

# Hybrid Plastics®

Superior Technology for Superior Products

## Tin POMS® Catalyst

Tin POMS® utilizes nanodispersion technology to achieve a low cost and highly active catalyst for polyurethane cure. Advantages of Sn POMS® catalyst include lower tin content, greatly reduced flammability, and very low catalyst migration.

### LOWER TIN CONTENT

The dispersion of Sn atoms in cages is key to reduction of the overall tin content in this catalyst by 7% relative to dibutyltindilaurate.

### HIGHER ACTIVITY

This silicon-oxygen cage framework is electron withdrawing and consequently renders a highly Lewis acidic tin atom. This in turn provides a highly activated tin atom and affords lower effective loadings of catalysts than can be achieved with siloxane based catalysts or organometallics like dibutyltindilaurate. The advantage of the higher activity is reduced cycle times.

### GREATER SURFACE AREA

The nanoscopic size of POMS® cages provides a very high surface area on the order of 3700 m<sup>2</sup> at a 1 wt% loading. This large surface area enables greater reactivity at the surface which aids in the completion of cure.

### ORGANIC COMPATIBILITY

Sn POMS® are colorless, nonvolatile solids that dissolve into polyurethane components. Because POMS® are chemicals rather than particles they follow the Gibbs equation and are not subject to limitations of particulate dispersion nor are they limited to microscopic phase separation as are polymeric catalyst carriers.

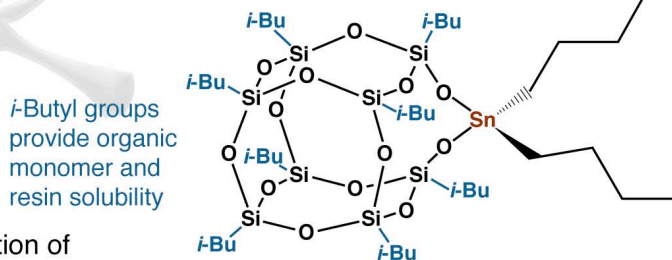
### SUGGESTED APPLICATIONS

Sn POMS® may be used as a replacement for organometallic polyurethane catalysts such as titanium and dibutyltin dilaurate. We are able to make analogous POSS®-tin structures with different ligands in place of isobutyl. This enables matching of the catalyst to polyurethane formulations of different polarity. Furthermore, we have seen that certain POSS® variants are able to improve the mechanical performance of foams and this may be relevant for polyurethane foams for thermal insulation or furniture. Sn POMS® are available as dry powders in R&D and bulk quantities or as predispersed concentrates suitable for use with component diluents.

### WARRANTY

The information contained herein is believed to be accurate and reliable. However, the user is responsible for determining the suitability and use of the final formulations/products. Hybrid Plastics® warrants that its products will meet specifications, but not merchantability or fitness for use.

Highly active silica supported Sn catalyst



*i*-Butyl groups provide organic monomer and resin solubility

1.5 nm cage size provides non-volatility and limited migration

