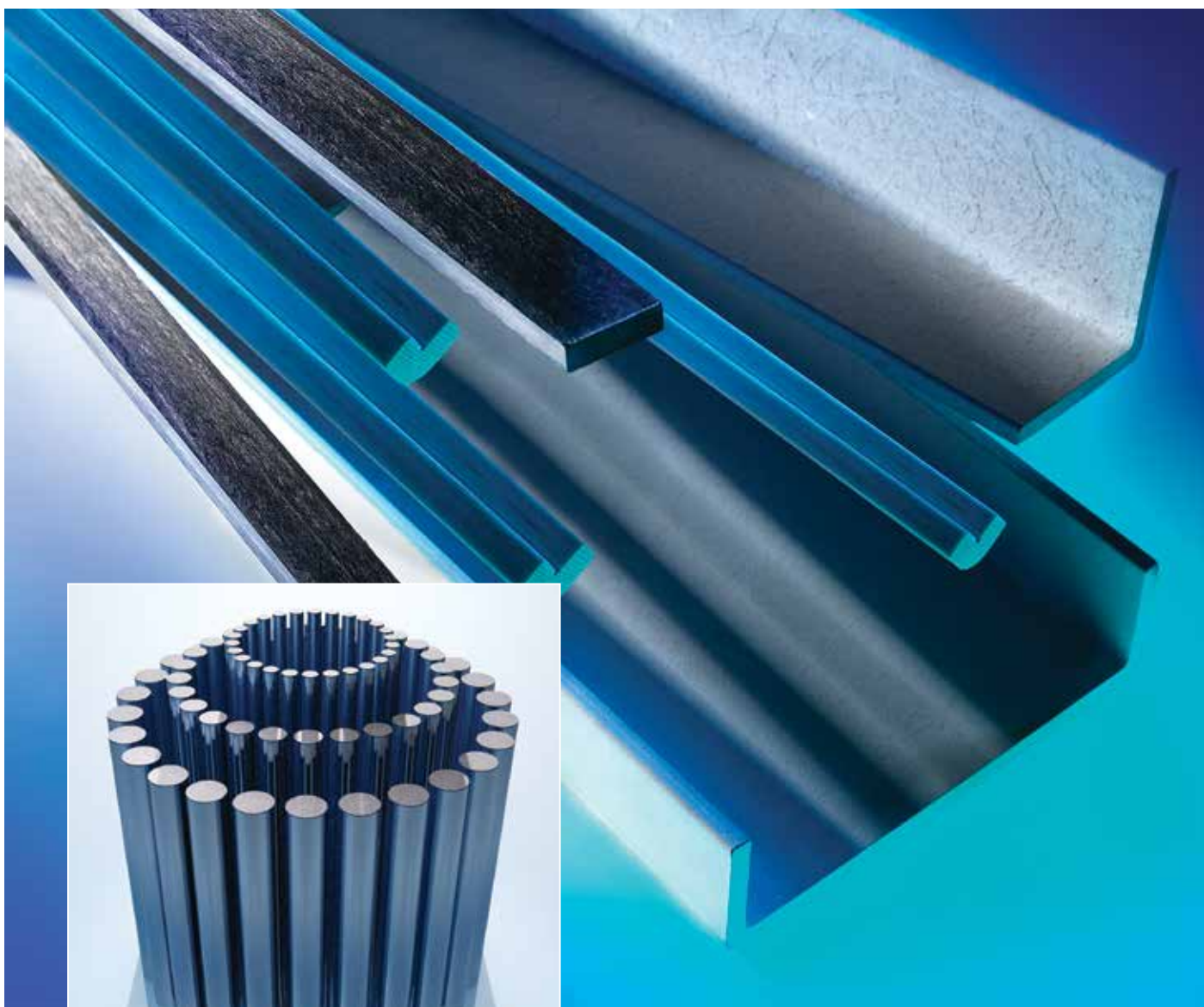




WE THINK
INNOVATION

Crestapol®
Resin Systems
for Pultrusion



CRESTAPOL is a very low viscosity, methacrylate-based thermosetting resin, developed for use in pultrusion in conjunction with high levels (up to 200phr) of alumina trihydrate (ATH) fire retardant filler to produce profiles with excellent low smoke, low toxicity fire performance.

CRESTAPOL 1212 and 1214 use standard initiators and additives associated with pultrusion, and can be processed on standard pultrusion equipment without modification.

CRESTAPOL 1214 is a modified urethane acrylate resin which gives a high quality surface finish and very low shrink. Crestapol 1214 has undergone repeated flexural, torsion, flammability and electrical testing to a variety of British Standards (BS) and National Coal Board (NCB) approvals, and European and BS fire standards.

FEATURES

■ HIGH REACTIVITY

Offering the potential for high line speeds compared to other typical thermosetting resins.

