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TECHNICAL DATA SHEET

**Silquat® 4016**

Silicone Quat

**Description**

**Silquat® 4016** is a solution of a synergistic blend of a high molecular weight water-soluble silicone quaternary ammonium compound and cetyltrimethylammonium chloride. The INCI name is Water, Dimethicone-PG Diethylammonium Chloride, Cetrimonium Chloride, and 1,3-propandiol.

**Typical Properties**

Appearance	Clear yellow liquid
Colour, Gardner	1
Viscosity, cps	150
Solid content %	40%
Solvent	1,3-propandiol and Water
Water solubility, 10%	Soluble

**Application & Uses**

**Silquat 4016** is an excellent hair conditioner for both clear and opaque 2 in 1 shampoos. Due to its positive charge, **Silquat 4016** is highly substantive to hair, gives good softening and both wet and dry combability. It also reduces flyaway and gives better manageability.

**Silquat 4016** does not decrease the viscosity of shampoos and provides good foaming. Typical use levels are 0.5-5% as received.

**Key features and benefits:**

- Improved wet and dry combing
- Substantive to hair
- Superior conditioning and softening
- Outstanding smoothness
- Non greasy or sticky feel
- Improved shine and gloss
- Good foaming
- Cost effective

**Example Formulation and Data**

Two formulations were made using the base shampoo shown in Table 1. One was prepared with 2% **Silquat 4016** and the other was used as a control.

Hair tresses were treated with the shampoo formulations and evaluated for standard properties. This performance data (Table 2) shows that **Silquat 4016** gives very effective conditioning with no impact on foaming or viscosity of the shampoo as often happens with silicone conditioning agents.

In data not shown here, **Silquat 4016** was comparable to or better than the competitive silicone in conditioner and hair gel formulations.

**Table 1:** Shampoo Formulation

Ingredient	%
D.I. Water	<b>47.5</b>
Guar Hydroxypropyl trimonium Chloride	<b>0.5</b>
Na <sub>2</sub> EDTA	<b>0.1</b>
Sodium Laureth-2 Sulfate	<b>28.0</b>
Cocamidopropyl Betaine	<b>10.0</b>
Decyl Glucoside	<b>3.0</b>
Disodium Cocoamphodiacetate	<b>3.0</b>
SLES-2 and PEG-3 DiStearate	<b>5.5</b>
<b>Silquat 4016 or competition</b>	<b>2.0</b>
Citric Acid (40% aq)	<b>q.s.</b>
Nipaguard DMDMH	<b>0.4</b>
Sodium Chloride	<b>q.s.</b>
Crothix (PEG-150 Pentaerythrityl Tetrastearate)	<b>q.s.</b>

**Table 2:** Shampoo Properties

	Properties	Shampoo Base	Shampoo with Silquat 4016
Physical Properties	Viscosity (cps)	7,000	6,900
	pH	6.45	6.50
	Appearance	White Cream	
	Stability @ RT/45 °C	Good/ Good	
	Compatibility	Good	
	Feel (1-10, 10 the best)	9.00	9.40
Foam after a 20 sec sparge	Initial foam height, mL	720	700
	2 min foam height, mL	720	700
	5 min foam height, mL	720	700
Wet Comb	Wet combability, 1-10	9.0	9.4
	Rinse Off, 1-10	9.0	9.4
	Clean Feel, 1-10	9.0	9.4
	Shine, 1-10	9.0	9.4
	Softness, 1-10	9.0	9.4
	Residual Feel, 1-10	9.1	9.4
	Fullness, 1-10	8.9	9.4
Dry Comb	Dry Combability, 1-10	9.0	9.4
	Feel, 1-10	9.0	9.4
	Clean Feel, 1-10	9.0	9.3
	Shine, 1-10	9.0	9.3
	Fullness, 1-10	9.0	9.4
	Flyaway, 1-10	9.0	9.5
	Residual Feel, 1-10	9.0	9.3
	Static, 1-10	9.0	9.4

Shown in Figure 1 is a visual comparison of hair tresses which have been shampooed with either the **Silquat® 4016** or a competitive silicone (also 2%) containing shampoo formulations. On the left is Brazilian Curly Hair and on the right is European Brown Hair. Both hair types are visually better with the **Silquat 4016** but in particular there is reduced fly-away in the Brazilian hair and a much more conditioned tress in the European hair.

**Figure 1:** hair tresses shampooed with formulas containing **Silquat 4016** or a competitive silicone.



### **Shelf Life**

When stored between 10 and 40°C in the original unopened container, **Silquat®4016** has a shelf life of 36 months from the date of manufacture.

### **Packaging**

**Silquat 4016** is 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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