EN

Product Information

Elan-tech ®

EC 157/W 152 MLR 100:30

EC 157/W 152 XLR 100:30

System certified by RINa for boat hull construction in composite materials

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ELANTAS

Resin	Hardener	Mixing ratio by weight
EC 157	**W 152 MLR**	**100:30**
	W 152 XLR	**100:30**

Application: High performance composite parts of medium and large size EC157/W152XLR system is certified by Registro Navale Italiano and complies to the regulation of components for composite materials designated for boat hull construction (NC/C.24 - ed. 01/01/1997). Approval N° DIP086509CS/003.

Processing: Manual or mechanical mixing or with automatic mixing/dispensing machines. Impregnation by infusion or under vacuum infusion (SCRIMP) of glass, carbon, kevlar fabrics. Room temperature curing.
W 152 MR: high reactivity for small components (see EC157/W152 MR).
W 152 LR: medium reactivity (see EC157/W152LR).
W 152 MLR: medium-slow. Large size components.
W 152 XLR: long pot life. Large size components.

Description: Two component epoxy system, fluid at high modulus. Good thermal resistance. Curing at room temperature plus the post-curing at a moderate temperature (50-60°C) allows to obtain high performances.

SYSTEM SPECIFICATIONS

Resin

Viscosity at: 25°C	IO-10-50 (EN13702-2)	mPas	500	600

Hardener W 152 MLR

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

Hardener W 152 XLR

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

TYPICAL SYSTEM CHARACTERISTICS

Resin

Resin Colour			Colourless	
Density resin 25°C	IO-10-51 (ASTM D 1475)	g/ml	1,14	1,16

Hardeners			**W 152 MLR**	**W 152 XLR**
Hardener Colour			Pale/yellow	Pale/yellow
Viscosity at: 25°C	IO-10-50 (EN13702-2)	mPas	5 20	10 30
Density 25°C	IO-10-51 (ASTM D 1475)	g/ml	0,90 0,95	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	100:37	100:38
Pot life at:	25°C (400 mPas)	IO-10-50 (EN13702-2) (*)	h	1,5 2,0	2,0 2,5
	25°C (800 mPas)		h	2,5 3,0	3,0 3,5
	25°C (3.000 mPas)		h	3,5 4,0	4,0 5,0
Pot life	25°C (50mm;200ml)	IO-10-53 (*)	min	120 150	135 165
Exothermic peak	25°C (50mm;200ml)	IO-10-53 (*)	°C	165 185	155 170
Initial mixture viscosity at:	25°C	IO-10-50 (EN13702-2)	mPas	150 250	150 200
Gelation time	25°C (1mm)	)-10-88 (ASTM D5895-03)	h	8 10	10 14
Demoulding time	25°C (15ml;6mm)	(*)	h	20 30	36 48
Post-curing	60°C	(**)	h	(15)	(15)
Maximum recommended thickness			mm	5	5

EC 157

TYPICAL CURED SYSTEM PROPERTIES

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

				W 152 MLR		W 152 XLR	
Colour				Pale yellow		Pale yellow	
Machinability				Excellent		Excellent	
Density 25°C		IO-10-54 (ASTM D 792)	g/ml	1,08	1,12	1,08	1,12
Hardness 25°C		IO-10-58 (ASTM D 2240)	Shore D/15	84	88	85	87
Glass transition (Tg)	7gg TA/RT	IO-10-69 (ASTM D 3418)	°C	57	63	58	60
	24h TA+15h 50°C		°C	67	73	71	73
	24h TA+15h 60°C		°C	77	83	79	82
Maximum Tg	8h 80°C	IO-10-69 (ASTM D 3418)	°C	85	90	86	90
Water absorption (24h RT)		IO-10-70 (ASTM D 570)	%	0,10	0,20	0,10	0,20
Water absorption (2h 100°C)		IO-10-70 (ASTM D 570)	%	0,65	0,85	0,65	0,85
Flexural strength		IO-10-66 (ASTM D 790)	MN/m²	110	120	108	113
Maximum strain		IO-10-66 (ASTM D 790)	%	5,0	7,0	5,5	6,0
Strain at break		IO-10-66 (ASTM D 790)	%	6,0	8,0	7,8	8,2
Flexural elastic modulus		IO-10-66 (ASTM D 790)	MN/m²	3.100	3.500	3.100	3.300
Tensile strength		IO-10-63 (ASTM D 638)	MN/m²	68	76	71	75
Elongation at break		IO-10-63 (ASTM D 638)	%	6,0	8,0	5,5	6,0
Compressive strength		IO-10-72 (ASTM D 695)	MN/m²	92	104	85	100

IO-00-00 = Elantas Italia's test method. The correspondent 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.

EC 157

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 big size components decrease the thermal gradient and increase the post-curing time. In the 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 Tg.

Storage: Epoxy resins and their hardeners can be stored for one year in the original sealed containers stored in a cool, dry place. The hardeners are moisture sensitive therefore it is good practice to close the vessel immediately after each use.

