

SILFIT Z 91

TECHNICAL DATA SHEET – Field of application: ELASTOMERS

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>Characteristics: Appearance: free-flowing powder Color CIELAB scale: L* 95 a* - 0.1 b* 1.0 Sieve residue > 40 µm: 10 mg/kg Volatile matter at 105°C: 0.2% Density: 2.6 g/cm³ Particle size distribution D₅₀: 2 µm D₉₇: 10 µm Surface area BET: 8 m²/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>Packaging: Paper bags à 25 kg PE bags: ≤ 20 kg EVA bags: ≤ 20 kg Big Bags: 600 – 900 kg Bulk: on demand</p> <p>Shelf life: Unlimited if stored properly under dry conditions.</p>	<p>In elastomer applications SILFIT Z 91 can be used as a functional filler either on its own or in combination with other non-reinforcing or reinforcing fillers.</p> <p>Fields of application: In general SILFIT Z 91 is suitable for any rubber products used for technical applications. Its particular properties are that it provides a balanced relationship between tensile strength, tear strength, low compression set and excellent extrusion properties. It is particularly suitable for very bright or white compounds. SILFIT Z 91 also provides advantages in the following instances:</p> <ul style="list-style-type: none">• very high dispersion requirements:• compounds with a high oil content• automotive profiles with very low surface defect rates• products with extremely thin walls (membranes)• very high surface quality requirements (roller coverings and offset blankets)• prevention of filler caused mold fouling during the injection process or deposits in the orifice die (Plating) during extrusion• very low chloride content (washing machine gaskets) <p>Methods of processing: Any process commonly used in the rubber industry</p> <p>Elastomers: BIIR, BR, CIIR, CR, HNBR, IIR, IR, NBR, NR, PNR, SBR; CM, CSM, EPM, EPDM, EVM, Q</p> <p>Dosage: Generally in the range from 50 to 300 phr, depending on application, formulation and requirements</p>	<ul style="list-style-type: none">• low sieve residues• good and rapid incorporation• very good dispersion, also in critical compounds• good flow properties• excellent surfaces• excellent extrusion properties• no negative influence on curing rate• low tensile and compression set• high electrical resistance• good aging properties• high chemical resistance• complies with the standards on articles in contact with foodstuffs of the BfR and FDA• matting effect <p>SILFIT Z 91 also provides the following benefits compared with Sillitin/Sillikolloid:</p> <ul style="list-style-type: none">• lower moisture content, less moisture absorption• lower chloride content• very high brightness• very high color-neutrality• improved dispersion behavior like the Sillitin puriss grades• slightly improved extrusion properties• markedly improved compression set possible• best combination of extrusion properties and compression set (within the range of non surface treated grades)• outstandingly low dielectric losses in high voltage cable insulations

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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
Color-neutrality		●●	●●●●●●	●	●●	●●●●	●●	●●●●●●	●●●●●●●●	●●
Extrusion	Profile quality	●	●	●●●●	●●	●●	●●●●	●●●●	●●●● [○]	●●●●●●
	Collapse resistance	●	●	●●●●	●●	●●	●●●●	●●●●	●●●●	●●●●●●
	Matting effect	●●●●●●	●●●●●●	●●●●	●●●●	●●●●	●●	●●	●●	●
Viscosity		●	●	●●●●	●●	●●	●●●●	●●●●	●●●●	●●●●●●
Tensile strength		●	●	●●●●	●●	●●	●●●●	●●●●	●●●●	●●●●●●
Tear resistance		●	●	●●●●	●●	●●	●●●●	●●●●	●●●●	●●●●●●
Compression set		●	●	●●●●	●●	●●	●●●●	●●●●	● [○]	●●●●●●
Rebound elasticity		●●●●●●	●●●●●●	●●●●	●●●●	●●●●	●●	●●	●●	●
Abrasion loss		●●●●●●	●●●●●●	●●	●●●●	●●●●	●●	●●	●●	●

● = low ●●●●●● = high

5. Application examples:

- **Plating**

Prevention of filler caused mold fouling during the injection process or deposits in the orifice die (plating) during extrusion
 Technical report: "Die Plating"

- **Car body seals**

- excellent extrusion properties
 - quick cure
 - higher tensile strength, higher tear resistance and markedly better compression set compared with calcined clay in non-conductive compounds
 - generally low compression set, also testing according to Volkswagen VW PV 3307
 - prevention of filler caused deposits in the orifice die (plating) during extrusion
- Technical report: "Silfit Z 91 in Car Body Seals"

- **Washing machine gaskets**

- higher tensile strength and higher tear resistance versus calcined clay
 - replacement of precipitated silica without deteriorating properties, faster cure and lower swelling in water and detergent lyes
 - prevention of filler caused mold fouling
 - very low chloride content
- Technical report: "Silfit in Grey Colored Washing Machine Gaskets"

- **White building profiles (window and facade seals)**

- good extrusion properties, slightly higher tensile strength, lower compression set and more neutral white color (less yellow tint) versus calcined clay
- Technical report: "Calcined Neuburg Siliceous Earth in White Building Profiles"

- **Medium to high voltage cable insulation**

- better dielectric loss factor $\tan \delta$, lower sieve residue, higher tensile strength versus calcined clay
- Technical report: "Calcined Neuburg Siliceous Earth in Medium and High Voltage Cable Insulation"

All mentioned technical reports and even more are available at www.hoffmann-mineral.com