Amber-E™ VHC000

Heat Curable Coating Resin

Amber-E™ VHC000 is a pale yellow, low viscosity liquid polysilazane-based coating resin that is specially designed for use in the formulation of heat-curable ceramic coatings. **Amber-E™ VHC000** is supplied as a 100% "solids" liquid of low viscosity, and rapidly solidifies upon heating to 200°C–250°C. Solidification can be achieved at lower temperatures with the addition of a free radical initiator such as dicumyl peroxide.

Coated Exhaust Manifold

Amber-E™ VHC000 can be blended with a variety of pigments, such as metal powders (zinc, aluminum, stainless steel), ceramic powders (silicon carbide, aluminum oxide, silicon nitride), or the like. Such compositions can be formulated with or without solvent and can be applied by dipping, spraying, or brushing onto a variety of substrates—metal, glass, and ceramics. For ultrahigh-temperature formulations, the coated part is then heated to at least 454°C to promote conversion of the polymer to ceramic. Depending on the exact formulation, coating operating temperatures of 900°C or above can be achieved.

Major Applications:

High Temperature Coatings and Thermally Stable Corrosion Coatings

Cure Conditions:

Depending on the free radical initiator employed, cure from liquid to solid can be accomplished in times ranging from 1 minute to 90 minutes over a temperature range of 100°C to 180°C. The peroxides are typically dissolved in solvent-free polymer at the 0.5wt% to 1.0wt% level, based on the weight of polymer employed. Cure without the use of a peroxide can be effected by heating to 200°C–250 °C.

Physical Properties of VHC000	
Color	Clear to pale yellow liquid
% Resin	100% solids as a liquid
Flash Point	29°C [84°F]
Density of Liquid	1.020 g/cm^3
Density of Cured Material	1.120 g/cm^3
Density of Ceramic	2.400 g/cm^3
Viscosity	80 cps @ 19°C [67°F]

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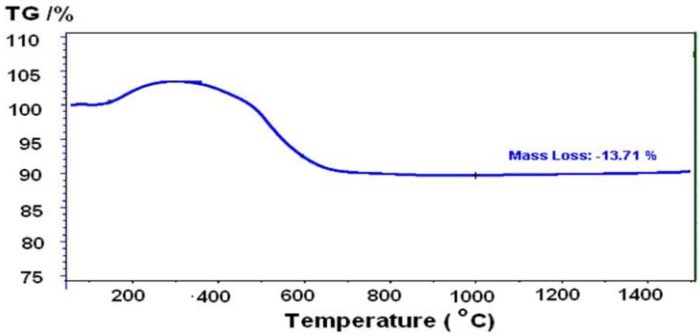

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Typical Amber-E™ VHC000 Ceramic Coating Properties			
Color	Variable	**Pencil Hardness**	> 9H
Finish	Matte to Satin	**Hot Adhesion**	100%
% Resin Solids	10 – 60	**Chemical Resistance**	Good
Film Thickness	10 – 300 µm	**Thermal Resistance**	800°C
VOC	Depends on formulation	**Thermal Shock**	Fair

Formulation and Application:

Amber-E™ VHC000 is easily formulated into a corrosion-resistant, high-temperature ceramic coating. It is typically added at 10wt% to 60wt% and is compatible with a wide array of solvents, including alkanes, aromatic hydrocarbons, ethers, ketones, esters, etc. In addition, **VHC000** may be blended with a variety of ceramic and metal powders and other coating additives. Once formulated, these coatings can be applied by conventional spray, dip, or brush application. The coatings are dry-to-touch in approximately one hour and are cured by heating at 150 °C for 30 minutes. Heating to temperatures above 700°C converts the **VHC000** to a ceramic.

Cleanup:

Clean tools immediately after use with acetone or mineral spirits. Solvent cleaning can be followed by a wash with soapy water. Cured material cannot be removed with solvent. Proper cleanup of equipment is essential.

Handling:

Storage Life: Minimum of 2 years for unopened containers.

Pot Life: Usable life will be determined by the precautions taken to keep containers tightly sealed and protected from moisture.

Solvents:

Amber-E™ VHC000 is miscible with dry aprotic solvents such as alkanes, aromatic hydrocarbons, ethers, ketones, and esters. **Amber-E™ VHC000** is hydrolytically sensitive and will slowly generate ammonia upon contact with moisture. The polymer will also react with other protic substances such as acids, bases, and alcohols.

Safety:

Use safety glasses and adequate ventilation. Protect skin from exposure using gloves and appropriate clothing. Seek medical attention if ingestion or overexposure is suspected. Keep uncured product from flame, all ignition sources, and moisture. This product is intended for professional use by persons familiar with this product data sheet, the Safety Data Sheet (SDS) that accompanies product shipments, and applicable health, safety, and environmental practices and regulations. Contact Hathaway Advanced Materials for advice concerning this product's suitability for specific applications.

Disclaimer:

Information on this product sheet is subject to change without notice as a result of experience and ongoing product development. It is the user's responsibility to verify that this sheet is current prior to use. The user accepts all risk associated with any use of this product for any purpose other than as recommended herein.

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