



PERSONAL CARE

URBATECTION™

Skin protection for the urban consumer

Addressing the challenges of urban pollution

As the world's population increases and shifts from rural to urban areas, consumers are becoming more aware of pollution's effect on the skin, and they are looking to personal care products to help protect their skin and reduce the damaging effects.

Dow offers ingredients to help brand owners create products to address this problem through two approaches: A preventive approach that reduces the adhesion of pollution particles on skin as well as the noxious effects of toxic gases; and a curative approach that maximizes the effect of antioxidants used to fight the damaging effects of pollutants.

Featured products

Preventive

- DOWSIL™ FA 4002 ID Silicone Acrylate
- DOWSIL™ FA 4003 DM Silicone Acrylate
- DOWSIL™ SW-8005 C30 Resin Wax

Curative

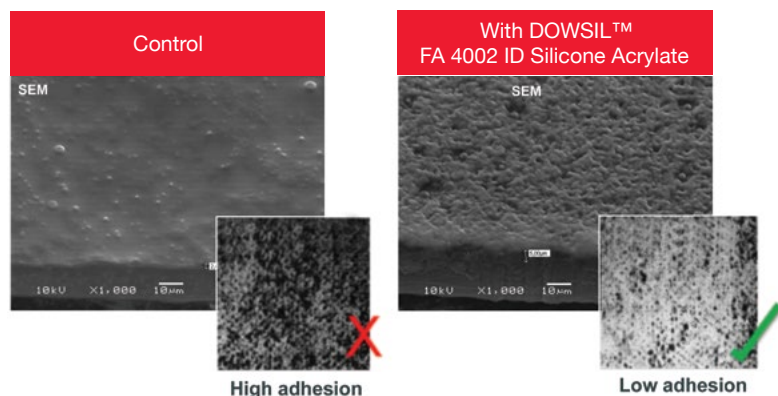
- DOWSIL™ EL-9241 DM Silicone Elastomer Blend
- DOWSIL™ ES-5612 Formulation Aid
- DOWSIL™ FZ-3196 Fluid



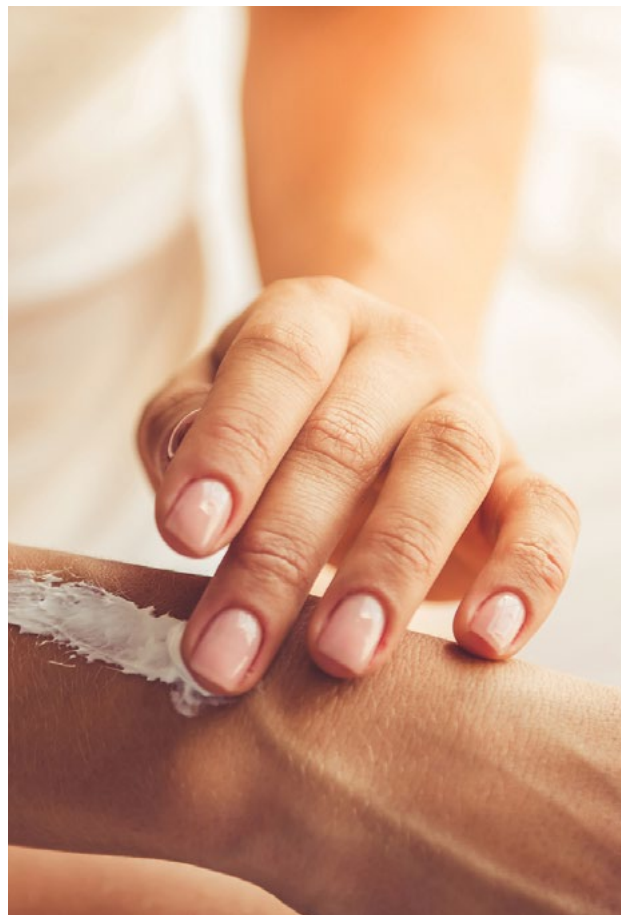
Preventive approach

Silicones can form a film at the skin surface and shield it from environmental stressors by limiting the adhesion of pollution particles on skin and by reducing the cutaneous damage induced by pollutants such as ozone and cigarette smoke. See the difference adding DOWSIL™ FA 4002 ID Silicone Acrylate can make in reducing particulate adhesion.

