



**Functional
fillers**

ELASTOMERS and TPE

Thermoplastic molded parts
and films

**HOFFMANN
MINERAL®**

We supply material for good ideas

Contents

Products	3
Neuburg Siliceous Earth	
SILLITIN & SILLIKOLLOID – Morphology	4
Separation process	6
SILLITIN & SILLIKOLLOID – Particle size distribution	8
SILLITIN & SILLIKOLLOID – Color neutrality	10
SILLITIN & SILLIKOLLOID – Product characteristics	12
PURISS – Products with improved dispersion properties	14
AKTISIL – Product characteristics	16
Calcined Neuburg Siliceous Earth	
SILFIT & AKTIFIT – Morphology	18
SILFIT & AKTIFIT – Comparison of particle size distribution	20
SILFIT & AKTIFIT – CIELAB color values	22
SILFIT & AKTIFIT – Product characteristics	24
Filler properties in elastomers	26
Typical applications in elastomers	34
Filler properties in TPE	62
Typical applications in TPE	63
Filler properties in thermoplastic molded parts	65
Typical applications in thermoplastic molded parts	68
Filler properties in thermoplastic films	73
Typical applications in thermoplastic films	76
Packaging	80
Testing methods	82

Products

SILLITIN | SILLIKOLLOID 4

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

PURISS 14

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

AKTISIL 16

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

SILFIT 18

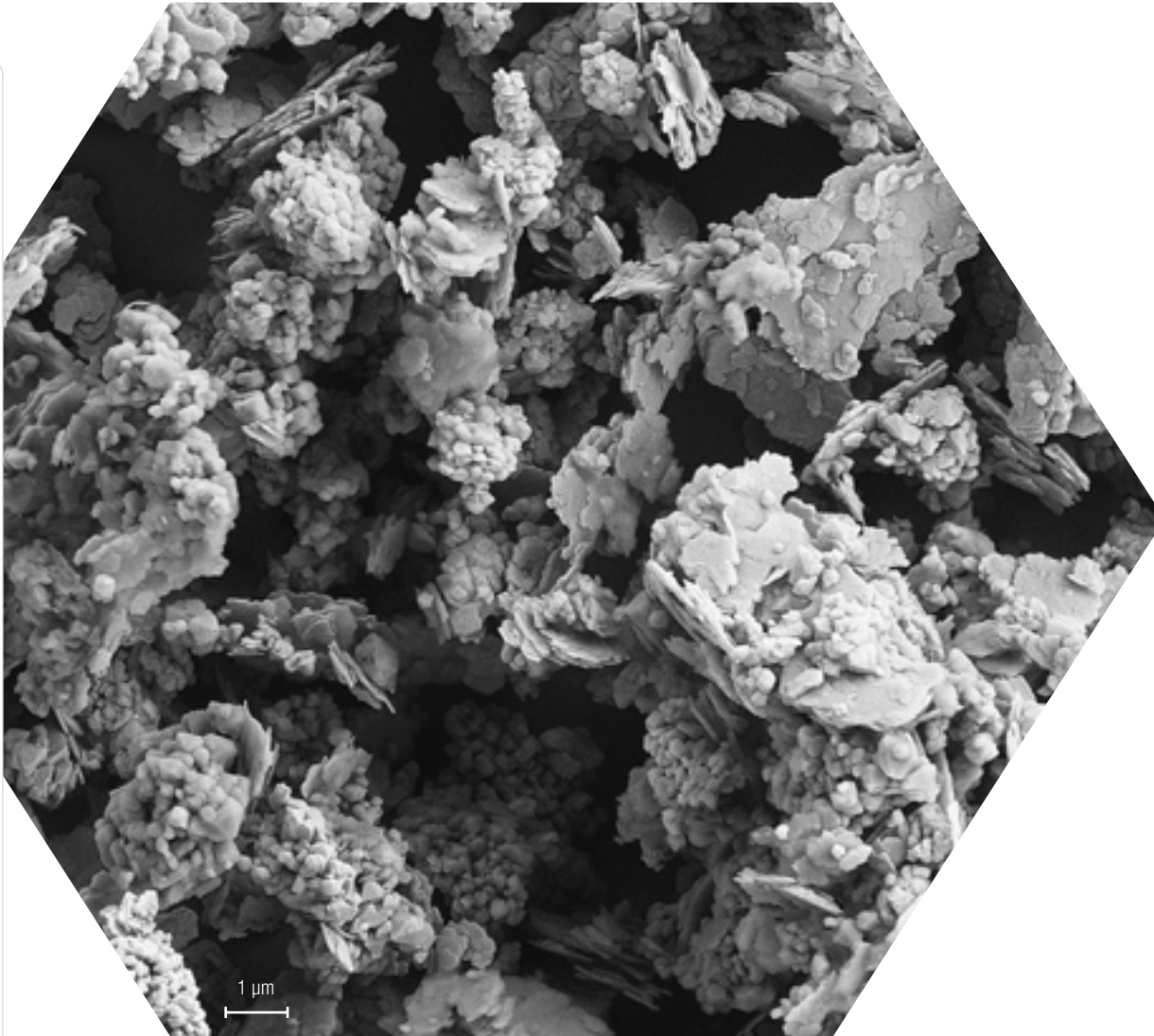
Calcined products based on SILLITIN. A downstream thermal process gives the product additional application advantages as a functional filler.

AKTIFIT 18

An activated SILFIT produced through surface treatment with special additives.

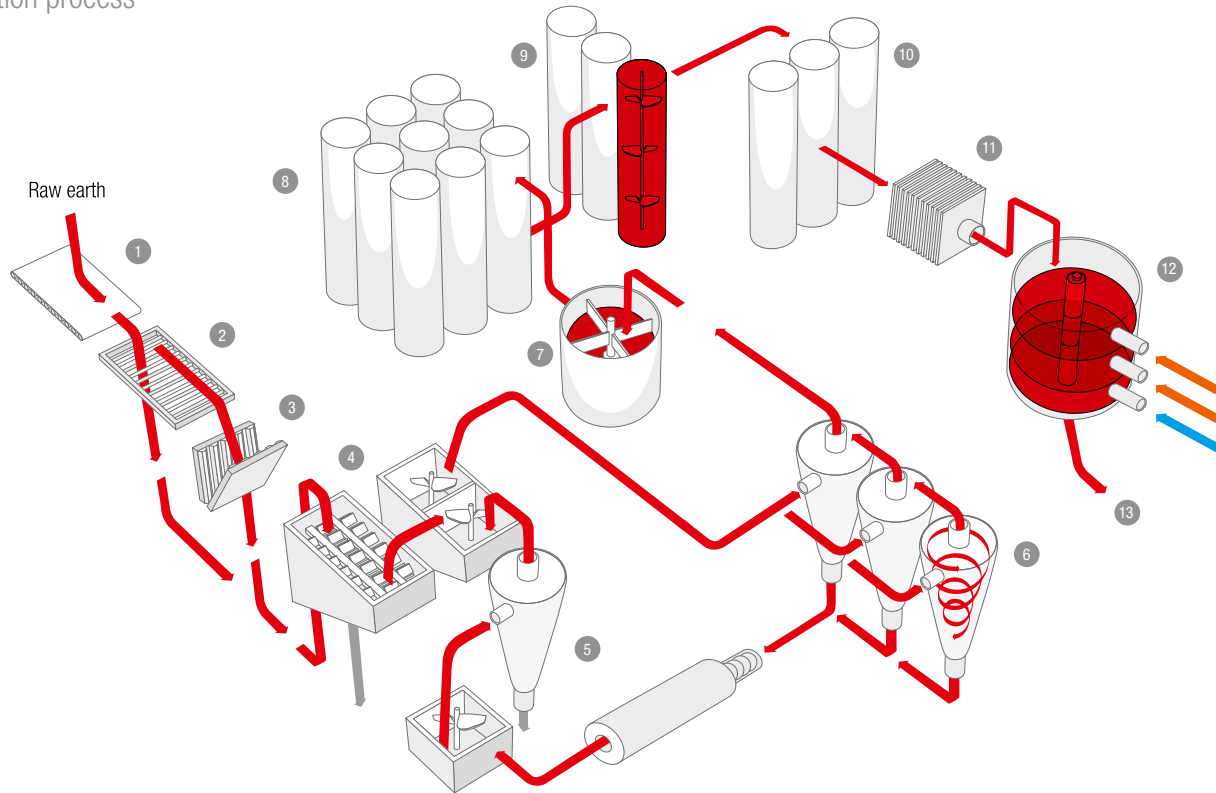
SILLITIN | SILLIKOLLOID

Morphology



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.

