

FUNCTIONAL FILLERS

ELASTOMERS AND TPE

THERMOPLASTIC
MOLDED PARTS AND FILMS

Sillitin

aktiSil

Sillikolloid

aktiFit

Silfit

**HOFFMANN
MINERAL**

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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 portion of oversized particles is reduced even more and the dispersion properties are improved.

aktiSil

16

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

Silfit

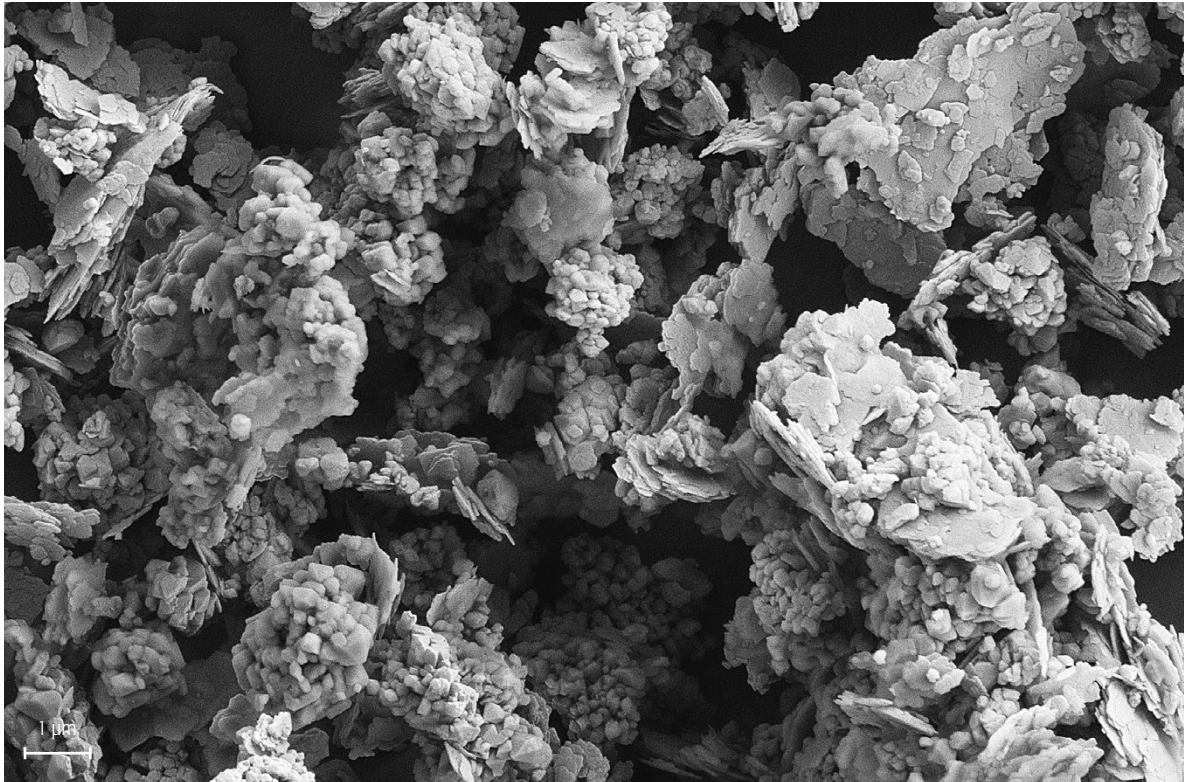
18

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

aktifit

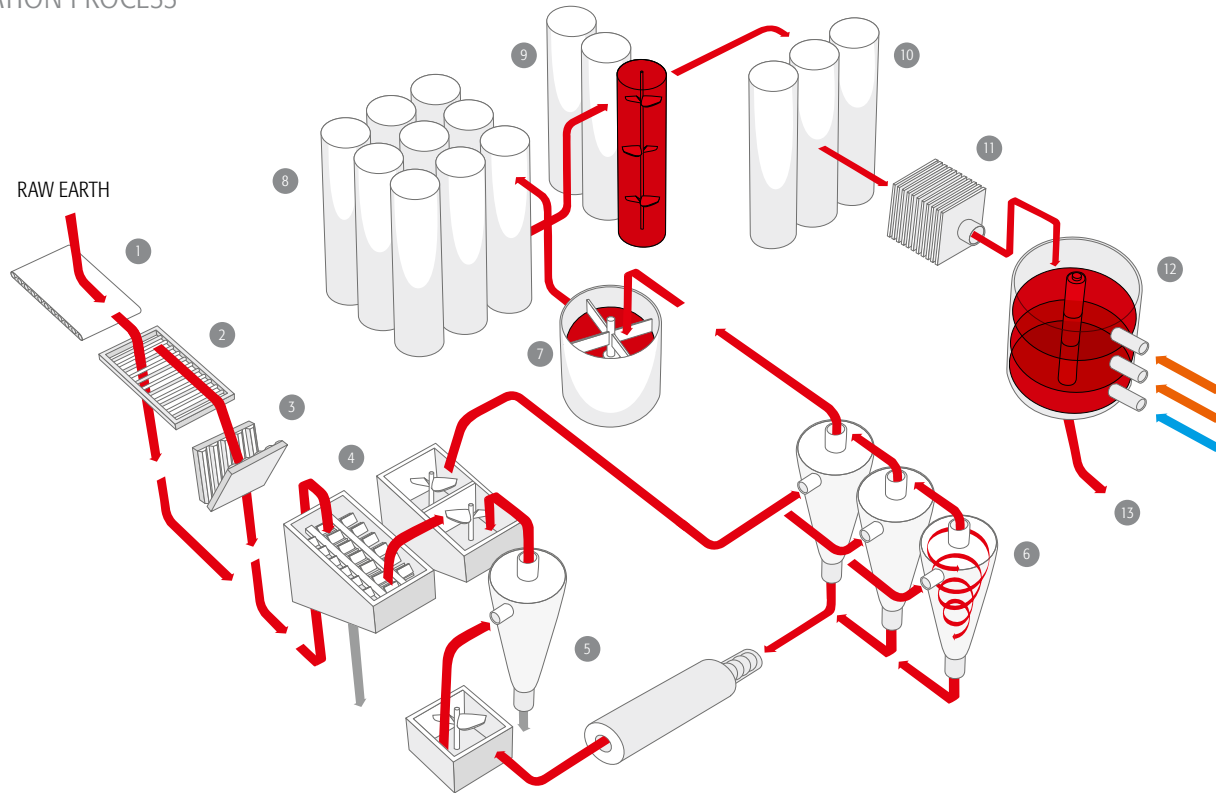
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An activated SILFIT produced through surface treatment with special silanes.

