Enhancing Shine in Hair
Shineblend® Max
Dr. Tony Gough
Consumers desire greater shine

► There is a growing demand by consumers for healthier looking hair and consumer studies frequently show that hair shine is a popular and key attribute which consumers desire and associate with healthy looking hair.

► Enhanced shine is thus one of the most recognisable sensory effects which consumers seek from hair care products.

► 4622 new SKU’s launched over the past year promoting hair shine or hair gloss*

► 1217 new SKU’s launched over the past year promoting shine or gloss in skin care products*

► There is an ongoing search by formulators for “more shine”!
Creating Shine in personal care products

Keys to improving shine in hair:
- Reflection of light – increase the alignment of hair fibres
- Complete wetting of entire surface
- High refractive index coating

Commonly found products in hair shine serums, sprays (and lipstick):
- Phenyl trimethicone
- Caprylic/capric triglyceride
- C12-15 alkyl benzoate
Shineblend® Max by Innospec

- INCI name: Diphenylsiloxy Phenyl Trimethicone (and) C12-15 Alkyl Benzoate
- Creates substantially greater shine
- Patent Pending
Hair Shine Test Protocol

Objective

► To test permutations of blends of high refractive index silicones with various high refractive index benzoate-ester emollients as hair serums (leave-on treatments) and sprays for their ability to increase the shine of hair compared to the appropriate controls.

Procedure

► Bleached hair tresses, 6 inches in length weighing approximately 2 grams each, were used to demonstrate gloss improvement.
► Tresses were pre-washed with 10 % SLES-2, blow dried and combed.
► Images of untreated and treated tresses were taken using a digital camera. Approximately 0.15 ml of each of the blends was applied to individual hair tresses. Application details:

  **Serum:**
  - Disperse 0.15 ml of hair serum into palm of hand.
  - Rub hands together and then rub the serum from the hands onto the dry hair swatch and distribute evenly throughout the hair.

  **Pump spray:**
  - Three pumps per swatch (total 0.30 ml)
Photography and Image Analysis

- Digital images were taken of untreated and treated tresses using a Kodak Z740, 5.0 megapixels, with 10x optical zoom.

- Untreated and treated tresses were placed side by side on a plain white background. An image was obtained of both tresses under identical lighting conditions and distance from the camera.

- Image files were imported into Image Pro Plus 7.0 for analysis of shine.

- All color photos were converted to gray scale and total area of bright pixels, representing shine on a dark background, was calculated.

- Data was imported into MS Excel and shine improvement in percent and times were calculated for each sample tested.
## Shine Improvement Results

<table>
<thead>
<tr>
<th>Sample Tested</th>
<th>Shine Improvement / %</th>
<th>Times Shine Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenyl Trimethicone</td>
<td>152</td>
<td>2.52</td>
</tr>
<tr>
<td>Diphenyl Dimethicone</td>
<td>56</td>
<td>1.56</td>
</tr>
<tr>
<td>Finsolv TN (C12-15 Alkyl Benzoate)</td>
<td>37</td>
<td>1.37</td>
</tr>
<tr>
<td><strong>Shineblend® Max</strong> <em>(Diphenylsiloxy Phenyl Trimethicone and C12-15 Alkyl Benzoate – special grade)</em></td>
<td><strong>358</strong></td>
<td><strong>4.58</strong></td>
</tr>
<tr>
<td>Diphenylsiloxy Phenyl Trimethicone + Finsolv TN (C12-15 Alkyl Benzoate)</td>
<td>48</td>
<td>1.48</td>
</tr>
<tr>
<td>Diphenyl Dimethicone + Finsolv TN (C12-15 Alkyl Benzoate)</td>
<td>43</td>
<td>1.43</td>
</tr>
</tbody>
</table>

(Data in table for Untreated and Treated Tresses is in square millimeters of bright pixels using image analysis; representing degree of gloss).
Shine Improvement Results

- Phenyl Trimethicone
- Diphenyl Dimethicone
- Finsolv TN (C12-15 Alkyl Benzoate)
- **Shineblend® Max**
- Diphenylsiloxyl Phenyl Trimethicone and Finsolv TN
- Diphenyl Dimethicone and Finsolv TN
Images used for Shine Improvement

Phenyl Trimethicone

Shineblend® Max
Comments on the results

► The magnitude of the effect obtained was not expected! The refractive index of Shineblend® Max is 1.490 compared to that of Diphenylsiloxy Phenyl Trimethicone (1.498) – so the mechanism is not due to a synergistic RI increase.

