



Notus NE5

Epoxy Prepreg System



DESCRIPTION

Notus NE5 is Notus Composites' next generation low pressure vacuum curing epoxy prepreg system with cure temperatures ranging from 85-120°C.

It has been formulated to be especially suited to large structural applications and provides a finished part Tg of 100-120°C. This system has been formulated with excellent handling characteristics as well as providing a very long out life. NE5 prepregs can remain at room temperature (21-23°C) for up to 60 days and have a shelf life of 24 months at -18°C.

NE5 is high flow matrix system that produces a high-quality surface on the final part. Outstanding consolidation can be achieved in extremely thick laminates using only vacuum bag pressure. Notus NE5 materials are available in prepreg and NI-Preg formats with all types of reinforcements including heavyweight fabrics, multiaxials and UD's and it is the material of choice for wind energy and large industrial applications.

FEATURES AND BENEFITS

- Versatile curing temperature, 85-120°C
- Low exotherm risk, even for thick laminates
- High flow resin matrix
- Good finished part surface finish

APPLICATIONS

NE5 materials are extremely versatile, having been used for large wind turbine blades, marine craft, sporting equipment and many other industrial applications.

CURE SCHEDULE

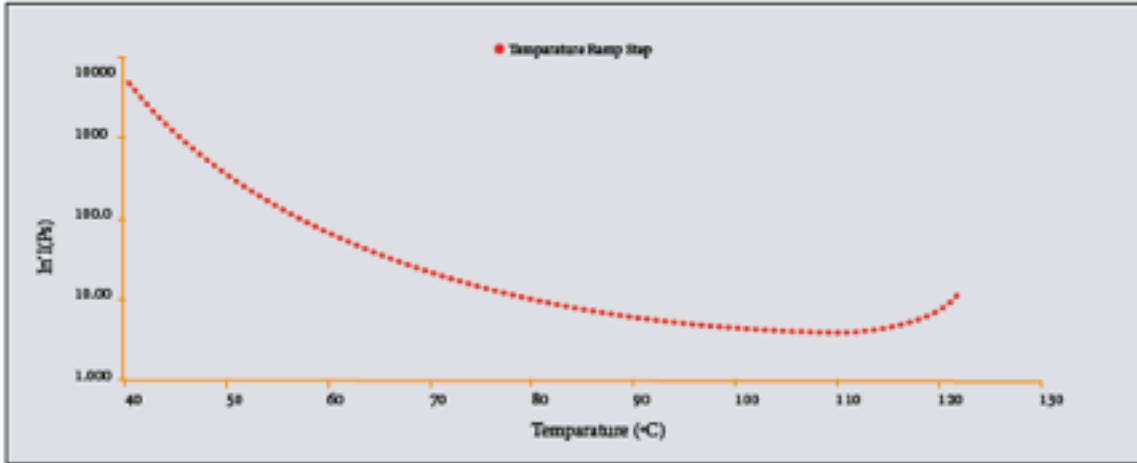
Minimum cure requirements

Property	Result	Test Method
Minimum cure temperature (°C)	85	DSC
Cure time (hours:mins) at min temperature	6:00	DSC
Glass transition temp, Tg (°C)	97	DSC

