

RESOLTECH 1800

Hardeners 1803, 1805, 1807 & 1808

Structural Epoxy system for infusion & injection

- Adjustable pot life from 18min to 7h
- Very low viscosity and high wetting power
- T_G up to 120°C depending on hardener used
- Excellent cross linking properties even at low post-curing temperatures



RESOLTECH 1800 is an advanced infusion and injection epoxy resin system with an extremely low viscosity for fast and safe wet out by infusion and injection.

It features high mechanical properties, a **service temperature up to 130°C** and up to 7h of infusion or injection time.

The **constant low viscosity** right until gel time offers reliable impregnation and air release throughout the infusion or injection process.

This system has **excellent cross linking properties** and enables to release from plugs even after **low post curing temperatures at 40°C**.

It is suitable for both **tooling and parts manufacturing**. Typical applications include large marine structures, wind turbine blades, moulds for prepreg production.

Monolithic carbon fibre infusions may be performed with fiber ratios of over 68% with 0,4% porosity.

The superior interlaminar shear strength of this system is one of its key advantages with its **improved health and safety formulation** following the latest EU regulation (CE) n° 453/2010.

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MIXING RATIO

| Systems | 1800 / 1803 | 1800 / 1805 | 1800 / 1807 | 1800 / 1808 |
|------------------------|-------------|-------------|-------------|-------------|
| Mixing ratio by weight | 100 / 30 | 100 / 17 | 100 / 16 | 100 / 38 |

The mixing ratio must be respected neither excess nor default. The mixture should be thoroughly stirred to ensure full homogeneity.

APPLICATION

Thermosetting products generate heat when curing. The amount of heat generated varies with the hardener used, the temperature and the quantity of resin mixed. It is therefore necessary to only mix the necessary amount usable within the given pot life.

Keeping the mixture in flat open containers reduces the risks of exothermic reaction as the mixture will heat up more in a mass than in a film. Automatic mixing and dispensing devices solve the exothermy problem by mixing at the required speed for the infusion.

RESOLTECH 1800 system is formulated for infusion and injection applications. It is recommended to infuse with a resin transfer medium onto the laminate or through the core when prepared with a special grooving for infusion.

Controlling the resin temperature, workshop temperature and humidity is important.

The reinforcements should not present any excessive moisture content as it may modify the infusion progress through the fibres.

PHYSICAL CHARACTERISTICS

Visual aspect

| | |
|--------------------------------------|--------------------------------------|
| 1800 : | Opalescent neutral liquid |
| 1803, 1805, 1807 & 1808 : | Transparent yellow liquid |
| Mixture aspect : | Neutral to transparent yellow liquid |

Densities at 23°C (ISO 1675, ±0.03)

| References | 1800 | 1803 | 1805 | 1807 | 1808 |
|-------------|------|------|------|------|------|
| Density | 1.15 | 0.94 | 0.94 | 0.99 | 0.99 |
| Mix density | - | 1.10 | 1.12 | 1.13 | 1.11 |

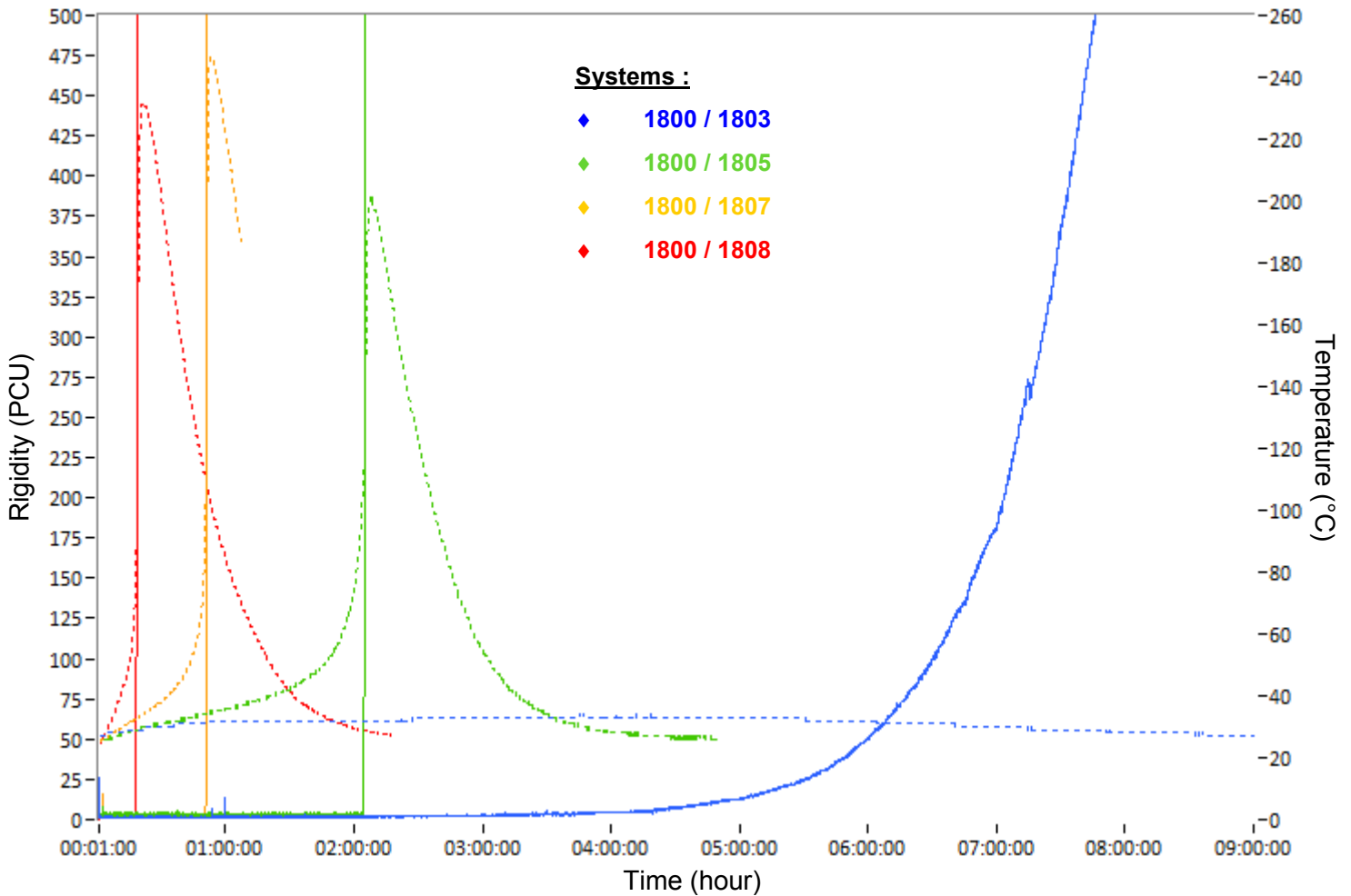
Viscosities at 23°C (ISO 12058.2, ±15%)

