

EN

Technical Data Sheet

**Elan-tech<sup>®</sup>****EC 152/W 152 LR**

100:30

RINA approved

Epoxy resin for lamination of composites

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## Product description

- 2K unfilled epoxy system
- Low reactivity HT hardener
- Possible combination with different reactivity hardener
- Good fibers wettability/High modulus
- Thermally resistant up to 105 °C
- RINA approved

## Areas of application

High performance composite parts. Available for large and medium thickness structure, such as sailing boats, shipyard structures.

## Processing methods

Wet lay-up of glass, aramid or carbon fiber fabrics & multiaxials. Room temperature curing. Post-curing needed to achieve the proper thermal resistance.

## 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 high temperature. Recommended post curing rump-up: 10°C/hour. Cool it down slowly. The rate of heating and the indicated post-curing time are referred to laboratory specimen size. Users should evaluate the best conditions of curing or post-curing depending on the component size and shape. For big size components it is advisable to decrease the thermal gradient and increase the post-curing time.

## Storage and stability

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.

## Sales specifications

### EC 152

Properties	Conditions	Test Method	Value	M/U
Viscosity	25 °C	IO-10-50 (ISO 3219)	1200 ÷ 1800	mPa·s

### W 152 LR

Properties	Conditions	Test Method	Value	M/U
Viscosity	25 °C	IO-10-50 (ISO 3219)	20 ÷ 40	mPa·s

## Typical product properties

### EC 152

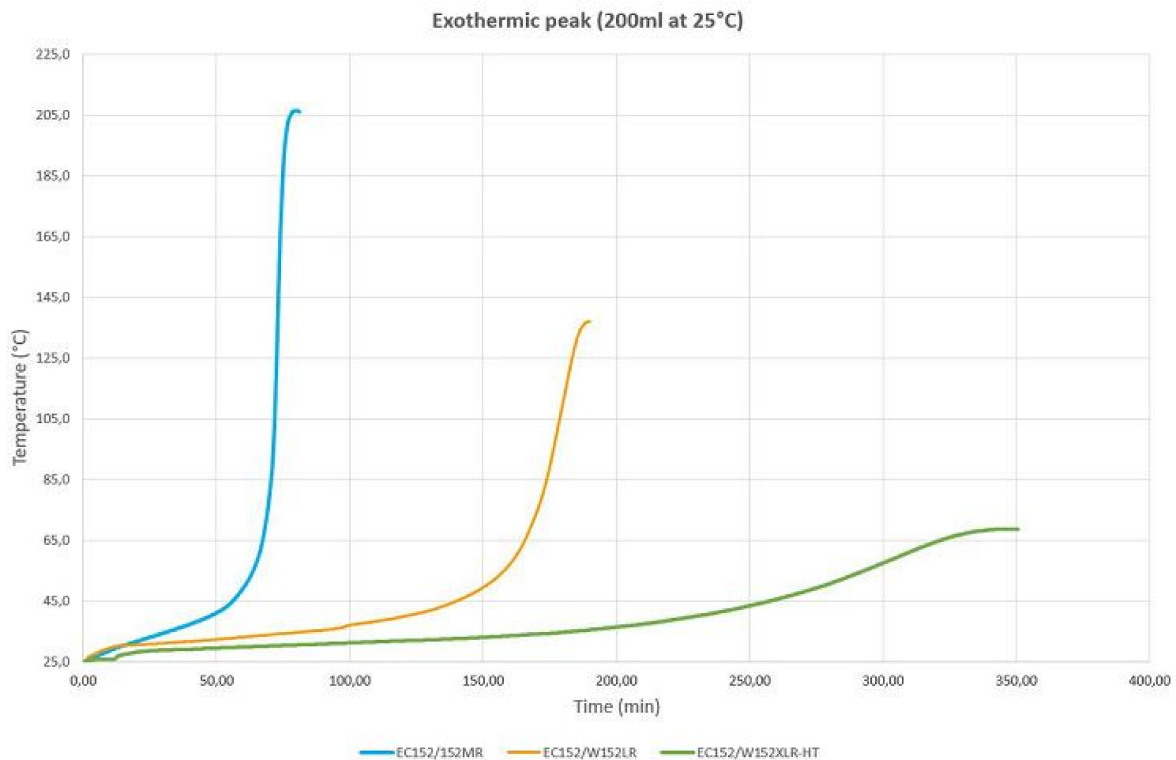
Properties	Conditions	Test Method	Value	M/U
Colour		--	Pale Yellow	
Viscosity	25 °C	IO-10-50 (ISO 3219)	1200 ÷ 1800	mPa·s
Density	25 °C	IO-10-51 (ASTM D 1475)	1,13 ÷ 1,15	g/ml