Separation process



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.

1–3
Input and crushing of raw earth, separation of coarse material through vibration sieve

4–5
Separation of gravel fractions and dispersion in water

6
Separation of sand fractions and division into different grain sizes with a hydrocyclone unit

7–10
Concentration, storage and blending of different product types in the form of slurry

11–12
Removal of water in filter presses, reduction of residue moisture in dryers

13
Refining, surface treatment, packaging

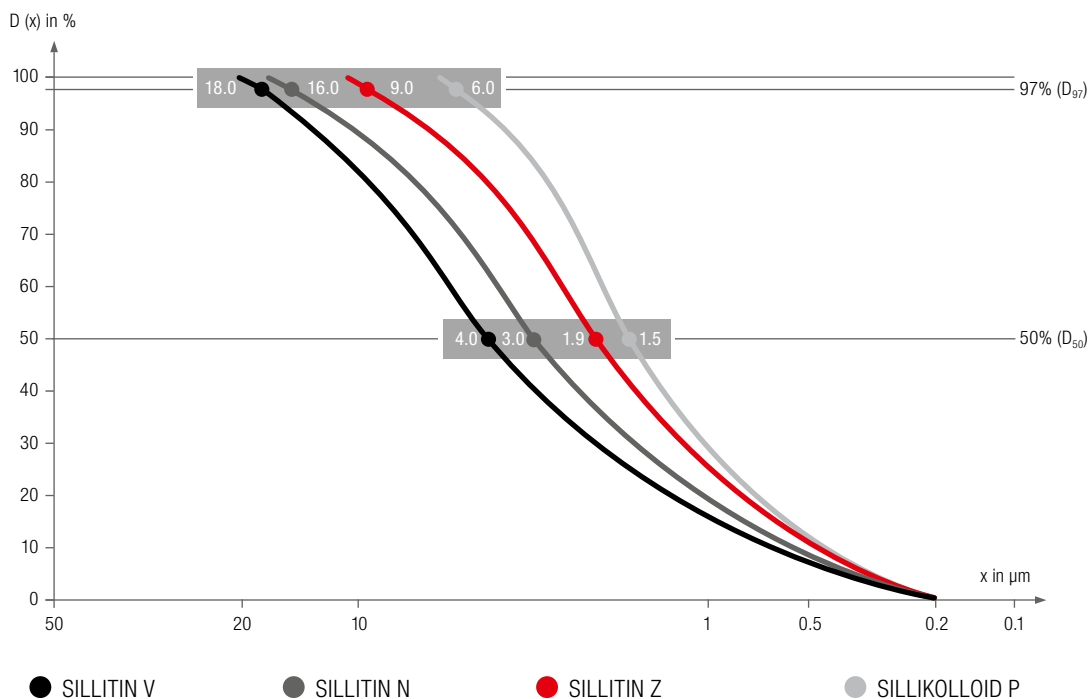
SILLITIN | SILLIKOLLOID

Particle size distribution

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.

Particle size distribution



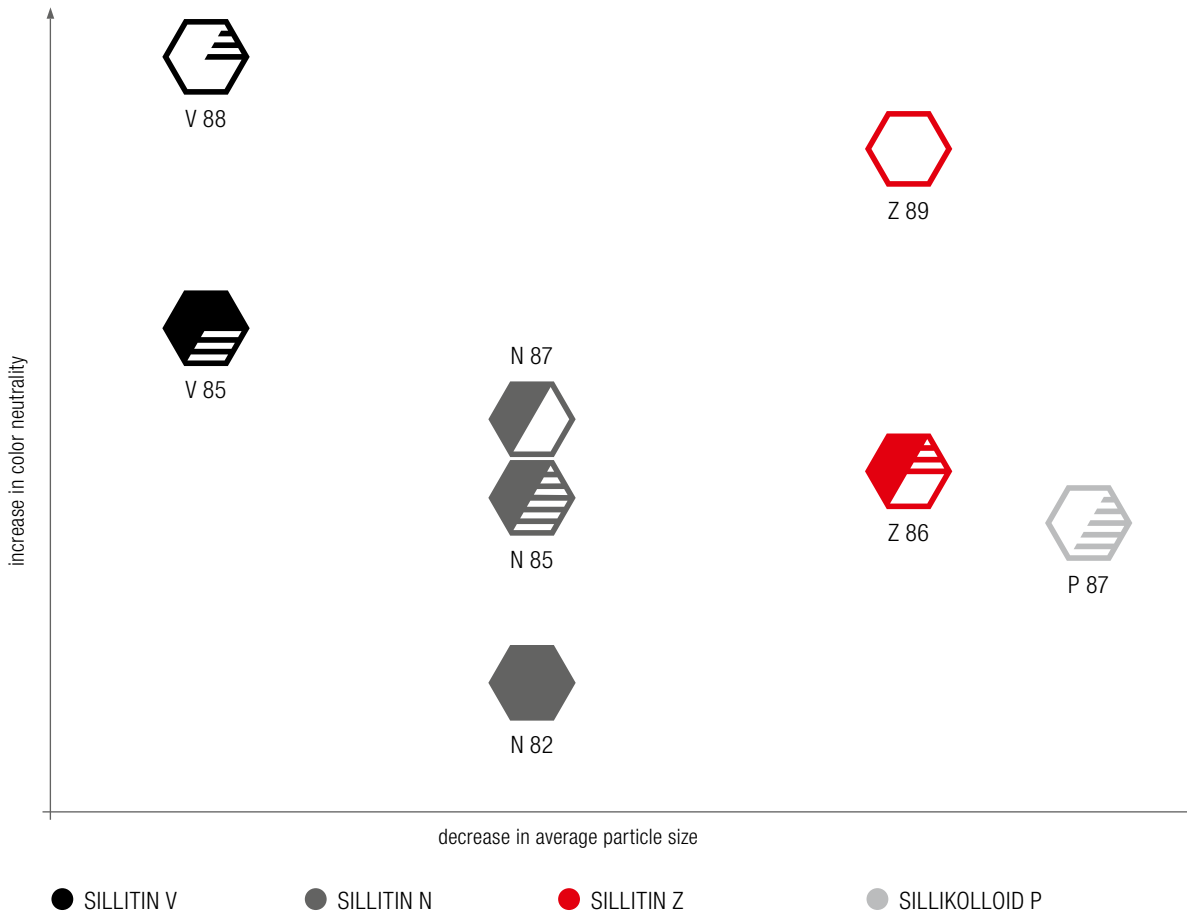
This particle size distribution is based on diffraction spectra by Fraunhofer. The analyses were performed with the Mastersizer 3000, a laser device from Malvern Instruments.

SILLITIN | SILLIKOLLOID

Color neutrality









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.

Color neutrality



SILLITIN | SILLIKOLLOID

Product characteristics

Product characteristic	Unit								
		SILLITIN V 85	SILLITIN V 88	SILLITIN N 82	SILLITIN N 85	SILLITIN N 87	SILLITIN Z 86	SILLITIN Z 89	SILLIKOLLOID P 87
Color values	L*	93.0	95.0	91.0	93.0	94.0	94.0	96.1	94.2
	a*	1.0	0.5	2.5	1.0	1.0	1.0	0.2	0.9
	b*	9.0	5.0	14.5	9.0	9.0	9.5	4.2	9.0
Particle size	D ₅₀	4.0	4.0	3.0	3.0	3.0	1.9	1.9	1.5
	D ₉₇	18	18	16	16	16	9	9	6
Residue	> 40 µm	mg/kg	25	25	25	20	20	20	20
Volatle matter at 105 °C	%	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
pH value		8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Density	g/cm ³	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Bulk density	g/cm ³	0.35	0.35	0.30	0.30	0.30	0.25	0.25	0.25
Tamped density	g/cm ³	0.60	0.60	0.50	0.50	0.50	0.40	0.40	0.40
Spec. surface area (BET)	m ² /g	8	8	11	10	10	12	11	13
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 ₂	%	87	88	82	84	84	82	82	80
Al ₂ O ₃	%	8	8	12	10	10	12	12	14
Fe ₂ O ₃	%	< 1	< 1	< 1.5	< 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.

