Formulator Report:
Nonwoven Face Mask with Floraesters K-20W® Jojoba

Floraesters K-20W Jojoba increases skin hydration, elasticity and firmness, decreases pore size and the number of fine lines, and enhances consumer perception in both American and Asian subjects when included in a nonwoven face mask.

Floraesters K-20W Jojoba [INCI: Hydrolyzed Jojoba Esters (and) Water] is a multifunctional ingredient that has been utilized and/or tested 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 oil-free formulations. Its film-forming properties make it ideal for rinse-off products and products that require water resistance or to extend the 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;\(^1\) sunscreen actives in combination with Floraesters K-20W Jojoba are retained on the skin after water immersion;\(^2\) and many fragrances are retained on the skin longer in the presence of Floraesters K-20W Jojoba.\(^3\) Clinical studies have also shown that Floraesters K-20W Jojoba is effective at reducing irritation-associated erythema, as well as affecting skin barrier function and restoration.\(^4\)

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

Clinical Study Facts\(^5\):
In double-blind, vehicle-controlled, take-home, consumer-use studies, Floraesters K-20W Jojoba in a nonwoven face mask produced the following benefits:

- Improved skin hydration by more than 20% (Figure 1)
- Improved skin elasticity and firmness significantly better than the face mask without (Figure 1)
- Significantly reduced the number of enlarged pores and fine lines (Figure 2)
- Reduced the size of pores in 80% of subjects (Figure 2)
- Favored by 93% of surveyed American subjects for overall product performance (Figure 3)
- Favored by greater than 60% of surveyed American subjects for other skin and product attributes such as improved skin softness/smoothness, product absorbency, and pleasing texture of the product (Figures 3 and 4)
- Favored by 88% of surveyed Asian subjects for overall product performance preference (Figure 5)
- Favor by greater than 60% of surveyed Asian subjects for other skin and product attributes such as improved skin softness/smoothness, decreased skin redness, and pleasing texture of the product (Figures 5 and 6)

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

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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 Reports available upon request. Figures can be found on the next two pages of this document.
Floraesters K-20W Jojoba Improved Skin Hydration, Firmness, and Elasticity

**Figure 1:** The test article containing 1% Floraesters K-20W Jojoba produced statistically significantly (p<0.05) higher percent changes in skin hydration and firmness than the vehicle test article. The test article containing 1% Floraesters K-20W Jojoba also resulted in statistically significant increases (p<0.05) in skin elasticity, which was not seen for the test article without Floraesters K-20W Jojoba. (See Claim Sheet 14-059.)

**Figure 2:** As shown in the table above, 1% Floraesters K-20W Jojoba in a face mask produced statistically significant decreases (p<0.05) in pore size (as determined by enlarged pore counts) and fine lines compared to the vehicle after two weeks of once-daily test article use (20 minute applications). (See Claim Sheet 14-060.)

### Floraesters K-20W Jojoba Decreased Pore Size and the Number of Fine Lines

<table>
<thead>
<tr>
<th>Skin Health Parameter 2 Weeks</th>
<th>Test Article</th>
<th>Mean Difference (count)</th>
<th>Subjects that Showed a Decrease (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enlarged Pores</td>
<td><strong>Vehicle + 1% K-20W</strong></td>
<td>-115</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td><strong>Vehicle</strong></td>
<td>-21</td>
<td>56%</td>
</tr>
<tr>
<td>Fine Lines</td>
<td><strong>Vehicle + 1% K-20W</strong></td>
<td>-5</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td><strong>Vehicle</strong></td>
<td>2</td>
<td>40%</td>
</tr>
</tbody>
</table>

6. All studies were conducted double-blind, vehicle-controlled, and randomized.
Ninety-three Percent of American Subjects Preferred a Nonwoven Face Mask with Floraesters K-20W Jojoba

Figures 3 and 4: Ninety-three percent of consumers prefer a nonwoven face mask with 1% Floraesters K-20W Jojoba compared to a face mask without. Statistical (**) significance was apparent where indicated (p<0.05). (See Claim Sheet 14-057.)

Eighty-eight Percent of Asian Subjects Preferred a Nonwoven Face Mask with Floraesters K-20W Jojoba

Figures 5 and 6: Eighty-eight percent of Asian subjects preferred a nonwoven face mask with 1% Floraesters K-20W Jojoba compared to a face mask without. Statistical (**) and directional (*) significance was apparent where indicated (p<0.05 and p<0.1, respectively). (See Claim Sheet 14-058.)
**Floraesters K-20W Jojoba**

This nonwoven face mask, featuring Floraesters K-20W Jojoba, demonstrates the synergistic moisturizing effect of Floraesters K-20W Jojoba with glycerin. The inclusion of Floraesters K-20W Jojoba enhances consumer preference for increased smoothness/softness, increased skin firmness, and overall product preference.

### Formula: Moisturizing Face Mask with Floraesters K-20W Jojoba

[7] INCI/Trade names must be verified with each manufacturer.

[8] Face masks were manufactured by Maxigen Biotech Inc. (New Taipei City, Taiwan). Please contact Maxigen Biotech Inc, for additional information.

[9] Preservative: Methylisothiazolinone

<table>
<thead>
<tr>
<th>Phase</th>
<th>Trade/Common Name</th>
<th>INCI Name</th>
<th>Manufacturer</th>
<th>% wt./wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Butylene Glycol</td>
<td>Chlorophenines</td>
<td>4.00</td>
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<tr>
<td>B</td>
<td>Xanthan Gum</td>
<td>Hydroxyethylcellulose</td>
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</tr>
<tr>
<td>C</td>
<td>Sodium Hyaluronate</td>
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<tr>
<td></td>
<td>Glycerin</td>
<td>Floraesters K-20W Jojoba</td>
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<td></td>
</tr>
<tr>
<td>D</td>
<td>PEG-40 Hydrogenated Castor Oil</td>
<td>0.40</td>
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</tr>
<tr>
<td>E</td>
<td>Deionized Water</td>
<td>PEG-4 Laurate, Iodopropynyl Butylcarbamate</td>
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<tr>
<td></td>
<td>Preservative</td>
<td>Preservative</td>
<td>q.s.</td>
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<tr>
<td>Total</td>
<td></td>
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</tbody>
</table>

### Procedure:

1. In the main vessel, mix the ingredients of Phase A at 50°C until completely dissolved. Maintain vessel at 50°C.
2. Add the ingredients of Phase B to Phase A.
3. In a separate vessel, heat the ingredients of Phase C with mixing to 50°C. Add Phase C to Phase AB.
4. Add Phase D to Phase ABC with mixing.
5. Add the ingredients of Phase E to Phase ABCD and mix until homogeneous.
6. Apply product to nonwoven face mask.

### Ingredient Information 24/7 Online

[Label](www.floratech.com/info)