X3-170

Transparent Epoxy Prepregs

TECHNICAL DATA SHEET

X3-170 MATRIX is a thermosetting epoxy matrix family with process temperatures ranging from 100°C to 170°C with wide curing and processing options. The system has high cosmetic results[1], high thermal resistance and high Tg.

PRODUCT VARIANTS

X3-170: Solvent version

X3-170HM: Hotmelt version

SHELF LIFE

OUT LIFE
28 days @ 21 °C

STORAGE LIFE
12 months @ -18 °C

TYPICAL APPLICATIONS

AUTOMOTIVE

SPORTING GOODS

FEATURES

- GOOD COSMETIC PROPERTIES
- HIGH Tg

[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 Srl terms and conditions of sale. Copyright 2020 - Microtex Composites Srl. All rights reserved worldwide. All trademarks or registered trademarks are the property of their respective owners.

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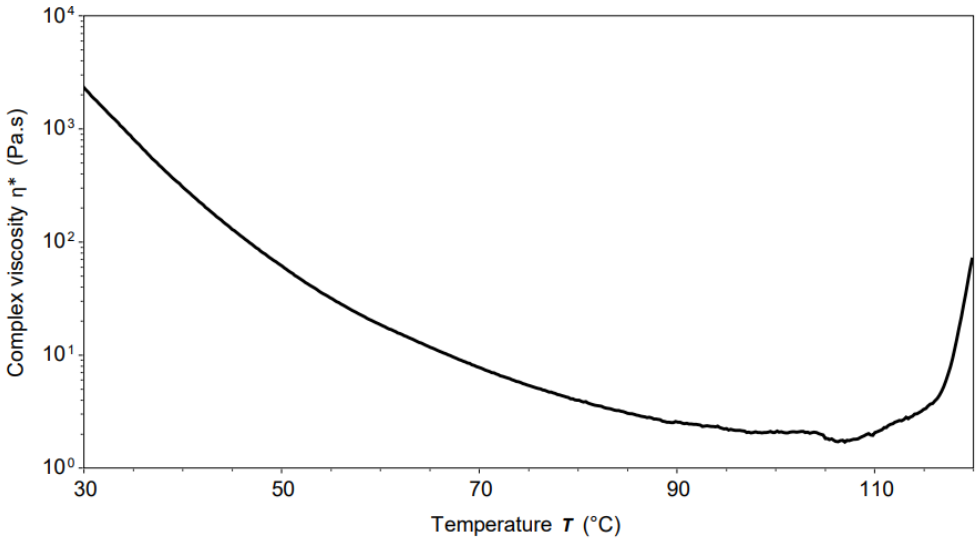
Quality system certified
ISO 9001:2015
by TUV Italia s.r.l.
cert. no. 50 100 12429

Quality system certified
IATF 16949:16
by TUV SUD Management Service GmbH
cert. no. 0365935

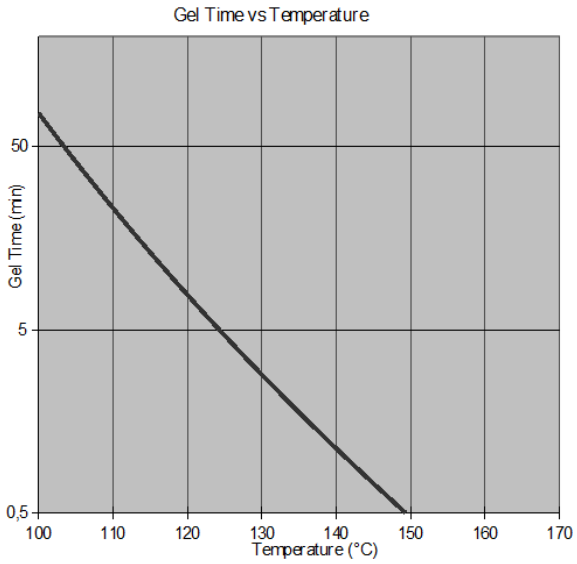
MATRIX PROPERTIES

Cured resin density @ RT:[2] (average value) 1.20 g/cm^3.

Resin viscosity: Ramp 2°C/min – ν = 10 rad/sec



Gel Time: (Hot Plate)



[2] Cure cycle: 1 h @ 130 °C.