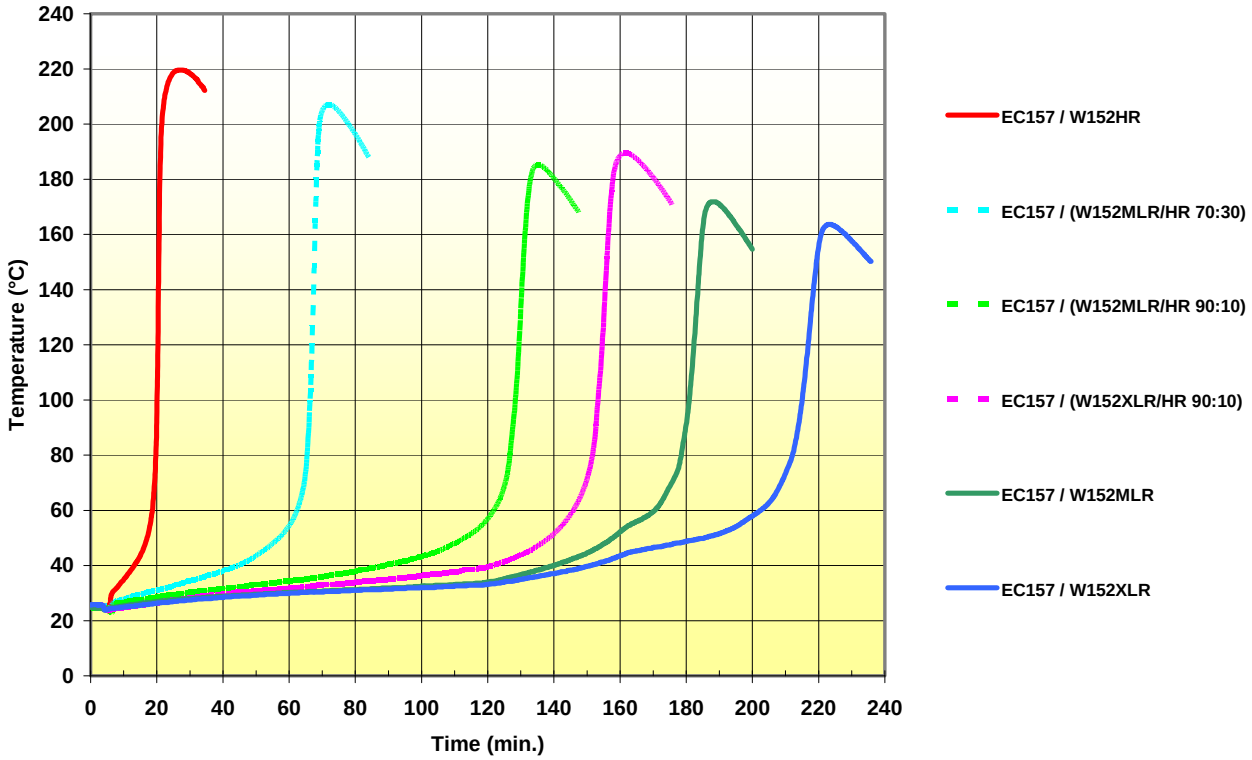
Handling precautions: Refer to the safety data sheet and comply with regulations relating to industrial health and waste disposal.

emission date:	February	2009
revision n° 03	November	2010

Systems properties in wet state

Reactivity Profiles

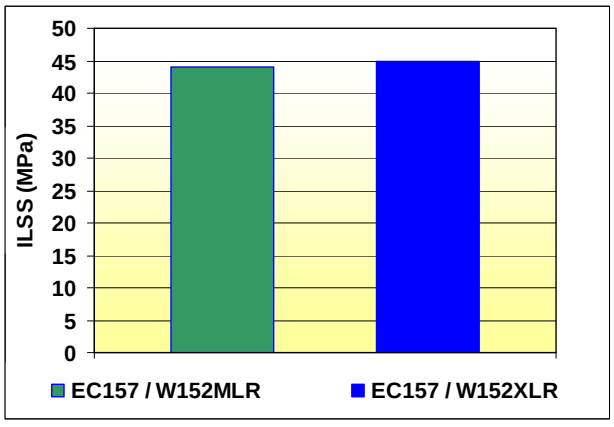
(200ml system volume, resin / hardener mixing ratio 100:30 at 25° C in air)

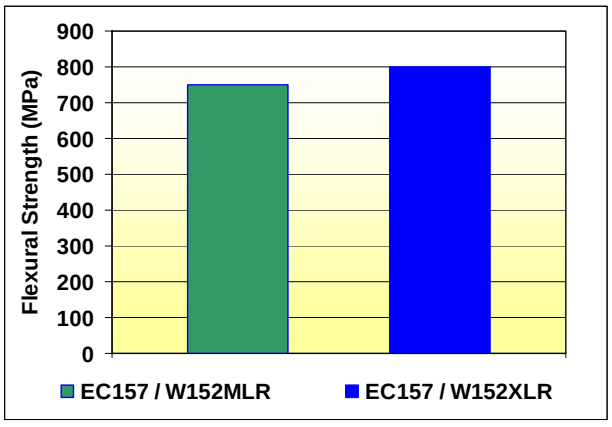


With HR label is identified the high reactivity hardener W152HR, generally utilized for small dimensions repairing or as reactivity modifier for the other W152 hardener.

Interlaminar shear stress (ILSS) and flexural Strength of laminates

(Unidirectional glass 600g/m^2 Realized with infusion technology) –ASTM D2344 and ASTM D790





The laminate has been obtained by infusion of a 600g/m^2 glass E tissue. The specimens were obtained from the 5mm thickness composites impregnated with the different system according to ASTM D790 and ASTM D2344 rules. Specimens were stabilized at 50°C for 16 hours before the test.