on X-ray diffraction pattern analysis combined with Rietveld</td>
<td>based on X-ray diffraction pattern analysis combined with Rietveld</td>
<td>based on X-ray diffraction pattern analysis combined with Rietveld</td>
</tr>
</tbody>
</table>

| Mineralogical Composition: | % |      |      |      |      |
| Cryptocrystalline silica |      | 60   | 60   | 60   |
| Calcined kaolinite       |      | 50   | 50   | 50   |
| Amorphous mineral phases |      | 10   | 10   | 10   |

¹ hydrophobic ² not applicable

The values shown in the table are to be considered as guidelines only.

Material specifications for each product are binding and are available on our website www.hoffmann-mineral.com.
## Filler Properties

### Advantages of Neuburg Siliceous Earth and Calcined Neuburg Siliceous Earth

<table>
<thead>
<tr>
<th>Filler Property</th>
<th>Effect in Coating Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loose structure, small particle size</td>
<td>Easily and rapidly incorporation, excellent dispersion properties (especially puriss products), very low sedimentation, no hard sediment, good rheological properties (shear thinning, thixotropic), matting effect, very fast drying, water vapor permeability, good pigment dispersion (spacer effect), good edge covering, good sanding, excellent stone-chipping resistance, good mechanical properties, good corrosion protection</td>
</tr>
<tr>
<td>Non-ground filler, low grit content</td>
<td>Low abrasivity</td>
</tr>
<tr>
<td>Very low electrical conductivity (&lt; 100 µS)</td>
<td>No disturbing electrolytes, good bath stability in electrophoretic applications</td>
</tr>
<tr>
<td>No buffer effect</td>
<td>Good stability in water-based coating systems</td>
</tr>
<tr>
<td>Mineralogical composition (hardness)</td>
<td>Scratch resistance, abrasion resistance</td>
</tr>
<tr>
<td>Chemically inert</td>
<td>Weather and chemical resistance, especially against acids</td>
</tr>
<tr>
<td>Refraction index similar to binder</td>
<td>Very good transparency (for clear coats)</td>
</tr>
<tr>
<td>Surface treatment possible</td>
<td>Good bonding properties with polymers</td>
</tr>
<tr>
<td>High purity</td>
<td>Also suitable for food contact in compliance with BfR and FDA regulations</td>
</tr>
</tbody>
</table>

### Special Advantages of Calcined Neuburg Siliceous Earth:

<table>
<thead>
<tr>
<th>Filler Property</th>
<th>Effect in Coating Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low moisture, low moisture absorption</td>
<td>Also suitable for moisture-curing systems, good storage stability</td>
</tr>
<tr>
<td>Very high brightness and color neutrality</td>
<td>For white products without yellowness, increase in hiding power or reduction of pigment content</td>
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<tr>
<td>Very good dispersion properties</td>
<td>Quick and easy coating production</td>
</tr>
<tr>
<td>Reduced interaction of filler particles</td>
<td>Often lower viscosity, improved leveling</td>
</tr>
</tbody>
</table>
ELECTROPHORETIC COATINGS

ADVANTAGES:

• small particle size
• low grit content (oversized particles)
• excellent dispersion properties
• very low sedimentation, no hard sediment
• very low electrical conductivity, no disturbing electrolytes
• good flexibility (Erichsen cupping, impact)
• potential for reducing the titanium dioxide, especially in low-density systems

RECOMMENDED PRODUCTS:

• SILLITIN Z 86
  balanced profile of properties, standard product
• SILLIKOLLOID P 87
  lowest sedimentation, improved edge covering, higher gloss
• SILLITIN Z 89
  as Z 86, but for brighter coatings
• AKTISIL PF 777
  as Z 86, but with enhanced low temperature impact toughness and lower rust creep in VDA test
• SILFIT Z 91
  as Z 89, but with highest brightness and color neutrality, minimization of soluble iron

PRIMER-SURFACER

ADVANTAGES:

