



# Functional fillers

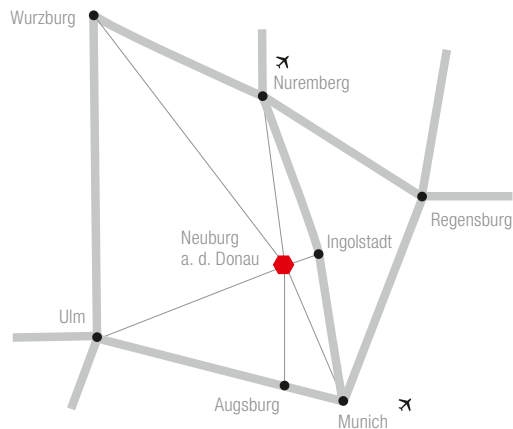
Neuburg  
Siliceous Earth

**Product information**

**HOFFMANN**  
**MINERAL®**

We supply material for good ideas

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### Sillitin

Standard products (natural, untreated fillers). Differ in brightness and particle size distribution.

### Puriss

Created by a downstream process. The extremely low residue > 40 µm particles is reduced even more and the dispersion properties are improved.

### Aktisil

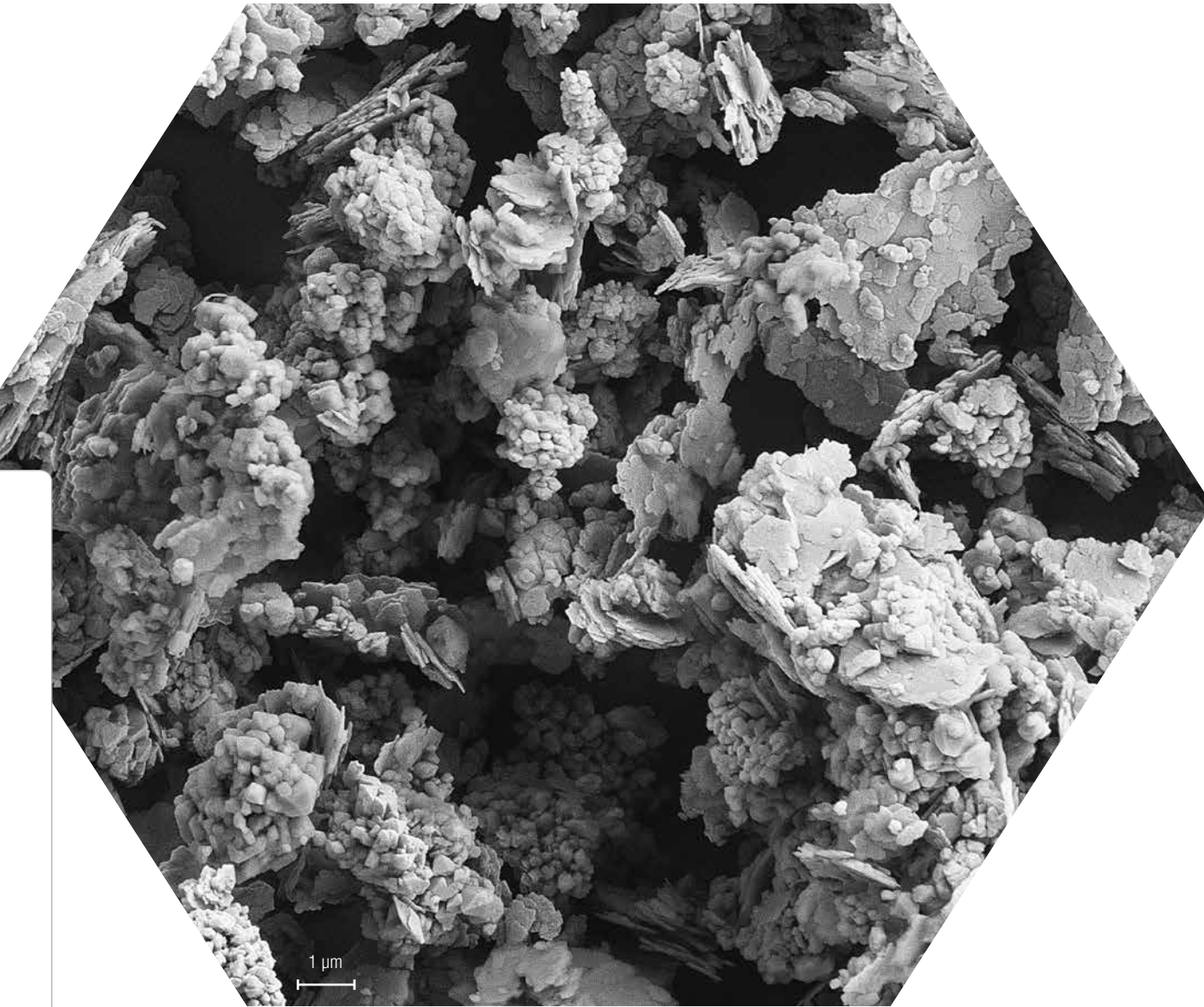
Surface-treated products. Neuburg Siliceous Earth treated with additives.

### Silfit

Calcined products based on Sillitin. A downstream thermal process gives the product additional application advantages as a functional filler.

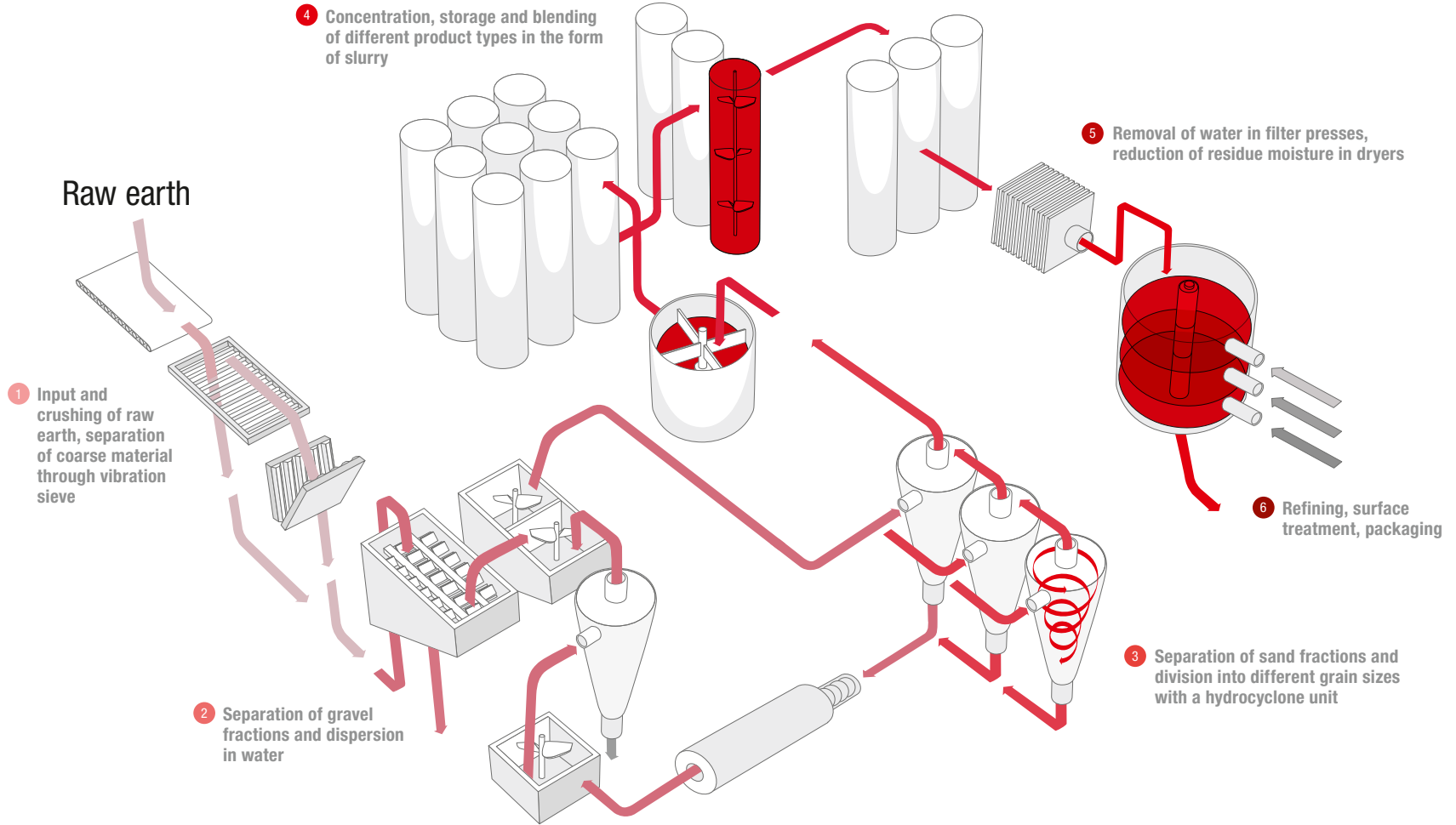
### Aktifit

An activated Silfit produced through surface treatment with special additives.



Classic Neuburg Siliceous Earth is a natural combination of corpuscular Neuburg Silica and lamellar kaolinite: a loose mixture impossible to separate by physical methods. As a result of natural aging, the silica portion exhibits a round grain shape and consists of aggregated cryptocrystalline primary particles of about 200 nm diameter. Such a unique structure is responsible for a relatively high specific surface area and oil absorption, which result, besides rheological activity, also in a whole range of application properties.

Our calcined products Silfit and Aktifit are based on the standard product Sillitin Z 86. A thermal process is used to expel the crystalline water in the kaolinite portion and new mineral phases are formed practically amorphous. The silica portion remains inert at the temperature used. The resulting products have an outstandingly high degree of white and color neutrality.



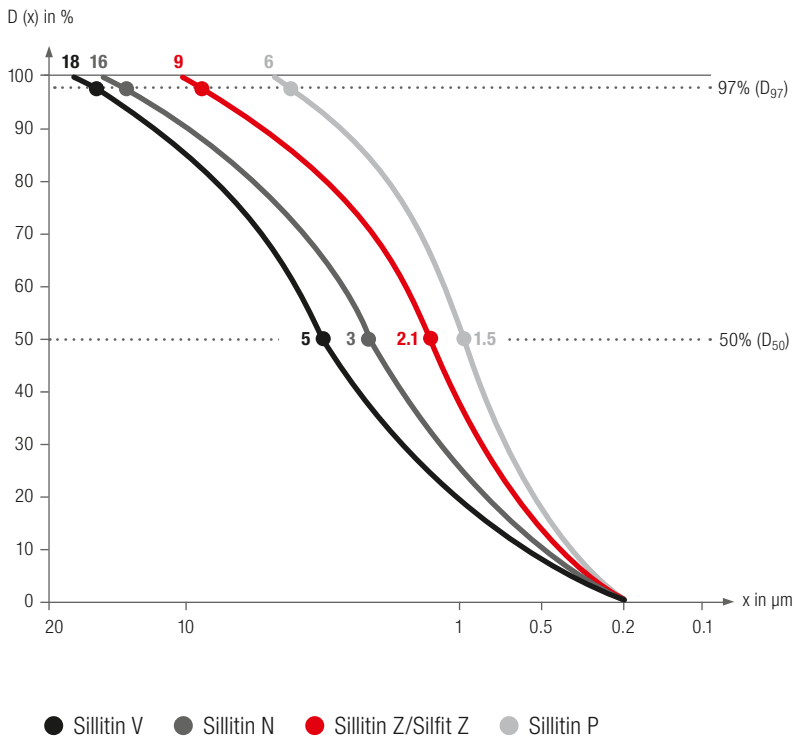
Basically speaking, our entire production process is a process of separation – only about 30% of the raw earth extracted is a usable fine product.

