



AKTIFIT Q

Field of application: Paint & Varnish

1. Description

AKTIFIT Q is an activated SILFIT Z 91, produced by modifying the surface with a methacrylic 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, which are potentially encountered with in-situ mixing (direct addition of additive to the compound).

A special process technology during the production of AKTIFIT Q provides high hydrophobicity as well as outstanding low moisture absorption even under very humid conditions. During curing (hardening) of the coating, the methacrylic groups of AKTIFIT Q react with the functional groups of the binder, especially in the presence of radicals.

Characteristics

Appearance		free-flowing powder
Color CIELAB scale:	L* a* b*	96.2 - 0.1 1.0
Residue > 40 µm		20 mg/kg
Volatile matter at 105 °C		0.2 %
Density		2.6 g/cm ³
Particle size distribution	D ₅₀ D ₉₇	2 µm 10 µm
Surface area BET		9 m ² /g
Oil absorption		65 g/100 g
Equilibrium moisture content at 23 °C:		
50 % relative humidity		0.04 %
80 % relative humidity		0.06 %
90 % relative humidity		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

The optimum effect of AKTIFIT Q is achieved in binder systems that polymerize or crosslink by a radical-initiated reaction.

These include in particular:

- UV or electron beam curing coatings and resins, also 3D-printing SLAs
- unsaturated polyester and vinyl ester resins
- acrylic and acrylated resins
- other radical curing systems
- Furthermore it is suitable for moisture curing binder systems such as:
 - 1 K polyurethane
 - MS / silane-terminated polymers (STP)

It is characterized by easy wettability, outstanding dispersing properties, which enable coating production potentially without grinding as well as very high brightness and color neutrality.

AKTIFIT Q enhances the opacity effect of pigments, so that the possibility of titanium dioxide exchange of up to 20 % exists or an improved hiding power results. In clear coats, it achieves very good transparency without yellow tint. Depending on the formulation principle and dosage, a slight white glazing effect can result.

In addition, it generates excellent mechanical properties with very good scratch and abrasion resistance as well as high resistance to moisture and chemicals.

Fields of application

- UV-curing clear coats (varnishes) and pigmented coatings
- UV-curing powder coatings
- UV-curing 3D printing SLA
- radical curing polyesters and vinyl esters
- moisture-curing adhesives and sealants, potting compounds

Minimum film thickness:

> 10 µm, in special cases also lower.

Dosage:

- depending on the application, up to 55 % m/m or up to PVK 35
- 3D printing SLA UV-curing: 5 to 20 %



3. Benefits

The excellent properties of the base material SILFIT Z 91 are retained:

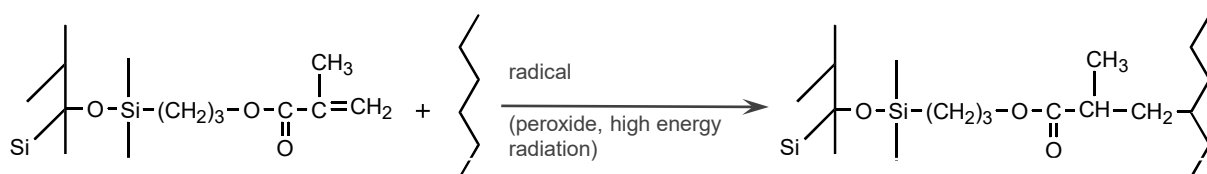
- low sieve residues
- low moisture content, low moisture absorption
- very high brightness
- very high color-neutrality
- outstanding dispersion behavior, even without grinding
- improved opacity (spacer effect), likewise potential for partial pigment replacement
- relatively low abrasivity
- quick drying
- weathering resistance
- scratch resistance
- abrasion resistance
- good transparency¹
- matting effect¹

AKTIFIT Q also provides the following benefits compared with the base SILFIT Z 91:

- hydrophobic filler
- outstandingly low moisture absorption, even under damp conditions
- improved wettability even using binders with medium polarity
- increased stiffness and heat distortion temperature, tensile and flexural strength as well as impact strength
- improved abrasion resistance and scratch resistance
- increased resistance to moisture, chemicals and weathering
- enhanced hiding power of white pigmented UV cured coatings

¹strongly depending on formulation

4. Possible reaction in binder system



AKTIFIT Q

oligomer or polymer



5. Application examples

White pigmented UV curing coatings

- improving hiding power (opacity) by adding Aktifit Q additionally to the given titanium dioxide loading
- cost reduction potential

UV curing clear coats

- very high transparency without yellow tint
- improved abrasion resistance
- cost reduction potential

Water-based corrosion protection based on acrylate, also DTM and single layer, i. e. 80 µm

Excellent results in corrosion protection tests, also long-term, i. e. 1000 h

- humidity test: good adhesion, no blistering, no corrosion
- salt spray test: good adhesion, no blistering, no corrosion, very little delamination

3D printing in stereolithographic process (SLA) UV-curing (or any other high energy radiation)

Despite filling level of up to 20 %

- only moderate viscosity increase
- undisturbed UV-crosslinking
- extensive retention of tensile strength, elongation at break and impact strength
- increase of stiffness (e-modulus) and heat distortion temperature

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