• small particle size
• low grit content (oversized particles)
• excellent dispersion properties
• very low electrical conductivity, no disturbing electrolytes
• good sanding, low visibility of sanding marks
• improved appearance of subsequent coating layers
• good corrosion protection
• excellent stone-chipping resistance
• gloss at high volume solids

RECOMMENDED PRODUCTS:

APPLICABLE IN ALL FILLER SYSTEMS:

• SILLITIN Z 86
  balanced profile of properties, standard product
• SILLITIN Z 89
  as Z 86, but for brighter coatings
• SILFIT Z 91
  as Z 89, but with highest brightness and color neutrality

IN SOLVENT-BASED SYSTEMS:

• SILLIKOLLOID P 87
  reduction of sanding marks and lowest sedimentation
• SILLIKOLLOID P 87 puriss
  as P 87, but with improved dispersion

IN WATER-BASED SYSTEMS:

• AKTISIL AM
  OEM primer-surfacer water-based, excellent stone-chipping resistance, high volume solids with high gloss, especially in combination with Disperbyk 111
• AKTIFIT AM
  as AKTISIL AM, but with highest brightness and color neutrality, excellent stone-chipping resistance, high volume solids with high gloss
METAL COATINGS

ADVANTAGES:
• excellent dispersion properties
• good rheological properties
• very low sedimentation
• low abrasivity
• fast drying
• good weathering resistance
• good corrosion protection
• good chemical resistance, especially against acids
• excellent abrasion resistance
• potential for reducing the corrosion protection pigment

RECOMMENDED PRODUCTS:
GENERALLY IN CORROSION PROTECTION COATINGS AND POLYASPARTIC SYSTEMS:
• SILLITIN V 85
  low viscosity, high gloss in polyaspartic systems
• SILLITIN Z 86/SILLITIN Z 89
  shear thinning, good and well-balanced results in the salt spray test and humidity test
• AKTISIL PF 777
  strongly shear thinning, very good adhesive strength and good humidity test results also on non-blasted steel, good chemical resistance

IN EPOXY SYSTEMS CONTAINING SOLVENTS:
• AKTISIL AM
  good leveling, good corrosion protection even with reduced zinc phosphate concentrations, also on non-blasted steel very good results for addition of amino silane, good chemical resistance
• AKTISIL PF 777
  strongly shear thinning, high sag resistance, good corrosion protection and good adhesion even with reduced zinc phosphate concentrations, also on non-blasted steel very good results for addition of amino silane, good chemical resistance

IN WATER AND DISPERSION-BASED PRIMERS:
• AKTISIL MM
• AKTISIL EM
• AKTISIL PF 777

FOR HIGHEST BRIGHTNESS AND COLOR NEUTRALITY, AND LOW VISCOSITY:
• SILFIT Z 91
• AKTIFIT AM
POWDER COATINGS

ADVANTAGES:
- excellent dispersion properties
- low abrasivity
- good edge covering
- good corrosion protection, especially low delamination and rust creep
- scratch resistance
- abrasion resistance
- flexibility (Erichsen cupping, impact)
- good chemical resistance, especially against hot water
- improved hiding power or partial replacement of titanium dioxide

RECOMMENDED PRODUCTS:

IN PURE EPOXY POWDER COATINGS:
- SILLITIN N 82
  low color requirements, standard product
- SILLITIN Z 86
  as N 82, but with higher color neutrality and lower abrasivity
- SILLITIN Z 89
  as Z 86, but for brighter coatings
- puriss products
  lower abrasivity
- AKTISIL AM/AKTISIL MM
  improved hot water resistance

IN HYBRID (EPOXY/POLYESTER) AND PURE POLYESTER POWDER COATINGS:
- SILFIT Z 91
  partial replacement of titanium dioxide, improved scratch resistance, very good leveling, excellent impact with higher dosing

