



Formulator Report:

Floraesters K-20W[®] Jojoba Improves Liquid Foundation



Floraesters[®] K-20W Jojoba enhances color longevity, coverage, and consumer perception when included in a liquid foundation.

Floraesters K-20W Jojoba [INCI: Hydrolyzed Jojoba Esters (and) Water (Aqua)] has been shown to enhance the efficacy and sensory properties of multiple finished cosmetic and personal care formulations, and has been explored in various categories such as creams/lotions, make-up primers, nonwoven wipes and face masks, sunscreens, mascara/eyeliner, shampoos/conditioners, toners/astringents, face washes, and oil-free formulations.¹ Its film-forming properties make it ideal for rinse-off products and products that require water resistance or an extended period of residence time on the skin.

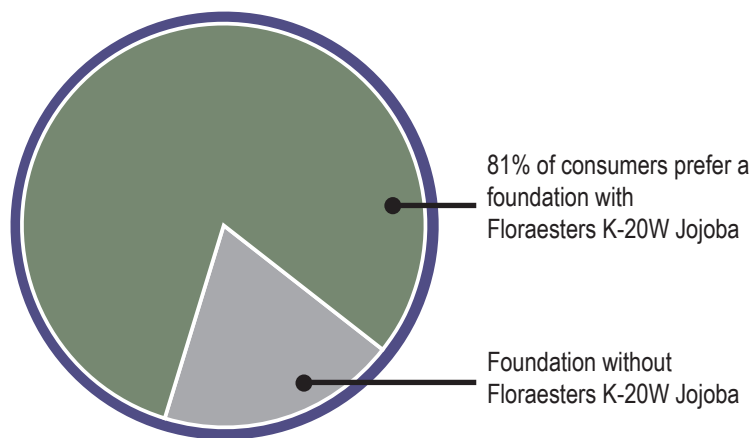
The substantivity of Floraesters K-20W Jojoba makes it well-suited to entrap molecules at the skin surface. For example, in combination with glycerin, Floraesters K-20W Jojoba enhances skin moisturization;² sunscreen actives in combination with Floraesters K-20W Jojoba are retained on the skin after water immersion;³ and make-up remains on the skin longer when a primer with Floraesters K-20W Jojoba was applied prior to make-up application.⁴ Clinical studies have also shown that Floraesters K-20W Jojoba is effective at reducing irritation-associated erythema, as well as improving skin barrier function and restoration.⁵

The botanically-derived Floraesters K-20W Jojoba is COSMOS/Ecocert certified, and EU and China REACH compliant.

Clinical Study Facts⁶:

In double-blind, vehicle-controlled, randomized, consumer-use clinical studies, **Floraesters K-20W Jojoba** produced the following benefits:

- **Improved color longevity** of a foundation on the skin (**Figure 1**)
- **Improved coverage of signs of aging** better than the vehicle foundation (**Figure 2**)
- **Preferred by consumers** for the **coverage of fine lines / wrinkles, long-wear, and moisturization** (**Figures 3 and 4**)



Purpose:

The purpose of these studies was to evaluate Floraesters K-20W Jojoba in a foundation for its ability to improve foundation coverage, increase longevity of wear, and enhance consumer perception.

1. Cargill has not tested Floraesters K-20W Jojoba in final OTC drug formulations. Compliance with FDA regulations is the responsibility of the customer.
2. See Claim Sheets 09-013, 09-014, 10-017, 10-024, and 13-052 for more information.
3. See Claim Sheet 10-018 for more information.
4. See Claim Sheets 17-100 and 17-101 for more information.
5. See Claim Sheets 11-035 and 11-036 for more information.
6. Final Reports available upon request. Figures and Images can be found on the next two pages of this document.

