

X2-121 is a thermosetting epoxy matrix with process temperature of 80°C. Versatile, high strength pre-preg system. The system is designed for "OoA" (Out of Autoclave) processing, notably oven vacuum bag curing.¹



Epoxy Resin System X2-121 HM is found to comply with DNV class programme DNV-CP-0431 cert. no. TAK00002F6

TYPE APPROVAL

PRODUCT VARIANTS

X2-121HM: Hotmelt version, unpigmented

SHELF LIFE



OUT LIFE
8 weeks @ 21 °C



STORAGE LIFE
12 months @ -18 °C

TYPICAL APPLICATIONS



MARINE



INDUSTRIAL



SPORTING
GOODS

FEATURES



LOW CURING TEMPERATURE OF 80°C



MEDIUM TACK



GOOD DRAPEABILITY



GOOD SURFACE FINISH



LOW VOLATILE CONTENT

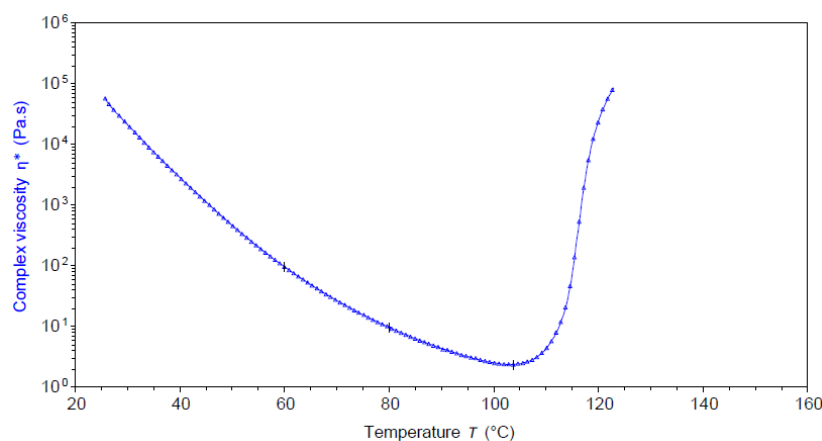
¹ Where the intended end application is for a cosmetic product, customers are advised to consult a Microtex Composites sales representative for specific advice on fibre selection when placing an order for material.

NOTE: All technical information contained in this document are given in good faith and are based on tests believed to be reliable, but their accuracy and completeness are not guaranteed. They do not constitute an offer to any person and shall not be deemed to form the basis of any contract. Accordingly, the user shall determine the suitability of the products for their intended use prior to purchase and shall assume all risk and liability in connection therewith. The information contained herein is under constant review and liable to be modified. All products are sold subject to Microtex Composites

MATRIX PROPERTIES

X2-121 Cured resin density @ RT²: (average value) 1.20 g/cm³.

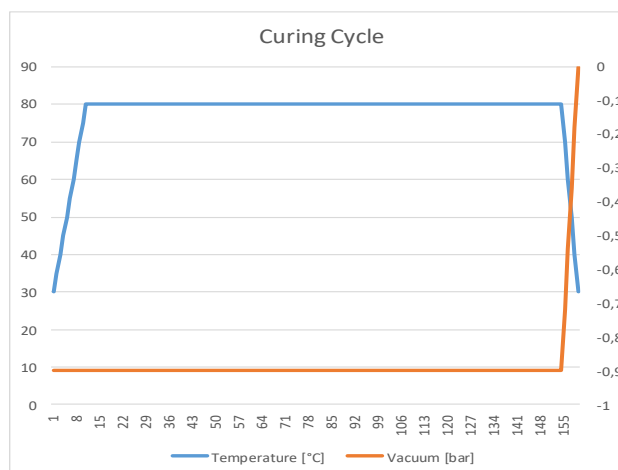
Resin viscosity: ramp rate = 2 °C/min, strain 0.1%, frequency 1.0 Hz.