■ MECHANICAL PERFORMANCE

The inherent “toughness” of the cured resin matrix results in profiles exhibiting excellent mechanical performance despite the presence of high levels of filler.

■ PIGMENTABLE

1212 is pigmentable and fully compatible with polyester pigment pastes.



The following tables give typical properties of Crestapol 1212 and 1214 when tested in accordance with BS2782.

LIQUID PROPERTIES

Property	Unit of Measurement	Crestapol 1212
Appearance		Clear yellowish brown
Viscosity @ 25°C 4500 sec-1	Poise	0.7
Density @ 25°C	gcm ⁻³	1.07
Volatile Content	%	49
Stability in the dark @ 20°C	months	>6

MECHANICAL PROPERTIES

Resin cast sheet properties (non-reinforced)

Property	Unit of Measurement	Fully cured resin*
Barcol hardness		43
Deflection Temperature under load (1.80MPa)#	°C	92
Tensile strength	MPa	64
Tensile modulus	GPa	2.7
Elongation at break	%	5.1

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

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

MECHANICAL PROPERTIES OF PULTRUDED PROFILES

Crestapol 1212 filled with Alumina Trihydrate (175phr) 48% wt/wt glass (CFM/ roving/ CFM)

Property	Unit of Measurement	Pultrusion profile
Tensile strength	MPa	405
Tensile modulus	GPa	30.0
Extension to break	%	1.70
Flexural strength	MPa	490
Flexural modulus	GPa	17.5

LIQUID AND MECHANICAL PROPERTIES OF 1214 – MECHANICAL PROPERTIES RELATE TO PULTRUDED PROFILES

Property	Unit of Measurement	Crestapol 1214
Viscosity, ICI cone and plate	Poise	1.4
Density @ 25°C	g/cm ³	1.09
Gel time,* 66°C - 88°C	Mins	16
Gel time,* 66°C - peak exotherm	Mins	18
Peak exotherm temperature	°C	175
Flexural modulus**	GPa	49.1
Flexural strength**	MPa	1014
Flexural extension to break**	%	2.10

* SPI gel test at 82°C, 2% Perkadox CH50X

** Tested to BS7861-1:2007

Pultrusion Guidelines

Typical Formulation

Crestapol 1212 and 1214	100 pbw
ATH *	100 – 200 pbw
BYK W996 #	3 – 6 pbw
Trigonox C †	1 pbw
Perkadox 16 † (dispersed in mma or styrene solvent)	0.5 pbw 1.0 pbw
Internal release agent added @ 1 pbw on total resin + filler ‡	1- 3 pbw
Pigment (if required)	2 – 5 pbw
Die temperature: (First section unheated to prevent gellation at die entrance)	140°C
Start up	approx 0.2 metre/minute

It is recommended starting up with dry rovings in the die, then gradually increasing the wet-out of the rovings thus allowing simultaneous build-up of cured resin in the area of the pullers, thus ensuring grip is always adequate. (It is essential to ensure that there is never a situation of fully cured profile in the die and dry rovings in the gripper).

* A suitable grade of ATH used for pultrusion, or equivalent product with a median particle size of 2 microns.

Registered trademark of BYK-Chemie GmbH

† Perkadox and Trigonox are trademarks of Akzo Nobel Chemicals

‡ INT-PUL 341 is produced by Axel Plastics Research Laboratories, Inc.

Fire Performance

Crestapol's fire performance is achieved by the addition of aluminium trihydrate (ATH). Due to the inherent low viscosity of Crestapol Resins up to 200 phr of ATH can be incorporated to achieve a range of stringent fire, smoke & toxic fume standards. For example, 170phr ATH can achieve M1, F0 to the French Epiradeatuer standards.

Fire performance will also be dependent on glass content and profile thickness. Please contact Scott Bader Technical Services Dept for advice on ATH loadings for specific applications.

Fire requirement	Minimum ATH loading	Results
French NFP 92-501	170	M1
French NFF 16-101	170	F0
DIN 5510	100	S4/SR2/ST2
ASTM 162	100	Is = 10 (limit <35). Meets Federal Railroad Admin requirements for surface flammability
ASTM 662	100	Ds (max) = 119 Ds(1.5) = 1 Ds max 4 = 4
ASTM E84	165	smoke index 110, flame index 15
ISO 5658-2	200	HL2
ISO 5659-2	200	HL2
ISO 5660- 1&2	200	HL2

Full line speed

Once fully cured profile has reached the grippers, line speed can be steadily increased. Actual speed attainable will be determined by the complexity of the profile and the maximum pulling force of the machine. If, however, running is constrained by undercure, the levels of initiators may be increased, up to a maximum of 2.0% Trigonox C + 1.0% Perkadox 16. Please contact Scott Bader Technical Service Department for further guidance.

Health and Safety

Refer to MSDS



Crestapol® 1212 Fracture Toughness



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All information correct at time of printing.



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