

## Key Features

- Very clear and UV resistant
- Expels trapped air
- Fast curing
- Tough and hard wearing
- Excellent mechanical properties

## Product Description

XCR<sup>TM</sup> is an extreme performance, high clarity epoxy developed for demanding visual applications including carbon fibre skinning, board manufacture and wood finishing. XCR<sup>TM</sup> is intended for use where laminates will remain unpainted, showcasing reinforcements like carbon fibre or natural fibres, inlaid graphics or beautiful wood grains.

To ensure the perfect finish, XCR<sup>TM</sup> uses special technology to enhance fibre wet-out and expel trapped air. Its fast cure allows multiple layers to be built-up in minimum time, significantly speeding up 'skinning' processes requiring multiple coats.

XCR<sup>TM</sup> will cure to a hard, durable, UV resistant finish which can be flatted and polished to a high gloss or over-painted with a suitable clear coat/lacquer. The resin offers excellent cured mechanical properties making it suitable for use laminating or finishing sports/recreational equipment like skis, boards or boat decking.

XCR<sup>TM</sup>'s distinctive 'purple' colour is due to the advanced UV protection agents used in the resin. Once mixed with its hardener this colour diminishes and when used as directed as a thin coating, the tint is barely detectable and in fact enhances the appearance of fibres (such as carbon fibre) and inlaid graphics. Once cured, XCR<sup>TM</sup> needs to be flatted using abrasive paper and then polished using a cutting/polishing compound to achieve a high gloss finish.

XCR<sup>TM</sup> is NOT intended as a coating resin for artwork. For particularly colour-sensitive projects requiring a self-levelling 'pour and leave' finish like this, specialist ArtResin<sup>®</sup> should be used.

## Recommended Uses

- Carbon fibre 'skinning'
- Wood coating / deck finishing
- Surfboard/sailcraft building
- R/C aircraft wing skinning
- Ski/snowboard finishing

## Process Specific Information

### Carbon Fibre Skinning

Overlaying carbon fibre or decorative reinforcements over existing parts like interior trim or even exterior vehicle panels is a skilled but much in-demand process. XCR<sup>TM</sup> addresses the long-standing challenges of air entrapment, clarity, UV stability and cure time between stages head-on with a unique combination of properties designed to deliver stunning, reliable results in the shortest possible time.

### Overlaminating with Other Materials

In the same way that XCR can be used to apply a glossy, hard wearing 'skin' of carbon fibre to any part, it can also be used to apply a durable, glossy layer of almost any fabric or material to a wide range of objects including furniture, interior trim or even music instruments. Materials including natural fibres (coconut mat, coffee sacks, flax), fabrics (denim, printed fabrics) and technical materials can all be used to create stunning, unique surfaces to a wide range of objects.

### Board Building and General Laminating

Not only does XCR<sup>TM</sup> provide a clear, vibrant finish to a range of reinforcements and substrates, it also has excellent mechanical properties comparable to most structural laminating epoxies and so can be used as a clear, UV stable laminating resin in conjunction with reinforcements like carbon fibre, glass fibre and natural reinforcements like flax and jute.

Its hard-wearing, fast curing properties make XCR<sup>TM</sup> ideal for a range of 'hot-coating' processes such as laminating EPS cores for surfboard manufacture. XCR<sup>TM</sup> is entirely solvent and styrene free and will not attack or affect EPS foam. Once fully cured, XCR<sup>TM</sup>'s advanced mechanical properties offer excellent strength and damage tolerance.

The clarity and UV stability of the resin further enhance inlaid graphics or the natural appearance of the reinforcements used. When used in conjunction with appropriate grades of glass reinforcement, XCR<sup>TM</sup> can produce a laminate of excellent clarity.

### Coating Wood

XCR<sup>TM</sup> has outstanding properties when used to preserve, protect, strengthen and enhance wooden surfaces. When applied to wood surfaces such as boat decking, traditional skis and boards or furniture, XCR<sup>TM</sup> can be used to create a hard-wearing protective layer which can be flatted and polished to a deep, glossy finish.

## Instructions for Use

XCR™ is a chemical product for professional use. It is essential to read and understand the safety and technical information before use.

Follow the guidelines for safe use outlined in the SDS which include the use of appropriate hand and eye protection during mixing and use.

### Mix Ratio

#### Mix Ratio 3:1 by Weight

XCR™ Epoxy Coating Resin should be mixed with XCR Epoxy Coating Hardener at a ratio of 3 parts of resin to 1 part of hardener, by weight.

#### Mix Ratio 5:2 by Volume

If you would prefer to mix by volume then the mix ratio should be adjusted to 5 parts resin to 2 parts hardener, by volume.

When working with any epoxy resin, it is essential to mix the resin and hardener exactly at the correct mix ratio. Failure to do so will result in a poor or only partial cure of the resin, greatly reduced mechanical properties and possibly other adverse effects. Under no circumstances add 'extra hardener' in an attempt to speed up the cure time; epoxies do not work in this way.

Mix Ratio Examples		
Total	Resin	Hardener
25g	19g	6g
50g	37g	13g
75g	56g	19g
100g	75g	25g
150g	113g	37g
200g	150g	50g
300g	225g	75g
400g	300g	100g
500g	375g	125g
750g	563g	187g
1kg	750g	250g
1.5kg	1125g	375g
2kg	1500g	500g

### Mixing Instructions

XCR™ is a highly reactive (fast curing) resin system. Only weigh out and mix as much resin as you can use in 10 minutes.

