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TECHNICAL BULLETIN

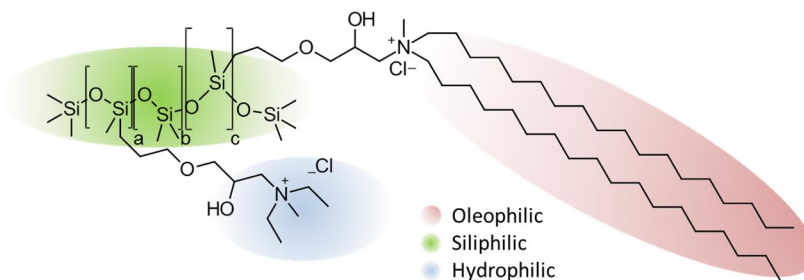
Silquat® J2-xB-PG Series

Distearmonium/Diethonium Chloride PG Dimethicone

DESCRIPTION

Silquat® J2-4B-PG, Silquat J2-6B-PG, Silquat J2-8B-PG are a series of novel silicone emulsifiers and conditioners. **Silquat J2-xB-PG** products are PEG free and 70% active in propylene glycol. Their unique structure and weak cationic charge results in molecules that provide not only excellent emulsification properties, but conditioning effects on hair and skin. The INCI name is Distearmonium/Diethonium Chloride PG Dimethicone.

This new class of compounds, represented by the **Silquat J2-xB-PG** products, are multi-domain silicone quaternary emulsifiers. They are represented by the generic structure on the right

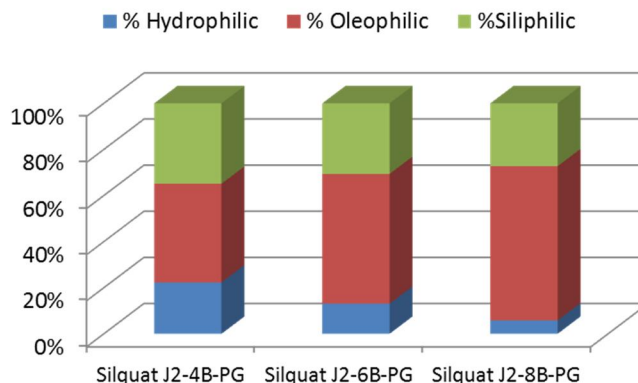


which shows that some of the quaternary ammonium groups remain hydrophilic from their charge, while others have lipophilic C₁₈H₃₇ chains in proximity. That dual nature, coupled with the hydrophobic surface active silicone polymer, gives a very unique structure and performance.

TYPICAL PROPERTIES

	Silquat J2-4B-PG	Silquat J2-6B-PG	Silquat J2-8B-PG
Appearance	Hazy liquid	Hazy liquid	Hazy liquid
Color, Gardner	1	1	1
Active Content, %	70	70	70
Visc. at 25°C, cps	6,000	7,000	8,000
Experimental HLB	9	7	5

Silquat J2-4B-PG, Silquat J2-6B-PG and Silquat J2-8B-PG differ by the values of a, b, and c in the structure above. The chart to the right shows the relative weight percent of hydrophilic, lipophilic and "siliphilic" regions within the molecules. **Silquat J2-4B-PG**, with the most hydrophile character, has the highest laboratory determined HLB of 9, while **Silquat J2-8B-PG**, which has the least hydrophilic and most lipophilic character has the lowest HLB of 5. The middle product, **Silquat J2-6B-PG**, has an HLB value of 7.



USES & APPLICATIONS

Multi-domain Silicone Quaternary emulsifiers have excellent properties and unique sensory profiles. We have found them to be especially effective in the following applications:

Hair Care: **Silquat® J2-xB-PG** products provide extraordinary wet comb and dry comb as well as unique lubricity, antistatic properties and smoothness to the hair fibres. The use level is 0.5% ~ 1%.

Skin Care: **Silquat J2-xB-PG** products provide the skin with a smooth powdery after-feel, extraordinary softness, unique lubricity and substantivity. Use levels are 0.5% ~ 1%.

Oil-in-Water emulsifiers: **Silquat J2-xB-PG** products are unique cationic **O/W** emulsifiers for skin care, hair care, sun care and make-up products. They offer a rich smooth powdery after-feel that allows high active loadings without sacrificing efficacy. The use level is 3% ~ 5%.

