

# PRO-SET®

## Technical Data

# M1049

# M2048

## BIO BASED INFUSION EPOXY

The New  
Standard

EPOXIES for  
Laminating  
Infusion  
Tooling  
Assembly

### Wessex Resins & Adhesives

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ISO9001:2015 Certified

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& Adhesives

### INTRODUCTION

The combination of PRO-SET M1049 Resin with PRO-SET M2048 Hardener is intended specifically for resin infusion processes. This production technique has become increasingly important to the composite industry and has made inroads into the marine market for the manufacture of lightweight, high performance hulls together with the deck assemblies and superstructure.

PRO-SET M1049 Resin is mixed with PRO-SET M2048 Hardener - the resin is 36% bio based and the hardener is free of phenol and phenol related products - to produce an extremely low viscosity epoxy that provides fast and thorough wetting of the reinforcing fabric(s) within the laminate when using the resin infusion process.

### CURING

The cure time will vary with the ambient temperature and the thickness of the laminate and, for example, at a working temperature of 20°C, vacuum pressure should remain on the laminate for at least 12 hours after infusion is complete.

The resin and hardener mix will initially cure to a brittle "B" stage after 24 hours at room temperature but laminate must be subsequently post cured at 50°C for 16 hours before demoulding the component.

### HANDLING PROPERTIES

Property	Standard	Units	25°C
100g Pot Life	ASTM D2471	minutes	50
500g Pot Life	ASTM D2471	minutes	44
3mm thin film gel time		minutes	245
Viscosity Mixed	ASTM D2196	mPas	440
Viscosity (resin)	ASTM D2196	mPas	480
Viscosity (hardener)	ASTM D2196	mPas	100

### MIX RATIO

Method	Resin:Hardener	Resin:Hardener
Weight	2.94:1	100:34
Volume	2.56:1	100:39

### DENSITY

State	Units	21°C
Mixed	gcm <sup>-3</sup>	1.13
Resin	gcm <sup>-3</sup>	1.17
Hardener	gcm <sup>-3</sup>	1.01

Test specimens were neat epoxy (without fibre reinforcement).  
Typical values not to be construed as specification

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### MECHANICAL PROPERTIES

Property	Standard	Units	RT x 1 Week	RT Gelation + 50°C x 16 hrs	RT Gelation + 50°C x 16 hrs + 80°C x 2 hrs
Hardness	ASTM D2240	Shore D	83	85	85
Compression Yield	ASTM D695	MPa	94.1	96.8	92.3
Tensile Strength	ASTM D638	MPa	64.8	65.4	59.4
Tensile Modulus	ASTM D638	GPa	3.8	3.4	3.4
Tensile Elongation	ASTM D638	%	2.8	3.7	3.5
Flexural Strength	ASTM D790	MPa	99.5	104.0	96.2
Flexural Modulus	ASTM D790	GPa	4.5	4.2	4.3

### THERMAL PROPERTIES

Property	Standard	Units	RT x 1 Week	RT Gelation + 50°C x 16 hrs	RT Gelation + 50°C x 16 hrs + 80°C x 2 hrs
Tg DMA Peak Tan Delta	ASTM E1640*1	°C	65	86	86
Tg DSC Onset - 1st Heat	ASTM E1356	°C	45.4	66.1	69.2
Tg DSC Ultimate	ASTM E1356	°C	69.6*2	68.5*2	73.2*2

\*1 1Hz, 3°C per minute.

\*2 Additional post cure may be required; contact Technical Department for details.

Test specimens were neat epoxy (without fibre reinforcement).

These are typical properties and cannot be construed as a specification. The end users should test the products to ensure the products are suitable for the intended application. Any information, data, advice or recommendation published by Wessex Resins or obtained from Wessex Resins by other means and whether relating to Wessex Resins' materials or other materials, is given in good faith and believed to be reliable.

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