



★^g Poly Suga[®]Mulse

Patent Pending

INCI NAME

D - Sorbitan Oleate Decylglucoside Crosspolymer

INTRODUCTION

Poly Suga[®]Mulse is a revolutionary new product that is a naturally derived, non-ethoxylated emulsifier.



WHAT IS IT GOOD FOR?

- Oil-in-water emulsions
- Water-in-oil emulsions
- Natural-based creams and lotions
- 1,4-Dioxane free products
- Low viscosity emulsions suitable for spray-on sunscreen lotions
- Various range of HLB surfactants

BENEFITS

- No PEGs
- 1,4-Dioxane-free
- Naturally derived
- Easy to use
- No ethylene oxide

TYPICAL PROPERTIES

Appearance	Clear, viscous liquid
Solids, %	70
Color, Gardner	2
pH (10% aqueous)	7.0

FOAM DATA

1% active solution	Poly Suga[®]Mulse D7
Ross-Miles Foam, mm	
Immed.	170
1 min.	160
5 min.	150
Draves Wetting, 1% active, seconds	3.6
HLB (estimate)	8
HET-CAM (10% solution)	13.3

ESTIMATED HLB VALUES

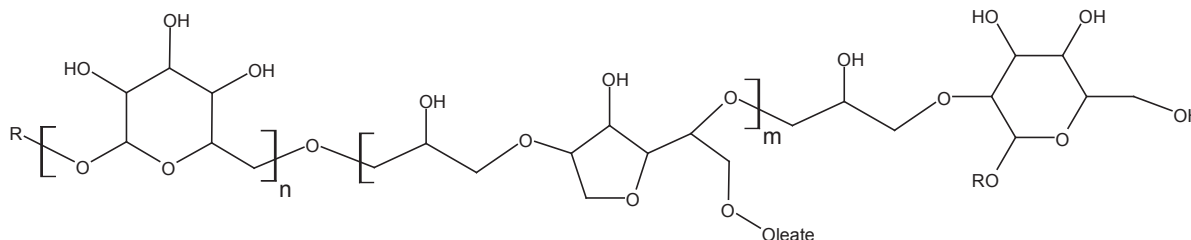
Poly Suga [®] Mulse	HLB Value
D3	3
D5	5
D7	8
D9	12



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STRUCTURE



FORMULATIONS

CITRUS HAND LOTION

A.	Water	63.0
	Water & Montmorillonite	2.0
	Glycerin	4.0
	Xanthan Gum	0.3
B.	Poly Suga[®]Mate D	6.0
	Poly Suga[®]Mulse D7	0.5
	Poly Suga[®]Betaine L	1.0
	Cetearyl Alcohol	5.0
	Orange Butter	5.0
	Squalane	1.0
	Joboba Oil	6.0
	Soybean Oil	5.0
	Tocopherol	0.1
C.	Dehydroacetic Acid & Benzyl Alcohol	0.8
D.	Lemon Fragrance	0.3

PROCEDURE

Phase A: Charge Water and Unifier into main vessel. Mix to uniformity. Continue mixing and begin heating Water phase to 75°C. Slurry Xanthan in Glycerin. Add to batch. Mix to uniformity. Phase B: Combine Phase B. Mix while heating to 85°C. When both phases are uniform and at temperature, add Phase B to Phase A. Mix to uniformity; hold at 75-80°C for 20 minutes. Continue mixing; begin cooling process. At 40°C, add remaining phases, mixing to uniformity after each addition. Mix to R/T; check against specifications and fill.

pH: 4.0 - 6.0
Viscosity: 3,000 cPs at 25°C

SPRAYABLE SUNSCREEN SPF15

A.	Deionized Water	15.0
	Poly Suga[®]Quat S1210P	5.0
B.	Poly Suga[®]Mulse D7	6.0
	Ethylhexyl Salicylate	5.0
	EthylhexylMethoxycinnamate	7.5
	Poly Octyldodecyl Propyl Citrate	19.0
	Castor Isostearate Succinate	2.0
	Soybean Oil	18.0
	Octyl Palmitate	15.0
	Sesame Seed Oil	5.0
	Tocopheryl Acetate	1.0
C.	Water & sodium benzoate & potassium sorbate	1.5

PROCEDURE

Combine Phase A ingredients in side vessel at R/T. Combine Phase B ingredients in main vessel at R/T. Under moderate agitation, add Phase A to Phase B. Mix until uniform and continue mixing for 20 minutes. Add Phase C and mix to uniformity. Homogenize batch at 5000 rpm for 5 minutes. Fill.

pH: 4.0 - 6.0
Viscosity: <100 cPs at 25°C



GREEN STAR RATING

D3 = 9.88

D5 = 9.82

D7 = 9.81

D9 = 9.71