Secret Shell formulation with 5% Dow silicone acrylate technology, CPF 1909 (in vitro testing on collagen substrate)



Secret Shell formulation with 10.5% Dow silicone acrylate technology, CPF 2287 (in vivo testing on panelist forearm)



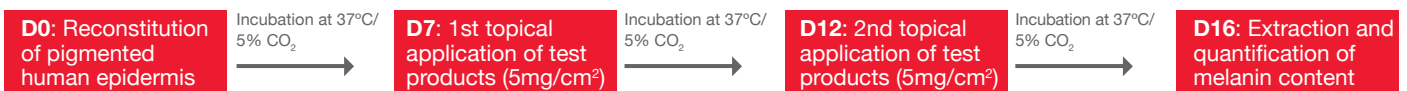
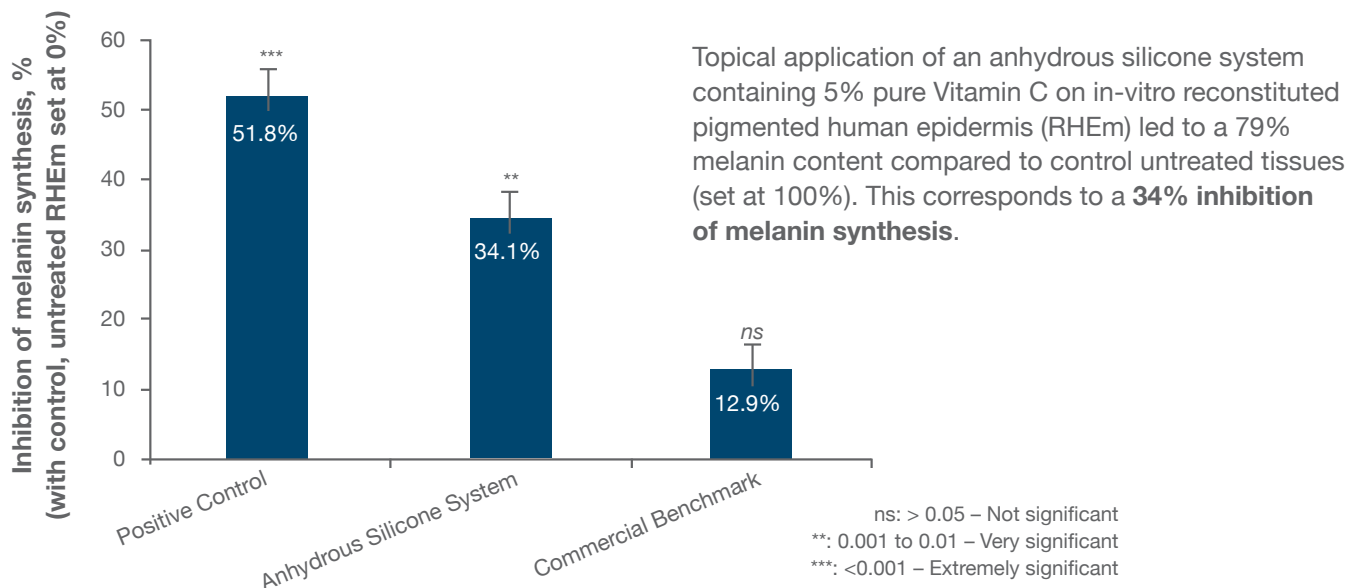
Product	DOWSIL™ FA 4002 ID Silicone Acrylate	DOWSIL™ FA 4003 DM Silicone Acrylate	DOWSIL™ SW-8005 C30 Resin Wax
INCI	Isododecane (and) Acrylates/ Polytrimethylsiloxymethacrylate Copolymer	Dimethicone (and) Acrylates/ Polytrimethylsiloxymethacrylate Copolymer	C30-45 Alkyldimethylsilyl Polypropyl- silsesquioxane
% Active	40%	40%	100%
Benefits	<ul style="list-style-type: none"> • Durable • Resistance to rub-off • Non-occlusive • SPF-boosting 	<ul style="list-style-type: none"> • Flexible and comfortable to wear • Resistance to rub-off • Resistance to sebum • Non-occlusive 	<ul style="list-style-type: none"> • Rheology and texture modifier, structuring agent • Increases non-transfer (lipsticks) • Improves coverage, color uniformity and intensity in color cosmetic applications • Broad compatibility with organic and silicone materials
Recommended Usage Level	2-11%	2-11%	1-5%
Cosmetic Regulatory Status	Listed in the Catalogue of Cosmetic Ingredients Used in China		

