CREATING TOMORROW’S SOLUTIONS

PERSONAL CARE | BELSIL®

SPECIAL EFFECTS FOR BEAUTY CARE WITH WACKER SILICONE SOLUTIONS
CREATE LONG-LASTING EFFECTS

Seductive lips, reliable sun protection, perfect make-up: cosmetic products and sun creams are expected to retain their desired effects for as long as possible. Thanks to their film-forming properties, silicone resins and silicone resin gels help cosmetics to retain their correct functioning, regardless of whether you need water-resistant UV protection, gloss, color intensity or the prevention of moisture loss. BELSIL® TMS 803:

- Makes lipsticks resistant to oily salad dressing
- Gives sun creams enhanced water resistance, and
- Reduces pigment transfer in decorative cosmetics

Lipsticks are a perfect example of how WACKER silicones achieve long-lasting effects.

Selected products:
- BELSIL® RG 90, INCI: Isododecane and Vinyl(dimethyl/trimethyl)siloxysilicate Stearyl Dimethicone Crosspolymer
- BELSIL® SPR 45 VP, INCI: Polyphenylsilsesquioxane
- BELSIL® TMS 803, INCI: TrimethylsiloxySilicate
- BELSIL® REG 102, INCI: Cyclopentasiloxane, Dimethicone/VinyltrimethylsiloxySilicate Crosspolymer
- BELSIL® REG 1102 INCI: Dimethicone, Dimethicone/VinyltrimethylsiloxySilicate Crosspolymer

For more information, visit www.wacker.com/belsil
MAKE IT SOFT AND SMOOTH TO THE TOUCH

High-quality hair-care and skin-care products not only show good spreadability, but have a pleasant feel, too. BELSIL® silicones spread evenly and form a continuous thin film. Skin or hair feels soft and silky smooth.

- BELSIL® dimethicones and amodimethicones are ideal for giving hair a soft touch and for enhancing the distribution of shampoo over hair.
- BELSIL® silicone waxes with a low melting point permit the formulation of easy-to-spread emulsions that confer a delicate, soft sensation on skin.

Selected products:
- Hair care: BELSIL®
  ADM 6102 E, INCI: Amodimethicone, Trideceth-10
  ADM 8301 E, INCI: Amodimethicone/Morpholinomethyl Silsesquioxane Copolymer, Trideceth-5, Glycerin
  ADM 8105 E, INCI: Amodimethicone, C11-15 Pareth-7, Laureth-9, Glycerin, Trideceth-12
  DM 3560 VP, INCI: Dimethiconol, Sodium Dodecylbenzenesulfonate, Trideceth-10
  DM 5102 E, INCI: Dimethicone, Laureth-4, Laureth-23

- Skin care: BELSIL®
  DM 5 and DM 10, INCI: Dimethicone
  PDM 20, INCI: Trimethylsiloxyphenyl Dimethicone
  EG 5, INCI: Cyclopentasiloxane, Dimethicone/Vinyl Dimethicone Crosspolymer
  EG 6000, INCI: Dimethicone, Divinyldimethicone/Dimethicone Crosspolymer
  REG 102, INCI: Cyclopentasiloxane, Dimethicone/Vinyltrimethylsiloxydimethicone Crosspolymer

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MOISTURIZING
ENSURE THE RIGHT BALANCE

High-melting, alkyl-modified silicones from the BELSIL® range form a protective, moisturizing film on the skin. This gives body-care products a silky feel and helps retain the skin’s natural moisture. What’s more, the effect is long-lasting.

• Selected BELSIL® silicones reduce transepidermal water loss and keep skin soft and supple.
• A typical example would be an after-sun body lotion.

Selected products:
• BELSIL® CM 7026 VP, INCI: C26-28 Alkyl Methicone

For more information, visit www.wacker.com/belsil
EASY COMBING
REDUCE COMBING FORCE

All hair is subject to stress – whether from combing, styling or environmental influences. Mechanical stress is challenging for long hair in particular. Luckily, even a tiny amount of silicone in hair-care products improves the combability of both wet and dry hair.

