EN

# Product Information

## Elan-tech ®

EC 152/W 152 HR 100:30

EC 152/W 152 MR 100:30

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| Resin | Hardener | Mixing ratio by weight |
|---|---|---|
| **EC 152** | **W 152 HR** | **100:30** |
| | **W 152 MR** | **100:30** |

**Application:** High performance composite parts of small and medium size. Manufacturing of structural parts for boats, model aircrafts, racing vehicles, sport components.

**Processing:** Manual lamination at atmospheric pressure for glass, carbon or kevlar fiber tissue. Room temperature curing. The hardeners can be blended in all proportions to adjust the reactivity of the system to the specific needs. Compared to traditional systems, this one also presents a high capability to post-cure with a moderate heat transfer.
W 152HR: High reactivity. For small components or as accelerator for other hardeners.
W 152MR: Medium reactivity. Standard hardener.
W 152LR: Medium and large size components. (see EC152/W152LR).
W 152XLR: Large size components. (see EC152/W152XLR).

**Description:** High modulus un-filled epoxy system. The curing agent should be selected according to the application. The curing at room temperature plus the post-curing at moderate temperatures (50-60°C) allows high performance. Further stabilization at higher temperatures improves the thermal resistance of the components.

## SYSTEM SPECIFICATIONS

### Resin

| | | | | |
|---|---|---|---|---|
| Viscosity at: | 25°C | IO-10-50 (EN13702-2) | mPas | 1.200 1.800 |

### Hardener W 152 HR

| | | | | |
|---|---|---|---|---|
| Viscosity at: | 25°C | IO-10-50 (EN13702-2) | mPas | 30 80 |
| Gelation time | 25°C | IO-10-52a (UNI 8701) | min | 15 25 |

### Hardener W 152 MR

| | | | | |
|---|---|---|---|---|
| Viscosity at: | 25°C | IO-10-50 (EN13702-2) | mPas | 30 60 |
| Gelation time | 25°C | IO-10-52a (UNI 8701) | min | 50 60 |

## TYPICAL SYSTEM CHARACTERISTICS

### Resin

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

| **Hardeners** | | | **W 152 HR** | **W 152 MR** |
|---|---|---|---|---|
| Hardener Colour | | | Pale/yellow | Pale/yellow |
| Viscosity at: 25°C | IO-10-50 (EN13702-2) | mPas | 30 80 | |
| Density 25°C | IO-10-51 (ASTM D 1475) | g/ml | 1,02 1,06 | 0,94 0,98 |

### Processing Data

| | | | | |
|---|---|---|---|---|
| Mixing ratio by weight | for 100 g resin | g | 100:30 | 100:30 |
| Mixing ratio by volume | for 100 ml resin | ml | 100:33 | 100:36 |
| Pot life 25°C (50mm;200ml) | IO-10-53 (*) | min | 12 17 | 35 45 |
| Exothermic peak 25°C (50mm;200ml) | IO-10-53 (*) | °C | 225 250 | 210 235 |
| Initial mixture viscosity at: 25°C | IO-10-50 (EN13702-2) | mPas | 400 600 | 400 600 |
| Gelation time 25°C (1mm) | IO-10-88 | h | 2 3 | 5 7 |
| Demoulding time 25°C (15ml;6mm) | (*) | h | 4 6 | 6 8 |

## EC 152

### TYPICAL CURED SYSTEM PROPERTIES

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

| | | | W 152 HR | | W 152 MR | |
|---|---|---|---|---|---|---|
| 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 | 85 | 89 | 85 | 89 |
| Glass transition (Tg) | IO-10-69 (ASTM D 3418) | °C | 70 | 76 | 85 | 90 |
| Maximum Tg | IO-10-69 (ASTM D 3418) | °C | 77 | 83 | 105 | 110 |
| Water absorption (24h RT) | IO-10-70 (ASTM D 570) | % | 0,10 | 0,20 | 0,15 | 0,25 |
| Water absorption (2h 100°C) | IO-10-70 (ASTM D 570) | % | 0,60 | 0,70 | 0,55 | 0,65 |
| Max recommended operating temperature | (***) | °C | 75 | | 95 | |
| Flexural strength | IO-10-66 (ASTM D 790) | MN/m² | 120 | 130 | 120 | 130 |
| Maximum strain | IO-10-66 (ASTM D 790) | % | 4,5 | 6,5 | 5,0 | 7,0 |
| Strain at break | IO-10-66 (ASTM D 790) | % | 7,0 | 9,0 | 6,0 | 8,0 |
| Flexural elastic modulus | IO-10-66 (ASTM D 790) | MN/m² | 3.600 | 4.000 | 3.400 | 3.800 |
| Tensile strength | IO-10-63 (ASTM D 638) | MN/m² | 67 | 75 | 65 | 75 |
| Elongation at break | IO-10-63 (ASTM D 638) | % | 6,0 | 8,0 | 6,0 | 8,0 |
| Compressive strength | IO-10-72 (ASTM D 695) | MN/m² | 88 | 98 | 95 | 105 |

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 152

**Instructions:** Verify and when necessary, homogenize the components before use. Add the appropriate quantity of hardener to the resin, mix carefully. Avoid air trapping. For the surface preparation (mould or model) refer to the release agents data sheet.