Curative approach

Pollution exacerbates oxidative stress through the production of free radicals. Silicones can improve the stability and delivery of antioxidant compounds, which help to neutralize the free radicals generated within the skin.



Improving active efficacy

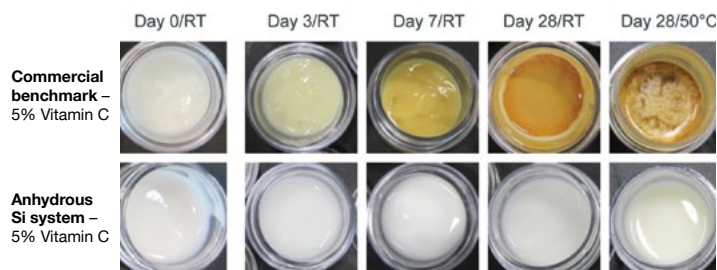


Positive control composition: aqua, glycerin, butylene glycol, squalane, Simmondsia chinensis, alcohol, petrolatum, cetyl alcohol, 4-butylrescorcinol, glyceryl oleatae, carbomer, Acryldates/C10-30 crosspolymer alkyl acrylate, sodium polymethacrylate, xanthan gum, glyceryl stearate, tocopherol, sucrose stearate, potassium hydroxide, methylparaben, propylparaben

- The positive control contains Rucinol (4-butylresorcinol), which has been reported to be a tyrosinase inhibitor and to decrease melanin synthesis. Kim et al., 2005, Biol. Pharm. Bull., 28(12), 2216-2219.
- The anhydrous silicone formulation outperforms the commercial benchmark. The presence of water in the benchmark formulation inhibits most likely the long-term efficacy of Vitamin C.

Antioxidant stability over time with glycerin-in-silicone formulations

In addition to further enhancing the chemical stability of Vitamin C, the incorporation of the Vitamin C/glycerin solution in the silicone elastomer matrix improves strongly the sensory properties of the final formulation and does not prevent the active from being released from the formulation when it is applied on skin.



Commercial benchmark composition: aqua, glycerin, cyclopentasiloxane, ascorbic acid (5 wt%), propylene glycol, nylon-12, sodium hydroxide, citric acid, PEG/PPG-18-18 dimethicone, propylparaben, acrylates copolymer, fragrance, disodium EDTA, methylparaben

Product	DOWSIL™ EL-9241 DM Silicone Elastomer Blend	DOWSIL™ ES-5612 Formulation Aid	DOWSIL™ FZ-3196 Fluid
INCI	Dimethicone (and) Dimethicone Crosspolymer	PEG-10 Dimethicone	Caprylyl Methicone
% Active	16-17%	100%	100%
Benefits	<ul style="list-style-type: none"> Contributes a silky, smooth feel Long-lasting skin feel Improves skin feel of glycerin-rich formulations Provides thickening in anhydrous and w/o emulsion formulations Acts as a surrounding matrix to entrap and protect actives that are sensitive to oxidation without preventing their release from the formulation once it is topically applied 	<ul style="list-style-type: none"> Rake-type polyether Non-diluted material Low odor Silicone emulsifier Formulation flexibility with a broad range of silicone and organic oil phases Low-viscosity emulsions can be achieved 	<ul style="list-style-type: none"> Excellent spreadability Light, silky, smooth feel Moderate volatility – feels less dry than more volatile materials Excellent compatibility with both silicones and organic materials Co-solubilizer between silicone and organic oils Improves spreadability and reduces tackiness and greasy feel of vegetable oils and polyols
Recommended Usage Level	4-30%	2-6%	1-20%
Cosmetic Regulatory Status	Listed in the Catalogue of Cosmetic Ingredients Used in China		

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