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)

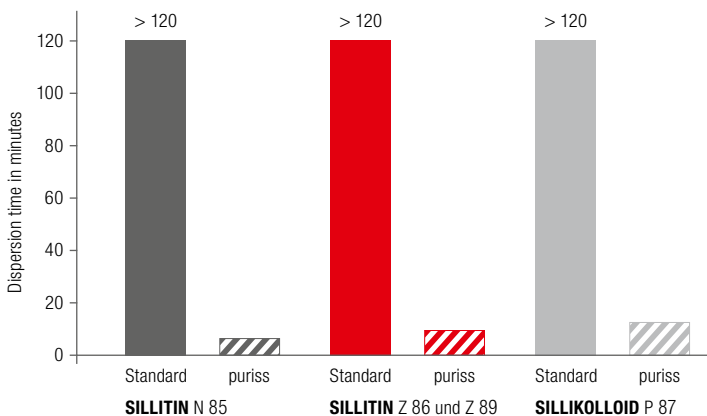
PURISS

Products with improved dispersion properties

- 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

Dispersion properties in ester plasticizer

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











Product characteristic	Unit	SILLITIN N 85 puriss	SILLITIN Z 86 puriss	SILLITIN Z 89 puriss	SILLIKOLLOID P 87 puriss
Color values	L*	93.0	94.0	96.1	94.2
	a*	1.0	1.0	0.2	0.9
	b*	9.0	9.5.0	4.2	9.0
Particle size	D ₅₀	3.0	1.9	1.9	1.5
	D ₉₇	16	9	9	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		8.5	8.5	8.5	8.5
Density	g/cm ³	2.6	2.6	2.6	2.6
Bulk density	g/cm ³	0.28	0.23	0.20	0.20
Tamped density	g/cm ³	0.48	0.37	0.34	0.34
Oil absorption	g/100 g	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 ₂	% 84	82	82	80
	Al ₂ O ₃	% 10	12	12	14
	Fe ₂ O ₃	% < 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.

AKTISIL

Product characteristics

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

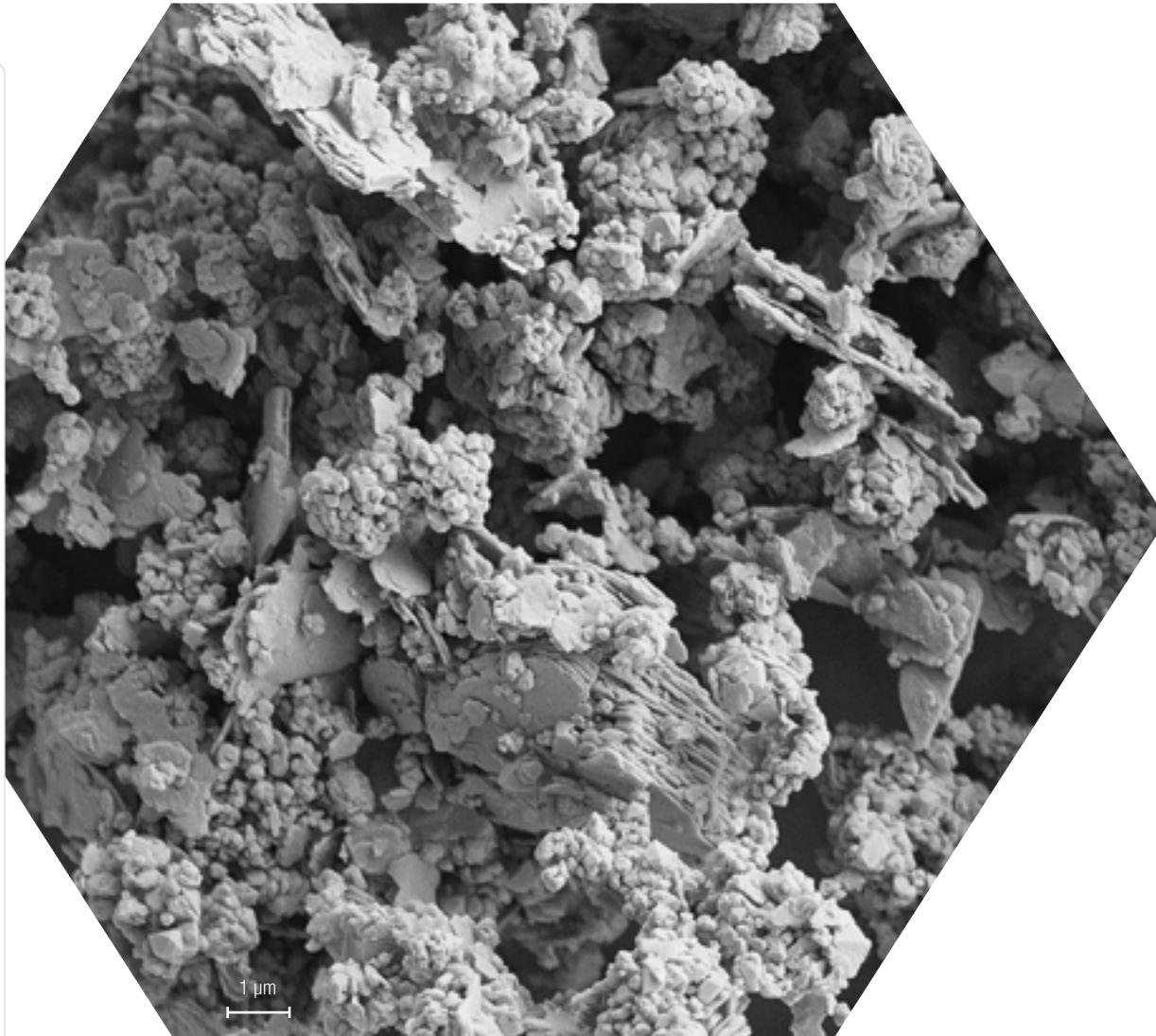
Product characteristic	Unit	 AKTISIL AM	 AKTISIL MAM	 AKTISIL MAM-R	 AKTISIL MM	 AKTISIL PF 216	 AKTISIL PF 777	 AKTISIL Q	 AKTISIL VM 56	 AKTISIL VM 56/89	
Basic material SILLITIN		Z 86	V 88	V 85	Z 86	Z 86	Z 86	V 90 ¹	Z 86	Z 89	
Functionalization		Amino	Methacryl	Methacrylic	Mercapto	Tetrasulfane	Alkyl	Methacrylic	Vinyl	Vinyl	
Color values	L* a* b*	93.8 1.0 10.0	94.9 -0.2 4.0	93.0 1.0 10.0	93.8 1.0 10.0	93.8 1.0 10.0	93.8 1.0 10.0	94.9 0.3 4.0	93.8 1.0 10.0	96.0 0.3 4.0	
Particle size	D ₅₀ D ₉₇	μm μm	2.2 10	4.0 18	4.0 18	2.2 10	2.2 10	2.2 10	4.0 18	2.2 10	2.0 9
Residue	> 40 μm	mg/kg	30	20	20	30	15	20	25	20	20
Volatile matter at 105 °C	%	0.2	0.2	0.2	0.7	0.3	0.3	0.3	0.8	0.8	
Density	g/cm ³	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	
Bulk density	g/cm ³	0.32	0.45	0.45	0.32	0.25	0.25	0.45	0.32	0.32	
Spec. surface area (BET)	m ² /g	9	7	9	9	9	9	6	9	8	
Oil absorption	g/100 g	45	45	45	45	60	35	43	45	45	
Water absorption	ml/g	not specified	0.9	0.9	not specified	0.01	0.01	0.5	not specified	not specified	
Reactive		✓	✓	✓	✓	✓		✓	✓	✓	
Hydrophobic						✓	✓				

¹ 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.

SILFIT | AKTIFIT

Morphology



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.

