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Silicone solutions for efficient deposition and durable hair care benefits

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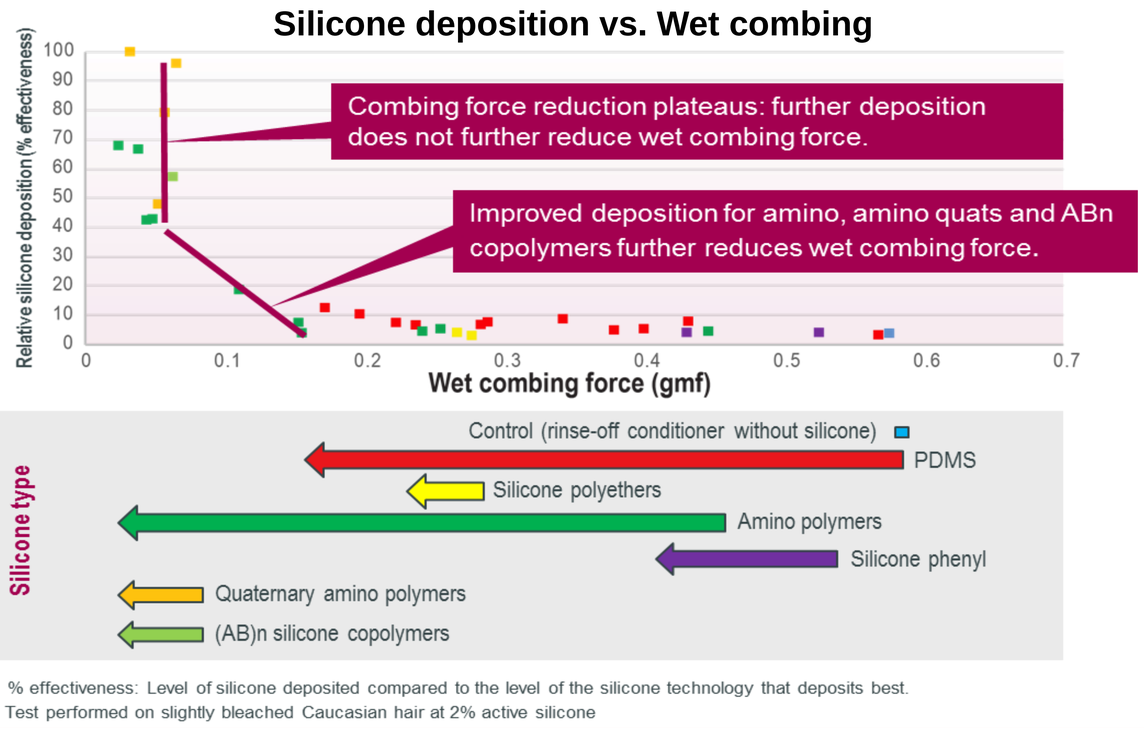
Silicone efficient deposition on hair

There's a consistent need from consumers for hair care products to protect and repair the hair from external environment. Silicones can help meet these customer demands.

Silicones are multifunctional ingredients but to be efficient they need to first deposit on hair. Therefore, a preliminary study has been carried out to understand the relationship between silicone structure, deposition efficacy and conditioning level on hair. Results showed good correlation between wet combing force and amount of silicone deposited from conditioners which allows formulators to select the best products depending on specific hair types and desired benefits.

Further investigations were conducted with best silicone candidates to go beyond conditioning and identify additional benefits. With their unique set of chemical and physical properties, these highly versatile materials not only condition hair but they can also provide fast dry, color protection and damage care.

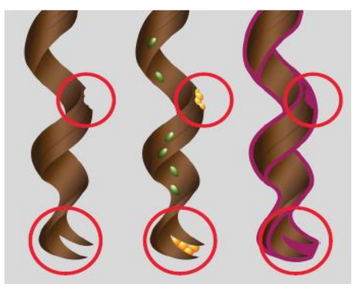
Since care benefits associated with damaged hair have consistently been in the top claims for new hair care products launched over the last several years, new testing capabilities were developed to address the desire for long-lasting and not just short-term beauty-enhancing benefits.



% effectiveness: Level of silicone deposited compared to the level of the silicone technology that deposits best.
Test performed on slightly bleached Caucasian hair at 2% active silicone