Figures⁷:

Figure 1. Improved Color Longevity with Floraesters K-20W Jojoba

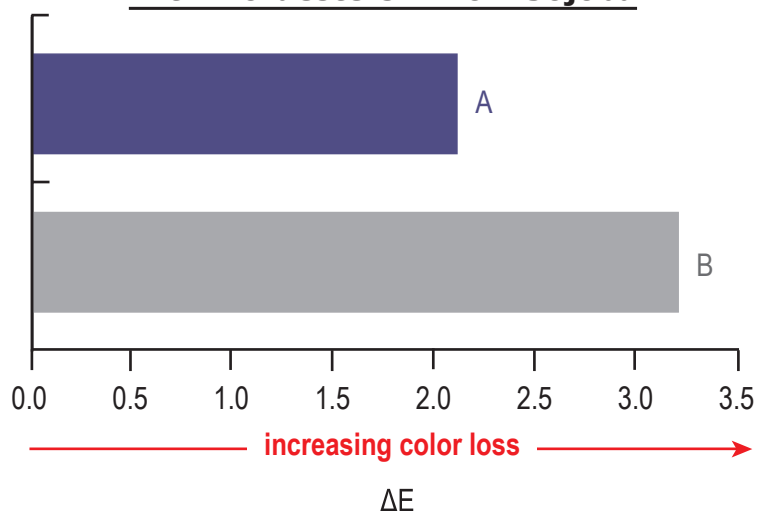


Figure 1. The foundation containing **2.5% Floraesters K-20W Jojoba** produced **54% less color loss** (i.e. longer wear time) after 8 hours compared to the vehicle. (See Claim Sheet 20-140.)

■ A - vehicle + 2.5% K-20W
 ■ B - vehicle

Image 1. 8-hours Post-Use (K-20W)



Image 2. 8-hours Post-Use (vehicle)

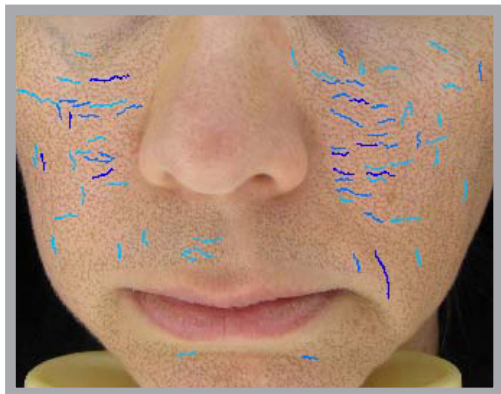


Figure 2. Improved Coverage of Signs of Aging with Floraesters K-20W Jojoba

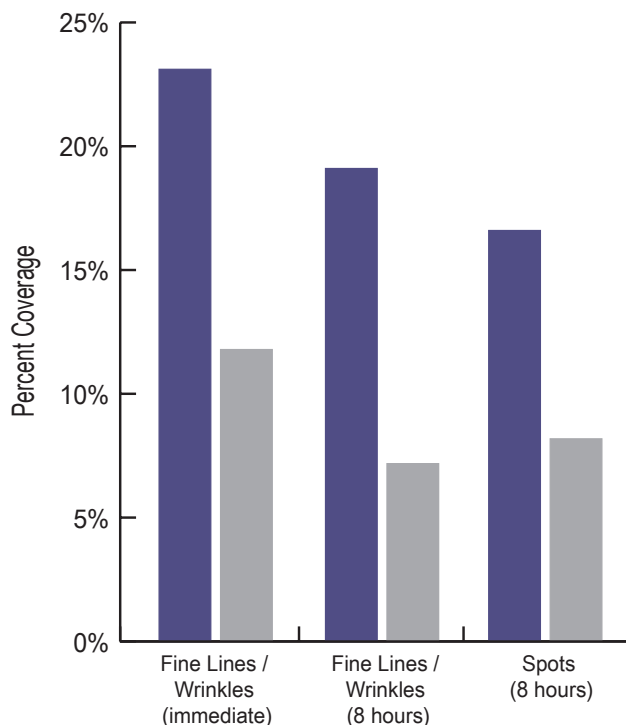


Figure 2. The foundation containing **2.5% Floraesters K-20W Jojoba** produced **up to 62% improvement in the coverage of wrinkles / fine lines** and **51% improvement in the coverage of age spots** compared to the vehicle. Images 1 and 2 showcase the appearance of fine lines/wrinkles after 8 hours of use of the foundation containing 2.5% Floraesters K-20W Jojoba (Image 1) and the foundation without (Image 2). (See Claim Sheet 20-141.)