- **BELSIL® DM and ADM silicones** reduce friction between hairs by up to 78% in shampoo.
- Very flexible polysiloxane chains provide a pleasant, silky feel and help the comb glide effortlessly through the hair.

**Selected products:**
- **BELSIL® DM 3560 VP**, INCI: Dimethiconol, Sodium Dodecylbenzenesulfonate, Trideceth-10
- **BELSIL® DM 5102 E**, INCI: Dimethicone, Laureth-4, Laureth-23
- **BELSIL® DM 5700 E**, INCI: Dimethicone, Caprylyl/Capryl Glucoside, Sorbitan Laurate
- **BELSIL® ADM 6102 E**, INCI: Amodimethicone, Trideceth-10
- **BELSIL® ADM 8301 E**, INCI: Amodimethicone/Morpholinomethyl Silsesquioxane Copolymer, Trideceth-5, Glycerin
- **BELSIL® ADM 8105 E**, INCI: Amodimethicone, C11-15 Pareth-7, Laureth-9, Glycerin, Trideceth-12
- **BELSIL® ADM 6300 E**, INCI: Amodimethicone/Morpholinomethyl Silsesquioxane Copolymer, Trideceth-10
- **BELSIL® ADM 9000 E**, INCI: Amodimethicone, Trideceth-12, Cetrimonium Chloride

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HAIR SHAPING WITH A SOFT TOUCH

Modern hair sprays, mousses and balms allow the creation of manifold hair shapes without compromising natural hair feel. BELSIL® P 1101, an innovative silicone hybrid styling polymer, is offered in ethanolic solution. It delivers excellent flexibility and elasticity, outstanding soft touch before and after combing and high curl retention, e.g. in styling spray formulations. In addition, BELSIL® P 1101 offers thermal protection properties.

BELSIL® P 1101 is not limited to styling. In dry shampoo, the addition of 3% of BELSIL® P 1101 significantly improved the soft touch and added volume.

For more information, visit www.wacker.com/belsil

Selected products:
• BELSIL® P 1101, INCI: Alcohol, Crotonic Acid/Vinyl C8-12 Isoalkyl Esters/VA/Bis-Vinyldimethicone Crosspolymer
OPTIMIZE DISTRIBUTION

A good product should feel pleasant as soon as it makes contact with the skin or hair. Owing to their low surface tension, low-viscosity dimethicones and special alkyl-functional silicones not only improve the spreadability of cosmetic oils, pigments and UV absorbers, they also impart a pleasant silky skin sensation.

Mechanism of Improved Oil Spreading with Silicone Waxes

Improved spreading makes these products excellent formulation ingredients, ideal for skin-care and color-cosmetics applications. A main example would be sunscreen products. Here, the improved spreading allows a more even distribution of sun-filter agents, leading to an increased sunscreen factor.

Selected products:
- BELSIL® DM 5, DM 10, INCI: Dimethicone
- BELSIL® CDM 3526 VP, INCI: C26-28 Alkyl Dimethicone

For more information, visit www.wacker.com/belsil
FORMULATE TANTALIZING REFLECTIONS

Long-lasting shine is the secret to attractive hair, nails and lips. Only reflective surfaces, whether glossy or matt, can shine. Silicone additives in personal-care products optimize shine and intensify color brilliance because they cover hair and lips with a thin film and create a smooth surface. Silicones with a high refractive index enhance shine.

BELSIL® P 1101 keeps your nail polish film in perfect shape and helps retain gloss and shine.

- Silicones are the ideal additive for glossy, kiss-proof lipstick.