Cationic emulsifiers: **Silquat J2-xB-PG** products can be used as conditioning agents in combination with a non-ionic organic or silicone emulsifier to impart unique sensory properties such as rich non-greasy, luxurious, very soft, smooth powdery dry feel and smooth powdery velvety skin feel. The use level is 3% ~ 5%.

High actives loading: **Silquat J2-xB-PG** products enables high lipophilic, high SPF and highly concentrated pigmented products for skin care, sun care and make-up. These products offer enhanced consumer benefits such as a non-greasy feel and better coverage and with good spreadability and superior skin feel.

Improved sensory properties: **Silquat J2-xB-PG** products mask the negative sensory properties of high lipophilic loading in skin moisturizers with specific aesthetics, giving the final products a very soft smooth powdery skin feel and an improved long lasting moisturizing effect.

Silquat J2-4B-PG with a HLB of 9 is very effective as an emulsifier for oil-in-water/ethanol emulsions. **Silquat J2-4B-PG** is also a very good skin feel modifier. Use levels are 1% ~ 5%.

Silquat J2-8B-PG is used in make-up color cosmetics to render very soft smooth powdery skin feel and improve pigment/pearlescent reagents/powders dispersion and stability. The use level is 1% ~ 5%.

In summary, **Silquat J2-xB-PG** multi-domain silicone quaternary emulsifiers/conditioning agents are free of Polyethylene Glycol (PEG), a chemical of concern in some markets. The multi-functional aspect of these products allows for simplification of formulations.

These **Silquat J2-xB-PG** multi-domain silicone quaternary products provide ease of formulation, enhanced performance, and extraordinary skin feel. They are multifunctional providing emulsion stability as well as typical silicone properties such as improved feel and conditioning, emmolliency, improved coverage, increased efficacy of SPF and other actives and gloss.

Solubility

	Solvent		Silquat® J2-4B-PG	Silquat J2-6B-PG	Silquat J2-8B-PG
Hydro-carbons	Water	1%	Dispersible	Dispersible	Dispersible
		5%	Dispersible	Dispersible	Insoluble
	Mineral Oils	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Isododecane	1%	Dispersible	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Isoparaffin	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
Esters	C ₈ /C ₁₀ Triglycerides	1%	Dispersible	Soluble	Soluble
		5%	Dispersible	Soluble	Soluble
	Isopropyl Myristate	1%	Dispersible	Soluble	Soluble
		5%	Dispersible	Soluble	Soluble
	Trioctyldodecyl Citrate	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	C ₁₂₋₁₅ alkyl benzoate	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
Ethers	PPG-14 Butyl Ether	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Dicaprylyl Ether	1%	Dispersible	Dispersible	Soluble
		5%	Dispersible	Insoluble	Soluble
Silicones	Cyclomethicone (D5)	1%	Dispersible	Dispersible	Dispersible
		5%	Insoluble	Insoluble	Insoluble
	Dimethicone	1%	Dispersible	Dispersible	Dispersible
		5%	Dispersible	Dispersible	Dispersible
	Phenyl Trimethicone	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Trimethylsiloxysilicate	1%	Dispersible	Dispersible	Dispersible
		5%	Dispersible	Dispersible	Dispersible
Natural Oils	Olive oil	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Sunflower oil	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Castor oil	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
Alcohols	Octyldodecanol	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Isopropanol	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Ethanol	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble

Glycols	Glycerin	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Propylene Glycol	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Butylene Glycol	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble
	Hexylene Glycol	1%	Soluble	Soluble	Soluble
		5%	Soluble	Soluble	Soluble

SAFETY

Before handling, read the Material Safety Data Sheet and container label for safe use, physical and health hazard information.

STORAGE AND SHELF LIFE

When stored between 10 and 40°C, all **Silquat®J2-xB-PG** products have a shelf life of 36 months from the date of manufacture.

PACKAGING

All products in this series are supplied in 20kg pails and 200kg drums.

LEGAL DISCLAIMER

Siltech Corporation believes that the information in this technical data sheet is an accurate description of the typical uses of the product. Siltech Corporation, however, disclaims any liability for incidental or consequential damages, which may result from the use of the product that are beyond its control. Therefore, it is the user's responsibility to thoroughly test the product in their particular application to determine its performance, efficacy and safety. Nothing contained herein is to be considered as permission or a recommendation to infringe any patent or any other intellectual property right.

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