

resoltech 1040

Hardeners 1041 HT & 1042 HT
High performance epoxy laminating system



- High temperature resistance laminating system
- For pre-preg tooling or high temperature parts
- T_g max up to 130°C

INTRODUCTION

Resoltech 1040 - 1041 HT & 1042 HT are advanced epoxy laminating systems formulated to manufacture high performance lightweight structures with glass, carbon, aramid and basalt fibres with post-curing.

This excellent wetout system, optimized with a **low reactivity, low viscosity** and **excellent air release properties**, is recommended for the manufacture of tools and composite parts that require to **resist to temperatures under load up to 130°C**.

This system is optimized for wet-layup but may be used by filament winding or casting when mixed with appropriate fillers & charges.

Typically, this system is used for the manufacture of 120°C curing prepreg tooling or parts exposed to high temperatures such as composite motorbike or race car exhausts.

The 1040 resin may be ordered in its **thixotropic version, the 1040T** for parts or moulds with vertical or overhanging surfaces. It is also recommended as first coat for carbon laminates to avoid air entrapment at the warp and weft intersections of the fabric.

It is recommended to cure the part or tool laminated at 60°C in order to release from the mould or plug, but it is also possible to cure at temperatures as low as 40°C with a longer curing time.

The resulting structures will have **high mechanical and interlaminar properties**.

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	1040 / 1041 HT	1040 / 1042 HT
Mixing ratio by weight	100/30	100/25

APPLICATION

- The standard procedure of working with epoxy systems applies this system. The 1040 system can be applied by brush, roller, infused or injected. In case of laminating over a cured surface without peel ply, it is required to deglaze, clean and degrease the support prior to laminating.
- 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.

PHYSICAL CHARACTERISTICS

1 Visual aspect

1040(T) :

Opalescent neutral liquid

1041 HT & 1042 HT :

Neutral to yellow transparent liquid

Mix :

Neutral to yellow transparent liquid

2 Density

References	1040	1041 HT	1042 HT
Density at 23°C	1.15	0.95	0.92
Mix density at 23°C	-	1.10	1.10

ISO 1675, ± 0.05 tolerance

3 Viscosity

References	1040	1041 HT	1042 HT
Viscosity at 23°C (mPa.s)	3350	80	25
Mix viscosity at 23°C (mPa.s)	-	980	800

ISO 12058.2, ± 15% tolerance

REACTIVITIES

Systems	1040 / 1041 HT	1040 / 1042 HT
Gel time on 70mL at 23°C (4cm high)	2h45min	2h20min
Time at exothermic peak on 70mL at 23°C	2h50min	2h20min
Temperature at exothermic peak on 70mL at 23°C	135°C	115°C
Gel time on 2mm film at 23°C	4h25min	4h20min

Gel time measurements realized with Trombotech*

RETICULATION & POST-CURING

Curing prior to mould release is mandatory. **The lowest admissible cure is 12h @ 40°C or preferably 8h @ 60°C.** Postcuring is mandatory in order to obtain a material at the maximum of its mechanical properties with a TG of up to 130°C.

Postcuring cycle and temperature will depend on the thickness of the laminate as it has been observed that every 7,5 mm of thickness, temperature drops in the laminate due to the high heat insulation properties of the epoxy resins. In case of doubt, contact us.

As general reference, postcuring should be done with a cycle of : **24h at room temperature (20-25°C) + 8h at 60°C + 2 h @ 80°C + 2h @ 120°C with ramps of 0,5 °C /minute.**

Slow cooling down after postcuring is recommended like for all composite laminates to avoid stress & tensions due to uneven cooling down of all surfaces.

Systems		1040 / 1041 HT	1040 / 1042 HT
24h25°C+8h60°C+2h80°C+2h120°C	T _g	115 °C	123 °C
24h25°C+3h50°C+3h100°C+3h150°C	T _g	127 °C	130 °C

T_g measured by DMA, Kinetech®
Shore D hardness measured at 23°C according to ISO 868

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, shorter post-curing cycles could lead to fully cured parts.

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

MECHANICAL PROPERTIES

Systems		1040 / 1041 HT	1040 / 1042 HT
24h25°C+3h50°C+3h100°C+3h150°C	TRACTION Modulus Maximum strength Strength at break Elongation at break		3.50 GPa 68.0 MPa 65.0 MPa 4%

Flexion properties on pure resin according to ISO 527

Systems		1040 / 1041 HT	1040 / 1042 HT
24h25°C+3h50°C+3h100°C+3h150°C	FLEXION Modulus Maximum strength Elongation at break		3.40 GPa 108 MPa 5%

Flexion properties on pure resin according to ISO 178

PACKAGING

1040 / 1041 HT :

- Plastic jerrycan kit of 1kg + 0.3kg
- Plastic jerrycan kit of 5kg + 1.5kg
- Plastic drum kit of 30kg + 9kg
- Metal drum kit of 200kg + 3 x 20kg

1040 / 1042 HT :

- Plastic jerrycan kit of 1kg + 0.25kg
- Plastic jerrycan kit of 5kg + 1.25kg
- Plastic drum kit of 30kg + 7.5kg
- Metal drum kit of 200kg + 2 x 25kg

1040T is packaged in bucket, stir before each use.

Same kit size are available.

HEALTH & SAFETY

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.

TRANSPORT & STORAGE

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).



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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