Sillitin Silikolloid – MORPHOLOGY

Classic Neuburg Siliceous Earth is a natural combination of corpuscular, cryptocrystalline and amorphous 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 which are coated partially opallike. 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 – because only about 30 % of the raw earth extracted are a usable fine product. A particularly structure-conserving process separates the fine product from sand and sundry stones and rock. 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 sorts 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 slurry 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 sorting 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, extraction of remaining moisture in dryers

13

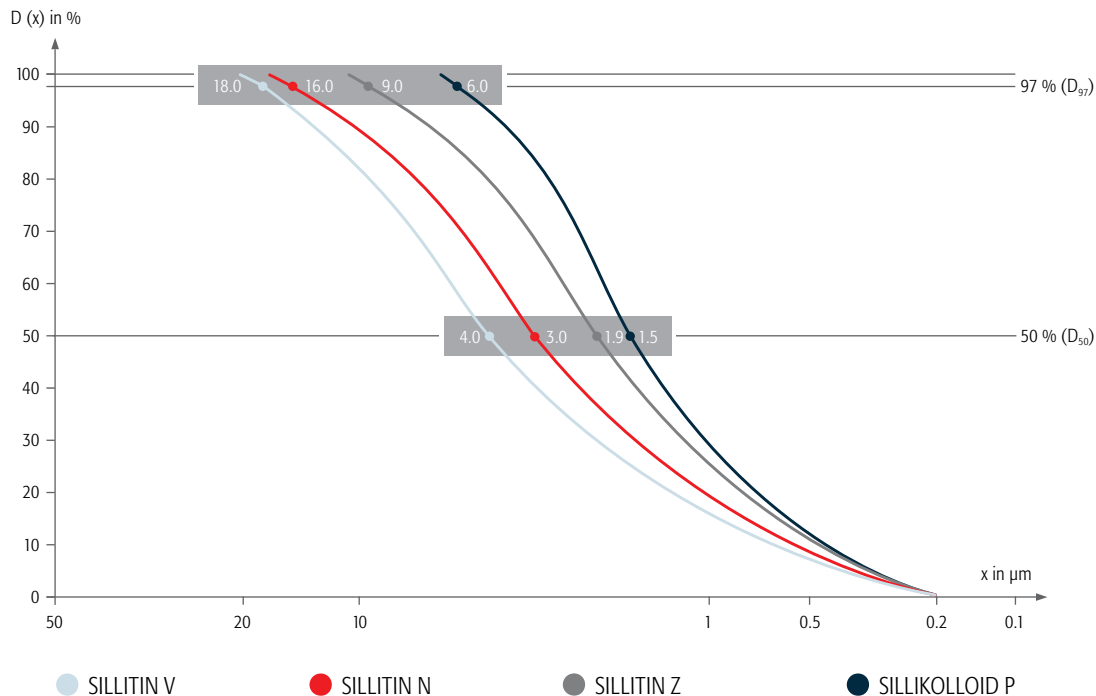
Refining, surface treatment, packaging

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 the Neuburg Siliceous Earth. The most significant differentiating characteristics are the 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

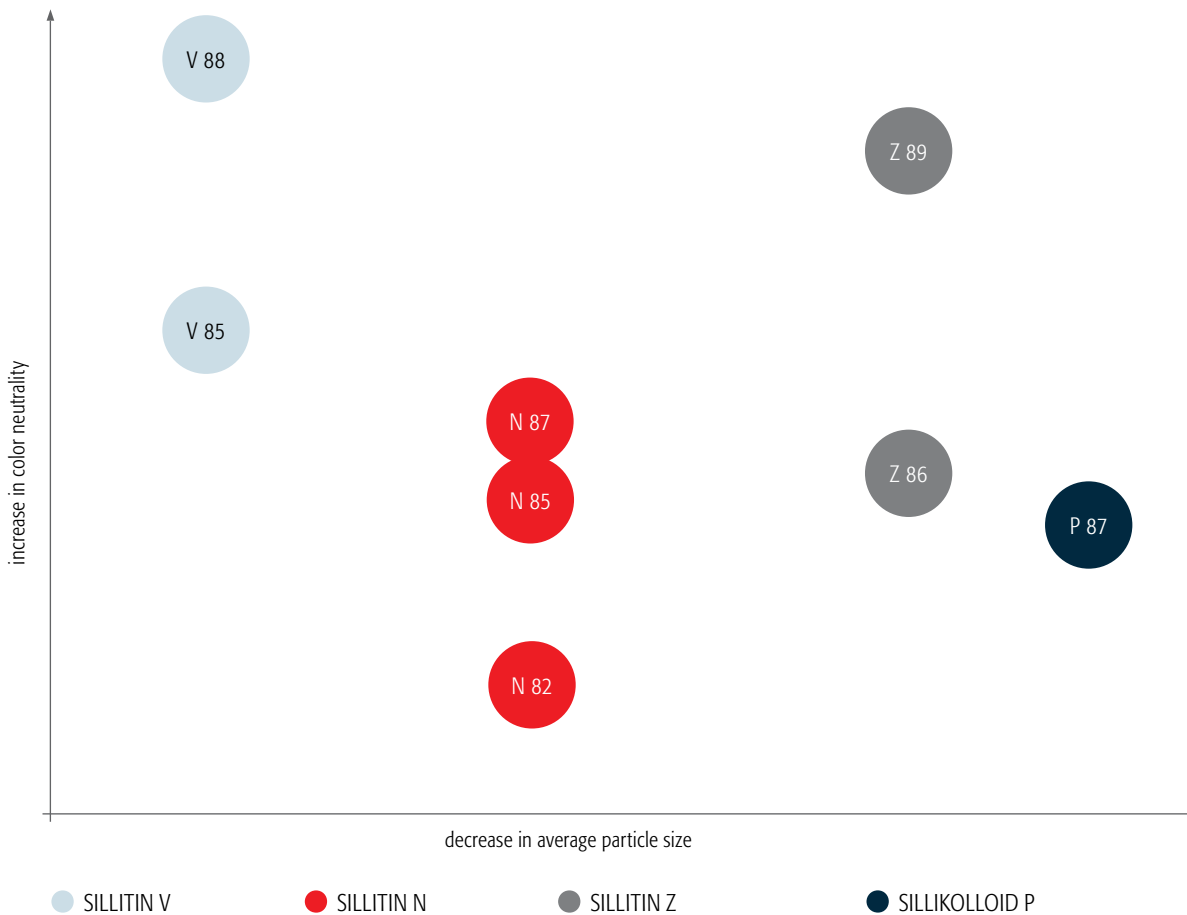


The measuring method for this particle size distribution is based on the Fraunhofer analysis of diffraction spectra. The analysis were performed with the Mastersizer 3000, a laser device from Malvern Instruments.

Sillitin Silikolloid – 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 Silikolloid – 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		
Brightness Y		82	86	77	82	83	82	86	82		
Brightness Z		76	88	65	75	76	75	86	76		
Particle size	D ₅₀	μm	4.0	4.0	3.0	3.0	3.0	1.9	1.9	1.5	
	D ₉₇	μm	18.0	18.0	16.0	16.0	16.0	9.0	9.0	6.0	
Residue	> 40 μm	mg/kg	25	25	25	25	20	20	20	20	
	> 200 μm	mg/kg	5	5	5	5	5	3	3	3	
Volatile 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		
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	%	insoluble	insoluble	insoluble	insoluble	insoluble	insoluble	insoluble	insoluble		
Acid solubility	%	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.5		
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:											
Cryptocrystalline silica	%	70	70	60	65	65	60	60	55		
Amorphous silica	%	8	8	10	10	10	10	10	10		
Kaolinite	%	17	17	25	20	20	25	25	30		
Other minerals	%	5	5	5	5	5	5	5	5		

The values shown in the table are to be considered as guidelines only.
Material specifications for each product are binding and are available on our website
www.hoffmann-mineral.com.

