SILFIT Z 91

Field of application: Elastomers

1. Description

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.

Characteristics

Appearance		free-flowing powder
Color CIELAB scale:	L* a* b*	96.5 - 0.1 1.0
Residue > 40 µm		10 mg/kg
Volatile matter at 105 °C		0.2 %
Densitiy		2.6 g/cm³
Particle size distribution	D_{50} D_{97}	2 µm 10 µm
Surface area BET		8 m²/g
Oil absorption		65 g/100 g
pH value		6.5
Equilibrium moisture content at 23 °C: 50 % relatice humidity 80 % relative humidity 90 % relative humidity		 0.12 % 0.22 % 0.54 %

Packaging

Paper bags	á 25 kg
EVA bags	≤ 20 kg
Big Bags	600 - 900 kg
Bulk	on demand

Shelf life

Unlimited if stored properly under dry conditions.

2. Applications

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.

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:

- 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)

Methods of processing:
Any process commonly used in the rubber industry.

Elastomers:
BIIR, BR, CIIR, CR, HNBR, IIR, IR, NBR, NR, PNR, SBR;
CM, CSM, EPM, EPDM, EVM, Q

Dosage:
Generally in the range from 50 to 300 phr, depending on application, formulation and requirements.

3. Benefits

- 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

SILFIT Z 91 also provides the following benefits compared with Sillitin/Sillikolloid:

- 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

4. Comparison of properties

		SILLITIN V 85	SILLITIN V 88	SILLITIN N 82	SILLITIN N 85	SILLITIN N 87	SILLITIN Z 86	SILLITIN Z 89	SILFIT Z 91	SILLIKOLLOID 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”

Wasching 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 δ
- lower sieve residue
- higher tensile strength versus calcined clay

Technical report: “Calcined Neuburg Siliceous Earth in Medium and High Voltage Cable Insulation

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Münchener Straße 75 • DE-86633 Neuburg (Donau)
Phone +49 8431 53-0 • info@hoffmann-mineral.com