IN UV-CURED POWDER COATINGS ACCORDING TO REQUIREMENTS:
- SILLITIN V 88
- SILFIT Z 91
- AKTIFIT VM
- AKTISIL MAM

TYPICAL APPLICATIONS

CAN & COIL COATINGS

ADVANTAGES:
- small particle size
- excellent dispersion properties
- low sedimentation
- good leveling
- good adhesion
- good scratch resistance
- retention of good weathering resistance
- retention of good flexibility
- slight matting effect (depending on formulation and dosage)
- improved hiding power/opacity or partial replacement of titanium dioxide (top coats)
- partial replacement of corrosion protection pigments (primers and back coats)

RECOMMENDED PRODUCTS:

IN TOP COATS:
Polyester-based, partial replacement of titanium dioxide up to 20 %
- SILFIT Z 91
  balanced profile of properties, standard product
- AKTIFIT AM
  as SILFIT Z 91, but with higher hardness, improved scratch resistance

IN PRIMERS AND BACK COATS:
Polyester-based, as filler and for partial replacement of the corrosion protection pigment (up to 50 %)
- SILFIT Z 91
  balanced profile of properties, standard product
- AKTIFIT AM
  good deaeration and good leveling, therefore suitable for the direct roller coating process, increase of moisture resistance, improved hiding power

METAL COATINGS
UV-CURING CLEAR COATINGS

ADVANTAGES:
• adjustable rheology through choice of product
• low sedimentation
• no hard sediment
• low abrasivity
• scratch resistance
• abrasion resistance
• very good transparency
• matting effect
• no effect on UV-curing

RECOMMENDED PRODUCTS:
• SILLITIN V 88
  low viscosity, good matting effect, good transparency and abrasion resistance
• AKTISIL MAM
  as V 88, but with improved abrasion resistance
• SILLITIN Z 91
  as V 88, but with highest color neutrality, best dispersion properties, higher viscosity at low shear rates, reduced sedimentation, minimally whitish glaze, higher gloss
• AKTIFIT VM
  as SILLITIN Z 91, but with lower viscosity at low shear rates, improved abrasion resistance, improved hiding power without UV-curing problems in white pigmented top coats
• SILLITIN Z 89
  as V 88, but with lower color neutrality, higher viscosity, reduced sedimentation, higher gloss
• SILLITIN Z 89 puriss
  as Z 89, but with improved dispersion
• AKTISIL VM 56/89
  as Z 89, but with improved abrasion resistance

WOOD AND FOIL COATINGS

RECOMMENDED PRODUCTS:
• SILLITIN V 88
  good transparency and matting
• SILLITIN Z 89
  as V 88, but with improved resistance to abrasion, water and stains
• AKTISIL MAM
  as V 88, but with improved resistance to abrasion, water and stains
• AKTISIL WW
  as V 88, but with optimum resistance to water and stains and best appearance on dark woods, easy dosing and incorporation, hardly any dust formation, wood grain enhancement
• SILFIT Z 91
  similar to V 88 and Z 89, but with highest color neutrality, slightly whitish glaze, for pigmented coatings
• AKTIFIT VM
  as SILFIT Z 91, but with improved resistance to abrasion, water and stains

DISPERSION-BASED CLEAR WOOD COATINGS

ADVANTAGES:
• easy dosing and incorporation, hardly any dust formation
• excellent dispersion properties
• little to no foam formation
• better sanding after shorter drying time
• improved abrasion resistance
• anti-blocking effect
• good transparency
• excellent matting effect
• resistance to water and stains
• good appearance on dark woods, wood grain enhancement
TYPICAL APPLICATIONS

WOOD AND FOIL COATINGS

ADVANTAGES:
• excellent dispersion properties
• balanced rheology
• very low sedimentation
• fast drying
• water vapor permeability

RECOMMENDED PRODUCTS:
• SILLITIN Z 89
  balanced profile of properties, standard product
• SILLITIN Z 89 puriss
  as Z 89, but with improved dispersion performance in solvent-based coatings
  (sufficient dispersion with dissolver)