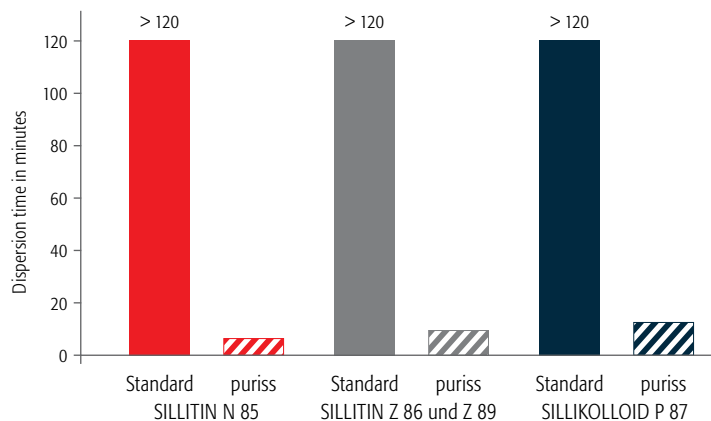
EINECS-Nr.: 310-127-6
CAS-Nr.: 1020665-14-8 (Siliceous Earth)
CAS-Nr.: 7631-86-9 (silica), 1318-74-7 (kaolinite)
TSCA-Nr.: 7631-86-9 (silica), 1318-74-7 (kaolinite)

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 for 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 N85 puriss	SILLITIN Z86 puriss	SILLITIN Z89 puriss	SILLIKOLLOID P 87 puriss
Brightness Y		82	82	86	82
Brightness Z		75	75	86	76
Particle size	D ₅₀	3.0	1.9	1.9	1.5
	D ₉₇	16.0	9.0	9.0	6.0
Residue	> 40 µm	8	8	8	8
	> 200 µm	1	1	1	1
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/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	%	insoluble	insoluble	insoluble	insoluble
Acid solubility	%	0.5	0.4	0.4	0.5
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:					
Cryptocrystalline silica	%	65	60	60	55
Amorphous silica	%	10	10	10	10
Kaolinite	%	20	25	25	30
Other minerals	%	5	5	5	5

The values shown in the table are to be considered as guidelines only. Material specifications for each product are binding and are available on our website www.hoffmann-mineral.com.

aktisil – PRODUCT CHARACTERISTICS

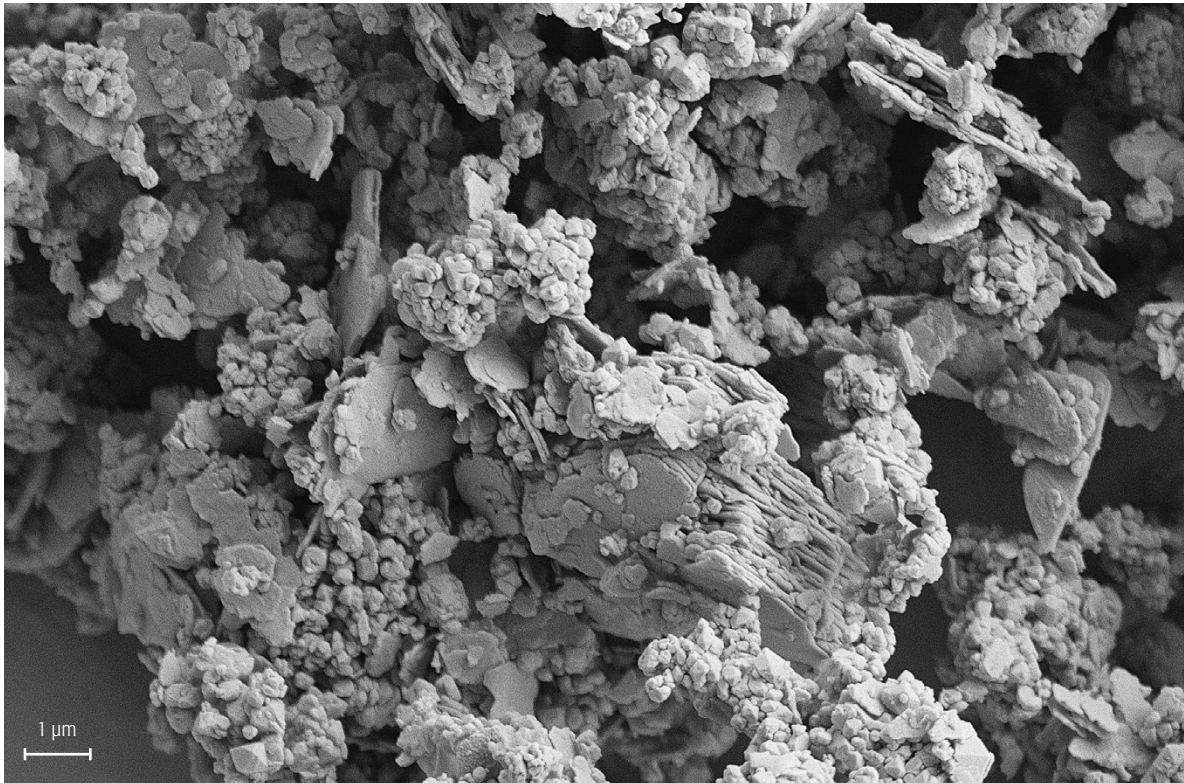
This special fillers are made by treating the surface of Neuburg Siliceous Earth with chemical agents, mostly silanes.

PRODUCT CHARACTERISTIC	UNIT	AKTISIL MAM	AKTISIL MAM-R	AKTISIL VM 56	AKTISIL VM 56/89	AKTISIL Q	AKTISIL EM	AKTISIL AM	AKTISIL MM	AKTISIL PF 216	AKTISIL PF 777
Basic material SILLITIN		V 88	V 85	Z 86	Z 89	V 90 ¹	Z 86	Z 86	Z 86	Z 86	Z 86
Silanized with		Methacrylic silane	Methacrylic silane	Vinyl silane	Vinyl silane	Methacrylic silane	Epoxy silane	Amino silane	Mercapto silane	Tetrasulfane silane	Alkyl silane
Brightness Y		83	80	81	85	84	82	82	81	82	80
Brightness Z		85	76	76	85	85	77	77	76	77	75
Particle size	D ₅₀	4.0	4.0	2.2	2.0	4.0	2.2	2.2	2.2	2.2	2.2
	D ₉₇	18.0	18.0	10.0	9.0	18.0	10.0	10.0	10.0	10.0	10.0
Residue	> 40 µm	20	20	20	20	25	20	30	30	15	20
	> 200 µm	3	3	3	3	5	3	3	3	3	3
Volatile matter at 105 °C	%	0.2	0.2	0.8	0.8	0.3	0.5	0.2	0.7	0.3	0.3
Density	g/cm ³	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Bulk density	g/cm ³	0.45	0.45	0.32	0.32	0.45	0.32	0.32	0.32	0.25	0.25
Spec. surface area (BET)	m ² /g	7	9	9	8	6	9	9	9	9	9
Oil absorption	g/100 g	45	45	45	45	43	45	45	45	60	35
Water absorption	ml/g	0.9	0.9	not specified	not specified	0.5	not specified	not specified	not specified	0.01	0.01
reactive		✓	✓	✓	✓	✓	✓	✓	✓	✓	
hydrophobic										✓	✓