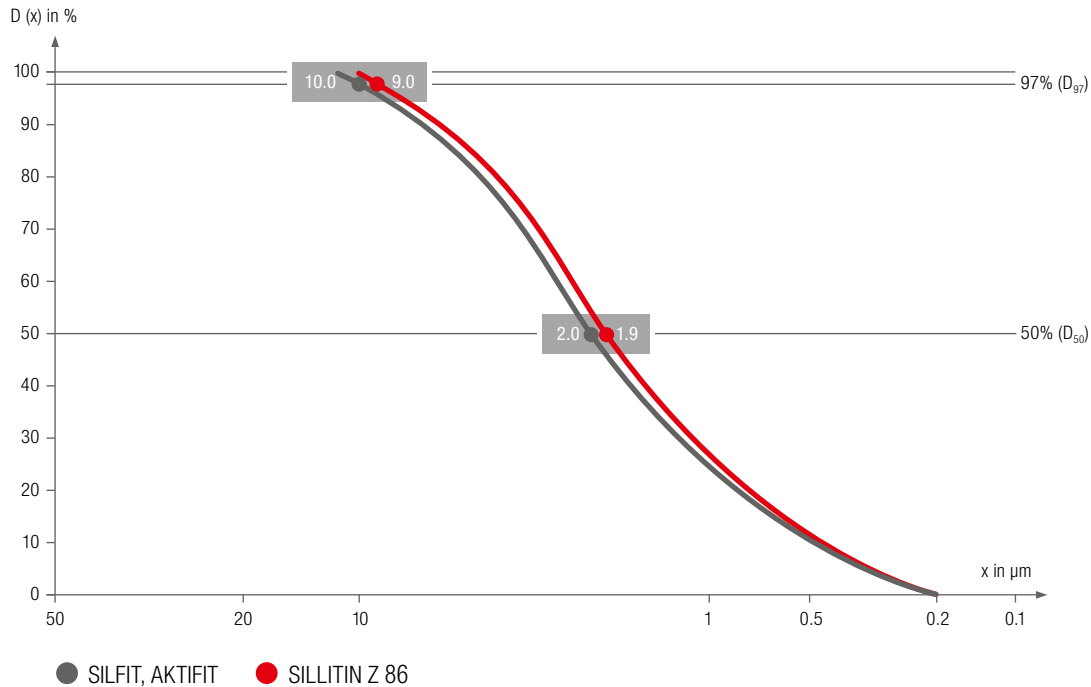
SILFIT | AKTIFIT

Comparison of particle size distribution

There are six Calcined Neuburg Siliceous Earth products available:

- Basic product SILFIT Z 91
- Five surface-treated products:
 - AKTIFIT AM amino functionalized
 - AKTIFIT PF 111 alkyl functionalized
 - AKTIFIT PF 115 amino functionalized
 - AKTIFIT Q methacrylic functionalized
 - AKTIFIT VM vinyl functionalized

All calcined products have a particle size close to that of the uncalcined basic material SILLITIN Z 86.

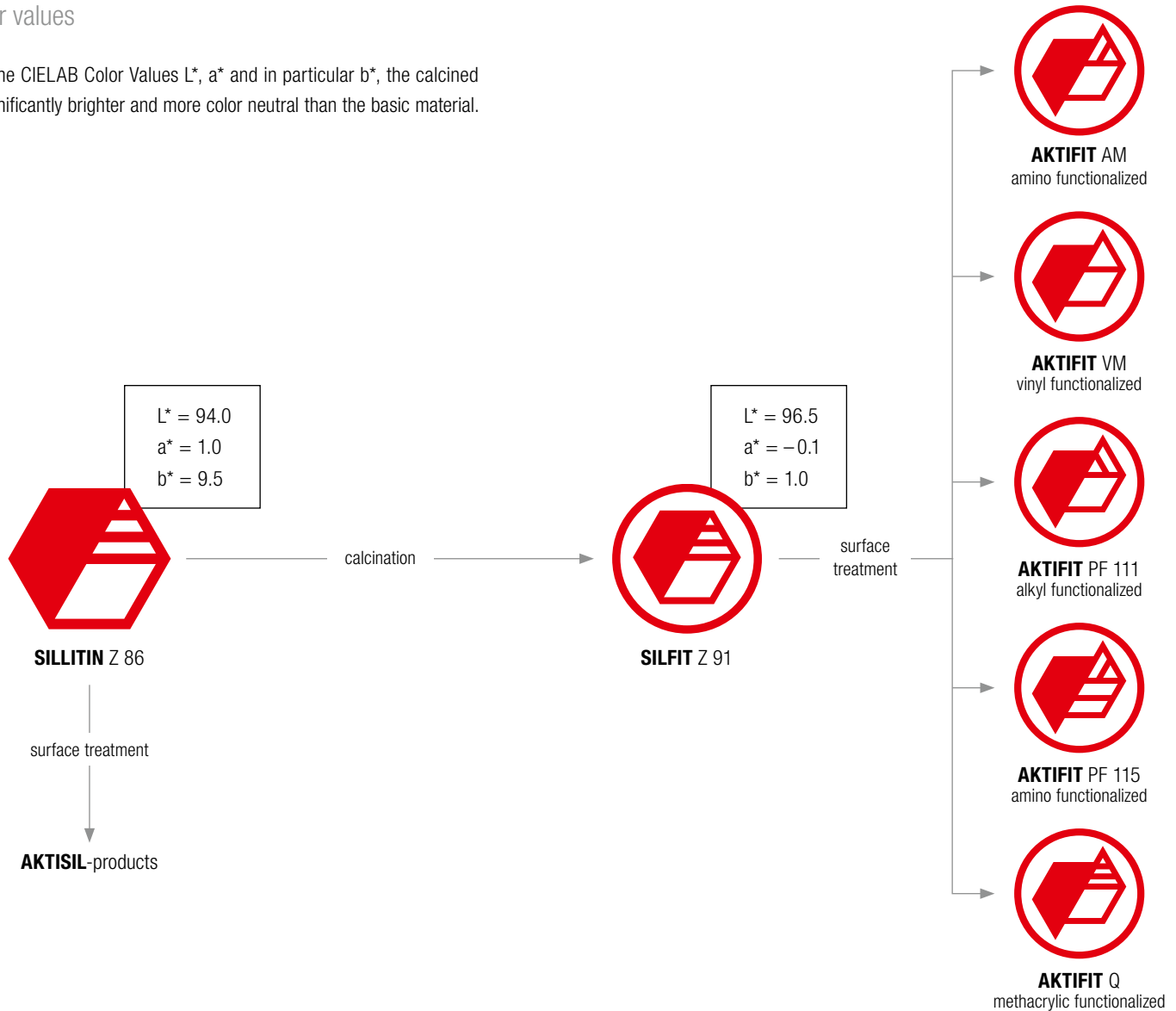


This particle size distribution is based on diffraction spectra by Fraunhofer. The analyses were performed with the Mastersizer 3000, a laser device from Malvern Instruments.

SILFIT | AKTIFIT







CIELAB color values

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.



SILFIT | AKTIFIT

Product characteristics

Product characteristic	Unit	 SILFIT Z 91	 AKTIFIT AM	 AKTIFIT PF 111	 AKTIFIT PF 115	 AKTIFIT Q	 AKTIFIT VM
Basic material		SILLITIN 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	96.2	96.2	96.2	96.2	96.2
a*		–0.1	–0.1	–0.1	–0.1	–0.1	–0.1
b*		1.0	1.0	1.0	1.0	1.0	1.0
Particle size D ₅₀	µm	2.0	2.0	2.0	2.0	2.0	2.0
D ₉₇	µm	10	10	10	10	10	10
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 ³	2.6	2.6	2.6	2.6	2.6	2.6
Bulk density	g/cm ³	0.33	0.31	0.30	0.32	0.32	0.37
Tamped density	g/cm ³	0.55	0.55	0.60	0.62	0.65	0.67
Spec. surface area (BET)	m ² /g	10	9	9	9	9	9
Oil absorption	g/100 g	65	65	60	60	65	65
Silica hardness/calcined 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	9	not applicable	not applicable	not applicable	not applicable
Water absorption	ml/g	not specified	not specified	≤ 0.1	≤ 0.1	≤ 0.01	≤ 0.1
Chemical analysis: SiO ₂	%	86	86	86	86	86	86
Al ₂ O ₃	%	13	13	13	13	13	13
Fe ₂ O ₃	%	< 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				✓	✓	✓	✓

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.

