



# ★ POLY SUGA® QUAT SERIES

## NATURAL, GREEN CONDITIONING SURFACTANTS

### benefits

- Poly Suga®Quats are “Green” and are derived from renewable resources
- Superior hair conditioning
- Low-Irritation Profile
- No greasy build-up
- Excellent wet comb properties
- Controls fly-away hair
- Biodegradable
- Formulates in the presence of anionics
- Supports viscosity in shampoos
- Enhances preservation of formulations

### applications

- Hair Conditioners
- Clear 2 - in - 1 Shampoos
- Body Washes
- Detanglers
- Clear Hair Rinse
- Styling Products
- Baby Products
- Hand Sanitizers
- Relaxers
- Shower Gels



INCI/CTFA Names: Poly Suga®Quat TM-8610P – Polyquaternium-77  
Poly Suga®Quat TM-1218P – Polyquaternium-82  
Poly Suga®Quat S-1210P – Polyquaternium-81  
Poly Suga®Quat S-1010P – Polyquaternium-79  
Poly Suga®Quat L-1210P – Polyquaternium-80  
Poly Suga®Quat L-1010P – Polyquaternium-78  
EINECS: Polymer exempt  
Patented: Poly Suga®Quat Series is covered under patent # 7,507,399



### introduction

The patented Poly Suga®Quat Series are unique and innovative new products for the personal care industry. These products are made from renewable resources, are excellent conditioners for hair and skin and are very mild. In addition, the Poly Suga®Quat products are natural and “green.”

The Poly Suga®Quat Series is derived from polymerized alkyl polyglucosides. The polymeric APG backbone is derivatized to provide cationic conditioning properties. This process yields products that are naturally derived, and cationic in character. These novel quats provide substantivity to skin and hair, much more so than their nonionic APG precursors. The sugar moiety decreases the irritation substantially over traditional quats, allowing the formulator an expanded use of these natural, “green” materials in a variety of personal care formulations. The Poly Suga®Quat Series provides longer lasting benefits to hair and skin products than can be achieved using conventional surfactant systems while reducing irritation over traditional quats.

The Poly Suga®Quat Series offers a group of products that allow the formulator great flexibility in formulating personal care products. Colonial has provided the industry these ingredients with a variety of possible structures. The Poly Suga®Quat Series are made from short and long chain quats reacted onto polymerized alkyl polyglucoside sugars. The alkyl polyglucoside sugars vary in the alkyl group carbon chain length. This variability gives the formulator great flexibility in formulating with these unique materials.

# typical properties

Property	Poly TM-1218P	Poly TM-8610P	Poly L-1010P
Solids, %	30.0	30.0	30.0
Viscosity (as is), cps	1300	30	50
pH (10% aqueous)	6-8	6-8	6-8
Color, Gardner ('98)	< 1	< 1	1
Ross-Miles Foam Height (1% active), mm			
Immed.	125	180	165
1 minute	115	160	155
5 minutes	110	155	145
Draves Wetting (1% active), seconds	7.4	3.6	5.6
Solubility, 10% active solution			
50% NaOH	Cloudy, viscous	Clear	Cloudy
25% NaOH	Clear	Clear	Clear
25% H <sub>2</sub> SO <sub>4</sub>	Clear, viscous	Clear	Clear
Compatibility, 5% active solution			
5% active SLS	Soluble	Soluble	Soluble, viscous
5% active DSLS	Soluble	Soluble	Soluble

