EN

Product Information

Elan-tech®
EC 157.1/W 152 LR 100:30

2-components thermal-resistance epoxy system for infusion

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Resin	Hardener	Mixing ratio by weight
EC 157.1	**W 152 LR**	**100:30**

Application: High performance composite parts of medium 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.
W 152.1 HR: High reactivity for small components or as accelerator for other hardeners (see Technical Data Sheet of EC 157.1/W 152.1 HR).
W 152 MR: Medium reactivity for medium-small size components (see Technical Data Sheet of EC 157.1/W 152 MR).
W 152 LR: Medium-slow reactivity for medium-large size components.
W 152 MLR: Medium-slow. Medium and large size components (see Technical Data Sheet of EC 157.1/W 152 MLR).
W 152 XLR: Long pot life. Large size components (see Technical Data Sheet of EC 157.1/W 152 XLR).

Description: Two components epoxy system. Low viscosity. Good thermal resistance. Curing at room temperature plus the post-curing at 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
Hardener					
Viscosity at:	25°C	IO-10-50 (ISO3219)	mPas	20	40

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	0,93	0,97
Pot life	25°C (50mm;200ml)	IO-10-53 (*)	min	100	120
Exothermic peak	25°C (50mm;200ml)	IO-10-53 (*)	°C	180	195
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	10	12
Demoulding time	25°C (15ml;6mm)	(*)	h	24	32

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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	1,08	1,12
Hardness 25°C		IO-10-58 (ASTM D 2240)	Shore D/15	84	88
Glass transition (Tg)	7gg TA/RT	IO-10-69 (ASTM D 3418)	°C	55	61
	24hRT+15h 50°C		°C	70	76
	24hRT+15h 60°C		°C	79	85
			°C		
Maximum Tg		IO-10-69 (ASTM D 3418)	°C	94	100
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	90	
Flexural strength		IO-10-66 (ASTM D 790)	MN/m²	110	120
Maximum strain		IO-10-66 (ASTM D 790)	%	5,0	7,0
Strain at break		IO-10-66 (ASTM D 790)	%	6,0	8,0
Flexural elastic modulus		IO-10-66 (ASTM D 790)	MN/m²	3.200	3.600
Tensile strength		IO-10-63 (ASTM D 638)	MN/m²	67	75
Elongation at break		IO-10-63 (ASTM D 638)	%	6,0	8,0
Compressive strength		IO-10-72 (ASTM D 695)	MN/m²	91	103

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

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 hardeners are moisture sensitive therefore it is good practice to close the container immediately after each use. The hardeners are 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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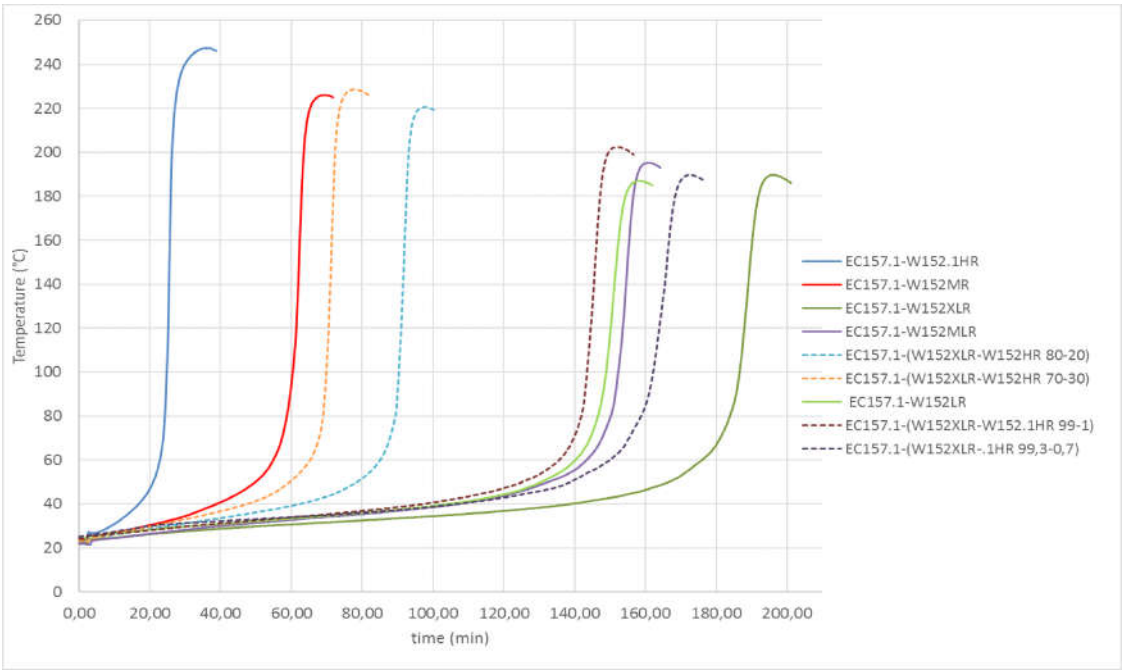
Reactivity profiles of the systems during mass reactions

(200ml system volume, resin/hardener mixing ratio 100:30 at 25°C in air)



With HR label is identified the high reactivity hardener W152.1HR, generally suitable for small dimensions repairing or as reactivity modifier for other hardeners. The mixture of W152XLR with W152.1HR in different ratios allows to obtain intermediate reactivities. The systems are approved by DNV GL.

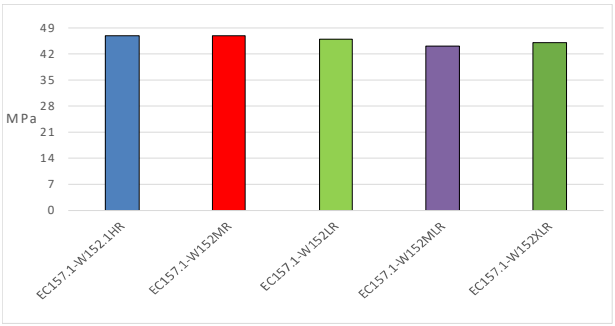
Processing times for the correct use of systems in vacuum infusion technology

	EC157.1-W152.1HR				EC157.1-W152MR				EC157.1-W152LR				EC157.1-W152MLR				EC157.1-W152XLR			
Application Temperature (°C)	15	20	25	30	15	20	25	30	15	20	25	30	15	20	25	30	15	20	25	30
Gelation Time (h)	6-8	NA	3-4	NA	12-16	NA	6-8	n.d.	16-22	NA	10-12	NA	16-22	NA	9-11	NA.	22-30	NA	13-16	NA
Minimum time before releasing the vacuum (h)	9	6	5	3,5	18	12	9	8	24	18	15	12	24	18	14	12	40	26	20	16
Demolding time (h)	12	8	6,5	5	24	18	15	12	44	36	30	24	42	36	30	24	110	60	42	30

N.B. The reported values are derived from lab tests and from the application experience. They must be considered indicative because they are related to the specific size and shape of the composite manufactures. Buyers and users should make their own assessments of our products under their own application conditions.

Interlaminar shear strength (ILSS) of laminates

(Unidirectional glass 600g/m^2 realized with infusion technology) –ASTM D2344



The composite laminates has been obtained by infusion of a 600g/m^2 glass E tissue. From laminating of 5 mm of thickness cured at room temperature and stabilized at 50°C for 16 hrs were obtained specimens following ASTM D2344 code.