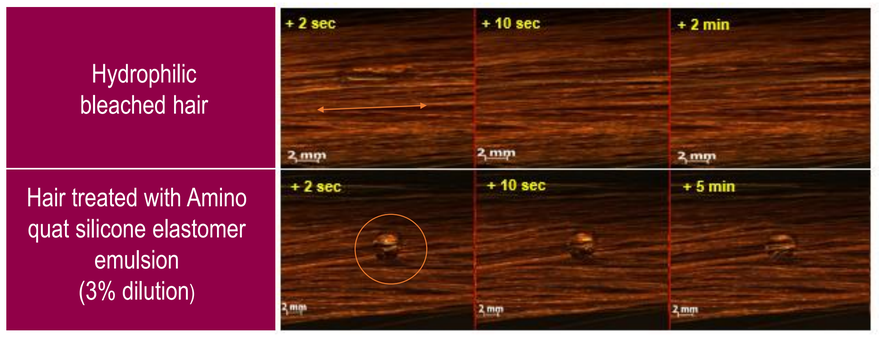
Restoration of hair's hydrophobic state

Many of today's hair repair solutions target damaged sites on the hair cuticle. Specific DOWSIL™ amino functional silicones form a homogeneous film that mimics the hydrophobic lipid layer on the cuticle of undamaged hair. They help to restore hair's hydrophobic state and protect the entire shaft from further damage.



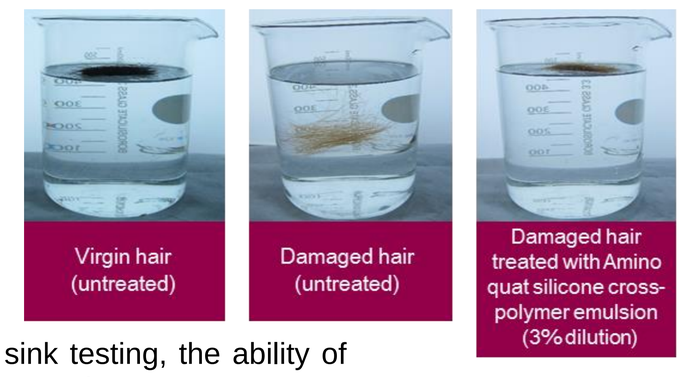
Water absorption test

Hair treated with this specific silicone demonstrated a much higher degree of hydrophobicity as evidenced by the longer time required for absorption.



Hair sink test

Hair treated with silicone behaves like virgin hair. It remains on top of the water, demonstrating hydrophobicity.

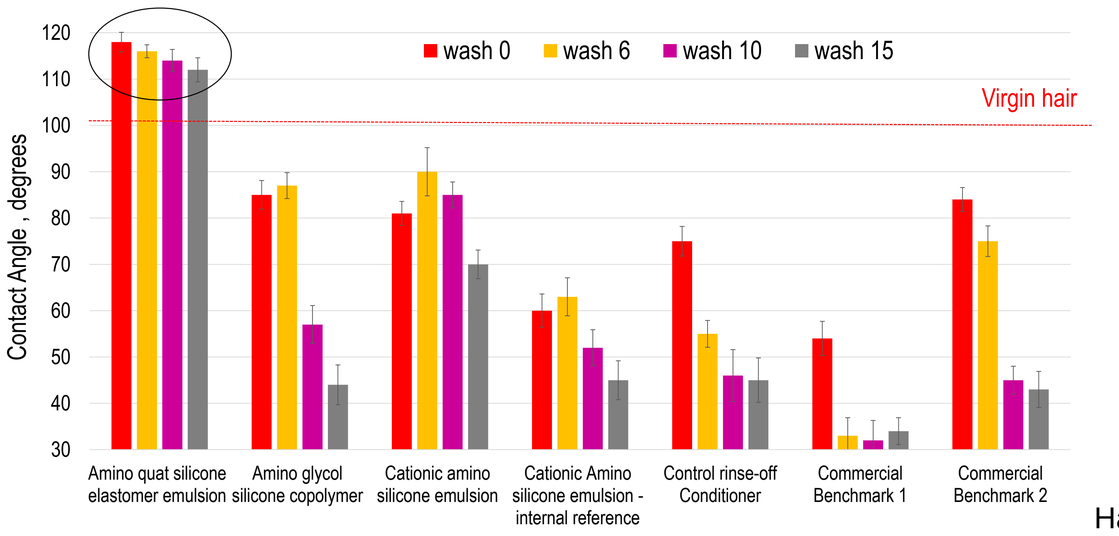


Healthy hair is naturally hydrophobic. Using a combination of absorption and sink testing, the ability of specific silicones to restore damaged hair's hydrophobic state has been demonstrated.