¹ internal product quality

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Silfit **aktifit** – MORPHOLOGY



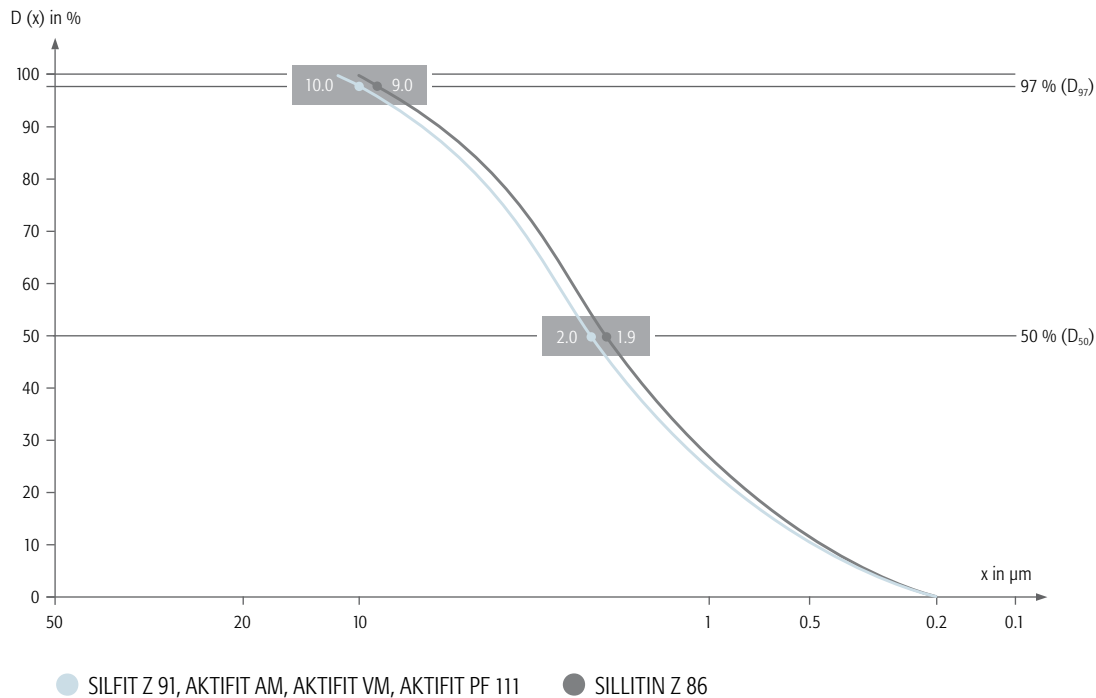
Our calcined products SILFIT and AKTIFIT are based on SILLITIN Z 86 which is thermally processed.

Silfit **aktifit** – COMPARISON OF PARTICLE SIZE DISTRIBUTION

THERE ARE FOUR CALCINED NEUBURG SILICEOUS EARTH PRODUCTS AVAILABLE:

- Basic product SILFIT Z 91
- Three surface-treated products:
 - AKTIFIT AM treated with amino silane
 - AKTIFIT VM treated with vinyl silane
 - AKTIFIT PF 111 treated with alkyl silane

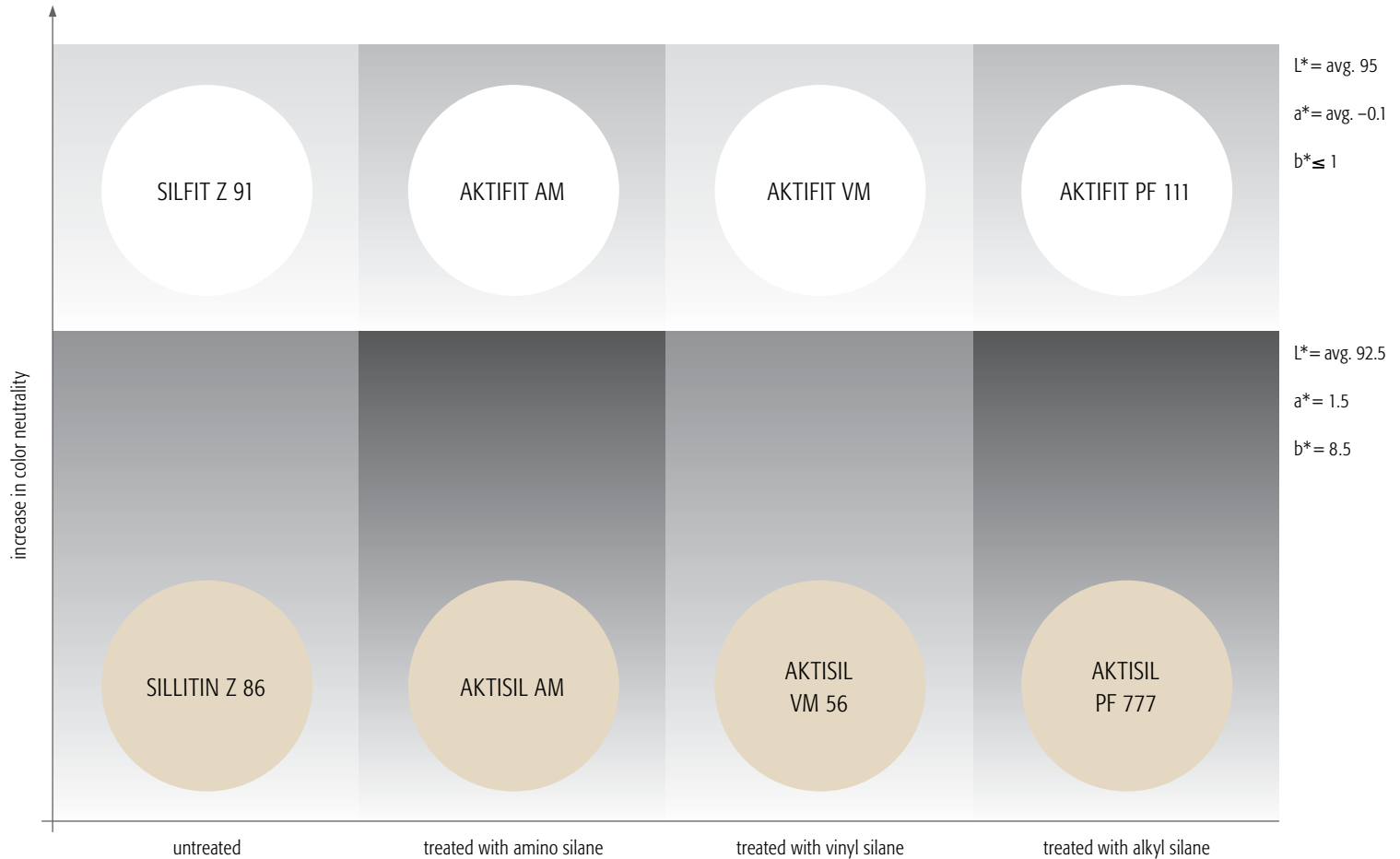
All calcined products have a particle size close to that of the uncalcined basic material SILLITIN Z 86.



