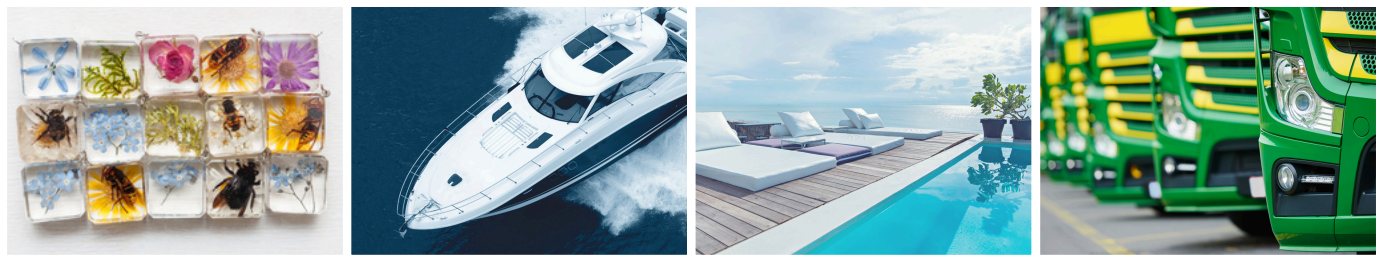


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PRODUCT GUIDE

Epoxy Resin System



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Designed for the manufacture of chemical and water-resistant laminates

R180 Epoxy Laminating System

R180 is a low viscosity epoxy especially developed for production of articles where thin film cure is of particular importance. Particular emphasis has been placed on the general toughness and strength of the cured system. As well as offering high mechanical properties, its low viscosity facilitates wet out of difficult material.

Mixing and Handling

R180 Resin and H180 hardener should be combined in the following ratio:

Product	Parts by Weight	Parts by Volume
Resin R180	5	5
Hardener H180	1	1

Quantities mixed to the above ratio will give 15-50 min pot life at 20°C.

Deviating from this specific ratio could seriously impair the strength of the final laminate and should not be done in an attempt to alter the gel time. The resin and hardener should be combined and well stirred ensuring that all materials from the sides and bottom of the container are thoroughly mixed. It should be placed in a shallow tray or similar container to increase the surface area of the mixture. This will avoid excessive exothermic heat which could shorten the working time.

Curing Schedule

R180 has been developed to provide good mechanical properties at a cure temperature between 18°C and 27°C. However, progressive post cure finishing at elevated temperatures (up to 50°C) will not only shorten processing times but will also increase the general toughness of the laminate. A post cure should begin only after an initial 24 hour room temperature cure. Care must also be taken to adequately support the laminate during an elevated post cure as temperature control is crucial as the laminate can be blown off the core if the temperature rises too quickly or if it is excessively higher. Laminates can be “green trimmed” with a sharp knife lubricated with solvent. The timing of this operation is dependent on the curing schedule but at the recommended working temperatures, which will normally be between two and five hours after laminating. Laminates cured for more than 12 hours should be wiped with Epoxy Solvent prior to further laminating or flow coating. If the laminate is allowed to cure for 48-72 hours at ambient temperatures, the surface should be degreased as above and lightly sanded before laminating or flow coating takes place.

At ambient temperature cures, laminates should not be sanded for at least 24 hours. Laminates cured in this temperature range will continue to cure and toughen for a period of 14 days after production. Surf and sailboard laminates should be stored at room temperature for a minimum of 7 days before use.

Surface Preparation

R180 is suitable for use with wood, glass, aramid and carbon fibres, steel, alloy as well as PVC, urethane and polystyrene foams.

The recommended surface treatments are as follows:

Timber

Timber should be clean, dry and degreased with either xylol or acetone. The surface should also be sanded with medium – fine sandpaper and all traces of sanding dust removed prior to laminating.

Epoxy Coated Timber

Abrade surface with course to medium sandpaper. Remove all traces of dust etc. solvent wipe with acetone and allow to dry prior to recoating.

FRP (Polyester Resin)

Bonding to FRP surfaces is easy achieved provided the FRP laminate is sufficiently cured. On new work, this would take between 7-14 days at ambient temperature after final FRP lay-up. However, it is recommended a sample area be tested prior to the actual bonding operation.

Note: Air exposed wax-free polyester laminates will have a layer of un-crosslinked monomer on the surface. This layer should be removed before attempting to bond. If cure is satisfactory, the following steps then apply. Sand surface with medium – coarse paper. Remove all traces of sanding dust and solvent wipe and allow to dry prior to bonding.

Steel

Remove loose rust, flaky paint etc. Sand surface with coarse sandpaper or preferably have area sandblasted. Degrease surface with solvent eg acetone. Bonding should be achieved as soon as possible after pre-treatment, to reduce amount of contact with the atmosphere which can cause corrosion to recommence.

Aluminium

Aluminium can be pre-treated in a similar fashion to that of steel. However, due to rapid oxidation of the surface, it is recommended an etch primer system be used prior to bonding.

Foams

Simply ensure surfaces are clean, dry and dust free prior to laminating.

GENERAL NOTES

Secondary Bonding

Laminates cured for more than 12 hours should be solvent wiped prior to laminating or flowcoating. Over 12 hours the laminate should be sanded, dusted and solvent wiped before further laminating etc. takes place.

