



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**”

Terminal hydroxyl aminosiloxane



 Siloxane – provides softness and silky feel

 Amino - anchors polymer to hair

 Hydroxyl – provides perceived moisturization

Product name: **HydroxySHIELD™ Polymer**

INCI: Bis-Diisopropanolamino-PG-Propyl Disiloxane/
Bis-Vinyl Dimethicone Copolymer

Polymer is 90% active in 10% butyloctanol

Butyloctanol is readily biodegradable

Appearance	Clear to slightly hazy fluid
Use level	1-2%
Viscosity	4000-15000 cSt
Shelf life	24 months
Cyclic concentration	< 0.1% D4, D5, D6
Approved for use in China	In progress

These are typical properties, not to be construed as specifications.

Summary of comparative benefits

Category	HydroxySHIELD™ Polymer	DOWSIL™ 2-8566 Amino Fluid	DOWSIL™ 8500 Conditioning Agent	DOWSIL™ CE-8411 Smooth Plus Emulsion
Wet combing	***	*	***	***
Dry combing	***	**	***	***
Improved sensory	****	**		
Reduced breakage	****	**	***	***
Reduced friction (conditioner)	****	*	***	***
Reduced friction (shampoo)	***	*	**	****
Fast drying	****	*	***	****
Color protection	**		**	
Heat protection	**	**	**	****
Non-yellowing	****	*	***	****
Low cyclics (<0.1%)	****	*	****	*

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.

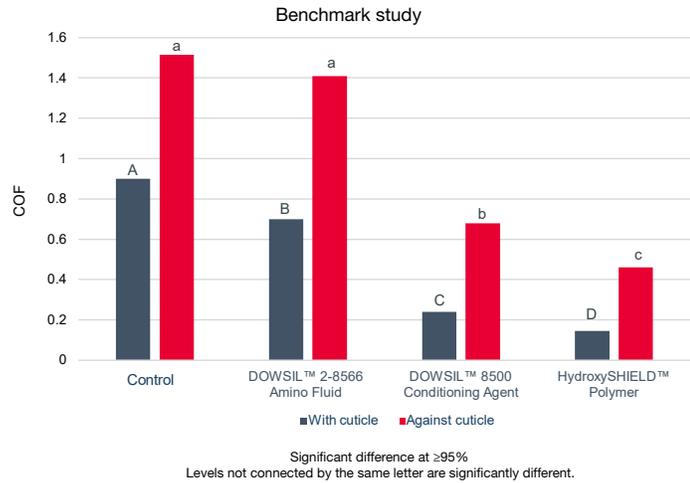


Rinse-off conditioner

HydroxySHIELD™ Polymer offers a multifunctional approach to hair conditioning. In rinse-off applications, this polymer delivers out-standing 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

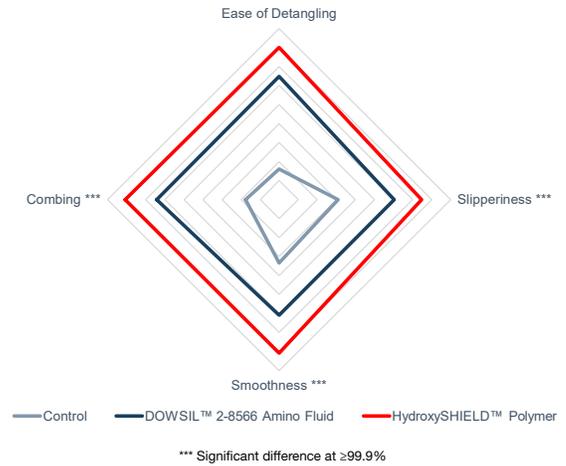
HydroxySHIELD™ Polymer significantly reduces friction on the surface of hair in comparison to the control and other aminosilicone benchmarks.



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

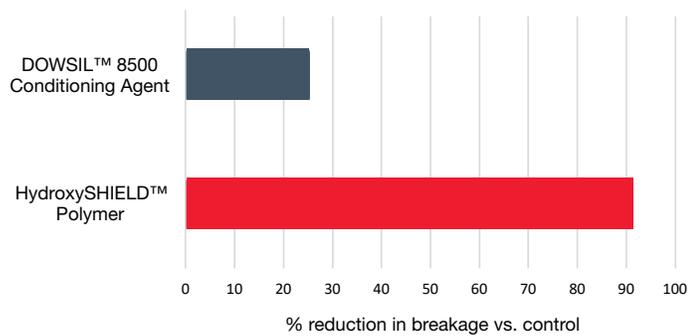
HydroxySHIELD™ Polymer provides enhanced combing and feel compared to aminosilicone benchmark.



