

## AKTIFIT AM

Field of application: Thermoplastics

### 1. Description

AKTIFIT AM is an activated SILFIT Z 91, produced by modifying the surface with an amino functional group. The by-products split off during the treatment reaction are largely removed during the production process which firmly attaches the functional group to the filler surface. This helps minimize undesirable side effects, as they are potentially encountered with in-situ mixing (direct addition of additive to the compound).

During compounding, the amino groups of AKTIFIT AM ensure good wetting and excellent dispersion in the matrix polymer. In addition, in polymers with suitable functional groups the use of this grade leads to high composite strength via hydrogen bonds or covalent bonds.

### Characteristics

Appearance		free-flowing powder
Color CIELAB scale:	L* a* b*	96.3 - 0.1 1.1
Sieve residue > 40 µm		10 mg/kg
Volatile matter at 105 °C		0.2 %
Density		2.6 g/cm <sup>3</sup>
Particle size distribution	D <sub>50</sub> D <sub>97</sub>	2 µm 10 µm
Surface area BET		9 m <sup>2</sup> /g
Oil absorption		65 g/100 g
Equilibrium moisture content at 23 °C:		
50 % relative humidity		0.11 %
80 % relative humidity		0.29 %
90 % relative humidity		0.55 %

### Packaging

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

### Shelf life

2 years if stored properly under dry conditions.



## 2. Application

In thermoplastics AKTIFIT AM is used as a functional filler. Optimum effects are achieved most frequently without any other filler or reinforcement.

AKTIFIT AM should be considered whenever low warpage, perfect surface finish and scratch resistance are as important as good melt flow, high strain at break and high impact strength, in polyamides even in a dry-as-molded state.

AKTIFIT AM performs best in PP compounds with the addition of maleic anhydride-grafted polypropylene (MAPP) as reactive counterpart for its amino groups, resulting in improved tensile strength as well as flexural strength and particularly ultimate scratch resistance.

In wood plastic composites (WPC) AKTIFIT AM improves mechanical and surface properties including scratch resistance.

AKTIFIT AM is also suitable for 3D printing of ABS in the FFF process (filament), where it is characterized by reduced warpage as well as excellent mechanical properties including high impact strength and high layer adhesion (yield stress in the Z-direction).

## Field of application

- automotive interiors like scratch and impact resistant trims, door panels and claddings
- engine coverings, wheel covers, grips and housings
- wood plastic composites (WPC)
- in films as functional filler, matting and anti-blocking agent

### Polymers:

- Polyamides
- Aliphatic Polyketon (PK)
- PP, PPS
- TPU, PE/EVA, ABS

### Dosage:

- Films: matting and anti-blocking in TPU: 5 to 20 %  
functional filler in PE/EVA: 5 % to 15 %
- WPC: 1 % to 10 %
- 3D printing ABS: 5 % to 10 %
- Compounds: up to 55 % (m/m), typical 20 % to 40 %



### 3. Benefits

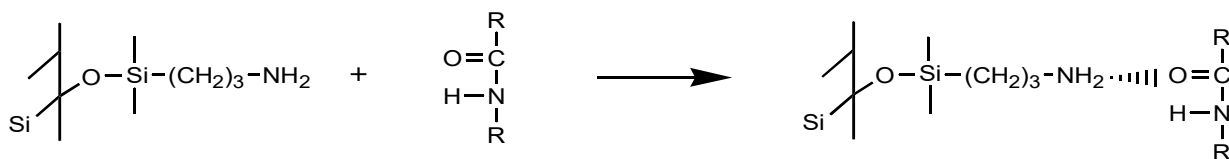
**In comparison with the unfilled polymer, the use of AKTIFIT AM will result in the following advantages:**

- lower processing shrinkage
- higher hardness
- higher stiffness (modulus)
- higher tensile and flex strength
- improved heat distortion temperature
- higher heat conductivity
- improved dimensional stability with varying humidity conditions (polyamides)

**In comparison with other mineral fillers, AKTIFIT AM offers the following advantages:**

- very low sieve residues
- easy feeding and metering
- good wetting and dispersion properties
- high melt flow rates
- no crosslinking in PK-compounds
- low warpage
- excellent surface finish
- optimum scratch resistance
- no graying of black-colored compounds
- excellent high tensile strain at break
- excellent high impact strength, even at low temperature
- low-temperature impact strength in most cases even higher than competitive fillers at room temperature (PA 66)
- matting (in films)