EXTERIOR TOP COATS AND VENTILATION PRIMERS

ADVANTAGES:
• low sedimentation
• excellent matting
• extended retention of the soft-feel effect
• good chemical resistance
• good abrasion resistance

RECOMMENDED PRODUCTS:
• SILLITIN Z 89
  balanced profile of properties, standard product
• AKTISIL PF 777
  as Z 86, but with greatly reduced sagging and improved adhesion

PLASTIC COATINGS

ADVANTAGES:
• very low sedimentation
• balanced rheology with only minimal sagging and good leveling
• good adhesion

RECOMMENDED PRODUCTS:
• SILLITIN Z 86
  balanced profile of properties, standard product
• SILLITIN V 88
  as V 85, but for brighter coatings
• SILLITIN Z 86
  as V 85, but with less matting, reduced sedimentation, reduced surface roughness
• SILLITIN Z 89
  as Z 86, but for brighter coatings

PLASTIC PRIMERS

ADVANTAGES:
• very low sedimentation
• balanced rheology with only minimal sagging and good leveling
• good adhesion

RECOMMENDED PRODUCTS:
• SILLITIN Z 86
  balanced profile of properties, standard product
• AKTISIL PF 777
  as Z 86, but with greatly reduced sagging and improved adhesion

WOOD AND FOIL COATINGS

ADVANTAGES:
• excellent dispersion properties
• balanced rheology
• very low sedimentation
• fast drying
• water vapor permeability

RECOMMENDED PRODUCTS:
• SILLITIN Z 89
  balanced profile of properties, standard product
• SILLITIN Z 89 puriss
  as Z 89, but with improved dispersion performance in solvent-based coatings
  (sufficient dispersion with dissolver)
SOLDER RESIST INKS

ADVANTAGES:

• particle size spectrum meeting requirements
• no disturbing electrolytes
• excellent dispersion properties
• low sedimentation
• balanced rheology
• good edge covering
• no effect on UV-curing
• superior chemical resistance

RECOMMENDED PRODUCTS:

• SILLITIN Z 89 puriss
  balanced profile of properties

• SILLIKOLLOID P 87
  finer than Z 89 puriss, higher viscosity at low shear rates

• SILLIKOLLOID P 87 puriss
  as P 87, but with improved dispersion performance

• AKTISIL AM
  according to requirements

• AKTISIL MAM
  according to requirements, mainly for low-viscosity UV-curing systems

CONSTRUCTION COATINGS AND DECORATIVE PAINTS

ADVANTAGES:

• very low sedimentation
• fast drying
• improved hiding power (opacity) or partial replacement of titanium dioxide
• abrasion resistance
• night visibility/improved anchoring of reflecting glass beads

RECOMMENDED PRODUCTS:

• SILLITIN Z 89
  balanced profile of properties

• SILFIT Z 91
  as Z 89, but with highest brightness and color neutrality, partial replacement of titanium dioxide, low viscosity, standard product

• SILLITIN V 88
  as Z 89, but with lower viscosity and better color neutrality

ROAD MARKING PAINTS

ADVANTAGES:

• very low sedimentation
• fast drying
• improved hiding power (opacity) or partial replacement of titanium dioxide
• abrasion resistance
• night visibility/improved anchoring of reflecting glass beads

RECOMMENDED PRODUCTS:

• SILLITIN Z 89
  balanced profile of properties

• SILFIT Z 91
  as Z 89, but with highest brightness and color neutrality, partial replacement of titanium dioxide, low viscosity, standard product

• SILLITIN V 88
  as Z 89, but with lower viscosity and better color neutrality
CONSTRUCTION COATINGS AND DECORATIVE PAINTS

FAÇADE AND DIFFUSIBLE DISPERSION PAINTS

ADVANTAGES:
• excellent dispersion properties
• very low sedimentation
• good abrasion resistance
• matting
• improved hiding power (opacity) or partial replacement of titanium dioxide
• water vapor permeability