Treatment: 0.4 g / g hair on bleached Caucasian hair, 1% silicone
Control: Rinse off conditioner with no silicone
Participants: 18

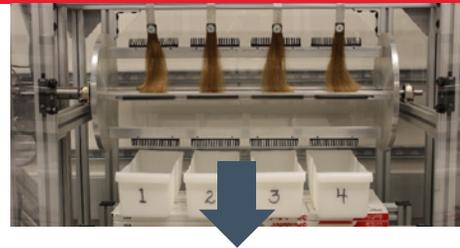
Dry sensory benefits

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



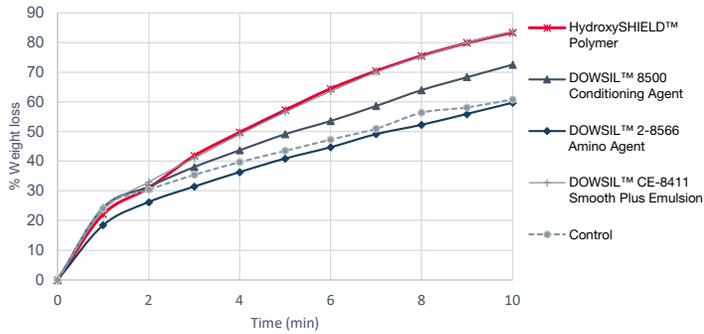
Treatment: 0.4 g / g hair on bleached Caucasian hair, 1% silicone
Method: Measured using repeated combing instrument. 3 tresses/product; 10,000 comb strokes; speed: 20 cycles/min (80 comb strokes/tress/min); broken hair fibers weighed and % reduction calculated
Control: Conditioner without silicone

Repeated combing 10,000 cycles



Speed-up blow drying

HydroxySHIELD™ Polymer provides up to 35% faster drying in comparison to the control and amodimethicone.



Treatment: 1% active silicone, 0.4 mL/g hair
Method: After rinse-off conditioner application, the tress was blow dried on a low heat/low speed for 10 minutes. The weight loss measurement was taken every minute.
Control: Rinse-off conditioner without silicone

% weight loss =

$$\frac{(\text{initial wet wt.} - \text{treated wet wt.}) \times 100}{(\text{initial wet wt.} - \text{initial dry wt.})}$$



Built For This (CPF 4320) Leave-in Conditioner Cream

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



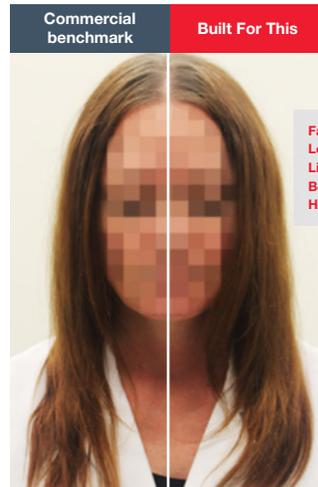
Benchmark Cream
Amodimethicone

Built For This
HydroxySHIELD™ Polymer

Amodimethicone: Formulation yellowed during processing

Leave-in conditioner	Description
Control	Conditioner formulation without HydroxySHIELD™ Polymer
Amodimethicone	Conditioner formulation with 2% Amodimethicone (DOWSIL™ 2-8566 Amino Fluid)
Built For This	Conditioner formulation

Built For This provides faster drying, increased body & volume, less residue, and improved slipperiness compared to a commercial benchmark.



Faster drying
Less residue
Light feel
Better volume
Healthy look

Treatment: Panelist washed hair with silicone-free shampoo, combed through wet hair, applied 3 g total cream to each side of head. After treatment, each side was blow dried with a round brush.

Built For This: HydroxySHIELD™ Polymer leave-in cream

Commercial benchmark: cream containing dimethicone & stearamidopropyl dimethylamine (initial wet wt. – initial dry wt.)



HydroxySHIELD™ Polymer goes beyond protection with multifunctional benefits. It allows you to build a hair cleansing and conditioning line that rescues, repairs and protects from hair breakage day after day.

Images: dow_58890153420, dow_60948152791, dow_60948151523

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