

**INDUSTRY
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**Consumer
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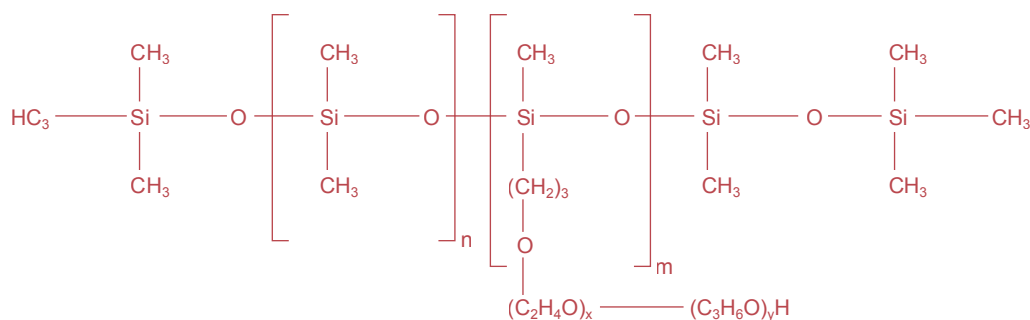
**SMART CHEMISTRY
WITH CHARACTER.**

SILICONE EMULSIFIERS

HIGHEST SENSORY EFFECT AND STABILITY

CHEMISTRY OF SILICONE EMULSIFIERS

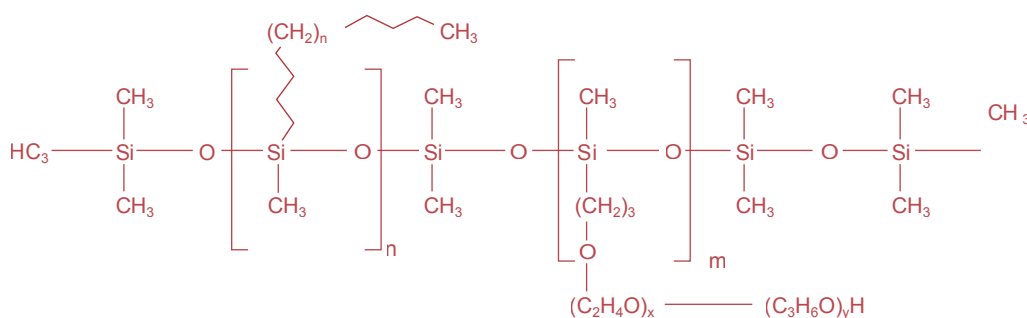
Polyether modified polysiloxane



Silicone emulsifiers are typically polymers that are modified with hydrophilic ethylene oxide, but they also can also be functionalized with propylene oxide.

The higher the ethylene oxide content, the more water soluble, and the higher the propylene oxide the more hydrophobic the polymer becomes.

Alkyl and polyether modified polysiloxane



Another class of silicone polymer can be made with increased oil compatibility by adding lipophilic alkyl groups on the silicone backbone.

In order to make this chemistry into an emulsifier this functionality is combined with a select mix of polyethers.

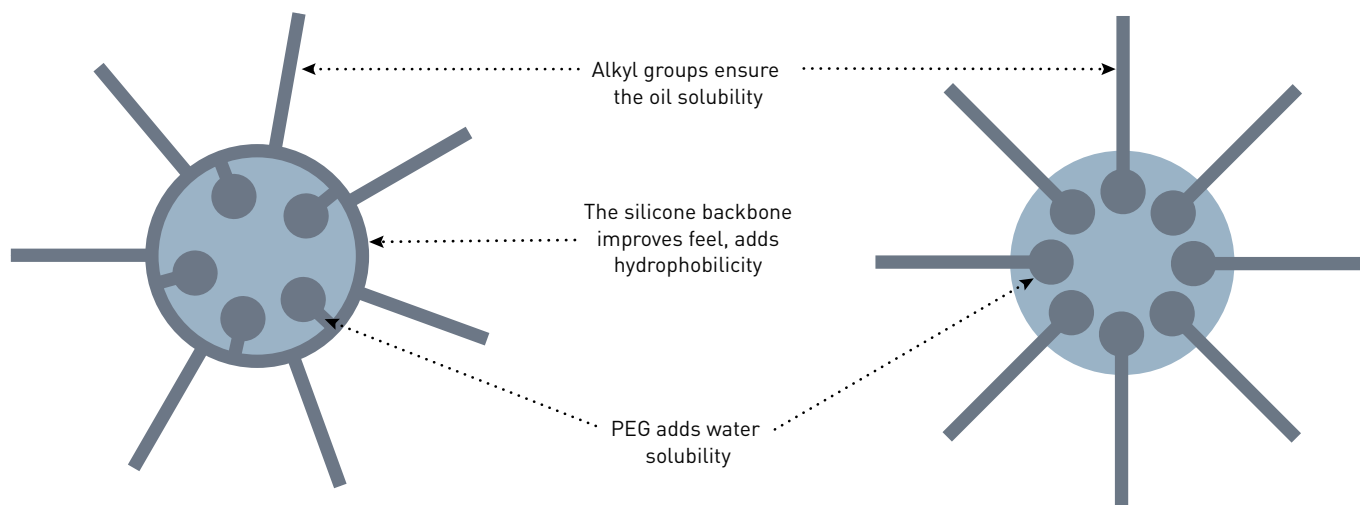
General benefits:

