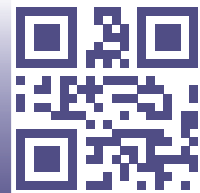




Formulator Report:

Floraesters K-20W® Jojoba Enhances Make-Up Primers



Floraesters® K-20W Jojoba increases skin hydration, facilitates better fine line / wrinkle coverage, increases longevity of make-up wear, and enhances consumer preference when included in facial primers.

Floraesters K-20W Jojoba [INCI: Hydrolyzed Jojoba Esters (and) Water (Aqua)] is a multifunctional ingredient that has been tested and utilized in a variety of cosmetic and personal care formulations such as creams / lotions, hand sanitizers, nonwoven wipes, sunscreens, sunless tanners, shampoos / conditioners, toners / astringents, face washes, and primers.¹ Its film-forming properties make it ideal for rinse-off products, products that require water resistance, and products that require an extended period of residence time on the skin (*i.e.* long wear).

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 fragrances remain on the skin longer in the presence of Floraesters K-20W Jojoba.⁴ Clinical studies have also shown that Floraesters K-20W Jojoba is effective at reducing the appearance of 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.

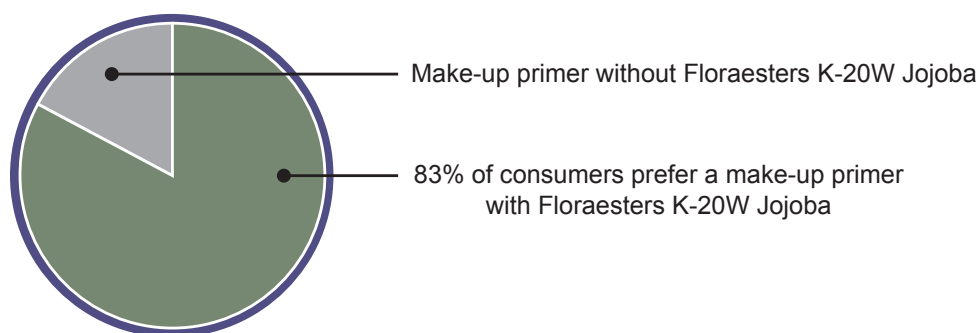
Clinical Study Facts⁶:

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

- **Significantly increased wear time** in primers when used with color cosmetics (**Figures 1 and 2**)
- **Improved initial coverage of wrinkles** (**Figure 3**)
- Preferred by **more than 80%** of consumers for **skin hydration and not settling into eyelid creases** (**Figure 4**)
- Preferred by **more than 80%** of consumers for **skin hydration and coverage of fine lines / wrinkles** (**Figure 5**)
- Preferred by **more than 80%** of consumers for **overall product performance** (**Figures 4 and 5**)

Formulation Benefits:

- Emolliency remains after rinse-off
- Results in rich emolliency on skin
- Substantivity
- Water resistant
- Soluble in most alcohols and glycols
- Botanically-derived
- Readily biodegradable⁷



Purpose:

The purpose of this investigation was to evaluate Floraesters K-20W Jojoba in both silicone and non-silicone based make-up primers for its ability to increase the duration of color cosmetic products on the skin (*i.e.* long wear). The silicone based formulation with and without Floraesters K-20W Jojoba was intended for foundation application usage and the non-silicone based formulation with and without Floraesters K-20W Jojoba was intended for eyeshadow application usage.

1. Cargill has not tested Floraesters K-20W Floraesters 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. M. Cummings. Built to last. *Soap, Perfumery & Cosmetics*. November 2001.
5. See Claim Sheets 11-035 and 11-036 for more information.
6. Final Report available upon request. Figures can be found on the next two pages of this document.
7. Biodegradable according to OECD 301B.

Figures⁸:

Increased Make-Up Longevity:

Figure 1. The silicone-free primer containing **1% Floraesters K-20W Jojoba** resulted in **35% less color loss** (i.e. longer wear time) after 8 hours compared to the vehicle (p<0.001). (See Claim Sheet 17-100.)

