

## POSS® Dispersion Aids - Case Study

### POSS® Titania - Enhanced filler dispersion improves appearance and eases processing

#### Problem:

Fillers can add color and improve the mechanical properties of many polymers, and can save money by replacing costly resin.

Unfortunately:

- Poorly dispersed fillers increase viscosity
- High loadings must be used to achieve desired color/properties
- Voids in agglomerated filler may decrease mechanical properties
- Common dispersants degrade at processing temperatures

#### POSS® Dispersion Aids can solve these problems at low loadings

POSS® Dispersion Aids react with the surface of the  $\text{TiO}_2$ , creating a monolayer coating on each particle. The organic R-groups, when properly matched to your resin, compatibilize the filler particles and allow for complete dispersion, and no particle agglomeration.

#### \* Save money by reducing melt viscosity

Poorly dispersed filler affects the flow of polymers, whether in solution or the melt, and increase viscosity. When the proper R-groups are selected, POSS® Dispersion Aids will reduce the melt viscosity of the polymer. A 10x reduction in melt viscosity can be realized with as little as 3% loading (by weight of filler) of POSS® Dispersion Aids.

#### \* Save money by using more filler

The viscosity increase with added filler often limits the amount of filler that can be used. POSS® Dispersion Aids help to disperse the  $\text{TiO}_2$  completely, allowing the polymer to flow freely. This can allow you to add up to 20% more filler to the polymer while maintaining the same viscosity.

#### \* High thermal stability leads to better color retention

Due to the inorganic core, POSS® Dispersion Aids are significantly more thermally stable than common dispersants - up to 400°C. This means that POSS® Titania can even be used in high temperature engineering plastics. In addition, POSS® Dispersion Aids will passivate any reactive groups on the surface of the filler, so the  $\text{TiO}_2$  will not catalyze degradation.

