HydroxySHIELD™ Polymer
Beyond hair protection

Market application usage
- Shampoos
- Sulfate-free shampoos
- Rinse-off conditioners
- Leave-in treatments
- Hair colorant kits
- Styling sprays and creams

Success is not easy in the saturated haircare market. The way we see it, brands need one of three strategies:

#Renovation, improving an existing product or idea across known consumer needs;
#Innovation, extending a market category through new product innovations;
#Disruption, inventing an entirely new category or market by tapping into a need of which consumers were not yet aware themselves.

Power your brand strategy with HydroxySHIELD™ Polymer our new and disruptive cleansing and conditioning ingredient. Tell a story and offer consistently superior customer experience.

HydroxySHIELD™ Polymer is a novel Hydroxy functional amino polymer that can create next generation formulations to meet consumer cleansing and conditioning needs, providing a SHIELD of multi-functional benefits for hair from heat, color and damage, delivering healthy hair that is improved with each step of your hair care routine.

Multifunctional benefits to boost “consumer differentiating claims”
- Improved hair alignment – “Healthy appearance”
- Reduces hair breakage – “Hair protection”
- Enhances sensory – “Smooth feeling”
- Convenience – “Fast drying”
- Accessibility – “Easy styling”
- Delays color fadeaway – “Color protection”
- Reduced breakage from heat appliances – “Heat protection”
Summary of comparative benefits

<table>
<thead>
<tr>
<th>Category</th>
<th>HydroxySHIELD™ Polymer</th>
<th>DOWSIL™ 2-8566 Amino Fluid</th>
<th>DOWSIL™ 8500 Conditioning Agent</th>
<th>DOWSIL™ CE-8411 Smooth Plus Emulsion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet combing</td>
<td>***</td>
<td>*</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Dry combing</td>
<td>***</td>
<td>**</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Improved sensory</td>
<td>****</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced breakage</td>
<td>****</td>
<td>**</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Reduced friction (conditioner)</td>
<td>****</td>
<td>*</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Reduced friction (shampoo)</td>
<td>***</td>
<td>*</td>
<td>**</td>
<td>****</td>
</tr>
<tr>
<td>Fast drying</td>
<td>****</td>
<td>*</td>
<td>***</td>
<td>****</td>
</tr>
<tr>
<td>Color protection</td>
<td>**</td>
<td>**</td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>Heat protection</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>****</td>
</tr>
<tr>
<td>Non-yellowing</td>
<td>****</td>
<td>*</td>
<td>***</td>
<td>****</td>
</tr>
<tr>
<td>Low cyclics (&lt;0.1%)</td>
<td>****</td>
<td>*</td>
<td>****</td>
<td>*</td>
</tr>
</tbody>
</table>

NOTE: Cells left blank indicate this product was not tested against HydroxySHIELD™ Polymer for this attribute.

Healthy hair is happy hair
One look says it all, consumers agree less breakage signals healthy hair.
**Rinse-off conditioner**

HydroxySHIELD™ Polymer offers a multifunctional approach to hair conditioning. In rinse-off applications, this polymer delivers outstanding performance in dry friction reduction and reduced breakage with additional benefits for color protection, ease of wet and dry combing, enhanced smoothness, fast drying, styling with less heat, and durable conditioning at low use levels.

### Reduced friction

**HydroxySHIELD™ Polymer** significantly reduces friction on the surface of hair in comparison to the control and other aminosilicone benchmarks.

### Dry sensory benefits

**HydroxySHIELD™ Polymer** provides enhanced combing and feel compared to aminosilicone benchmark.

#### Benchmark study

<table>
<thead>
<tr>
<th>COF</th>
<th>Control</th>
<th>DOWSIL™ 2-8566 Amino Fluid</th>
<th>DOWSIL™ 8500 Conditioning Agent</th>
<th>HydroxySHIELD™ Polymer</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Significant difference at ≥95%**

Levels not connected by the same letter are significantly different.

**Treatment:** 0.4 g / g hair on bleached Caucasian hair, 1% silicone

**Method:** Measured using Diastron MTT175 miniature tensile tester

**Control:** Conditioner without silicone

#### Dry sensory benefits

**HydroxySHIELD™ Polymer** reduces breakage by 91% compared to the control and 66% compared to aminosilicone benchmark.

**Repeated combing 10,000 cycles**

**Control**

**HydroxySHIELD™ Polymer**

**DOWSIL™ 8500 Conditioning Agent**

**% reduction in breakage vs. control**

**Treatment:** 0.4 g / g hair on bleached Caucasian hair, 1% silicone

**Method:** Measured using repeated combing instrument. 3 tresses/product; 10,000 comb strokes; speed: 20 cycles/min (80 comb strokes/tress/min); broken hair fibers weighed and % reduction calculated

**Control:** Conditioner without silicone
Built For This (CPF 4320)

Leave-in Cream

Built For This – HydroxySHIELD™ Polymer creates a pure white cream compared to the yellowing effect of traditional amodimethicone containing formulations.

<table>
<thead>
<tr>
<th>Leave-in conditioner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Conditioner formulation without HydroxySHIELD™ Polymer</td>
</tr>
<tr>
<td>Amodimethicone</td>
<td>Conditioner formulation with 2% Amodimethicone (DOWSIL™ 2-8566 Amino Fluid)</td>
</tr>
<tr>
<td>Built For This</td>
<td>Conditioner formulation</td>
</tr>
</tbody>
</table>

Images: dow_58890153420, dow_60948152791, dow_60948151523

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer’s use and for ensuring that Customer’s workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to “Dow” or the “Company” mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

© 2020 The Dow Chemical Company. All rights reserved.

2000004765

Form No. 27-2861-01-1120 S2D