

Additives for the Surface-Treatment of Pigments, Fillers and Flame retardants

SURFACE-TREATMENT MAKES THE DIFFERENCE

Create more value and give more function to tailor made pigments, fillers and flame retardants. Evonik additives meet your demands with focusing on high value end applications like

- functional fillers for automotive compounds
- special MDH and ATH grades for HFFR compounds
- easy to disperse pigments for plastic colorizing
- avoid pigment bleeding

TEGOPREN® 6875/6875-45 (45% Emulsion)

- An alkyl modified siloxane to be used for surface treatment of inorganic fillers and pigments in plastic formulations
- Easy to handle and easy to implement into the production process

TEGOPREN® 6879

- Bi-functional siloxane with high surface interaction
- Results in super-hydrophobic surfaces
- Also usable for carbonates and sulfates

TEGOPREN® 5885

- A hydrophobic, non-ionic polyether siloxane based wetting and dispersing agent
- It is a highly efficient dispersing agent, especially recommended for fine or nano scaled fillers, such as organo clays

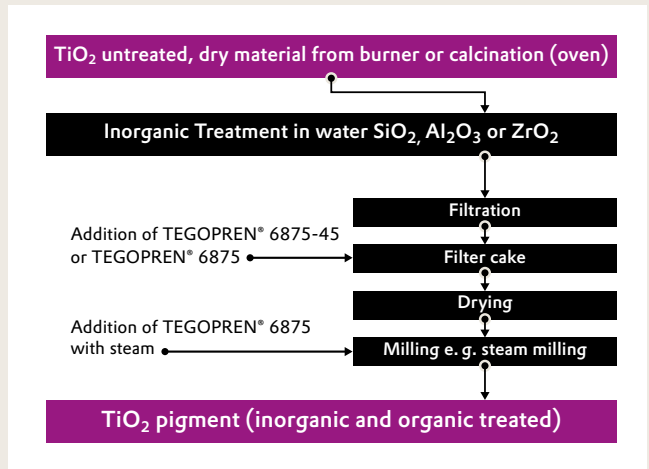
Benefits

The use of Evonik's organo modified siloxane technology (OMS) offers several advantages:

- No VOC and no migration
- Faster filtration in water-based production processes, which saves drying time and energy
- Less agglomeration size of the pigment or filler, even in dry stage
- Easy dispersing with higher filling grades in a variety of polymers
- Less specks and higher color strength in finished plastic parts
- Hydrophobic surface improves the weatherability and water repellence
- Improves mechanical and surface properties of plastic parts

TEGOPREN® 6875 / 6875-45 for the post-treatment of titanium dioxide

During the production of TiO₂ our additives can be added either in the TiO₂ slurry (wet stage) or during milling (dry stage), illustrated in the processing picture right. It can be added during the regular production. Therefore no extra investment is needed. TEGOPREN® 6875 is an inert OMS based liquid, which allows easy handling. Since no volatiles are evaporated no additional fire safety measures or explosion safe equipment need to be implemented.



TEGOPREN® 6875 allows the same hydrophobization as silicone oils but does not create disadvantages in the final application, like VOC or migration which results in fish eyes, sealing or printing issues or loss of mechanical properties. Furthermore, a higher bulk density and better storage properties on pallets can be achieved with OMS technology. On the right side is illustrated as a simple test to visualize the effect of the surface treatment: TEGOPREN® 6875 hydrophobizes the oxidic surface so effectively that even the high density material as TiO₂ floats on water.



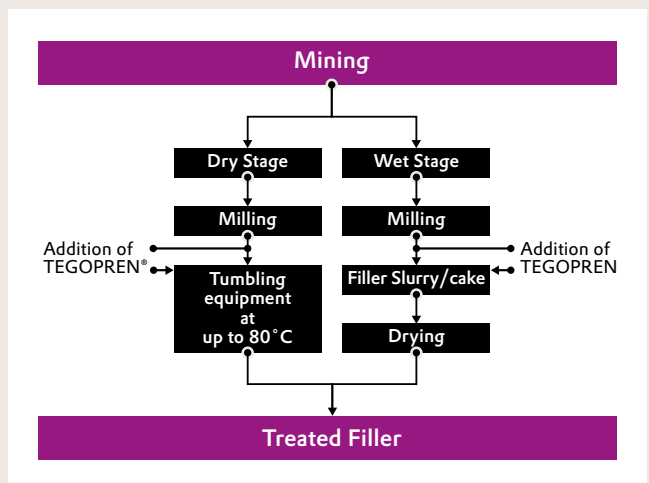
Uncoated TiO₂ hydrophilic



TEGOPREN® 6875 treated TiO₂ hydrophobic, swims on water

TEGOPREN® 6875 / 6875-45 for filler treatment

Most fillers are produced by wet or dry milling. In both cases our additives can be applied quite easily at the end of the milling stage, in the tumbler or filtration step. The treatment will give better storage behavior in the silo. The filler is more compact, less dusty and has a reduced tendency of bridging and baking, which allows homogenous and therefore faster feeding in the compounding step and results in fewer variations of filler content.



