

## Glycidyl POSS<sup>®</sup> Cage Mixture in Bis-Oxetane

EP4F09.04 features EP0409 POSS dissolved in 3-Ethyl-3[[3-ethyloxetane-3-yl)methoxy]methyl]oxetane for solvent-free UV coating applications.

### APPEARANCE

Clear, colorless, medium viscosity liquid.

### DESCRIPTION

EP4F09.04 contains the active EP0409 POSS, with glycidyl groups attached to the silicon vertices of the cage. The combination with bis-oxetane provides enhanced rate of cationic cure and enhanced coating durability relative to glycidial chemistry.

### APPLICATIONS AND BENEFITS

EP4F09.04 is a film former however it is designed for use as an additive in UV coatings for high transparency and hardness.

### EP4F09.04 PROPERTIES

|                   |                                |
|-------------------|--------------------------------|
| Appearance        | Clear, medium viscosity liquid |
| Viscosity (@25°C) | 815.6 mPa-s                    |
| Density           | 1.18 g/ml                      |
| EEW               | 179-180                        |
| Resin Solubility  | epoxy, urethane, acrylic       |

### REGULATORY STATUS

INCI, REACH pending TSCA, EP0409 CAS 68611-45-0.  
EP0409 is not a primary dermal irritant.

3-Ethyl-3[[3-ethyloxetane-3-yl)methoxy]methyl]oxetane CAS 18934-00-4

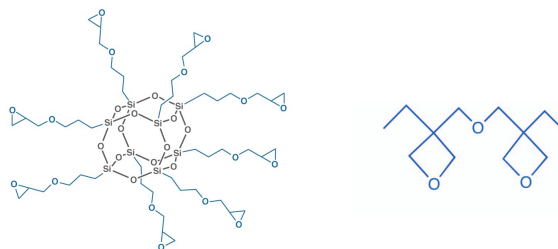
### HANDLING PRECAUTIONS

*Product safety information required for safe use is not included in this document. Before handling, read product and safety data sheets and container labels for safe use, physical health and hazard information. For safety data information, contact Hybrid.*



### PRODUCT BENEFITS

The EP0409 cage molecule is an excellent compatibilizer, rheological diluent and carrier. It has a robust resistance to environmental degradation such as moisture, oxidation, and provides 200-300 nm absorption. In combination with bis-oxetane, stable clear films are realized with 9H hardness and modest flexibility.



### FEATURED IMAGE

The EP0409 octamer structure is shown.

### EP0409 STRUCTURE AND FUNCTION

EP0409 is a mixture of cage sizes 8, 10 and 12. The EP0409 POSS is a hybrid, 1.5 nm molecule with an inorganic silsesquioxane core and organic glycidyl groups attached at the corners of the cage, which act as multifunctional cross-links and dispersant arms. EP0409 shows high compatibility and diluent properties in urethane, epoxy and acrylic resins. As a cross-linker, EP0409 retains modulus above glass transition and increases hardness, and solvent resistance.

### RELATED LITERATURE

1. Cross-linking of CTBN: DOI 10.1007/S10973-015-5019-9
2. Increased Thermal Stability of POM: DOI 10.1002/pc.21191
3. Decreased water uptake in epoxy resin: DOI 10.1007/s00289-015-1475-4.  
DOI 10.1002/app
4. Impact Improvement in Epoxidized Pine Oil: DOI: 10.1002/app.42451.

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