Study Design: Foundations with and without 2.5% Floraesters K-20W Jojoba were applied to the entire face (on two consecutive days). Color measurements (using a Colorimeter CL 400) and photographs (using the Clarity Pro Advanced skin analysis system) were taken immediately after the foundation application and 8 hours later. ΔE was used to evaluate overall change in color. The larger the ΔE value, the more color change between the two time points (i.e. the foundation wearing off). The results appear in *Figures 1* and *2*. Consumers also evaluated the foundations on a 1-5 scale immediately after the foundation application and 8 hours later. The results appear in *Figure 3*.

⁷ All studies were conducted double-blind, vehicle-controlled, and randomized.

Figure 3. Enhanced Consumer Perception with Floraesters K-20W Jojoba⁸

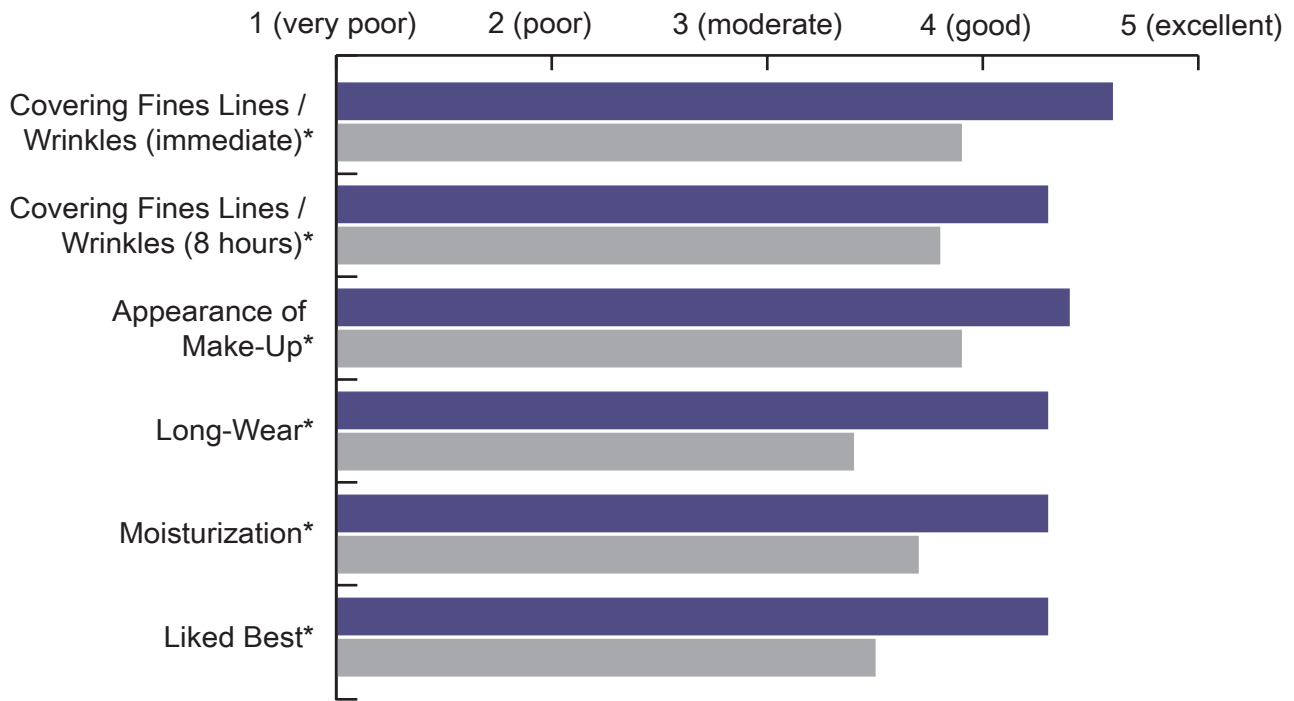


Figure 3. Consumers preferred the foundation with Floraesters K-20W Jojoba for coverage of fine lines/wrinkles, long-wear, and moisturization compared to the foundation without. (See Claim Sheet 20-142.)