| References | 1800 | 1803 | 1805 | 1807 | 1808 |
|-----------------------|------|------|------|------|------|
| Viscosity (mPa.s) | 900 | 11 | 15 | 20 | 130 |
| Mix viscosity (mPa.s) | - | 190 | 250 | 273 | 325 |

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Mixed viscosity evolution vs. time on 70mL at 23°C



REACTIVITIES

| Systems | 1800 / 1803 | 1800 / 1805 | 1800 / 1807 | 1800 / 1808 |
|--|-------------|-------------|-------------|-------------|
| Reactivity on 70mL (~4cm thickness) | 7h | 2h04min | 50min | 18min |
| Time at exothermic peak on 70mL | 3h45min | 2h05min | 53min | 21min |
| Temperature at exothermic peak on 70mL | 34°C | 201°C | 246°C | 232°C |
| Reactivity on 2mm film | 8h20min | 7h17min | 3h | 1h20min |

Gel time measurements are realized on Trombotech® according to ISO 2535 at 23°C

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CURING & POST CURING

The 1800 epoxy system should not be released from the mould without initial curing of minimum 8 to 12h at 40°C or 6h at 60°C as it remains brittle without this initial cure.

| Curing cycles | 14 days at 23°C | | 16h at 60°C | | 6h at 60°C + 10h at 120°C |
|---------------|-----------------|---------------------|----------------|---------------------|--|
| | T _G | Shore D Hardness | T _G | Shore D Hardness | T _G |
| 1800 / 1803 | 51.5°C | 86 | 62.0°C | 88 | 70.9°C |
| 1800 / 1805 | 52.7°C | 89 | 86.5°C | 90 | 111.2°C T _G max: 119.8°C |
| 1800 / 1807 | 55.0°C | 88 | 74.0°C | 89 | 95°C |
| 1800 / 1808 | 54.0°C | 87 | 67.0°C | 88 | - |

Glass transition temperature measured by Kinetech®
 (DMA type under mechanical sollicitation)

MECHANICAL PROPERTIES

| Systems | Flexion | | | | | |
|-------------|---------------|-------------|--------------------|-------------|--------------------------------|-------------|
| | Modulus (GPa) | | Max strength (MPa) | | Elongation at max strength (%) | |
| | Curing cycles | | | | | |
| | 14d at 23°C | 16h at 60°C | 14d at 23°C | 16h at 60°C | 14d at 23°C | 16h at 60°C |
| 1800 / 1803 | 3.22 | 3.15 | 89.8 | 108.4 | 3.1 | 5.0 |
| 1800 / 1805 | 3.55 | 3.10 | 76.9 | 95.0 | 2.3 | 2.1 |
| 1800 / 1807 | 3.48 | 2.98 | 104.0 | 116.5 | 3.2 | 6.0 |
| 1800 / 1808 | 3.04 | 2.81 | 93.7 | 97.0 | 4.2 | 5.5 |

Tests realized on pure resin cast samples according to ISO 178

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PACKAGING

Kits 1800 / 1803 :

- (1+0.3)kg
- (5+1.5)kg
- (25+7.5)kg
- (200+2x30)kg

Kits 1800 / 1805 :

- (1+0.17)kg
- (5+0.85)kg
- (25+4.25)kg
- (200+2x17)kg
- (1000+170)kg

Kits 1800 / 1807 :

- (1+0.16)kg
- (5+0.8)kg
- (25+4)kg
- (200+2x16)kg
- (1000+160)kg

Kits 1800 / 1808 :

- (1+0.38)kg
- (5+1.9)kg
- (25+9.5)kg
- (200+3x25.33)kg
- (1000+2x190)kg

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.

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 stated on the label).

Nota : The data provided in this document are provided good-faith and are based on the test in laboratory and our practical experience and is believed to be accurate. Considering the application of our products gets away from our control, 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.