### Comparison of Lipstick with and without Silicone Resin.

<table>
<thead>
<tr>
<th>Relative Increase of Gloss [%]</th>
<th>Daylight D65</th>
<th>Daylight D50</th>
<th>Store light</th>
<th>Incandescent Lamp</th>
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<tbody>
<tr>
<td>40</td>
<td></td>
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<td>30</td>
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Selected products:

- BELSIL® PF 22 (n<sub>D</sub> : 1.459) INCI: Phenyl Trimethicone
- BELSIL® PF 100 (n<sub>D</sub> : 1.464) INCI: Lauryl Phenylisopropyl Methicone
- BELSIL® PF 200 (n<sub>D</sub> : 1.458) INCI: PEG/PPG-20/20 Phenylisopropyl Caprylyl Dimethicone
- BELSIL® PDM 1000 (n<sub>D</sub> : 1.461) INCI: Trimethylsiloxyphenyl Dimethicone
- BELSIL® SPR 45 VP (n<sub>D</sub> : film 1.569) INCI: Polyphenylsilsesquioxane
- BELSIL® P 1101, INCI: Alcohol, Crotonic Acid/Vinyl C8-12 Isoalkyl Esters/VA/Bis-Vinyldimethicone Crosspolymer

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TACKINESS
Consumers want body-care products that are simple to use and leave their skin feeling pleasant and moisturized. What they don’t want is tackiness, which is hardly ever desirable in a cosmetic product. Usually it is something to be avoided, or reduced. Silicones can reduce tackiness – yielding cosmetics with a pleasant feel. Low-viscosity dimethicones and phenyl-modified fluids can be used here. For long-lasting formulations, silicone resin elastomer gels are the answer.

BELSIL® P 1101 is an ethanolic solution of an excellent hair-styling polymer that combines strong hold and softness with a rapid drying time - perceived as low tackiness when the product is applied.

Comparison of Tackiness of a Skin Care Cream Containing Dimethicone and Trimethylsiloxyphenyl Dimethicone

<table>
<thead>
<tr>
<th>Reduced Tackiness</th>
<th>BELSIL® DM 350</th>
<th>BELSIL® PDM 20</th>
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<tbody>
<tr>
<td>2.0</td>
<td></td>
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</tr>
<tr>
<td>1.5</td>
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Low-viscosity silicones (e.g. BELSIL® DM 350) reduce tackiness. Even better performance can be obtained with phenyl-modified silicones (e.g. BELSIL® PDM 20).

Selected products:
- BELSIL® DM 5, DM 10, DM 50, DM 100, DM 350, INCI: Dimethicone
- BELSIL® PDM 20, PDM 1000, INCI: Trimethylsiloxyphenyl Dimethicone
- BELSIL® EG 5, INCI: Cyclopentasiloxane, Dimethicone/Vinyl Dimethicone Crosspolymer
- BELSIL® EG 6000, INCI: Dimethicone, Divinyldimethicone/Dimethicone Crosspolymer
- BELSIL® REG 102, INCI: Cyclopentasiloxane, Dimethicone/Vinyltrimethylsiloxyisilicate Crosspolymer
- BELSIL® REG 1102, INCI: Dimethicone, Dimethicone/Vinyltrimethylsiloxyisilicate Crosspolymer
- BELSIL® P 1101, INCI: Alcohol, Crotonic Acid/Vinyl C8-12 Isoalkyl Esters/VA/Bis-Vinyltrimethicone Crosspolymer

For more information, visit www.wacker.com/belsil
Successful cosmetic products need both effective active ingredients and a suitable carrier, such as a cream or lotion. The carrier’s consistency will determine not only a cosmetic’s properties on the skin or hair, but will also show whether a product offers a certain richness or lightness. Its shelf life will be prolonged, too. A product’s rheological profile can be adjusted with WACKER silicones. Creams and lotions require a certain viscosity for their care effects to be rendered visible, while ensuring suitable consistency. At the same time, a cosmetic will need a low viscosity during application. The following products are used to adjust such thixotropic behavior.