Figure 4. Increased Consumer Preference with Floraesters K-20W Jojoba^{8,9}

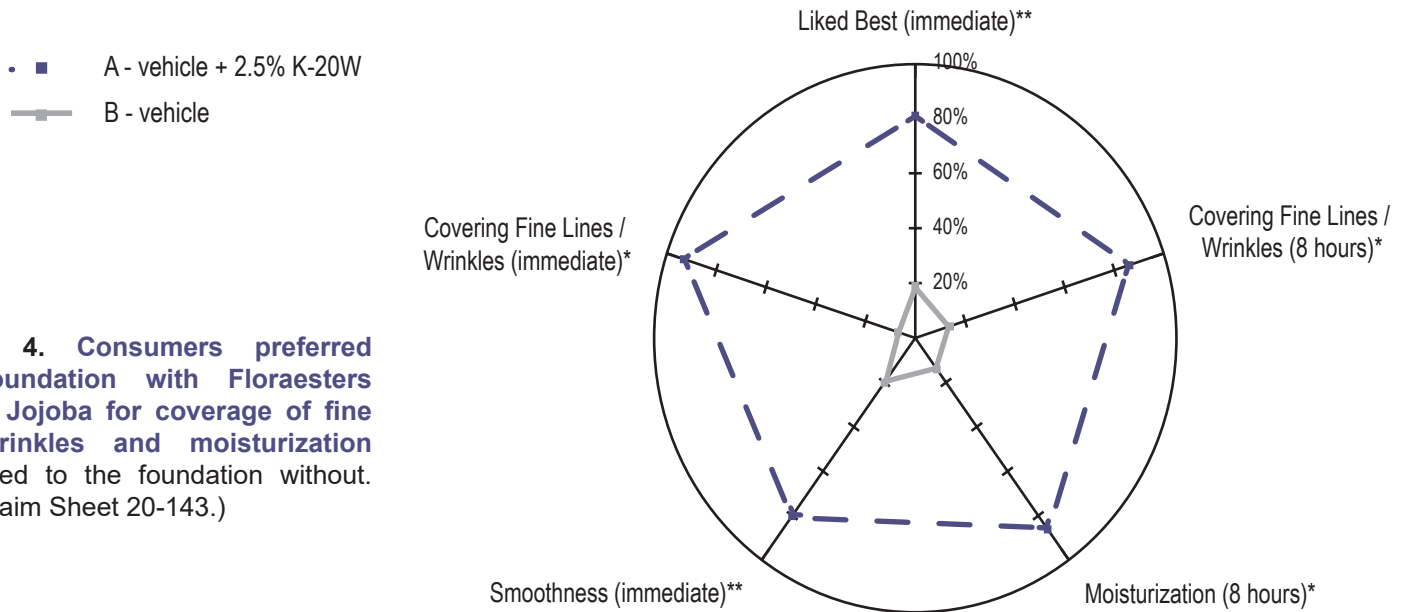


Figure 4. Consumers preferred the foundation with Floraesters K-20W Jojoba for coverage of fine lines/wrinkles and moisturization compared to the foundation without. (See Claim Sheet 20-143.)

Study Design: Foundations with and without 2.5% Floraesters K-20W Jojoba were applied to the right or left side of the face. Consumers evaluated the foundations by choosing which one they liked best for each attribute immediately after the foundation application and 8 hours later. The results appear in *Figure 4*.

8. The preference data does not include subjects that indicated no preference.
 9. Statistical (p<0.05*) and directional (p<0.10**) significance was apparent where indicated.

Formula: Silicone-Free Foundation with L22 and Emulsun¹⁰

This full-coverage, long-wear foundation utilizes a harmonious blend of Floratech ingredients to maximize function and quality. Floraesters and L22 provide skin hydration and barrier function properties while Floramac 10 helps increase pigment wetting and dispersion.

