

# resoltech 1410

Hardener 1417 & Accelerator AC140  
Hot curing epoxy system

- High performance composite parts
- Adjustable potlife
- Ultra low viscosity
- Ideal for infusion, filament winding, pultrusion or pressure moulding
- Tg up to 205 °C

## INTRODUCTION

RESOLTECH 1410 / 1417 with accelerator AC140 is an extremely low viscosity epoxy-anhydride system.

It is a reactive diluent free matrix system which exhibits excellent mechanical properties. The reactivity of the system is adjustable by variation of the accelerator AC140 content.

The system is easy to process, has good fibre impregnation properties and exhibits excellent mechanical, dynamic and thermal properties. It has an excellent chemical resistance especially to acids at temperatures up to 80 °C. Displays very good temperature resistance after post cure.

Ideal for infusion, filament winding, pultrusion or pressure moulding.

## MIXING RATIO

The mixing ratio must be accurately followed. It is not possible to change the ratio, it would result in lower mechanical properties.  
The mixture should be thoroughly stirred to ensure full homogeneity.

Systems	1410/1417/AC140
Mixing ratio by weight	100/115/0.5-2
Mixing ratio by volume	100/110/0.6-2.4

## APPLICATION

- It is recommended to use products at a temperature close to 18-25°C in order to facilitate the mixing and the reinforcements impregnation.
- Lower temperatures will increase the viscosity of the mixture and the gel time, but the resin will not crystallize at low temperatures.
- On the contrary, a higher temperature will reduce the viscosity of the mixture as well as the pot life.
- 1410 resin can, under certain conditions, cristalize. Heat the resin at 60-80°C in an oven will make it liquid again without consequence.
- **1417 hardener is sensitive to moisture, use quickly after opening.**

# PHYSICAL CHARACTERISTICS

## 1 Visual aspect

### 1410 :

Clear yellow liquid

### 1417 & AC140 :

Clear liquid

### Mix :

Yellow liquid

## 2 Density

References	1410	1417	AC140
Density at 25°C	1.17	1.20	1.04
Mix density at 23°C	-	1.19	-

ISO 1675,  $\pm 0.05$  tolerance

## 3 Viscosity

References	1410	1417	AC140
Viscosity at 23°C (mPa.s)	380	75	< 50
Mix viscosity at 23°C (mPa.s)	-	135	-

ISO 12058.2,  $\pm 15\%$  tolerance

# REACTIVITIES

System	Test temperature	1410/1417/AC140	
Mixing ratio by weight	-	100/115/1	100/115/2
Pot life on 70mL	23°C	> 1-2 days	> 1-2 days
Gel time on film 1mm*	100°C	1h30min	58min
Gel time on film 1mm*	140°C	16min	11min

\* Gel time on film measurement realized on rheometer (gap 1 mm,  $1 \text{ s}^{-1}$ ,  $\phi = 35 \text{ mm}$ )

The values below were obtained with a formulation using 0.5 pbw AC140.

## RETICULATION & POST-CURING

In order to obtain the maximum thermo-mechanical properties, it is necessary to respect the recommended curing cycle.  
The table below shows the glass transition temperatures (DSC) according to different curing cycles.

**Typical cure cycles** : 1-2h at 100°C + 6h 160°C or 1-2h 100°C + 4-6h at 180°C.

System		1410/1417/AC140
1h at 100°C + 6h at 180°C	T <sub>G DSC</sub> *	206°C
	T <sub>G DMA</sub> **	199°C

\* measured by DSC, 10°C/min, inflexion point

\*\* measured by DMA, 3°C/min, TGM point

Post-curing cycles previously presented were chosen in order to reach the maximum potential of each systems. Depending on piece size, oven performance and hardener used, other post-curing cycles could lead to fully cured parts.

Please contact our laboratory service for any help on post-curing cycles.

## MECHANICAL PROPERTIES

System		1410/1417/AC140
Flexion 1h at 100°C + 6h at 180°C	Modulus Maximum strength Elongation at max strength	3.2 GPa 93.9 MPa 3.2%
Tensile 1h at 100°C + 6h at 180°C	Modulus Maximum strength Elongation at max strength	2.95 GPa 54 MPa 2.2 %
Fracture properties Bend notch test 1h at 100°C + 6h at 180°C	Fracture toughness K <sub>IC</sub> Fracture energy G <sub>IC</sub>	0.48 MPa√m 70 J/m <sup>2</sup>
Water absorption	Immersion :  4 days H <sub>2</sub> O 23 °C 10 days H <sub>2</sub> O 23 °C 30 min H <sub>2</sub> O 100 °C 60 min H <sub>2</sub> O 100 °C	  0.92 % 1.47 % 0.30 % 0.50 %
Coefficient of linear thermal expansion	Mean value :  from 20 to 170°C	  62.10 <sup>-6</sup> /K

Flexion : ISO 178

Tensile : ISO 527

Fracture properties : ISO 13586

Water absorption : ISO 62

Coefficient of linear thermal expansion : ISO 11359-2

## PACKAGING

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- Plastic jerrycan kit of 1kg + 1.15kg
- Plastic jerrycan kit of 5kg + 5.75kg
- Plastic drum kit of 25kg + 28.75kg
- Drum kit of 200kg + 220kg

## TRANSPORT & STORAGE

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Keep containers sealed and away from heat and cold preferably between 10°C and 30°C in a well ventilated area. Our products are guaranteed in their original packaging (check expiry date on the label).

## HEALTH & SAFETY

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Skin contact must be avoided by wearing protective nitrile gloves & overalls or other protective clothing.

Eye protection should be worn to avoid risk of resin, hardener, solvent or dust entering the eyes. If this occurs flush the eye with water for 15 minutes, holding the eyelid open, and seek medical attention.

Ensure adequate ventilation in work areas. Respiratory protection should be worn with ABEKP coded filters.

Resoltech issues full Material Safety Data Sheet for all hazardous products. Please ensure that you have the correct MSDS to hand for the materials you are using before commencing work.



The data provided in this document is the result of tests and is believed to be accurate. We do not accept any responsibility over the mishandling of these products and our liability is limited strictly to the value of the products we manufacture and supply.

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