Scientific Support for the Benefits of Synthetic Wax in Petroleum Jelly and Hair Care

In-Cosmetics Asia (Korea), 12 September 2013
Presentation Content

An overview of Sasol Group & Sasol Wax

Synthetic Wax in Petroleum Jelly - SERANEL

Seranel Safety

Seranel Performance

Seranel Stability

Synthetic Wax Performance
Sasol Group & Sasol Wax

- Founded in 1950 as South African Synthetic Oil Ltd.
- Public Listings:
  - 1979 - JSE (Johannesburg Securities Exchange)
  - 2003 - NYSE (New York Stock Exchange)
- FY2012 Sasol Group Turnover: USD21.8 billion (Sasol Wax Turnover: EUR711 million)
- Sasol Group: 34,916 employees Worldwide (Sasol Wax: 1170 employees)
- Pioneer in Coal-to-liquids (CTL), and Gas-to-liquids (GTL) technology
- The world’s largest producer of synthetic fuels
Sasol Wax
Personal Care (PC)

- Industrial wax
- Candle wax
- Adhesives and Polymers
- Construction board
- Liquid paraffin
- Asphalt additives

Personal Care

Sasol Wax GmbH – Birkenhead
Sasol Wax GmbH – Hamburg
Sasol Wax S.A.S. (France)
Sasol Wax GmbH – Linz
Alexandria Wax Products Co. (Egypt)
Sasol Chemicals Pacific Ltd. – Singapore
Sasol Wax (South Africa)

Sasol Wax North America Corp.
Introducing Synthetic Wax in Petroleum Jelly
Seranel Safety
Scientifically Testing Results

Certified as a Non-irritant and Dermatologist approved by Medical University of South Africa

Proven Non-irritant to the Eye at the Research Toxicology Centre (RTC) in Italy (www.rtc.it)

Non-carcinogenic by RTC (AMES test - bacterial reverse mutation)

Passed very Stringent Purity Assessment by BIU Grimmer, Hamburg (Germany) with significantly low level of PAH (Polycyclic Aromatic Hydrocarbons)

<table>
<thead>
<tr>
<th>PAH groups</th>
<th>Limits µg/kg</th>
<th>Actual levels µg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum group I PAHs</td>
<td>≤ 5</td>
<td>0.937</td>
</tr>
<tr>
<td>Sum group II PAHs</td>
<td>≤ 20</td>
<td>7.456</td>
</tr>
<tr>
<td>Sum group III PAHs</td>
<td>≤ 100</td>
<td>41.634</td>
</tr>
</tbody>
</table>

*Medunsa’s Photobiology lab is a SAPC (South African Pharmacy Council) accredited facility that conducts testing according to International Good Clinical Practice guidelines*
Moisturization Efficiency of **SERANEL and Synthetic Wax** were tested at **MEDUNSA** in clinical trials (June 2012)

- **Corneometer Testing**
- **Visual Moisturization Assessment**
- **Trans-Epidermal Water Loss (TEWL)**

**SERANEL** was tested in comparison with other traditional Petroleum Jellies

**Cream Formulations** containing **SERANEL and Sasol Synthetic Wax** were also compared to traditional Petroleum Jelly products

A panel of 15 people was selected and asked to apply and rate a range of cream samples
Skin Care Cream

Moisture Efficiency Test (MET) done in MEDUNSA

Corneometer Testing

Visual Moisturization Assessment

Trans-Epidermal Water Loss (TEWL)
Seranel Performance
Corneometer Testing Result: Degree of Skin Hydration

![Graph showing Corneometer testing results for various samples and time intervals.](image)
Seranel Performance
Trans-Epidermal Water Loss (TEWL) Result

Sample A  Sample B  Sample C  Seranel

kg m⁻² s⁻¹

1 hour  48 hours  96 hours
The assessment of Petroleum Jelly performance on Skin Care application is often **Subjective**

In literature, **Primary Skin Feel (Spreadability)** is correlated to product yield stress and **Secondary Skin Feel** is correlated to product viscosity at high shear*

A window for evaluating good primary skin feel of creams was proposed by Brummer et al**

A panel of 15 people was selected and asked to apply and rate a range of cream samples


Seranel Performance
Primary Skin Feel – Spreadability

<table>
<thead>
<tr>
<th>Product</th>
<th>Sensory Assessment Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cream 1</td>
<td>1</td>
</tr>
<tr>
<td>Cream 2</td>
<td>2</td>
</tr>
<tr>
<td>Cream 3 (with 15% Seranel)</td>
<td>3.5</td>
</tr>
<tr>
<td>Cream 4</td>
<td>4.5</td>
</tr>
<tr>
<td>Cream 5 (with 20% Synthetic Wax)</td>
<td>5</td>
</tr>
</tbody>
</table>
Seranel Performance
Correlating Window for Good Primary Skin Feel of Creams

Brummer et al. good
1.0 skin feeling area (7)
Seranel Performance
Correlating Windows for Good Spreadability of Creams with rheology results

Max viscosity (Pa.s) vs Shear stress at flow onset (Pa)

- Cream 1
- Cream 2
- Cream 3
- Cream 4
- Cream 5

Boundary for Cream
The Relationship of Percentage of Synthetic Wax, Viscosity and the Secondary Skin Feel: Creams*

\[ R^2 = 0.9003 \]

* M. Bekker, G.V. Webber, N.R. Louw, *Relating rheological measurements to primary and secondary skin feeling when mineral based and FT wax based cosmetic emulsions are applied to the skin*, Journal of Cosmetic Science (2013)
Seranel Product Stability

Product stability tests (>90 days, influence of different temperatures)

- Hair Food
- Hair Care Holding Wax
- Lip Balm
- Moisturiser
- Hand & Nail Cream
- Baby Cream
- Night Cream

pH, Viscosity and Visual Assessment were tested
Synthetic Wax Performance
Hair Care

Ethnic Hair Relaxer

The same Sasol Synthetic Wax used in SERANEL was tested in hair care products and compared to Paraffin Wax products.

Synthetic Wax were found to be better in application: Spreadability, Washability and Relaxing Capacity when tested.

Stylists reported better final condition of hair with the use of Relaxer contains Synthetic Wax in comparison with the Standard relaxer.

SEM images showed Hair Relaxer with additional of Synthetic Wax performed better than other Standard Relaxer.
Comparative SEM slides to illustrate the conditioning effect achieved by using FT waxes in a NaOH relaxer system.
Thank you for your attention!

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