

# CRYSTIC<sup>®</sup> VE673

## Vinyl Ester Resin

### Introduction

Crystic VE673 is an epoxy Novolac based vinyl ester resin. Crystic VE673 has outstanding chemical resistance to a wide range of substances (acids, alkalies, oxidising agents, chlorinated media and solvents) at room and elevated temperatures.

### Application

Crystic VE673 is suitable for the fabrication of fibre reinforced composites by all conventional techniques (contact moulding, filament winding, injection moulding) and for use in many chemical processing industry applications (storage tanks, vessels, ducts, scrubbers and chimneys).

### Features and Benefits

Crystic VE673 has a very high heat distortion temperature giving excellent temperature resistance and superior retention of properties characteristics at higher temperatures. Crystic VE673 is especially resistant to chlorinated media, many solvents and petrol.

### Typical Properties

The following tables give typical properties of Crystic VE673.

Property		Liquid Resin
Acid value	mgKOH/g	max. 11
Viscosity at 25°C poise (Brookfield RVT)	mPas	250 ± 50*
Density at 20°C	g/ml	1.06 – 1.07
Colour Gardner		max. 7
Volatile Content	%	36 ± 2
Shelf life (max 25°C)	months	3
Geltime at 25°C using 100g resin, 0.5-1,0g DMA (10% in Styrene) 0.7g Cobalt Octoate (3%Co) 2.0g Butanox LPTJ	minutes	12 – 20*
Time to Peak	minutes	22 – 34
Peak Exotherm	°C	176 – 196
Property		Cured Cast Resin *
Tensile Strength **	MPa	75
Tensile Modulus**	GPa	3.5
Elongation to Break**	%	3
Flexural Strength**	MPa	120
Barcol Hardness **	-	48
HDT***	°C	130 - 135
Water Absorption** : 7 days	mg	60

\*Variants available, on request, designed for improved fabrication.

\*\* Curing Schedule: 24 hrs at 20°C followed by 3 hrs at 80°C.

\*\*\*Curing Schedule: 24 hrs at 20°C followed by 5 hrs at 80°C and then 3 hrs at 120°C.

**NB:** LPT catalyst should be used in order to reduce the possibility of foam formation. Alternatively, 1 – 2 % of Trigonox 239 with 0.8 % Cobalt Octoate (3% Co) can be used. If 1% cobalt is available then an addition of 2.4% will be required.

### **Post Curing**

Satisfactory laminates for many applications can be made from Crystic VE673 by curing at ambient temperature (20°C). For optimum properties and long term performance laminates should be post cured before being put into service. The laminate should be allowed to cure for 24 hours at 20°C and then be oven cured for a minimum of 3 hours at 80°C; the time will be dependent upon the thickness of the laminate. Post curing at 100°C is advisable for high operating temperatures.

### **Chemical Resistance**

Crystic VE673 has excellent chemical resistance to a wide range of substances; (acids, alkalies, oxidising agents) at room and elevated temperatures and is especially resistant to chlorinated media, many solvents and petrol.

Crystic VE673 has been tested extensively for its resistance to different kinds of fuel and is ideal for use as an inner liner for fuel storage tanks. After total immersion in both leaded and unleaded fuels for 500 hours at 45°C or 6 months at ambient temperature, Crystic VE673 based laminates retained over 80% of their flexural properties.

A separate technical leaflet offers the user a comprehensive guide to the use of Crystic VE673 based laminates in a wide variety of chemical environments.

### **Storage**

Resin should be stored in dark. It is recommended that storage temperature should be less than 20°C, but should not exceed 25°C. In addition, it can be recommended that the vinyl ester resin is weekly aerated with dry and oil free air for 30 minutes through dip pipe (Note: this dip pipe should not contain any zinc or copper alloy). This is done to improve efficiency of inhibitor in order to extend the shelf life of the resin.

### **Packaging**

195 Kg resin is supplied in 210 m<sup>3</sup> protected drums, white coloured outside.

### **Health & Safety**

Please see separate Material Safety Data Sheet.

Version 2 : February 2013

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