**Curing / Post-curing:** Post curing is always advisable for RT curing systems in order to stabilize the component and to reach the best mechanical properties, although, this system is able to reach (already at room temperature) a thermal resistance higher than those of traditional systems. If post-cured at a moderate temperature (60°C) it is possible to obtain a good thermal resistance. Curing and post-curing should be carried out before using, the mould as a function of the required thermal resistance. Post cure the tool increasing gradually 10°C/hour.
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.

**Storage:** Epoxy resins and their 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 vessel immediately after each use.

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

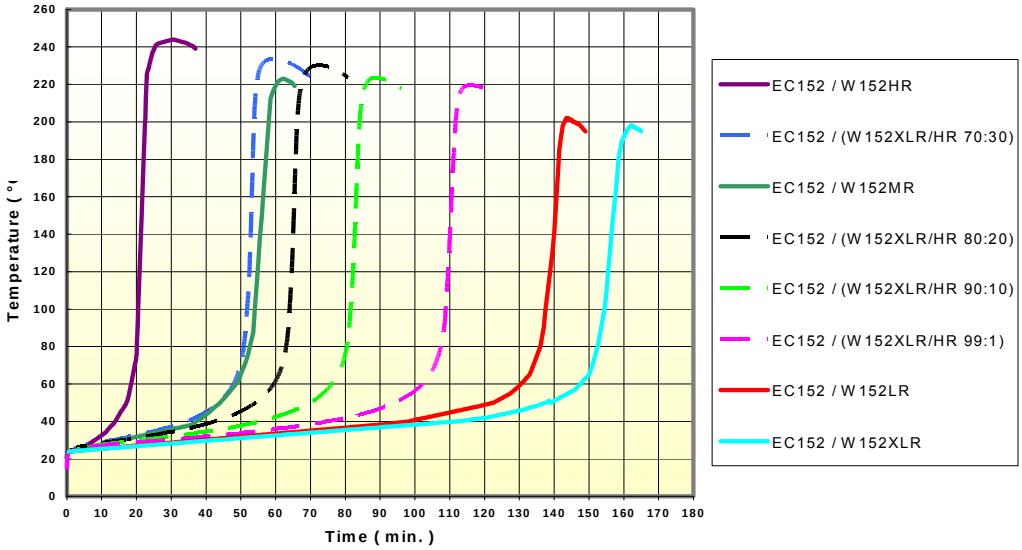
| | | |
|---|---|---|
| emission date: | July | 2008 |
| revision n° 01 | March | 2009 |

## EC 152

# Systems properties in wet state

## Reactivity Profiles

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




## Suggestions for the proper use of the systems with vacuum bag process

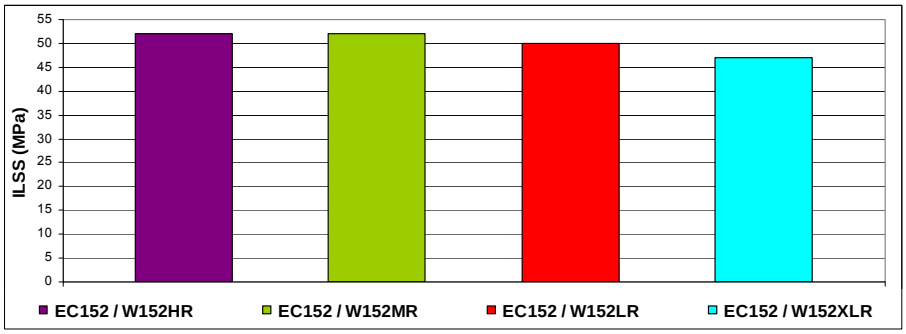
### 2 mm thickness

| | EC152/W152 HR | | | | EC152/W152 MR | | | | EC152/W152 LR | | | | EC152/W152 XLR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15°C | 20°C | 25°C | 30°C | 15°C | 20°C | 25°C | 30°C | 15°C | 20°C | 25°C | 30°C | 15°C | 20°C | 25°C | 30°C |
| Maximum time before vacuum application (h) | 3 2 | | 1,5 | 1 | 7 4 | 3 | | 2 | 9 | 8 | 7 | 5 | 13 | 10 | 8 | 6 |
| Gelification time (h) | 4-7 | n.d. | 2-3 | n.d. | 11-15 | n.d. | 5-7 | n.d. | 16-21 | n.d. | 10-13 | n.d. | 22-30 | n.d. | 13-16 | n.d. |
| Minimum time for vacuum release (h) | 8 | 5 | 3,5 | 2 | 16 | 9 | 7,5 | 6,5 | 24 18 | | 15 12 | | 40 26 | | 20 | 16 |
| Demoulding (h) | 9 | 6 | 4,5 | 3 | 20 | 12 1 | 0 | 8 | 44 3 | 6 | 30 2 | 4 | 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 components. Buyers and users should make their own assessments of our products under their own application conditions.

## Interlaminar shear stress (ILSS) of laminates

(Multiaxial glass 300g/m$^2$ Realized with vacuum bag) - ASTM standard D 2344




The laminate has been obtained by hand lay-up of a glass tissue of 300g/m$^2$ (Type raso 8) impregnated with the different systems until a final thickness of 5 mm has been obtained.
The test specimens have been prepared according to ASTM D2344 and before testing they were stabilized at 50°C for 16 hours.