



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 - 0.2 1.0 |
| Residue > 40 µm | | 10 mg/kg |
| Volatile matter at 105 °C | | 0.2 % |
| Density | | 2.6 g/cm ³ |
| Particle size distribution | D ₅₀ D ₉₇ | 2.1 µm 9.5 µm |
| Surface area BET | | 10 m ² /g |
| Oil absorption | | 65 g/100 g |
| pH value | | 6.5 |
| Equilibrium moisture content at 23 °C: | | |
| 50 % relative humidity | | 0.12 % |
| 80 % relative humidity | | 0.22 % |
| 90 % relative humidity | | 0.54 % |

Packaging

| | |
|------------|--------------|
| Paper bags | à 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.

Information on compliance with certain regulations/recommendations and other safety-related aspects: [Product safety information](#)

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 $\tan \delta$
- 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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