



**Florotech**  
**Product Functions:**  
Sunscreens Made Better With  
Floraesters<sup>®</sup> K-20W Jojoba  
and Floramac<sup>®</sup> 10

*The Natural Solution*<sup>SM</sup>

[www.floratech.com](http://www.floratech.com)

# Sunscreens

Sunscreens protect the skin from damaging UVA and UVB radiation. Sunscreen active chemical ingredients such as oxybenzone, octinoxate, and avobenzone absorb this radiation, while natural mineral sunscreens such as titanium dioxide and zinc oxide scatter harmful UVA and UVB rays.



# Chemical Sunscreens

Due to evidence indicating that oxybenzone and octinoxate can damage natural coral reefs and marine ecosystems, sunscreens containing these ingredients will not be permitted for sale after 2019 in the South Pacific country of Palau, and after 2020 in the US states of Florida and Hawaii, and in some islands in the Caribbean.



# Mineral Sunscreens

Sunscreens using only natural mineral active ingredients are increasingly popular; however, mineral sunscreens are more easily washed from the skin when swimming and can often form an unsightly white film. Floraesters K-20W<sup>®</sup> Jojoba and Floramac 10 can aid in improving these qualities in mineral-based sunscreens.



# Mineral Sunscreens

Mineral sunscreens are most effective when the active mineral particles are efficiently and evenly dispersed on the skin. Even particle dispersion can reduce the need for heavy white creams.



# Study: Titanium Dioxide Dispersion

- **Objective**

- To evaluate Floramac 10 for its ability to disperse titanium dioxide.

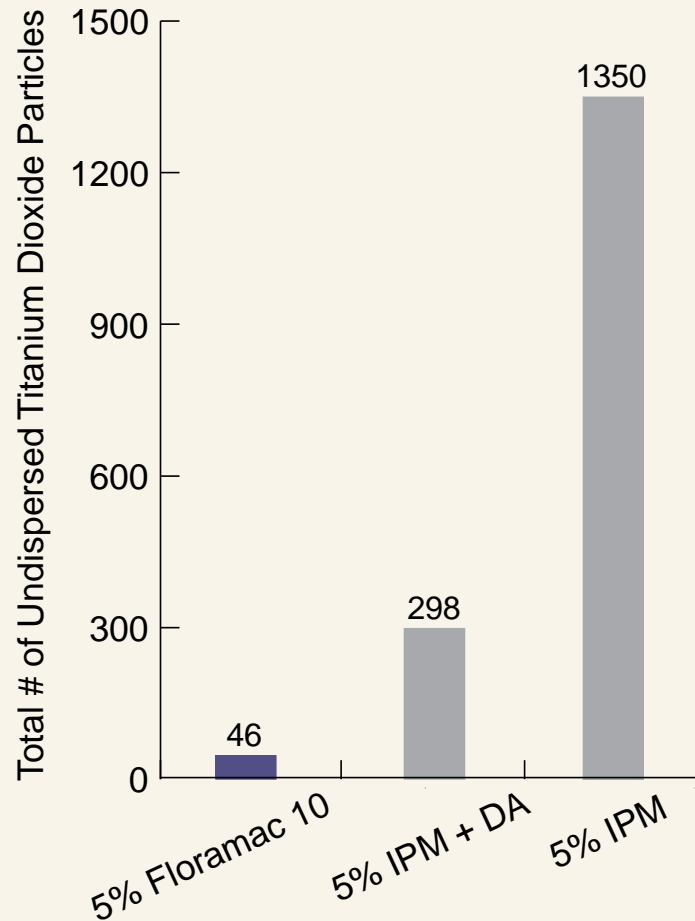
- **Results**

- Sunscreen formulas containing 5% **Floramac 10** resulted in fewer undispersed titanium dioxide particles than sunscreen formulas with 5% isopropyl myristate (IPM). Additionally, the sunscreen containing 5% **Floramac 10** resulted in more uniform dispersion.



# Titanium Dioxide Dispersion

Undispersed Particle Count



## Conclusion

Floramac 10 resulted in significantly fewer undispersed titanium dioxide particles than isopropyl myristate.

