



® fiber glass international

ABN 25 000 045 572 a division of Nuplex Industries (Aust) Pty Limited

SYDNEY 02 9938 7222 Fax 02 9938 5826 BRISBANE 07 3271 3944 Fax 07 3271 3603 TOLL FREE 1800 777 954
MELBOURNE 03 9550 5656 Fax 03 9550 5651 TOLL FREE 1800 655 234 ADELAIDE 08 8234 9499 Fax 08 8234 9490
SOUTHPORT 07 5532 4266 Fax 07 5571 0231 CAIRNS 07 4035 2126 Fax 07 4035 2125
WESTERN AUSTRALIA 08 9455 1972 Fax 08 9455 1012

PRODUCT DATA SHEET

ES180 EPOXY DATA SYSTEM

ES180 is a low viscosity epoxy system especially developed for the production of articles where thin film cure is of particular importance. Particular emphasis has been placed on deferral toughness and strength of the cure system. As well as offering high mechanical properties, its low viscosity facilitates wet out of difficult fabrics.

MIXING AND HANDLING

R180 Resin and H180 Hardeners should be combined in the following ratio-

	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 @ 20°C

Note for easy measuring direct from the container, FGIs have dispensing pumps calibrated to the above volumetric ratio.

Deviating from the specific ratio could seriously impair the strength of the final laminate and should not be done in an attempt to alter the geltime.

The resin and hardener should be well stirred ensuring that all materials from the sides and bottom of the container are thoroughly mixed. It should be placed in a shallow container to increase the surface area of the mixture. This will avoid excessive exothermic heat that could shorten the working time.

CURING SCHEDULE

ES180 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 (upto 50°C) will not only shorten progressing geltimes 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 be taken to adequately support the laminate during an elevated post cure. Also temperature control is crucial as the laminate can be blown off the core if the temperature rises too quickly or if it

QUALITY & SERVICE IN ALL FIBREGLASS MATERIALS

The Australian Trade Practices Act implies into contracts for the supply by a corporation of services as a "consumer" non-excludable warranties that, among other things, the goods provided will be of merchantable quality. Except to the extent that the Purchaser has non-excludable rights against the company under the Trade Practices Act, and because we cannot anticipate or control the many different conditions under which our products and information furnished relating to their use may be used, we do not guarantee the applicability or the accuracy of this information of the suitability of our products in any given situation. In accepting our goods the customer acknowledges:

- The materials are of a hazardous nature and that the customer is responsible for disposal of the container in accordance with the requirements and regulations of the relevant supervising government.
- The materials have a limited shelf life and must be stored strictly in accordance with the guidelines and specifications related to the particular product.
- The company gives no warranty as to the applicability for the particular use by the customer and the customer shall be responsible for having to ensure that the materials are fit for the use by the customer.



® fiber glass international

ABN 25 000 045 572

a division of Nuplex Industries (Aust) Pty Limited

SYDNEY 02 9938 7222 Fax 02 9938 5826 BRISBANE 07 3271 3944 Fax 07 3271 3603 TOLL FREE 1800 777 954
MELBOURNE 03 9550 5656 Fax 03 9550 5651 TOLL FREE 1800 655 234 ADELAIDE 08 8234 9499 Fax 08 8234 9490
SOUTHPORT 07 5532 4266 Fax 07 5571 0231 CAIRNS 07 4035 2126 Fax 07 4035 2125
WESTERN AUSTRALIA 08 9455 1972 Fax 08 9455 1012

QUALITY & SERVICE IN ALL FIBREGLASS MATERIALS

PRODUCT DATA SHEET

is excessively high. Laminates can be "green trimmed" with a sharp knife lubricated with solvent. The timing of this operation is dependent on the curing schedule but a the recommended working temperatures this will normally be between two and five hours after laminating. Laminates cured for more than 12 hours should be wiped with an Epoxy Solvent prior to further laminating or flowcoating. 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 flowcoating takes place.

Ambient cured laminates can be released from smooth metal FRP moulds with the use of TR-Non Silicon mould wax and plastilease release agents. Further assistance can be obtained from FGIs technical staff.

VACUUM TECHNIQUES

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

ADDITIVES

Fillers such as Q-cells, Glass Bubbles and Microballons can be added to form filling and fairing compounds. The amount of filler 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 quantity of ES180 to the bonding surface.

WORKING CONDITIONS

ES180 is effected by the ambient temperature and is therefore important to know the effects of the workshop conditions. The ideal working condition is between 15°C AND 25°C. As with all exothermic reaction, heat will excelebrate the cure.

SAFETY DIRECTIONS

Care must be taken to avoid contact with skin if possible by wearing disposable gloves and barrier cream.