A particularly structure-conserving process separates the fine product from sand, sundry stones and rocks. In the first step, the raw material is dispersed in water and thus separated from gravel fractions. This is followed by the hydrocyclone unit which

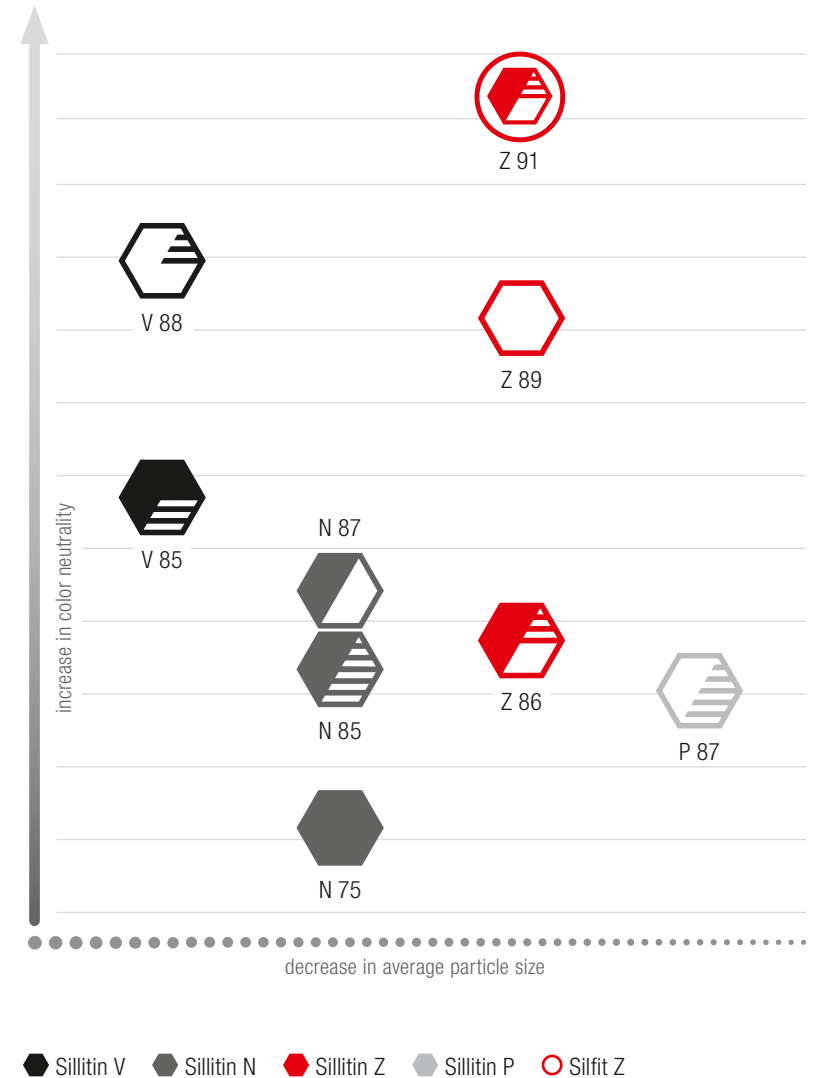
separates the sand fractions and divides the fine particles into different particle sizes. The slurry obtained is then concentrated and the water removed in filter presses. Finally, the natural gas powered turbine dryers remove the remaining moisture. The material is then pulverized and stored for further processing.

The particle size distribution, color value graphs and overview tables on the following pages show the physical properties and chemical composition of Neuburg Siliceous Earth. The most significant differentiating characteristics are particle size distribution and color neutrality.

Neuburg Siliceous Earth is available in four different particle fractions, identified by the letters V, N, Z and P.



In addition, classic Neuburg Siliceous Earth is available in different shades and colors ranging from yellow to off-white to white depending on the particle size distribution. This color neutrality is expressed in numbers.



**Sillitin**



Product characteristic	Unit	Sillitin V 85	Sillitin V 88	Sillitin N 75	Sillitin N 85	Sillitin N 87	Sillitin Z 86	Sillitin Z 89	Sillitin P 87
Color values	L*	93.5	95.0	88.0	93.5	94.0	94.0	96.1	94.5
	a*	1.0	0.5	4.5	1.0	1.0	1.0	0.2	0.9
	b*	9.0	5.0	20.0	9.0	9.0	9.5	4.2	9.0
Particle size	D <sub>50</sub>	5.0	5.0	3.0	3.5	3.5	2.1	2.1	1.5
	D <sub>97</sub>	18	18	16	17	17	9.5	9.5	6.5
Residue	> 40 µm	30	30	25	25	25	20	20	20
Residue	> 40 µm	30	30	25	25	25	20	20	20
Volatile matter at 105 °C	%	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
pH value		8.7	8.7	8.5	8.7	8.7	8.7	8.7	8.7
Density	g/cm <sup>3</sup>	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Bulk density	g/cm <sup>3</sup>	0.35	0.35	0.30	0.30	0.30	0.25	0.25	0.25
Tamped density	g/cm <sup>3</sup>	0.60	0.60	0.50	0.50	0.50	0.40	0.40	0.40
Spec. surface area (BET)	m <sup>2</sup> /g	10	9	12	11	11	13	11	14
Oil absorption	g/100 g	45	45	45	45	45	55	55	55
Hardness silica/kaolinite		7/2.5	7/2.5	7/2.5	7/2.5	7/2.5	7/2.5	7/2.5	7/2.5
Abrasivity	mg	40	40	40	35	35	30	30	25
Refractive index n		1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55
Water solubility	%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acid solubility	%	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chemical analysis:									
SiO <sub>2</sub>	%	87	88	83	84	84	82	82	80
Al <sub>2</sub> O <sub>3</sub>	%	8	8	10	10	10	12	12	14
Fe <sub>2</sub> O <sub>3</sub>	%	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1
Mineralogical composition:									
Neuburg Silica	%	70	70	60	65	65	60	60	55
Kaolinite	%	17	17	25	20	20	25	25	30
Amorphous mineral phases	%	8	8	10	10	10	10	10	10
Other minerals	%	5	5	5	5	5	5	5	5

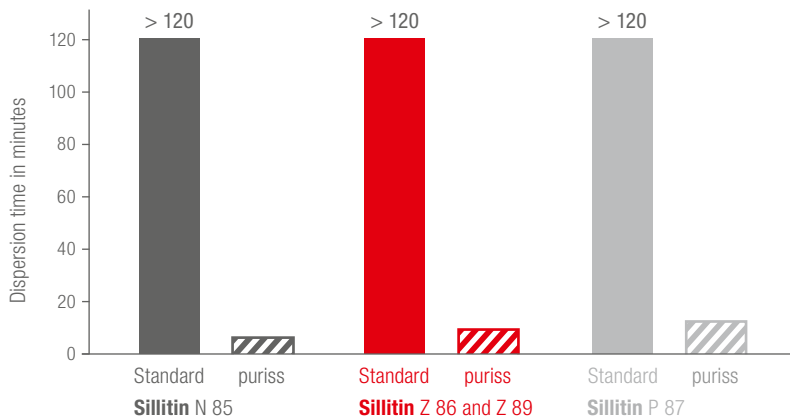
The values shown in the table are to be considered as guide values only.  
 Material specifications for each product are binding and are available on our website  
[www.hoffmann-mineral.com](http://www.hoffmann-mineral.com).

EINECS no.: 310-127-6  
 CAS no.: 1020665-14-8 (Siliceous Earth)  
 CAS no.: 7631-86-9 (silica), 1318-74-7 (kaolinite)  
 TSCA no.: 7631-86-9 (silica), 1318-74-7 (kaolinite)

**Puriss**

- The extremely low residue of > 40 µm is significantly reduced even more
- Reduction of wear when processing through optimum dispersion in low viscosity compounds
- puriss products are the #1 choice for extremely high requirements in terms of dispersion performance and surface quality for application in elastomers and thermoplastic elastomers:
  - low viscosity compounds with high dose of plasticizer
  - extremely thin-walled products like membranes
  - printing roller coverings, printing stencils, offset printing blankets
  - low durometer automotive profiles with Class A surface quality

Stirred with blade mixer 1200 rpm, 20% filler concentration, grain size (Hegman gauge) ≤ 20 µm.



Product characteristic










Product characteristic	Unit	Sillitin N 85 puriss	Sillitin Z 86 puriss	Sillitin Z 89 puriss	Sillitin P 87 puriss
Color values	L*	93.5	94.0	96.1	94.5
	a*	1.0	1.0	0.2	0.9
	b*	9.0	9.5	4.2	9.0
Particle size	D <sub>50</sub>	3.0	1.9	2.1	1.5
	D <sub>97</sub>	16	9	9.5	6
Residue > 40 µm	mg/kg	8	8	8	8
Volatile matter at 105 °C	%	0.5	0.5	0.5	0.5
pH value		8.7	8.7	8.7	8.7
Density	g/cm <sup>3</sup>	2.6	2.6	2.6	2.6
Bulk density	g/cm <sup>3</sup>	0.28	0.23	0.20	0.20
Tamped density	g/cm <sup>3</sup>	0.48	0.37	0.34	0.34
Oil absorption	g/100g	45	55	55	55
Hardness silica/kaolinite		7/2.5	7/2.5	7/2.5	7/2.5
	Abrasivity	mg	35	30	30
Refractive index n		1.55	1.55	1.55	1.55
Water solubility	%	< 0.5	< 0.5	< 0.5	< 0.5
Acid solubility	%	< 1	< 1	< 1	< 1
Dispersion time in ester plasticizer	min	3	7	7	8
Chemical analysis:					
SiO <sub>2</sub>	%	84	82	82	80
Al <sub>2</sub> O <sub>3</sub>	%	10	12	12	14
Fe <sub>2</sub> O <sub>3</sub>	%	< 1	< 1	< 1	< 1
Mineralogical composition:					
Neuburg Silica	%	65	60	60	55
Kaolinite	%	20	25	25	30
Amorphous mineral phases	%	10	10	10	10
Other minerals	%	5	5	5	5

The values shown in the table are to be considered as guide values only. Material specifications for each product are binding and are available on our website [www.hoffmann-mineral.com](http://www.hoffmann-mineral.com).

## Product characteristics

### Aktisil

These special fillers are made by treating the surface of Neuburg Siliceous Earth with additives.

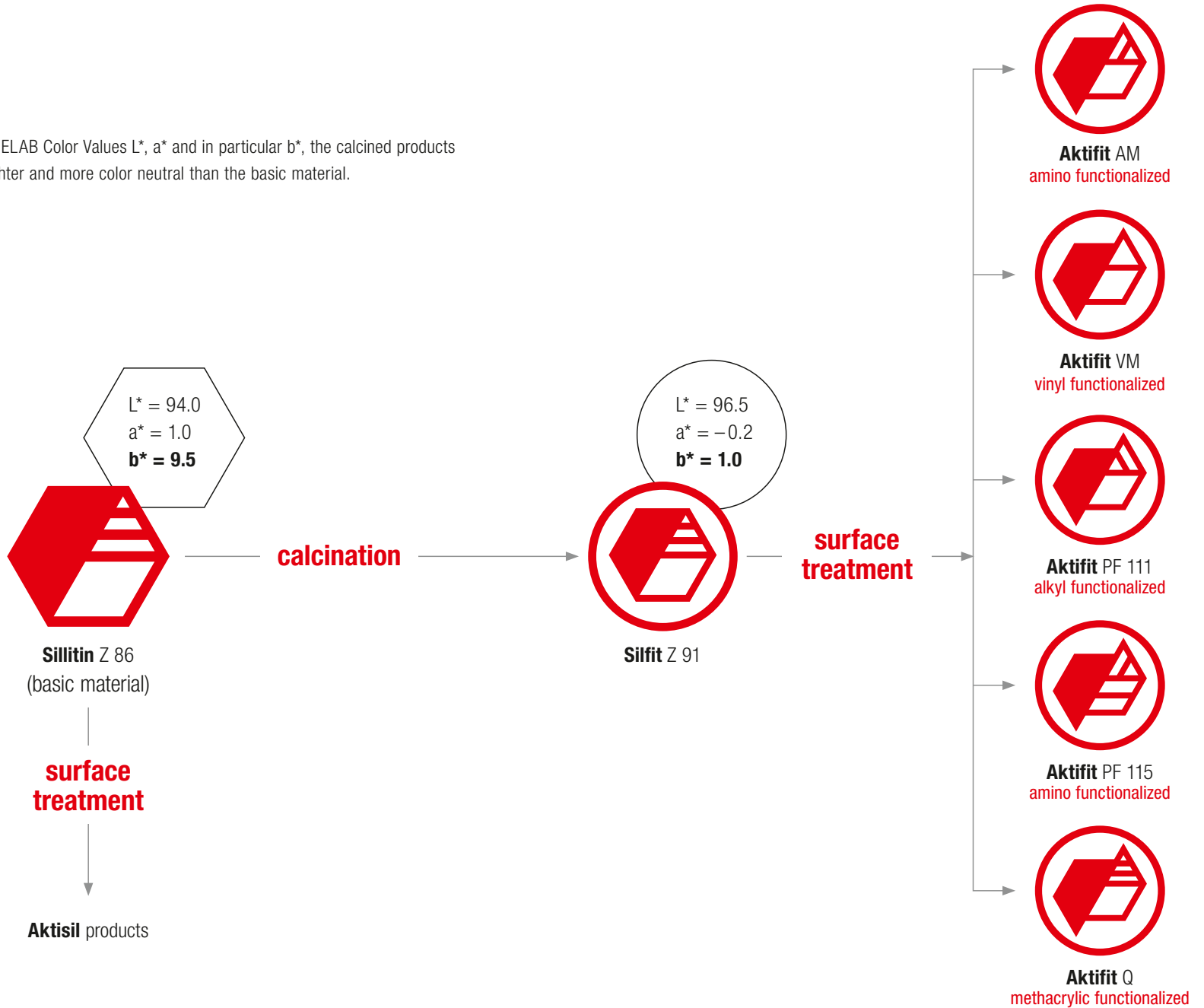
Product characteristic	Unit									
		Aktisil AM	Aktisil AM/89	Aktisil MAM-R	Aktisil PF 216	Aktisil PF 777	Aktisil PF 777/89	Aktisil Q	Aktisil VM 56	Aktisil VM 56/89
Basic material Sillitin		Z 86	Z 89	V 85	Z 86	Z 86	Z 89	V 90 <sup>1</sup>	Z 86	Z 89
Functionalization		Amino	Amino	Methacrylic	Tetrasulfane	Alkyl	Alkyl	Methacrylic	Vinyl	Vinyl
Color values	L*	94.0	96.0	93.0	94.0	93.8	96.0	94.5	94.0	96.0
	a*	1.0	0.1	1.0	1.0	1.0	0.2	0.3	1.0	0.2
	b*	10.0	3.6	9.0	10.0	10.0	4.2	4.0	10.0	3.7
Particle size	D <sub>50</sub>	2.4	2.4	5.0	2.4	2.4	2.1	5.0	2.4	2.4
	D <sub>97</sub>	12	10	18	12	12	10	18	12	12
Residue > 40 µm	mg/kg	30	30	30	15	20	15	25	15	15
Volatile matter at 105 °C	%	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.5	0.5
Density	g/cm <sup>3</sup>	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Bulk density	g/cm <sup>3</sup>	0.22	0.22	0.35	0.25	0.25	0.3	0.45	0.25	0.25
Spec. surface area (BET)	m <sup>2</sup> /g	10	9	9	10	9	8	6	9	8
Oil absorption	g/100 g	60	60	45	60	40	35	43	45	45
Water absorption	ml/g	not specified	not specified	0.9	≤ 0.1	≤ 0.1	≤ 0.1	0.5	not specified	not specified
Reactive		✓	✓	✓	✓			✓	✓	✓
Hydrophobic					✓	✓	✓			