- ▶ High compatibility with other ingredients
- ▶ Emulsifiers with conditioning properties
- ▶ High emulsion stability over a wide temperature range
- ▶ W/O and W/Si emulsions impart a light skin feeling like a typical O/W or Si/W emulsion
- ▶ Safe silicone emulsifier chemistries require no special labelling
- ▶ Non-ionic for increased compatibility
- ▶ Low surface tensions = easy spreading
- ▶ Non-tacky skin feeling
- ▶ 2 in 1 characteristic of emulsifier + emollient
- ▶ Suitable for cold-cold / hot-hot and hot-cold processing
- ▶ Creates a nice, exquisite texture on the skin
- ▶ Easy to use
- ▶ Effective at very low concentrations



WHY USE SILICONE EMULSIFIERS AND WHAT IS THE ADVANTAGE OF THIS TECHNOLOGY?

Example of a typical W/O emulsion



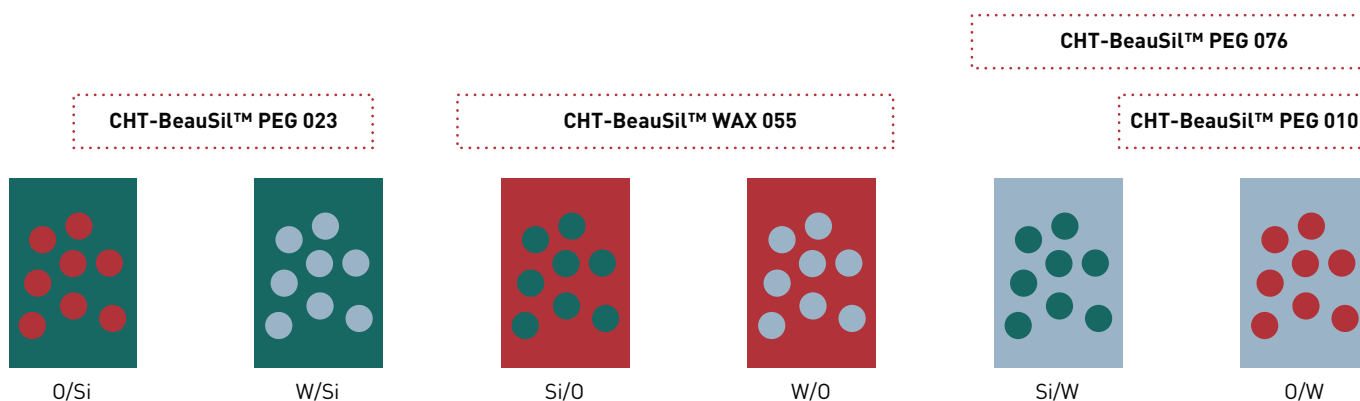
The silicone emulsifier shown here, cetyl PEG/PPG-10/1 dimethicone, stabilizes the internal phase (water) within the continuous oil phase with a single emulsifying molecule. The advantage of silicone technology apart from imparting excellent feel is that the highly flexible backbone enables excellent emulsion stability across extreme temperature ranges.

In a silicone-free W/O emulsion, several molecules of organic emulsifiers are needed to stabilize a water droplet in the internal phase, and the emulsifying coverage is incomplete. Organic emulsifiers are also rigid and cannot conform to stresses common in W/O emulsions, such as changes in shear and temperature. This greatly sacrifices stability.

Advantage of the silicone emulsifiers compared to organic emulsifiers:

- ▶ Better overall emulsion stability, especially in temperature extremes
- ▶ Non-tacky skin feeling
- ▶ W/O emulsions provide an exquisite, light sensory profile similar to typical O/W emulsions
- ▶ 3D emulsification ability: organic lipids, silicones and water
- ▶ Very effective at low concentrations
- ▶ Creates a better texture on the skin compared to organic emulsifiers

CHT product range for different types of emulsions



Product overview



Product	INCI	HLB	Application			
			Skin care	Colour cosmetic	Sun care	Hair care
		Approx.				
CHT-BeauSil™ PEG 010	PEG/PPG-15/5 Dimethicone	11	●			●
CHT-BeauSil™ PEG 023	PEG-10 Dimethicone	4	●	●	●	
CHT-BeauSil™ PEG 076	PEG-8 Dimethicone	7	●	●	●	
CHT-BeauSil™ WAX 055	Cetyl PEG/PPG-10/1 Dimethicone	4	●	●	●	●