RECOMMENDED PRODUCTS:
• SILLITIN N 82
  as replacement for yellow pigments

• SILLITIN Z 89
  balanced profile of properties

• SILLITIN V 88
  as Z 89, but with greater matting effect and better color neutrality

• SILFIT Z 91
  as Z 89, but with highest brightness and color neutrality, partial replacement of titanium dioxide, low viscosity, standard product

• AKTISIL MAM
  as V 88, but with less water absorption

DISPERSION COATINGS FOR CONCRETE FOR ROOFS AND BALCONIES

ADVANTAGES:
• balanced rheology
• fast drying, even with thick layers and moist climate
• abrasion resistance

RECOMMENDED PRODUCTS:
• AKTISIL MAM
  low water absorption, abrasion resistance, matting

• SILLITIN Z 89
  higher viscosity at low shear rates, low sedimentation, less matting

• SILFIT Z 91
  highest brightness and color neutrality

• AKTIFIT VM
  as SILFIT Z 91, but with improved abrasion resistance, lower water absorption

ARTISTS’ PAINTS

ADVANTAGES:
• excellent dispersion properties
• improved pigment dispersion
• fast drying

RECOMMENDED PRODUCTS:
• SILLITIN Z 89
  balanced profile of properties
## Packaging

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<thead>
<tr>
<th>Product</th>
<th>Paper Bag</th>
<th>PE Bag</th>
<th>EVA Bag</th>
<th>Big Bag Type 1/Type 2/Type 3</th>
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<tr>
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<td>5 to 20 kg</td>
<td>≤ 750/850/1200 kg</td>
<td>≤ 25 t</td>
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<tr>
<td>SILLITIN N 82</td>
<td>25 kg</td>
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<td>SILLITIN N 85</td>
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<td>SILLITIN N 87</td>
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<td>SILLITIN Z 86</td>
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<tr>
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<td>10 to 25 kg</td>
<td>10 to 20 kg</td>
<td>≤ 600/750/900 kg</td>
<td>on request</td>
</tr>
</tbody>
</table>

Special packaging and sizes are available on request.
OCCUPATIONAL SAFETY INFORMATION

Fine dust might be generated when processing SILLITIN, SILLIKOLLOID, AKTISIL, SILFIT or AKTIFIT. The quality of the particular tendency to agglomeration of the airborne siliceous earth particles has long been known. It leads to an enormous reduction of “free” particles < 5µm and thus to class A fine dust concentrations which you would not expect because of the classic, water-dispersed particle size distribution.

The DIN EN 15051-B standard “Workplace atmospheres – Measurement of the dustiness of bulk materials” provides a method of assessing the quantity of “dustiness”. It confirms in an impressive way the qualitatively considered very low A class dust fractions of Neuburg Siliceous Earth.

Referred to the portion of cryptocrystalline silica all the measured values lie in a range of 0.001 to max. 0.06% by weight. Therefore, our products are classified as “low dust” to “minimally dusty” according to the standard and are below by more than one power of ten the lower general concentration limit value for particles for a specific target organ.

The conclusion is that according to GHS regulations our range of products does not have to be specially identified. Nevertheless, it is recommended to monitor and observe safety regulations concerning exposure to dust. Refer here to our safety data sheets at www.hoffmann-mineral.com.

The results of the KAFKA* study of the Institute for Prevention and Occupational Medicine made in 2011 indicate the possible risk of damage to the lungs through dust from the material and if a person were to work 8 hours a day, 220 days per year over a period of many years in such a fine dust atmosphere without dust suction mechanism or face masks. They show that despite the large number of employees exposed to a very high cumulative concentration (up to 90 mg/m² x years) of cryptocrystalline Neuburg Siliceous Earth, no statistically significant risk of lung cancer could be established.

Employees who worked underground in mines and were subject to long-term exposure of > 0.15 mg/m² of respirable fine dust did however show an increased risk of developing silicosis.

* KAFKA study: This is a cohort study made at Hoffmann Mineral. It observed 675 employees who worked or who are still working in the company from 1923 to 2007.