

KINETIX R240 resin is a low viscosity resin specifically formulated for use with H341 hardener, and designed for custom high-flow wet-preg construction of reinforced laminates.

This system has a unique curing chemistry, and wet-pregs formed with this system can be cured at relatively low temperature (around 50-60°C) without the risk of inadequate flow and poor interlayer fusion which is inherent in the use of dry and hot melt pre-pregs cured at these temperatures. Tooling can be relatively low cost as a result of the lower temperature requirement.

R240 is used for "state of the art" high performance construction, and excellent mechanical properties are produced in carbon fibre, Kevlar and glass laminates. It has high elastic modulus, very high extensibility and impact toughness, and is much less brittle than the resins used in general purpose, pre-made, high viscosity pre-pregs.

MIX RATIO

9 parts hardener to 100 parts resin by weight
10 parts hardener to 100 parts resin by volume

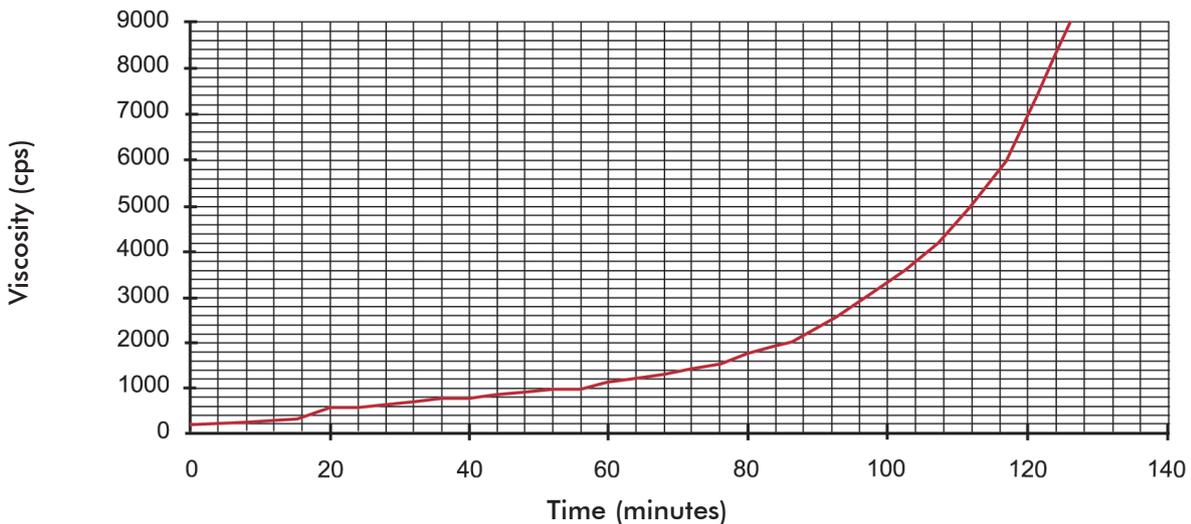
Note: Care should be taken when dispensing and mixing. Do not attempt to control the cure time by altering the hardener ratio. Contact ATL composites for specific information.

Cross-linking predominantly is by etherification of epoxy molecules rather than the conventional amine addition. Because the curing agent is catalytic in function, mix ratio is not as critical.

TYPICAL CURED RESIN MECHANICAL PROPERTIES	
Tensile Modulus	3650 MPa
Tensile Strength (ultimate)	83.3 MPa
Tensile Elongation	9.8%
Compressive Strength (yield)	98 MPa
Compressive Strength(ultimate)	130MPa
Izod Impact	0.598 ft lb/in notch

FLOW CHARACTERISTICS

Viscosity vs.time



Resin viscosity in the early part of an elevated temperature cure cycle has a very strong influence on the total resin bleedout. The graph above shows how resistance to flow (viscosity) increases during cure. The data was obtained in 2 mm thick resin films

which give a reasonable representation of viscosity development in thin, composite laminates. This avoids the extremely high exothermic build-up of heat which otherwise occurs in bulk cures.

