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Product Information

Elan-tech®

EC 157.1/W 152 XXL

100:30

Infusion extra slow epoxy system for composite parts

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Resin
EC 157.1

Hardener
W 152 XXL R

Mixing ratio by weight
100:30

Application: High performance composite parts of large size.

Processing: Manual mixing, mechanical mixing, mechanical mixing with automatic mixing/dispensing machines. Impregnation by infusion or under vacuum infusion (SCRIMP) of glass, carbon, kevlar fabrics. Room temperature curing. Long pot life. Large size components.

Description: Two components epoxy system. High modulus low viscosity. Good thermal resistance. Curing at room temperature plus the post-curing at a moderate temperature (50-60°C) allows to obtain high performances. The system is RoHS compliant (European directive 2002/95/EC) and the new RoHS Directive 2011/65/EU (RoHS 2) entered into force on 21 July 2011 and requires Member States to transpose the provisions into their respective national laws by 2 January 2013.

SYSTEM SPECIFICATIONS

Resin

Viscosity at:	25°C	IO-10-50 (ISO3219)	mPas	500	700
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Hardener

Viscosity at:	25°C	IO-10-50 (ISO3219)	mPas	10	30
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TYPICAL SYSTEM CHARACTERISTICS

Processing Data

Colour resin				Colourless	
Colour hardener				Pale/yellow	
Mixing ratio by weight		for 100 g resin	g	100:30	
Mixing ratio by volume		for 100 ml resin	ml	100:37	
Density	25°C Resin	IO-10-51 (ASTM D 1475)	g/ml	1,13	1,17
Density	25°C Hardener	IO-10-51 (ASTM D 1475)	g/ml	0,96	1,00
Pot life	25°C (50mm;200ml)	IO-10-53 (*)	min	380	460
Exothermic peak	25°C (50mm;200ml)	IO-10-53 (*)	°C	30	35
Initial mixture viscosity at:	25°C	IO-10-50 (ISO3219)	mPas	150	250
Gelation time	25°C (1mm)	IO-10-88 (ASTM D5895-03)	h	17	19
Gelation time	60°C 100ml	IO-10-52b	min	30	45
Suggested curing cycles		(**)		48hrs at RT + 24hrs at 50°C	

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TYPICAL CURED SYSTEM PROPERTIES

Properties determined on specimens cured: 24 h RT + 15 h 60°C

Colour				Pale yellow
Machinability				Excellent
Density 25°C		IO-10-54 (ASTM D 792)	g/ml	1,12 1,16
Hardness 25°C		IO-10-58 (ASTM D 2240)	Shore D/15	80 84
Glass transition (Tg)	24h RT + 15h 60°C	IO-10-69 (ASTM D 3418)	°C	73 78
	24h RT + 15h 80°C		°C	78 84
Maximum Tg	24h RT + 6h 100°C	IO-10-69 (ASTM D 3418)	°C	85 90
Water absorption (24h RT)		IO-10-70 (ASTM D 570)	%	0,10 0,20
Water absorption (2h 100°C)		IO-10-70 (ASTM D 570)	%	0,60 0,70
Max recommended operating temperature		(***)	°C	80
Flexural strength		IO-10-66 (ASTM D 790)	MN/m ²	82 92
Maximum strain		IO-10-66 (ASTM D 790)	%	4,0 6,5
Strain at break		IO-10-66 (ASTM D 790)	%	>15
Flexural elastic modulus		IO-10-66 (ASTM D 790)	MN/m ²	2.400 3.000
Tensile strength		IO-10-63 (ASTM D 638)	MN/m ²	56 62
Elongation at break		IO-10-63 (ASTM D 638)	%	8 12
Compressive strength		IO-10-72 (ASTM D 695)	MN/m ²	80 90

IO-00-00 = ELANTAS Europe's test method. The corresponding international method is indicated whenever possible.

nd = not determined na = not applicable RT = TA = laboratory room temperature (23±2°C)

Conversion units: 1 mPas = 1 cPs 1MN/m² = 10 kg/cm² = 1 MPa

(*) for larger quantities pot life is shorter and exothermic peak increases

(**) the brackets mean optionality

(***) The maximum operating temperature is given on the basis of laboratory information available being it function of the curing conditions used and of the type of coupled materials. For further possible information see post-curing paragraph.

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Instructions: Before use verify if components are perfectly transparent. Add the appropriate quantity of hardener to the resin, mix carefully. Avoid air trapping. If the mixing is carried on with dosing/mixing equipment deaeration of the mixture is not necessary. On the contrary evaluate if it is necessary as function of vacuum applied during infusion.

Curing/Post-curing Post-curing is always advisable for RT curing systems in order to stabilize the component and to reach the best properties. It is necessary when the component works at a high temperature. The rate of heating and the indicated post-curing time are referred to standard specimen size. Users should evaluate the best conditions of curing or post-curing depending on the component size and shape. For large size components decrease the thermal gradient and increase the post-curing time. In case of thin layer applications and composites, post cure on the jig. As general guide to minimize the risk of thermal deformations we suggest to carry on the post-curing in the following way:

- on mould: 24 h RT + 6 h 40°C + 6 h 50°C + 6 h 60°C + 12 h 70°C
- out of the mould but on the jig: 7 days RT + 6 h 40°C + 6 h 50°C + 6 h 60°C + 12 h 70°C.

The glass transition temperature obtained in these conditions is close to maximum T_g.

Storage: Unfilled epoxy resin and its amine based hardener can be stored for two years in the original sealed containers stored in a cool, dry place. The hardener is moisture sensitive therefore it is good practice to close the container immediately after each use.

Handling precautions: Refer to the safety data sheet and comply with regulations relating to industrial health and waste disposal.

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The information given in this publication is based on the present state of our technical knowledge but buyers and users should make their own assessments of our products under their own application conditions.