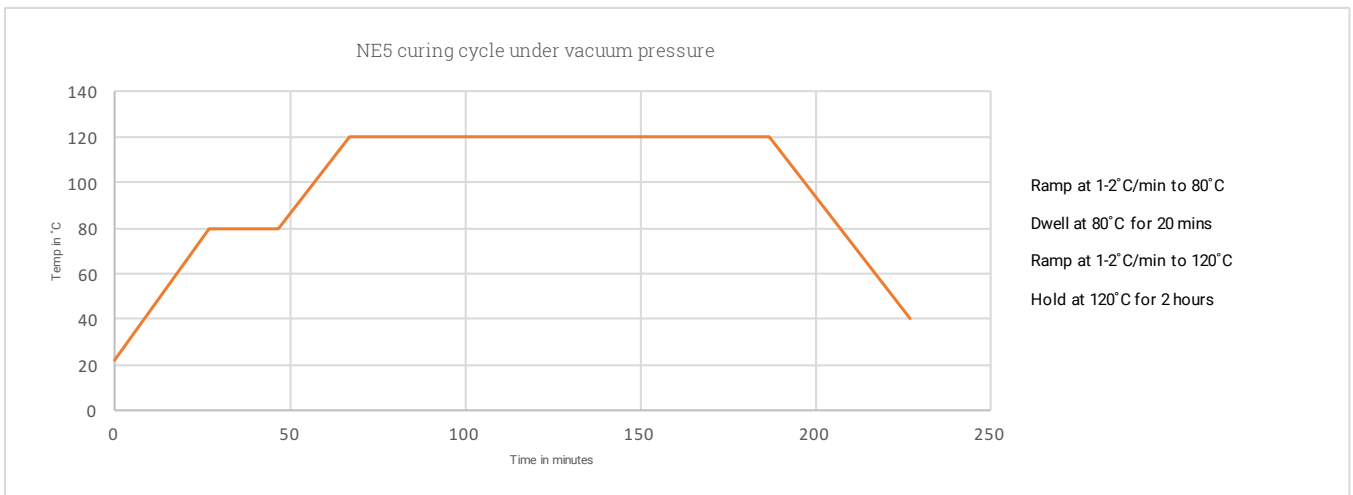


RHEOLOGY

Rheology profile for NE5 prepreg system



Typical vacuum curing schedule for NE5 prepreg system





CURED MATRIX PROPERTIES

(2hrs at 120°C)

Property	Result	Test Method
Tensile Strength (MPa)	79 ± 2	ISO R527
Tensile Modulus (GPa)	3.2 ± 0.1	ISO R527
Strain (%)	3.65 ± 0.1	ISO R527
Flexural strength (MPa)	130 ± 5	ISO R178
Flexural modulus (GPa)	3.02 ± 0.1	ISO R178
Compression strength (MPa)	105 ± 2	ASTM D695
Compression modulus (GPa)	3 ± 0.1	ASTM D695
Fracture toughness K1C (MPa√m)	0.81 ± 0.05	ISO 13586
Fracture energy G1C (J/m ²)	235 ± 20	ISO 13586
Density (g/cm ³)	≈ 1.161	
Glass Transition Temperature (°C)	115 ± 2	DSC - 10°C/min

LAMINATE PROPERTIES

(30mins at 85°C and 2hrs at 120°C – Stitched E-Glass +/-45° biax, 50% RC)

Property	Result	Test Method
Reinforcement weight (gsm)	600	
Resin content by weight (%)	50	
Number of plies in test laminate	4	
Cured laminate thickness (mm)	2.2	
Fibre volume in test laminate (%)	42.2	
Tensile strength at 45° (MPa)	472.9	BS EN ISO527-4 & 5
Tensile modulus at 45° (GPa)	23.9	BS EN ISO527-4 & 5
Flexural strength at 45° (MPa)		BS EN 14125
Flexural modulus at 45° (GPa)		BS EN 14125



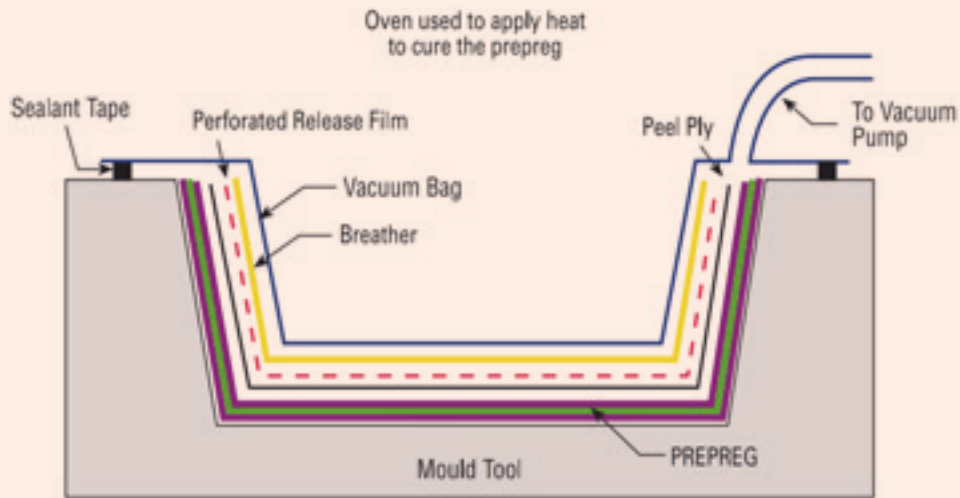
Normalized properties at 53% fibre volume fraction

