

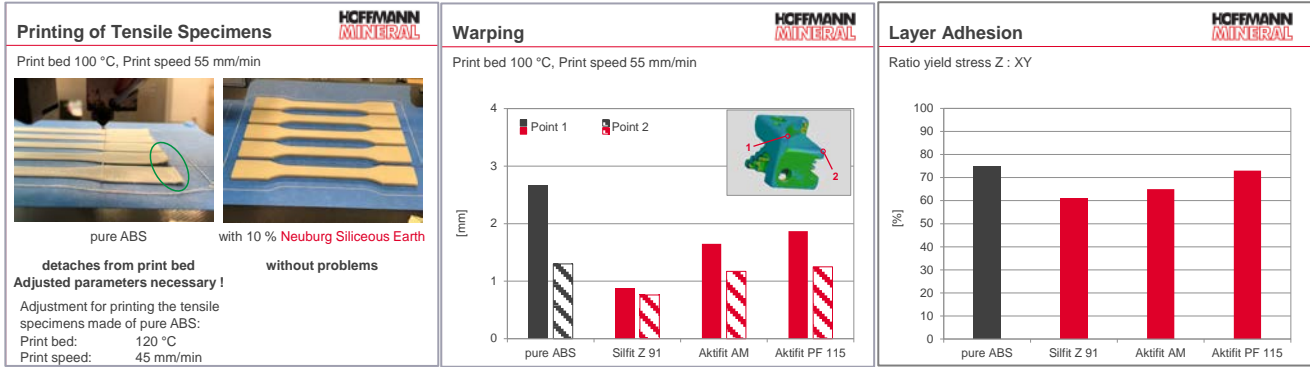
## SILFIT Z 91

### TECHNICAL DATA SHEET – Field of application: THERMOPLASTICS

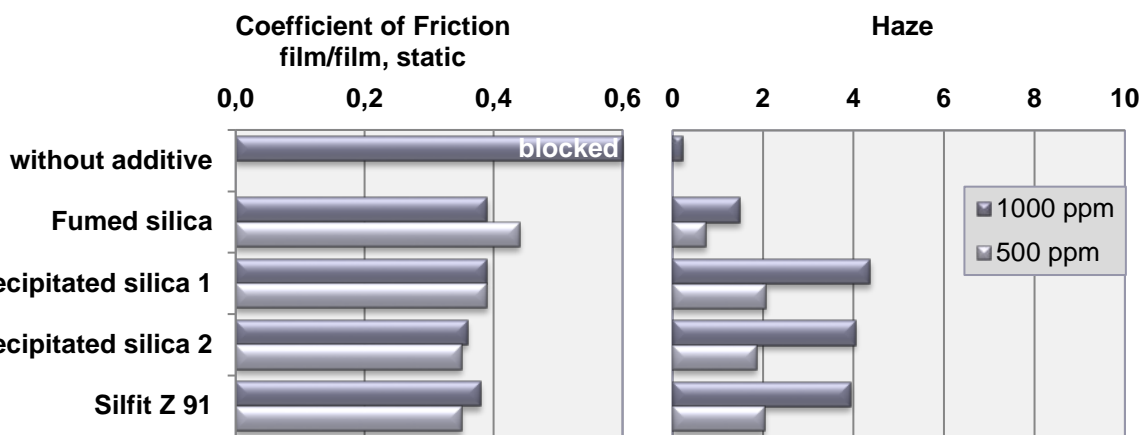
1. Description	2. Applications	3. Benefits
<p>SILFIT Z 91 is a natural combination of corpuscular silica and lamellar kaolinite, which has been subjected to a heat treatment. The components and the thermal process lead to a product that offers special performance benefits as a functional filler.</p> <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            Spec. surface area BET: 8 m<sup>2</sup>/g            Oil absorption: 55 g/100 g            pH value: 6.5            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 thermoplastics SILFIT Z 91 is used as a functional filler either by itself or in combination with other fillers or reinforcing fibers. SILFIT Z 91 should be considered whenever low warpage, perfect surface finish and scratch resistance are as important as good melt flow, high strain at break and high impact strength. The addition of maleic anhydride-grafted polypropylene (MAPP) enhances the performance of SILFIT Z 91 in <b>PP compounds</b> resulting in improved tensile strength as well as flexural strength and particularly additional improvement of scratch resistance. For higher requirements the Aktifit AM is recommended. In <b>wood plastic composites (WPC)</b> SILFIT Z 91 improves mechanical and surface properties including scratch resistance. For higher requirements the Aktifit AM is recommended. In <b>white pigment masterbatches</b> SILFIT Z 91 replaces up to 30 % relative of the TiO<sub>2</sub> concentration, largely maintaining opacity and amplifying bluish undertone of the TiO<sub>2</sub>. In <b>films</b> SILFIT Z 91 achieves very good results as an <b>anti-blocking agent</b>, in PET comparable to precipitated silicas: very good transparency and low haze combined with a low coefficient of friction and cost advantage. Furthermore applying SILFIT Z 91 in <b>infrared (IR) greenhouse and agricultural films</b> it performs in very high light transmission and very low haze at medium IR absorption. The latter can be increased by using SILLITIN V 88. In <b>3D printing using the FFF (filament) process of ABS</b>, it significantly reduces warpage and maintains layer adhesion (yield stress in the Z-direction) at a high level.</p> <p><b>Dosage:</b>  <b>Films:</b>  <ul style="list-style-type: none"> <li>Anti-blocking additive: 500 ppm (PET) to 1 % (LDPE)</li> <li>Functional filler in films: 5 to 15 %</li> </ul> <b>WPC:</b> 1 % to 10 %  <b>White (TiO<sub>2</sub>) masterbatches:</b> 10 to 30 % rel. of TiO<sub>2</sub>, ratio 1:1 to 1:2 m/m  <b>3D-Printing FFF in ABS:</b> 10 %  <b>Compounds:</b>  <ul style="list-style-type: none"> <li>20 to 50 % without other fillers</li> <li>10 to 30 % in combination with glass fibers</li> </ul> </p>	<p><b>In comparison with the unfilled polymer, the use of SILFIT Z 91 will result in the following advantages:</b></p> <ul style="list-style-type: none"> <li>improved scratch resistance</li> <li>higher hardness</li> <li>higher stiffness (modulus)</li> <li>higher tensile and flex strength</li> <li>improved heat distortion temperature</li> <li>higher heat conductivity</li> <li>improved dimensional stability with varying humidity conditions (polyamides)</li> </ul> <p><b>In comparison with other mineral fillers and anti-blocking agents, SILFIT Z 91 offers the following advantages:</b></p> <ul style="list-style-type: none"> <li>very low sieve residues</li> <li>easy feeding and metering</li> <li>good wetting and dispersion properties</li> <li>high melt flow rates</li> <li>low warpage</li> <li>excellent surface finish</li> <li>higher scratch resistance</li> <li>high impact strength</li> <li>no graying of black-colored compounds</li> <li>good transparency</li> <li>high light transmission</li> <li>IR absorption</li> <li>low haze</li> <li>low coefficient of friction</li> <li>high opacity in TiO<sub>2</sub> pigmented films and compounds</li> <li>complies with the standards on articles in contact with foodstuffs of the BfR and FDA</li> </ul>