<sup>1</sup> internal product quality

The values shown in the table are to be considered as guide values only. Material specifications for each product are binding and are available on our website [www.hoffmann-mineral.com](http://www.hoffmann-mineral.com).

**Silfit | Aktifit**

With regard to the CIELAB Color Values  $L^*$ ,  $a^*$  and in particular  $b^*$ , the calcined products are significantly brighter and more color neutral than the basic material.











Product characteristic	Unit	 Silfit Z 91	 Aktifit AM	 Aktifit PF 111	 Aktifit PF 115	 Aktifit Q	 Aktifit VM
Basic material		Sillit Z 86	Silfit Z 91	Silfit Z 91	Silfit Z 91	Silfit Z 91	Silfit Z 91
Functionalization		–	Amino	Alkyl	Amino	Methacrylic	Vinyl
Color values							
L*		96.5	96.3	96.3	95.7	96.3	96.3
a*		–0.2	–0.1	–0.1	0	–0.1	–0.1
b*		1.0	1.1	1.0	1.0	1.1	1.0
Particle size							
D <sub>50</sub>	µm	2.1	2.3	2.3	2.3	2.3	2.3
D <sub>97</sub>	µm	9.5	11	11	11	11	11
Residue > 40 µm	mg/kg	10	10	10	10	20	10
Volatile matter at 105 °C	%	0.2	0.2	0.2	0.1	0.2	0.1
Density	g/cm <sup>3</sup>	2.6	2.6	2.6	2.6	2.6	2.6
Bulk density	g/cm <sup>3</sup>	0.3	0.31	0.35	0.35	0.35	0.37
Tamped density	g/cm <sup>3</sup>	0.55	0.55	0.65	0.7	0.6	0.7
Spec. surface area (BET)	m <sup>2</sup> /g	10	9	9	9	8	10
Oil absorption	g/100 g	65	65	55	60	65	65
Silica hardness/calced kaolinite		7/4.5	7/4.5	7/4.5	7/4.5	7/4.5	7/4.5
Refractive index n		1.55	1.55	1.55	1.55	1.55	1.55
Water solubility	%	< 0.5	< 0.5	not applicable	not applicable	not applicable	not applicable
Acid solubility	%	< 1	< 1	not applicable	< 1	not applicable	not applicable
pH value		6.5	not applicable	not applicable	not applicable	not applicable	not applicable
Water absorption	ml/g	not specified	not specified	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
Chemical analysis:							
SiO <sub>2</sub>	%	86	86	86	86	86	86
Al <sub>2</sub> O <sub>3</sub>	%	13	13	13	13	13	13
Fe <sub>2</sub> O <sub>3</sub>	%	< 1	< 1	< 1	< 1	< 1	< 1
Mineralogical composition:							
Neuburg Silica	%	60	60	60	60	60	60
Calcined kaolinite	%	40	40	40	40	40	40
Equilibrium moisture content at 25 °C and 50% relative humidity	%	0.12	0.11	0.07	0.04	0.04	0.05
and 80% relative humidity	%	0.22	0.29	0.10	0.06	0.06	0.07
and 90% relative humidity	%	0.54	0.55	0.13	0.07	0.07	0.08
Reactive			✓		✓	✓	✓
Hydrophobic				✓	✓	✓	✓



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EINECS no.: 310-127-6  
 TSCA no.: 7631-86-9 (silica),  
 92704-41-1 (kaolin, calcined)

CAS no.: 1214268-39-9 (Siliceous Earth, calcined)  
 CAS no.: 7631-86-9 (silica),  
 92704-41-1 (kaolin, calcined)


Product	Paper bag	EVA-bag	Big Bag Type 1/ Type 2/Type 3	Bulk
 Sillitin V 85	25 kg	5 to 20 kg	≤ 750/850/1200 kg	≤ 25 t
 Sillitin V 88	25 kg	5 to 20 kg	≤ 750/850/1200 kg	≤ 25 t
 Sillitin N 75	25 kg	5 to 20 kg	≤ 750/850/1200 kg	≤ 25 t
 Sillitin N 85	25 kg	5 to 20 kg	≤ 750/850/1200 kg	≤ 25 t
 Sillitin N 87	25 kg	5 to 20 kg	≤ 750/850/1200 kg	≤ 25 t
 Sillitin Z 86	25 kg	5 to 20 kg	≤ 600/750/1000 kg	≤ 22 t
 Sillitin Z 89	25 kg	5 to 20 kg	≤ 550/700/900 kg	≤ 22 t
 Sillitin P 87	25 kg	5 to 15 kg	≤ 550/700/900 kg	≤ 22 t

### Puriss






 Sillitin puriss	25 kg	–	–	–
 Sillitin P 87 puriss	20 kg	–	–	–

### Aktisil

 Aktisil AM	25 kg	5 to 20 kg	≤ 550/700/900 kg	–
 Aktisil AM/89	on request	on request	on request	on request
 Aktisil MAM-R	25 kg	5 to 20 kg	≤ 550/700/900 kg	–
 Aktisil PF 216	25 kg	10 to 20 kg	≤ 550/700/900 kg	–
 Aktisil PF 777	25 kg	5 to 20 kg	≤ 550/700/900 kg	–
 Aktisil PF 777/89	25 kg	5 to 20 kg	≤ 550/700/900 kg	–
 Aktisil Q	25 kg	5 to 20 kg	≤ 550/700/900 kg	–
 Aktisil VM 56	25 kg	5 to 20 kg	≤ 550/700/900 kg	≤ 24 t
 Aktisil VM 56/89	25 kg	5 to 20 kg	≤ 550/700/900 kg	–

Product	Paper bag	EVA-bag	Big Bag Type 1/ Type 2/Type 3	Bulk
 Silfit Z 91	25 kg	10 to 20 kg	≤ 600/750/900 kg	on request

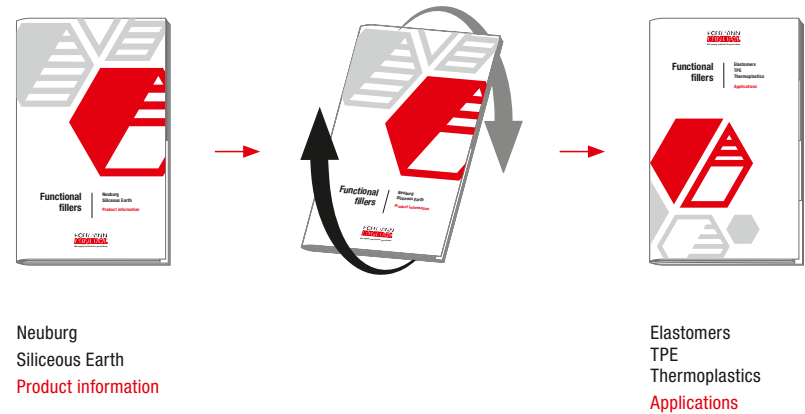
### Aktifit

 Aktifit AM	25 kg	on request	≤ 600/750/900 kg	on request
 Aktifit PF 111	25 kg	on request	on request	–
 Aktifit PF 115	25 kg	on request	on request	–
 Aktifit Q	25 kg	on request	on request	–
 Aktifit VM	25 kg	on request	≤ 550/900/– kg	–

Special packaging and sizes are available on request.

Product characteristic	Testing method
Color values L* a* b*	acc. to CIELAB
Particle size D <sub>50</sub> D <sub>97</sub>	acc. to ISO 13320
Residue > 40 µm	acc. to DIN EN ISO 787 part 18
Volatile matter at 105 °C	acc. to DIN EN ISO 787 part 2
Density Bulk density Tamped density	acc. to DIN EN ISO 787 part 10 acc. to DIN ISO 903-1976 acc. to DIN EN ISO 787 part 11
Spec. surface area (BET) Oil absorption	acc. to DIN ISO 9277 acc. to DIN EN ISO 787 part 5
Water absorption	acc. to Baumann
Hardness silica/kaolinite Abrasivity	acc. to Mohs acc. to Einlehner
Refractive index n	sin α/sin β
Water solubility Acid solubility	acc. to DIN EN ISO 787 part 3 acc. to DIN 53 770 (0.1 N HCl)
pH value	acc. to DIN EN ISO 787 part 9
Chemical analysis: SiO <sub>2</sub> Al <sub>2</sub> O <sub>3</sub> Fe <sub>2</sub> O <sub>3</sub>	acc. to DIN 51001 (RFA)
Mineralogical composition: Crystalline silica Amorphous mineral phases Kaolinite and other minerals	based on X-ray diffraction pattern analysis combined with Rietveld
Equilibrium moisture content at 25 °C and 50% relative humidity and 80% relative humidity and 90% relative humidity	following DIN 66138
Dispersion time in ester plasticizer	UGR-PV/PT/67

To find out more about the applications, close the brochure now and turn it so that the application section is in front of you.