OoA CURING CONDITIONS

OoA Cure (Oven Vacuum bag)²

Time (min)	Temp. (°C)	Time (min)	Vacuum (bar)
0	30	0	-0.9
50	80	50	-0.9
770	80	770	-0.9
795	30	795	0



² Curing cycle: 12hrs @ 80 °C

CURING TEMPERATURES AND Tg's

X2-121 ³		
Curing cycle	Tg (DMA) Onset (°C)	Tg (DMA) tanδ (°C)
12hrs @ 80°C	115	130

MECHANICAL PROPERTIES

X2-121 - 12hrs @ 80°C, O.o.A.		GG200T
Property	Test Method	Value*
0° Tensile strength [MPa]	ASTM D3039	700
0° Tensile modulus [GPa]		63
90° Tensile strength [MPa]		758
90° Tensile modulus [GPa]		65
0° Compressive strength [MPa]	SACMA SRM 1R-94	811
0° Compressive modulus [GPa]		62
90° Compressive strength [MPa]		838
90° Compressive modulus [GPa]		67
0° Flexural strength [MPa]	ASTM D790	872
0° Flexural modulus [GPa]		54
90° Flexural strength [MPa]		927
90° Flexural modulus [GPa]		55
0° Interlaminar shear strength (ILSS) [MPa]	ASTM D2344	81

* Test conditions: room temperature, dry . Normalized values at 55% VF .

³ GG200T 3K 12 plies laminate.

PREPREG PROCESSING BY OVEN VACUUM BAG CURING

The following can be helpful for producing good quality mouldings:

Prepreg should normally be cut to shape using templates and laid up in accordance with design instructions.

Care must be taken to ensure the prepreg conforms exactly to the tool shape, especially around internal corners.

If necessary, the tack of the system may be increased by gentle warming with hot air.

The lay up should be vacuum debulked at regular intervals using a P3 (pin pricked) release film on the prepreg surface and 2 thin breather layers.

The laminate is vacuum bagged and a vacuum of 980 mbar (29 mm Hg) applied for 5 to 10 minutes.

Once the required thickness has been built up, the laminate may be prepared for cure.

Holding the bagged uncured panel under vacuum for an extended period before curing (e.g. overnight). Whilst time consuming, it does help air removal.

Use a slow ramp (around 1°C/minute) at the beginning of the cure cycle, with a low temperature (warm) dwell, whilst the resin is still fairly viscous.

Debulking:

Repeat: Unitape: Every 4 plies; Fabric: Every 2 plies.

Vacuum: 29 mmHg.

Time: 5 to 10 minutes; Fabric: 5 minutes. Temperature: Ambient.

EXOTHERM RISK

This matrix system can undergo severe exothermic heat up during the curing process if incorrect procedures are followed. Great care must be taken to ensure that safe heating rates, dwell temperatures and lay-up/bagging procedures are properly executed, especially when molding solid laminates with more than 8 mm thickness. The risk of exotherm increases with lay-up thickness and increasing of curing temperature. It is strongly recommended that the user identifies a safe curing cycle through trials that are representative of all the relevant processing parameters⁴. It is also important to recognize that the model or tool material and its thermal mass, combined with the insulating effect of breather/bagging materials can affect the risk of an exotherm.

Please contact our technical department for further information on the exotherm behavior of these systems.

AVAILABILITY

X2-121 Series prepregs are available in a wide range of reinforcing fabrics and UD, including carbon, aramid, glass and special fabrics.

STORAGE CONDITIONS

This prepreg should be stored as received in a cool dry place or in a refrigerator.

After removal from refrigerated storage, prepreg should be allowed to reach room temperature before opening the polyethylene bag, thus preventing condensation (a full roll in its packaging can take more than 1 day).

PRECAUTIONS FOR USE

The usual precautions when handling uncured resins and fibrous materials should be observed, and a Safety Data Sheet is available for this product.

SDS Reference Codes: X2-121: SIS-456

⁴ A thermocouple must be fitted underneath the first material ply on a non-critical mold surface area. For all low temperature curing cycle a temperature reference thermocouple (for temperature control during curing cycle) must be fitted underneath the first material ply on a non-critical mold surface area. Working with air temperature as Temperature control may result in lack in polymerization and/or reduction in the developed Tg