The measuring method for this particle size distribution is based on the Fraunhofer analysis of diffraction spectra. 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 VM	AKTIFIT PF 111
Basic material		SILLITIN Z 86	SILFIT Z 91	SILFIT Z 91	SILFIT Z 91
Silanized with		untreated	Amino silane	Vinyl silane	Alkyl silane
Color values L*		95	95	94	94
a*		- 0.1	- 0.1	- 0.1	- 0.2
b*		1	1	1	1
Particle size D ₅₀	µm	2.0	2.0	2.0	2.0
D ₉₇	µm	10.0	10.0	10.0	10.0
Residue > 40 mm	mg/kg	10	10	10	10
Volatile matter at 105 °C	%	0.2	0.2	0.1	0.2
Density	g/cm ³	2.6	2.6	2.6	2.6
Bulk density	g/cm ³	0.33	0.31	0.42	0.38
Tamped density	g/cm ³	0.55	0.55	0.70	0.70
Spec. surface area (BET)	m ² /g	8	7	7	7
Oil absorption	g/100 g	55	55	55	49
Silica hardness/calcined kaolinite		7/4.5	7/4.5	7/4.5	7/4.5
Refractive index n		1.55	1.55	1.55	1.55
Water solubility	%	insoluble	insoluble	insoluble	insoluble
Acid solubility	%	0.25	0.25	0.25	0.25
pH value		6.5	9	not applicable	not applicable
Water absorption	ml/g	not specified	not specified	≤ 0.1	≤ 0.1
CHEMICAL ANALYSIS: SiO ₂	%	86	86	86	86
Al ₂ O ₃	%	13	13	13	13
Fe ₂ O ₃	%	< 1	< 1	< 1	< 1
MINERALOGICAL COMPOSITION:					
Cryptocrystalline silica	%	60	60	60	60
Calcined kaolinite	%	30	30	30	30
Amorphous mineral phases	%	10	10	10	10
Equilibrium moisture content at 25 °C and 50% relative humidity	%	0.12	0.11	0.05	0.07
and 80% relative humidity	%	0.22	0.29	0.07	0.10
and 90% relative humidity	%	0.54	0.55	0.08	0.13
reactive			✓	✓	
hydrophobic				✓	✓

The values shown in the table are to be considered as guidelines only. Material specifications for each product are binding and are available on our website www.hoffmann-mineral.com.

EINECS-Nr.: 310-127-6
CAS-Nr.: 1214268-39-9 (Siliceous Earth, calcined)
CAS-Nr.: 7631-86-9 (silica), 92704-41-1 (kaolin, calcined)
TSCA-Nr.: 7631-86-9 (silica), 92704-41-1 (kaolin, calcined)

ADVANTAGES OF NEUBURG SILICEOUS EARTH AND CALCINED NEUBURG SILICEOUS EARTH IN ELASTOMERS

PROPERTY IN ELASTOMERS

easily and rapidly mix in, very good dispersion properties

high degree of filling

good rheology

good extrusion properties, good calendering properties

matting effect

no negative influence on cure rate, good thermal conductivity

excellent surface

low tension and compression set

high electrical resistivity

favorable aging properties

superior chemical resistance

high purity

SPECIAL ADVANTAGES OF CALCINED NEUBURG SILICEOUS EARTH IN ELASTOMERS

low moisture content, low moisture absorption

very high brightness and color neutrality

optimum dispersion properties even in critical compounds, comparable with puriss products

avoids mold fouling/deposits on dies caused by filler

very fine cell structure in sponge and microcellular rubber

low dielectric loss in high voltage insulation

potential for lower compression set

potential for improved oil resistance

ADVANTAGES FOR USERS

short mixing times, no agglomerates

low compound costs

molds with high number of cavities

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

high quality appearance with satin finish of black profiles

short vulcanization time, high haul-off speed for continuous vulcanization

visually perfect articles, few rejects

excellent sealing properties

insulation with low loss

long service life, cost reduction through low need for anti-aging agents

high resistance against aggressive media

can be used in pharmaceutical articles and food contact materials

lower risk of blistering for pressureless vulcanization

for white products without yellowness, less need for white pigments like titanium dioxide

short mixing times, no agglomerates

high productivity and low costs thanks to reduction of stoppages for cleaning and prevention of waste

high quality sponge and expanded rubber products

reduced energy losses in electric power transmission

improved long-term sealing effect, for greater flexibility in creating recipes

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	TREATED WITH	SULPHUR/SULPHUR DONORS	METAL OXIDE	RESIN	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 MAM	SILLITIN V 88	Methacrylic silane			•	•	•	•	•			
AKTISIL MAM-R	SILLITIN V 85	Methacrylic silane			•	•	•	•	•			
AKTISIL VM 56	SILLITIN Z 86	Vinyl silane			•	•		•	•			
AKTISIL VM 56/89	SILLITIN Z 89	Vinyl silane				•		•	•			
AKTISIL Q	SILLITIN V 90 ¹	Methacrylic silane			•	•	•			•	•	
AKTISIL EM	SILLITIN Z 86	Epoxy silane	•	•	•		•		•			(•)
AKTISIL AM	SILLITIN Z 86	Amino silane	•	•		•	•	•	•			(•)
AKTISIL MM	SILLITIN Z 86	Mercapto silane	•	•	•		•		•			
AKTISIL PF 216	SILLITIN Z 86	Tetrasulfane silane	•	•	•		•		•			
AKTISIL PF 777	SILLITIN Z 86	Alkyl silane	•	•	•	•	•	•	•			
AKTIFIT VM	SILFIT Z 91	Vinyl silane			•	•		•	•	•	•	
AKTIFIT AM	SILFIT Z 91	Amino silane	•	•	•	•	•	•	•	•		•
AKTIFIT PF 111	SILFIT Z 91	Alkyl silane	•	•	•	•	•	•	•	•		

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 chemical agents, mostly silanes.

The AKTISIL and AKTIFIT types have largely functional groups that enable covalent bonds or intensive interaction with the polymer matrix and produce special effects.

