

# AKTIFIT PF 115

## TECHNICAL DATA SHEET – Field of application: THERMOPLASTICS

### 1. Description

**AKTIFIT PF 115** is an activated SILFIT Z 91, produced by modifying the surface with special amino functional silane. The by-products split off during the treatment reaction are largely removed during the production process which firmly attaches the silane to the filler surface. This helps minimize undesirable side effects, as they are potentially encountered with insitu mixing (direct addition of silane to the compound).

A special process technology during the production of **AKTIFIT PF 115** provides high hydrophobicity as well as outstanding low moisture absorption even under very humid conditions.

During compounding, the hydrophobic amino groups of **AKTIFIT PF 115** ensure good wetting and excellent dispersion in the matrix polymer. In addition, in polymers with suitable functional groups the use of this filler leads to high composite strength via hydrogen bonds or covalent bonds.

#### Characteristics:

Appearance: free-flowing powder

Color CIELAB scale:

L\* 94

a\* - 0.1

b\* 0.9

Sieve residue > 40 µm: 5 mg/kg

Volatile matter at 105°C: 0.1 %

Density: 2.6 g/cm<sup>3</sup>

Particle size distribution

D<sub>50</sub>: 2.0 µm

D<sub>97</sub>: 10.0 µm

Oil absorption: 60 g/100 g

Surface area BET: 9 m<sup>2</sup>/g

Equilibrium moisture content at 25 °C and

50 % relative humidity 0.04 %

80 % relative humidity 0.06 %

90 % relative humidity 0.07 %

#### Packaging:

Paper bags: 25 kg

#### Shelf life:

2 years if properly stored under dry conditions.

### 2. Applications

In thermoplastics **AKTIFIT PF 115** is used as a functional filler. Best performance results most frequently without any other filler or reinforcement.

Optimum effects are achieved particularly in high temperature engineering thermoplastics like PPS (Polyphenylene sulphide). It is also suitable for PK (aliphatic polyether ketone).

**AKTIFIT PF 115** should be considered whenever low warpage and perfect surface finish are as important as good melt flow and mechanical properties.

The white color in PPS and the bright color in PK are additional benefits. In the latter **AKTIFIT PF 115** performs similar to Aktifit AM regarding melt flow and prevention of crosslinking, modulus, tensile and flexural as well as impact strength.

**AKTIFIT PF 115** is also suitable for 3D printing of ABS in the FFF process (filament), where it is characterized by reduced warpage as well as excellent high layer adhesion (yield stress in Z-direction).

#### Application areas:

- scratch and impact resistant trims, panels, claddings and housings

- films

#### Polymers:

- In particular polar high temperature engineering thermoplastics like PPS and special polyamides
- PK, ABS
- Other thermoplastics capable of interacting with amino groups

#### Dosage:

Up to 55 % (w/w), typically 10 to 50 %

### 3. Benefits

#### Powder-related features and general effects vs. neat resins:

- hydrophobic filler
- outstandingly low moisture absorption, even under damp conditions
- pre-drying usually not required
- higher hardness
- improvement of scratch resistance
- higher stiffness (modulus)
- higher tensile and flex strength
- improved heat distortion temperature
- higher heat conductivity

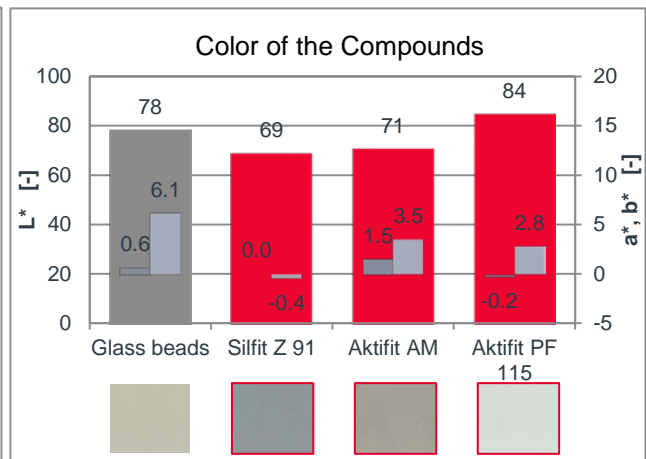
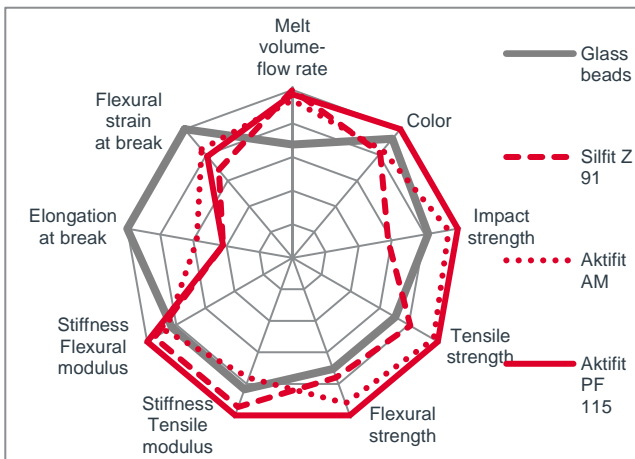
#### In comparison with surface treated glass beads, **AKTIFIT PF 115** offers the following advantages in PPS at 40 % filler level:

- significant higher melt flow rate
- higher tensile and flexural modulus
- markedly higher tensile strength
- markedly higher flexural strength
- higher impact strength
- brighter, almost white color of the compound

#### In comparison to non filled PK, **AKTIFIT PF 115** offers the following advantages at 30 % filler level:

- sufficient melt flow rate without any crosslinking
- higher tensile and flexural modulus
- higher tensile strength
- markedly higher flexural strength
- comparable strain at break
- comparable high impact strength, even at low temperature like -30 °C
- brighter color of the compound

#### 4. Performance of AKTIFIT PF 115 in PPS, 40 % (w/w)



#### 5. Performance in ABS, 10 %, 3D Printing FFF

#### Printing of Tensile Specimens

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

pure ABS      with 10 % Neuburg Siliceous Earth

detaches from print bed      without problems  
Adjusted parameters necessary !

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

