

## AKTISIL PF 777

Field of application: Paint & Varnish

### 1. Description

AKTISIL PF 777 is an activated SILLITIN Z 86, produced by modifying the surface with an alkyl 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 into the compound). The non-polar alkyl groups of the coating agent impart the desired hydrophobic properties to the filler surface.

During paint manufacture (dispersion), the hydrophobic surface of AKTISIL PF 777 enters into strong interaction with the polymer, which gives rise to optimum wetting.

### Characteristics

Appearance		free-flowing powder
Color CIELAB scale:	L*	93.8
	b*	10.0
Volatile matter at 105 °C		0.3 %
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		35 g/100 g
Water absorption acc. Baumann		0.01 %

### Packaging

Paper bags		à 25 kg
EVA bags		≤ 20 kg
Big Bags		550 - 900 kg

### Shelf life

3 years if stored properly under dry conditions.



## 2. Applications

In paints and coatings, AKTISIL PF 777 is used as a functional filler alone by itself, or in combination with rheological additives and/or flattening agents. The optimum efficiency is very much a function of the binder used. In non-polar to slightly polar vehicle systems, AKTISIL PF 777 is easily dispersed already with low shear energy input, and in rheological respects gives rise to shear thinning. In highly polar systems, appropriate loadings cause thixotropic properties, strong shear thinning and lead to a high yield point.

Applications consequently concern areas where easy dispersion, desired rheological effects and very low sedimentation tendency are of similar importance as hydrophobic properties, good corrosion protection and high chemical resistance.

## Fields of application

- high performance industrial coatings
- sealant and casting compounds, including one-component PU systems
- anti-corrosion coatings
- high solid fillers and primers
- thickening and rheology control of epoxide resins, PU systems and plastisols

### Minimum film thickness:

> 10 µm, in special cases even lower

### Metering:

Depending on the target, up to 50 % (m/m), PVC up to appr. 30 %



### 3. Benefits

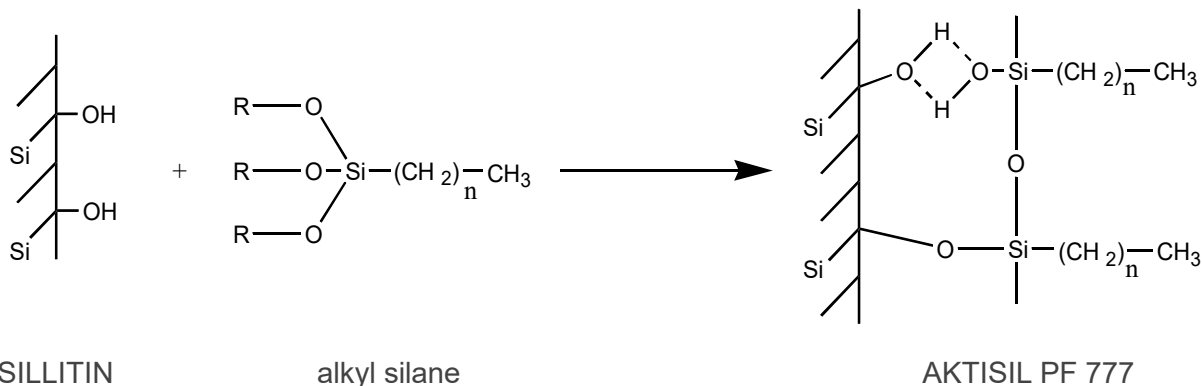
The excellent properties of the base material SILLITIN Z 86 are retained:

- high filling ratio
- outstanding dispersion behavior
- good pigment dispersion (spacer effect)
- low abrasivity
- very low tendency to settle
- soft sediment
- good edge covering
- quick drying
- weathering resistance
- breathability
- scratch resistance
- high abrasion resistance
- good transparency
- slight flattening effect

**AKTISIL PF 777 also provides the following benefits compared with the base SILLITIN Z 86:**

- hydrophobic
- improved wetting and easy dispersion in binders with low to slight polarity
- rheological activity
- rheological stability
- improvement of adhesion on non blasted steel
- improvement of anti-corrosive properties (blistering, rust creepage and elamination at scribe, adhesion)
- improved humidity test results
- increased resistance to chemicals, particularly acids