PRODUCT NAME	APPLICATION
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 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	as VM 56 but for greater color neutrality requirements
AKTISIL Q	silicone compounds, silicone turbocharger hoses, seals and molded parts based on HNBR and FKM, improvement of oil resistance
AKTISIL EM	special seals, PU elastomers (solid rubbers), roller coverings, butyl-based and resin-crosslinked condenser seals
AKTISIL AM	elastomer-metal composite bearings for vibration isolation, PU elastomers (solid rubbers), roller coverings, seals for pharmaceuticals, sponge rubber
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, 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

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 VM	like AKTISIL 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
AKTIFIT PF 111	similar to AKTISIL PF 777, but with highest color neutrality, hydrophobic, avoidance of mold fouling/deposits on dies caused by filler, lower compression set, bisphenol crosslinking (FKM)

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/FOAMED

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**
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**
as Z 86 but with higher tensile strength, higher tensile modulus, lower compression set, improved abrasion resistance
- **AKTISIL PF 216**
as MM but with highest tensile strength and tensile modulus as well as lowest compression set and best abrasion resistance
- **AKTIFIT AM**
as Z 91 but with higher tensile strength, higher tensile modulus and lower compression set, improved abrasion resistance

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**
as Z 86 but with avoidance of mold fouling caused by filler, less moisture content, improved dispersion, slightly lower compression set

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

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**
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**
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**
as Z 86 but with higher tensile strength, higher tensile modulus and lower compression set even over 100 °C, better abrasion resistance, improved chemical resistances
- **AKTISIL PF 216**
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 resistances
- **AKTIFIT AM**
as Z 91 but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances

SPECIALLY FOR BISPHENOLIC CROSSLINKING (FKM):

- **AKTIFIT AM**
as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, optimum abrasion resistance, improved resistance to water and fuel
- **AKTISIL Q**
similar to AKTIFIT AM, but with lower mooney viscosity, greater elongation at break and optimum compression set, good resistance to water and oil
- **AKTIFIT PF 111**
similar to AKTIFIT AM, but with lower mooney viscosity, greater tensile strength and elongation at break, good resistance to water and oil

SPECIALLY FOR PEROXIDE CROSSLINKING:

- **AKTISIL VM 56**
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**
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**
as Z 91 but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances

AUTOMOTIVE



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**
as N 85 but with avoidance of mold fouling caused by filler, less moisture content, improved dispersion

RADIATOR HOSES

ADVANTAGES:

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

SPECIALLY FOR SULPHUR CROSSLINKING:

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

SPECIALLY FOR PEROXIDE CROSSLINKING:

- **AKTISIL VM 56**
as Z 86 but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances
- **AKTIFIT VM**
as Z 91 but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances



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**



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 calendaring 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**
as N 82, standard product for slightly higher requirements for color and dispersion
- **SILLITIN Z 86**
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**
as AKTISIL AM but with avoidance of mold fouling caused by filler, improved dispersion, slightly lower compression set



WASHING MACHINE GASKETS

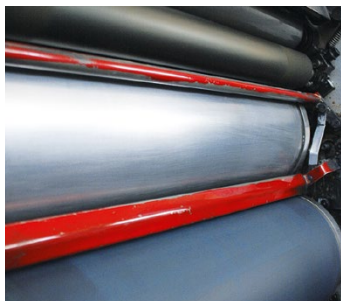
ADVANTAGES:

- 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

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**
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, substitute for silica and potential reduction of titanium dioxide, zinc oxide and processing aids, reduced swelling in suds (silica substitute)

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 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 as Z 86 but with higher tensile strength, higher tensile modulus and lower compression set even over 100 °C, better abrasion resistance, improved chemical resistances, lower dynamic heat build-up
- AKTISIL PF 216 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 as Z 91 but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances, lower dynamic heat build-up

SPECIALLY FOR PEROXIDE CROSSLINKING:

- AKTISIL VM 56 as Z 86 but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances, lower dynamic heat build-up
- AKTISIL VM 56/89 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 as Z 91 but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances, lower dynamic heat build-up

SPECIALLY FOR DIAMINE CROSSLINKING (ACM, AEM):

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

SPECIALLY FOR BISPHENOLIC CROSSLINKING (FKM):

- AKTIFIT AM as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, optimum abrasion resistance, improved resistance to water and fuel
- AKTISIL Q similar to AKTIFIT AM, but with lower mooney viscosity, greater elongation at break and optimum compression set, good resistance to water and oil
- AKTIFIT PF 111 similar to AKTIFIT AM, but with lower mooney viscosity, greater elongation at break, good resistance to water and oil

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, oil, water, acid
- avoids deposits on dies caused by filler

RECOMMENDED PRODUCTS:

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

SPECIALLY FOR PEROXIDE CROSSLINKING:

- **AKTISIL VM 56**
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**
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**
as Z 91 but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances

SPECIALLY FOR DIAMINE CROSSLINKING (ACM, AEM):

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

SPECIALLY FOR BISPHENOLIC CROSSLINKING (FKM):

- **AKTIFIT AM**
as Z 91, but with higher tensile strength, higher tensile modulus and lower compression set, optimum abrasion resistance, improved resistance to water and fuel
- **AKTISIL Q**
similar to AKTIFIT AM, but with lower mooney viscosity, greater elongation at break and optimum compression set, good resistance to water and oil
- **AKTIFIT PF 111**
similar to AKTIFIT AM, but with lower mooney viscosity, greater elongation at break, good resistance to water and oil

CABLE AND ELECTRICAL INDUSTRY



CABLE SHEATHS, CABLE INSULATION

ADVANTAGES:

- very good extrusion properties
- medium to high tensile strength
- good compressive property at high temperature
- good hot set property
- 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, acid

RECOMMENDED PRODUCTS:

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

SPECIALLY FOR PEROXIDE CROSSLINKING:

- **AKTISIL VM 56**
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**
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**
as Z 91 but with higher tensile strength, higher tensile modulus and lower compression set, better abrasion resistance, improved chemical resistances, 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):

- **SILFIT Z 91**
standard product, balanced properties, good processing properties, counter product to non-surface-treated calcined kaolinite
- **AKTISIL VM 56**
similar to Z 91 but with higher tensile modulus, lower compression set and slightly increased electrical resistance
- **AKTIFIT AM**
as VM 56 but with improved processing properties and further increased tensile modulus
- **AKTISIL MAM-R**
as AKTISIL VM 56 but with slightly improved processing properties and further increased tensile modulus
- **AKTIFIT VM**
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
- **AKTISIL EM**
similar to VM 56 but in combination with carbon black N-990 highest tensile modulus

CONSTRUCTION INDUSTRY



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**
as Z 86 but for lighter floor coverings and better color neutrality
- **SILFIT Z 91**
as Z 89 but for white and brilliant floor coverings, reduced need for titanium dioxide and color pigments, viscosity similar to that of N 87

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

CONSTRUCTION INDUSTRY



ROOFING MEMBRANES

ADVANTAGES:

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

RECOMMENDED PRODUCTS:

- **SILLITIN N 82**
standard product for non-critical compounds with low requirements
- **SILLITIN N 85**
as N 82 standard product for slightly higher requirements for color and dispersion, low compression set
- **SILLITIN Z 86**
as SILLITIN N products, but less wear
- **SILFIT Z 91**
for white roofing membranes with improved processing properties