IPM = isopropyl myristate / DA – dispersing agent polyhydroxystearic acid

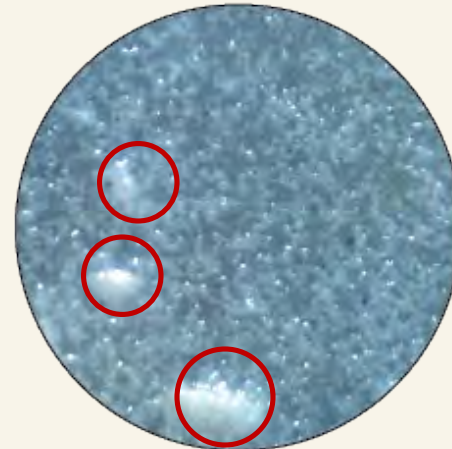


# Uniform Particle Dispersion

Floramac 10



Isopropyl Myristate



## Conclusion

The microscopic images above (60x) show the more uniform dispersion of titanium dioxide particles with Floramac 10. Note the circled undispersed particles.



# Clinical Study: SPF Boosting

- **Objective**

- To evaluate Floramac 10 for its potential to boost SPF when used in a mineral sunscreen that contained 15% zinc oxide and 4.8% titanium dioxide.\*

- **Results**

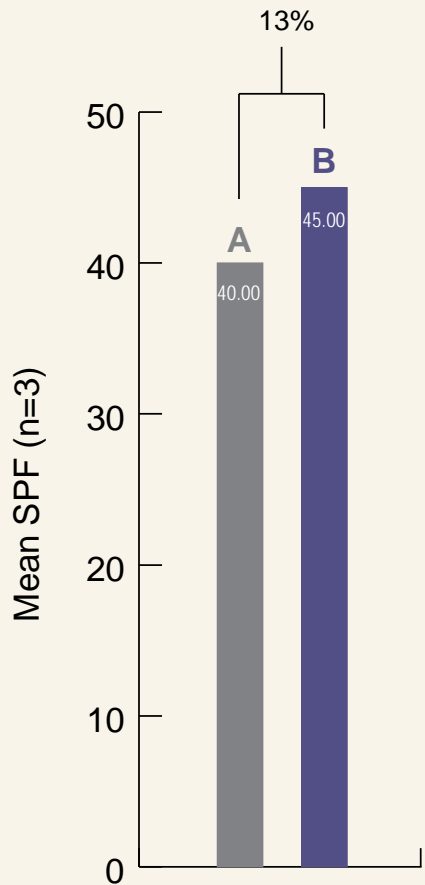
- The sunscreen containing 12% **Floramac 10** boosted **SPF by 13%** compared to the sunscreen with 5% Floramac 10.

\*Testing was conducted according to the US FDA Final Rule, 21 CFR Parts 201 and 310.



# Clinical Study: SPF Boosting

Static SPF



## Conclusion

The inclusion of 12% Floramac 10 resulted in a 13% increase in the SPF of a mineral sunscreen formula.

- A - vehicle + 5% Floramac 10
- B - vehicle + 12% Floramac 10



# Clinical Study: Consumer Preference

- **Objective**

- To evaluate the effect of Floramac 10 in a mineral sunscreen on consumer preference regarding multiple product and skin characteristics.