Property	Result	Test Method
Cured laminate thickness (mm)	1.78	
Tensile strength at 45° (MPa)	472.9	BS EN ISO527-4 & 5
Tensile modulus at 45° (GPa)	23.9	BS EN ISO527-4 & 5
Tensile stiffness coefficient (GPa.m)	2.2	BS EN ISO527-4 & 5
Flexural strength at 45° (MPa)		BS EN 14125
Flexural modulus at 45° (GPa)		BS EN 14125
Interlaminar shear strength ILSS (MPa)	35.7	ASTM D-2344 / ISO14130
In plane shear strength IPSS (MPa)		
Shear Modulus		

PROCESSING METHOD

- Take the prepreg roll out of sealed plastic bags.
- Cut the prepreg to the desired size on a cutting table.
- Pull off the protective polyethylene film and lay the prepreg onto the mould. If multiple layers are required, pull off protective film and lay prepreg layers one on top of each other. Make sure that a roller is applied to each layer to avoid any wrinkling or air voids between layers.
- When the desired thickness or lay-up is completed, make the vacuum bag on the mould to cover the entire laminate and apply vacuum.
- Apply full vacuum (approx. 760mm Hg) for 10 minutes before starting the heated cure cycle
- When all air is removed, place the mould in the oven or turn on heat source.
- Complete the cure cycle (as per the defined cure cycle chart).
- After completing the cure cycle, turn off the heat source whilst maintaining vacuum pump pressure.
- Turn off the vacuum pump only when part temperature has dropped to 60°C or below.
- After turning of the vacuum pump, the part can be removed from the mould.

Typical Vacuum Bagging Arrangement



TRANSPORTATION, HANDLING AND STORAGE

NE5 preregs should be kept in the original packaging during transport and storage. Transport should be at -18°C to maximise the life of the product. NE5 preregs should be stored, wrapped and sealed in polythene, at -18°C for maximum shelf life.

Temperature	Time
-18°C	24 months
5°C	6 months
23°C	60 days

The material must be fully thawed for 48 hours and allowed to reach ambient temperature before breaking the polythene seal to avoid moisture contamination.

Handling of the prepreg should be at a clean area where relative humidity is $\leq 50\%$ and ambient temperature is $20-23^{\circ}\text{C}$.

Only take out the quantity required for immediate production usage, the remaining material should be wrapped up and sealed and returned to the freezer. This will extend the shelf life of the NE5 prepreg.

The backing film should be removed from the NE5 prepreg only when it is ready to be laminated or positioned in the mould. Remove the backing film from the side which is going to touch the mould surface. Remove the remaining backing film only when the next prepreg layer is ready to be placed.



HEALTH AND SAFETY PRECAUTIONS

Prepregs are low risk in terms of handling hazards. However, the usual precautions should be applied. Gloves and protective clothing should be worn and operators should avoid skin contact with the materials. Hands and contaminated skin must be cleaned properly with soap and warm water after finishing work.

To avoid eye contamination, safety glasses should be worn. In the case of any contamination, eyes must be flushed for 15 minutes with clean water and a doctor should be consulted or further medical advice should be sought. Use mechanical exhaust ventilation when heat curing the NE5 prepreg product.

NOTICE AND DISCLAIMER

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CONTACT

Notus Composites FZC, P.O Box 38124, Shed 26
Warehouse 8,9 & 10, RAK FTZ Technology Park, Ras al Khaimah, U.A.E

Tel: +971 50 531 2552
Email: info@notuscomposites.com
Web: www.notuscomposites.com