

CRESTOMER[®]

Urethane Acrylate Structural Adhesives



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Crestomer® structural adhesives are used in a wide range of demanding applications in a variety of markets.

The key features and benefits for customers are:

- ▶ Structural adhesives
- ▶ Considerable weight savings versus traditional GRP joining techniques
- ▶ Excellent impact and fatigue performance
- ▶ Low VOC emissions

Stronger, Lighter, Quicker, Tougher.

A Record Of Achievement

The Crestomer® pedigree was established over 40 years ago. The first commercial application for Crestomer® adhesive was in the manufacture of minehunters. The unique properties of Crestomer® ensured peel and crack resistance was significantly improved. Crestomer® is the only successful material specifically designed to meet this demanding application.

Challenging Mindsets

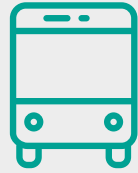
Crestomer's outstanding performance record and unique properties have fundamentally challenged conventional thinking among moulders, who have been sceptical of the performance possibilities with adhesives. Freed from the constraints of traditional fabricating techniques, FRP moulders are now capitalising on the design flexibility, time and cost savings that structural adhesives can offer. Crestomer® is now used in a wide range of demanding applications across the marine, transport, building and construction sectors within the FRP industry.



Chemistry and Bonding



Marine
from kayaks to
super yachts



Land & transportation
buses, coaches, cars,
trains and trucks



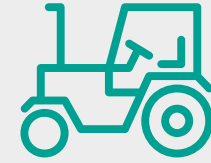
Building & construction
doors, windows
and cladding



Wind energy
blades, housing
and nacelles



Recreational vehicles
motorhomes
and caravans



Agricultural vehicles
tractors, diggers, off-road
and combine harvesters

Crestomer[®] Dispensing Equipment

- ▶ The Crestomer[®] Advantage 10/30/60 cartridges can be applied using a manual or pneumatic gun. Suitable manual and pneumatic guns plus static mixers are available to purchase from Scott Bader.
- ▶ Crestomer[®] adhesives can be dispensed directly from pails and drums using a manual or automated dispensing machine/ putty gun.
- ▶ Scott Bader technical support can provide advice on appropriate dispensing equipment.



Product Range Overview

Crestomer® Product	Description	Approvals	Appearance	*Gel time (mins)	**Fixture time (hours)	Tensile strength (MPa)	Tensile modulus (MPa)	Elongation at break (%)	Performance characteristics
1150PA	High performance structural adhesive with shorter fixture time	N/A	Mauve Gel	*50	**5	25	1000	100	Structural adhesive for demanding applications on smaller components
1151A	Adhesive for bulk application Amine accelerated	Lloyds, DNV	Green/ Yellow Gel	***25	**2.5	22	500	>100	Structural adhesive for demanding applications
1152PA	High performance structural adhesive	Lloyds, DNV, RINA	Mauve Gel	*50	**10	26	1400	100	Structural adhesive for demanding applications
1153PA	High performance structural adhesive with long open time	Lloyds, RINA	Mauve Gel	*90	**8.5	23	500	115	Long gel time structural adhesive for demanding applications on large components
1186PA	Multi-purpose structural adhesive	Lloyds	Grey Paste	*50	**5.5	14	800	6	High strength gap filling adhesive
1196PA	Structural core bonding adhesive	Lloyds, DNV	Pink Paste	*50	**6.5	20	1300	4	Low density adhesive specifically developed for demanding core bonding applications
Crestomer® Advantage 10	High performance structural adhesive for bonding a wide range of substrates	N/A	White Paste	10	**1.2	20	920	>85	High performance structural adhesive with excellent adhesion and gap filling capabilities
Crestomer® Advantage 30	High performance structural adhesive pre-packed in cartridges	Lloyds, DNV, RINA	White paste	30	**2.5	15	340	>85	High performance structural adhesive for convenience and flexibility
Crestomer® Advantage 60	High performance structural adhesive with minimal surface preparation	Lloyds, DNV, RINA	White paste	60	**3	22	400 - 600	>100	High performance structural adhesive with high elongation at break

*2% Butanox® M-50 at 25°C **Time taken at 23°C to achieve 1.4MPa strength in lap-shire tests according to BS ISO 4587 ***2% Perkadox® BT-50 at 25°C

Packaging and equipment

The Crestomer® range is available in kegs (pails) with some products also supplied in drums. Crestomer® Advantage 10/30/60 is packed in 380ml cartridges. Manual and pneumatic guns plus static mixers are also on the product range.

