

SilFORT™ UVHC3000K

Description

SilFORT UVHC3000K is a UV-curable, silica-modified coating, designed to give optimum weathering, chemical and abrasion protection to Polycarbonate. In particular, UVHC3000K is designed for use on Vehicle Headlamps. Products coated with UVHC3000K include applications where superior weathering and mar resistance combined with chemical resistance is demanded. UVHC3000K is supplied as a singlecomponent lacquer in a mild glycol-ether solvent. This makes it suitable for chemical-sensitive substrates such as Polycarbonate, PMMA, SAN, etc.

Key Features and Benefits

Transparent

Suitable for the protection of high quality optical parts such as headlamps. Provides easy-to-clean properties

Adhesion to many plastic substrates High chemical resistance

High cure response Single solvent formulation Easy to recycle

Application by spray, dip, roller and flow Superior weatherability

Typical Physical Properties

	Unit	Typical Value
Physical Form	-	Liquid
Appearance	-	clear, slightly yellow
Solids content	%	45
Dynamic viscosity (@ 25°C)	mPa·s	9
Abrasion resistance ¹	Δ haze in %	< 10

Water soak adhesion ²	-	Gt 0
Density	g/cm ³	1.025

ΔE after 2000 hours ^{3,4}	-	0.3
Yellowness-Index acc to ASTM E313 after 2000 hrs ³	-	< 0.5
ΔHaze acc to ASTM D1003 after 2000 hours ³	%	0.6
Grey scale acc to ISO 105A02 after 2000 hours ³		>4
Shelf life period ⁵	days	360

- 1ASTM D1044/1003, 500 cycles, CS10F wheels, 4th generation
- 210d at 65°C water immersion followed by tape pull test according to EN ISO 2409 on various PMMA, PC, SAN, substrate dependent

3Test Protocol: ASTM G155 Black Panel Temperature: 70 °C Chamber Temperature: 55 °C Relative Humidity: 50% Irradiance at 340nm: 0.55 W/m² Xenon Lamp Filters: Inner: S.Boro, Outer: S.Boro

$$4 \Delta E = ((L1L2)^2 + (a1-a2)^2 + (b1-b2)^2)^{1/2}$$

5 from manufacturing day

Potential Applications

The UVHC3000K can be applied by dip, spray, roller or flow coating methods. The coating is supplied at 45% non volatile content. The coating may be thinned with 1-methoxy-2-propanol (Dowanol PM) or 2- propanol(iso propyl alcohol) and other solvents. (please inquire regarding the suitability of other solvents)

For all coating processes a two stage cartridge filter system consisting of a 5-8 micrometer pre-filter (nominal) and a second filter of 0.5-1.0 micrometer(absolute,gel) is recommended. A flash-off period of 2 - 5 minutes is needed for evaporation of the solvents (spray application needs a shorter flash-off time than flow, dip or roller coating). Recovered over spray can be re-used by using a purpose designed recovery system.

After the flash-off period, the coated substrate should be pre-conditioned at 65-95°C part surface temperature for 1.5 - 3 minutes using Infra Red Heating to ensure

evaporation of the solvent(s) prior to curing, promote flow-out, develop adhesion and help eliminate any orange-peel. An electric or indirect-fired air convection oven may also be used for pre-heating, in which case a somewhat longer residence time will be needed. Up to 8 minutes may be used. The preheat time and temperature may differ between the various polymeric substrates and is largely related to the inherent sensitivity to solvent of the substrate used. Oven design and air distribution efficiency are additional factors affecting the best conditions for any individual installation. If desired, the part may be allowed to cool after pre-heat and prior to curing. The coating is cured by UV radiation using an un-doped 80-240W/cm Mercury or Fusion F600 "H" lamp, with a recommended energy of ideally at least 5.0 J/cm² (an absolute minimum of 4.0 J/cm² is acceptable) at typically 0.3 W/cm² peak intensity (measured in the UV-A region on the part front face with an EIT® Power Puck®). Much higher cure energies have no detrimental effects. The recommended minimum coating thickness is 8.0 µm. For any given article, it is important to establish the best process window that is compatible with the product when coated in a particular installation. Meeting cured performance requirements is, in the end, a most important criterion.

Due to the light-sensitivity of UVHC3000K it is recommended to avoid the use of even semi-transparent pipework to avoid gelling. Lights should be shielded with yellow filters to absorb any UV and near-UV wavelength light. All equipment and pipe-work should be of stainless steel polyethylene/polypropylene or polytetrafluoroethylene and be suitable for use with acrylate oligimers. It is suggested that the lamp supplier be contacted to ascertain the best configuration and reflector type to cure a given article. Generally, as with

most UV curing systems, the focal length and type of UV lamp reflector can play a major role in the efficiency of curing on shaped and flat products.

* PowerPuck® instrument from EIT Inc.

Patent Status

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

Product Safety, Handling and Storage

Customers should review the latest Safety Data Sheet (SDS) and label for product

safety information, safe handling instructions, personal protective equipment if necessary, emergency service contact information, and any special storage conditions required for safety. Momentive Performance Materials (MPM) maintains an around-the-clock emergency service for its products. SDS are available at www.momentive.com or, upon request, from any MPM representative. For product storage and handling procedures to maintain the product quality within our stated specifications, please review Certificates of Analysis, which are available in the Order Center. Use of other materials in conjunction with MPM products (for example, primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

Limitations

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.

Packaging

UVHC3000K is available in 25 kg pails and 180 kg drums.

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