- **Results**

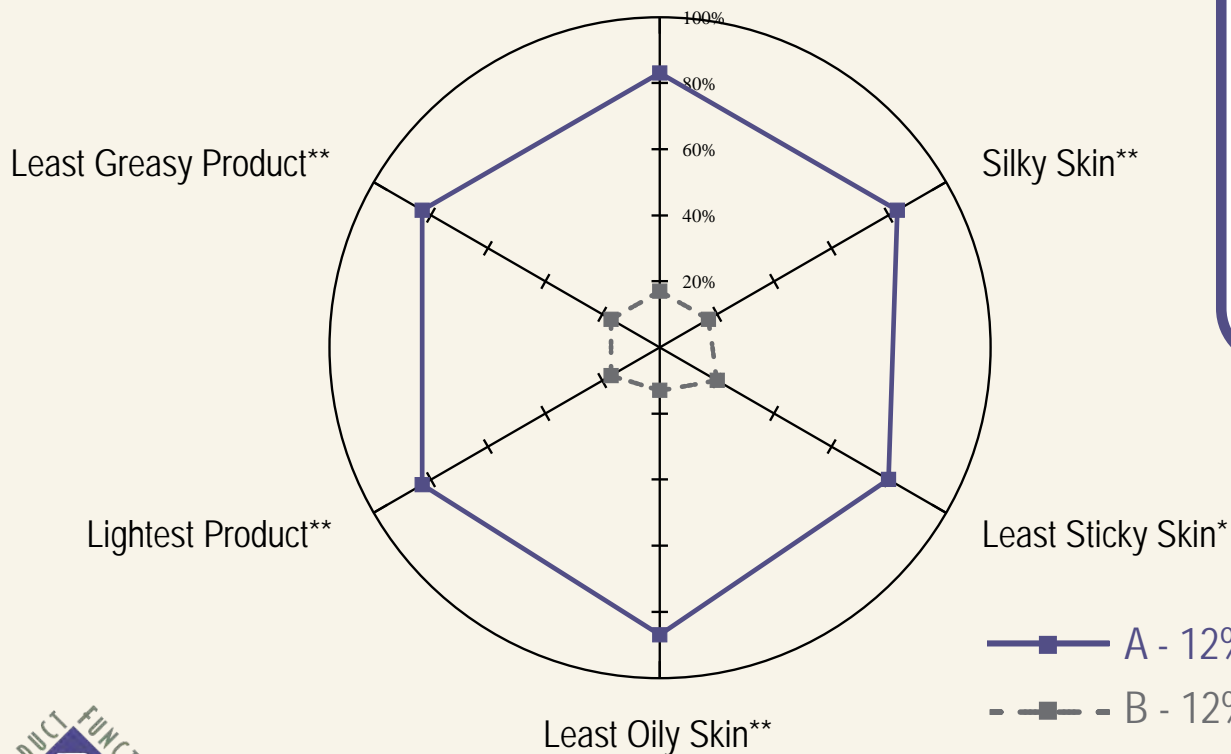
- 83% of female consumers preferred Floramac 10 in a mineral sunscreen.



# Clinical Study: Consumer Preference

## Consumer Preference

Overall Product Performance\*\*



## Conclusion

More than 80% of female consumers preferred the sunscreen containing Floramac 10 overall, and for silky, least greasy skin, compared to the sunscreen with caprylic/capric triglyceride oil.

Statistical (\*\*) and directional (\*) significance was apparent where indicated ( $p < 0.05$  and  $p < 0.10$ , respectively).



# Sunscreen Water Resistance

Mineral sunscreens can be prone to easily washing and rubbing off of the skin, requiring frequent reapplication to maintain effectiveness.

Floraesters K-20W Jojoba improves water resistance of mineral sunscreens, maintaining the sunscreen's effectiveness after water exposure.



# Clinical Study: Water Resistance

- **Objective**

- To evaluate the potential for Floraesters K-20W Jojoba, when added to a sunscreen formula, to improve water resistance after a 40-minute water immersion.\*

- **Results**

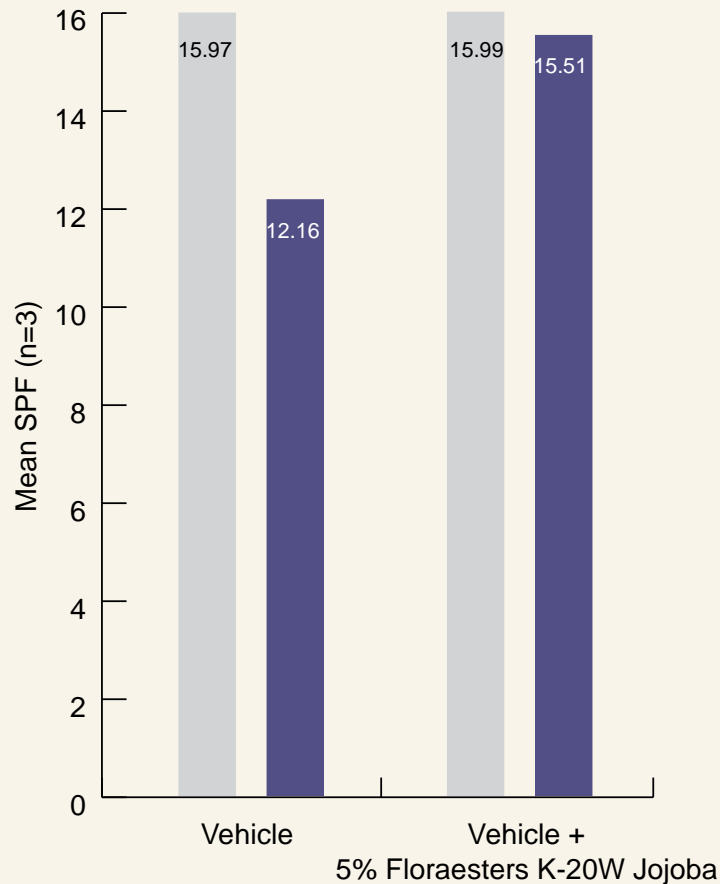
- After 40 minutes of water immersion, the sunscreen formula containing 5% **Floraesters K-20W Jojoba** had a **28% higher SPF** and maintained an SPF rating of **15**.

