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Product Information

Elan-tech®

EC 157.1/W 152.1 HR 100:30

EC 157.1/W 152 XLR 100:30

2-components epoxy system for infusion

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Resin	Hardener	Mixing ratio by weight
EC 157.1	**W 152.1 HR**	**100:30**
	W 152 XLR	**100:30**

Application: High performance composite parts of medium and 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.
W 152.1 HR: High reactivity for small components or as accelerator for other hardeners.
W 152 XLR: Long pot life. Large size components.

Description: Two components epoxy system. 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

Hardener W 152.1 HR

Viscosity at:	25°C	IO-10-50 (ISO3219)	mPas	30	80

Hardener W 152 XLR

FTIR spectrum (correlation factor)		IO-10-75		0,990	1,000

TYPICAL SYSTEM CHARACTERISTICS

Resin

Colour resin				Colourless	
Density resin 25°C		IO-10-51 (ASTM D 1475)	g/ml	1,13	1,17

Hardeners				W 152.1 HR		W 152 XLR	
Colour hardener				Pale/yellow		Various/colurs/	
Viscosity at:	25°C	IO-10-50 (ISO3219)	mPas	30	80	10	30
Density	25°C	IO-10-51 (ASTM D 1475)	g/ml	1,02	1,06	0,90	0,95

Processing Data

Mixing ratio by weight		for 100 g resin	g	100:30		100:30	
Mixing ratio by volume		for 100 ml resin	ml	100:34		100:38	
Pot life	25°C (50mm;200ml)	IO-10-53 (*)	min	10	14	135	165
Exothermic peak	25°C (50mm;200ml)	IO-10-53 (*)	°C	220	240	135	145
Initial mixture viscosity at:	15°C	IO-10-50 (ISO3219)	mPas	700	1.000	400	500
	25°C		mPas	200	400	100	200
	35°C		mPas	100	200	50	100
Gelation time	15°C tack start (1mm)	)-10-88 (ASTM D5895-03)	h	5	6	14	16
	15°C tack end (1mm)		h	7	8	20	22
	25°C tack start (1mm)		h	2	3	10	11
	25°C tack end (1mm)		h	3	4	14	15
Suggested curing cycles		(**)		24 h RT + 16 h 50° C		24 h RT + 16 h 50° C	

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TYPICAL CURED SYSTEM PROPERTIES

Properties determined on specimens cured: 24 h RT + 16 h 50°C

				W 152.1 HR		W 152 XLR	
Density 25°C		IO-10-54 (ASTM D 792)	g/ml	1,15	1,19	1,13	1,17
Hardness 25°C		IO-10-58 (ASTM D 2240)	Shore D/15	84	88	84	88
Glass transition (Tg)	24 h RT + 15 h 50°C	IO-10-69 (ASTM D 3418)	°C	68	74	68	74
	24 h RT + 15 h 80°C		°C	82	88	77	83
Maximum Tg		IO-10-69 (ASTM D 3418)	°C	82	88	82	88
Water absorption (24h RT)		IO-10-70 (ASTM D 570)	%	0,3	0,4	0,3	0,4
Water absorption (2h 100°C)		IO-10-70 (ASTM D 570)	%	0,4	0,5	0,4	0,5
Flexural strength		IO-10-66 (ASTM D 790)	MN/m²	104	116	104	116
Maximum strain		IO-10-66 (ASTM D 790)	%	4,5	7,0	4,5	7,0
Strain at break		IO-10-66 (ASTM D 790)	%	10	14	10	14
Flexural elastic modulus		IO-10-66 (ASTM D 790)	MN/m²	2.600	3.100	2.600	3.100
Tensile strength		IO-10-63 (ASTM D 638)	MN/m²	70	80	68	76
Elongation at break		IO-10-63 (ASTM D 638)	%	6,5	9,5	6,5	9,5
Compressive strength		IO-10-72 (ASTM D 695)	MN/m²	78	86	78	86

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. Users should evaluate the best conditions of curing or post-curing depending on the component size and shape. For big 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.

Storage: Unfilled epoxy resin and its amine based hardeners 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.

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

emission date:	May	2017
revision n° 01	April	2018

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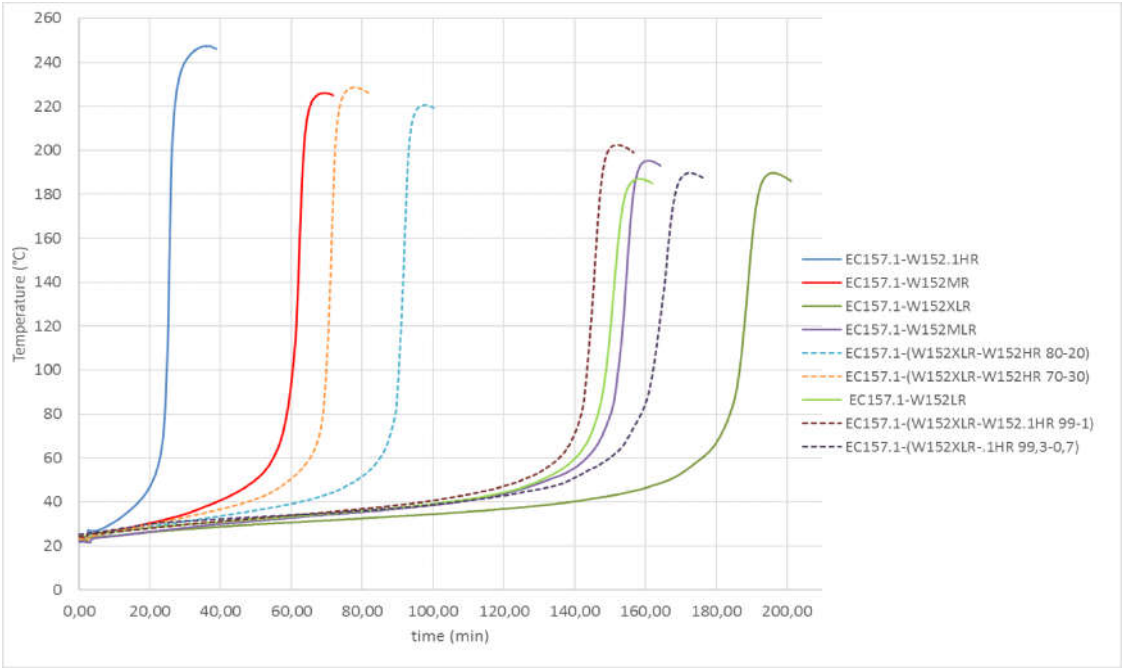
Reactivity profiles of the systems during mass reactions

(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.

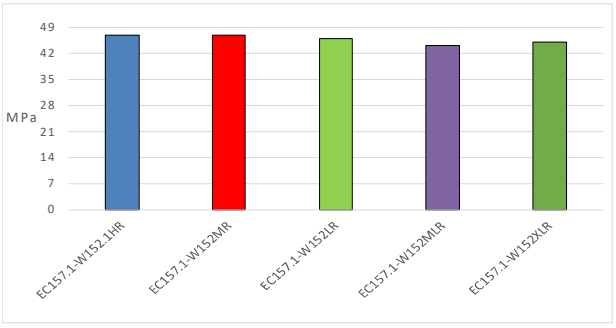
Processing times for the correct use of systems in vacuum infusion technology

	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.