CRYSTIC® VE 671-03

Vinyl Ester Resin

Introduction
Crystic VE671-03 is a bisphenol A epoxy based, vinyl ester resin.

Applications
Crystic VE671-03 was designed for use in closed mould applications and centrifugal casting processes. It is recommended for the manufacture of fibre reinforced composite tanks, vessels, ducts etc. for use in chemical processing applications.

Features and benefits
Crystic VE671-03 has excellent resistance to a wide range of chemical substances (acid, alkalies and oxidising agents).

Product characteristics

Formulation
Crystic VE 671-03 should be allowed to attain workshop temperature (18°C-25°C) before use. It requires the addition of a catalyst and accelerators to start the curing reaction.

The correct amount of Accelerator G (1% Cobalt) and Acetyl Acetone should be stirred into the resin.
The recommended catalyst for this system is Trigonox 239, which should be added at 2% into the resin and thoroughly dispersed. The geltime can be adjusted by varying the levels of Acetyl Acetone.

N.B. Catalyst and accelerator must not be mixed directly together, as they can react with explosive violence.

Typical properties
The following tables give typical properties of Crystic VE 671-03 when tested in accordance with the appropriate BS, or BS EN IS0 test method.

Property		Liquid resin
Acidic value	mgKOH/g	Max. 8.5
Viscosity Brookfield RVT @ 25ºC	mPas	150-200
Colour gardner		Max. 7
Volatile content	%	53 ± 2
Shelf life (max 25 ºC, in the dark)	Months	6
Geltime @ 25 ºC using: 2% Acc.G & 2% Trigonox 239	Minutes	20-30
Geltime @ 25 ºC using: 2% Acc.G 0.06 % Acetyl acetone & 2% Trigonox 239	Minutes	110

Mechanical properties

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***	ºC	95-100
Water absorption**: 7 days	mg	35

** 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

Laminate property		At different temperature					
Temperature	(°C)	23°C	65°C	93°C	107°C	121°C	149°C
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)	1185	-	-	-	-	-
Glass content	(%)	40					
Laminate construction:		V/M/M/WR/M/WR/M					

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

Post curing
Satisfactory laminates for many applications can be made from Crystic VE671-03 by curing at workshop temperature (20°C). However, for optimum properties and long term performance laminates must be post cured before being put into service. Mouldings 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. Post curing at 100°C is advisable if mouldings are to operate at high temperatures.

Storage
Crystic VE 671-03 should be stored in the dark in suitable closed containers. It is recommended that the storage temperature should be less than 20°C where practical, but should not exceed 30°C.

Packaging
Crystic VE 671-03 is supplied in 225kg drums.

Health & safety
Please see separate Material Safety Data Sheet.

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