### W 152 LR

Properties	Conditions	Test Method	Value	M/U
Colour		--	Pale yellow	
Viscosity	25 °C	IO-10-50 (ISO 3219)	20 ÷ 40	mPa·s
Density	25 °C	IO-10-51 (ASTM D 1475)	0,93 ÷ 0,97	g/ml

## Typical system properties

Properties	Conditions	Test Method	Value	M/U
Mix Ratio by weight		--	100: 30	g
Mix Ratio by volume		--	100 : 37	ml
Initial mixture viscosity	15 °C	IO-10-50 (ISO 3219)	800 ÷ 1300	mPa·s
	25 °C		445 ÷ 670	mPa·s
Exothermic peak	25 °C - 50 mm - 200 ml	IO-10-53 (*)	na	°C
Pot life	25 °C - 50 mm - 200 ml	IO-10-53 (*)	90 ÷ 110	min
Gel time	25 °C - 1 mm	IO-10-88 (ASTM D 5895-03)	na	hrs
Gel time (Tack Start/End)	25 °C - 1 mm - Tack Start	IO-10-88 (ASTM D 5895-03)	6 ÷ 7	hrs
	25 °C - 1 mm - Tack End		8,5 ÷ 9,5	hrs
Suggested curing cycles		(**)	24 h RT + 15 h 60 °C	



## Typical cured system properties

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	24 h RT + 15 h 60 °C	
Density (solid)	25 °C	IO-10-54 (ASTM D 792)	1,12 ÷ 1,16	g/ml
Hardness	25 °C	IO-10-58 (ASTM D 2240)	84 ÷ 88	Shore D/15
Glass Transition (Tg)	24 h RT + 15 h 40 °C	IO-10-69 (ASTM D 3418)	70 ÷ 76	°C
	24 h RT + 15 h 50 °C		74 ÷ 80	°C
	24 h RT + 15 h 60 °C		84 ÷ 90	°C
	24 h RT + 15 h 70 °C		97 ÷ 103	°C
Maximum Tg	24 h RT + 15 h 80 °C	IO-10-69 (ASTM D 3418)	103 ÷ 109	°C
Water absorption (24 h RT)		IO-10-70 (ASTM D 570)	0,1 ÷ 0,2	%
Water absorption (2 h 100 °C)		IO-10-70 (ASTM D 570)	0,6 ÷ 0,7	%
Heat deflection temperature (HDT)	24 h RT + 16 h 40 °C	ISO 75	71 ÷ 75	°C

## Mechanical properties in cured condition

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	24 h RT + 16 h 40 °C	
Flexural strength	25 °C	IO-10-66 (ASTM D 790)	100 ÷ 120	MN/m <sup>2</sup>
Strain at maximum stress	25 °C	IO-10-66 (ASTM D 790)	4,5 ÷ 6,5	%
Strain at break	25 °C	IO-10-66 (ASTM D 790)	7,0 ÷ 10,5	%
Flexural elastic modulus	25 °C	IO-10-66 (ASTM D 790)	2800 ÷ 3400	MN/m <sup>2</sup>
Tensile strength	25 °C	IO-10-63 (ASTM D 638)	60 ÷ 74	MN/m <sup>2</sup>
Nominal strain at break	25 °C	IO-10-63 (ASTM D 638)	3,5 ÷ 5,0	%

## Mechanical properties of composite material

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	24 h RT + 15 h 60 °C	
Texture	Stacking sequence 0 °C	--	UNIE 640	
I.L.S.S. (interlaminar shear strength)	25 °C	ASTM D 2344	30 ÷ 40	N/mm <sup>2</sup>
Flexural strength	25 °C	ASTM D 790	430 ÷ 520	MN/m <sup>2</sup>
Strain at maximum stress	25 °C	ASTM D 790	2,0 ÷ 3,0	%
Strain at break	25 °C	ASTM D 790	3,5 ÷ 5,5	%
Flexural elastic modulus	25 °C	ASTM D 790	20000 ÷ 25000	MN/m <sup>2</sup>
Tensile strength	25 °C	ASTM D 638	30 ÷ 37	MN/m <sup>2</sup>
Nominal strain at break	25 °C	ASTM D 638	5 ÷ 10	%

## Processing time for the correct use of systems in vacuum impregnation technology (thickness 2mm)

	EC152/W152MR				EC152/W152LR				EC152/W152XLR-HT			
Application temperature (°C)	15	20	25	30	15	20	25	30	15	20	25	30
Maximum time before vacuum application (h)	6	4	3	2	9	8	7	5	13	10	8	6
Gel time (h)	11-15	n.d.	5-7	n.d.	15-20	n.d.	9-12	n.d.	22-30	n.d.	11-14	n.d.
Minimum time for vacuum release (h)	16	9	8	7	24	18	15	12	40	26	20	16
Demoulding time (h)	20	15	12	9	44	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.