# Functional fillers

Elastomers  
TPE  
Thermoplastics

**Applications**



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## Advantages in elastomers

### Properties of Neuburg Siliceous Earth

#### Advantages for users





easily and rapidly mixed in, very good dispersion properties	> short mixing times, no agglomerates
high degree of filling	> low compound costs
good rheology	> molds with high number of cavities
good extrusion properties, good calendering properties	> high haul-off speeds with good surface quality for high quality extrusions and sheets, cost reduction through no or low need for auxiliary processing aids
matting effect	> high quality appearance with satin finish of black profiles
no negative influence on cure rate, good thermal conductivity	> short vulcanization time, high haul-off speed for continuous vulcanization
excellent surface	> visually perfect articles, few rejects
low tension and compression set	> excellent sealing properties
high electrical resistivity	> insulation with low loss
favorable aging properties	> long service life, cost reduction through low need for anti-aging agents
superior chemical resistance	> high resistance against aggressive media
high purity	> can be used in pharmaceutical articles and food contact materials
very low CO <sub>2</sub> -footprint	> reduction of product carbon footprint of rubber compounds

### Properties of Calcined Neuburg Siliceous Earth















#### Advantages for users

low moisture content, low moisture absorption	> lower risk of blistering for pressureless vulcanization
lowest chloride content	> prevention of corrosion e.g. at washing machine gaskets
very high brightness and color neutrality	> for white products without yellowness, less need for white pigments like titanium dioxide
optimum dispersion properties even in critical compounds, comparable with puriss products	> short mixing times, no agglomerates
avoids mold fouling/deposits on dies caused by filler	> high productivity and low costs thanks to reduction of stoppages for cleaning and prevention of waste
very fine cell structure in sponge and microcellular rubber	> high quality sponge and expanded rubber products
low dielectric loss in high voltage insulation	> reduced energy losses in electric power transmission
potential for lower compression set	> improved long-term sealing effect, for greater flexibility in creating recipes
potential for improved oil resistance	> combined with the very low compression set for meeting high demands for sealing
very low CO <sub>2</sub> -footprint	> reduction of product carbon footprint of rubber compounds

**Sillitin | Silfit**

	 <b>Sillitin</b> V 85	 <b>Sillitin</b> V 88	 <b>Sillitin</b> N 75	 <b>Sillitin</b> N 85	 <b>Sillitin</b> N 87	 <b>Sillitin</b> Z 86	 <b>Sillitin</b> Z 89	 <b>Silfit</b> Z 91	 <b>Sillitin</b> P 87
Color neutrality	● ●	● ● ● ● ● ●	●	● ●	● ● ● ●	● ●	● ● ● ● ● ●	● ● ● ● ● ● ● ●	● ●
Extrusion	Profile quality, edge smoothness of complex profiles	●	●	● ● ● ●	● ●	● ●	● ● ● ●	● ● ● ● ○	● ● ● ● ● ●
	Collapse resistance	●	●	● ● ● ●	● ●	● ●	● ● ● ●	● ● ● ●	● ● ● ● ● ●
	Matting effect	● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ●	● ●	●
Viscosity	●	●	● ● ● ●	● ●	● ●	● ● ● ●	● ● ● ●	● ● ● ● ○	● ● ● ● ● ●
Tensile strength	●	●	● ● ● ●	● ●	● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ● ● ●
Tear resistance	●	●	● ● ● ●	● ●	● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ● ● ●
Compression set	●	●	● ● ● ●	● ●	● ●	● ● ● ●	● ● ● ●	● ● ○	● ● ● ● ● ●
Rebound elasticity	● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ●	● ●	● ●	●
Abrasion loss	● ● ● ● ● ●	● ● ● ● ● ●	● ●	● ● ● ●	● ● ● ●	● ●	● ●	● ●	●

Characteristic: respectively ● = low ● ● ● ● ● ● ● ● = high optimum

Product	Basic material	Functionalization	Sulphur/sulphur donors	Metal oxide	Resin, IIR	Peroxide, radiation	NR, SBR, BR, IR, NBR, HNBR (partly hydrogenated), CR, IIR, CIIR, BIIR	HNBR (fully hydrogenated) CM, CSM, EPM, EVM	EPDM	FKM, ACM, AEM (Vamac®)	Silicone compounds	PU-elastomers
 Aktisil AM	Sillitin Z 86	Amino	●	●		●	●	●	●	●		●
 Aktisil AM/89	Sillitin Z 89	Amino	●	●		●	●	●	●	●		●
 Aktisil MAM-R	Sillitin V 85	Methacrylic			●	●	●	●	●			
 Aktisil PF 216	Sillitin Z 86	Tetrasulfane	●	●	●		●		●			
 Aktisil PF 777	Sillitin Z 86	Alkyl	●	●	●	●	●	●	●			
 Aktisil PF 777/89	Sillitin Z 89	Alkyl	●	●	●	●	●	●	●			
 Aktisil Q	Sillitin V 90 <sup>1</sup>	Methacrylic			●	●	●	●	●	●	●	
 Aktisil VM 56	Sillitin Z 86	Vinyl	●		●	●		●	●	●		
 Aktisil VM 56/89	Sillitin Z 89	Vinyl	●		●	●		●	●	●		
 Aktifit AM	Sifit Z 91	Amino	●	●	●	●	●	●	●	●		●
 Aktifit PF 111	Sifit Z 91	Alkyl	●	●	●	●	●	●	●	●		
 Aktifit PF 115	Sifit Z 91	Amino	●	●	●	●	●	●	●	●		●
 Aktifit Q	Sifit Z 91	Methacrylic	●		●	●	●	●	●	●	●	
 Aktifit VM	Sifit Z 91	Vinyl	●		●	●		●	●	●	●	










● = possible ● = recommendation

<sup>1</sup> internal product quality  
Specialties available on request






Technical data sheets and material specifications for the above-mentioned products are available on our website [www.hoffmann-mineral.com](http://www.hoffmann-mineral.com).

These special fillers are based on Neuburg Siliceous Earth, the surface of which is treated with additives.

The Aktisil and Aktifit products have largely functional groups that enable covalent bonds or intensive interaction with the polymer matrix and produce special effects.

Product name	Application
 Aktisil AM	elastomer-metal composite bearings for vibration isolation, PU elastomers (solid rubbers), roller coverings, seals for pharmaceuticals, sponge rubber, car body seals, window and façade sealing, radiator hoses, cable sheaths, seals and O-rings
 Aktisil AM/89	same as AM but for greater color neutrality requirements
 Aktisil MAM-R	like Aktisil Q, but for lesser color neutrality requirements and mechanical properties
 Aktisil PF 216	car body seals, hydraulic and fuel hoses, condenser seals, seals and O-rings, roller coverings, solid tires, full rubber tires, timing belts, bearings for vibration isolation
 Aktisil PF 777	products for which an extremely hydrophobic filler is required to minimize water absorption, e.g. anti-corrosion strips and adhesion primers, sealing tape or sheets, or where a reduction in viscosity must be achieved without processing agents
 Aktisil PF 777/89	same as PF 777 but for greater color neutrality requirements
 Aktisil Q	silicone compounds, silicone turbocharger hoses, seals and molded parts based on HNBR, EPDM, FKM and AEM (Vamac®), improvement of oil resistance, condenser seals based on resin-cured butyl rubber
 Aktisil VM 56	window and façade sealing, low-voltage cable sheaths and insulation, radiator hoses, seals, O-rings, sponge rubber, timing belts, roller coverings
 Aktisil VM 56/89	same as VM 56 but for greater color neutrality requirements

The following properties can be significantly improved: tensile strength, tensile modulus, tension and compression set, abrasion resistance, resistance to fluids, electrical resistivity and dielectric loss after exposure to water.

Product name	Application
 Aktifit AM	like Aktisil AM, but with highest color neutrality, avoidance of mold fouling/deposits on dies caused by filler, lower compression set and improved oil resistance with amine crosslinking (AEM, Vamac®, ACM and BIIR), bisphenol crosslinking FKM, thermoplastic EVA and TPU compounds
 Aktifit PF 111	similar to PF 777, but with highest color neutrality, hydrophobic, avoidance of mold fouling/deposits on dies caused by filler, lower compression set, bisphenol crosslinking (FKM)
 Aktifit PF 115	similar to Aktifit AM, but less polar, highly hydrophobic
 Aktifit Q	like Aktisil Q, but with highest color neutrality, hydrophobic, avoidance of mold fouling/deposits on dies caused by filler, improved extrusion properties
 Aktifit VM	like VM 56 and VM 56/89, but with highest color neutrality, hydrophobic, avoidance of mold fouling/deposits on dies caused by filler, lower compression set, high-voltage cable and electrical applications with low dielectric loss, molded parts, peroxide crosslinking FKM

**Automotive**



**Molded gaskets, o-rings and radial shaft seals**

**Advantages:**

- very low sieve residue
- good mixing and dispersion properties
- long flow time with short vulcanization time
- easy deflashing
- low compression set
- good resistance against oil, water and acid
- avoidance of mold fouling caused by filler

	Sillitin N 75	Sillitin N 85	Sillitin Z 86	Sillitin P 87	Sifitt Z 91 <sup>A)</sup>
Dispersion	•••	••••	••••	••••	•••••
Wear	•••	•••	••	•	•••
Plating/Mold fouling	•	•	••	•••	no
Brightness	•	•••	•••	•••	•••••
Color neutrality	•	•••	•••	•••	•••••
Tensile strength	••	••	•••	••••	•••
Tear resistance	••••	••••	••••	•••••	••••
Compression set	••••	••••	••••	•••••	•••

<sup>A)</sup>less moisture than Sillitin; very fine cell structure in sponge rubber

**Specially for diamine crosslinking (ACM, AEM):**

	Aktisil Q
Tensile strength	••••
Moduli	••••
Compression set	•
Abrasion resistance	••••
Chemical resistance	••••

**Specially for sulphur and metaloxide crosslinking:**

	Aktisil PF 216	Aktisil AM	Aktifit AM <sup>A)</sup>
Cure rate	••••	•••••	•••••
Tensile strength	•••••	••••	••••
Moduli	•••••	•••••	•••••
Compression set	•	••	•
Abrasion resistance	•••••	•••••	•••••
Chemical resistance	•••••	••••	••••

<sup>A)</sup>less moisture than Aktisil

**Specially for peroxide crosslinking:**

	Aktisil VM 56	Aktisil VM 56/89	Aktisil Q <sup>A)</sup> / <sup>B)</sup>	Aktifit VM <sup>A)</sup>	Aktifit Q <sup>A)</sup>
Dispersion	••••	••••	••••	•••••	•••••
Color neutrality	•••	••••	•••••	•••••	•••••
Tensile strength	•••••	•••••	•••••	•••••	•••••
Moduli	•••••	•••••	•••••	•••••	•••••
Compression set	••	••	•	•	•
Abrasion resistance	•••••	••••	••••	•••••	•••••
Chemical resistance	••••	••••	••••	••••	••••

<sup>A)</sup>less moisture

<sup>B)</sup>lower viscosity; best product for silicone rubber

**Specially for FKM compounds:**

detailed information on page 36

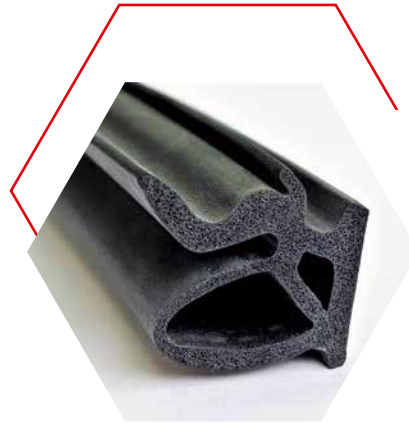
**Automotive**



**Car body seals, solid**

**Advantages:**

- good extrusion properties
- high surface quality
- low moisture content
- high tensile modulus
- low compression set
- high electrical resistance (compared with carbon black)
- avoids deposits on dies caused by filler



**EPDM profiles, foamed**

**Advantages:**

- good mixing and dispersion properties
- good extrusion properties
- high surface quality
- high electrical resistance
- cost reduction potential
- avoid deposits on dies caused by filler
- lower water absorption (compared with carbon black)

	Sillitin N 75	Sillitin N 85	Sillitin Z 86	Sillitin P 87	Silfit Z 91 <sup>A)</sup>	Aktisil PF 216	Aktifit AM <sup>A)</sup>
Dispersion	•••	••••	••••	••••	••••••	••••	••••••
Profile quality/extrusion speed	••••	•••	•••••	••••••	•••••	•••••	••••••
Collapse resistance	•••	•••	•••••	••••••	••••	•••••	••••
Wear	•••	•••	••	•	•••	••	•••
Plating/Mold fouling	•	•	••	•••	no	••	no
Brightness	•	•••	•••	•••	••••••	•••	••••••
Color neutrality	•	•••	•••	•••	••••••	•••	••••••
Matting	•••	•••	••	•	••	••	••
Tensile strength	•••	•••	••••	•••••	••••	••••••	••••••
Tear resistance	•••	•••	••••	•••••	••••	••	••
Moduli	••	••	•••	••••	••	••••••	••••
Compression set	•••	•••	••••	•••••	•••	•	•
Abrasion resistance	••	••	•••	••••	•••	••••••	••••

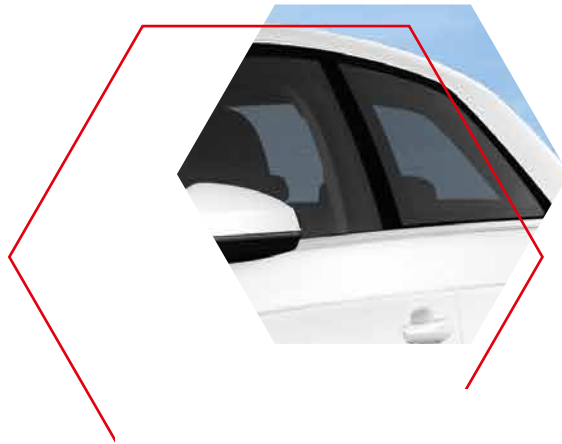
<sup>A)</sup>less moisture than Sillitin/Aktisil

	Sillitin N 75	Sillitin Z 86	Sillitin P 87	Aktisil PF 216	Aktifit PF 115 <sup>A)</sup>
EPDM profile, cellular – soft, chemically foamed					
Profile quality/extrusion speed	•••	••••	•••••	••••	••••
Plating/Mold fouling	•	••	•••	••	no
Wear	•••	••	•	••	••
Tensile strength	•••	•••	••••	••••	••••
Moduli	•••	•••	••••	•••••	•••••
Compression set	•••	•••	••••	••	••