Durable Hair Hydrophobicity & Conditioning

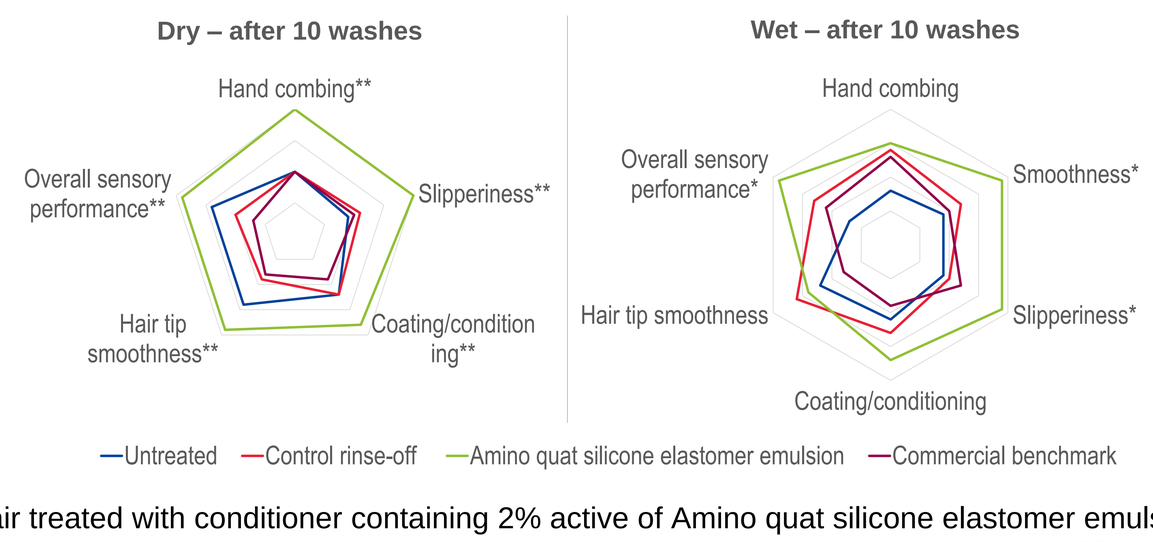
These silicones remain on the hair for long-lasting performance. They not only restore hair's hydrophobic state, but they also provide long-lasting hydrophobicity & conditioning.

Contact angle on hair



Selected silicones retained a greater degree of hydrophobicity over multiple washes than untreated hair, control and benchmarks.

Sensory Performance



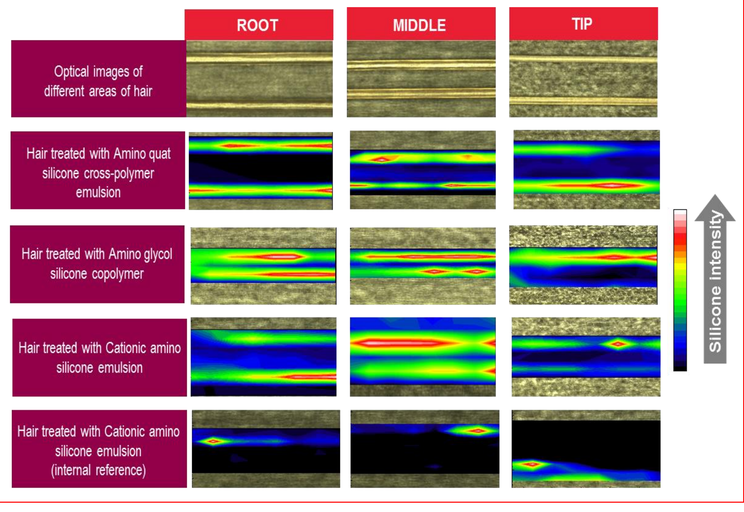
Hair treated with conditioner containing 2% active of Amino quat silicone elastomer emulsion showed better overall sensory performance in the dry stage than the other treatments after 10 washes.
In the wet stage, results also showed a trend for this silicone to be the best on several attributes.

Homogeneous Silicone Coverage

Fourier transform infrared spectroscopy (FTIR) analysis of silicone distribution and quantification

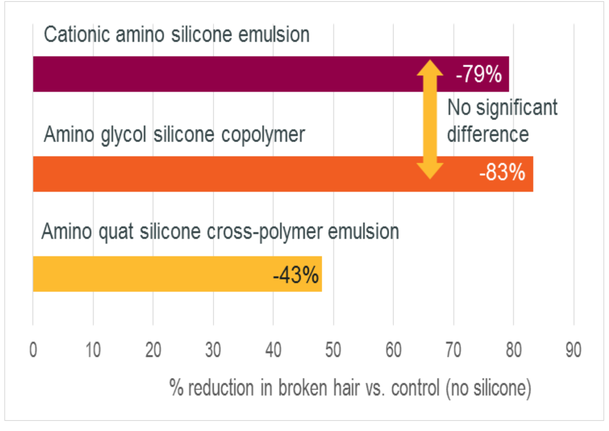
Chemical distribution of Si-C band (1,258 cm-1) for the root, middle and tip regions of bleached hair treated with conditioner containing 2% active silicone

Selected silicones deposited more homogeneously among the hair fibers than the benchmark.



Protection Against Breakage

Repeated combing test



Treated tresses were subjected to 10,000 comb strokes at a speed of 80 strokes per minute; the broken hairs were weighed, and percent reduction in broken hair was calculated.

Tresses treated with rinse-off conditioner containing 2% silicone active showed significantly less breakage than the tresses treated with the control.