Bond Strengths With Different Substrates

Crestomer® can be used to bond many substrates. The following tables give typical examples of bond strengths and types of failure mode observed when bonding various substrates with different products from the Crestomer® range. All figures shown are for lap shear strengths (MPa).

Crestomer® 1152PA

Results achievable with Crestomer® Advantage and Crestomer® 1153PA are similar to those shown right



	FRP	Marine Ply	Aluminium*	Stainless Steel*
FRP	10	-	-	-
Marine Ply	-	5	-	-
Aluminium	-	-	15	-
Stainless Steel	-	-	-	12

Crestomer® 1186PA

	FRP	Marine Ply	Aluminium	Stainless Steel
FRP	10	-	-	-
Marine Ply	-	5	-	-
Aluminium	-	-	10	-
Stainless Steel	-	-	-	8

Crestomer® 1196PA

	Balsa	PVC Foam (80kg/m3)
FRP	10	6

Substrate failure 
 Cohesive failure 

*Requires surface preparation

Fillet joints constructed using Crestomer® 1152PA are stronger and aesthetically superior to FRP laminated joints as well as being quicker to manufacture and giving far lower styrene emission.

There are three different ways in which a joint can fail.

Substrate failure

indicates that the adhesive is stronger than the materials being bonded together.

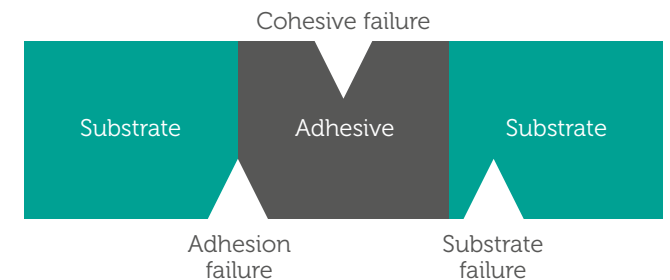
Cohesive failure

is a failure of the bulk adhesive itself and is characterised by a film of adhesive being left on both sides of the failed joint.

Adhesive failure

occurs in the bond line between the adhesive and substrate and is characterised by the film of adhesive being left on one side of the failed joint.

Adhesive failure modes



Comparisons With Competitive Materials

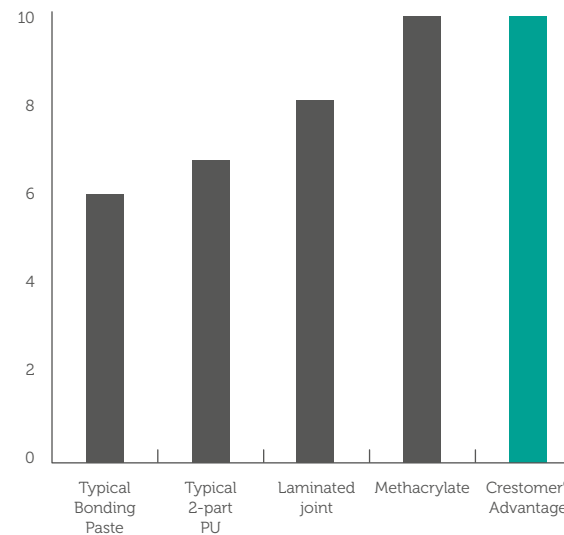
Crestomer® adhesives are one of a wide variety of materials that can be used in bonded assemblies. Compared to other adhesives, Crestomers offer the following benefits:

- ▶ Monomer type identical to polyester resins
- ▶ Cured with conventional peroxides
- ▶ Low exotherm during cure
- ▶ Available in a range of gel and fixture times
- ▶ Ease of application
- ▶ Cost effective