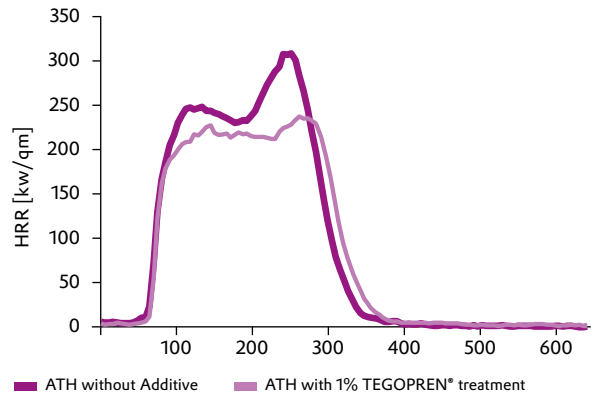
SOME EXAMPLES

Treatment of ATH or MDH for HFFR compounds

The use of treated fillers in the production of cable compounds shows outstanding advantages:

- Improved dispersing of fillers
- Better hydrophobic properties
- Smooth and supple cable surfaces
- No influence on printability
- Better flame-retardant properties in the UL 94V and Cone Calorimeter measurement (See heat release graph on the right side)

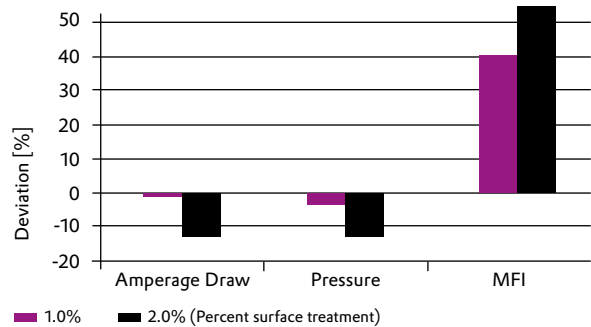
Heat Release Ratio Measurement



Treated fillers in the production of automotive compounds

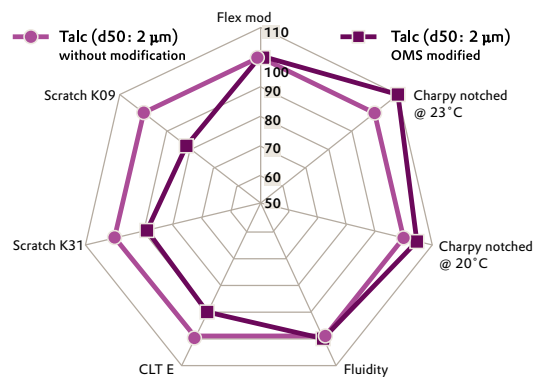
TEGOPREN® 6875 treatment will optimize the processing, which will lead to an extended tool life and reduced energy consumption. In this example the MFI could be increased more than 50% and 15% electricity has been saved.

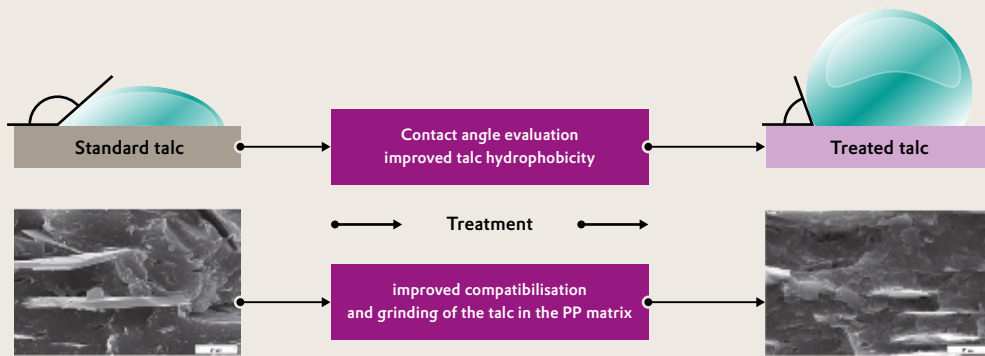
PP/Talc compound with 40% treated Talc



Effect of talc treatment in TPO application

- No reduction of stiffness
- Better effect on impact resistance (notched charpy)
- Important reduction of CLTE (Coefficient of Linear Thermal Expansion)
- Reduced scratch visibility (K09, K31)
- Improved hydrophobicity
- Better dispersion and distribution of the talc



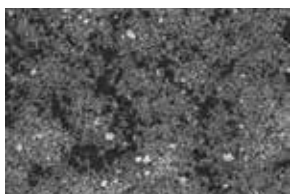


Comparison of different technologies for the surface modification of pigments and fillers

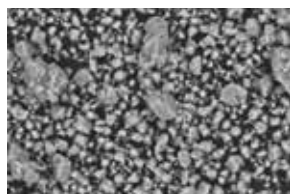
	TEGOPREN® 6875	TEGOPREN® 6879	Silicone oil	Silanes	Stearates
Handling in production	+	+	+	o	o
Hydrophobization	+	+	+	+	o
FDA	+	+	+	o	+
Influence on end application (migration, sealing, printing)	+	+	-	+	-
Loading [%]	0.2 – 2.0	0.2 – 2.0	0.4 – 2.0	0.4 – 1.0	0.2 – 1.5

+ = positive influence o = moderate or no influence - = negative impact

PICTURES OF DIFFERENT FILLERS



Titanium dioxide



Calcium carbonate grinded



Aluminium silicate

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