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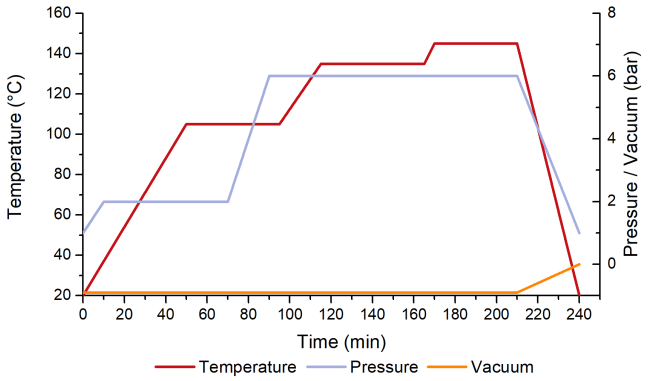
CURING CONDITIONS

Preliminary Note: The matrix rheology, reaction times and final component surface quality are all affected by the chosen heat up rates. Heating rates are generally related to components size (large and thick components require slow heating rates). The heat up rate selected should avoid large temperature differentials between the component, tool and the heat source. For certain configurations and for most large components, an intermediate dwell can also be introduced into the cure cycle. It will guarantee even temperature distribution throughout the tooling and component. Good temperature control will provide consistent and improved resin flow characteristics during cure. To ensure that the matrix stability is fully developed, no polymerization residual should be present on the products.

Autoclave Cure[3,4,5]			
Time (min)	**Temp. (°C)**	**Time (min)**	**Pressure (bar)**
0	20	0	1
50	105	10	2
95	105	70	2
115	135	90	6
165	135	210	6
170	145	240	1
210	145		
240	20		



ALTERNATIVE CURING CYCLES AND Tg's

Cure cycle	Tg (DSC) (°C)	Tg (DMA) Onset (°C)	Tg (DMA) tanδ (°C)
90 min @ 120 °C	130÷135	-	-
60 min @ 130 °C	-	110÷115	-
90 min @ 130 °C	145÷150	-	145÷150
90 min @ 135 °C	150÷155	125÷130	-
45 min @ 135 °C + 40 min @ 145 °C	155÷160	-	-
45 min @ 135 °C + 40 min @ 145 °C + 1h @ 175 °C	170÷175	140÷145	-

3 Temperature must be measured by the lagging thermocouple attached to the part.

4 Vacuum bag pressure: 0.9 bar.

5 This system has not adhesion properties and is not suggested for classical sandwich production; For this kind of application please contact our Technical Department.
Suggested Release film: Not perforated release film

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MECHANICAL PROPERTIES

X3-170 - 90 min @ 130 °C, 6 bar		GG245T-40[6]	GG400T-36[7]	GG630T-37[8]
Property	**Test Method**	**Values***		
0° Tensile strength [MPa]	ASTM D3039	770	715	965
0° Tensile modulus [GPa]		65	61	67
90° Tensile strength [MPa]		827	704	-
90° Tensile modulus [GPa]		64	61	-
0° Compressive strength [MPa]	ASTM D6641	559	442	-
0° Compressive modulus [GPa]		53	60	-
90° Compressive strength [MPa]		591	439	-
90° Compressive modulus [GPa]		52	60	-
0° Interlaminar shear strength (ILSS) [MPa]	ASTM D2344	52	52	63
90° Interlaminar shear strength (ILSS) [MPa]		51	53	-
0° Flexural strength [MPa]	ASTM D790	-	-	941
0° Flexural modulus [GPa]		-	-	56
Mode I Strain Energy release Rate G1c [J/m^2]	ASTM D5528 (MBT METHOD)	-	-	300

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

AGING TEST

PV1200 (20 cycles)	SAE J2020 (100 h)
Pass [9]	GC 5/5 [10]

6 Carbon fabric 245 gsm twill 2/2 3K Pyrofil HTA40, RC 40%.
7 Carbon fabric 400 gsm twill 2/2 6K Pyrofil TR50S, RC 36%.
8 Carbon fabric 630 gsm twill 2/2 12K Pyrofil TR50S, RC 37%.
9 Carbon laminate; Cure cycle: 1 h @ 130 °C
10 Carbon laminate; Cure cycle: 90 min @ 130 °C (glossy painted).

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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 high thickness.

The risk of exotherm increases with lay-up thickness and increasing of temperature cure. It is strongly recommended that the user identifies a safe cure cycle through trials that are representative of all the relevant processing parameters. 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

X3-170 series prepregs are available in a wide range of reinforcing fabrics, 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: X3-170: SDS-415

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