



Notus NE7

Low Temperature Curing Epoxy Prepreg
System



Notus NE7 is a high-performance low temperature curing epoxy prepreg system that delivers significant cost savings by allowing the use of cost effective (or existing) low temperature mould tools. The standard NE7 cure cycle is 70°C for 12 hours.

NE7 has been formulated for applications requiring a low temperature cure and a final Tg in the range of 80-90°C. Alternatively, the system can be cured at higher temperatures such as 100°C to reduce production cycle times. It is easy to handle and laminate with and is suitable for both vacuum bag and autoclave curing. Notus NE7 has a moderate out life at room temperature (30 days at 18-20°C) and can be kept frozen for up to 9 months at -18°C.

The medium to high flow NE7 resin matrix produces even and consistent wet out in the laminate, even when using the heaviest reinforcement fabrics. Outstanding consolidation can be achieved in extremely thick laminates using only vacuum bag pressure.

Notus NE7 is available in all prepreg and N1-Preg formats with unidirectional, multiaxial and woven reinforcements, it can also be supplied as a resin film.

FEATURES AND BENEFITS

- Significant cost reduction through cost low temperature tooling.
- Cures at temperatures as low as 70°C.
- Suitable for vacuum and autoclave curing (up to 3.5 bar pressure).
- Low exotherm risk, even for thick laminates.
- 30 days out-life & 9 months shelf-life

APPLICATIONS

The NE7 prepreg system is extremely versatile, lending itself to the production of marine, architectural, industrial and wind energy components, sporting equipment and other structural applications where only low Tg tooling is available. NE7 cure temperatures make this system a viable replacement for infusion where components typically require a post cure to 80°C after infusion.

CURE SCHEDULE

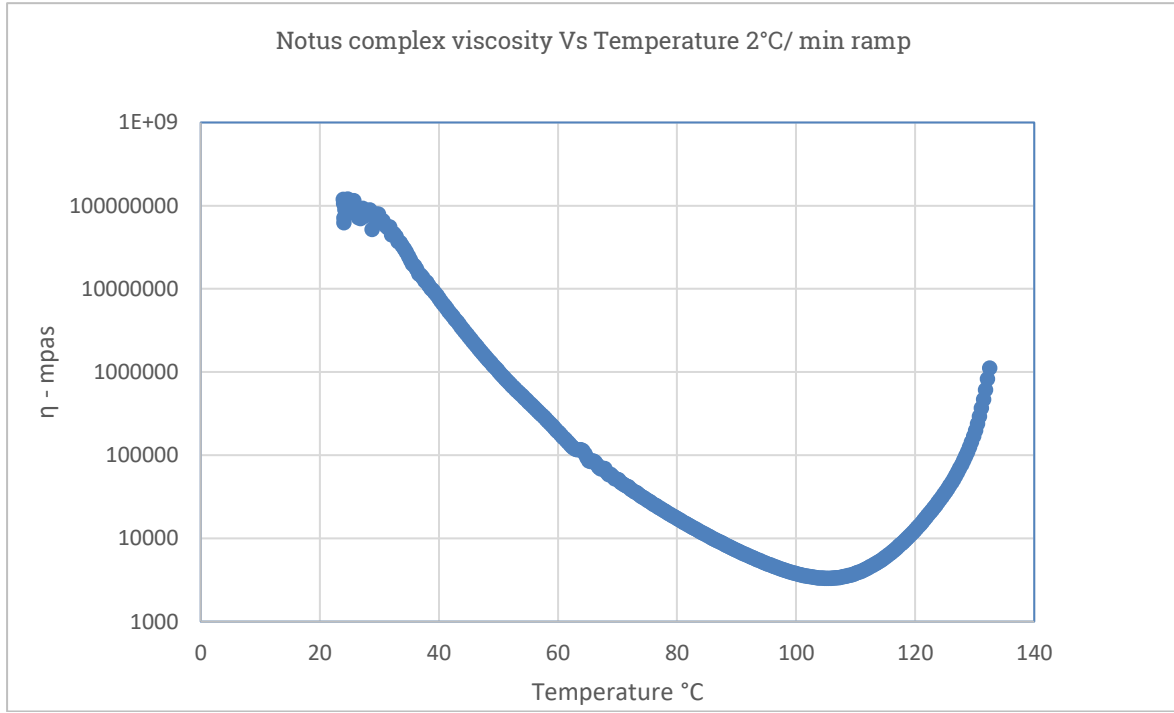
Minimum cure requirements

Property	Result	Test Method
Minimum cure temperature (°C)	70	DSC
Cure time (hours:mins) at min temperature	12:00	DSC
Glass transition temp, Tg (°C)	85	DSC