### 4. Effect in polymer matrix



AKTIFIT AM

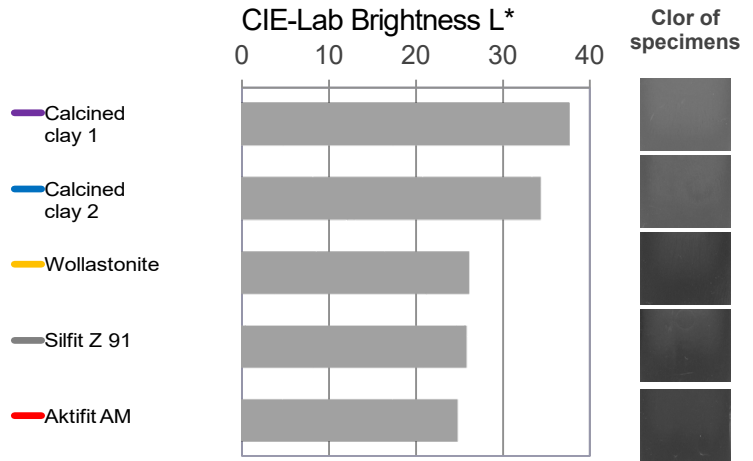
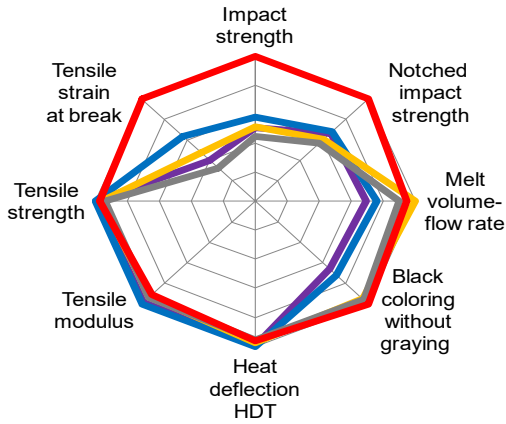
suitable functional group of polymer,  
i. e. amide, carbonyl, carboxyl, acid anhydride group



**5. Polyamide (PA), 40 % filler**

**PA 66**

**Black coloring without graying (PA 6)**



**6. 3D printing FFF, ABS, 10 % filler**

**Printing of Tensile Specimens**

Print bed 100 °C, Print speed 55 mm/min

pure ABS: detaches from print bed. Adjusted parameters necessary!

with 10 % Neuburg Siliceous Earth: without problems

Adjustment for printing the tensile specimens made of pure ABS:  
Print bed: 120 °C  
Print speed: 45 mm/min

**Warping**

Print bed 100 °C, Print speed 55 mm/min

Material	Point 1	Point 2
pure ABS	~2.6	~1.3
Silfit Z 91	~0.9	~0.8
Aktifit AM	~1.6	~1.2
Aktifit PF 115	~1.8	~1.3

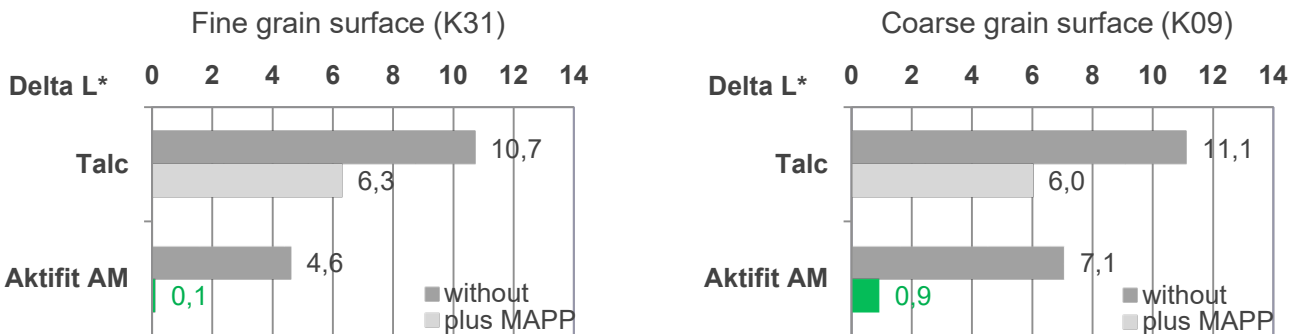
**Impact Strength Charpy**

DIN EN ISO 179-1 / 1eU

Material	Impact Strength
pure ABS	~27
Silfit Z 91	~22
Aktifit AM	~25
Aktifit PF 115	~18

**7. PP Compounds with enhanced scratch resistance, copolymer, 40 % filler**

**Brightening delta L\* of black compounds due to scratch pattern**



More information about Aktifit AM in thermoplastics at [www.hoffmann-mineral.com](http://www.hoffmann-mineral.com).

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