Mould Release Systems

Mould release systems vary greatly and depend on the following factors:

- Mould surface condition
- Number of releases required
- Heat of cure cycle

Ambient cured laminates can be released from smooth metal or FRP moulds with the use of TR-NS wax and plastilease release agents. Further assistance on mould release systems can be obtained from Allnex Composites Technical Services.

Vacuum Techniques

Care should be taken not to expose wet laminates to vacuums of more than half on atmosphere (500m bar). Higher vacuums may result in the lower molecular weight components of the system being extracted.

Additives

Fillers such as Q-Cells Glass Bubbles Microballoons can be added to form filling and fairing compounds. The amount of the filler added being dependent on the nature of the job, however, care should be taken not to overfill the system as this will result in a very dry mix and will lower the adhesive qualities of R180 to bonding surface.

Working Conditions

R180 is affected by the ambient temperature and it is therefore important to know the effects of workshop conditions. The ideal working temperature is between 15°C and 25°C. At these temperatures pot life and the resultant cure material will exhibit good mechanical properties, as with all exothermic reactions, heat will accelerate the cure.

Designed for the manufacture of chemical and water-resistant laminates

SAFETY DIRECTIONS

Skin contact must be avoided if possible by wearing disposable gloves. and the use of barrier creams is also recommended. Care should be taken to avoid the risk of splashing resin or hardener into the eyes. If this occurs, the eyes should be immediately well flushed with running water and medical advice sought.

The inhalation of sanding dust should be avoided and in particular care should be taken not to rub the eye area when exposed to sanding dust. After a sanding operation of any reasonable size, a shower or bath should be taken which should include hair washing. Overalls or other protective clothing should be worn when sanding and contaminated clothes should be thoroughly cleaned before re-use. Any areas of skin coming into contact with resin and hardener must be thoroughly cleansed. This should be achieved by the use of resin removing creams and followed by washing with soap and water. Do not use solvents on the skin.

This cleaning should be routine:

- before eating or drinking;
- before smoking;
- before using the lavatory;
- after finishing work

TRANSPORT AND STORAGE

R180 Resin and Hardener should be kept in securely closed containers during transport and storage.
Note: Mini pumps should be removed for transport or when long periods of non-use are expected.

Any accidental spillage should be soaked up with sand, sawdust, cotton waste or any other absorbent material. The area should then be washed clean. Adequate long term storage conditions for both materials will result in shelf lives of one year. Storage should be in a dry place out of direct sunlight and protected from frost. The temperature should be between 14°C and 28°C. Containers should be firmly close.

R180 Epoxy Resin

Modified, low viscosity epoxy resin. Used in conjunction with H180 for the construction of reinforced laminates in the Marine and Civil Engineering Industries. Low viscosity combined with fast cure makes this system ideal for sand filled mortars and grouts.

R180 Epoxy Resin		Hardeners	
Viscosity @ 20°C	1000 - 1400 mPa	60-160 mPas	ISO 12058-1B
Density @ 20°C	1.1-1.21 g/cm3	0.96-1.01 g/c3	ISO 1675
Flash Point	>120°C	>120°C	ISO 2719

APPLICATION DATA

Potlife 100 grams @ 20°C

Epoxy Hardener	Potlife
H180 - Fast	15 minutes
H180 - Standard	25 minutes
H180 - Slow	40 minutes

Room Temperature Cure

Epoxy Hardener	Standard	
Reactivity dynamic jg^	324	ISO 11357-5
Tg 24 hour 40°C	48	ISO 11357-3
Tg Ultimate °C	67	ISO 11357-3
Tg Enthalpy jg^ - 1	-2.08	ISO 13357-5
Δ Enthalpy jg^ - 1	2.63	ISO 13357-5

Post Cure (16 hours)

Epoxy Hardener Standard	60°C	80°C	
Tg °C	59	67	ISO 11357-3
Tg Enthalpy jg^ - 1	-1.30	0.0	ISO 13357-5
Δ Enthalpy jg^ - 1	1.81	0.0	ISO 13357-5

The low ΔH enthalpy for R180 Resin indicates that most properties are obtained from room temperature curing

Designed for the manufacture of chemical and water-resistant laminates

Static Mechanical Analysis 20°C (cured 14 days @ 20°C)

Tensile Test (ISO 527)	Flexural Test (ISO 178)		
Tensile Strength	47 N/mm2	Flexural Strength	93 N/mm2
Tensile Modulus	2100 N/mm2	Flexural Modulus	3000 N/mm2
Tensile Elongation	4%	Flexural Elongation	2%

PRECAUTIONS

High atmospheric humidity or drops in temperature around dew point may result in condensation on the uncured film causing changes in the film surface as a result of hydration. This effect may cause loss of intercoat adhesion. In these conditions good adhesion may be obtained by re-roughening the surface aftr thoroughly drying it.

Important Notice:

The specification listed above is given to the best of our knowledge, however, it is given without any warranty expressed or implied. The specification is subject to change without notice.

Consultant QUALITY CONTROL REPORT available for each Batch for actual results.

Consult MATERIAL SAFETY DATA SHEET for handling of material.

Please consult your allnex Sales Manager or Customer Service on 1800 789607 to select the best product for your specific requirements. For other product and application updates check out our website : www.allnex.com