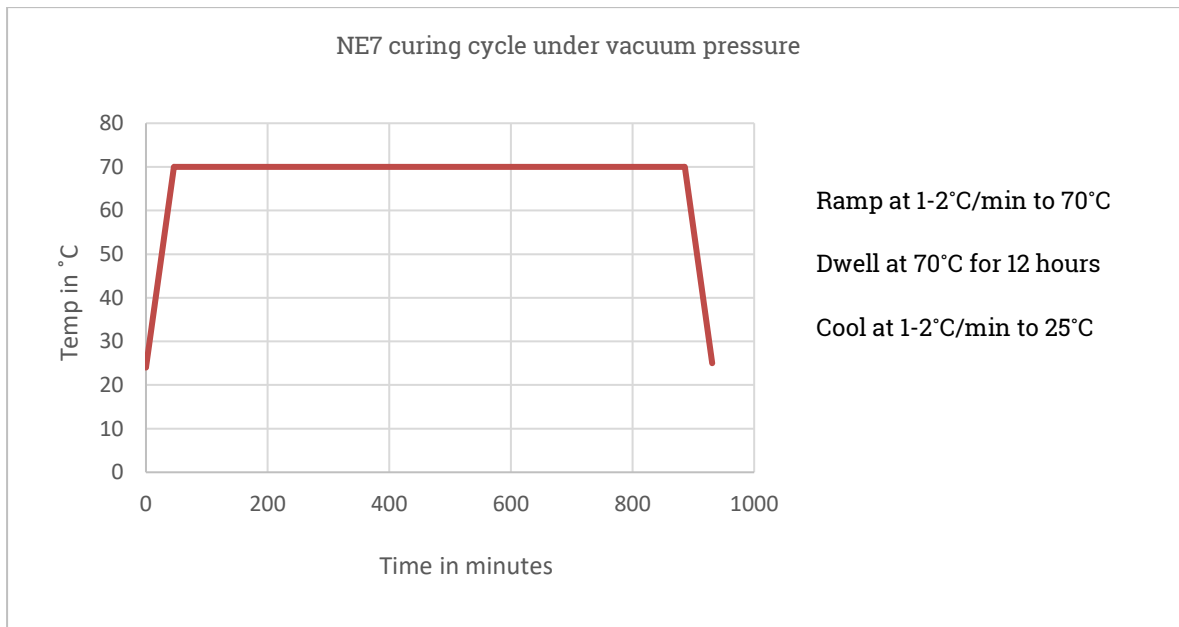


RHEOLOGY

Rheology profile for NE7 prepreg system



Typical vacuum curing schedule for NE6 prepreg system





Alternative cure cycles

Laminate Temp. (°C)	Dwell Time (Hours)	Tg by DSC (°C)	Test Method
80	10	85	DSC
90	8	95	DSC
100	2	100	DSC
110	1	100	DSC

CURED MATRIX PROPERTIES

(12hrs at 70°C)

Property	Result	Test Method
Tensile Strength (MPa)	73 ± 2	ISO R527
Tensile Modulus (GPa)	2.89 ± 0.1	ISO R527
Strain (%)	3.6 ± 0.12	ISO R527
Flexural strength (MPa)	118 ± 5	ISO R178
Flexural modulus (GPa)	2.9 ± 0.1	ISO R178
Compression strength (MPa)	101 ± 2	ASTM D695
Compression modulus (GPa)	2.81 ± 0.1	ASTM D695
Fracture toughness K _{1C} (MPa√m)	0.84 ± 0.05	ISO 13586
Fracture energy G _{1C} (J/m ²)	251 ± 25	ISO 13586
Density (g/cm ³)	≈ 1.16	
Glass Transition Temperature (°C)	85	DSC - 10°C/min