<sup>A)</sup>less moisture than Sillitin/Aktisil

	Sillitin N 75	Sillitin Z 86	Aktisil PF 216	Aktisil AM
EPDM profile, cellular – hard, physically foamed				
Profile quality/extrusion speed	•••	••••	•••••	•••••
Plating/Mold fouling	•	••	••	••
Wear	•••	••	••	••
Tensile strength	•••	•••	••••	•••••
Moduli	•••	•••	••••	•••••
Compression set	•••	•••	••	••

**Automotive**



**Direct glazing of fixed side windows**

**Advantages:**

- good mixing and dispersion properties
- long flow time with short vulcanization time
- easy deflashing
- low compression set
- matting
- high surface quality and evenness
- prevention of mould fouling

	Sillitín Z 86	Sillitín Z 91 <sup>A)</sup>
Dispersion	••••	••••••
Plating/Mold fouling	•••	no
Compression set	•••	••

<sup>A)</sup>less moisture than Sillitín



**Radiator hoses**

**Advantages:**

- high extrusion speed
- high tensile modulus
- low compression set
- coolant resistance
- high electrical resistance
- avoids deposits on dies caused by filler

	Sillitín N 85	Sillitín Z 86	Sillitín Z 91 <sup>A)</sup>
Dispersion	••••	••••	••••••
Profile quality	•••	••••	••••
Wear	•••	••	•••
Plating/Mold fouling	•	••	no

<sup>A)</sup>less moisture than Sillitín

**Specially for sulphur crosslinking:**

	Aktisil AM	Aktifit AM <sup>A)</sup>
Cure rate	••••••	••••••
Tensile strength	••••••	••••••
Moduli	••••••	••••••
Compression set	•••	••
Abrasion resistance	••••	••••
Chemical resistance	••••	••••

<sup>A)</sup>less moisture than Aktisil

**Specially for peroxide crosslinking:**

	Aktisil VM 56	Aktifit VM <sup>A)</sup>	Aktifit Q <sup>A)</sup>
Tensile strength	••••	••••••	••••••
Moduli	••••	••••••	••••••
Compression set	••	••	•
Abrasion resistance	••••	••••	••••
Chemical resistance	••••	••••	••••

<sup>A)</sup>less moisture than Aktisil

**Automotive**



**Air intake hoses EPDM**

**Advantages:**

- quick conversion timer  $t_{90}$
- prevention of mould fouling
- low compression set
- cost reduction potential

	Sillitin N 75	Sillitin Z 86	Silfit Z 91 <sup>A)</sup>	Aktisil AM	Aktifit AM <sup>A)</sup>
Cure rate	•••	•••	••••	•••••	•••••
Plating/Mold fouling	•	••	no	••	no
Wear	•••	••	•••	••	•••
Compression set	•••	••••	•••	•••	••

<sup>A)</sup>less moisture than Sillitin/Aktisil



**HCR Silicone turbocharger hoses**

**Advantages:**

- high extrusion speed
- high collapse resistance for hose extrusion
- high tensile modulus
- low compression set
- heat resistance
- high oil resistance

	Aktisil Q
Collapse resistance	•••••
Moduli	•••••
Compression set	•
Heat resistance	•••••
Oil resistance	•••••

**Timing belts**

**Advantages:**

- good processing properties
- good adhesive strength to reinforcing materials
- good dynamic properties
- low compression set
- high oil resistance



Aktisil PF 216

Aktisil VM 56

	Aktisil PF 216	Aktisil VM 56
Compression set	••	••
Oil resistance	•••••	•••••
Sulfur and metaloxide crosslinking	•••••	•••
Peroxide crosslinking	•••	•••••



Aktisil VM 56

**Urea-resistant EPDM gaskets and hoses**

**Advantages:**

- short curing time
- high tensile modulus
- high surface quality
- improved collapse resistance for hose extrusion
- no blooming
- cost reduction potential
- great resistance against urea solution (AdBlue) and hot air aging

	Aktisil VM 56
Collapse resistance	•••••
Moduli	•••••
Heat resistance	•••••
Urea resistance	•••••

## Machine and equipment construction



### Washing machine gaskets and hoses

#### Advantages:

- long flow time with short vulcanization time
- good balance between tensile strength, tear resistance and compression set
- good suds resistance
- potential substitute for silica
- potential for reducing titanium dioxide and zinc oxide
- avoidance of mold fouling caused by filler
- very low chloride content

	Sillitín N 85	Sillitín Z 86	Sillitín P 87	Sillitín Z 91 <sup>A)</sup>
Dispersion	••••	••••	••••	••••••
Wear	•••	••	•	•••
Plating/Mold fouling	•	••	•••	no
Brightness	•••	•••	•••	••••••
Color neutrality	•••	•••	•••	••••••
Tensile strength	•••	•••	••••	•••
Tear resistance	•••	•••	••••	••••
Compression set	•••	••••	•••••	•••

<sup>A)</sup>less moisture than Sillitín, lowest chloride content



### Conveyor belt skim compounds

#### Advantages:

- good processing properties
- good calendering properties
- good adhesive strength to reinforcing materials
- high tensile modulus

	Sillitín N 75	Sillitín N 85	Sillitín Z 86
Dispersion	•••	••••	••••
Wear	•••	•••	••
Color neutrality	•	•••	•••



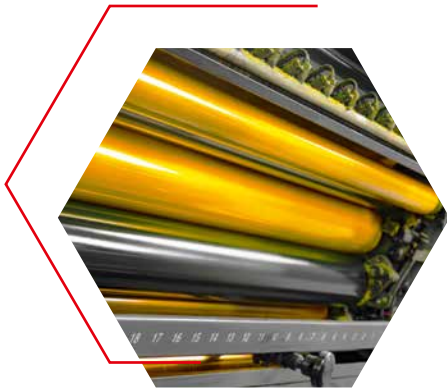
### Elastomer-metal composites

#### Advantages:

- improved elastomer-metal adhesive strength
- prevention of mould fouling

	Aktisil AM	Aktifit AM <sup>A)</sup>
Dispersion	••••	••••••
Plating/Mold fouling	••	no
Color neutrality	•••	••••••
Compression set	•••	••

<sup>A)</sup>less moisture than Aktisil



Sillitit N 85 (puriss)

Sillitit Z 86 (puriss)

Silfit Z 91<sup>A)</sup>

Dispersion	●●●● (●●●●●)	●●●● (●●●●●)	●●●●●
Wear	●●●	●●	●●
Plating/Mold fouling	●	●●	no
Brightness	●●●	●●●	●●●●●
Color neutrality	●●●	●●●	●●●●●

<sup>A)</sup>less moisture than Sillitit

### Roller coverings and printing blankets

#### Advantages:

- very low residue > 40 µm
- good mixing and dispersion properties
- good rubber-metal adhesive strength
- excellent grinding properties
- high surface quality
- good for laser engraving
- low dynamic heat build-up
- low compression set
- good resistance against solvents, oil, water, acid
- prevention of mould fouling

**Specially for FKM compounds:**  
 detailed information on page 36

### Specially for peroxide crosslinking

	Aktisil VM 56	Aktisil VM 56/89	Aktisil Q <sup>A)</sup> /B)	Aktifit VM <sup>A)</sup>	Aktifit Q <sup>A)</sup>
Dispersion	●●●	●●●	●●●	●●●●●	●●●●●
Color neutrality	●●	●●●	●●●●	●●●●●	●●●●●
Tensile strength	●●●●	●●●●	●●●●	●●●●	●●●●●
Moduli	●●●●	●●●●	●●●●	●●●●	●●●●●
Compression set	●●	●●	●	●	●
Abrasion resistance	●●●●	●●●	●●	●●●●	●●●●●
Chemical resistance	●●●	●●●	●●●	●●●	●●●
Dynamic heat build-up	●●	●●	●●	●●	●●

<sup>A)</sup>less moisture

<sup>B)</sup>lower viscosity; best product for silicone rubber

### Specially for sulphur and metaloxide crosslinking:

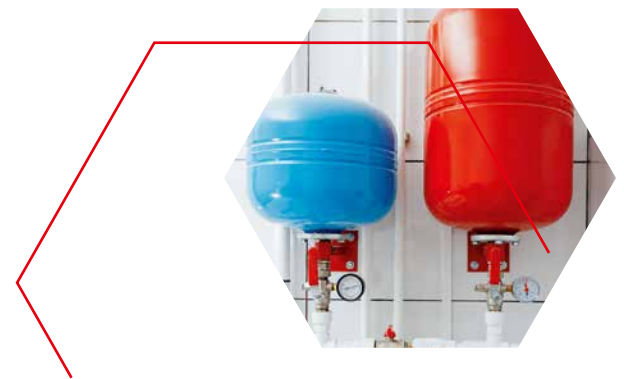
	Aktisil PF 216	Aktisil AM	Aktifit AM <sup>A)</sup>
Cure rate	●●●●	●●●●●	●●●●●
Tensile strength	●●●●●	●●●●	●●●●
Moduli	●●●●●	●●●●	●●●●
Compression set	●	●●	●
Abrasion resistance	●●●●	●●●	●●●
Chemical resistance	●●●●●	●●●	●●●
Dynamic heat build-up	●	●●	●●

<sup>A)</sup>less moisture than Aktisil

### Specially for diamine crosslinking (acm, aem):

	Aktisil AM	Aktifit AM <sup>A)</sup>
Dispersion	●●●	●●●●●
Tensile strength	●●●●	●●●●
Moduli	●●●●	●●●
Compression set	●●	●●
Abrasion resistance	●●●●	●●●
Chemical resistance	●●●●	●●●
Dynamic heat build-up	●●	●●

<sup>A)</sup>less moisture than Aktisil



### Diaphragms for expansion vessels

#### Advantages:

- low viscosity
- high tear resistance
- high elongation at break

	Sillitit Z 86
Viscosity	●●
Tear resistance	●●●●
Elongation at break	●●●●



**Hydraulic and fuel hoses, oil-resistant hoses in general**

**Advantages:**

- very good extrusion properties
- high surface quality
- high tensile modulus
- low compression set
- good resistance against fuels, oils, water, acids
- avoids deposits on dies caused by filler

	Sillitin Z 86	Silfit Z 91 <sup>A)</sup>
Dispersion	••••	••••••
Plating/Mold fouling	••	no
Brightness	•••	••••••
Color neutrality	•••	••••••
Compression set	•••••	•••

<sup>A)</sup>less moisture than Sillitin

**Specially for diamine crosslinking (ACM, AEM):**

	Aktisil AM	Aktifit AM <sup>A)</sup>
Dispersion	••••	••••••
Plating/Mold fouling	••	no
Tensile strength	••••••	••••••
Moduli	••••	••••
Compression set	••	••
Abrasion resistance	••••	••••
Chemical resistance	••••	••••

<sup>A)</sup>less moisture than Aktisil

**Specially for sulphur and metaloxide crosslinking:**

	Aktisil PF 216	Aktisil AM	Aktifit AM <sup>A)</sup>
Cure rate	••••	••••••	••••••
Dispersion	••••	••••	••••••
Plating/Mold fouling	••	••	no
Tensile strength	••••••	••••••	••••••
Moduli	••••••	••••••	••••••
Compression set	•	••	•
Abrasion resistance	••••••	••••	••••
Chemical resistance	••••••	••••	••••

<sup>A)</sup>less moisture than Aktisil

**Specially for peroxide crosslinking:**

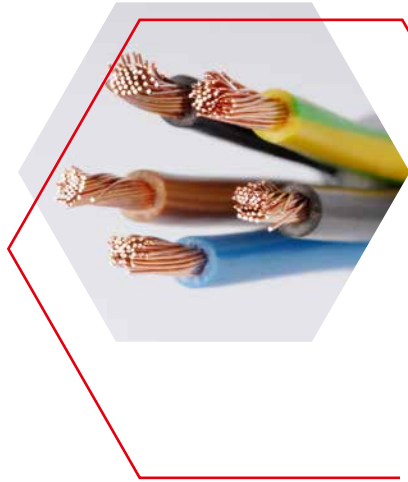
	Aktisil VM 56	Aktisil VM 56/89	Aktisil Q <sup>A)</sup> / <sup>B)</sup>	Aktifit VM <sup>A)</sup>	Aktifit Q <sup>A)</sup>
Dispersion	••••	••••	••••	••••••	••••••
Plating/Mold fouling	••	••	•	no	no
Color neutrality	•••	••••	••••••	••••••	••••••
Tensile strength	••••••	••••••	••••••	••••••	••••••
Moduli	••••	••••	••••	••••••	••••••
Compression set	•••	•••	••	••	•
Abrasion resistance	••••	••••	••••	••••	••••
Chemical resistance	••••	••••	••••••	••••	••••