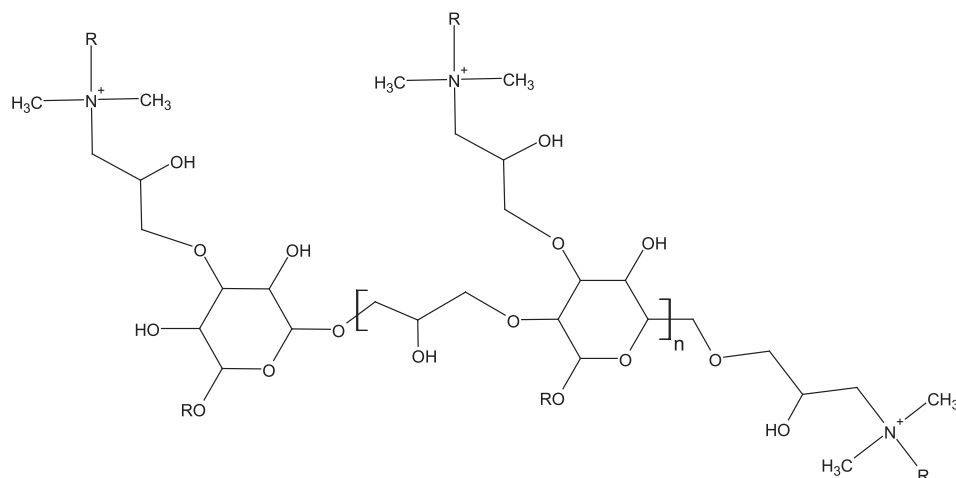
Property	Poly L-1210P	Poly S-1010P	Poly S-1210P
Solids, %	30.0	30.0	30.0
Viscosity (as is), cps	70	20	9400
pH (10% aqueous)	6-8	6-8	6-8
Color, Gardner ('98)	< 1	< 1	< 1
Ross-Miles Foam Height (1% active), mm			
Immed.	170	165	145
1 minute	160	150	135
5 minutes	155	140	130
Draves Wetting (1% active), seconds	10.6	12.5	18.8
Solubility, 10% active solution			
50% NaOH	Cloudy	Clear	Cloudy
25% NaOH	Clear	Clear	Clear
25% H <sub>2</sub> SO <sub>4</sub>	Clear	Clear	Clear
Compatibility, 5% active solution			
5% active SLS	Soluble, viscous	Soluble	Soluble
5% active DSLS	Soluble	Soluble	Soluble



## Green Star Ratings

<b>S1210P</b>	<b>7.37</b>
<b>S1010P</b>	<b>7.25</b>
<b>L1210P</b>	<b>7.11</b>
<b>L1010P</b>	<b>6.96</b>
<b>TM1218P</b>	<b>5.01</b>
<b>TM8610P</b>	<b>6.08</b>





# formulations

## body wash

with Poly Suga®Quat S-1210P

Phase	COMPOUND	Wt. %
A	Deionized Water	41.15
A	Poly Suga®Nate 160P	51.45
B	Cola®Teric LMB	2.57
C	Poly Suga®Quat S-1210P	2.26
D	Cola®Liqid DS	2.07
E	NaCl	0.50
<b>TOTAL</b>		<b>100.00</b>

pH (10% aqueous): 5.5 – 6.0  
 Viscosity: 5,000 cps - RVT #4 @ 12 RPM

### PROCEDURE:

Heat Phase A to 50°C. Add Phases B, C and D. Add Phase E to the batch, stir to dissolve completely. Cool to 35°C, adjust pH with citric acid as needed. Add fragrance and preservative as needed.

## cold blend shampoo

with Poly Suga®Quat L-1010P

Phase	COMPOUND	Wt. %
A	Deionized Water	40.00
A	Na <sub>2</sub> EDTA	0.20
A	Poly Suga®Betaine L	15.10
B	Poly Suga®Nate 160P	27.80
C	Poly Suga®Quat L-1010P	3.00
D	Tauranol WS Conc	13.90
<b>TOTAL</b>		<b>100.00</b>

pH (10% aqueous): 5.5 – 6.0  
 Viscosity (cps): 4,900 cps – RVT #4 @ 12 RPM

### PROCEDURE:

Mix Phase A. Add Phase B with sufficient mixing until clear, followed by Phase C. Add Phase D and mix until dissolved. Add fragrance and preservative as desired.

# formulations

## conditioner for damaged hair

with Poly Suga®Quat TM-1218P

Phase	COMPOUND	Wt. %
A	Deionized Water	83.20
A	Tetrasodium EDTA	0.10
A	Glycerin 96%	2.50
A	Guar Hydroxypropyl Trimonium Chloride	0.50
B	Poly Suga®Quat TM-1218P	5.20
C	Glyceryl Stearate	0.50
C	Behenyl Alcohol	2.00
C	Siltech F-1000	1.00
C	Siltech FVC	5.00
<b>TOTAL</b>		<b>100.00</b>

pH (10% aqueous): 5.18  
Viscosity (cps): 1,200 – RVT #2 @ 12 RPM

### PROCEDURE:

Combine Phase A and heat to 50°C. Slowly add Phase B to Phase A with agitation. Cool to 30°C and add remaining phases.

## clear conditioning rinse

with Poly Suga®Quat S-1210P

Phase	COMPOUND	Wt. %
A	Deionized Water	92.30
A	Hydroxycellulose	1.00
B	Poly Suga®Quat S-1210P	6.70
<b>TOTAL</b>		<b>100.00</b>

pH (10% aqueous) 4.5 - 5.0  
Viscosity (cps): 800 - Spindle #2 @ 20 RPM

### PROCEDURE:

Slowly mix hydroxylethylcellulose with water until uniform. Add Phase B, and mix until homogenous. Adjust pH, add fragrance and preservatives as needed.



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