Floraesters® K-20W Jojoba increases skin hydration, reduces skin barrier dysfunction, and enhances consumer preference when included in bar soaps.

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, primers, and oil-free formulations. 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; sunscreen actives in combination with Floraesters K-20W Jojoba are retained on the skin after water immersion; and fragrances remain on the skin longer in the presence of Floraesters K-20W Jojoba. 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.

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

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

- **Significantly increased skin hydration** in skin washed repeatedly with bar soap (Figure 1)
- **Reduced barrier disruption** in skin washed repeatedly with bar soap (Figure 2)
- **Increased skin smoothness more than 5 times** as much as the vehicle bar soap (Figure 3)
- **Preferred by more than 94%** of consumers for smooth, soft, and moisturized skin (Figure 4)

Other Benefits in Bar Soaps:
- Increased foam quantity and stability of bar soaps (Figure 5 and Image 1)
- Increased structural strength and compactness of foam in bar soaps (Figure 6 and Image 2)
- Improved spreadability and texture of foam in bar soaps (Figure 7)
- Reduced cracking in bar soaps (Table 1 and Image 3)

Formulation Benefits:
- Emolliency remains after rinse-off
- Results in rich emolliency on skin
- Substantivity
- Readily biodegradable
- **Botanically-derived**
- Allows for oil-free claims
- Soluble in most alcohols and glycols
- **COSMOS certified**

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1. See Claim Sheets 09-013, 09-014, 10-017, 10-024, and 13-052 for more information.
2. See Claim Sheet 10-018 for more information.
4. See Claim Sheets 11-035 and 11-036 for more information.
5. Final Report available upon request. Figures, Images, and Tables can be found on the next two pages of this document.
**Purpose:**
The purpose of this investigation was to evaluate Floraesters K-20W Jojoba in bar soap for its skin care qualities, including mitigating the drying and barrier disruption effects of bar soaps on skin after repeated use. Consumer preference and skin smoothness were also evaluated after a single use. Additionally, soaps with and without Floraesters K-20W Jojoba were evaluated for relative foaming, the number / size of cracks in used soap bars that were allowed to dry in a humid environment, and the structure, spreadability, and texture of foam.

**Figures:**

**Increased Skin Hydration:**

*Figure 1. Improved Skin Hydration with Floraesters K-20W Jojoba*

**Decreased Skin Barrier Dysfunction:**

*Figure 2. Reduced Skin Barrier Dysfunction with Floraesters K-20W Jojoba*

**Study Design:** Baseline hydration and barrier function (i.e. TEWL) measurements on subject’s forearms were captured. Forearms were then repeatedly washed with each bar soap 10 times (i.e. wet, 10 strokes, 60 second wash by hand, rinse, and pat dry). Measurements were repeated at the respective evaluation time points. The results appear in **Figures 1 and 2.** (Bar Soap Total Fatty Matter = 62.73%)

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6. All studies were conducted double-blind, vehicle-controlled, and randomized.
Increased Skin Smoothness:

Figure 3. The bar soap containing 0.5% Floraesters K-20W Jojoba increased skin smoothness more than 5 times as much as the vehicle (p<0.05). (See Claim Sheet 18-113.)

Study Design: Hands were washed with each bar soap 1 time (i.e. wash soiled hands with soap for 30 seconds, rinse for 10 seconds, and pat dry). Skin smoothness was measured at baseline and 30 minutes post-wash. The results appear in Figure 3. (Bar Soap Total Fatty Matter = 62.73%)

Increased Consumer Preference:

Figure 4. More than 94% of consumers preferred the bar soap containing 0.5% Floraesters K-20W Jojoba for smooth, soft, and moisturized skin as compared to the vehicle. Statistical significance (p<0.05) was apparent where indicated (*). (See Claim Sheet 18-114.)

Study Design: Hands were washed with each bar soap 1 time (i.e. wash soiled hands with soap for 30 seconds, rinse for 10 seconds, and pat dry). Subjects evaluated consumer preference during the wash, 0 (i.e. immediately after washing), and 30 minutes after washing with the bar soap. The results appear in Figure 4. (Bar Soap Total Fatty Matter = 62.73%)

7. The preference data does not include subjects that indicated no preference.
Formulation Benefits:

**Figure 5. Improved Foam Quantity and Stability with Floraesters K-20W Jojoba**

Study Design: Bar soaps were diluted to 1% in water and blended for 1 minute. The foam solution was then transferred to a graduated cylinder and foam height was measured every 5 minutes for 20 minutes. The results appear in Figure 5. Bar soaps were also rubbed by hand for approximately 60 seconds and foam was collected. The results appear in Image 1. (Bar Soap Total Fatty Matter = 62.73%)

**Image 1.** Note how the soap with Floraesters K-20W Jojoba produced a creamier, denser foam compared to the vehicle soap without.

Figure 5. Initially and after 20 minutes, the bar soaps with Floraesters K-20W Jojoba produced more foam compared to the vehicle soap without.
**Figure 6. Improved Structural Strength of Foam with Floraesters K-20W Jojoba**

Image 2. Note how the soap with Floraesters K-20W Jojoba produced foam with a more compact structure and finer bubbles compared to the vehicle soap without.