\*Testing was conducted according to the US FDA Final Rule, 21 CFR Parts 201 and 310.



# Clinical Study: Water Resistance

## Static and 40-Minute Water Immersion SPF



### Conclusion

The inclusion of Floraesters K-20W Jojoba resulted in 28% higher SPF after water immersion, and maintained an SPF of 15, unlike the vehicle.

- Static SPF
- 40-min Water Immersion SPF



# Sunless Tanners

Sunless tanners are increasing in popularity as consumers seek the appearance of tan skin without the risk of skin damage caused by excessive exposure to UVA and UVB radiation. Sunless tanners can be drying to the skin and have an unpleasant odor caused by the dihydroxyacetone (DHA) active ingredient. Floraesters K-20W Jojoba can improve skin hydration and reduce the perception of unpleasant odor associated with the use of these products.





# Clinical Study: Sunless Tanner Hydration

- **Objective**

- To evaluate Floraesters K-20W Jojoba for its ability to improve skin hydration when used in a DHA based sunless tanner.

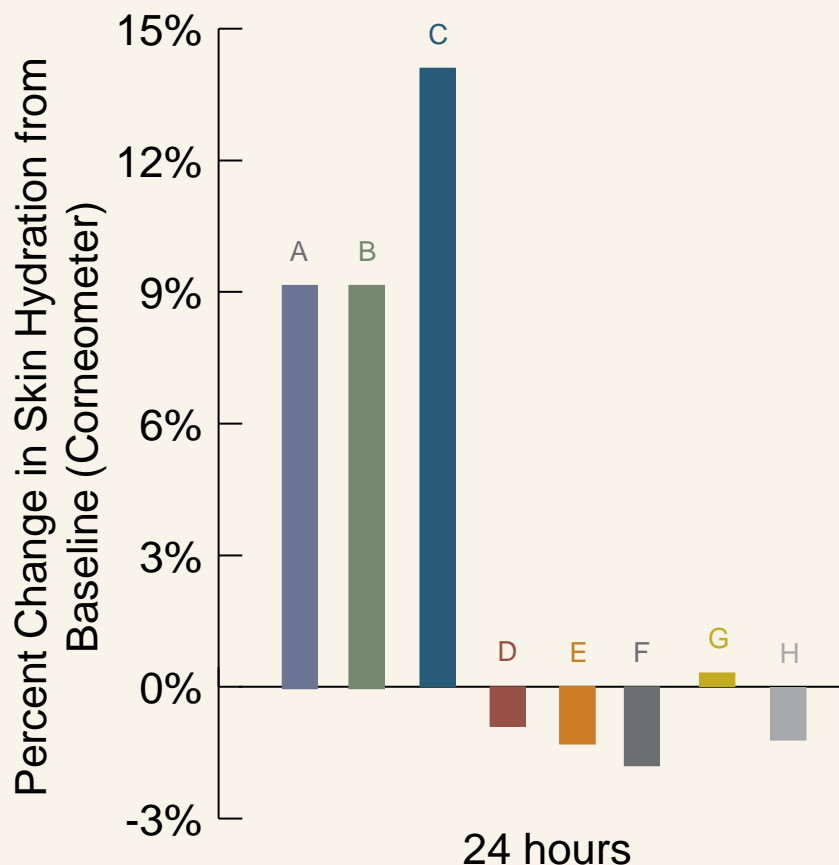
- **Results**

- **Floraesters K-20W Jojoba increased skin hydration in a sunless tanner with 5% dihydroxyacetone better than all other test articles at 24 hours.**



# Clinical Study: Sunless Tanner Hydration

## Change in Skin Hydration



### Conclusion

The inclusion of Floraesters K-20W Jojoba in a sunless tanner resulted in significantly greater increases in skin hydration than any other tested sunless tanner.