LAMINATE PROPERTIES

Introduction

E-Glass and carbon laminates were fabricated and tested. A 100% 0-degree stacking sequence of uni-directional material was chosen, and tests were conducted in bending and tension, both in 0 and 90 degree directions. The lay-up procedure was designed to simulate “on site, hand lay-up” conditions, and consequently the resin contents reflected the high flow of the R240/H341 system. The average E-glass content was 54%, while the carbon samples gave an average weight fraction of 57%. Actual test results reflecting these figures are presented.

TENSILE TESTING

Tests were carried out in accordance with BS 2782, Part 10 Method 1003.

TENSILE TESTS ON E-GLASS @ 0 DEGREES

6 layers of 400 gram E-glass uni-directional. Vacuum cured.

Cured thickness	2.07mm
Approximate fibre volume	45%
Tensile Strength	878 MPa
Tensile Modulus	38000 MPa
Tensile Modulus (normalised to 40% fibre volume)	33400 MPa

Tensile tests on E-glass @ 90 degrees:

As expected results were too low to obtain significant data from 12 layers as above.

TENSILE TESTS ON CARBON @ 0 DEGREES

6 layers of 320 gram Carbon uni-directional. Vacuum cured.

Cured thickness	2.28mm
Approximate fibre volume	47%
Tensile Strength	1382 MPa
Tensile Modulus	106200 MPa
Tensile Modulus (normalised to 50% fibre volume)	116600 MPa

TENSILE TESTS ON CARBON @ 90 DEGREES

12 layers of 320 gram Carbon uni-directional. Vacuum cured.

Cured thickness	4.83mm
Approximate fibre volume	44%
Tensile Strength	20.7 MPa
Tensile Modulus	6100 MPa
Tensile Modulus (normalised to 50% fibre volume)	6900 MPa

FLEXURAL TESTING

Three point bending tests were carried out over a span of 160 mm in accordance with BS 2782 Part 10, Method 1005.

FLEXURAL TESTS ON E-GLASS @ 0 DEGREES

12 layers of 400 gram E-glass uni-directional. Vacuum cured.

Cured thickness	4.02mm
Approximate fibre volume	47%
Flexural Strength	816 MPa
Flexural Modulus	34100 MPa

FLEXURAL TESTS ON E-GLASS @ 90 DEGREES

12 layers of 400 gram E-glass uni-directional. Vacuum cured.

Cured thickness	4.02mm
Approximate fibre volume	47%
Flexural Strength	44.7 MPa
Flexural Modulus	10200 MPa

FLEXURAL TESTS ON CARBON @ 0 DEGREES

12 layers of 320 gram Carbon uni-directional. Vacuum cured.

Cured thickness	4.52mm
Approximate fibre volume	47%
Flexural Strength	777 MPa
Flexural Modulus	82500 MPa

FLEXURAL TESTS ON CARBON @ 90 DEGREES

12 layers of 320 gram Carbon uni-directional.
Vacuum cured.

Cured thickness	4.74mm
Approximate fibre volume	47%
Flexural Strength	35.0 MPa
Flexural Modulus	4700 MPa

HEALTH & SAFETY

KINETIX R240 resin and H341 hardener have moderate sensitising potential, and should be kept out of the eyes and off the skin.

- Use with good ventilation and adequate safety equipment including impervious gloves and safety glasses.
- If skin contact occurs, remove contaminated clothing immediately, and wash the affected area thoroughly with water, avoiding the use of solvents except in the case of massive contamination.
- If eye contact occurs, immediately flush with running water for at least 15 (fifteen) minutes and seek medical advice.
- If swallowed:

Resins - DO NOT induce vomiting, and contact a doctor or the Poisons Information Centre.

Hardeners - DO NOT induce vomiting, give plenty of milk or water and contact a doctor or the Poisons Information Centre.

NOTE Our products are intended for sale to industrial and commercial customers. We request that customers inspect and test our products before use and satisfy themselves as to contents and suitability. Nothing herein shall constitute a warranty, express or implied, including any warranty or merchantability or fitness, nor is protection from law or patent to be inferred. All patent rights are reserved. The exclusive remedy for all proven claims is replacement of our materials and in no event shall we be liable for special or consequential damages. 24.1.18