**Study Design:** Bar soaps were diluted to 5% in water and blended with 20 consistent shakes. Fifteen milliliters of foam was analyzed using a rheometer (MCR 102, Anton Paar) in oscillatory mode with a strain of 0.1-500%, a gap of 2.2mm, and a temperature of 30°C. The results of storage modulus (G') versus shear strain appear in Figure 6. (G' is an indicator of elasticity when evaluated over low to high strain; the higher the G' value, the better the structural strength and thus more stable the foam.) Microscope images of foam were also captured using a dermascope (60x) at low and high shear. The results appear in Image 2. (Bar Soap Total Fatty Matter = 77.95%)
**Figure 7. Improved Spreadability and Texture of Foam with Floraesters K-20W Jojoba**

Study Design: Bar soaps were diluted to 5% in water and blended with 20 consistent shakes. Fifteen milliliters of foam was analyzed using a rheometer (MCR 102, Anton Paar) in oscillatory mode with an angular frequency of 100-1 rad/sec, a gap of 2.2 mm, and a temperature of 30°C. The results of storage modulus (G') versus angular frequency appear in Figure 7. (G' is an indicator of spreadability at high angular frequency and an indicator of texture at low angular frequency; the higher the G' value, the stiffer, more stable (better spread) and smoother textured the foam.) (Bar Soap Total Fatty Matter = 77.95%)

Table 1. Reduced Soap Cracking with Floraesters K-20W Jojoba

<table>
<thead>
<tr>
<th>% Floraesters K-20W Jojoba</th>
<th>Average Crack Length (mm)</th>
<th>% Decrease in Crack Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00%</td>
<td>16.0</td>
<td>-----</td>
</tr>
<tr>
<td>0.50%</td>
<td>11.5</td>
<td>-28%</td>
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</table>

Table 1. The bar soaps with Floraesters K-20W Jojoba produced smaller cracks compared to the vehicle soap without.

Image 3. Note how the soap with Floraesters K-20W Jojoba produced less cracking compared to the vehicle soap without.

Study Design: Bar soaps were rubbed 50 times between gloved palms in a pool of 25-29°C tap water to simulate use. The bars of soap were then placed in a humidity chamber at 26-30°C and 70%+ relative humidity for 24 hours. The number of cracks >10 mm were counted and measured. The results appear in Table 1. Bar soaps were also immersed in water for 10 minutes for 7 days and allowed to air dry under ambient conditions. The results appear in Image 3. (Bar Soap Total Fatty Matter = 62.73%)
Formula: Smoothing and Softening Bar Soap

This moisturizing bar soap featuring Floraesters K-20W Jojoba provides a luxurious creamy lather that washes away dirt and residue, without substantially disrupting skin barrier function. The synergy between Floraesters K-20W Jojoba and glycerin extends moisturization, even after rinse-off. Additionally, the inclusion of Floraesters K-20W Jojoba enhances consumer preference for increased smoothness, softness, and overall product preference.

### Procedure:

1. In a Sigma Mixer, mix the Soap Noodles of Phase A with heat (60-65°C).
2. Add the ingredients of Phase B one by one in the order listed and continue mixing with heat.
3. In a separate vessel, mix the ingredients of Phase C until uniform. Add to Phase AB and continue mixing.
4. In a separate vessel, combine the ingredients of Phase D, and mix until uniform. Add to Phase ABC and continue mixing.
5. Continue mixing for 30 minutes to ensure a uniform mixture.
6. Pass the mixture through a triple roller mill 2-3 times.
7. Pass the mixture through an extruder with heat (60-65°C).
8. Cool soap to 40°C and mold it.

### Ingredient Information

<table>
<thead>
<tr>
<th>Phase</th>
<th>Trade/Common Name</th>
<th>INCI Name</th>
<th>Manufacturer</th>
<th>% wt./wt.</th>
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<td>A</td>
<td>Soap Noodles</td>
<td>----</td>
<td>----</td>
<td>78.90</td>
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<tr>
<td>B</td>
<td>Titanium Dioxide</td>
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<tr>
<td></td>
<td>Tetrasodium EDTA</td>
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<td>----</td>
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<td></td>
<td>Corn Starch</td>
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<td></td>
<td>Talc</td>
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<tr>
<td>C</td>
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<tr>
<td></td>
<td>Butylated Hydroxytoluene (BHT)</td>
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<td></td>
<td>Sodium Chloride</td>
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<tr>
<td>D</td>
<td>Floraesters K-20W Jojoba</td>
<td>Hydrolyzed Jojoba Esters (and) Water (Aqua)</td>
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<tr>
<td></td>
<td>Glycerin</td>
<td>----</td>
<td>----</td>
<td>2.00</td>
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</table>

Total: 100.00

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9. INCI/Trade names must be verified with each manufacturer
10. Bars of soap were manufactured by Connell Brothers Company Ltd., India.
11. Soap Noodles consist of the following: Sodium Palmate, Sodium Palm Kernelate, Sodium Chloride, Glycerin, Tetrasodium EDTA, and Sodium Etidronate.
12. Total Fatty Matter = 62.73%
LOT SPECIFIC RAW MATERIAL INFO 24/7?
NOW THAT’S GENIUS!
CofA, TDS, SDS,
Efficacy Data,
Formulas, etc…
No Registration or Passwords!

Scan the QR Code
on your product or sample

...or go to floratech.com/info
for lot specific information 24/7!