IO-00-00 = Elantas Europe internal 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 1 MN/m<sup>2</sup> = 10 kg/cm<sup>2</sup> = 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.

**Product of ELANTAS Europe.** Our advice given verbally or in writing is based on the present state of our technical knowledge, but is intended as information given without obligation, also with respect to any protective rights held by third parties. It does not relieve your own responsibility to check the products for their suitability to the purposes and processes intended and in accordance with the technical sheets of the products. The application usage and processing of the product are beyond our control and will completely fall into the scope of responsibility of buyers and users. Should there nevertheless be a case of liability from our side, this will be limited to any damage equivalent to the value of the merchandise delivered by us. Naturally, we assume responsibility for the unobjectionable quality of our products, as defined in our general terms and condition.



**CERTIFICATO DI OMOLOGAZIONE DI TIPO**  
*TYPE APPROVAL CERTIFICATE*  
**N. DIP386718CS/001**

Si certifica che il seguente prodotto soddisfa le prescrizioni delle norme RINA per l'omologazione di tipo.  
*This is to certify that the product identified below is in compliance with the applicable requirements of the RINA type approval system.*

<b>Descrizione</b> <i>Description</i>	<b>Resine Epossidiche per Laminazione</b> <i>Laminating Epoxy Resin</i>
<b>Tipo</b> <i>Type</i>	EC 152 / W 152 EC 152 / W 152 MR EC 152 / W 152 LR EC 152 / W 152 XLR- HT
<b>Richiedente</b> <i>Applicant</i>	ELANTAS Europe S.r.l. STRADA ANTOLINI, 1 43044 Collecchio (PR) ITALY
<b>Fabbricante</b> <b>Luogo di produzione</b> <i>Manufacturer</i> <i>Place of manufacture</i>	ELANTAS Europe S.r.l. STRADA ANTOLINI, 1 43044 Collecchio (PR) ITALY
<b>Norme di riferimento</b> <i>Reference standards</i>	Norme per l' omologazione di componenti di materiali compositi destinati alla costruzione di scafi (NC/C.24 - ed. 01/01/1997) Norme per l' omologazione di componenti di materiali compositi destinati alla costruzione di scafi (NC/C.24 - ed. 01/01/1997)

Rilasciato a Genova il 15 Maggio 2019. Questo  
Certificato è valido fino al 14 Maggio 2022  
*Issued in Genoa on May 15, 2019 - This Certificate is valid until  
May 14, 2022*

Questo Certificato e' composto di 1 pagina e di 1 allegato  
*This certificate consists of this page and 1 enclosure*

RINA Services S.p.A.

*Giorgio Gallo*



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**CERTIFICATO DI OMOLOGAZIONE DI TIPO**

TYPE APPROVAL CERTIFICATE

DIP386718CS/001

Allegato - Pagina 1/1

Enclosure - Page 1 of 1

EC 152 / W 152

<b>Documenti di riferimento</b> <i>Reference documents</i>	Specifiche tecniche depositate presso la Direzione Generale del RINA. Test report archiviato con DIP 96161 e inoltrato con lettera DIP/2019/00795/EDU01. <i>Technical specification deposited at RINA Head Office. Test report filed with DIP96161 and dispatched with letter DIP/2019/00795/EDU01</i>
<b>Campo di applicazione</b> <i>Fields of application</i>	Realizzazione con metodo hand lay-up di stratificati e parti strutturali di scafi in plastica rinforzata con fibra di vetro, nei limiti previsti dai pertinenti Regolamenti del RINA. <i>Construction of laminates (hand lay-up method) and structural parts of vessels in G.R.P. at conditions of the relevant RINA Rules.</i>
<b>Condizione di accettazione</b> <i>Acceptance conditions</i>	Le resine devono essere conservate ed impiegate secondo le indicazioni del fabbricante. Gli estremi del presente certificato dovranno essere riportati sui contenitori di resine prodotte. <i>The resins have to be stocked and used following the instructions of the manufacturer. The number and the date of this certificate shall have to be marked on the drums of the resins</i>

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Genova 15 Aprile 2019

Genoa April 15, 2019

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