The Beauty of Silicone in Hair Care
Daily Wear and Tear on Hair

dryness; absence of smoothness; tangles; breakage/split ends; lack of body/static; unmanageability; dullness; frizziness ... BAD HAIR DAY!
Silicones Bring Beauty to Hair Care

**Intrinsic properties**
- Quick spreading
- Low surface friction
- Low surface energy
- Permeability
- Low thermal conductivity

**Superior benefits**
- Detangling
- Smooth and soft feel
- Smoothes cuticles:
  - restore shine, repair damage, strengthen
- Efficacy at low use level
- Breathability
- Heat protection
Silicones Provide Solutions “Ideal for Me”

Type of silicone
Amount of silicone

Tailor to

Hair type
Hair condition
Hair style

Transform
dull, dry, damaged,
thin, color-treated or
unruly hair

Smooth, Soft
Sleek, Shine
Flexible
Stronger
Bounce
Manageable
Longer lasting shine, color
Protection from hot appliances
Repair damage

...
Silicones: a proven conditioning agent

- Time tested: widely used in hair care since 1980’s.
- Silicones perform: 68% conditioners launched in 2011 contain Si.
- With consumers so heavily focused on efficacy, ~50% products with “natural/herb” claim contain Si.
SILICONE PERCEPTION IN HAIR CARE
Silicones: Safe to Use in Hair Products

- Silicones used in personal care are stable and inert under conditions for the intended applications.
- Silicones are among the most extensively studied materials used in consumer and industrial applications today.
- More than 1,000 studies have been conducted by silicone manufacturers to assess the safety of silicones relative to workers, consumers, the environment and manufacturing processes. The results of this continued research and testing demonstrate the safety of silicones in their diverse and important applications.
- Dow Corning assesses every product that is sold or sampled into the personal care from a human health and environmental perspective.
- For further reading:
  - http://www.silicones.eu
Will Silicones Allow Moisture to Enter my Hair?

• Even though silicones are impermeable to water, they are very permeable (breathable) to water vapor (moisture).
• Silicone’s ability of allowing moisture to breathe is demonstrated by its extensive use in wound care products.

Silicones are impermeable to water and bacteria, but they are permeable to water vapor. This allows regulated skin hydration yet minimize fluid accumulation and infection. Combining with the softness of silicone enables removal of wound dressing without causing trauma to the wound or to the surrounding skin, the use of silicones has been a major advancement in wound care for fast healing and reduced scar formation.
Build-up on Hair

What is build-up on hair?
Build-up refers to an unwanted coated feel, leaving the hair heavy, dull, flat, stiff as a result of repeated usage of hair products.

What can contribute to build-up on hair?
Most people do not experience build-up. However, it may occur when soils such as sebum, dirt, pollutants, and products used which are not removed sufficiently, and continue to accumulate over time.

How to prevent build-up?
It is recommended to use a clarifying shampoo (effective cleansing) periodically to remove or prevent build-up.
Variables which may contribute to build-up

Consumers’ hair care routines are all different, therefore it is difficult to conclude what causes build up.

If we only look at conditioning agents, they are designed to deposit on hair to provide the desired benefits. However, if cleansing is less than sufficient, build up may occur.

Well documented* studies have shown:

- Cationic conditioning agents are prone to deposit on hair (negatively charged) and are resistant to wash off.\(^2,3,4\)
- Cationic conditioning agents and typical anionic cleaning surfactants form insoluble dulling complex on hair that is resistant to wash off.\(^5,6\)
- Ingredients that are not soluble in water such as waxes and oils can deposit on hair.\(^7,8\)
- Washing with hard water form mineral deposits which can cause dull and dry hair.\(^9\)
- Styling polymers not washed out can also contribute to build-up.\(^10\)

* Please see appendix for list of literature references.
Does Silicone Build-up on Hair?

Silicone needs to be present on hair to provide benefits. Many factors contribute to build-up. Our studies on consumer products have shown:

- Silicone deposition is product dependent.
- Sensory results after repeated use showed
  - Hair smoothness without perceived residue
  - Impact on volume was product dependent
- Silicones are easily removed after one use of clarifying shampoo.

We help you invent the future.
Si Deposition Study on Repeated Use of Shampoo and Conditioner Containing Dow Corning® CE 8411 Smooth Plus Emulsion

1. No build up after repeated use of shampoo
2. Si deposition is not cumulative with shampooing and conditioning cycle
3. One clarifying shampooing removes ~90% silicone

Treatment: 0.8g or 0.4g /1g hair, 1% silicone active
S= Shampoo; C=Conditioner , SC=Shampoo & Conditioner
CS= Clarifying Shampoo (no Si)

Testing: ICP-OES

We help you invent the future.™
The Effect of Silicones on Your Scalp

- Silicones are typically used in antidandruff shampoos as part of scalp care.
- Silicones are breathable to air and moisture, there is no evidence on negative impact to the scalp.\(^1\)
- Dimethicone is also approved by the Food and Drug Administration (FDA) as an Over-the-Counter (OTC) skin protectant for minor cuts, scrapes, burns, chapped skin and lips, etc. when used ≥ 1% level
- The conditioning, detangling and ease of combing helps to minimize hair breakage and hair fall as result of daily grooming and styling.

\(^1\) COSMETIC ACCEPTANCE OF ANTI-DANDRUFF SHAMPOO, Journal of Investigative Dermatology, Symposium Proceedings, 10:3 December 2005, page 201-204.
Key Messages

• **Silicones perform**
  – Silicones are efficacious ingredients that maintain and revitalize the beauty of hair by providing conditioning, shine, volume, repair, color and heat protection.

• **Silicones are proven**
  – Silicones have been widely used in hair care since 1970s. 68% newly launched hair conditioning products contain at least one silicone.

• **Safety of silicone**
  – Results of extensive studies on safety of silicones relative to human and environment continue to demonstrate the safety of silicones in their diverse and important applications.
Appendix—References on Build-up

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