Crestafire®
FST Performance Products

Crestapol® 1211A

INTRODUCTION

Crestapol® 1211A is a filled, partially accelerated, tough, urethane acrylate resin designed for applications requiring the highest levels of fire & smoke performance. It incorporates a selected grade of Alumina Trihydrate (ATH) which makes it suitable for the production of laminates where excellent fire resistance and low levels of smoke & toxic fumes are required. Crestapol® 1211A is halogen free and does not contain heavy metals.

APPLICATIONS

Crestapol® 1211A has been primarily designed for use in closed mould applications, including RTM and Vacuum infusion with suitable reinforcements. Due to its excellent fire, smoke & toxicity properties, the product can be used in the most demanding applications in the building and construction, public transport and railway industries.

KEY FEATURES AND BENEFITS:

- Low viscosity
- Rapid cure
- Excellent toughness
- No post cure required
- Pre-filled with a special grade of Alumina Trihydrate (ATH)
- Excellent surface finish
- Excellent FST performance

Crestapol® 1211A is a versatile resin with excellent fire, smoke & toxicity properties and good mechanical properties. Its viscosity characteristics have been designed to promote a good resin flow through the mould using appropriate reinforcements, whilst minimising filler settlement during storage. It is recommended for use when excellent low smoke, low toxic fume emissions and fire resistant laminates is desired.

FORMULATION

Crestapol® 1211A is a pre-filled, partially accelerated resin and must be thoroughly stirred and allowed to attain workshop temperature (18°C - 23°C) before use. It requires the addition of a catalyst and one accelerator to start the curing reaction.

N.B. Catalyst and accelerators should not be mixed directly together, since they react with explosive violence.

The recommended catalyst is MEKP (50%) and the recommended accelerator is Accelerator G (1% solution of cobalt, as cobalt octoate, in styrene monomer). Cobalt free accelerators may be also considered (for more details on liquid cobalt free cure systems please seek assistance from our Technical Services Department). The accelerator should be added into the resin and thoroughly dispersed prior the injection of the resin in the RTM mould cavity. Catalyst Acetylacetone peroxide can also be used when faster demould times is required. Dibenzoyl peroxide based catalysts can also be used to start the curing reaction without the need to add an accelerator. The recommended catalyst is Dibenzoyl peroxide (50%) and should be added into the resin at a level of 1.0% and thoroughly dispersed.

The geltimes that can be achieved depend on the levels of accelerator and catalyst. Examples of approximate pot life are shown in the tables below.

POT LIFE

Table 1 – 1.5% MEKP (50%)

Parts of Accelerator G to 100 Parts of Catalysed Resin	2.0	2.5	3.0
Pot life (mins) at 20°C	26.1	21.7	22.7
Pot life (mins) at 25°C	24.7	19.8	19.2

Table 2 – 1.5% Acetylacetone peroxide

Parts of Accelerator G to 100 Parts of Catalysed Resin	2.0	2.5	3.0
Pot life (mins) at 20°C	29.6	19.4	16.4
Pot life (mins) at 25°C	24.3	16.9	13.4

Accelerator G = 1% cobalt as cobalt octoate in styrene monomer.

Table 3 – Dibenzoyl peroxide (50%)

Parts of Perkadox® CH50-X	1.0	1.5	2.0
Pot life (mins) at 20°C	29.5	23.8	17.0
Pot life (mins) at 25°C	25.5	16.5	12.7

Inhibitor NLC-10 can be used at ambient temperature to lengthen the geltime of a mixture of Crestapol® 1211A/ Dibenzoyl peroxide (50%). The following table demonstrates the effect of Inhibitor NLC-10 addition to Crestapol® 1211A resin.

Inhibitor NLC-10 (on Resin)	Typical Geltime (mins) at 20°C
0.00%	25.5
0.05%	42.4
0.10%	60.9
0.15%	88.7

ADDITIVES

Crestapol® 1211A is filled with a special grade of Alumina Trihydrate (ATH) to provide good resin flow in closed mould systems and also give excellent fire, smoke & toxicity properties. It incorporates anti-settling additives to minimise filler settlement during storage and promote good filler re-dispersion in the resin.

POST CURING

Without post cure, laminates made with Crestapol® 1211A can reach approximately 90% of their total cure. Therefore, no post cure is required. For optimum fire retardant properties, however, 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 3 hours at 80°C.

PHYSICAL DATA – UNCURED

The following tables give typical properties of Crestapol® 1211A when tested in accordance with the appropriate SB, BS, BS EN or BS EN ISO test methods.

Property	Unit	Crestapol 1211A
Appearance	-	Cream
Viscosity at 25°C, 4500s-[1]	Poise	5
Specific Gravity at 25°C	-	1.54
Volatile Content	% wt./wt.	22.3
Stability from date of manufacture when stored in accordance with storage recommendations	Months	3
Geltime*	Minutes	20 - 30
Geltime to Peak	Minutes	10

*With 1.0% Dibenzoyl peroxide (50% at 25°C

PHYSICAL DATA – CURED

Property	Unit	Resin (without post-cure)
Barcol Hardness	-	45 - 50
Deflection Temperature Under Load (1.80MPa)	°C	64
Water Absorption 24hrs @ 23°C	mg	15 - 20
Tensile Strength	MPa	32
Tensile Modulus	GPa	8.0
Elongation at Break	%	0.82
Property	**Unit**	**C.S.M* (not post-cured laminate)**
Glass Content	%	15
Tensile Strength	MPa	78
Tensile Modulus	GPa	11.4
Elongation at Break	%	1.35
Flexural Strength	MPa	158
Flexural Modulus	GPa	9.4
Property	**Unit**	**Fully Cured Resin****
Barcol Hardness	-	45 - 50
Deflection Temperature Under Load (1.80MPa) †	°C	77
Water Absorption 24hrs @ 23°C	mg	15 - 20
Tensile Strength	MPa	33
Tensile Modulus	GPa	7.9
Elongation at Break	%	0.89

Property	Unit	C.S.M* (fully cured laminate)
Glass Content	%	15
Tensile Strength	MPa	77
Tensile Modulus	GPa	10.1
Elongation at Break	%	1.48
Flexural Strength	MPa	141
Flexural Modulus	GPa	8.6

* Made with 4 layers 450g/m2 PB CSM

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

† Curing schedule – 24hours at 20°C, 5 hours at 80°C, 3 hours at 120°C

STORAGE

Crestapol® 1211A should be stored between 5°C and 25°C in the original, unopened container in a dry, well ventilated place. Protect from freezing and direct sunlight. Avoid contact with oxidising agents. If stored outside of these recommendations, shelf life will be significantly reduced.

PACKAGING

Crestapol® 1211A is supplied in 25kg and 300kg containers.

HEALTH & SAFETY

Please see separate Materials Safety Data Sheet.

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