

SilForce™ UV9390C Release Coating

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Description

Silforce UV9390C photocatalyst is a solution of a bis(4-alkylaryl)iodonium hexafluoroantimonate salt plus photosensitizer in a glycidyl ether reactive diluent. UV9390C is designed for use with Momentive Performance Materials Silforce UV Cure epoxysilicone release system (polymer products UV9300, UV9315, UV9400, UV9430, UV9440E, UV9500 and blends thereof). UV9390C - catalyzed formulations with these silicone polymers are intended for release coating applications. UV9390C is also an excellent cationic photocatalyst in non-silicone acid-polymerized coatings including cycloaliphatic epoxy resins, vinyl ethers, oxetanes, and glycidyl ethers. UV9390C is added to epoxysilicone polymers or cationic-cure organic formulae just prior to use. Catalyzed coating baths are applied to substrates of choice using conventional coating techniques, then crosslinked (cured) by exposure to focused UV light. UV9390C is a cationic type photo-acid generating catalyst not subject to oxygen inhibition, so inerting of cure chambers where this catalyst initiates crosslinking is not necessary for fast cure. 1 to 4 parts of UV9390C per 100 parts of coating are usually sufficient for good performance. The precise catalyst requirement is a function of substrate, lamp intensity and type, converting speed target, and final application.

Key Features and Benefits

- Compatible with non-polar cationic curing systems
- Radiation-initiated generation of 'superacid' is not inhibited by atmospheric oxygen
- Shelf-Stable for a year stored in the dark at or below room temperature
- Easy to handle; low viscosity, low toxicity
- Well-suited for use with medium pressure mercury vapor UV cure lamp systems

Typical Physical Properties

Property	Typical Value
Specific Gravity, 25°C	1.06
Lbs. / gallon, 25°C	9.14
Weight % Antimony	6.3 %
Viscosity, 25°C	100 cstk (Ostwald)
UV Absorption peaks	255 nm (major peak); 385 nm (minor peak)

Potential Applications

USE and FORMULATION with EPOXYSILICONE RELEASE SYSTEM

SilForce UV9390C is a cationic photocatalyst. The active iodonium salt component of UV9390C rapidly decomposes upon irradiation with deep UV light in a complex reaction sequence that ultimately yields a strong acid (often called a 'superacid'). The photogenerated acid catalyzes fast ring-opening polymerization of cycloaliphatic epoxy groups pendant on epoxysilicone polymers which provides for a highly crosslinked silicone coating that releases PSA's in tag and label applications. 1 to 3 parts of UV9390C per 100 parts of epoxysilicone coating are usually sufficient for excellent photocure response. Precise formulation of UV9390C is substrate dependent. 1 to 2 parts UV9390C per 100 parts UV9XXX polymer blend are suggested for coating on plastic films and plastic laminated papers (such as polykraft liner). 2 to 4 parts UV9390C per 100 parts UV9XXX polymer blend are recommended for coating on paper or glassine substrates. Vigorous agitation is necessary to completely disperse and dissolve UV9390C in epoxysilicone polymers. The appearance of such coating formulations will vary from clear to very hazy depending on the organofunctional content of the silicone employed. For example, UV9300, UV9315, and UV9430 are more miscible with UV9390C than UV9400. The active iodonium ingredient of UV9390C may precipitate from hazy epoxysilicone coating baths over time, necessitating thorough re-dispersion before reuse. Coating formulations including epoxysilicone + UV9390C will remain useful for several days if stored in the dark (away from exposure to sunlight, fluorescent room lighting or direct UV light from cure lamps) at or below room temperature. Catalyzed coating formulations will rapidly set up to a gel if kept > 40 ° C. The iodonium antimonate active ingredient of UV9390C is thermally

unstable, so the catalyst product itself should be stored in its original container at or below 25 ° C.

Patent Status

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute the 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

The warranty period for UV9390C is 12 months from date of shipment provided the product is stored in its original container (unopened) away from light exposure, at or below 25oC. Refrigerated storage will extend shelflife. Care should be taken to avoid inadvertent contamination of UV9390C with acidic, basic, or oxidizing materials, or with water. Photocure response of UV9390C-catalyzed coatings is subject to inhibition by basic impurities and contaminants such as amines, phosphines, alkaline compounds, and certain metal soaps and driers including tin soaps and titanium chelates.