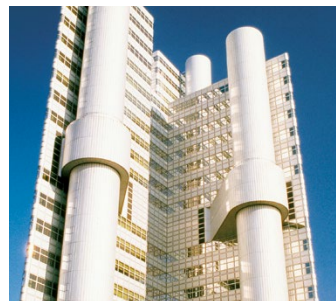
ANTI-CORROSION LINING

ADVANTAGES:

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

RECOMMENDED PRODUCTS:

- **SILLITIN N 82**
standard product for non-critical compounds with low requirements
- **SILLITIN N 85**
as N 82, for slightly higher requirements for color and dispersion, low compression set
- **SILLITIN Z 86**
as N 85, less wear than SILLITIN N products
- **AKTISIL PF 777/AKTIFIT PF 111**
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



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**
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**
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**
as Z 89 but with higher tensile strength, higher tensile modulus and lower compression set, higher loading of filler/plasticizer
- **SILFIT Z 91**
standard product for white profiles, 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**
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 resistances

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 AKTISIL 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
- very good oil resistance
- low tension and compression set without post cure
- partial replacement of ATH with AKTISIL Q or SILFIT Z 91 provides practically 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
– 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**
– for very bright and white compounds with low requirements
– 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

OTHER APPLICATIONS



LATEX THREADS

- partial substitution of titanium dioxide with SILFIT Z 91

LATEX DIPPED ARTICLES

- filling of natural rubber latex with SILFIT Z 91
- dispersion properties
- acid resistance



FOOD CONTACT MATERIALS

- 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



PHARMACEUTICAL PACKAGING

- 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
as Z 91, but better profile of properties, especially for diamine crosslinking



SOLES OF SHOES

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

RECOMMENDED PRODUCTS:

For white and brilliant colors: SILFIT Z 91, AKTIFIT AM and AKTIFIT VM as well as potential pigment reduction and finer cell structure in foamed products

SOLID TIRES AND SPINNING COTS

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

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
- reactivity through silanization

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
- SILFIT Z 91
for lower requirements

ADVANTAGES OF CALCINED NEUBURG SILICEOUS EARTH IN THERMOPLASTIC MOLDED PARTS AND MASTERBATCHES

BASIC PROPERTIES AND EFFECTS OF THE FILLER

- low moisture content, low moisture absorption
- high brightness and color neutrality
- high fineness
- very low sieve residue
- excellent dispersion properties
- supports pigment dispersion (spacer effect), potential pigment savings
- temperature resistance
- low warpage
- high melt flowability
- high hardness
- high surface quality
- very good scratch resistance
- medium increase in modulus/rigidity
- high impact strength
- high ultimate elongation
- reactivity through silanization

SELECTION CRITERIA FOR THERMOPLASTIC MOLDED PARTS AND MASTERBATCHES

POLYMER/ APPLICATION	RECOMMENDED PRODUCT	ALTERNATIVE PRODUCT RECOMMENDATION	REMARKS	FLOWABILITY	ULTIMATE ELONGATION	IMPACT STRENGTH	SCRATCH RESISTANCE	TENSILE STRENGTH	FLEXURAL STRENGTH	NO CROSSLINKING	PARTIAL REPLACEMENT OF WHITE PIGMENT	COST REDUCTION
PA (polyamide)	AKTIFIT AM	SILFIT Z 91		•	•	•						
PBT (polybutylene terephthalate)	AKTIFIT VM	AKTIFIT AM			•	•	•					
PC (polycarbonate)	AKTIFIT VM	AKTIFIT PF 111, SILFIT Z 91	SILFIT Z 91 primarily for low filler levels with low polymer degradation, 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			•	•					
PPS (polyphenylene sulfide)	AKTIFIT AM	development product	development product available with better properties than Aktifit AM: brighter and white color, higher stiffness and flexural strength; sampling possible at any time	•		•		•	•			
PEK (aliphatic polyketone)	AKTIFIT AM	development product	development product available with better properties than Aktifit AM: brighter color (light gray/beige); sampling possible at any time	•	•	•			•	•		
other polymers	SILFIT Z 91, AKTIFIT AM, AKTIFIT VM, AKTIFIT PF 111		depending on the polymer for optimal interaction and other requirements	•	•	•	•	•	•			
white pigment masterbatch	SILFIT Z 91		partial replacement of titanium dioxide up to 30 %								•	•

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 COPOLYMER COMPOUNDS FOR AUTOMOTIVE INTERIOR TRIM

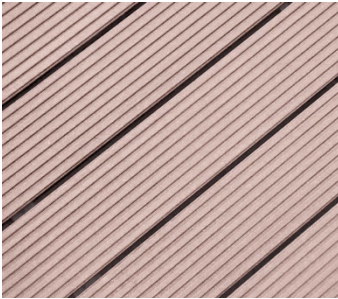
ADVANTAGES:

- scratch resistance
- ultimate elongation
- 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 notch impact strength, even at low temperatures, increased flexural strength

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
- SILFIT Z 91 for lower requirements



CHAIRS, ABS

ADVANTAGES:

- very good dispersion properties
- better crack resistance
- high ultimate elongation
- improvement of rigidity
- low distortion
- very smooth surface

RECOMMENDED PRODUCTS:

- SILFIT Z 91



TRANSPORT PACKAGING FOR WAFER CANISTER, HDPE

ADVANTAGES:

- improved physical properties
- very smooth surface

RECOMMENDED PRODUCTS:

- AKTIFIT AM
- SILFIT Z 91 for lower requirements for ultimate elongation and impact strength

THERMOPLASTIC MOLDED PARTS



RECOMMENDED PRODUCTS:

- **SILFIT Z 91**
for thick-walled parts up to 30 % substitute for titanium dioxide,
for thin-walled parts 10 to 15 % substitute for titanium dioxide

PARTIAL SUBSTITUTE FOR
TITANIUM DIOXIDE IN WHITE
(MASTERBATCH) COMPOUNDS

ADVANTAGES:

- opacity can be retained to a great extent
- brightness can be retained to a great extent
- supports and amplifies blue undertone of bluish titanium dioxide

ADVANTAGES OF NEUBURG AND CALCINED NEUBURG SILICEOUS EARTH IN THERMOPLASTIC FILMS AND MASTERBATCHES

BASIC PROPERTIES AND EFFECTS OF THE FILLER

- low coefficient of friction
- good transparency
- high gloss or matting
- low haze
- hardly any adsorption of additives thanks to relatively small surface area
- improvement of film processing/manufacturing properties by increasing modulus

SELECTION CRITERIA FOR THERMOPLASTIC FILMS AND MASTERBATCHES

POLYMER/ APPLICATION	RECOMMENDED PRODUCT	ALTERNATIVE PRODUCT RECOMMENDATION	REMARKS	ANTIBLOCK ADDITIVE	COST REDUCTION	FILM WORKABILITY/FINISHING	MECHANICAL PROPERTIES WITH- OUT INCREASE OF MELTING POINT	MATTING
BO PET (biaxially-oriented polyethylene terephthalate)	SILFIT Z 91	AKTIFIT AM		•	•			
PE, LDPE	SILFIT Z 91, SILLITIN V 88	AKTIFIT PF 111, AKTIFIT AM		•	•			
PE/EVA copolymers	SILFIT Z 91	AKTIFIT AM				•	•	
TPU	AKTIFIT AM	SILLITIN V 88						•
white pigment masterbatch	SILFIT Z 91	SILLITIN V 88	partial replacement of titanium dioxide up to 10 %		•			•