Weigh or measure the exact correct ratio of resin and hardener into a straight sided container. Using a suitable mixing stick begin to mix the resin and hardener together to combine them completely.

Spend at least one minute mixing the resin and hardener together, paying particular attention to the sides and base of the container. Remember: Any resin that has not been thoroughly combined with hardener will not cure.

Once you have finished mixing in one container, it is good practice to transfer the mixed resin into a second container and undertake further mixing of the resin using a new mixing stick. Doing so will eliminate the risk of accidentally using unmixed resin from the bottom or sides of the container.

### Pot-Life / Working Time / Cure Time

XCR™ is a highly reactive resin system and once the resin has been mixed with the hardener, the reaction will start to give off heat (exotherm) which will further accelerate the cure of the resin, especially when the resin is in the mixing pot. Transfer the resin from the mixing pot onto the part as soon as possible to extend the working time and avoid the risk of uncontrollable rapid cure in the mixing pot.

As with all epoxies, the pot-life/working time will vary significantly depending on the ambient temperature, the starting temperature of the resin and hardener and the amount of resin mixed.

XCR can be used in ambient temperatures between 15°C (59°F) and 30°C (86°F). For best results, an ambient temperature of at least 20°C (68°F) is recommended. Ensure that both resin and hardener containers are within this temperature range before use.

The table below gives an indication of pot-life and cure properties at a range of different ambient temperatures.

	Mixed Resin and Hardener			
	15°C (59°F)	20°C (68°F)	25°C (77°F)	30°C (86°F)
Pot-Life - 500g Mixed	45mins	33mins	23mins	16mins
Overcoat Time	2:30	1:40	1:30	1:15
Initial Cure*	4:30	3:40	2:50	2:10

Time shown in Hrs:mins

### Overcoating (Building Up Layers)

When using XCR™ for carbon fibre 'skinning' or to build up a thick coat of resin over any part or material it is recommended that subsequent layers of resin are applied once the previous application has firmed up but before it reaches its 'tack-free' stage. Applying additional layers at this 'overcoat time' (or 'B stage') means that they can be applied without any surface preparation and that they will bond chemically to the still tacky layer underneath.

The table above indicates the approximate 'overcoat time' when a new layer of resin should be applied over the previous layer although you should check the status of the cure beforehand. If the resin feels firm but still tacky, this is the right time to overcoat.

If the resin exceeds the 'overcoat time' and reaches its 'tack-free' point then it cannot be over-coated without first allowing it to cure for at least 12hrs (at 25°C) and then keying the surface with an abrasive paper to facilitate a mechanical bond between the original and new resin layers.

See notes below for important advice relating to post-curing of 'skinned' parts.

### Full Cure / Post-Cure

As with most epoxy systems, where parts cure in normal ambient temperatures, full cure is not reached for several days. Although parts will be handleable after around 12hrs (at 25°C), full mechanical properties will take at least 14 days to develop in (at 25°C). Where possible, avoid exposing the cured resin to full service rigours for at least this time.

To achieve full mechanical properties, a higher heat deflection temperature and a harder, more colour-stable laminate, an elevated temperature post-cure is highly recommended. During post-cure, the resin will initially soften before it hardens further and so it is recommended to leave moulded parts in their mould during post cure to ensure that they are fully supported. Skinned or over-laminated parts will not require supporting during post-cure.

Having allowed the laminate to cure fully at room temperature for at least 24hrs, post cure for 16hrs at 50°C (or longer at lower temperatures) to achieve full properties.

### Post-Curing Skinned or Over-laminated Parts

When following the 'skinning' process of over-laminating parts with carbon fibre or other reinforcements, it is STRONGLY recommended to post-cure parts BEFORE flattening and polishing them as post-curing will cause some sinking of the resin surface.

Once post-cured, this fully cured surface can be flattened and polished for a perfect durable finish.

## Mechanical Properties

### Cured Resin Properties

	Units	Ambient Cured	Post Cured
Tg (DMTA)	°C	64.4	84.2
Tg Ultimate (DMTA)	°C	97.5	97.5
HDT	°C	49	69
Moisture Absorption	%	1.37	1.2
Cured Density	g/cm <sup>3</sup>	1.16	1.16
Linear Shrinkage	%	1.6	1.6
Barcol Hardness	-	30	37
Cast Tensile Strength	MPa	70.3	75.9
Cast Tensile Modulus	GPa	3.67	3.70
Cast Strain to Failure	%	1.9	4.7
Lam. Comp. Strength	MPa	398	444
Laminate ILSS	MPa	49.9	60.2

Ambient Cure = 28days @ 21°C / 70°F

Post Cured = 28days @ 21°C / 70°F followed by 16hrs @ 50°C / 122°F

## Transport and Storage

Resin and hardener should be kept in tightly seal containers during transport and storage. Both the resin and hardener should be stored in ambient conditions of between 10°C (50°F) and 25°C (77°F).

When stored correctly, the resin and hardener will have a shelf-life of 12 months. Although it may be possible to use the resin after a longer period, a deterioration in the performance of the resin will occur, especially in relation to clarity and cure profile.

Pay particular attention to ensuring that containers are kept tightly sealed. Epoxy hardeners especially will deteriorate quickly when exposed to air.

## Disclaimer

This data is not to be used for specifications. Values listed are for typical properties and should not be considered minimum or maximum.

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