#### 4. Application examples:

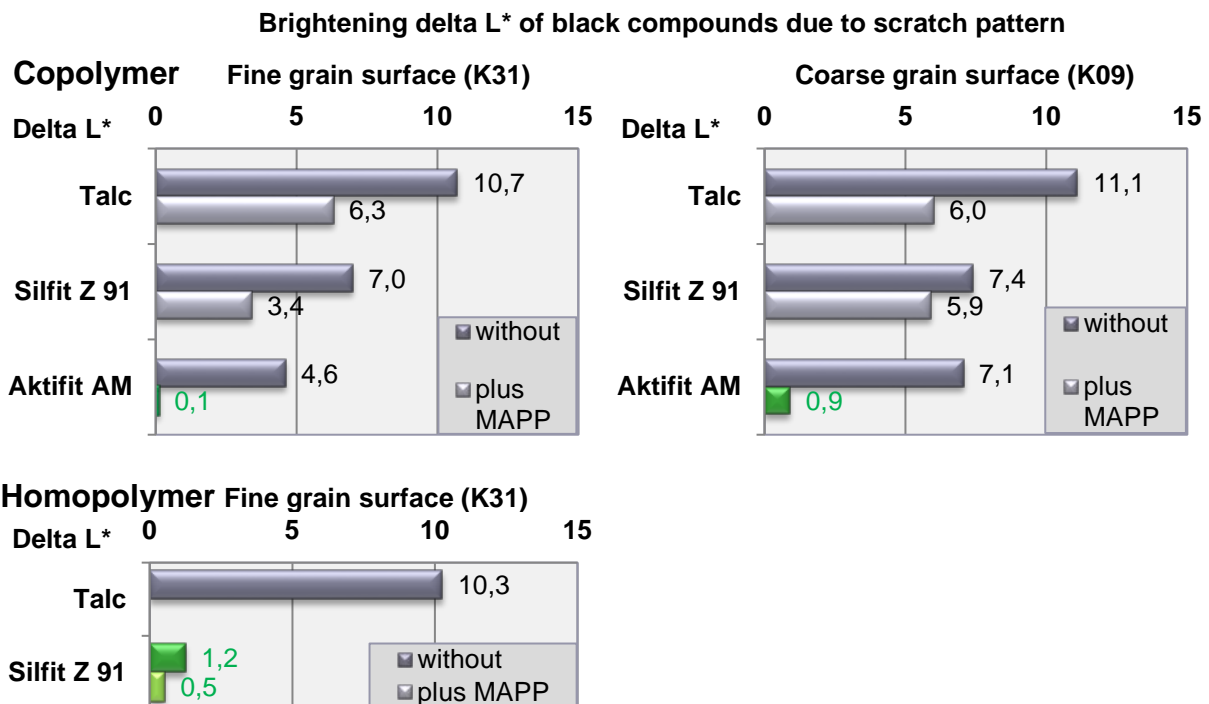
- 3D-Printing in FFF-Process (Filament) of ABS, 10 % filler



- PET-Film, Anti-blocking, 15 µm film thickness



- PP Compounds with enhanced scratch resistance, 40 % filler



For more information about Silfit Z 91 in thermoplastic applications, please see [www.hoffmann-mineral.com/industries/thermoplastics](http://www.hoffmann-mineral.com/industries/thermoplastics)