AKTIFIT PF 115

Field of application: Thermoplastics

1. Description

AKTIFIT PF 115 is an activated SILFIT Z 91, produced by modifying the surface with a special 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).
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* a* b*	95.7 0 1.0
Residue > 40 µm		10 mg/kg
Volatile matter at 105 °C		0.1 %
Densitiy		2.6 g/cm³
Particle size distribution	D_{50} D_{97}	2 µm 10 µm
Surface area BET		9 m²/g
Oil absorption		60 g/100 g
Equilibrium moisture content at 23 °C: 50 % relative humidity 80 % relative humidity 90 % relative humidity		 0.04 % 0.06 % 0.07 %

Packaging

Paper bags	á 25 kg
EVA bags	on demand
Big Bags	on demand

Shelf life

2 years if stored properly 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).

Fields of application

- 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

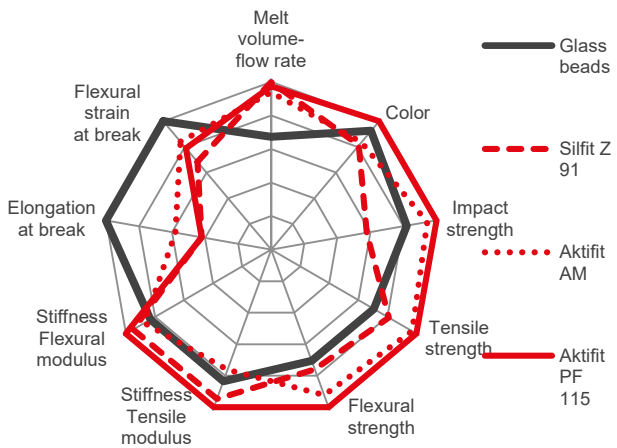
In comparison with surface treated glass beads, AKTIFIT PF 115 offers the following advantages in PPS at 40 % filler level:

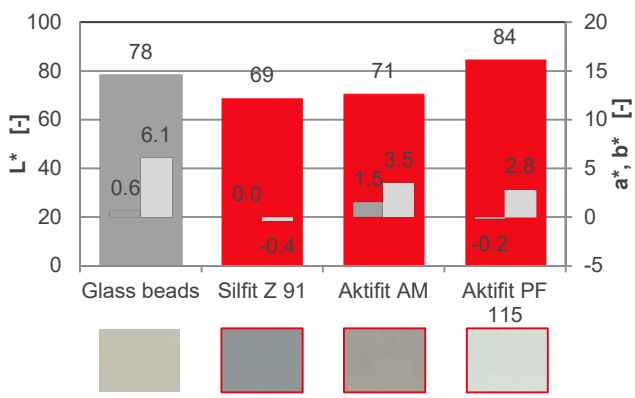
- significant higher melt flow rate
- higher tensile and flexural modulus
- markedly higher tensile strength
- markedly higher flexural strength
- higher impact strength
- brighter, almost white color of the compound

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 in PPS, 50 % (w/w)

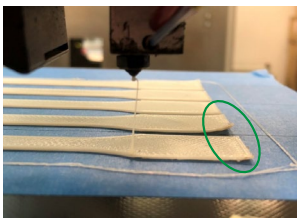




5. Performance in ABS, 10 %, 3D Printing FFF

Printing of Tensile Specimens

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



pure ABS

with 10 % Neuburg Siliceous Earth

detaches from print bed
Adjusted parameters necessary !

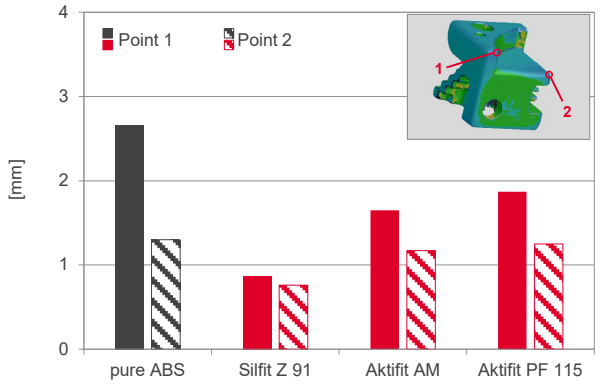
without problems

Adjustment for printing the tensile specimens made of pure ABS:

Print bed: 120 °C
Print speed: 45 mm/min

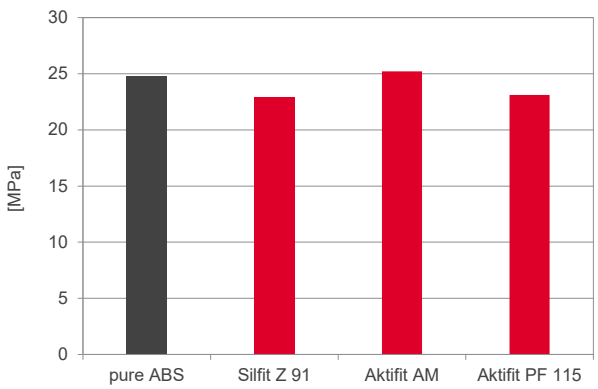
Warping

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



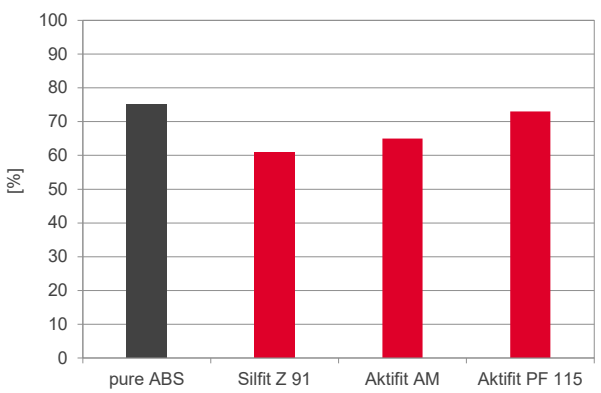
Yield Stress

DIN EN ISO 527-1,-2; 5 mm/min



Layer Adhesion

Ratio yield stress Z : XY



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