- A - vehicle + 1% K-20W + 1% Erythulose (pH=5.0)
- B - vehicle + 0.5% K-20W + 0.5% Erythulose (pH=5.5)
- C - vehicle + 1% K-20W (pH=5.5)
- D - vehicle + 1% Erythulose (pH=5.0)
- E - Marketed Product (pH=3.2)
- F - vehicle (pH=5.5)
- G - vehicle + 1% Dermacryl 79 (pH=5.5)
- H - vehicle (pH=4.0)



# Clinical Study: Consumer Preference

- **Objective**

- To evaluate the effect of Floraesters K-20W Jojoba in a sunless tanner on consumer preference regarding multiple product and skin characteristics.

- **Results**

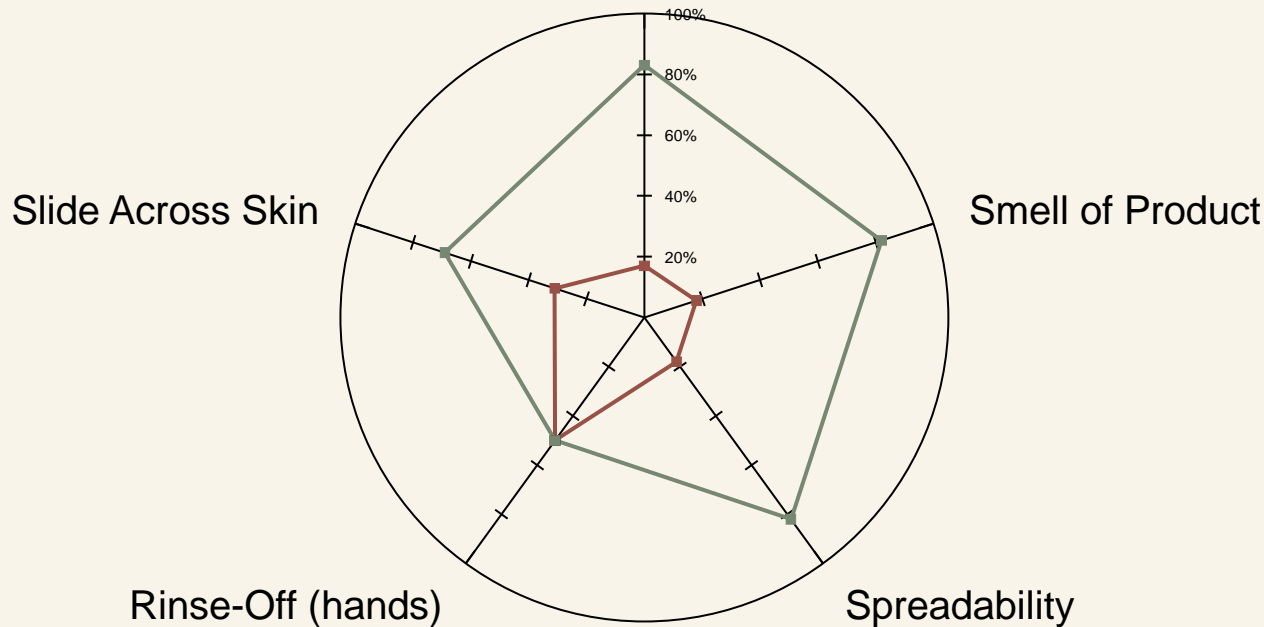
- Consumers indicated a preference for Floraesters K-20W Jojoba for the following qualities: overall product performance, slide across skin, smell of product, spreadability, overall tanning experience, evenness of tan, moisturization, longevity of tan, and overall color.



# Clinical Study: Consumer Preference

## Product Characteristics

### Overall Product Preference



## Conclusion

The graph shows that a sunless tanner with Floraesters K-20W Jojoba was preferred over one without for the qualities of overall product preference, smell of product, and slide across skin.