<sup>A)</sup>less moisture

<sup>B)</sup>lower viscosity; best product for silicone rubber

**Specially for FKM compounds:**  
 detailed information on page 36

## Cable and electrical industry



### Cable sheaths, cable insulation

#### Advantages:

- very good extrusion properties
- medium to high tensile strength
- good compressive properties at high temperature
- good hot set properties
- high electrical resistivity, also after immersion in water
- very low dielectric loss, also after immersion in water, even without additional silane in the compound
- avoidance of deposits on dies caused by filler
- good resistance against oil, water, acids

	Sillitín Z 86	Silift Z 9T <sup>A)</sup>
Dispersion	••••	••••••
Plating/Mold fouling	••	no
Brightness	••••	••••••
Color neutrality	••••	••••••
Compression set	••••	••
Dielectric loss	••••	••

<sup>A)</sup>less moisture than Sillitín

### Specially for sulphur and metaloxide crosslinking:

	Aktisil PF 216	Aktisil AM	Aktifit AM <sup>A)</sup>
Dispersion	••••	••••	••••••
Plating/Mold fouling	••	••	no
Cure rate	••••	••••••	••••••
Tensile strength	••••••	••••••	••••••
Moduli	••••••	••••••	••••••
Compression set	•	••	•
Abrasion resistance	••••••	••••	••••
Chemical resistance	••••••	••••	••••

<sup>A)</sup>less moisture than Aktisil

### Specially for peroxide crosslinking

	Aktisil VM 56	Aktisil VM 56/69	Aktisil Q <sup>A)/B)</sup>	Aktifit VM <sup>A)</sup>
Dispersion	••••	••••	••••	••••••
Plating/Mold fouling	••	••	•	no
Color neutrality	••••	••••	••••••	••••••
Tensile strength	••••••	••••••	••••	••••••
Moduli	••••••	••••	••••	••••••
Compression set	••••	••••	••	••
Abrasion resistance	••••	••••	••••	••••
Chemical resistance	••••	••••	••••	••••
Electrical resistivity after exposure to water	••••••	••••••	••••••	••••••
Dielectric loss	••	••	••	• <sup>C)</sup>

<sup>A)</sup>less moisture than Aktisil

<sup>B)</sup>lower viscosity; best product for silicone rubber

<sup>C)</sup>even after storage in water; even without additional silane

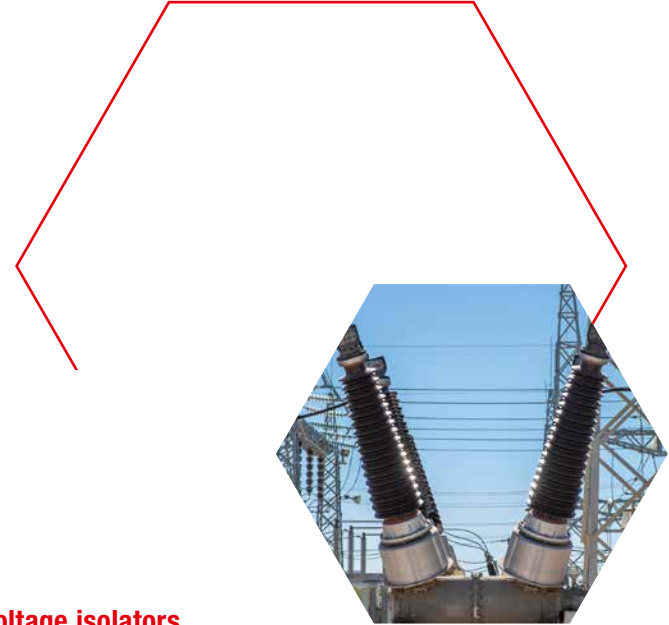


### Medium- and high voltage cable insulations

**Advantages:**

- very low sieve residues in ppm range
- excellent dispersion properties
- very good extrusion properties
- high tensile strength
- very high electrical resistivity, even after storage in water
- very low dielectric loss, even after storage in water, even without additional silane
- avoids mold fouling/deposits on dies caused by filler
- good resistance to oils, water and acids

	Sifit Z 91	Aktifit VM
Moisture	••	•
Increase in humid climatic conditions	low	no
Dispersion	•••••	•••••
Residue	•	•
Tensile strength	••••	••••
Electrical resistivity after exposure to water	•••	•••••
Dielectric loss after exposure to water	••	•



### High voltage isolators

**Advantages:**

- very low sieve residues in ppm range
- excellent dispersion properties
- high elongation at break
- high tear resistance
- very high electrical resistivity
- high tracking resistance

	Aktisit Q	Aktifit VM
Cure rate	••••	••••
Tensile strength	••••	••••
Elongation at break	••••	••••
Tear resistance	••••	••••
Electrical resistivity	••••	••••
Tracking resistance	••••	••••

**Capacitor gaskets**

**Advantages:**

- very low sieve residue
- very low chloride content
- long flow time with short vulcanization time
- high tensile modulus
- low compression set
- good hot air aging properties
- prevention of mould fouling
- sealing tightness at high soldering temperatures



**Specially for peroxide cross-linked EPDM compounds:**

	Aktisil VM 56	Aktifit VM <sup>A)</sup>
Processing properties	●●●●	●●●●●
Plating/Mold fouling	●●	no
Moduli	●●●●	●●●●●
Compression set	●●●	●●
Ageing properties	●●●	●●●●

<sup>A)</sup>less moisture than Aktisil

**Specially for resin crosslinking of butyl rubber (IIR):**

	Aktisil VM 56	Aktisil MAM-R	Aktifit VM <sup>A)</sup> / <sup>B)</sup>
Processing properties	●●●●	●●●●	●●●●●
Moduli	●●●●	●●●●●	●●●●●
Compression set	●●	●	●
Ageing properties	●●●	●●●●	●●●●
Electrical resistivity	●●●●●	●●●●●	●●●●●

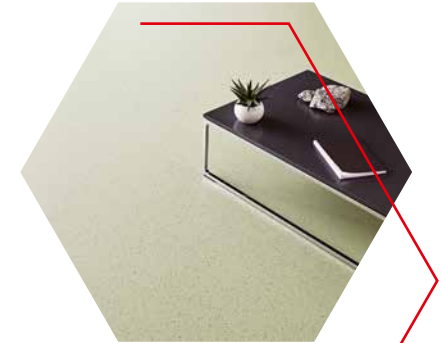
<sup>A)</sup>less moisture than Aktisil

<sup>B)</sup>counterpart to surface-treated calcined kaolin with improved processing, better aging properties and lower compression set

**Floor coverings**

**Advantages:**

- good mixing and dispersion properties
- good calendaring properties
- long flow time, short vulcanization time
- low residual indentation
- less white scratch marks
- high surface quality
- high abrasion resistance
- good resistance to aggressive substances



	Sillitrim N 87 <sup>A)</sup>	Sillitrim Z 86 <sup>B)</sup>	Sillitrim Z 89 <sup>B)</sup>
Brightness	●●●	●●●	●●●●
Color neutrality	●●●	●●●	●●●●
Abrasion resistance	●●●	●●●●	●●●●

<sup>A)</sup>standard product

<sup>B)</sup>preferably with replacement of silica and existing filler in combination with silane



**Roofing membranes**

**Advantages:**

- good calendaring properties
- high tensile modulus
- good resistance to aggressive substances such as acids and other chemicals

	Sillitrim N 75	Sillitrim N 85	Sillitrim Z 86	Sillitrim Z 89
Dispersion	●●●	●●●●	●●●●	●●●●
Brightness	●	●●●	●●●	●●●●
Color neutrality	●	●●●	●●●	●●●●
Wear	●●●	●●●	●●	●●
Compression set	●●●	●●●	●●●●	●●●●



### Anti-corrosion lining

#### Advantages:

- good processing properties
- good calendering properties
- good resistance to aggressive substances such as acids and other chemicals

	Sillitín N 75	Sillitín N 85	Sillitín Z 86	Aktisil PF 777 <sup>A)</sup> (B)	Aktifit PF 111 <sup>A)</sup> (B)
Dispersion	•••	••••	••••	••••	•••••
Brightness	•	•••	•••	•••	•••••
Color neutrality	•	•••	•••	•••	•••••
Wear	•••	•••	••	••	•••
Compression set	•••	•••	••••	••	••
Water swelling of non-crosslinked corrosion protection tapes	•••	•••	•••	•	•
Adhesion to steel	•••	•••	•••	••••	••••
Hydrophobicity	no	no	no	yes	yes

<sup>A)</sup>less moisture than Sillitín

<sup>B)</sup>filler for non-crosslinked butyl corrosion protection tapes with minimized water swelling, hydrophobic filler for adhesion primers with improved adhesion to steel



### Building profiles (window and façade sealing)

#### Advantages:

- low to very low moisture content
- enables high loading of filler and plasticizer
- excellent extrusion properties
- avoids deposits on dies caused by filler
- high surface quality
- high tensile modulus
- low compression set

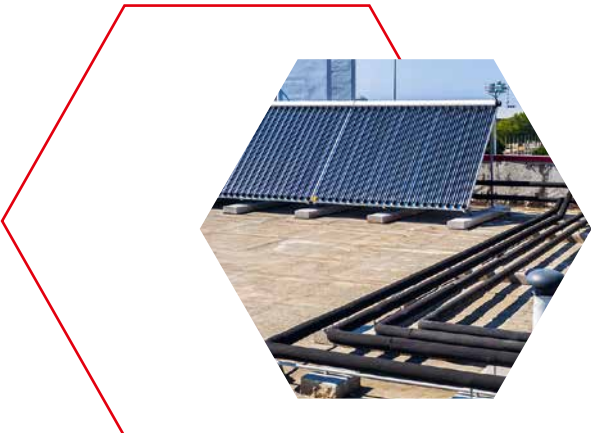
	Sillitín Z 86	Sillitín P 87	Aktisil VM 56 <sup>C)</sup>	Sillitín Z 89	Aktisil VM 56/89 <sup>C)</sup>	Sifit Z 91 <sup>A)</sup>	Aktifit VM <sup>B)</sup> (C)
Dispersion	••••	••••	••••	••••	••••	•••••	•••••
Profile quality/extrusion speed	•••	••	••••	••••	•••••	•••••	•••••
Collapse resistance	••••	•••••	••••	••••	••••	••	••
Plating/Mold fouling	••	•••	••	••	••	no	no
Potential for increase loading of filler and plasticizer	•••	•••	••••	•••	••••	•••	••••
Brightness	•••	•••	•••	••••	••••	•••••	•••••
Color neutrality	•••	•••	•••	••••	••••	•••••	•••••
Tensile strength	•••	••••	•••••	••	•••••	••	•••••
Tear resistance	•••••	•••••	••	•••••	••	••••	••
Moduli	•••	••••	•••••	••	•••••	••••	•••••
Compression set	•••	••••	••	•••	••	••	•

<sup>A)</sup>less moisture than Sillitín, very fine cell structure in sponge rubber

<sup>B)</sup>less moisture than Sifit

<sup>C)</sup>lower peroxide dosage possible

**Construction industry**



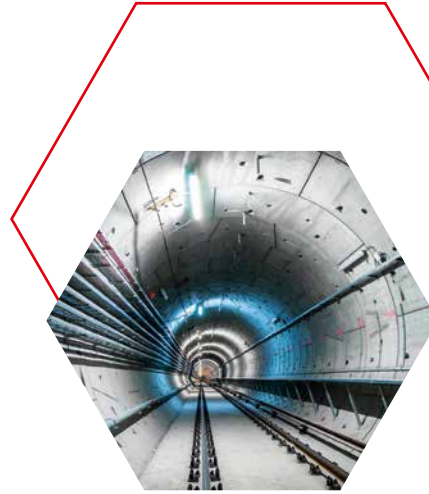
**Solar panel tubes for swimming pools**

**Advantages:**

- high extrusion speed with good contour shaping and smooth surfaces
- low compression set
- high tensile strength
- high filler concentration for high thermal conductivity
- avoids deposits on dies caused by filler

	Aktisil VM 56	Aktifit VM <sup>A)</sup>
Extrusion properties	••••	••••••
Plating/Mold fouling	••	no
Brightness	••••	••••••
Color neutrality	••••	••••••
Tensile strength	••••	••••
Compression set	••	•
Hydrophobicity	no	yes

