EN

Preliminary Technical Data Sheet

Elan-tech®

EC 157.1 BIO/W 154

100:30

2K Unfilled epoxy system

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Product description

- 2K unfilled epoxy system
- Bio-based part resin and hardener
- Very low viscosity
- Low reactivity hardener
- Good fibers wettability
- High modulus
- Thermally resistant up to 70°C

Areas of application

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

Processing methods

Vacuum infusion of glass, aramid or carbon fiber fabrics & multiaxials. Suitable for application with natural fibers (flax). Room temperature curing. Post curing needed to achieve the proper thermal resistance.

Curing/Post-curing

Post-curing is always advisable for Room Temperature curing system in order to stabilize the component and/or 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 one year in the original sealed containers 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.

Typical product properties

EC 157.1 BIO

Properties	Conditions	Test Method	Value	M/U
Colour		--	Amber	
Viscosity	25 °C	IO-10-50 (ISO 3219)	600 ÷ 900	mPa·s
Density	25 °C	IO-10-51 (ASTM D 1475)	1,13 ÷ 1,17	g/ml

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Properties	Conditions	Test Method	Value	M/U
Colour		--	Amber	
Viscosity	25 °C	IO-10-50 (ISO 3219)	120 ÷ 180	mPa·s
Density	25 °C	IO-10-51 (ASTM D 1475)	0,94 ÷ 0,98	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	25 °C	IO-10-50 (ISO 3219)	450 ÷ 650	mPa·s
Exothermic peak	25 °C - 50 mm - 200 ml	IO-10-53 (*)	185 ÷ 205	°C
Pot life	25 °C - 50 mm - 200 ml	IO-10-53 (*)	50 ÷ 60	min
Gel time	25 °C - 1 mm	IO-10-88 (ASTM D 5895-03)	7 ÷ 9	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)	1,09 ÷ 1,13	g/ml
Hardness	25 °C	IO-10-58 (ASTM D 2240)	81 ÷ 85	Shore D/15
Glass Transition (Tg)		IO-10-69 (ASTM D 3418)	77 ÷ 83	°C
Maximum Tg		IO-10-69 (ASTM D 3418)	77 ÷ 83	°C
Water absorption (24 h RT)		IO-10-70 (ASTM D 570)	0,05 ÷ 0,07	%
Water absorption (2 h 100 °C)		IO-10-70 (ASTM D 570)	0,55 ÷ 0,65	%
Heat deflection temperature (HDT)		ISO 75	58 ÷ 64	°C

Typical mechanical properties in cured condition

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	24 h RT + 15 h 60 °C	
Flexural strength	25 °C	IO-10-66 (ASTM D 790)	90 ÷ 110	MN/m²
Strain at maximum stress	25 °C	IO-10-66 (ASTM D 790)	12 ÷ 17	%
Strain at break	25 °C	IO-10-66 (ASTM D 790)	18 ÷ 27	%
Flexural elastic modulus	25 °C	IO-10-66 (ASTM D 790)	2500 ÷ 3000	MN/m²
Tensile strength	25 °C	IO-10-63 (ASTM D 638)	63 ÷ 77	MN/m²
Nominal strain at break	25 °C	IO-10-63 (ASTM D 638)	5 ÷ 7	%
Compressive strength	25 °C	IO-10-72 (ASTM D 695)	65 ÷ 75	MN/m²

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 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.