CRYSTIC® VE676

Low Viscosity Epoxy Vinyl Ester Resin

Introduction
Crystic VE676 is a low viscosity epoxy vinyl ester resin. It is particularly suitable for contact moulding, filament winding and injection moulding applications. Crystic VE676 has excellent chemical resistance to a wide range of substances.

Formulation
Crystic VE676 requires the addition of an accelerator and a catalyst for curing to take place. A mixture of cobalt and amine catalysts is recommended, as shown in the example in Table 1:

Table 1: Formulation and cure behaviour of Crystic VE676

Formulation	Cure behaviour
100 ml resin 0.5g Accelerator D 2.1g Accelerator G 2.0g Norox® MEKP-925H catalyst	Geltime at 25°C 15-23 minutes Time to peak 30-60 minutes Peak exotherm 145-175°C

Catalyst O should be used in order to reduce the possibility of foam formation.

N.B. Peroxide catalysts are highly reactive and may decompose with explosive violence, or cause fires, if they come into contact with flammable materials, metals or accelerators. For this reason they must never be stored in metal containers or be mixed directly with accelerators.

Versions
Crystic VE676 is available in two preaccelerated versions:
Crystic VE676PA1 has extended geltime but develops cure quickly once it has gelled. It is intended for laminating large structures when extended pot life is an advantage. Table 2 gives typical geltimes at a range of temperatures.

Table 2: Geltimes of Crystic VE676PA1 at varying temperatures.

= Combination not recommended.

Catalyst type		Norox MEKP-925H catalyst		
Catalyst addition		1%	2%	3%
Temperature	15ºC		>2hr	>1.5hr
	25ºC	65	39	31
	35ºC	41	27	

Crystic VE676PA2 has similar gel and cure behaviour to the formulation described in Table 1 above. Table 3 gives the geltimes of this version at varying temperatures:

Table 3: Geltimes of Crystic VE676PA2 at varying temperatures.

= Combination not recommended.

Catalyst type		Norox MEKP-925H catalyst		
Catalyst addition		1%	2%	3%
Temperature	15ºC		39	37
	25ºC	19	16	15
	35ºC	11	9	

Typical Properties
Tables 4 & 5 give the typical properties of liquid and solid Crystic VE676.

Table 4: Characteristics of liquid Crystic VE676

Property	Units	Nominal value
Acid Value	mgKOH/g	8.5
Viscosity at 25°C poise[Brookfield RVT]	centipoise	500±50
Colour	Gardner	7 Max
Volatile content	%	45±2
Shelf Life	mths	6 at 20ºC

Table 5: Characteristics of cured* cast Crystic VE676

Property	Units	Nominal value
Tensile Modulus	GPa	3.4
Tensile Strength	Mpa	80
Barcol Hardness (GYZJ 934-1)		45
Deflection Temperature under load (1.80 MPa)	°C	95-100
Elongation to Break	%	4-5
Water Absorption (7 days)	mg	35

* Post Cure recommendation - 3 hours at 100°C

Table 6 gives the typical laminate properties of Crystic VE676

Table 6: Typical properties of Crystic VE676* laminate. Glass content of 40%, Construction: V/M/M/WR/M/WR/M

Property	Units	Nominal values					
Temperature	ºC	23	65.5	93	107	121	149
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	-	-	-	-	-

* Post cure recommendation : 3 hours at 100°C

Storage
Crystic VE676 should be stored in the dark in suitable, closed containers. It is recommended that the storage temperature should be less than 20ºC where practical, but should not exceed 30ºC. Ideally, containers should be opened only immediately prior to use. Where they have to be stored outside, it is recommended that drums are kept in a horizontal position to avoid the possible ingress of water.

Packaging
Crystic VE676 is supplied in 25kg and 200kg containers.

Health and Safety
Please see the applicable Material Safety Data Sheets, depending on the curing system used.

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Before you use this information, kindly verify that this data sheet is the latest version.

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