<sup>A)</sup>less moisture than Aktisil



**Sealing profiles for road and tunnel construction**

**Advantages:**

- very good extrusion properties
- low moisture content
- low compression set

	Sillitn N 75	Sillitn N 85	Sillitn Z 86
Dispersion	•••	••••	••••
Brightness	•	•••	•••
Color neutrality	•	•••	•••
Wear	•••	•••	••
Compression set	•••	••	••••

**Sealing tape**

**Advantages:**

- good processing properties
- good calendering properties
- balanced ratio of tensile stress/modulus/tear resistance



	Sillitn N 75	Aktisil PF 777 <sup>A)</sup>	Aktifit PF 111 <sup>A)</sup>
Brightness	•	••••	••••••
Color neutrality	•	••••	••••••
Water absorption (also in unvulcanized state)	•••	•	•
Moduli	••	•	••
Hydrophobicity	no	yes	yes

<sup>A)</sup>less moisture than Sillitn

**Other applications**



**FKM Compounds**

**Advantages:**

- very low sieve residue
- good mixing and dispersion properties
- high tensile strength
- high abrasion resistance
- long flow time with short vulcanization time
- good resistance to substances (fuel, oil, water, acid)
- low compression set
- easy deflashing
- avoidance of mold fouling on dies caused by filler

**Bisphenol crosslinking:**

	Sillitín V 85	Aktisil Q	Aktisil AM
Plating/Mold fouling	•	•	no
Tensile strength	•••	•••••	•••••
Elongation at break	•••••	••••	••
Moduli	••	•••••	•••••
Tear resistance	•••	••	••
Compression set	••	••	••
Abrasion resistance	••••	••••	•••••
Heat resistance	••	••	••••
Water resistance	••	••	••
Fuel resistance	••	••	••
Oil resistance	••••	••••	••

**Peroxide crosslinking:**

	Sillitín Z 86	Sillitín V 88	Aktisil AM	Aktisil VM 56	Aktisil Q
Plating/Mold fouling	••	•	••	••	•
Viscosity	••••	•••	•••	•••	•••
Cure rate	•••	•••	•••••	•••	•••••
Tensile strength	••••	•••	•••••	•••••	•••
Elongation at break	•••••	•••••	•••••	•••••	•••
Moduli	•••••	••••	•••••	•••••	•••••
Tear resistance	•••••	•••••	•••	•••	•••
Compression set	••	••	••	••	• <sup>A)</sup>
Compression set, acc. to VW	••	••	•	•	••
Abrasion resistance	••	••	•••	••••	•••
Heat resistance	•••	•••	•••••	•••••	••• <sup>B)</sup>
Resistance to acetic acid	••	••	••••	•••••	•••••
Fuel resistance	•••	•••	•••	•••	•••
Oil resistance	••••	••••	••••	••••	••••

<sup>A)</sup> no post-cure

<sup>B)</sup> positive change of tensile strength and elongation at break

**Other applications**



**Silicone rubber compounds**

**Advantages:**

- good extrusion properties and collapse resistance
- reduced stickiness
- no blooming
- drier surface
- very good oil resistance
- low tension and compression set without post cure
- partial replacement of ATH with Aktisil Q, Aktifit Q or Silfit Z 91 provides the same flame-retardant properties of pure ATH

**Silicone rubber compounds, addition crosslinked (Pt-catalyzed) up to 25 phr**

	Silfit Z 91	Aktifit VM	Aktifit Q	Aktisil Q
Tear resistance (Graves)	••••	••	••••	••
Moduli	••••	••	••••	••••
Compression set	••	••	••	•
Heat resistance	••	••	••	••••
Oil resistance	••••	••••	••••	•••••
Brightness	•••••	•••••	•••••	••••
Color neutrality	•••••	•••••	•••••	••••

**Peroxide crosslinked silicone rubber compounds:**

	Silfit Z 91	Aktifit Q	Aktisil Q <sup>A)</sup>
Suitable for all peroxidea	no <sup>B)</sup>	yes <sup>C)</sup>	yes
Compression set	••••	••• <sup>D)</sup>	•
Brightness	•••••	•••••	••••
Color neutrality	•••••	•••••	••••

**For flame retardant compounds, partial replacement of ATH up to 30%**

	Silfit Z 91	Aktifit Q	Aktisil Q <sup>A)</sup>
Retained flame retardancy	yes	yes	yes
Mechanical properties	•••	•••	•••••

<sup>A)</sup>even in high loadings up to 100 phr, even for chlorine-free peroxide

<sup>B)</sup>with DBPH (2,5-Bis-[tert-butyl-peroxy]-2,5 dimethylhexane): up to 25 phr; with DCBP (Di-[2,4-dichlorobenzoyl]peroxide): up to 75 phr; with dicumyl peroxide: no

<sup>C)</sup>with DBPH: up to 50 phr; increase of tear resistance without changing compression set up to 25 phr with DCBP: up to 75 phr with dicumyl peroxide: up to 50 phr, improvement of tear resistance at high concentration

<sup>D)</sup>up to 25 phr

## Other applications

### Potable water seals peroxide cross-linked

#### Advantages:

- cost reduction potential
- low mooney viscosity
- short vulcanisation time
- UBA positive list part 1 compliant, meets BfR purity requirements
- potential to reduce the PAH concentration in the compound by partial replacement of the carbon black



	Sililitin Z 86	Aktisil VM 56
Viscosity	●●●	●●●
Vulcanization time	●●●	●●●
Carbon black exchange potential	●●	●●●●
Cost reduction potential	●●●●	●●



### Pharmaceutical closures

#### Advantages:

- high purity
- good mixing and dispersion properties
- easy deflashing
- low compression set
- prevention of mould fouling
- low fragment release and good self-sealing after needle penetration

	Sililitin N 86 <sup>A)</sup> / Sililitin Z 86 <sup>A)</sup>	Sifit Z 91	Aktifit AM <sup>B)</sup>	Aktifit VM <sup>C)</sup>
Moisture	●●●	●●	●●	●
Dispersion	●●●●	●●●●●●	●●●●●●	●●●●●●
Brightness	●●●	●●●●●●	●●●●●●	●●●●●●
Color neutrality	●●●	●●●●●●	●●●●●●	●●●●●●
Plating/Mold fouling	●●	no	no	no
Compression set	●●●	●●	●	●

<sup>A)</sup>standard product

<sup>B)</sup>especially for diamine crosslinking

<sup>C)</sup>especially for crosslinking with peroxides, even without coagents good curing properties

### Food contact materials

Here you will find further information on safety regulations and the applicable regulations.



(No specific product recommendation)



**Other applications**



**Shoe components**

**Advantages:**

- good processing properties
- long flow time with short vulcanization time
- easy deflashing

	Aktifit AM	Aktifit VM
Brightness	●●●●●	●●●●●
Color neutrality	●●●●●	●●●●●
Pigment reduction	●●●●	●●●●
Sulfur crosslinking	●●●●●	●●
Peroxide crosslinking	●●	●●●●●

**Solid tires and spinning cot**

**Advantages:**

- good processing properties
- long flow time with short vulcanization time
- easy deflashing
- low rolling resistance
- low compression set



	Sillitín Z 86	Aktisil PF 216
Dispersion	●●●●	●●●●
Compression set	●●●	●●
Rolling resistance	●●●	●●
Abrasion resistance	●●	●●●●

Basic properties of (Calcined) Neuburg Siliceous Earth

**Advantages for users**

- |  |   |
|--|---|
| low moisture, low moisture absorption                                  | > less effort for pre-drying, pre-drying may not be necessary, less polymer degradation with hydrophobic products |
| high fineness, very low sieve residue, excellent dispersion properties | > high surface quality, no spots or agglomerates, even matting  |
| hard silicate mineral  | > very good acid resistance, abrasion resistance, scratch resistance  |
| polymer-specific adaptation via functionalization                      | > low compression set, very good abrasion and scratch resistance  |
| low CO <sub>2</sub> -footprint   | > reduction of product carbon footprint of TPE  |

**TPE**



**Windshield water guide trim, SEBS compound on PP core in injection molding process**

**Advantages:**

- sufficient melt flowability
- no flow lines
- evenly matte surface without “tiger stripes”

	Sillitín Z 86 puriss	Aktsil AM	Akfitit AM
Even matting	●●●●●	●●●●●	●●●●●
Dispersion	●●●●●	●●●	●●●●●
Scratch resistance	●●●	●●●●	●●●●

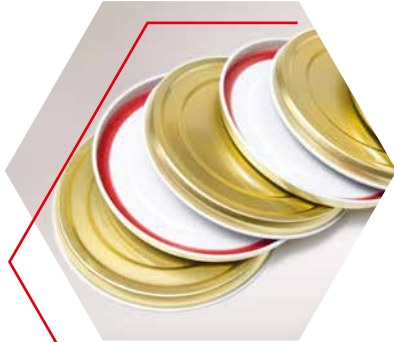


**Pickup truck liners, SEBS-PE compound**

**Advantages:**

- reduction of joint line visibility
- high ultimate elongation
- very good scratch resistance
- reduced shrinkage/warpage
- high tensile strength
- improvement of rigidity
- very good dispersion properties
- very good surface quality

	Akfitit AM
Reduction of joint line visibility	●●●●●
Rigidity	●●●●●
Surface quality	●●●●●
Scratch resistance	●●●●●



**Packaging seals like screw cap seals for acidic contents on a sebs basis**

**Advantages:**

- very good dispersion properties
- good extrusion properties
- very good acid resistance
- hydrophobic properties
- good mechanical properties
- low compression set
- high purity, suitable for food contact materials

	Aktifit VM
Hydrophobicity	•••••
Acid resistance	•••••
Compression set	•













Basic properties of Calcined Neuburg Siliceous Earth

**Advantages for users**

low moisture, low moisture absorption	> less effort for pre-drying, pre-drying may not be necessary, less polymer degradation with hydrophobic products
high fineness, very low sieve residue, excellent dispersion properties, morphology	> high surface quality, no spots or agglomerates, supports pigment dispersion (spacer effect), potential pigment savings
high brightness and color neutrality	> enables white products without a yellow tint, low requirement for white pigments such as titanium dioxide
largely isotropic properties	> low warpage, medium increase in stiffness
hard silicate mineral	> very good acid resistance, abrasion resistance, scratch resistance
polymer-specific adaptation via functionalization	> very good scratch resistance, high impact strength, high ultimate elongation
temperature resistance	> can also be used for technical thermoplastics, no by-products or decomposition
low CO <sub>2</sub> -footprint	> reduction of product carbon footprint of thermoplastic molded parts

## Selection criteria for thermoplastic molded parts

### Aktifit

Polymer/Application	Recommended product	Alternative product recommendation	Remarks	Flowability	Ultimate elongation	Impact strength	Scratch resistance	Tensile strength	Flexural strength	No crosslinking
PA (polyamide) 6/66	 Aktifit AM			●	●	●	●			
PPA (polyphthalamide)	 Aktifit AM	Aktifit PF 115		●	●	●	●			
PBT (polybutylene terephthalate)	 Aktifit VM	Aktifit Q			●	●	●			
PC (polycarbonate)	 Aktifit VM	Aktifit PF 111 Aktifit Q	Aktifit VM and Aktifit PF 111 also for higher filler levels without any significant polymer degradation		●	●	●			
PP (polypropylene)	 Aktifit AM  Aktifit AM + MAH-modified polymer	Silfit Z 91 + MAH-modified polymer Aktifit PF 111	Aktifit PF 111 primarily for homopolymers for high ultimate elongation and impact strength with good flowability		●	●	●			
PK (aliphatic polyketone)	 Aktifit AM	Aktifit PF 115		●	●	●	●		●	●
PPS (polyphenylene sulfide)	 Aktifit PF 115	Aktifit AM		●		●		●	●	
other polymers	 Aktifit AM  Aktifit VM  Aktifit PF 111  Aktifit PF 115  Aktifit Q		depending on the polymer for optimal interaction and other requirements	●	●	●	●	●	●	

## Thermoplastic molded parts



Aktifit AM

Melt flowability	●●●●●
Shrinkage/warpage	●●
Weld line strength	●●●●●
Scratch resistance	●●●●●
Ultimate elongation/flexibility	●●●●●
Impact strength	●●●●● <sup>A)</sup>

<sup>A)</sup>even at low temperatures

### Housings and impact resistant molded parts, PA 6 and PA 66

#### Advantages:

- high melt flowability
- low warpage
- extremely high ultimate elongation
- extraordinarily high impact strength, even at low temperatures
- great weld line strength
- no graying of black compounds
- enables low warpage, impact-resistant parts without or with little impact modifier as alternative to PA 6 GF15 impact modified



