

## SILFIT Z 91

### TECHNICAL DATA – Field of application: PAINT & VARNISH

1. Description	2. Applications	3. Benefits
<p><b>SILFIT Z 91</b> is a natural combination of corpuscular silica and lamellar kaolinite, which has been subjected to a heat treatment. The components and the thermal process lead to a product that offers special performance benefits as a functional filler.</p> <p><b>Characteristics:</b>            Appearance: free-flowing powder            Color CIELAB scale:            L* 95            a* - 0.1            b* 1.0            Sieve residue &gt; 40 µm: 10 mg/kg            Volatile matter at 105°C: 0.2 %            Density: 2.6 g/cm<sup>3</sup>            Particle size distribution            D<sub>50</sub>: 2 µm            D<sub>97</sub>: 10 µm            Surface area BET: 8 m<sup>2</sup>/g            Oil absorption: 55 g/100 g            pH value: 6.5            Electrical conductivity: 20 µS/cm            Refractive index n: 1.55            Equilibrium moisture content at 25 °C and            50 % relative humidity 0.12 %            80 % relative humidity 0.22 %            90 % relative humidity 0.54 %</p> <p><b>Packaging:</b>            Paper bags: à 25 kg            PE bags: ≤ 20 kg            EVA bags: ≤ 20 kg            Big Bags: 600 – 900 kg            Bulk: on demand</p> <p><b>Shelf life:</b>            Unlimited if stored properly under dry conditions.</p>	<p>In paint and varnish applications <b>SILFIT Z 91</b> can be used as functional filler either on its own or combined with extenders or matting agents.</p> <p><b>Potential fields of application:</b></p> <ul style="list-style-type: none"> <li>• road marking paints</li> <li>• coil coatings</li> <li>• powder coatings</li> <li>• emulsion and silicate paints</li> <li>• industrial paints</li> <li>• wood and foil coatings</li> <li>• primers and surfacers, also for the automotive industry</li> <li>• electrophoretic paints (anaphoretic and cataphoretic)</li> <li>• adhesives and sealants</li> </ul> <p>It stands out for its excellent dispersion properties, low yield point and pseudo plasticity in high solid formulations as well as very high brightness and color-neutrality.</p> <p><b>SILFIT Z 91</b> enhances the opacity effect of pigments, thus it provides a replacement potential of titanium dioxide up to 20 %.</p> <p>In clear coats it achieves good transparency without yellow tint, a slight whitish glazing effect can result depending on formulation principle and loading.</p> <p>The outstanding dispersion behavior enables paint production potentially without grinding, even for low film thickness applications.</p> <p><b>Formulation principle:</b>            Solvent-based, solvent-free, water-based.</p> <p><b>Hardening principle:</b>            All conventional reaction types, also UV-curing.</p> <p><b>Minimum film thickness:</b>            &gt; 10 µm, less in special cases.</p> <p><b>Dosage:</b>            up to 55 % depending on intended application likewise up to PVC 35, often 10 to 20 % w/w</p>	<ul style="list-style-type: none"> <li>• low sieve residues</li> <li>• outstanding dispersion behavior, even without grinding</li> <li>• improved opacity (spacer effect), likewise potential for partial pigment replacement</li> <li>• relatively low abrasivity</li> <li>• quick drying</li> <li>• weathering resistance</li> <li>• scratch resistance</li> <li>• abrasion resistance</li> <li>• good transparency</li> <li>• matting effect<sup>1</sup></li> <li>• complies with the standards on articles in contact with foodstuffs of the BfR and FDA</li> </ul> <p><b>SILFIT Z 91</b> also provides the following <b>benefits compared with Sillitin/Sillikolloid:</b></p> <ul style="list-style-type: none"> <li>• lower moisture content, less moisture absorption</li> <li>• very high brightness</li> <li>• very high color-neutrality</li> <li>• improved dispersion behavior like the Sillitin puriss grades</li> <li>• stronger matting effect<sup>1</sup> combined with lower viscosity compared with the similar fine Sillitin Z</li> </ul> <p><sup>1</sup>strongly dependent on formulation</p>

#### 4. Comparison of properties:

	Sillitin						Silfit	Sillikolloid	
	V 85	V 88	N 82	N 85	N 87	Z 86	Z 89	Z 91	P 87
Dispersion effort (required shear forces)	●●	●●	●●●●	●●●	●●●	●●●●	●●●	●	●●●●●
Viscosity at high shear rate	●	●	●●	●●	●●	●●●	●●●	●(●●) <sup>1</sup>	●●●●
Yield point, viscosity at low shear rate	●	●	●●●	●●	●●	●●●	●●●	●(●●) <sup>1</sup>	●●●●
Color-neutrality	●●●	●●●●●	●	●●	●●●	●●	●●●●●	●●●●●●	●●
Sedimentation	●●●●●	●●●●●	●●●	●●●	●●●	●●	●●	●●(●●●) <sup>1</sup>	●
Matting	●●●●●	●●●●●	●●●	●●●	●●●	●●	●●	●●(●●●) <sup>1</sup>	●
Abrasion resistance	●●●●	●●●●	●●●	●●●	●●●	●●	●●	●●	●

● = low    ●●●●● = high

<sup>1</sup> strongly dependent on formulation principle

#### 5. Application examples:

- **Road marking paints**

- cost cutting potential by partial replacement of titanium dioxide up to 40 %
- improved abrasion resistance

Technical report: "Neuburg Siliceous Earth in Road Marking Paints (water based, white, low film thickness)" and "Technical report: Neuburg Siliceous Earth in Road Marking Paints (water based, white, wet film thickness 600 µm)" under [www.hoffmann-mineral.com](http://www.hoffmann-mineral.com) .

- **Coil coating**

Silfit Z 91 represented by the surface treated Aktifit AM, color values and opacity are similar, other properties may vary

- cost cutting potential by partial replacement of titanium dioxide up to 20 %

Technical report: "Partial Replacement of Titanium Dioxide by Neuburg Siliceous Earth in a White Polyester-based Coil Coating Top Coat" under [www.hoffmann-mineral.com](http://www.hoffmann-mineral.com) .

- **Adhesives based on silane terminated polymers (STP, 1 C moisture curing)**

Silfit Z 91 performs generally similar to Sillitin Z 86 puriss in adhesives for parquet floors:

- easy and quick incorporation, very good dispersion
- very high tensile strength of free film and high lap shear strength

additional benefits versus Sillitin Z 86 puriss:

- lower viscosity
- neutral light grey color of the adhesive without titanium dioxide addition