Phase	Trade/Common Name ¹¹	INCI Name	Manufacturer	% wt./wt.
A	Deionized Water	Water	-----	q.s.
	Butylene Glycol	Butylene Glycol	Making Cosmetics	5.00
	Natrosol 250-HR	Hydroxyethylcellulose	Ashland	0.50
	Veegum® R	Magnesium Aluminum Silicate	Vanderbilt Minerals, LLC	0.85
B	Dispersun DSP-OL100	Polyhydroxystearic Acid	Innospec Performance Chemicals	0.35
C	Unipure® White LC 987	Titanium Dioxide	Sensient Cosmetic Technologies	5.30
	Tres BN® PUHP1109	Boron Nitride	Saint-Gobain Advanced Ceramics	0.80
	Supra® H USP	Talc	Luzenac America, Inc.	0.50
	Unipure Yellow LC 182	Iron Oxides	Sensient Cosmetic Technologies	1.23
	Unipure Red LC 381	Iron Oxides	Sensient Cosmetic Technologies	0.16
	Pur Oxy Black BC (34PC3190E)	Iron Oxides	DyStar	0.10
D	Floraesters IPJ	Isopropyl Jojobate (and) Jojoba Alcohol (and) Jojoba Esters	Floratech	5.00
	L22	Jojoba Oil/Macadamia Seed Oil Esters (and) Squalene (and) Phytosteryl Macadamiate (and) Phytosterols (and) Tocopherol	Floratech	3.00
	Floramac 10	Ethyl Macadamiate	Floratech	5.00
	Florasun® 90	Helianthus Annuus (Sunflower) Seed Oil	Floratech	2.00
	Floraesters 20	Jojoba Esters	Floratech	0.50
	Floraesters 60	Jojoba Esters	Floratech	0.50
	Vegarol® 1898	Stearyl Alcohol	Essential Ingredients	1.50
	Polyaldo® 3-1-S	Polyglyceryl-3 Stearate	Lonza, Inc.	0.50
	Vitamin E Acetate	Tocopheryl Acetate	Essential Ingredients	0.50
	Actique Ceramide	Ceramide NG	Jarchem Industries, Inc.	0.10
	Emulsun®	Hydrogenated Sunflower Seed Oil Polyglyceryl-3 Esters (and) Hydrogenated Sunflower Seed Oil Glyceryl Esters (and) Cetearyl Alcohol (and) Sodium Stearoyl Lactylate	Floratech	4.00
E	Glycerine 99.7% USP Kosher	Glycerin	Acme-Hardesty Co.	3.00
	Zemea® Propanediol	Propanediol	DuPont Tate & Lyle BioProducts	3.00
	Floraesters K-20W Jojoba	Hydrolyzed Jojoba Esters (and) Water (Aqua)	Floratech	2.50
F	Perservative ¹²	-----	-----	q.s.
	Citric Acid (10% Solution)	Citric Acid (and) Water	Archer Daniels Midland Co.	q.s.
			Total	100.00

Procedure:

- Mix the Natrosol 250-HR and the Veegum R with the 1,3-BG. Add to the deionized water of Phase A with rapid propeller agitation and heat to 75-80°C. Keep mixing with moderate to rapid propeller agitation until completely hydrated.
- Shift Phase A to homomixing. Utilize high-speed homomixing to activate the Veegum R.
- When Phase A becomes smooth, add Phase B to Phase A at 75-80°C with high-speed homomixing.
- When Phase AB becomes uniform, add the ingredients of Phase C to Phase AB at 75-80°C with high-speed homomixing.
- In a separate vessel, combine all the ingredients except the Actique Ceramide and the Emulsun of Phase D. Heat to 75-80°C and mix with moderate propeller agitation until uniform. Then add the Actique Ceramide to the mixture at 75-80°C. Keep mixing until uniform. When the mixture becomes clear, add the Emulsun. Maintain the temperature at 75-80°C.
- Add Phase D to Phase ABC with high-speed homomixing agitation at 75-80°C. Mix until the color of mixture becomes uniform.
- Shift Phase ABCD to rapid propeller mixing and cool to 55-60°C.
- In a separate vessel, mix all the ingredients of Phase E until uniform. Add to Phase ABCD at 55-60°C with moderate propeller agitation.
- Add Phase F to Phase ABCDE at 50-55°C in the order listed with moderate propeller agitation.
- Adjust weight with water at 50-55°C.
- Stop mixing at 40-45°C. Allow the batch to stand overnight to complete the emulsification.

10. Formula Properties: pH 6-7; viscosity 273-401kcP.

11. INCI/Trade names must be verified with each manufacturer.

12. Preservative: Euxyl® PE 9010 [INCI: Phenoxyethanol (and) Ethylhexylglycerin] supplied by Schülke Inc.