

CRYSTIC[®] VE676

Vinyl Ester Resin

Introduction

Crystic VE676 is an epoxy bisphenol A based vinyl ester resin. Crystic VE676 has excellent chemical resistance to a wide range of substances (acid, alkalies and oxidising agents).

Application

It 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).

Features and Benefits

Crystic VE676 is less reactive than Crystic VE671 and despite a higher molecular weight and a higher styrene content it has a higher viscosity than Crystic VE671. It has excellent chemical resistance.

Typical Properties

Property		Liquid Resin
Acid Value	mgKOH/g	max. 8.5
Viscosity Brookfield RVT at 25°C	mPas	500 ± 50 *
Colour Gardner		max. 7
Volatile content	%	45 ± 2
Shelf life (max 25 °C)	months	6
Geltime at 25°C using 100g resin 0.5-1.0 g DMA (10% in Styrene) 0.7g Cobalt Octoate (3%Co) 2.0g Butanox LPT	minutes	18 – 25 *
Time to Peak	minutes	30 – 60
Peak Exotherm	°C	145-165
Property		Cured Cast Resin *
Tensile Strength**	MPa	80
Tensile Modulus**	GPa	3.4
Elongation to Break**	%	4 – 5
Flexural Strength**	MPa	125
Barcol Hardness**		45
HDT ***	°C	95 - 100
Water Absorption**: 7 days	mg	35

*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.

Laminate Property	Temperature						
	(°C)	23°C	65°C	93°C	107°C	121°C	149°C
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Flexural Strength	(MPa)	208	198	189	101	34	22
Flexural Modulus	(GPa)	7.6	6.9	5.9	3.4	3.3	1.6
Tensile Strength	(MPa)	152	172	145	124	76	50
Tensile Modulus	(GPa)	9.9	10.2	8.5	6.3	4.3	-
Compressive Strength	(MPa)	185	-	-	-	-	-
Glass Content	(%)	40					
Laminate Construction:		V/M/M/WR/M/WR/M					

V = veil, M = CSM, W = woven roving

Post Curing

Satisfactory laminates for many applications can be made from Crystic VE676 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 VE676 has excellent chemical resistance to a wide range of substances (acids, alkalis, oxidising agents) at room and elevated temperatures. A separate technical leaflet offers the user a comprehensive guide to the use of Crystic VE676 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 dm³ protected drums, white coloured outside.

Health & Safety

Please see separate Material Safety Data Sheet.

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