- HDK® pyrogenic silicas with a variety of polarities for different solvents
- Elastomer gels such as BELSIL® EG 5, RG 90, RG 100, REG 102 and REG 1102

Selected products:
- BELSIL® EG 2, EG 5, INCI: Cyclopentasiloxane, Dimethicone/Vinyl Dimethicone Crosspolymer
- BELSIL® RG 100, INCI: Cyclopentasiloxane, Dimethicone/Vinyltrimethylsiloxysilicate Crosspolymer
- BELSIL® RG 90, INCI: Isododecane (and) Vinyl(dimethyl/Trimethyl)siloxysilicate Stearyl Dimethicone Crosspolymer
- BELSIL® REG 102, INCI: Cyclopentasiloxane, Dimethicone/Vinyltrimethylsiloxysilicate Crosspolymer
- BELSIL® REG 1102, INCI: Dimethicone, Dimethicone/Vinyltrimethylsiloxysilicate Crosspolymer
- HDK® N20 and HDK® T30, INCI: Silica
- HDK® H15 and HDK® H30, INCI: Silica Dimethyl Silylate
- HDK® H2000, INCI: Silica Silylate

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CREATE THE RIGHT TEXTURE

One of the key challenges facing cosmetic formulators is to give a cosmetic product the right texture and consistency. From how a product looks when first opened to how it feels when applied on the skin, the texture of a skin-care product is vital to its market acceptance. Wherever formulations need thickening, or lotions and creams need viscosity control, you can rely on WACKER silicones and silicas to deliver the desired effects.

- HDK® pyrogenic silicas are available in various polarities and make it possible to fine-tune a formulation’s viscosity.
- Silicone waxes such as BELSIL® CM 7026 VP are structural components providing the right balance between beneficial sensory parameters and thickening of the formulation.

**Thickening of C12-15 Alkyl Benzoate**

![Graph showing the thickening effect of different HDK® pyrogenic silica grades on C12-15 Alkyl Benzoate](image)

Depending on the polarity of a formulation, different HDK® pyrogenic silica grades enable the required thickening effect to be adjusted.

**Selected products:**
- BELSIL® CM 7026 VP, INCI: C26-28 Alkyl Methicone
- BELSIL® W 3230, INCI: Bis-Stearoxydimethylsilane, Stearyl Alcohol, Dimethicone
- HDK® N20 and HDK® T30, INCI: Silica
- HDK® H15 and HDK® H30, INCI: Silica Dimethyl Silylate
- HDK® H2000, INCI: Silica Silylate

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PROTECT HAIR DURING HEAT STYLING

Heat styling routines like flat iron straightening expose hair to extreme conditions. Surface temperatures can easily exceed 220°C and can damage the hair fiber surface and core. The film-forming emulsions BELSIL® ADM 8301 E and BELSIL® ADM 6300 E protect hair during harsh thermal treatments and reduce hair damage. They provide a silk hair touch and make hair significantly easier to manage. Both products are ideal for aqueous thermal protection formats like sprays, treatments, conditioners or balms. BELSIL® P1101, an innovative silicone hybrid styling polymer offered in ethanolic solution, is also an excellent protector against thermal damage. Typical formats for BELSIL® P 1101 are sprays, balms and mousses.

Selected products:
- BELSIL® P 1101, INCI: Alcohol, Crotonic Acid/Vinyl C8-12 Isoalkyl Esters/VA/Bis-Vinylidimethicone Crosspolymer
- BELSIL® ADM 8301 E, INCI: Amodimethicone/Morpholinomethyl Silsesquioxane Copolymer, Trideceth-5, Glycerin
- BELSIL® ADM 6300 E, INCI: Amodimethicone/Morpholinomethyl Silsesquioxane Copolymer, Trideceth-10

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ANTI-AGING
DISCOVER THE SECRET OF BEAUTY

What’s the secret of beautiful, silky-smooth firm skin? Active ingredients such as retinol, which prevent wrinkles and help skin regenerate. For the first time, it’s possible to reliably protect these agents from oxygen, light and heat. Encapsulated in CAVAMAX® cyclodextrin complexes, they have led to the development of a new generation of care products.