► We believe the invention is profound and will provide formulators with a means of delivering step-change enhancement in hair shine.
# Results From Anhydrous Serums

## Serum Prototype 1

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Untreated (1)</th>
<th>Treated</th>
<th>Times Gloss Improvement (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF 9109-OH (3)</td>
<td>0.950</td>
<td>5.08</td>
<td>5.35</td>
</tr>
<tr>
<td>CF 9109-OH + 5% Diphenylsiloxy Phenyl Trimethicone</td>
<td>0.950</td>
<td>8.38</td>
<td>8.82</td>
</tr>
<tr>
<td>CF 9109-OH + 2.5% Diphenylsiloxy Phenyl Trimethicone and 2.5% Finsolv TN</td>
<td>0.950</td>
<td>7.07</td>
<td>7.44</td>
</tr>
<tr>
<td>CF 9109-OH Base + 5% Shineblend® Max</td>
<td>0.950</td>
<td>13.9</td>
<td>14.6</td>
</tr>
</tbody>
</table>

(1) Mean of 12 readings on untreated tresses; 95 % confidence interval = 0.33  
(2) Ratio of Treated to Untreated Values  
(3) Cosmetic Fluid 9109 Base – Cyclotetrasiloxane and Cyclopentasiloxane and Dimethiconol

(Data in table for Untreated and Treated Tresses are in square millimeters of bright pixels using image analysis; representing degree of gloss).
## Serum Prototype 2

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Untreated (1)</th>
<th>Treated</th>
<th>Times Gloss Improvement (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gelaid CPDP(3)</td>
<td>1.81</td>
<td>9.32</td>
<td>5.15</td>
</tr>
<tr>
<td>Gelaid CPDP + 2.5% Phenyl Trimethicone and 2.5% C12-15 Alkyl Benzoate (special grade)</td>
<td>1.81</td>
<td>6.92</td>
<td>3.82</td>
</tr>
<tr>
<td>Gelaid CPDP + 5% Shineblend® Max</td>
<td>1.81</td>
<td>16.1</td>
<td>8.90</td>
</tr>
</tbody>
</table>

(1) Mean of 9 readings on untreated tresses; 95 % confidence interval = 1.34
(2) Ratio of Treated to Untreated values
(3) Gelaid CPDP - Cyclopentasiloxane (and ) Dimethicone (and) Phenyl Trimethicone

(Data in table for Untreated and Treated Tresses is in square millimeters of bright pixels using image analysis; representing degree of gloss).
Results From a Shine Pump Spray

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Mean Response</th>
<th>Normalized Shine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shineblend Max alone (Control)</td>
<td>15.1</td>
<td>100%</td>
</tr>
<tr>
<td>Shineblend 6005(1)</td>
<td>1.58</td>
<td>10%</td>
</tr>
<tr>
<td>Shineblend 6005 + 0.25% Phenyl Trimethicone</td>
<td>1.56</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Shineblend 6005 + 0.25% Shineblend® Max</strong></td>
<td><strong>3.21</strong></td>
<td><strong>21%</strong></td>
</tr>
</tbody>
</table>

(1) C13-14 Isoparaffin and Cyclopentasiloxane

(Data in table for Untreated and Treated Tresses are square millimeters of bright pixels using image analysis; representing degree of gloss).
Addition of Shineblend® Max to John Frieda Frizz Ease Glossing Mist

- Cyclopentasiloxane, Dimethiconol, Ethylhexyl methoxycinnamate, Mineral oil, Hydrolyzed silk, Fragrance

John Frieda Frizz Ease
- % Shine Improvement: 64.2

John Frieda Frizz Ease + 10% Shineblend® Max
- % Shine Improvement: 74.1

15% improvement
Addition of Shineblend® Max to TRESemme Smooth & Silky Shine Spray

- Alcohol, Cyclopentasiloxane, Cyclohexasiloxane, C12-C15 Alkyl benzoate, Fragrance

<table>
<thead>
<tr>
<th>% Shine Improvement</th>
<th>TRESemme</th>
<th>TRESemme + 10% Shineblend® Max</th>
<th>TRESemme + 20% Shineblend® Max</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9.1</td>
<td>15.8</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td>74% increase</td>
<td>79% increase</td>
<td></td>
</tr>
</tbody>
</table>
Garnier Brilliant Shine Glossing Spray

- Alcohol, Cyclopentasiloxane, Isopropyl myristate, C12-C15 alkyl benzoate, fragrance, ……..

% Shine Improvement

- Garnier: 7.7%
- Garnier + 5% Shineblend® Max: 11.3%
- Garnier + 10% Shineblend® Max: 518% improvement

47% improvement

518% improvement
Summary

► **Shineblend® Max** was created as an improvement over high refractive index silicones. Initial investigations have focused on anhydrous hair shine serums and sprays. Other applications are being investigated (eg, aqueous leave-on and rinse-off).

► **Shineblend® Max** is proven to significantly increase shine on hair as part of an anhydrous silicone serum.

► The mechanism of increased shine is not based on refractive index alone.

► Additional testing is underway to expand use of this patent pending product for water based hair shine products, lipstick and other color cosmetics.
Thank you for listening.

Any questions?

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