

# functionalproducts

## VERSAMINE® C 31

### Use

Versamine® C 31 is an extremely low viscosity, very light colored, moisture insensitive room temperature cycloaliphatic amine curing agent for liquid and solid epoxy resins. It has been designed specifically for use in high solids coatings, self leveling flooring and aggregates where excellent flow, levelling and blush resistance are required.

### Specification

Amine Value - mg KOH/gram	290 - 360
Thermosel Viscosity @ 25 °C - poise	0.5 - 1.0
Gardner Color - maximum	2

### Additional data

Amine Hydrogen Equivalent Weight	86
Mix Ratio with 190 EEW Liquid Epoxy	45 phr
Density - lbs/gal	8.4
Percent Benzyl Alcohol by weight	42
Seta Flash Point - °F	> 200
Density (25° C) (g/cm <sup>3</sup> )	1.010

### Properties

#### **Typical Properties in Cured Coating**<sup>1</sup>

Tack Free Time - hours (3 mils wet film at 25 °C)	5
Through Cure Time - hours (3 mils wet film at 25 °C)	10
Gel Time (200 gram mass) - minutes	31

<sup>1</sup> With 190 EEW Liquid Epoxy Resin

#### **Typical Cured Resin Properties**<sup>2</sup>

Glass Transition Temperature by DSC	99 °C
Tensile Strength - psi	8,000
Elongation - %	6.0
Flexural Strength - psi	11,800
Flexural Modulus - psi	489,000
Compressive Strength - psi	11,600

<sup>2</sup> With 190 EEW Liquid Epoxy Resin Cured 7 days @ 25 °C

### Typical Resistance Properties of Unfilled Coatings<sup>3</sup>

10 % Sodium Hydroxide	0.52
10 % Acetic Acid	2.57
10 % Hydrochloric Acid	0.63
10 % Sulfuric Acid	0.91
Methyl Ethyl Ketone	Destroyed
Xylene	0.36
Ethanol	4.72

<sup>3</sup> Percent weight increase of samples cured 7 days @ 25 °C then immersed for 21 days at 25 °C

### Application

#### White Topcoat - Starting Point Formulation

Component A	Parts by Weight
Liquid Epoxy Resin, EEW-190	37.7
Titanium Dioxide, R-960	15.0
Emtal 41	5.0
Barytes (bleached)	25.8
Aerosil 300	2.1
Tricresylphosphate	3.0
Xylene	3.4
Dowanol PM	<u>8.0</u>
	100.0

#### Component B

Versamine® C31	<u>19.0</u>
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**Total Formulation 119.0**

#### Mixed Properties

Nonvolatiles % By Weight (theoretical)	83.4
Pigment/Binder Ratio	1/1
Pot Life at 25 °C - hours	1 - 2
Tack Free Time at 25 °C - hours	6 - 8
Through Cure Time at 25 °C - hours	24 - 36

#### Raw Material Suppliers

Liquid Epoxy Resin, EEW-190	Dow Chemical Shell Chemical
Titanium Dioxide, R-960	E.I. du Pont de Nemours & Co.
Emtal 41	Engelhard
Aerosil 300	Degussa
Dowanol PM	Dow Chemical Co.
Versamine® C31	COGNIS Corporation

**Solventless Epoxy Coating Starting Point Formulation**

<b>Component A</b>	<b>Parts by Weight</b>
Liquid Epoxy Resin, EEW-190	52.5
Inorganic Pigment Colorant	15.0
Barytes (bleached)	16.0
Emtal 41	10.0
Icecap K	5.0
Aerosil 300	<u>1.5</u>
	100.0
<b>Component B</b>	
Versamine® C31	<u>27.0</u>
<b>Total Formulation</b>	<b>127.00</b>

**Mixed Properties**

Nonvolatiles % By Weight	100
Pigment/Binder Ratio	0.6/1.0
Pot Life at 20°C - minutes	40 - 50
Through Cure time - hours	20 - 24
60° Gloss	80 approx.

**Raw Materials Suppliers**

Liquid Epoxy Resin,	Dow Chemical Co.
EEW- 190	Shell Chemical Co.
Emtal 41	Engelhard
Icecap 41	Burgess Pigment Co.
Aerosil 300	Degussa
Versamine® C31	COGNIS Corporation

**Approvals**

**Toxicological Information**

Based on toxicological studies with animals, Versamine® C 31 will cause severe eye and skin irritation or burns on contact and may be harmful if swallowed.

In case of skin or eye contact, immediately flush eyes or skin with clean running water for at least 15 minutes removing contaminated clothing.

If swallowed, do not induce vomiting until after consulting a physician. Immediately drink large quantities of milk or water and call a physician.

Consult a Material Safety Data Sheet for full details before handling.

## **Regulatory Status**

DSL, AICS, TSCA, PICCS, ECL, IECSC, EINECS

## **Miscellaneous**

### **PACKAGING, STORAGE AND HANDLING**

Versamine® C 31 will absorb moisture and carbon dioxide if left in open containers. This may result in an increased viscosity and some foaming when curing epoxy resins. Therefore, it should be kept in tightly closed containers when not in use and stored in a cool, dry place. Properly protected from moisture, the product has a minimum shelf life of one year.

Versamine® C 31 and epoxy resins should not be mixed until just before use because a chemical reaction will take place.

Do not get this product in eyes, on skin or on clothing. Do not breathe its vapors. Wear protective equipment such as rubber gloves, eye protection and protective clothing. Maintain good housekeeping standards at all times.

If Versamine® C 31 epoxy coatings are to be applied in confined areas, the applicator should wear an air supplied hood and other protective clothing sufficient to cover the entire body. Use only with adequate ventilation.

### **Availability**

Versamine® C 31 is supplied in 55-gallon drums containing 440 pound net. Shipments are made from Kankakee, Illinois and conveniently located warehouses. Additional information and samples are available from COGNIS Corporation, Coatings & Inks Division, 300 Brookside Avenue, Ambler, PA 19002.

## **Revision-No.**

2-10.2006 Effective October 27, 2006

Subject to appropriate storage under the usual storage and temperature conditions, our products are durable for at least 1 year.

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Suggestions of processing and using our products are given with best knowledge and information but without obligation. COGNIS does not accept any guarantee to the suitability of a product for the user's specific purpose. Furtheron the user himself assumes a liability to follow all legal regulations by using our products. The user can only pass on our sample to third parties with previous assent of COGNIS.



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