### Scratch-resistant PP co-polymer compounds for automotive interior trim

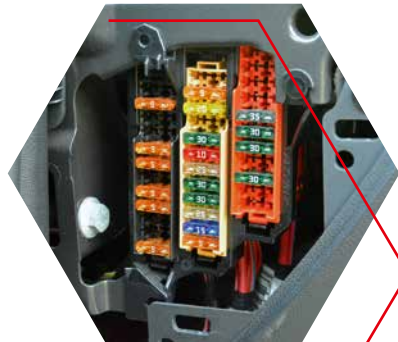
#### Advantages:

- very good scratch resistance
- high ultimate elongation
- high impact strength, even at low temperatures

### Polyphenylene sulfide (PPS)

#### Advantages:

- bright and neutral color of the compound
- high impact strength
- high strength
- high melt flowability
- low warpage



Aktifit AM  
Aktifit PF 115

Brightness	●●●	●●●●●
Color neutrality	●●●	●●●●
Increased stiffness	●●●	●●●●
Flexural strength	●●●	●●●●

Silift Z 91  
Aktifit AM

Scratch resistance	●●●	●●●●●
Ultimate elongation	●●●●●	●●●
Impact strength	●●●●● <sup>A)</sup>	●●●●● <sup>A)</sup>
Notched impact strength	●●●	●●● <sup>A)</sup>

when MAH-modified polymer is added:

Scratch resistance	●●●●	●●●●●
Ultimate elongation	●●●●	●●●●
Impact strength	●●●●	●●●●● <sup>A)</sup>
Notched impact strength	●●●	●●●● <sup>A)</sup>

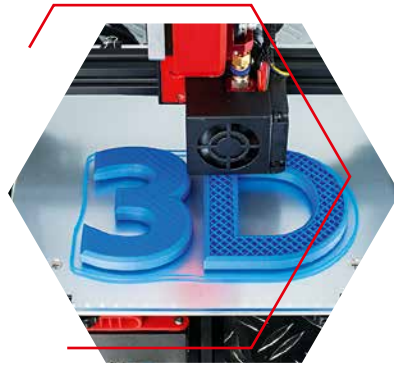
<sup>A)</sup>even at low temperatures

## Thermoplastic molded parts

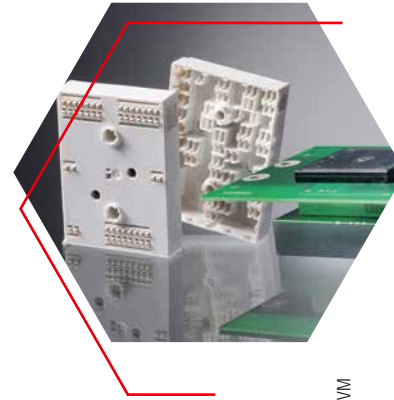
### 3D printing, filament printing of ABS, FFF process

#### Advantages:

- easy handling during compounding (low dust, easily dispersible)
- reduced warpage of the component
- very good mechanical properties
- comparable layer adhesion as unfilled ABS
- faster print speed
- lower printing temperature enables processing even on printer without heated build chamber/print bed



	Sifit Z 91	Aktifit AM	Aktifit PF 115
Shrinkage/warpage	•	••	••
Layer adhesion	••••	••••	•••••
Impact strength	•••	••••	••
Mechanical properties	•••	•••	•••
Cost-effective	••••	•••	•••



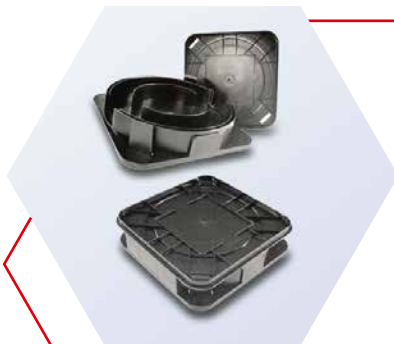
	Aktifit VM
Melt flowability	••••
Shrinkage/warpage	••
Heat deflection temperature HDT	••••
Increased stiffness, tensile strength and flexural strength	•••••
Ultimate elongation/flexibility	•••••
Impact strength	••••• <sup>A)</sup>

<sup>A)</sup>even at low temperatures

### Polybutylene terephthalate (PBT)

#### Advantages:

- good melt flowability
- bright and neutral color of the compound
- extremely high ultimate elongation
- high stiffness, tensile strength and flexural strength
- increase of HDT
- extraordinarily high impact strength, even at low temperature
- retention of good mechanics even with black coloring
- low warpage



### Transport packaging for wafer canister, HDPE

#### Advantages:

- improved physical properties
- very smooth surface

	Aktifit AM
Surface quality	•••••
Improvement of physical properties	•••••

### Polycarbonate (PC)

#### Advantages:

- low warpage
- high translucency
- high thermal stability of the melt (low polymer degradation), even at higher VM level
- good scratch resistance
- high ultimate elongation
- extraordinarily high impact strength, even at higher VM level



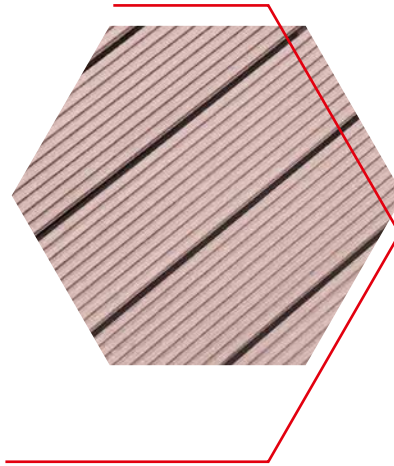
	Aktifit VM	Aktifit PF 111	Aktifit Q <sup>A)</sup>
Thermal stability of the melt	••••	••••	
Impact strength	•••••	••••	preferably for PC blends, e.g. PC/ASA
Scratch resistance	••••	••••	
Translucency	••••	••••	

## Thermoplastic molded parts

### Wood-plastic composites (WPC), handles, extruded profiles

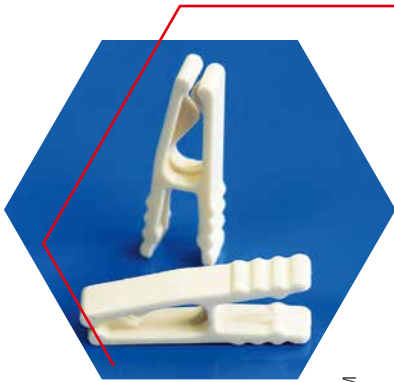
**Advantages:**

- high throughput/extrusion speed
- smooth and optically even surfaces
- improved scratch resistance
- improved physical properties (impact strength, tensile strength)



Aktift AM

Scratch resistance	●●●●
Surface quality	●●●●
Improvement of mechanical properties	●●●●



Aktift AM

Aktift PF 115

Melt flowability, no crosslinking	●●●●	●●●●
Increased stiffness, tensile strength and flexural strength with good stretching properties	●●●●	●●●●
Impact strength and notched impact strength	●●●● <sup>A)</sup>	●●●● <sup>A)</sup>
Brightness	●●●	●●●●
Color neutrality	●●●	●●●●

<sup>A)</sup>Even at low temperatures

### Polyketon (PK)











**Advantages:**

- good flowability and melt stability, no crosslinking
- increased stiffness, tensile strength and flexural strength with good stretching properties
- bright and neutral color of the compound
- high impact strength, even at low temperature
- low warpage

Basic properties of (Calcined) Neuburg Siliceous Earth

**Advantages for users**

low moisture, low moisture absorption	> less effort for pre-drying, pre-drying may not be necessary, less polymer degradation with hydrophobic products
high fineness, very low sieve residue, excellent dispersion properties, refractive index similar to polymers	> good transparency, high light transmission in the visible range, very thin film thicknesses possible
chemical/mineralogical composition	> infrared barrier
high brightness and color neutrality, morphology	> supports pigment dispersion (spacer effect), potential pigment savings
morphology and choice of different particle sizes	> low coefficient of friction/anti-blocking, high gloss or matting, low haze or higher haze, improvement of film processing/manufacturing properties by increasing modulus
relatively low specific area	> almost no adsorption of additives
polymer-specific adaptation via functionalization	> higher impact strength, scratch resistance, printability
low CO <sub>2</sub> -footprint	> reduction of product carbon footprint of thermoplastic films

Polymer/application	Recommended product	Alternative product recommendation	Antiblock additive	Cost reduction	Film workability/finishing	Mechanical properties with-out increase of melting point	Matting	IR-Absorption
BO PET (biaxially-oriented polyethylene terephthalate)	 Aktifit VM	Silfit Z 91 Aktifit Q	•	•				
PE, LDPE	 Silfit Z 91  Sillitin V 88  Aktifit PF 111  Sillitin Z 89 puriss	Aktifit AM	•	•				
PE/EVA copolymers	 Silfit Z 91  Sillitin V 88	Aktifit AM	•	•	•	•		
TPU	 Aktifit AM	Sillitin V 88 Aktifit PF 115	•				•	
Greenhous films with IR barrier based on LDPE and PE/EVA	 Sillitin V 88  Sillitin Z 89 puriss  Silfit Z 91	Aktisil Q Aktifit PF 111 Aktifit PF 115 Aktifit VM Aktifit Q Aktifit AM	•					•

## Thermoplastic films

### Films with anti-blocking, packaging and technical films

**Advantages:**

- low coefficient of friction
- good transparency
- high gloss
- low haze



**PET, biaxially stretched, film thickness 15 to 50 µm:**

	Sifit Z 91	Aktifit VM
Moisture	••	•
Increase in humid climatic conditions	low	no
Coefficient of friction	•	•
Optical properties, transparency, gloss, low haze	•••••	•••••

**LLDPE and LDPE blown films concentration 0.3–1%:**

	Silitin V 88 <sup>A)</sup>	Silitin Z 89 puriss <sup>B)</sup>	Sifit Z 91 <sup>B)</sup>	Aktifit PF 111 <sup>B)</sup>
Anti-blocking (coefficient of friction)	••••	••••	••••	••••
Color neutrality	•••	••	•••••	•••••
Gloss	•••	••••	••••	••••
Clarity	•••	••••	••••	••••
Light scattering (Haze)	•••	••	••	••
Moisture	•••	•••	••	•
Increase in humid climatic conditions	•	••	low	no
Hydrophobicity	no	no	no	yes
Interaction with slip additives	••	•••	••	•

<sup>A)</sup>especially for films with higher thickness

<sup>B)</sup>preferably for films up to 30 µm

### Low melting point films with high EVA content

**Advantages:**

- low coefficient of friction
- good transparency
- improvement of film processing/ manufacturing properties by increasing modulus without increasing the melting temperature
- very good anti-blocking properties, easy opening of film tube
- reduced wastage, increased productivity



**concentration 10–15%:**

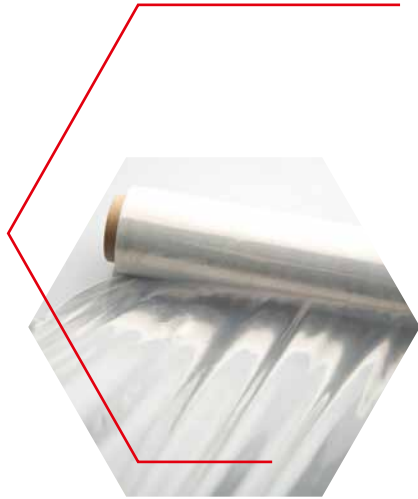
	Sifit Z 91	Silitin V 88 <sup>A)</sup>	Aktifit AM
Antiblocking	•••	••••	•••
Mechanical properties	•••	•••	••••

<sup>A)</sup>especially for films with higher thickness

### Matting of TPU-films

**Advantages:**

- good matting
- good scratch resistance
- anti-blocking



	Sillitn V 88 <sup>A)</sup>	Aktifit AM <sup>B)</sup>	Aktifit PF 115 <sup>B)</sup>
Matting	●●●●	●●	●●
Antiblocking	●●●●	●●●	●●●
Dispersion	●●●	●●●●●	●●●●●
Interaction with TPU matrix	●	●●●●●	●●●●
Scratch resistance	●●●	●●●●●	●●●●
Hydrophobicity	no	no	yes

<sup>A)</sup>especially for films with higher thickness

<sup>B)</sup>for thin and very thin films

### Greenhouse film with IR barrier

**Advantages:**

- very low residue
- good dispersion properties
- good anti-blocking properties
- high light transmission in the photosynthetically active range (400 to 700 nm)
- light-scattering properties adjustable per product type
- high infrared barrier, particularly in the terrestrial radiation range (7 to 13 μm)



	Silfit Z 91	Sillitn Z 89 puriss	Sillitn V 88
IR barrier	●●●●	●●●●	●●●●●
Transmission in PAR	●●●●●	●●●●	●●●
Light scattering	●●●	●●	●●●●●
Light scattering (Haze)	●●●	●●	●●●
Gloss	●●●	●●●●	●●●
Color neutrality	●●●●	●●●	●●●