

resoltech 1050

Hardeners 1053S to 1059S

Structural lamination epoxy system



New hardeners salicylic acid free

- Adjustable pot life from 10min to 14hours
- Room temperature cure & mould release
- T_g up to 75°C
- Excellent wetting properties on all reinforcements
- For small to XXL size parts productions

INTRODUCTION

The 1050 epoxy laminating system is formulated to manufacture high performance lightweight structures with glass, carbon, aramid and basalt reinforcements with or without post-curing.

This latest generation system, **without CMR substances (including salicylic acid)** according to GHS criteria is optimized with a low exotherm, low viscosity and excellent air release properties. This epoxy system is also suitable for the manufacture of small to very large structures and composite parts by **wet lay-up, infusion, injection moulding or filament winding** while guaranteeing low toxicity working conditions to the users.

All hardeners mix with a 100/35 ratio and can be pre-blended together to precisely adjust the desired pot life. The 1050 resin + 1053S system is particularly recommended for infusion thanks to its low mixed viscosity (205mPa.s).

The 1050 resin is **available in a thixotropic version 1050T** for wet lay-up application in vertical or overhanging surfaces prone to resin dripping.

It is possible to **release the parts from the mould without post-curing**. To speed up demoulding a 40°C cure is possible and optimum thermo-mechanical properties of the laminate will be obtained after a 60°C post-curing cycle.

Laminates produced with the 1050 system will offer very good mechanical properties combined with **excellent fatigue resistance thanks to its exceptional wetting properties**, improving the composite interlaminar properties even on aramid reinforcements.

Its elongation at break in flexion up to 5% makes the 1050 system as a prime choice epoxy system for large structural laminates submitted to dynamic working efforts.

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	1050 / 1053S	1050 / 1054S	1050 / 1055S	1050 / 1056S	1050 / 1058S	1050 / 1059S
Mixing ratio by weight	100 / 35					
Mixing ratio by volume	100 / 42	100 / 42	100 / 42	100 / 41	100 / 41	100 / 39

APPLICATION

- The 1050 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 have workshop temperature conditions between 18-25°C in order to facilitate the mixing and the fibers reinforcement impregnation.
- On the contrary, a higher temperature will reduce the viscosity and the pot life of the mix.

PHYSICAL CHARACTERISTICS

1 Visual aspect

1050 :
Opalescent neutral liquid

1053S à 1059S :
Transparent to yellow liquid

Mélange :
Neutral to transparent yellow liquid

2 Density

References	1050	1053S	1054S	1055S	1056S	1058S	1059S
Density at 23°C	1.14	0.94	0.96	0.96	0.97	0.97	1.02
Mixed density at 23°C	-	1.08	1.09	1.09	1.10	1.10	1.11

ISO 1675, ± 0.05 tolerance

3 Viscosity

References	1050	1053S	1054S	1055S	1056S	1058S	1059S
Viscosity at 23°C (mPa.s)	1300	14	20	24	47	117	216
Mixed viscosity at 23°C (mPa.s)	-	251	268	274	332	545	595

ISO 12058.2, ± 15% tolerance

REACTIVITIES

All hardeners mix with a 100/35 ratio and can be pre-blended together to precisely adjust the desired pot life.

Systems	1050/1053S	1050/1054S	1050/1055S	1050/1056S	1050/1058S	1050/1059S
Gel time on 70mL at 23°C (4cm high mix)	14h	4h02min	2h37min	55min	27min	13min
Time at exothermic peak on 70 mL at 23°C	NA*	NA*	2h52min	57min	26min	14min
Temperature at exothermic peak on 70mL at 23°C	NA*	41°C	107°C	201°C	217°C	249°C
Gel time on 1mm thick film at 23°C	12h40min	8h30min	7h56min	4h51min	2h53min	1h55min

*measurements realized on Trombotech®

** measurements realized on rheometer

*NR : Non Applicable

CURING AND 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.

Systems		1050/1053S	1050/1054S	1050/1055S	1050/1056S	1050/1058S	1050/1059S
14 days at 23°C	T _g	44°C	56°C	56°C	57°C	61°C	69°C
	Shore D Hardness	88	86	87	87	88	88
16h at 60°C	T _g	64°C	77°C	77°C	83°C	95°C	73°C
	Shore D Hardness	88	89	89	90	90	90

T_g measured by DSC, 10°C/min, inflection point
Hardness : ISO 868

MECHANICAL PROPERTIES

Systems		1050/1053S	1050/1054S	1050/1055S	1050/1056S	1050/1058S	1050/1059S
14 days at 23°C	FLEXION Modulus	3.17 GPa	3.46 GPa	3.48 GPa	3.44 GPa	3.50 GPa	3.52 GPa
	Maximum strength	81.5 MPa	91 MPa	94 MPa	89 MPa	82 MPa	116 MPa
	Elongation at yield	2.7%	2.9%	3%	2.8%	2.4%	5.3%
16h at 60°C	FLEXION Modulus	3.08 GPa	3.35 GPa	3.30 GPa	3.35GPa	3.36 GPa	3.17 GPa
	Maximum strength	97 MPa	111 MPa	107 MPa	116 MPa	129 MPa	122.4 MPa
	Elongation at yield	4.3%	8.5%	8.2%	7.7%	5.8%	6.5%

Measurements on pure resin according to the following standard : ISO 178

PACKAGING

- Pastic jerrycan kit of 1kg + 0.35kg
- Pastic jerrycan kit of 5kg + 1.75kg
- Pastic jerrycan kit of 28kg + 9.8kg
- Drum kit of 200kg + 3 x 23,33kg
- IBC kit of 1t + 2 drums of 175kg

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).

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.

! 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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