THERMOPLASTIC FILMS AND MASTERBATCHES



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:

- SILFIT Z 91
concentration 500 to 1000 ppm

LDPE BLOWN FILMS:

- SILFIT Z 91
mainly for film thicknesses of up to 50 µm,
concentration approx. 1%
- SILLITIN V 88
for thicker films above 50 µm, concentration
approx. 1%



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

RECOMMENDED PRODUCTS:

- SILFIT Z 91
concentration 10 to 15 %
- AKTIFIT AM
for increased requirements for mechanical
properties



MATTING OF TPU-FILMS

ADVANTAGES:

- matting
- scratch resistance

RECOMMENDED PRODUCTS:

- AKTIFIT AM
very good dispersion properties, good inter-
action with TPU-matrix through amino silane
functionalization, good scratch resistance,
moderate matting effect, for thin and very
thin films
- SILLITIN V 88
good dispersion properties, stronger matting
effect

PACKING

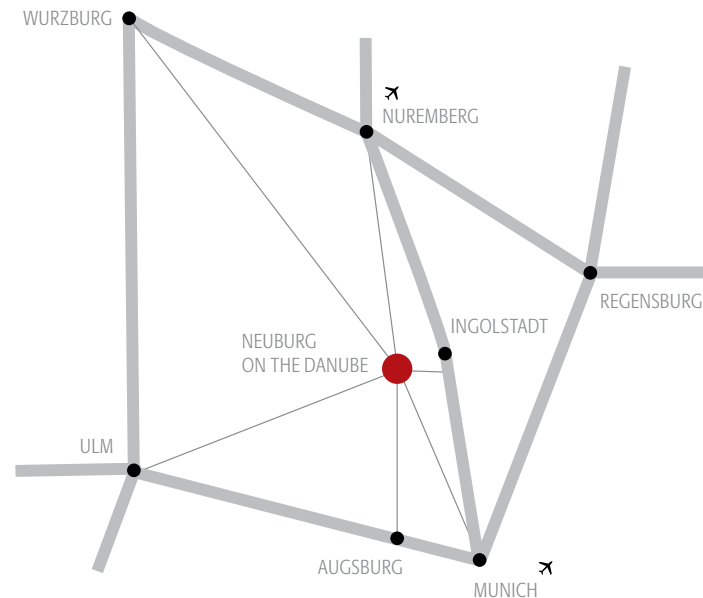
PRODUCT	PAPER BAG	PE BAG	EVA BAG	BIG BAG TYPE 1/TYPE 2/TYPE 3	BULK
Sillitin					
SILLITIN V 85	25 kg	10 to 25 kg	5 to 20 kg	≅ 750/850/1200 kg	≅ 25 t
SILLITIN V 88	25 kg	10 to 25 kg	5 to 20 kg	≅ 750/850/1200 kg	≅ 25 t
SILLITIN N 82	25 kg	10 to 25 kg	5 to 20 kg	≅ 750/850/1200 kg	≅ 25 t
SILLITIN N 85	25 kg	10 to 25 kg	5 to 20 kg	≅ 750/850/1200 kg	≅ 25 t
SILLITIN N 87	25 kg	10 to 25 kg	5 to 20 kg	≅ 750/850/1200 kg	≅ 25 t
SILLITIN Z 86	25 kg	10 to 25 kg	5 to 20 kg	≅ 600/750/1000 kg	≅ 22 t
SILLITIN Z 89	25 kg	10 to 20 kg	5 to 15 kg	≅ 550/700/900 kg	≅ 22 t
Sillikolloid					
SILLIKOLLOID P 87	25 kg	10 to 20 kg	5 to 15 kg	≅ 550/700/900 kg	≅ 22 t
puriss					
SILLITIN puriss	25 kg	-	-	-	-
SILLIKOLLOID P 87 puriss	20 kg	-	-	-	-
aktisil					
AKTISIL MAM	25 kg	10 to 25 kg	5 to 20 kg	≅ 550/700/900 kg	-
AKTISIL MAM-R	25 kg	10 to 25 kg	5 to 20 kg	≅ 550/700/900 kg	-
AKTISIL VM 56	25 kg	10 to 25 kg	5 to 20 kg	≅ 550/700/900 kg	≅ 24 t
AKTISIL VM 56/89	25 kg	10 to 20 kg	5 to 20 kg	≅ 550/700/900 kg	-
AKTISIL Q	25 kg	10 to 25 kg	5 to 20 kg	≅ 550/700/900 kg	-
AKTISIL EM	25 kg	10 to 25 kg	5 to 20 kg	≅ 550/700/900 kg	-
AKTISIL AM	25 kg	10 to 25 kg	5 to 20 kg	≅ 550/700/900 kg	-
AKTISIL MM	25 kg	10 to 25 kg	5 to 20 kg	≅ 550/700/900 kg	-
AKTISIL PF 216	25 kg	10 to 25 kg	10 to 20 kg	≅ 550/700/900 kg	-
AKTISIL PF 777	25 kg	10 to 25 kg	5 to 20 kg	≅ 550/700/900 kg	-
Silfit					
SILFIT Z 91	25 kg	10 to 20 kg	10 to 20 kg	≅ 600/750/900 kg	on request
aktifit					
AKTIFIT VM	25 kg	10 to 20 kg	10 to 20 kg	≅ 550/700/900 kg	-
AKTIFIT AM	25 kg	10 to 20 kg	10 to 20 kg	≅ 600/750/900 kg	on request
AKTIFIT PF 111	25 kg	10 to 20 kg	10 to 20 kg	≅ 600/750/900 kg	-

Special packaging and sizes are available on request.

Sillitin Sillikolloid **aktisil** Silfit **aktifit**

HOW TO FIND US

PRODUCT CHARACTERISTIC	TESTING METHOD
Brightness Y Brightness Z	DIN 53 163/measuring geometry d/8°
Color values L* a* b*	acc. to CIELAB
Particle size D ₅₀ D ₉₇	ISO 13320-1
Residue > 40 µm > 200 µm	DIN ISO 787 part 18
Volatile matter at 105 °C	DIN ISO 787 part 2
Density Bulk density Tamped density	DIN ISO 787 part 10 DIN ISO 903-1976 DIN ISO 787 part 11
Spec. surface area (BET) Oil absorption	DIN ISO 9277 DIN 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	DIN ISO 787 part 3 DIN 53 770 (0.1 N HCl)
pH value	DIN ISO 787 part 9
CHEMICAL ANALYSIS: SiO ₂ Al ₂ O ₃ Fe ₂ O ₃	DIN 51001 (RFA)
MINERALOGICAL COMPOSITION: Cryptocrystalline silica Amorphous silica 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



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