Figure 2. The primer containing **1% Floraesters K-20W Jojoba** resulted in **41% less color loss** (i.e. longer wear time) after 8 hours compared to the vehicle (p<0.001). (See Claim Sheet 17-101.)

Figure 1. Improved Eye Make-Up Wear Time with Floraesters K-20W Jojoba

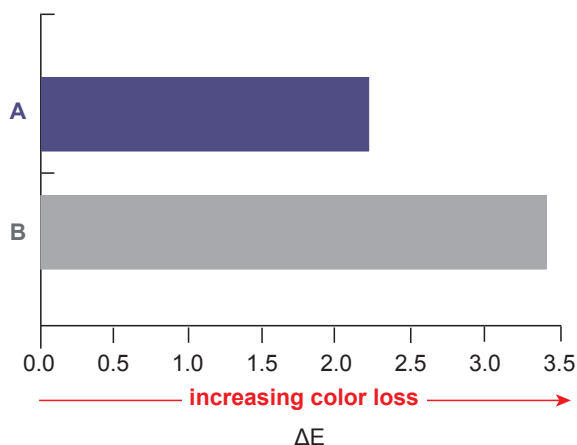
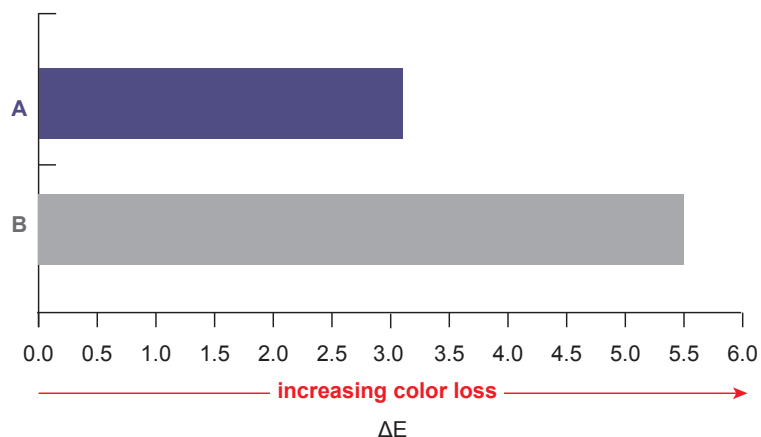
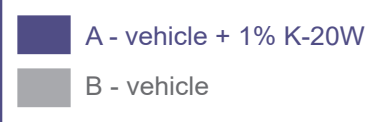


Figure 2. Improved Foundation Make-Up Wear Time with Floraesters K-20W Jojoba



Study Design: Silicone-free and silicone-based primers were applied to the upper arms or to the entire face, respectively. Color cosmetics (eyeshadow or foundation / BB cream) were applied on top of the primers. Color measurements were taken immediately after the color cosmetic 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 color cosmetic wearing off). The results appear in *Figures 1* and *2*.

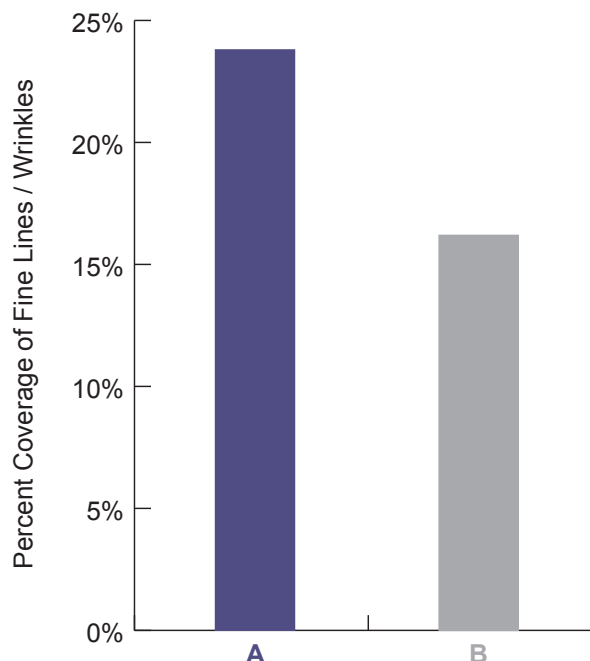


Improved Fine Line / Wrinkle Coverage:

Figure 3. The primer containing **1% Floraesters K-20W Jojoba** resulted in **47% improvement in the initial coverage of fine lines / wrinkles** compared to the vehicle (p<0.05). (See Claim Sheet 17-104.)

Study Design: Coverage was determined by the appearance of fine lines / wrinkles. Baseline facial photographs were taken (front of face) using the Clarity Pro Advanced skin analysis system, along with photographs immediately after application of the silicone-based primer followed by foundation / BB cream. The results appear in *Figures 3*.

Figure 3. Floraesters K-20W Jojoba Improved Coverage



⁸. All studies were conducted double-blind, vehicle-controlled, and randomized.

Increased Consumer Preference:

Figure 4. Increased Consumer Preference (Eye Make-Up) with Floraesters K-20W Jojoba⁹

After 8 Hours

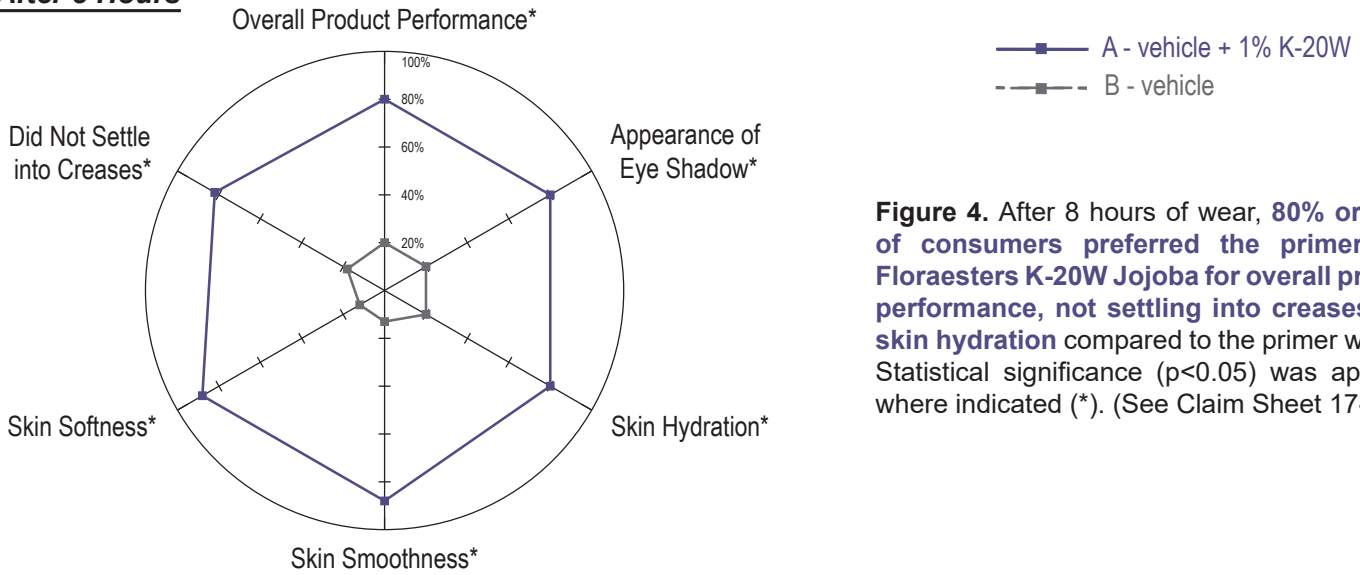


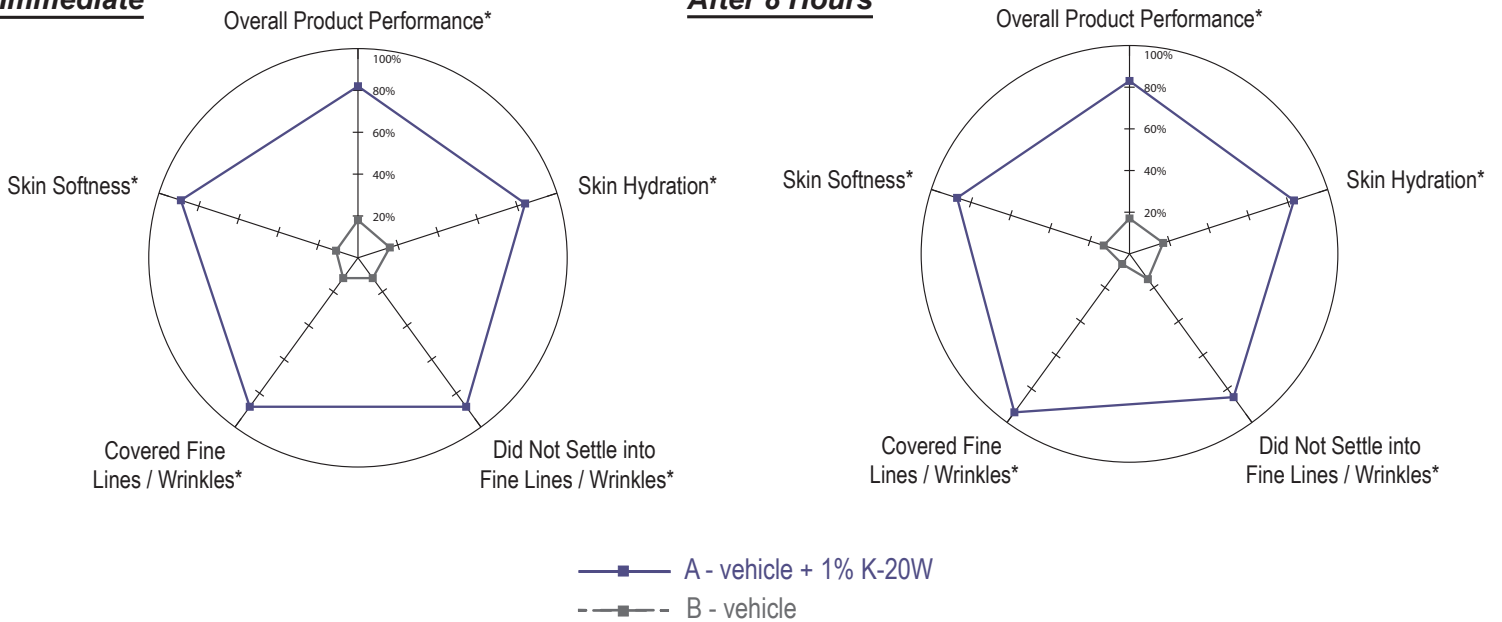
Figure 4. After 8 hours of wear, 80% or more of consumers preferred the primer with Floraesters K-20W Jojoba for overall product performance, not settling into creases, and skin hydration compared to the primer without. Statistical significance ($p < 0.05$) was apparent where indicated (*). (See Claim Sheet 17-102.)

Figure 5. Increased Consumer Preference (Foundation) with Floraesters K-20W Jojoba⁹

Figure 5. Both immediately and 8 hours after application, 80% or more of consumers preferred the primer with Floraesters K-20W Jojoba for overall product performance, coverage of fine lines / wrinkles, and skin hydration compared to the primer without. Statistical significance ($p < 0.05$) was apparent where indicated (*). (See Claim Sheet 17-103.)

