CRYSTIC® 921LV

Polyester Resin for Polymer Concrete Castings

Introduction
Crystic 921LV is a un-accelerated, orthophthalic unsaturated polyester resin with a low viscosity to accept the maximum level of filler particles.

Applications
Crystic 921LV has been developed specifically for polymer concrete.

Features and Benefits
- Suitable for both mechanical and hand mixing processes.
- Exhibits excellent wetting of filler particles to achieve the required filler loadings.
- Finished castings have excellent painting and staining properties.

Formulation
Crystic 921LV should be allowed to attain workshop temperature (18°C - 25°C) before use. Crystic 921LV is formulated for room temperature curing applications. It requires the addition of accelerator and then the correct amount of catalyst - Andonox® KP9 catalyst or Norox® MEKP-925H to start the curing reaction. The recommended formulation is given below:

Crystic 921LV	Filled/Unfilled	Gel time at 25ºC	Gel time at 35ºC
100g resin + 0.5% Cobalt 12% + 1.5% Andonox KP9	Unfilled	5 minutes	Not applicable
100g resin + 0.5% Cobalt 12% + 1.5% Andonox KP9	Unfilled	Not applicable	3 minutes
23g resin + 0.5% Cobalt 12% (on rwt) + 77g Kulu 40+ 1.5% Andonox KP9 (on rwt)	77% Kuku 40	6.5 minutes	Not applicable
23g resin + 0.5% Cobalt 12% (on rwt) + 77g Kulu 40+ 1.5% Curox M200 (on rwt	77% Kuku 40	Not applicable	4 minutes

Products made with Crystic 921LV are generally filled with different grades of powdered filler (e.g. calcium carbonate), minimum 50% by weight. Higher amounts may be added but this may require the mould to be vibrated.

Pigment pastes can be mixed with Crystic 921LV, when a specific colour is required.

Table 1: Formulation for room temperature curing of Crystic 921LV.

Component	Parts by weight
Crystic 921LV	100
Andonox® KP9	1.0-3.0
Powdered filler	100-200

The catalyst must be stirred thoroughly into the resin shortly before use. Curing should not be carried out at temperatures below 15ºC. The resin, mould and workshop should be at, or above, 15ºC before curing is carried out. Scott Bader (Pty) Ltd. will not be liable for problems caused by use at lower temperatures than recommended.

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.

Pot Life
The temperature and the amount of catalyst control the gel time of the resin formulation and can be approximately determined from table 2.

Table 2: Geltimes in minutes for Crystic 921LV with 0.5% cobalt 12%:

Temp	Andonox® KP9	
	1 %	1.5%
25° C	8	5
35° C	5	3

Crystic 921LV is formulated for use between 15ºC and 35ºC. It is recommended that workshop temperatures be maintained within this range. At temperatures above 30°C, the gel time even at 1% Andonox® KP9 can be so short that there is insufficient working time to fill the mould. Also, this can cause excessive exotherm which may cause mouldings to crack. In such cases, do not use less than 1% catalyst as this can cause undercure. Rather use Norox® MEKP-925H .

At temperatures below 15°C, the curing reaction can be so slow that there is a high probability of undercure of the resin, even with over 3.0% Andonox® KP9. Do not use more than 3% catalyst as that will not speed up the geltime appreciably or result in a faster cure; in fact it can further retard the cure. Rather warm up the resin and working area so that it is above 15°C.

Typical Properties
The following tables give typical properties of Crystic 921LV.

Property	**Units**	**Liquid Resin**
Colour / Appearance		Pinkish Mauve / Clear
Acid Value	mgKOH/g	21
Non Volatiles	%	58
Viscosity at 25°C using Brookfield RVT at 100rpm	cPs	290
Stability at 25°C	Months	3
Geltime with 0.5% cobalt 12% using 1% Andonox® KP9 at 25°C	minutes	8
Property	**Units**	**Fully Cured* Resin (unfilled casting)**
Barcol Hardness (Model GYZ 934-1)		14
Water Absorption 24 hours at 23°C	mg	33.5
Deflection Temperature under load† (1.80 MPa)	°C	40.4
Elongation at Break at 20°C	%	14.0
Tensile Strength	MPa	26.5
Tensile Modulus	MPa	1085
Flexural Strength	MPa	41.3
Flexural Modulus	MPa	1060
Impact-Charpy	KJ/m^2	12.12

* Curing Schedule. 24 hrs at 20°C, 3 hrs at 80°C
† Curing Schedule. 24 hrs at 20°C, 5 hrs at 80°C, 3 hrs at 120°C

Storage

Crystic 921LV 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. Ideally containers should be opened only immediately prior to use.

Packaging

Crystic 921LV is supplied in 25kg, 225kg and 1125kg intermediate bulk containers.

Health and Safety

Please see separate Material Safety Data sheet(s).

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