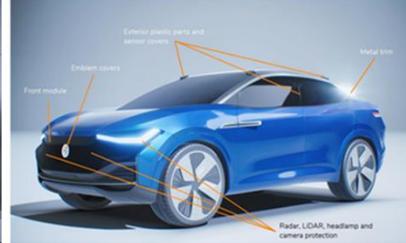
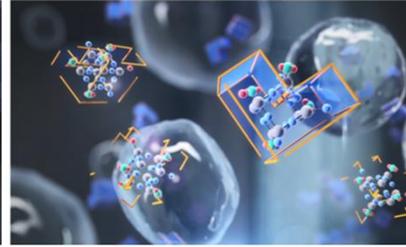


SilFORT™ AS4700-SP1
 Thermally Cured, Sprayable
 Polysiloxane Hardcoats



MARKETING BULLETIN

SilFORT AS4700-SP1 is a thermally cured, abrasion resistant, weatherable polysiloxane hardcoat, now available for spray application, from which larger plastic parts can greatly benefit. When used in combination with the SilFORT SHP470-FT2050 primer, the hardcoat offers excellent protection to plastic parts, specifically those made from polycarbonate. SilFORT AS4700-SP1 can be used to protect exterior automotive parts, for example, new front modules for electric vehicles, which often feature a combination of complex designs with dark, tinted and transparent areas and multiple functionalities.

Spray application of the primer and hardcoat allows the deposition of coating layers with more uniform thickness across a complex part, enabling extended long-term weathering performance of the polycarbonate without the size and shape limitations of other coating application methods. Spraying SilFORT AS4700-SP1 has opened the door to more innovative plastic part designs that are helping to drive the future of automotive sustainability by enabling the combination of lighting and ADAS functionalities, while at the same time protecting decorative design elements on the exterior of electric vehicles. SilFORT AS4700-SP1 can withstand aggressive chemicals and provide a durable, glossy and easy-to-clean surface for eye-catching designs with patterned, illuminated decor.

Key Features and Typical Benefits

- Extended long-term part weatherability via increased coating layer thickness uniformity
- Spray coat application capability for enhanced part design flexibility
- High transparency
- High scratch and abrasion resistance
- High resistance to chemicals
- Durable, easy-to-clean, high gloss finish

Typical Physical Properties*	SilFORT SHP470-FT2050 Primer	SilFORT AS4700-SP1 Hardcoat
Physical Form	Liquid	Liquid
Color	Amber	Pale Orange
Solids content (% by weight)	Approx. 9%	Approx. 22.5%
Specific Gravity at 25 °C (g/cm ³)	Approx. 0.95	Approx. 0.94
pH	N/A	5.0
Viscosity at 25 °C (cSt)	Approx. 85	Approx. 5

*Typical properties are average data and are not to be used as or to develop specifications.

SilFORT AS4700-SP1 for Spray Applications

Greater uniformity of coating layer thickness

Spray application of both the SilFORT SHP470-FT2050 primer and the SilFORT AS4700-SP1 hardcoat can allow a more even distribution of coating film thickness across a part. The challenges sometimes observed when using dip or flow coating techniques can be avoided by carefully controlling spray parameters and coating liquid viscosities. More narrow distribution of primer and hardcoat layer thicknesses on a part is key to achieving a coating system’s optimal performance.

Improved long-term part weatherability

UV-radiation can damage plastic substrates, especially polycarbonate. The longevity of the protection against UV damage that SilFORT AS4700 coating systems can provide depends to a large extent on the thickness of both primer and hardcoat layers. The more uniform these thicknesses are, and the more accurately the thickness specification targets are met, the longer a coating system can resist physical and chemical degradation, and therefore protect the coated part for a longer period. SilFORT AS4700 can withstand the harshest of (test) environments and offers outstanding longevity of its protective function and the durability of coated parts. Accelerated weathering testing conducted at our state-of-the-art application development center in Leverkusen, Germany, in conjunction with actual outdoor weathering, yielded predictive data showing that the lifetime of SilFORT AS4700 coated parts under Florida conditions can go beyond 5 years on black parts, and can go beyond 10 years on transparent parts.



