SAMPLE FORMULATION

Using Solstice® Enhance and Solstice® Propellant



Cool Ultra-Crackling Foam

Unique moisturizing foam with extra cooling and ultra-crackling sensation

Solstice Propellant (HFO-1234ze(E)), a breakthrough for aerosol-based products, and Solstice Enhance (HFO-1233zd(E)), a multifunctional solvent and carrier fluid, offer exciting possibilities for formulators. As nonflammable¹ alternatives to hydrocarbons and high global warming potential (GWP) hydrofluorocarbons, they are non-ozone-depleting, VOC-exempt,² with an **Earth-friendly** ultra-low GWP of one or less.

PHASE	TRADE NAME	INCI	WT%
Concentrate	DI Water	Water	68.6
	Natrosol™ 250 HX	Hydroxyethylcellulose	1.6
	Propylene Glycol	Propylene Glycol	0.8
	Tween™ 20	Polysorbate-20	0.6
	Solulan™ C-24	Choleth-24	2.4
	DOWSIL™ 9041 Silicone Elastomer Blend	Dimethicone; Dimethicone Crosspolymer	2.4
	XIAMETER™ PMX-1184 Silicone Fluid	Dimethicone; Trisiloxane	2.8
	euxyl® PE 9010	Phenoxyethanol; Ethylhexylglycerin	0.4
	Fragrance	Fragrance	0.4
	Ethanol 200 Proof	Alcohol Denat.	20
		TOTAL	100
Aerosolized	Concentrate		23
	Solstice Enhance	Chlorotrifluoropropene	9
	Solstice Propellant	Tetrafluoropropene	68
		TOTAL	100

¹ASTM E-681, EU A11

² Solstice Enhance: VOC-exempt (U.S. EPA), Solstice Propellant: VOC-exempt (U.S. EPA and CARB); negligible contribution to smog formation

FORMULATION PROCEDURE:

Pre-step: Chill Solstice Enhance (below 19°C) before combining with the formulation. Store in refrigerator.

Concentrate:

- 1. In a main beaker, weigh Water and Propylene Glycol.
- Disperse Natrosol 250 HX in cold water with a paddle mixer and start heating to 70-75°C. Once it's dispersed, start adding Tween-20 and Solulan C-24.
- While continually mixing, cool down the batch to room temperature and then add the rest of the ingredients in the order of addition.
- 4. Homogenize the batch for 1 minute to ensure uniform mixing.

Aerosolized:

- 1. Fill liquid concentrate into aluminum/ plastic cans in the order of addition.
- 2. Add Solstice Enhance.
- 3. Crimp valve on can.
- 4. Charge with Solstice Propellant.
- 5. Shake the can vigorously until uniform.

For more information:

call 800-631-8138 (U.S. and Canada) or your local sales office.

www.hwll.co/personalcare

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Tween™ 20 is a registered trademark of Croda Inc. Solulan™ C-24 is a registered trademark of Lubrizol.

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6406 FP PC LTR | v1 | 06/ 2020
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