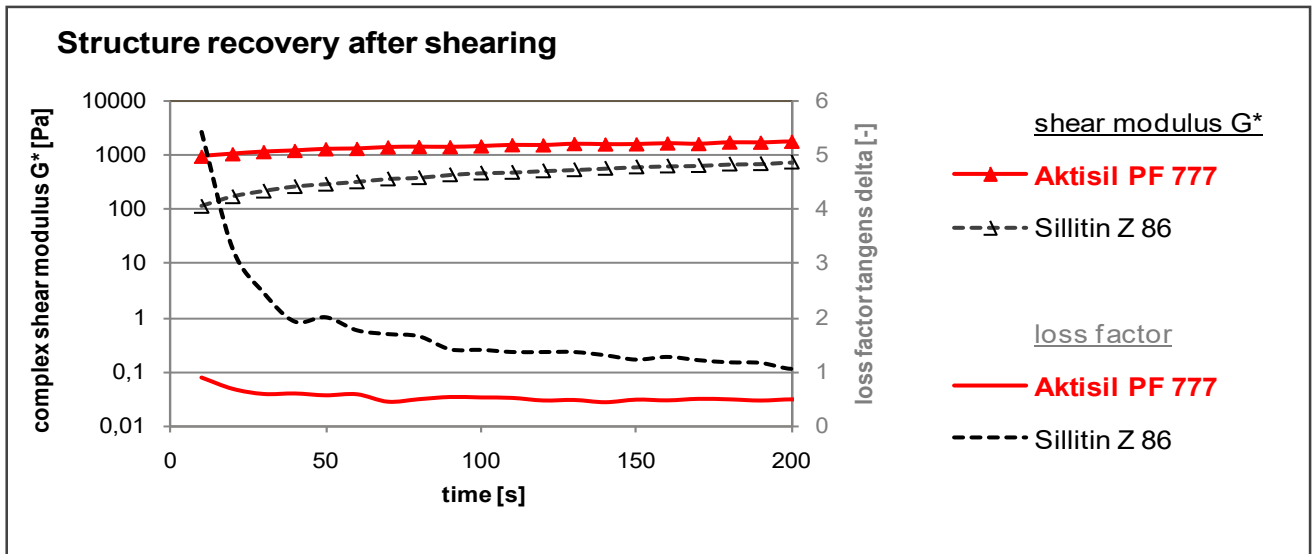
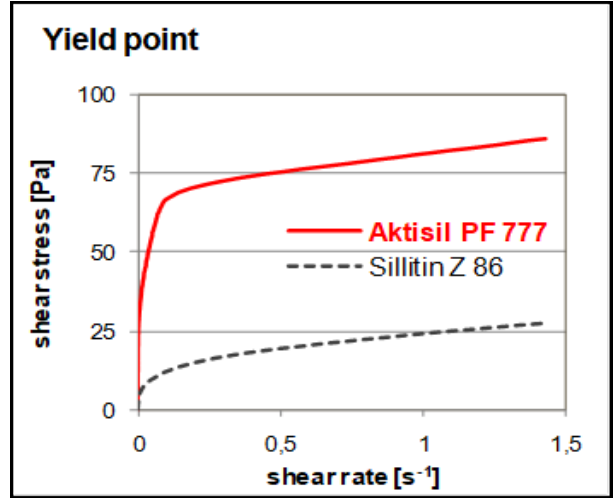
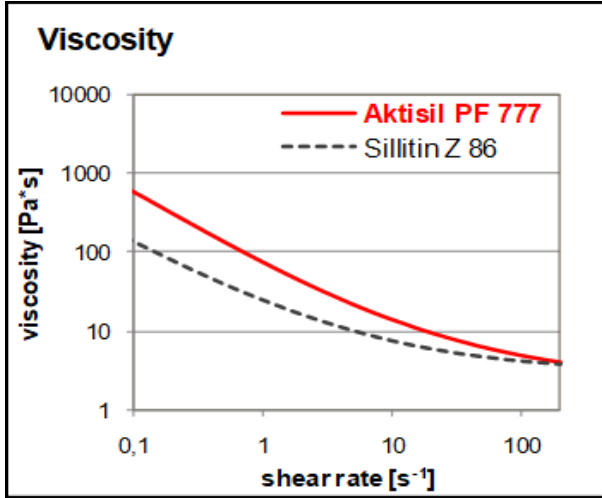
### 4. Possible reaction at HOFFMANN MINERAL (model)





**5. Rheology**

50 phr in epoxy resin (bisphenol F-type),  
complete formulation with hardener TETA (triethylenetetraamine)



This chart shows the structure recovery after structure degradation by shear stress. The complex shear modulus  $G^*$  is composed of an elastic and a viscous portion, and indicates the rigidity of a batch under oscillating deformation. The loss factor is the quotient of the viscous and the elastic part and, therefore, characterizes the structure of the sample (liquid vs. solid). A low loss factor indicates a strong solid nature and thus shows very good structure recovery with Aktisil PF 777.

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