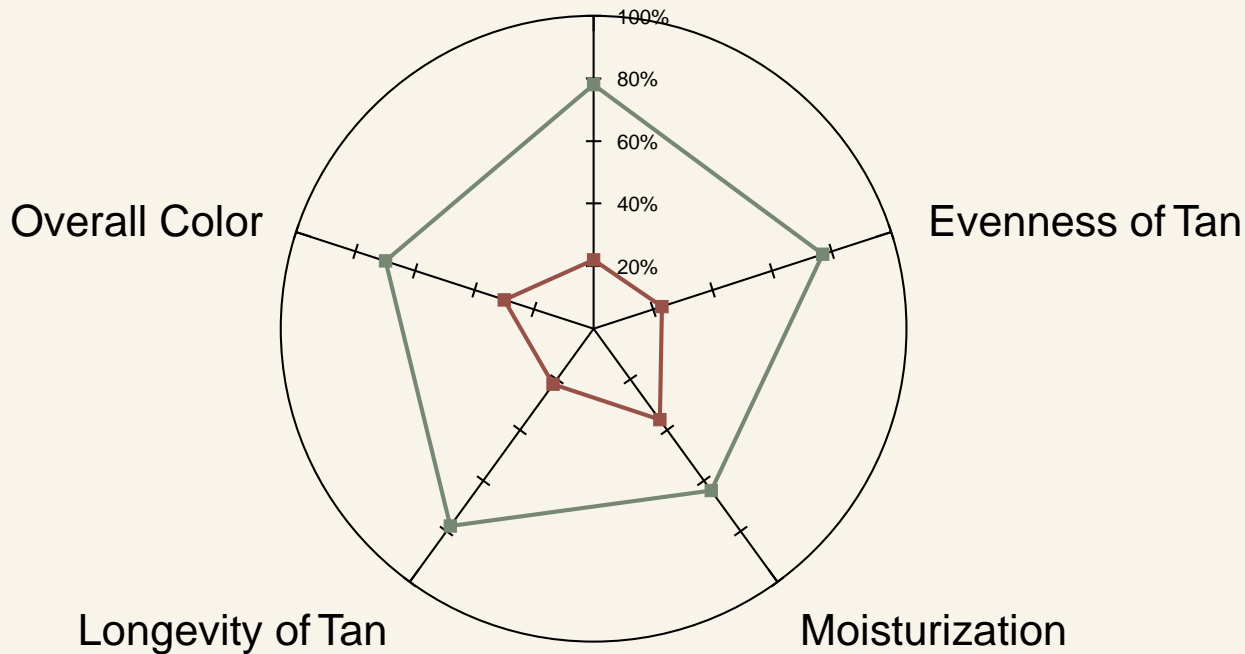
- vehicle + 0.5% K-20W + 0.5% Erythrulose (pH=5.5)
- vehicle + 1% Erythrulose (pH=5.0)



# Clinical Study: Consumer Preference

## Skin Characteristics

### Overall Tanning Experience



## Conclusion

The graph shows that a sunless tanner with Floraesters K-20W Jojoba was preferred over one without for the qualities of overall tanning experience, evenness of tan, moisturization, longevity of tan, and overall color.

- vehicle + 0.5% K-20W + 0.5% Erythrulose (pH=5.5)
- vehicle + 1% Erythrulose (pH=5.0)



