

resoltech 3450

Hardener 3458

High T_g adhesive epoxy system



- 44% biobased on hardener part*
- T_g up to 90°C
- 2/1 volume mixing ratio
- Vertical sagging limit up to 7 mm
- High adherence on steel and composite

*ratio of the number of biobased carbon atoms / the number of total carbon atoms

INTRODUCTION

3450 / 3458 epoxy system is a epoxy adhesive with high toughness formulated for structural applications. Its T_g can reach 90°C after post-curing. Thanks to its wettability, elongation and resilience, this system offers excellent adhesive properties on many materials.

Its grease-like consistency makes it very easy to apply with a spatula. Its vertical sagging limit at 23°C is 7 mm with 3458 hardener.

Particularly resistant to the propagation of micro-cracking, this system is well adapted to bondings subject to important cycles of fatigue. The areas of application of the 3450 are very varied : structural composite and metallic bonding, adhesion promotion layer on secondary lamination specially on cured prepregs...

With 24% of biobased carbon atoms in the resin part and 44% on hardener part, the use of 3450 will reduce the carbon footprint of composites structures making no concessions on thermo-mechanical performances.

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.

System	3450 / 3458
Mixing ratio by weight	100 / 43
Mixing ratio by volume	2 / 1

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.
- The surface should be clean, dust-free and degreased. Prepare all surfaces by abrading with medium grit paper or other suitable abrasive, remove dust then wipe with acetone, MEK or similar solvents. Metals such as aluminum & stainless steel usually require a chemical pre-treatment & mechanical abrasion to create the best bond.

BIOBASED CARBON CONTENT

References or mix	3450	3458	3450 3458
Biobased carbon mass content*	24%	44%	29%

*ratio of the number of biobased carbon atoms / the number of total carbon atoms

PHYSICAL CHARACTERISTICS

1 Visual aspect

3450 :

Opalescent white gel

3458 :

Opalescent black gel

Mix :

Opalescent grey gel

2 Density

References	3450	3458
Density at 23 °C	1.15	1.01
Mix density at 23 °C	-	1.10

ISO 1675, ± 0.05 tolerance

3 Vertical sagging limit

System	3450 / 3458
Vertical sagging limit at 23°C	7 mm

On vertical panel at 90°

REACTIVITIES

System	3450 / 3458
Gel time on 70 mL at 23 °C* (4cm high)	30 min
Time at exothermic peak on 70 mL at 23 °C	33 min
Temperature at exothermic peak on 70 mL at 23 °C	172.3°C
Gel time on 1 mm film at 23 °C**	1h56min
Clamp time at 23°C	4h

* Gel time measurements realized with Rheotech*

** Gel time on film measurement realized on rheometer, shear rate 1s⁻¹

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.

System		3450 / 3458
7d at 23 °C	T _g	47°C
	Shore D hardness	87
4h at 60 °C + 2h at 80°C	T _g	80°C
	Shore D hardness	89
1h at 90°C	T _g	77°C
	Shore D hardness	82
T _g max		92°C

T_g measured by DSC, 10 °C/min, inflexion point
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 parts 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

System		3450 / 3458	
14d at 23 °C	FLEXION		
	Modulus	2.65 GPa	
	Maximum strength	77.9 MPa	
	Elongation at max strength	4.5%	
4h at 60 °C + 2h at 80°C	FLEXION		
	Modulus	2.15 GPa	
	Maximum strength	71.0 MPa	
	Elongation at max strength	4.5%	
1h at 90°C	FLEXION		
	Modulus	1.72 GPa	
	Maximum strength	38.5 MPa	
	Elongation at max strength	4.0 %	
		Elongation at break	4.0 %

Flexion properties on pure resin according to ISO 178

System		3450 / 3458
Shear resistance on sandblasted steel (MPa)*	24h at 23°C	23.3 (A)
	7d at 23°C	-
	4h at 60°C + 2h at 80°C	27.9 (A)
	1h at 90°C	33.5 (A)
Shear resistance on sanded composite (MPa)*	24h at 23°C	-
	7d at 23°C	24.1 (CS)
	4h at 60°C + 2h at 80°C	To be measured
	1h at 90°C	-

*ISO 4587, A = Adhesive failure ; CR = Cohesive failure in resin, CS = Cohesive failure in support, composite epoxy/glass

HEALTH & SAFETY

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 information below is valid for MSDS – 3450 version 1.x and MSDS – 3458 version 1.x.

Personal protection equipment :



1 Resin part



GHS07

GHS09

Signal word : Warning

Hazard statements :

H315 - Causes skin irritation.

H317 - May cause an allergic skin reaction.

H319 - Causes serious eye irritation.

H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements :

P102 - Keep out of reach of children.

P202 - Do not handle until all safety precautions have been read and understood.

P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 - Wash hands, forearms and face thoroughly after handling.

P272 - Contaminated work clothing should not be allowed out of the workplace.

P273 - Avoid release to the environment.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352 - IF ON SKIN: Wash with plenty of water.

P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P321 - Specific treatment (see supplemental first aid instruction on this label).

P332+P313 - If skin irritation occurs: Get medical advice/attention.

P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.

P337+P313 - If eye irritation persists: Get medical advice/attention.

P362+P364 - Take off contaminated clothing and wash it before reuse.

P391 - Collect spillage.

P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

2 Hardener part



GHS05

GHS07

GHS09

Signal word : Warning

Hazard statements :

H314 - Causes severe skin burns and eye damage.

H317 - May cause an allergic skin reaction.

H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements :

P102 - Keep out of reach of children.

P270 - Do not eat, drink or smoke when using this product.

P271 - Use only outdoors or in a well-ventilated area.

P273 - Avoid release to the environment.

P280 - Wear protective gloves, protective clothing, eye protection.

P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

PACKAGING

- Metal box kit of 1kg + 0.43kg
- Metal box kit of 5kg + 2.15kg
- Drum kit of 25kg + 10.75kg

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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