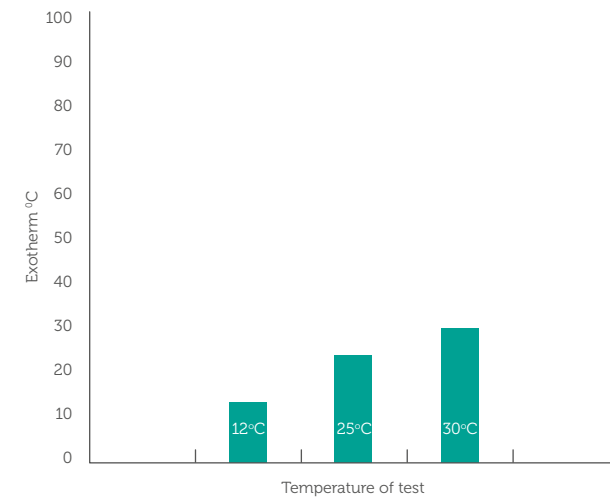
High exotherm in an adhesive can cause the substrate to distort and give poor aesthetic characteristics to the parts being bonded. The chemistry of Crestomer® adhesives ensures that high exotherm temperatures, a characteristic of some other adhesives do not occur. The graph shows the exotherm temperatures of Crestomer® adhesives over a range of test temperatures.



FRP to FRP bond strength

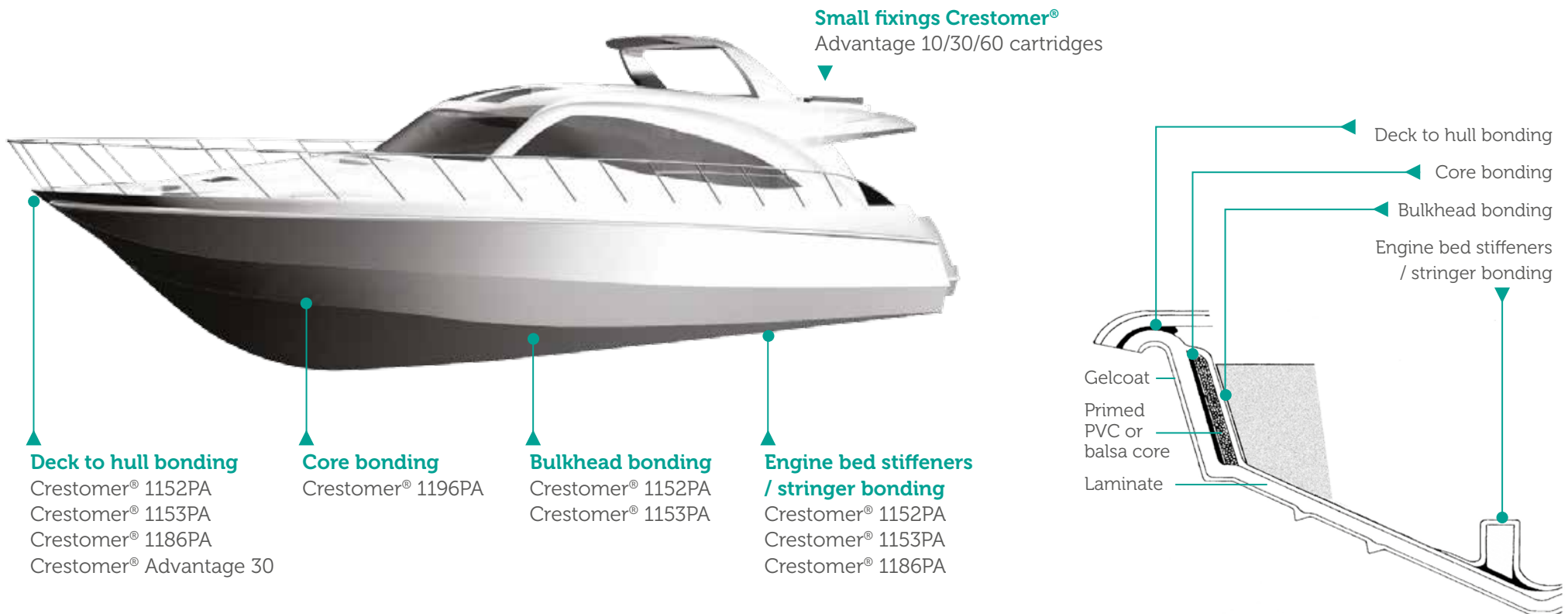


Exotherm of Crestomer® adhesives



Crestomers In Action

Crestomer® products have been successfully used by leading European boatbuilders to improve the performance of their products, to make productivity improvements through time savings in construction and to provide considerable weight savings. The following diagram shows areas where Crestomer® structural adhesives can be used in FRP boatbuilding.





Making a **positive** difference

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ADHESIVES

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