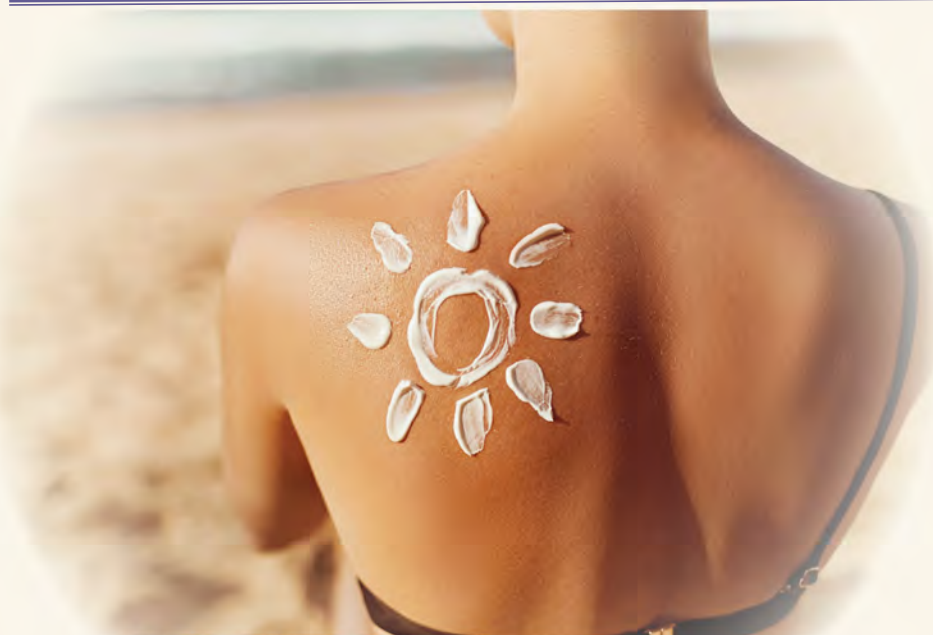
# Claim Sheets for Sunscreens

- A sunless tanner containing **Floraesters K-20W Jojoba** increased **skin hydration and consumer preference** ([CS13-049](#) and [CS13-050](#))
- A sunscreen with **Floraesters K-20W Jojoba** had a **28% higher SPF** than the vehicle after a 40 minute water immersion ([CS15-066](#))
- A sunscreen with **Floramac 10** resulted in **fewer undispersed titanium dioxide particles and more uniform dispersion** ([CS15-073](#)).
- **Floramac 10** in a sunscreen boosted SPF ([CS19-125](#))
- **83% of female consumers preferred Floramac 10** in a sunscreen ([CS20-138](#))

The collage displays five distinct claim sheets, each featuring the Floratech logo, a QR code, and specific product data. The sheets are:
 

- INCREASED SKIN HYDRATION WITH FLORAESTERS K-20W JOJOBA IN A SUNLESS TANNER:** A bar chart showing a positive change in skin hydration from baseline.
- CONSUMERS PREFER A SUNLESS TANNER WITH FLORAESTERS K-20W JOJOBA:** A circular chart illustrating consumer preference for sunless tanners containing this ingredient.
- FLORAESTERS K-20W JOJOBA IMPROVES SUNSCREEN WATER RESISTANCE:** A bar chart comparing SPF levels before and after 40-minute water immersion.
- SUNSCREEN CONSUMER PREFERENCE IMPROVED BY FLORAMAC 10:** A circular chart showing a high percentage of female consumers preferring sunscreens with Floramac 10.
- FLORAMAC 10 BOOSTS SPF OF INORGANIC SUNSCREENS:** A bar chart showing an increase in SPF for inorganic sunscreens when Floramac 10 is added.

# Formulation Information for Sunscreens



- Formula: Zinc Oxide & Titanium Dioxide Pre-Sun Lotion with Emulsun ([S013](#)).
- Formula: Pre-Sun Lotion with Floramac 10 ([S021](#))
- Formulator Report: Benefits of Floramac 10 in Sunscreens ([FR-010](#)).
- Formulator Report: Sunless Tanning Lotion with Floraesters K-20W ([FR-003](#))

**Formulator Report: Sunless Tanning Lotion with Floraesters K-20W®**

Floraesters K-20W® efficacy and sensory explored in various consumer, fragrance properties make it an all-in-one solution on the skin.

**Formulator Report: Benefits of Floramac® 10 in Sunscreens**

Floramac 10 (INCI: Ethyl Macadamate) is a unique oil-free emulsifier that can be utilized in a variety of cosmetic and personal care formulations including creams, lotions, serums, mousses, sunscreens, deodorants, shampoos, color cosmetics, and hair care products. Its dry emulsifier gives it a skin feel similar to that of cytopentasiloxane, without the volatility. Floramac 10 can also be used to mimic the skin feel of other silicones. With its low slip and high spread, its physical behavior is similar to that of isopropyl myristate. Furthermore, its inherent refractive index (1.44) lends to its ability to provide shine and gloss when used in tanning or products. In addition to benefits associated with product aesthetics, Floramac 10 is also functional within a formulation, assisting in the dispersion and solubilization of sunscreens, and boosting the SPF of organic sunscreens, as this report will describe.

Biotech-derived Floramac 10 is sustainable, EU and China REACH compliant, TGA approved, and listed on ACS.

**Zinc Oxide & Titanium Dioxide Pre-Sun Lotion with Emulsun**

This formula lotion with zinc oxide and titanium dioxide provides broad spectrum UV protection without leaving the skin. Floramac 10 emulsifier helps to disperse the zinc oxide and titanium dioxide particles, ensuring a uniform, stable, and clear lotion.

**Pre-Sun Lotion with Floramac 10**

The pre-sun lotion with zinc oxide and titanium dioxide provides broad spectrum UV protection without leaving the skin. Floramac 10 emulsifier helps to disperse the zinc oxide and titanium dioxide particles, ensuring a uniform, stable, and clear lotion.

Floraesters®, Floraesters K-20W®, and Floramac® are registered Trademarks of Floratech.

# Hydrate ♦ Strengthen ♦ Protect



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