- CAVAMAX® provides anti-aging components with long-lasting protection against oxidation and evaporation.
- Thanks to their molecular encapsulation within a cavity, these components are gradually released on the skin.

Premature aging is also caused by free radicals. These by-products of cell metabolism attack cell membranes, and our skin loses elasticity, for example. Antioxidants such as hydroxytyrosol provide protection against the effects of damaging free radicals on the cells in your body, including the skin. Hydroxytyrosol is considered one of the most powerful antioxidants.

- HTEssence® is the first nature-identical, highly pure hydroxytyrosol.
- HTEssence® fills up the skin’s antioxidant pool more effectively and for longer than other antioxidants.

For more information, visit www.wacker.com/personalcare
LIGHTEN THE SKIN’S PIGMENTATION

There is a growing demand for skin lightening products. As an antioxidant, hydroxytyrosol has been shown to effectively increase glutathione levels within the cells. It is known that high glutathione levels are associated with increased production of pheomelanin, which leads to a light pigmentation of the skin. At the same time, the production of the dark pigment eumelanin is reduced. HTEssence® is the first nature-identical, highly pure hydroxytyrosol.

Hydroxytyrosol is considered one of the most powerful antioxidants:
- Taken as a supplement, it can help to raise glutathione levels, leading to a lighter skin pigmentation and the lightening of dark spots on the skin.
- HTEssence® protects the skin against UV-induced radicals more effectively and for longer than other antioxidants.

Comparison of the Effectiveness of the Skin’s Antioxidant Pool

<table>
<thead>
<tr>
<th>SAR (%)</th>
<th>1% Tocopherol (10 min.)</th>
<th>0.1% HTEssence® (60 min.)</th>
<th>Placebo</th>
</tr>
</thead>
</table>

Skin antioxidant potential determined by electron spin resonance spectrometry; measured by an independent test institute

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PERM HAIR
THE GENTLE WAY

Natural curls full of bounce and stability need a uniform hair structure in which disulfide bonds play a key role. When hair is permed, its disulfide bonds or bridges are broken and remade. If the perming agent is too aggressive, the hair structure is damaged. That’s where cysteine comes in. Fewer disulfide bridges are broken when cysteine is used instead of the usual thioglycolic acid. And the resulting curls are just as tight and stable.

- L-cysteine is one of the 20 natural amino acids. Apart from methionine, it is the only one that contains sulfur.
- When cysteine is used to perm hair, fewer disulfide bridges are broken.
- Cysteine-based perming agents have a pleasant, non-pungent smell.
- WACKER is the only manufacturer worldwide to produce highly pure cysteine by the fermentation of vegetarian-grade raw materials.

When hair is permed, its disulfide bonds or bridges are broken and remade.
STABILIZATION
ENCAPSULATE SENSITIVE INGREDIENTS

Organic agents fulfill important functions in skin and hair care. But they are often sensitive to oxygen, light and heat, and can rapidly evaporate. Innovative cyclodextrin complexes offer them protection. Moisture unlocks these tiny “strongboxes” and gradually releases organic agents – providing skin and hair products with new functions.

- CAVAMAX® forms cyclodextrin complexes that work like tiny strongboxes.
- CAVAMAX® provides long-lasting protection against oxidation and evaporation.
- CAVAMAX® enables skin-care and hair-care products to gradually release organic agents with anti-wrinkle, skin-regeneration and moisturizing effects.
- WACKER is the only company to manufacture all three natural cyclodextrins – α, β and γ.
- WACKER supplies ready-to-use cyclodextrin complexes. For example: CAVAMAX® W 8/retinol complex and CAVAMAX® W 8/tocopherol complex.

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