

# ChemBrief



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## Recent work by SCP scientists leads to the discovery of a revolutionary class of thixotropes.

Recent work by scientists at Southern Clay Products, Inc. (SCP) has led to the discovery of a revolutionary new class of thixotropes. Marketed under the trademark of *Garamite*®, these thixotropes represent a breakthrough in functionality, efficiency, stability, and ease of dispersion.

Garamite® products are currently aimed at both the unsaturated polyester and epoxy markets. The current stable of Garamite® products utilizes a patented mixed mineral formulation in combination with a proprietary blend of cationic surface treatment chemistries to deliver a product that requires little shear to disperse. Garamite® products can replace a range of competitive thixotropes, including treated and untreated fumed silica, organoclays, hydrogenated castors, and polyamide waxes.

The combination of minerals and surface treatments used in Garamite® products was discovered and developed through the use of Design of Experiment (DOE) software. Additional work was incorporated to evaluate a series of processing options. As a result of the novelty of some of the raw materials used in the manufacture of Garamite® products, it was found that conventional processing assumptions were no longer accurate.



**Figure 1:**  
**0.3% GARAMITE® ADDITIVE**  
8 mils (203 microns) sag  
resistance

**Figure 2:**  
**0.5% FUMED SILICA**  
8 mils (203 microns) sag  
resistance

**Figure 3:**  
**0.5% CONVENTIONAL  
ORGANOCLAY**  
4 mils (102 microns)  
sag resistance

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Using this software and development methodology, Southern Clay developed products that exhibited a high degree of robustness, both in manufacturing and in the application of the products in the marketplace. This results in a Garamite® product that displays consistent performance.

Garamite® products were originally developed for the unsaturated polyester market and targeted against fumed silica products. Garamite® thixotropes were found to incorporate into styrene at concentrations up to 15% by weight by simply shaking the mixture in a bottle. Even at this 15% concentration, the mixture remains quite fluid. In manufacturing circumstances, it is recommended that the customer first incorporate Garamite® into styrene monomer or solvent and then add this mixture to the system. Garamite® requires no polar activators or activation temperature.

When used to replace fumed silica in unsaturated polyester systems, SCP scientists found that Garamite® additives could be used at levels as much as 50% below those of conventional thixotropes. Combined with Garamite's® ease of incorporation, this efficiency offers you significant cost savings opportunities.

Furthermore, Garamite's® unique chemistry generates a product that develops application properties before it appreciably thickens the system in which it is used. This means you can secure equal or higher sag resistance and drainage control at lower viscosities than those to which you have become accustomed.

Subsequent work found that Garamite® thixotropes could replace other rheology additives. Customers found they could replace not only fumed silica, but also combinations of other rheology additives with a single product, Garamite®. Laboratory and market evaluations also proved that Garamite® products work well in a range of epoxy applications. Further work has shown that the performance of Garamite® additives, like many fumed silica products, can be improved further still with the addition of small amounts of enhancers such as BYK R605.

We invite you to evaluate Garamite® products in your applications that require Garamite's® unique combination of low viscosity, high efficiency, and high performance. There are more developments in the pipeline for our exciting Garamite® platform of products. Garamite® presents you with previously unattainable combinations of performance, efficiencies, and economics.

*For more information on how Southern Clay Products can assist you, please contact us at (800) 324-2891 or visit us on the internet at [www.scprod.com](http://www.scprod.com).*



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**ROCKWOOD**  
ADDITIVES

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