The Australian Trade Practices Act implies into contracts for the supply by a corporation of services as a "consumer" non-excludable warranties that, among other things, the goods provided will be of merchantable quality. Except to the extent that the Purchaser has non-excludable rights against the company under the Trade Practices Act, and because we cannot anticipate or control the many different conditions under which our products and information furnished relating to their use may be used, we do not guarantee the applicability or the accuracy of this information of the suitability of our products in any given situation. In accepting our goods the customer acknowledges:

- The materials are of a hazardous nature and that the customer is responsible for disposal of the container in accordance with the requirements and regulations of the relevant supervising government.
- The materials have a limited shelf life and must be stored strictly in accordance with the guidelines and specifications related to the particular product.
- The company gives no warranty as to the applicability for the particular use by the customer and the customer shall be responsible for having to ensure that the materials are fit for the use by the customer.



® fiber glass international

ABN 25 000 045 572

a division of Nuplex Industries (Aust) Pty Limited

SYDNEY 02 9938 7222 Fax 02 9938 5826 BRISBANE 07 3271 3944 Fax 07 3271 3603 TOLL FREE 1800 777 954
MELBOURNE 03 9550 5656 Fax 03 9550 5651 TOLL FREE 1800 655 234 ADELAIDE 08 8234 9499 Fax 08 8234 9490
SOUTHPORT 07 5532 4266 Fax 07 5571 0231 CAIRNS 07 4035 2126 Fax 07 4035 2125
WESTERN AUSTRALIA 08 9455 1972 Fax 08 9455 1012

QUALITY & SERVICE IN ALL FIBREGLASS MATERIALS

PRODUCT DATA SHEET

Care should be taken to avoid the risk of splashing resin or hardener into the eyes. If this occurs the eye should be immediately well flushed out with running water and medical advice sort

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 and other protective cloths should be worn when sanding and contaminated clothes should be thoroughly cleaned before re-use. Any area of the skin coming in 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 toilet
- After finishing work

TRANSPORT AND STORAGE

ES180resin 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 adsorbent material. The area should 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 closed.

The Australian Trade Practices Act implies into contracts for the supply by a corporation of services as a "consumer" non-excludable warranties that, among other things, the goods provided will be of merchantable quality. Except to the extent that the Purchaser has non-excludable rights against the company under the Trade Practices Act, and because we cannot anticipate or control the many different conditions under which our products and information furnished relating to their use may be used, we do not guarantee the applicability or the accuracy of this information of the suitability of our products in any given situation. In accepting our goods the customer acknowledges:

- The materials are of a hazardous nature and that the customer is responsible for disposal of the container in accordance with the requirements and regulations of the relevant supervising government.
- The materials have a limited shelf life and must be stored strictly in accordance with the guidelines and specifications related to the particular product.
- The company gives no warranty as to the applicability for the particular use by the customer and the customer shall be responsible for having to ensure that the materials are fit for the use by the customer.



® fiber glass international

ABN 25 000 045 572 a division of Nuplex Industries (Aust) Pty Limited

SYDNEY 02 9938 7222 Fax 02 9938 5826 BRISBANE 07 3271 3944 Fax 07 3271 3603 TOLL FREE 1800 777 954
MELBOURNE 03 9550 5656 Fax 03 9550 5651 TOLL FREE 1800 655 234 ADELAIDE 08 8234 9499 Fax 08 8234 9490
SOUTHPORT 07 5532 4266 Fax 07 5571 0231 CAIRNS 07 4035 2126 Fax 07 4035 2125
WESTERN AUSTRALIA 08 9455 1972 Fax 08 9455 1012

PRODUCT DATA SHEET

H180 SLOW EPOXY HARDENER

DESCRIPTION: Amine adduct for use with R180 Epoxy Resin for laminating systems.

SPECIFICATION:	Viscosity 20°C	50-100Cps
	Mixing ratio Wt or Vol	100 R180 to 20 180 slow
	Pot life 100Grm 20°C	30-50 min R180

APPLICATION DATA:

Specific Gravity	0.95 Kg/Lt
Amine Eqv wt H	38
Colour	5 Max
Min application	20 Deg C 500 m Dfb

TYPICAL PROPERTIES: 100: 20 by Wt

Flexural properties ASTM D790-90	14 days @20°C
80mm Span 2mm/min	
Tangent Elastic Modulus	2900 Mpa
Modulus of Rapture	88 Mpa

Compression to ASTM D695-91

Elastic Modulus	1300 Mpa
Compressive Stress	83 Mpa
Yield %	7.3 %
Offset Yield	74 Mpa
Offset Yield %	6.0 %

H.D.T. ASTM D618 1820 KPa		+4 hr 80°C
	41°C	45°C
Expansion ASTM D696 MM/MM/0C	90X10	60X10
Tg	35°C	49°C
Expansion past Tg mm/mm/0C		140x10

PRECATIONS: 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 may cause loss of intercoat adhesion. In these conditions good adhesion may be obtained by re-roughening the surface.