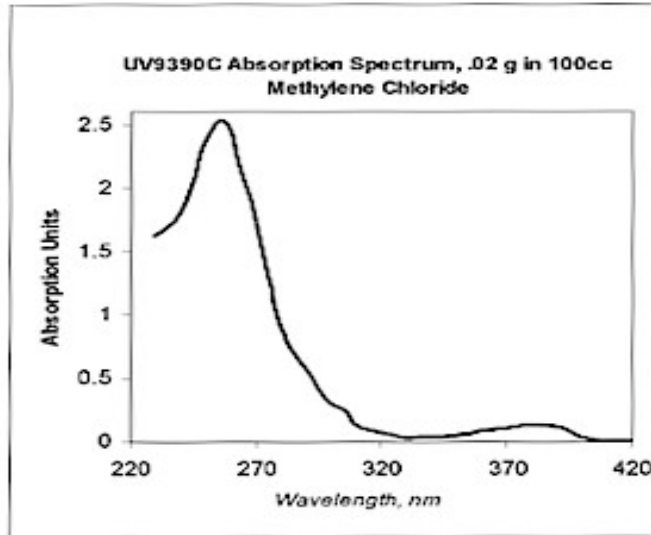
Customers should review the latest Safety Data Sheet (SDS) and label for product safety information, safe handling instructions, personal protective equipment if necessary, emergency service contact information, and any special storage conditions required for safety. Momentive Performance Materials (MPM) 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.

Processing Recommendations

UV LAMPS

SilForce UV9390C is a solution of iodonium salt catalyst and photosensitizer in reactive diluent. Diaryl iodonium compounds are deep UV absorbers lacking significant light absorption > 300 nm wavelength. The sensitizer component of UV9390C absorbs lamp emission in the 300 - 400 nm wavelength range. This combination of UV absorption is

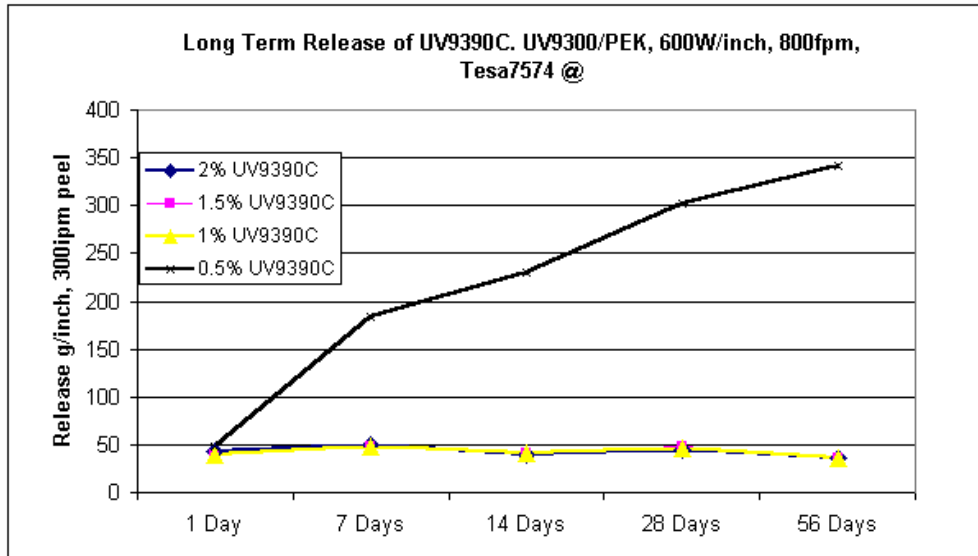
well matched to medium pressure mercury vapor lamp emission. Such lamps (either microwave-fired or conventional arc type) are recommended for efficient photocure of cationic type UV cure coatings including epoxysilicone release coatings. 'Doped' UV lamps with long wavelength emission are not recommended for cure of UV9390C-catalyzed coatings in the absence of additional longer wavelength sensitizers. The absorption spectrum of UV9390C is displayed in Figure 1 .



FORMULATING WITH UV9390C

Input	Film or Plastic Liner	Paper or Glassine Liner
UV9XXX epoxysilicone blend	100 parts	100 parts
UV9390C catalyst	1 - 2 parts	2 - 4 parts

As outlined above, specific recommendations for UV9390C use with epoxysilicone release agents are largely substrate-driven. End-users must carefully evaluate all aspects of their silicone release coating formulation in terms of ultimate application requirements before committing to commercial use. The effect of different concentrations of UV9390C on release stability in a typical epoxysilicone release application is illustrated in Figure 2 .



In the application illustrated in Figure 2, the film laminate liner permits use of 1 - 2 parts UV9390C in UV9300 without much effect on long term release stability versus the TESA test tape, but <1 phr catalyst may be insufficient.

NON-SILICONE UV CURE COATINGS

UV9390C is specifically designed for use with epoxysilicone release agents, but it is also a good cationic photocatalyst, with excellent solubility, in other reactive organic systems. UV9390C has been shown to effect rapid crosslinking of coatings including cycloaliphatic epoxy resins, vinyl ether monomers and oligomers, glycidyl ether resins, and oxetanes. The presence of photosensitizer, alkylglycidyl ether diluent, and variable amounts of aromatic impurities may affect properties of photocured organic coatings. We urge careful evaluation of UV9390C for photocure of non-silicone coatings before any commercial processing is undertaken.

Limitations

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

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