Silicone Defoamers

What is silicone?

Silicon (Si) is a naturally occurring element on the periodic table, while silicone is a polymer. When silicon is reacted with hydrocarbons it forms a synthetic polymer made of Silicon, oxygen, carbon, hydrogen, and sometimes flourine. This polymer is silicone.

Silicone vs Siloxane

Silicone, as stated above, is a polymer consisting of silicon, oxygen, carbon, hydrogen, and sometimes fluorine. Siloxane is a molecular functional group consisting of Silicon – Oxygen – Silicon bonding. The term polysiloxane is used to describe a molecule with multiple siloxane bonds.

Compatibility and solubility

Silicone defoamers have a low surface tension and contain polysiloxanes as the active site. When selecting a defoamer the structure of it is critical. The shorter chain polysiloxanes are surface active but have no defoaming characteristics and can actually stabilize foam. The defoaming or foam-stabilizing effects depend on the compatibility and solubility of the fluid it is being added to or formulated with. Only incompatible and insoluble polysiloxanes have a defoaming effect. This is typically achieved with longer chains, side chains, and higher molecular weights. Since the siloxanes have to be insoluble to perform defoaming properties, they are added to fluids as a dispersant. As such, siloxanes may agglomerate causing the defoamer to be ineffective. To prevent this, routine mixing is recommended. These characteristics also mean that silicone defoamers can be filtered out of solution, removing their defoaming capabilities.

Remember when using any product refer to the SDS for proper handling procedures and consult with a Castrol technologist for the proper defoamer and dose rate.

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