

Siloxylated Polyethers with EO/PO Copolymers

Major Industries Served

- Adhesives
- Agriculture/Crop Protection
- Cleaners & Detergents
- Engineering Industries
- Mold Release
- Paints, Coatings & Inks
- Paper
- Personal Care
- Polyurethane Foam Additives
- Pressure Sensitive Adhesives
- Textiles & Leathers

Structures of Silicone Glycol Copolymers

All currently available SPEs are “rake” or “graft” copolymers or ABA block copolymers.



Siloxylated polyethers (SPEs) are nonionic “surface active agents”

Emulsifier application considerations:

- HLB = Hydrophile/Lipophile Balance: classic system proposed in 1949 by Griffin. Compares the ratio of oil-soluble to water-soluble portions of the molecule. $HLB = (\% \text{ Hydrophile by weight of molecule})/5$.
- CER = Cohesive Energy Ratio: developed by Beerbower & Hill (American Cosmetics and Perfumery; 1972, 87, 85 - 89). Fundamental method based on molecular structure and solubility parameter. More “absolute” than HLB, which is empirical, based on oleic acid (HLB=1) and potassium oleate (HLB=20).
- HLB-CER = HLB calculated using CER value from equation:
– $HLB = (0.925 - \log CER)/0.0963$
- For silicone/oil emulsions: CER < 1.0 (generally ~0.5)
- For oil/silicone emulsions: CER > 1.0 (generally ~2.0)
- Molecular weight of emulsifier must be relatively high (>10,000)

Aqueous Emulsions

Type	HLB	CER
O/W	10 - 18	0.90 - 0.10
W/O	3 - 8	1.5 - 4.0

Silicone-Organic Emulsions

Type	HLB	CER
S/O	N/A	0.80 - 0.06
O/S	N/A	1.5 - 6.0

For further information, reference:

- Silicone Surfactants: Surfactant Science Series, Marcel-Dekker, Volume 86, ISBN #0-8247-0010-4

Product Information

A complete list of XIAMETER® brand fluids is available at www.xiameter.com.



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