IMPORTANT NOTE: The specifications listed above is given to the best of our knowledge, however without any warranty expressed or implied. The specification is subject to change without notice. **QUALITY CONTROL REPORT** available for each batch for actual results. Consult **MATERIAL SAFETY DATA SHEET** for handling of material.

QUALITY & SERVICE IN ALL FIBREGLASS MATERIALS

The Australian Trade Practices Act implies into contracts for the supply by a corporation of services as a "consumer" non-excludable warranties that, among other things, the goods provided will be of merchantable quality. Except to the extent that the Purchaser has non-excludable rights against the company under the Trade Practices Act, and because we cannot anticipate or control the many different conditions under which our products and information furnished relating to their use may be used, we do not guarantee the applicability or the accuracy of this information of the suitability of our products in any given situation. In accepting our goods the customer acknowledges:

(a) The materials are of a hazardous nature and that the customer is responsible for disposal of the container in accordance with the requirements and regulations of the relevant supervising government.

(b) The materials have a limited shelf life and must be stored strictly in accordance with the guidelines and specifications related to the particular product.

(c) The company gives no warranty as to the applicability for the particular use by the customer and the customer shall be responsible for having to ensure that the materials are fit for the use by the customer.



® fiber glass international

ABN 25 000 045 572

a division of Nuplex Industries (Aust) Pty Limited

SYDNEY 02 9938 7222 Fax 02 9938 5826 BRISBANE 07 3271 3944 Fax 07 3271 3603 TOLL FREE 1800 777 954
MELBOURNE 03 9550 5656 Fax 03 9550 5651 TOLL FREE 1800 655 234 ADELAIDE 08 8234 9499 Fax 08 8234 9490
SOUTHPORT 07 5532 4266 Fax 07 5571 0231 CAIRNS 07 4035 2126 Fax 07 4035 2125
WESTERN AUSTRALIA 08 9455 1972 Fax 08 9455 1012

PRODUCT DATA SHEET H180 EPOXY HARDENER

DESCRIPTION: Amine adduct for use with R180 Epoxy Resin for laminating systems.

SPECIFICATION: Viscosity 20°C 100- 300Cps
Mixing ratio Wt or Vol 100 R180 to 20 H180
Pot life 10Grm 20°C 20-30 Min R180

APPLICATION DATA:

Specific Gravity 0.94Kg/Lt
Amine Eqv wt H 38
Colour 5 Max
Min application 15 Deg C 500 m Dfb

TYPICAL PROPERTIES: 100: 20 by Wt

Flexural properties ASTM D790-90 14 days @20°C
80mm Span: 2mm/min
Tangent Elastic Modulus 3000 MPa
Modulus of Rupture 93 Mpa
Compression toASTM D695-91
Elastic Modulus 1340 MPa
Compressive Stress 86 MPa
Yield % 7.4 %
Offset Yield 79 MPa
Offset Yield % 6.1 %

H.D.T ASTM D 684 1820 KPa +4hr 80°C
42°C 50°C
expansion ASTM D696 mm/mm/°C 90x10 60x10
Tg 33°C 52°C
Expansion past Tg mm/mm/0C 120x10

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. The effect may cause loss of intercoat adhesion. In these conditions good adhesion may be obtained by re-roughening the surface.

IMPORTANT NOTE: The specifications listed above are given to the best of our knowledge, however without any warranty expressed or implied. The specification is subject to change without notice. **QUALITY CONTROL REPORT** available for each batch, for actual results. Consult **MATERIAL SAFETY DATA SHEET** for handling of material.

QUALITY & SERVICE IN ALL FIBREGLASS MATERIALS

The Australian Trade Practices Act implies into contracts for the supply by a corporation of services as a "consumer" non-excludable warranties that, among other things, the goods provided will be of merchantable quality. Except to the extent that the Purchaser has non-excludable rights against the company under the Trade Practices Act, and because we cannot anticipate or control the many different conditions under which our products and information furnished relating to their use may be used, we do not guarantee the applicability or the accuracy of this information of the suitability of our products in any given situation. In accepting our goods the customer acknowledges:

- (a) The materials are of a hazardous nature and that the customer is responsible for disposal of the container in accordance with the requirements and regulations of the relevant supervising government.
- (b) The materials have a limited shelf life and must be stored strictly in accordance with the guidelines and specifications related to the particular product.
- (c) The company gives no warranty as to the applicability for the particular use by the customer and the customer shall be responsible for having to ensure that the materials are fit for the use by the customer.