Immediate

After 8 Hours



Study Design: Each silicone-free / silicone-based primer duo, was compared by consumers on a 1-5 scale for initial product evaluations and skin feel observations (8 hours post-application of color cosmetics). The higher the score, the more the listed attribute was perceived by consumers. *Figure 4* shows the results of consumer preference for eye makeup applied to the silicone-free primer pair on the eye lids after 8 hours of wear ($n=27$); *Figure 5* shows the results for both immediate and after 8 hours of wear for foundation / BB cream applied to the silicone-based primer pair on the face ($n=26$).

9. The preference data does not include subjects that indicated no preference.

Formula: Hydrating, Long-Wearing Make-Up Primer¹⁰

Floraesters K-20W Jojoba is a botanically-based emollient that enhances primer formulations by providing skin hydration, and improving coverage and longevity of make-up on the skin. This light weight, non-greasy primer glides on with a silky feel and softens the appearance of imperfections.

Phase	Trade/Common Name	INCI Name	Manufacturer	% wt./wt.
A	Deionized Water	Water	-----	q.s.
	Natrosol® 250 HHR CS	Hydroxyethylcellulose	Ashland, Inc.	0.75
	Preservative ¹¹	-----	-----	q.s.
B	Deionized Water	Water	-----	64.00
	Versene® Na2 Crystals	Disodium EDTA	The Dow Chemical Co.	0.10
	Pemulen TR-1 Polymer	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	The Lubrizol Corporation	0.25
C	Glycerine 99.7% USP Kosher	Glycerin	Acme-Hardesty Co.	1.00
	Floraesters K-20W Jojoba	Hydrolyzed Jojoba Esters (and) Water (Aqua)	Floratech	1.00
	Deionized Water	Water	-----	5.00
D	AMP-Ultra® PC 2000, Neutralizing Amine (15% Solution)	Aminomethyl Propanol (and) Water	Angus Chemical Company	q.s.
	Citric Acid, USP (15% Solution)	Citric Acid (and) Water	Archer Daniels Midland Company	q.s.
E	Chione Snowfall White S130D	Synthetic Fluorophlogopite (and) Titanium Dioxide	BASF Corporation	2.00
			Total	100.00

Procedure:

1. Mix the Natrosol 250 HHR CS with the deionized water of Phase A in a vessel with rapid propeller agitation at room temperature. Continue mixing until well dispersed, and begin heating to 40-45°C. Continue mixing at 40-45°C until the Natrosol 250 HHR CS is fully hydrated and forms a gel. Then begin cooling to room temperature.
2. Add the preservative to the mixture with rapid to moderate propeller agitation at room temperature.
3. In the main vessel, mix the Versene Na2 Crystals with the deionized water of Phase B using moderate propeller agitation at room temperature until the Versene Na2 Crystals are completely dissolved.
4. Add the Pemulen TR-1 Polymer to the main vessel with rapid propeller agitation at room temperature. Continue mixing until the Pemulen TR-1 Polymer is fully hydrated.
5. Add Phase A to Phase B with rapid propeller agitation. Continue mixing with rapid propeller agitation at room temperature until Phase AB becomes uniform.
6. In separate vessel, mix the ingredients of Phase C at room temperature. Add Phase C to Phase AB with moderate propeller agitation.
7. Add the AMP-Ultra PC 2000, Neutralizing Amine (15% Solution) of Phase D to Phase ABC to neutralize the Pemulen TR-1 Polymer. Mix until uniform.
8. Add the Citric Acid, USP (15% Solution) of Phase D to the mixture to achieve pH 5-6. Continue mixing until uniform.
9. Add Phase E to Phase ABCD with moderate propeller agitation at room temperature. Make sure the Chione Snowfall White S130D is well dispersed without any clumps.

Formula Properties:

Property	Result
pH	5 - 6
Viscosity	33 - 92 kcP

Ingredient Information
24/7 Online

iLabel®
www.floratech.com/info



Floraesters
K-20W Jojoba

¹⁰. INCI/Trade names must be verified with each manufacturer
¹¹. Preservative: Microcare PHD [INCI: Phenoxyethanol (and) Decylene Glycol (and) Propylene Glycol] by Thor