LAMINATE PROPERTIES

(12hrs at 70°C – Various Carbon and E-glass Reinforcements)

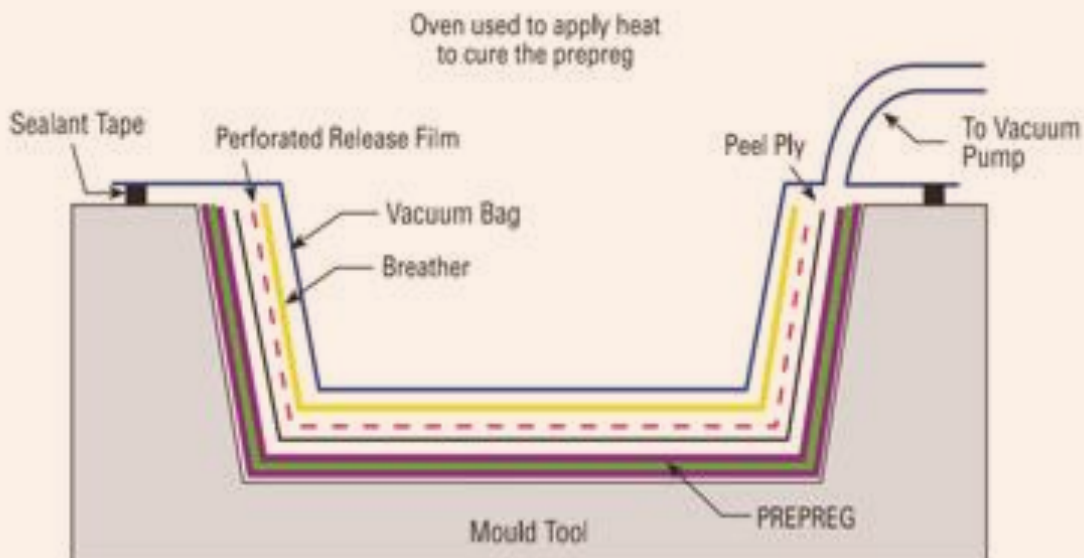
Property	GUD-600	GBX-600 (±45°)	GBX-600 (0/90)	CUD-400	CBX-400 (±45°)	CBX-400 (0/90°)	Test Method
Fibre weight (gsm)	600	600	600	400	400	400	
Resin content by weight (%)	32	35	35	40	45	45	
Plies in test laminate	5	5	5	5	5	5	
Laminate thickness (mm)	2.5	2.68	2.68	2.4	2.68	2.68	
Fibre volume fraction (%)	53	53	53	53	53	53	
Tensile strength (MPa)	1030	150	594	1850	175	825	ISO 527-4 & 5
Tensile modulus (GPa)	49.2	14	27	130	35	68	ISO 527-4 & 5
Flexural strength (MPa)	1160	200	630	1925	250	915	

Flexural modulus (GPa)	51	15	30	145	40	72	
Strain to failure (%)							ISO 527-4 & 5
ILSS (MPa)	61	-----	38	78	-----	48	ASTM D-2344/ISO 14130

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 & STORAGE

NE7 prepregs should be kept in the original packaging during transport and storage. Transport should be at -18°C to maximise the life of the product. NE7 prepregs should be stored, wrapped and sealed in polythene, at -18°C for maximum shelf life.

Temperature	Maximum Storage Time
-18°C	9 months
5°C	3 months
20°C	30 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°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 NE7 prepreg.

The backing film should be removed from the NE7 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 NE6 prepreg product

NOTICE AND DISCLAIMER

Information supplied by Notus Composites in this document is based on representative samples. As the handling conditions and methods are critical to the material performance, the company strongly recommends that customers make test panels and conduct appropriate testing of any goods or materials supplied by Notus to ensure that they are suitable for the customer's intended application. The company specifically excludes any warranty of fitness for purpose of the goods other than as provided in writing by the company.

All advice, instruction or recommendation is given in good faith but the company only warrants that advice in writing is given with reasonable skill and care. No further duty or responsibility is accepted by the company. All advice is given subject to the Terms and Conditions of Sale which are available on the website or on request from the company. Notus Composites continuously reviews and updates its technical and marketing literature. Please ensure that you are working with the most current version which can be checked by contacting your Notus sales or technical support contacts

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