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)

Advantages of Neuburg Siliceous Earth and Calcined Neuburg Siliceous Earth in elastomers










Property in elastomers	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

Special advantages of Calcined Neuburg Siliceous Earth in elastomers

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

SILLITIN | SILLIKOLLOID | SILFIT















Selection criteria in elastomers

										
		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, edge smoothness of complex profiles	●	●	● ● ●	● ●	● ●	● ● ●	● ● ●	● ● ● ○	● ● ● ●
	Collapse resistance	●	●	● ● ●	● ●	● ●	● ● ●	● ● ●	● ● ●	● ● ● ●
	Matting effect	● ● ● ● ●	● ● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ●	● ●	● ●	●
Viscosity		●	●	● ● ●	● ●	● ●	● ● ●	● ● ●	● ● ○	● ● ● ●
Tensile strength		●	●	● ● ●	● ●	● ●	● ● ●	● ● ●	● ● ●	● ● ● ●
Tear resistance		●	●	● ● ●	● ●	● ●	● ● ●	● ● ●	● ● ●	● ● ● ●
Compression set		●	●	● ● ●	● ●	● ●	● ● ●	● ● ●	● ○	● ● ● ●
Rebound elasticity		● ● ● ● ●	● ● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ●	● ●	● ●	●
Abrasion loss		● ● ● ● ●	● ● ● ● ●	● ●	● ● ● ●	● ● ● ●	● ●	● ●	● ●	●

Property: ● = low ● ● ● ● ● ● ● ● = high

AKTISIL | AKTIFIT

Selection criteria in elastomers

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 MAM	SILLITIN V 88	Methacrylic			●	●	●	●	●			
 AKTISIL MAM-R	SILLITIN V 85	Methacrylic			●	●	●	●	●			
 AKTISIL MM	SILLITIN Z 86	Mercapto	●	●	●		●		●			
 AKTISIL PF 216	SILLITIN Z 86	Tetrasulfane	●	●	●		●		●			
 AKTISIL PF 777	SILLITIN Z 86	Alkyl	●	●	●	●	●	●	●			
 AKTISIL Q	SILLITIN V 90 ¹	Methacrylic			●	●	●			●	●	
 AKTISIL VM 56	SILLITIN Z 86	Vinyl			●	●		●	●			
 AKTISIL VM 56/89	SILLITIN Z 89	Vinyl			●	●		●	●			
 AKTIFIT AM	SILFIT Z 91	Amino	●	●	●	●	●	●	●	●		●
 AKTIFIT PF 111	SILFIT Z 91	Alkyl	●	●	●	●	●	●	●	●		
 AKTIFIT PF 115	SILFIT Z 91	Amino	●	●	●	●	●	●	●	●		
 AKTIFIT Q	SILFIT Z 91	Methacrylic			●	●		●	●	●	●	
 AKTIFIT VM	SILFIT Z 91	Vinyl			●	●		●	●	●	●	

¹ 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.






AKTISIL | AKTIFIT

Applications in elastomers

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
 AKTISIL MAM	seals and molded parts based on EPDM and HNBR, butyl-based and resin-crosslinked condenser seals
 AKTISIL MAM-R	like MAM but for lesser color neutrality requirements
 AKTISIL MM	car body seals, window and façade sealing, radiator hoses, cable sheaths, seals and O-rings, roller coverings
 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 Q	silicone compounds, silicone turbocharger hoses, seals and molded parts based on HNBR and FKM, improvement of oil resistance
 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

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 BliR), 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

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.

Automotive



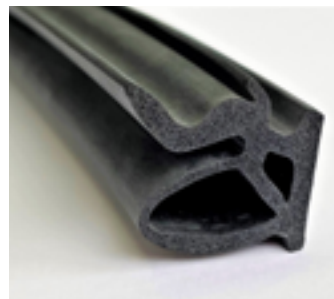
Car body seals, solid

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

Recommended products:

- **SILLITIN N 82**
standard product for non-critical compounds with low requirements
- **SILLITIN N 85**
standard product for slightly higher requirements for dispersion, low compression set, good matting effect
- **SILLITIN Z 86**
standard product with improved extrusion quality/edge smoothness of complex profiles, less wear than SILLITIN N products
- **SILLIKOLLOID P 87**
best extrusion quality/edge smoothness and collapse resistance of complex profiles and stability, lesser matting effect, higher tensile strength and tear resistance, least wear
- **SILFIT Z 91**
same as Z 86, but with avoidance of deposits on dies caused by filler, greater brightness and color neutrality, less moisture content, improved dispersion, lower compression set, very fine cell structure in sponge rubber profiles
- **AKTISIL MM**
same as Z 86, but with higher tensile strength, higher tensile modulus, lower compression set, improved abrasion resistance
- **AKTISIL PF 216**
same as MM, but with highest tensile strength and tensile modulus as well as lowest compression set and best abrasion resistance
- **AKTIFIT AM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, improved abrasion resistance



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)

Recommended products:

- **SILLITIN Z 86**
standard product
- **SILLIKOLLOID P 87**
same as Z 86, but with best extrusion quality/edge smoothness of complex profiles even at high extrusion speed, slightly higher tensile strength
- **SILFIT Z 91**
same as Z 86, but with avoidance of mould fouling caused by filler, less moisture content
- **AKTISIL PF 216**
same as Z 86, but higher tensile modulus, lower compression set
- **AKTIFIT PF 115**
same as Z 91, but higher tensile modulus, best 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

Recommended products:

- **SILLITIN Z 86**
standard product
- **SILFIT Z 91**
same as Z 86, but with avoidance of mold fouling caused by filler, less moisture content, improved dispersion, slightly lower compression set



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

Recommended products:

- **SILLITIN N 82**
standard product for non-critical compounds with low requirements

- **SILLITIN N 85**
standard product for slightly higher requirements for color and dispersion, low compression set
- **SILLITIN Z 86**
standard product, less wear than SILLITIN N products
- **SILLIKOLLOID P 87**
higher tensile strength and tear resistance, least wear
- **SILFIT Z 91**
same as N 85, but with avoidance of mold fouling caused by filler, greater brightness and color neutrality, less moisture content, improved dispersion, very fine cell structure in sponge rubber parts

Specially for diamine crosslinking (ACM, AEM):

- **AKTIFIT AM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances

Specially for sulphur and metaloxide crosslinking:

- **AKTISIL MM**
same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set even over 100 °C, better abrasion resistance, improved chemical resistance
- **AKTISIL PF 216**
same as MM, but with highest tensile strength and tensile modulus as well as lowest compression set up to 100 °C, best abrasion resistance, best chemical resistance

- **AKTIFIT AM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance

Specially for peroxide crosslinking:

- **AKTISIL VM 56**
same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance
- **AKTISIL VM 56/89**
same as VM 56, but for greater color neutrality requirements and slightly improved dispersion
- **AKTISIL Q**
similar to VM 56/89, but with less moisture content, lower viscosity, lower compression set, improved resistance, best product for silicone rubber
- **AKTIFIT VM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance
- **AKTIFIT Q**
same as Z 91, but with higher tensile strength, highest tension value and lowest compression set, improved abrasion resistance, improved chemical resistance

Specially for FKM compounds:

detailed information on page 56

Automotive



Specially for sulphur crosslinking:

- **AKTISIL MM**
same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance
- **AKTIFIT AM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance

Radiator hoses

Advantages:

- high extrusion speed
- high tensile modulus
- low compression set
- coolant resistance
- high electrical resistance

Recommended products:

- **SILLITIN N 85**
standard product
- **SILLITIN Z 86**
standard product with better extrusion properties, less wear than SILLITIN N products
- **SILFIT Z 91**
same as N 85, but with avoidance of mold fouling caused by filler, less moisture content, improved dispersion



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

Recommended products:

- **AKTISIL Q**



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

Recommended products:

- **AKTISIL VM 56**
standard product

Automotive



Air intake hoses EPDM

Advantages:

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

Recommended products:

- SILLITIN N 82
standard product for non-critical compounds with low requirements
- SILLITIN Z 86
less wear than N 82
- SILFIT Z 91
same as Z 86, but avoidance of mould fouling, quicker conversion time, better compression set
- AKTIFIT AM
same as Z 91, but higher cure rate, higher moduli, lower compression set



Timing belts

Advantages:

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

Recommended products:

- AKTISIL PF 216
for sulphur and metal-oxide crosslinking
- AKTISIL VM 56
for peroxide crosslinking

Machine and equipment construction



Conveyor belt skim compounds

Advantages:

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

Recommended products:

- **SILLITIN N 82**
standard product for non-critical compounds with low requirements
- **SILLITIN N 85**
same as N 82, standard product for slightly higher requirements for color and dispersion
- **SILLITIN Z 86**
same as N 85, standard product, less wear than SILLITIN N products



Elastomer-metal composites

Advantages:

- improved elastomer-metal adhesive strength

Recommended products:

- **AKTISIL AM**
standard product
- **AKTIFIT AM**
same as AKTISIL AM, but with avoidance of mold fouling caused by filler, improved dispersion, slightly lower compression set



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

Recommended products:

- **SILLITIN N 85**
standard product
- **SILLITIN Z 86**
standard product, less wear than SILLITIN N products
- **SILLIKOLLOID P 87**
higher tensile strength and tear resistance, least wear
- **SILFIT Z 91**
same as N 85, but with avoidance of mold fouling caused by filler, greater brightness and color neutrality, less moisture content, improved dispersion, slightly lower compression set

Machine and equipment construction



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

Recommended products:

- SILLITIN N 85/SILLITIN N 85 puriss standard product, puriss for high requirements for dispersion
- SILLITIN Z 86/SILLITIN Z 86 puriss standard product, less wear than N 85, puriss for high requirements for dispersion
- SILFIT Z 91 same as N 85, puriss but with avoidance of mold fouling caused by filler, greater brightness and color neutrality, less moisture content

Specially for sulphur and metaloxide crosslinking:

- AKTISIL MM same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set even over 100 °C, better abrasion resistance, improved chemical resistance, lower dynamic heat build-up
- AKTISIL PF 216 same as MM, but with highest tensile strength and tensile modulus as well as lowest compression set up to 100 °C, best abrasion resistance, best resistance, lowest dynamic heat build-up
- AKTIFIT AM same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance, lower dynamic heat build-up

Specially for peroxide crosslinking:

- AKTISIL VM 56 same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance, lower dynamic heat build-up
- AKTISIL VM 56/89 same as VM 56, but for greater color neutrality requirements and slightly improved dispersion
- AKTISIL Q similar to VM 56/89, but with less moisture content, lower viscosity, lower compression set, improved chemical resistance, best product for silicone rubber
- AKTIFIT VM same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance, lower dynamic heat build-up
- AKTIFIT Q same as Z 91, but with higher tensile strength, highest tension value and lowest compression set, improved chemical resistance, lower dynamic heat build-up

Specially for diamine crosslinking (acm, aem):

- AKTIFIT AM same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance, lower dynamic heat build-up

Specially for FKM compounds: detailed information on page 56

Machine and equipment construction



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

Recommended products:

- **SILLITIN Z 86**
standard product
- **SILFIT Z 91**
same as Z 86, but with avoidance of deposits on dies caused by filler, greater brightness and color neutrality, less moisture content, improved dispersion, slightly lower compression set

Specially for sulphur and metaloxide crosslinking:

- **AKTISIL MM**
same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set even over 100 °C, better abrasion resistance, improved chemical resistance
- **AKTISIL PF 216**
same as MM, but with highest tensile strength and tensile modulus as well as lowest compression set up to 100 °C, best abrasion resistance, best chemical resistance
- **AKTIFIT AM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance

Specially for peroxide crosslinking:

- **AKTISIL VM 56**
same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances
- **AKTISIL VM 56/89**
same as VM 56, but for greater color neutrality requirements and slightly improved dispersion
- **AKTISIL Q**
similar to VM 56/89, but with less moisture content, lower viscosity, lower compression set, improved chemical resistances, best product for silicone rubber
- **AKTIFIT VM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances
- **AKTIFIT Q**
same as Z 91, but with higher tensile strength, highest tension value and lowest compression set, improved abrasion resistance, improved chemical resistance

Specially for diamine crosslinking (ACM, AEM):

- **AKTIFIT AM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance

Specially for FKM compounds:

detailed information on page 56



Diaphragms for expansion vessels

Advantages:

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

Recommended products:

- **SILLITIN Z 86**
standard product

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

Recommended products:

- **SILLITIN Z 86**
standard product
- **SILFIT Z 91**
same as Z 86, but with avoidance of deposits on dies caused by filler, greater brightness and color neutrality, less moisture content, improved dispersion, slightly lower compression set, significantly lower dielectric loss

Specially for sulphur and metaloxide crosslinking:

- **AKTISIL MM**
same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set even over 100 °C, better abrasion resistance, improved chemical resistance
- **AKTISIL PF 216**
same as MM, but with highest tensile strength and tensile modulus as well as lowest compression set up to 100 °C, best abrasion resistance, best chemical resistance
- **AKTIFIT AM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance

Specially for peroxide crosslinking:

- **AKTISIL VM 56**
same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved resistivity, high and constant electrical resistivity when immersed in water
- **AKTISIL VM 56/89**
same as VM 56, but for greater color neutrality requirements and slightly improved dispersion
- **AKTISIL Q**
similar to VM 56/89, but with less moisture content, lower viscosity, lower compression set, improved chemical resistances, best product for silicone rubber
- **AKTIFIT VM**
same as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistance, very low dielectric loss, also after immersion in water, also without additional silane in the compound, best product for medium- and high-voltage insulation

Cable and electrical industry



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
- sealing tightness at high soldering temperatures

Recommended products:

Specially for peroxide crosslinked EPDM compounds:

- **AKTISIL VM 56**
standard product, good processing properties, high tensile modulus and low compression set

- **AKTIFIT VM**
similar to VM 56, improved processing properties, higher tensile modulus, lower compression set, better aging properties

Specially for resin crosslinking of butyl rubber (IIR):

- **AKTISIL VM 56**
higher tensile modulus, lower compression set and slightly increased electrical resistance
- **AKTIFIT AM**
same as VM 56, but with improved processing properties and further increased tensile modulus
- **AKTISIL MAM-R**
same as VM 56, but with slightly improved processing properties and further increased tensile modulus
- **AKTIFIT VM**
same as MAM-R, but with mostly improved aging properties, counter product to surface-treated calcined kaolinite, but with improved processing and aging properties and better compression set
- **AKTIFIT Q**
same as AKTIFIT AM, but higher tensile modulus

Construction industry



Floor coverings

Advantages:

- good mixing and dispersion properties
- good calendering 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

Recommended products:

- **SILLITIN N 87**
standard product, balanced properties
- **SILLITIN Z 86**
similar to N 87, preferably used as a substitute for silica and fillers in combination with silane, improved abrasion resistance
- **SILLITIN Z 89**
same as Z 86, but for lighter floor coverings and better color neutrality



Roofing membranes

Advantages:

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

Recommended products:

- **SILLITIN N 82**
standard product for non-critical compounds with low requirements
- **SILLITIN N 85**
same as N 82 for slightly higher requirements for color and dispersion, low compression set
- **SILLITIN Z 86**
same as SILLITIN N products, but less wear
- **SILLITIN Z 89**
same as Z 86, but for light colors with higher color neutrality

Construction industry



Anti-corrosion lining

Advantages:

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

Recommended products:

- **SILLITIN N 82**
standard product for non-critical compounds with low requirements
- **SILLITIN N 85**
same as N 82, for slightly higher requirements for color and dispersion, low compression set
- **SILLITIN Z 86**
same as N 85, less wear than SILLITIN N products
- **AKTISIL PF 777/AKTIFIT PF 111**
same as Z 86, hydrophobic filler for uncured butyl anti-corrosion strips with minimized water swelling, hydrophobic fillers for adhesion primers with improved adhesive strength on steel



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

Recommended products:

- **AKTIFIT VM**
Standard product, avoidance of deposits on dies caused by filler
- **AKTISIL VM 56**
for lower requirements



Building profiles (window and façade sealing)

Advantages:

- low to very low moisture content
- enables high loading of filler and plasticizer
- excellent extrusion properties
- high surface quality
- high tensile modulus
- low compression set

Recommended products:

- **SILLITIN Z 86**
standard product for black profiles
- **SILLIKOLLOID P 87**
same as Z 86, but with best extrusion quality/edge smoothness and collapse resistance of complex profiles even at high extrusion speed, slightly higher tensile strength and tear resistance
- **AKTISIL VM 56**
same as Z 86, but with higher tensile strength, higher tensile modulus and lower compression set, higher loading of filler/plasticizer
- **SILLITIN Z 89**
standard product for color profiles, similar to Z 86
- **AKTISIL VM 56/89**
same as Z 89, but with higher tensile strength, higher tensile modulus and lower compression set, higher loading of filler/plasticizer
- **SILFIT Z 91**
avoidance of deposits on dies caused by filler, greater brightness and color neutrality, less moisture content, improved dispersion, lower compression set, very fine cell structure in sponge rubber profiles
- **AKTIFIT VM**
same as Z 91, but with very low moisture content (reduced blistering potential and less need for moisture absorber for pressureless vulcanization), higher tensile strength, higher tensile modulus and lower compression set, higher loading of filler/plasticizer, lower concentration of peroxide possible

Construction industry



Sealing profiles for road and tunnel construction

Advantages:

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

Recommended products:

- **SILLITIN N 82**
standard product for non-critical compounds with low requirements
- **SILLITIN N 85**
standard product for slightly higher requirements for color and dispersion, low compression set
- **SILLITIN Z 86**
standard product, less wear than SILLITIN N products



Sealing tape

Advantages:

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

Recommended products:

- **SILLITIN N 82**
standard product for non-critical compounds with low requirements
- **AKTISIL PF 777**
for high hydrophobic requirements also in unvulcanized state, low tensile modulus
- **AKTIFIT PF 111**
similar to PF 777, but with even lower water absorption of unvulcanized mixtures, higher brightness and color neutrality

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

Recommended products:

- **AKTISIL Q**
 - standard product for peroxide crosslinked silicone rubber compounds, suitable for all types of peroxide, also in high doses of up to 100 phr, outstandingly low compression set
 - as combination partner with ATH up to 30% of the ATH part for improving the mechanical properties while retaining the flame-retardant properties
- **SILFIT Z 91**
 - as combination partner with ATH up to 30% of the ATH part while retaining the flame-retardant properties
 - using 2,5-Bis-(tert. butylperoxy)-2,5-dimethylhexane (DBPH) up to 25 phr
 - using Bis-2,4-(dichlorobenzoyl)-peroxide up to 75 phr
 - not suitable for crosslinking with dicumylperoxide
- **AKTIFIT Q**
 - for very light and white compounds
 - good compression set up to 25 phr
 - as combination partner with ATH up to 30% of the ATH part while retaining the flame-retardant properties
 - using 2,5-Bis-(tert. butylperoxy)-2,5-dimethylhexane (DBPH) up to 50 phr, increase in tear resistance without significant change of compression set up to 25 phr
 - using Bis-2,4-(dichlorobenzoyl)-peroxide up to 75 phr
 - using dicumyl peroxide up to 50 phr, at high concentration improvement of the tear resistance

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

Recommended products:

Bisphenol crosslinking:

- **AKTIFIT AM**
high crosslinking speed, high tensile strength, very good abrasion resistance, good to very good resistance to water and fuel
- **AKTIFIT PF 111**
like AKTIFIT AM, but with greater elongation at break, better resistance to oil, better compression set according to the VW test standard with high filler content
- **AKTIFIT PF 115**
similar to AKTIFIT AM, but lower viscosity, better abrasion resistance, better resistance to water, oil, fuel
- **AKTISIL Q**
like AKTIFIT AM, but with lower viscosity, greater elongation at break, very good compression set, good resistance to water and oil
- **SILFIT Z 91**
like AKTIFIT AM, but with greatest elongation at break, good compression set (depending on the polymer and crosslinking system), medium resistance to aggressive substances

Peroxide crosslinking:

- **AKTISIL AM**
high crosslinking speed, high tensile strength, high tensile modulus, good compression set according to the VW test standard, good hot air resistance, very good resistance to oil, good resistance to fuel, medium resistance to acetic acid with little alteration of the elongation at break
- **AKTIFIT AM**
like AKTISIL AM, but with highest crosslinking speed, best resistance to oil, greater elongation at break in the unconditioned state

- **AKTIFIT PF 111**
like AKTIFIT AM, but with greater elongation at break, lower compression set at high temperatures, resistance to acetic acid with minimum increase in weight
- **AKTIFIT PF 115**
similar to AKTIFIT AM, but higher tear resistance, better resistance to acetic acid (at change in hardness and weight)
- **AKTIFIT VM**
like PF 111, but with highest tensile strength, best abrasion resistance, best hot air resistance at high temperatures, resistance to acetic acid with minimum change in hardness
- **AKTISIL Q**
like VM, but with best compression set in the unconditioned state, hot air resistance with positive change in tensile strength and elongation at break, better resistance to oil, resistance to acetic acid with minimum changes in tensile strength and elongation at break



Food contact materials

Advantages:

- high purity, in compliance with BfR and FDA regulations
- good mixing and dispersion properties
- high surface quality
- low compression set
- good resistance, especially against acidic media

Other applications



Pharmaceutical closures

Advantages:

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

Recommended products:

- **SILLITIN N 85/SILLITIN Z 86**
standard products with balanced properties
- **SILFIT Z 91**
as standard products, but for highest brightness and color neutrality, avoidance of mold fouling caused by filler, low moisture content, improved dispersion properties, lower compression set than Z 86
- **AKTIFIT AM**
same as Z 91, but better profile of properties, especially for diamine crosslinking
- **AKTIFIT VM**
same as Z 91, but especially for peroxide crosslinking, without coactivator very constant vulcanization, lower compression set



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

Recommended products:

- **SILLITIN Z 86**
greatest cost reduction potential, with adjustments up to 50% carbon black replacement is possible, low mooney viscosity, short vulcanisation time
- **AKTISIL VM 56**
significant cost reduction potential, with adjustments up to 50% carbon black replacement is possible, low mooney viscosity, short vulcanisation time



Shoe components

Advantages:

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

Recommended products:

- **AKTIFIT AM/AKTIFIT VM**
for white and brilliant colors, for potential pigment reduction and finer cell structure in foamed products

Other applications



Solid tires and spinning cot

Advantages:

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

Recommended products:

- AKTISIL PF 216
- SILLITIN Z 86
for lower requirements

Advantages of Neuburg Siliceous Earth and Calcined Neuburg Siliceous Earth in TPE

Basic properties and effects of the filler

- low moisture content
- high fineness
- very low sieve residue
- good dispersion properties
- high hardness
- high surface quality
- even matting
- scratch resistance
- polymer-specific adaptation via functionalization
- abrasion resistance
- low compression set
- very good acid resistance

TPE



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

Recommended products:

- AKTIFIT AM



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"

Recommended products:

- SILLITIN Z 86 puriss
- AKTISIL AM
for increased requirements for scratch resistance
- AKTIFIT AM
similar to AKTISIL AM, but with easier dispersion and also suitable for colored or white products

TPE



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

Recommended products:

- AKTIFIT VM

Advantages of Calcined Neuburg Siliceous Earth in thermoplastic molded parts














Filler-related advantages

- low moisture content, low moisture absorption
- high fineness
- excellent dispersion properties
- very low sieve residue
- high brightness and color neutrality
- high hardness
- temperature resistance
- polymer-specific adaptation via functionalization

Effects in plastics

- low warpage
- high melt flowability
- high surface quality
- medium increase in modulus/rigidity
- very good scratch resistance
- high impact strength
- high ultimate elongation
- supports pigment dispersion (spacer effect), potential pigment savings

Selection criteria for thermoplastic molded parts

Polymer/Application	Recommended product	Alternative product recommendation	Remarks	flowability	ultimate elongation	impact strength	scratch resistance	tensile strength	flexural strength	no crosslinking
PA (polyamide)	 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 AM	AKTIFIT PF 115		●		●		●	●	
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



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

Recommended products:

- AKTIFIT AM



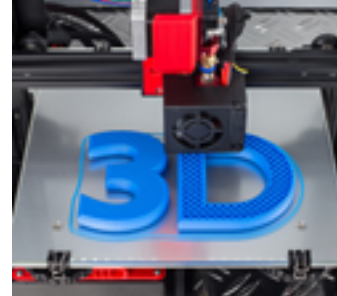
Scratch-resistant PP co-polymer compounds for automotive interior trim