SilFORT AS4700-SP1 for Automotive Front Modules

Enhanced flexibility in part design



Because of the outstanding coating thickness uniformity that can be achieved with SilFORT AS4700-SP1 by spray application, ever bigger and more complex parts can be designed using a polycarbonate substrate. This allows designers to create shapes and to integrate features that would be difficult or impossible to coat otherwise. Flow issues around holes can be avoided and stronger curvatures can be dealt with. Thus, potential advantages that polycarbonate offers in vehicle design can be explored more deeply than previously possible. With front modules of electric vehicles, for example, where no large air inlet is required, designers are expressing their design language more freely with more eye-catching concepts for illuminated decor and patterned surfaces.

Compatibility with ADAS functionalities

The front of a vehicle is a prime location for integration of ADAS functionalities. Whether camera, LiDAR or radar, the combination of polycarbonate plastic with the SilFORT AS4700 hardcoat systems has shown excellent transmission of the electromagnetic signals for these sensor technologies. By smoothing of native, injection molded substrate surfaces, the overall transmission rates of LiDAR waves at 905nm can be shown to increase. These gains can be as high as 8% depending on the initial surface roughness, coating system type and whether one, or both sides of a panel are coated. Thus, polycarbonate front modules of electric vehicles with incorporated ADAS functionalities that are protected with SilFORT AS4700, can support safe and sustainable mobility.

Light Transmission @905nm Through Coated Polycarbonate*		
SilFORT Coating Type	Sides Coated	Single Pass of Light
Uncoated Polycarbonate	N/A	88.9%
UVHC3000K	Single	90.7%
PHC587C2	Single	91.4%
PHC587C2	Double	92.8%
AS4700	Single	91.7%
AS4700	Double	93.4%

*Makrolon AG26755T, Color 978001, 3.0mm thickness. Data provided courtesy of Covestro AG.

SilFORT AS4700-SP1 Abrasion and Stain Resistance

Abrasion resistance

Typical Taber Abrasion Δ%Haze Values* of SilFORT Coating Systems		
SilFORT Coating Type	Curing Type	Δ%Haze Value
Uncoated Polycarbonate	N/A	>35%
UVHC3000K	UV-Cure	5-8%
UVHC5000	UV-Cure	<10%
PHC587C2	Thermal Cure	~4%
AS4700-SP1	Thermal Cure	~3%

*CS-10F wheels, 500 cycles. Momentive test data. Actual results may vary.

SilFORT AS4700-SP1 can achieve benchmark abrasion resistance performance typical of other thermally cured systems in Momentive’s portfolio. The Taber abrasion test reveals almost glass-like performance of just a few % delta Haze over that of glass. Moreover, the balanced, uniform thicknesses of primer and hardcoat of a 2-layer coating system, as achieved by spray coating, reduces the cracking propensity under mechanical loads.

Stain resistance and cleanability

The additive package of SilFORT AS4700-SP1 has been especially fine-tuned to allow the coating’s visual and physical integrity to be maintained when exposed to aggressive chemicals. Even under harsh conditions, SilFORT AS4700-SP1’s surface remained glossy and dirt-repelling, for example, at a 24-hour bake at 60°C with deposits of varying chemical compositions that resemble the likes of insect proteins and bird droppings. The picture to the right shows that the same protein smudge is very hard to remove from a UV-cured coating surface, whereas it is freely moving around on the thermally cured SilFORT AS4700-SP1 surface. The chemical’s stains did not stick and were easy to wipe clean.

The high initial hydrophobicity of thermally cured polysiloxane surface structures also helps to ensure that water droplets easily run off a part’s outside finish, further leading to less dirt adhesion and an easier-to-clean exterior surface. Such a benefit can be crucial to the sustained performance of sensitive electronics, such as ADAS sensors, that rely heavily on a coated polycarbonate cover that remains clean and glossy for longer.



Application Development Support

Our team of well-trained coating experts can help you invent possibilities by turning exciting exterior designs into reality with a SilFORT protective coating that is right for your plastic substrate parts. With application development centers located around the world, our experts are there to help you find the right spray parameters or solvent compositions, optimize coating process settings, or to provide input on the design of your dedicated spray thermal cure coating line. Contact us to learn more!
www.momentive.com/hardcoats





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