

# CRYSTIC<sup>®</sup> D3846SA

## Isophthalic Resin for Pipe Relining

### Introduction

Crystic D3846SA is a thixotropic, non accelerated, isophthalic unsaturated polyester resin with low exotherm.

### Application

Crystic D3846SA has been specially developed for the production of liners to be used in the pipe relining (CIPP or Cured-In-Place-Pipe) industry. Fully cured laminates offer high chemical resistance and mechanical properties, together with excellent long term property retention.

### Features and Benefits

Features	Benefits
High HDT	Excellent mechanical properties
High molecular weight	Excellent resistance to water ingress
High elongation	Excellent impact resistance
Low exotherm	Prevents distortion of heat sensitive plastic liner

Crystic D3846SA is also available as a high viscosity version, Crystic D3846SAHV.

### Chemical Resistance

Crystic D3846SA has equivalent chemical resistance to Crystic 272 or Crystic 491PA. These resins have been evaluated in contact with many commonly encountered chemical environments. Maximum safe exposure temperatures for these are given in Scott Bader's "Safe Chemical Containment" brochure. Alternatively, contact our technical service department.

### Formulation

The following formulation is recommended for hot curing (80 – 85°C):

Crystic D3846SA	100 parts
Perkadox <sup>®</sup> 16 or equivalent (di-(4-tert-butyl-cyclohexyl)peroxydicarbonate)	0.5 parts
Trigonox <sup>®</sup> 42S or equivalent (tert-butylperoxyisononanoate)	0.5 parts

The following formulation is recommended for cold curing (25°C) but can be used in conjunction with heat curing:

Crystic D3846SA	100 parts
BP75W or equivalent (75% dibenzoyl peroxide powder, water damped)	1-3 parts
Crystic Accelerator D (10% dimethylaniline in styrene)	1-3 parts

Perkadox<sup>®</sup> and Trigonox<sup>®</sup> are trademarks of AKZO Chemie.

### Geltime

The ambient temperature, the quantity and the type of catalyst will control the gel time of the resin. The geltime of Crystic D3846SA with the formulation described above at 82°C is 30 to 60 seconds.

Geltimes ranging from 10 minutes to 3hrs can be obtained by adjusting the amounts and ratios of BP75W to Crystic Accelerator D. Users are advised to carry out their own trials before use.

### Additives

Since certain pigments, fillers or extra styrene may affect properties of Crystic D3846SA their effect should be evaluated before addition to the formulation.

## Typical Properties

**Table 1:** Typical properties of liquid Crystic D3846SA.

Property	Units	Crystic D3846SA	Crystic D3846SAHV
Appearance		Cloudy, pale green	
Viscosity at 25°C Brookfield RVT at 100rpm	centipoise	570	3400
Thixotropic index	ratio	2.8	3.2
Stability at 20°C	months	6	6
Geltime at 25°C using 1% BP75W and 2% Crystic Accelerator D	minutes	45	45

**Table 2:** Typical properties of Crystic D3846SA fully cured\* resin (unfilled casting)

Property	Units	Nominal value
Barcol Hardness (GYZJ 934-1)		45
Deflection Temperature under load † (1.80 MPa)	°C	75
Water Absorption 24hrs at 23°C	mg	16
Volumetric shrinkage	%	7.5
Flexural strength	MPa	86
Flexural modulus	MPa	3600
Tensile Strength	MPa	75
Tensile Modulus	MPa	3500
Elongation at Break	%	3.8

\*Curing schedule - 24hrs at 20°C, 3hrs at 80°C

†Curing schedule - 24hrs at 20°C, 5hrs at 80°C, 3hrs at 120°C

**Table 3:** Mechanical properties of impregnated felt, thickness 3 mm using Crystic D3846SA

	Unit	Unfilled Resin	Filled Resin 25% Martinal ON 310
Tensile Strength	MPa	31	29
Tensile Modulus	MPa	3750	4700
Flexural Strength	MPa	64	54
Flexural Modulus	MPa	2850	3700

**Storage**

Crystic D3846SA 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. Where they have to be stored outside, it is recommended that drums be kept in a horizontal position to avoid the possible ingress of water. Wherever possible, containers should be stored under cover. Crystic D3846SA should be continuously stirred to avoid sedimentation during the storage period.

**Packaging**

Crystic D3846SA is supplied in 25kg kegs, 225kg drums, and 1125kg intermediate bulk containers. Bulk supplies can be delivered by road tanker.

**Health and Safety**

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

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