Advantages:

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

Recommended products:

- SILFIT Z 91
very good scratch resistance, very good impact strength, even at low temperatures. With the addition of MAH-modified polymer: can be increased to outstanding scratch resistance and increased flexural strength
- AKTIFIT AM
outstanding scratch resistance, good resistance to bending. With addition of MAH-modified polymer: can be increased to optimum scratch resistance and very good impact strength and notched impact strength, even at low temperatures, increased flexural strength



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

Recommended products:

- SILFIT Z 91
standard product, cost-effective, good mechanical properties, lowest warping
- AKTIFIT AM
low warping, good mechanical properties, higher requirement to impact strength
- AKTIFIT PF 115
low warping, very good layer adhesion

Thermoplastic molded parts



Polyphenylene sulfide (PPS)

Advantages:

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

Recommended products:

- AKTIFIT AM
standard product
- AKTIFIT PF 115
same as AM, but higher stiffness and flexural strength, brighter and almost white color of the compound



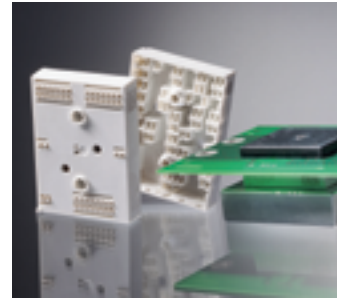
Polyketon (PK)

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

Recommended products:

- AKTIFIT AM
standard product
- AKTIFIT PF 115
same as AKTIFIT AM, but brighter and more color-neutral color of the compound



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

Recommended products:

- AKTIFIT VM
standard product



Polycarbonate (PC)

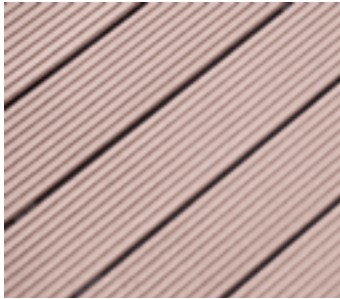
Advantages:

- 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

Recommended products:

- AKTIFIT VM
best recommendation Polycarbonate (PC)
- AKTIFIT PF 111
similar to VM
- AKTIFIT Q
similar to VM, but for PC-Blends, e.g. PC/ASA

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)

Recommended products:

- AKTIFIT AM



Transport packaging for wafer canister, HDPE

Advantages:

- improved physical properties
- very smooth surface

Recommended products:

- AKTIFIT AM

Advantages of Neuburg and Calcined Neuburg Siliceous Earth in thermoplastic films












Filler-related advantages

- low moisture content, low moisture absorption
- high fineness
- excellent dispersion properties
- very low sieve residue
- high brightness and color neutrality
- high hardness
- temperature resistance
- polymer-specific adaptation via functionalization

Effects in Films

- low coefficient of friction; antiblocking
- good transparency/high light transmission in the visible range
- high gloss or matting
- low haze or higher haze
- hardly any adsorption of additives thanks to relatively small surface area
- improvement of film processing/manufacturing properties by increasing modulus
- IR barrier

Selection criteria for 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 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

Recommended products:

Pet, biaxially stretched, film thickness 15 to 50 µm:

- **AKTIFIT VM**
film thickness 15 to 50 µm, very low moisture content without increase in humid climatic conditions

LLDPE AND LPDE BLOWN FILMS

Concentration 0.3–1%:

- **SILLITIN V 88**
cost-effective standard grade, especially for films with higher thickness
- **SILLITIN Z 89 puriss**
for films up to 30 µm, better optical properties, higher gloss, high clarity, lowest haze
- **SILFIT Z 91**
similar to Z 89 puriss, but higher color neutrality (foil reel)
- **AKTIFIT PF 111**
same as Z 91, but hydrophobic, very low moisture content without increase in humid climatic conditions, minimized interaction with slip additives



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

Recommended products:

- **SILFIT Z 91**
concentration 10 to 15%
- **SILLITIN V 88**
for increased requirements for anti-blocking and for greater film thicknesses
- **AKTIFIT AM**
for increased requirements for mechanical properties

Thermoplastic films



Matting of TPU-films

Advantages:

- good matting
- good scratch resistance
- anti-blocking

Recommended products:

- **AKTIFIT AM**
very good dispersion properties, good interaction with TPU-matrix through amino functionalization, good scratch resistance, moderate matting effect, for thin and very thin films
- **AKTIFIT PF 115**
same as AKTIFIT AM, but less polar, highly hydrophobic
- **SILLITIN V 88**
good dispersion properties, stronger matting effect and anti-blocking effect



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)

Recommended products:

- **SILLITIN Z 89 puriss**
good light scatter and IR barrier, low optical turbidity
- **SILFIT Z 91**
good light scatter and IR barrier, high color neutrality
- **SILLITIN V 88**
best light scatter and best IR barrier


Packing

Product	Paper bag	EVA-bag	Big Bag Type 1/ Type 2/Type 3	Bulk
---------	-----------	---------	----------------------------------	------

SILLITIN

 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 82	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





SILLIKOLLOID

 SILLIKOLLOID P 87	25 kg	5 to 15 kg	≤ 550/700/900 kg	≤ 22 t
--	-------	------------	------------------	--------

PURISS

 SILLITIN puriss	25 kg	–	–	–
 SILLIKOLLOID P 87 puriss	20 kg	–	–	–


AKTISIL

 AKTISIL AM	25 kg	5 to 20 kg	≤ 550/700/900 kg	–
 AKTISIL MAM	25 kg	5 to 20 kg	≤ 550/700/900 kg	–
 AKTISIL MAM-R	25 kg	5 to 20 kg	≤ 550/700/900 kg	–
 AKTISIL MM	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 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	–






Special packaging and sizes are available on request.

Product	Paper bag	EVA-bag	Big Bag Type 1/ Type 2/Type 3	Bulk
---------	-----------	---------	----------------------------------	------

SILFIT

 SILFIT Z 91	25 kg	10 to 20 kg	≤ 600/750/900 kg	on request
---	-------	-------------	------------------	------------

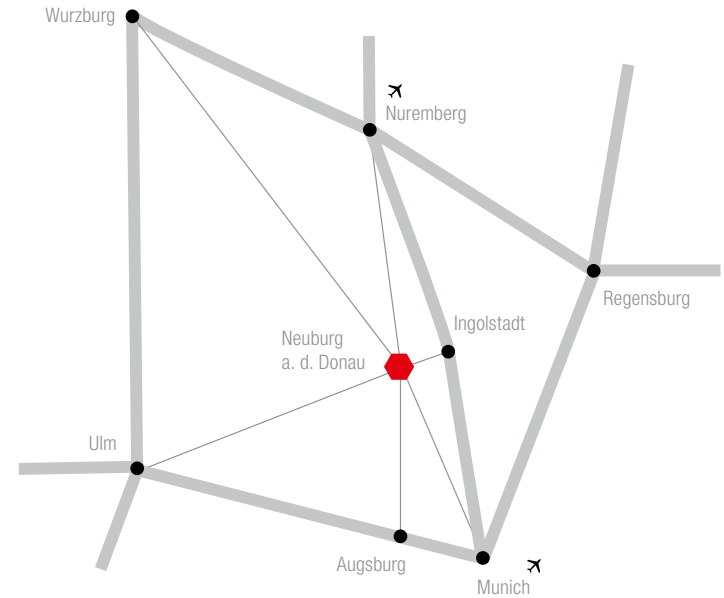
AKTIFIT

 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	–

SILLITIN | SILLIKOLLOID | AKTISIL | SILFIT | AKTIFIT

How to find us

Product characteristic	Testing method
Color values L* a* b*	acc. to CIELAB
Particle size D ₅₀ D ₉₇	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 ₂ Al ₂ O ₃ Fe ₂ O ₃	acc. to DIN 51001 (RFA)
Mineralogical composition: Corpuscular 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



Publisher:

HOFFMANN MINERAL GmbH

Muenchener Strasse 75

86633 Neuburg a. d. Donau

Germany

Phone: +49 8431 53-0

E-Mail: info@hoffmann-mineral.com

www.hoffmann-mineral.com

HOFFMANN
MINERAL®

We supply material for good ideas

E VM-10/06.2022/06105980