# resoltech 2060 GC ALU

## Hardeners 2062 & 2066H

### Tooling aluminium epoxy gelcoat






**New Hardener 2062 CMR free**

- High gloss surface
- For demanding heat cycles post cures & thermoforming
- High modulus & mechanical properties
- $T_G$ 102°C with 2062 hardener

# INTRODUCTION

Resoltech 2060 GC ALU / 2062 & 2066H epoxy gelcoat is formulated for the production of composites tooling. It enables to manufacture tooling that will resist many years to the most demanding heating and cooling post-curing cycles of : **heating RTM & pre-preg tooling, high output heat forming of thermoplastics or polymer concrete/solid surface injection tools.**

Its novolac based formula guarantees the highest mechanical and chemical resistances, notably to styrene. Polyester or vinylester parts manufactured on the 2060 GC ALU gelcoat will release with high gloss for numerous cycles. Should the gelcoat needed to be repaired, polishing the repaired area will enable to regain a high gloss surface aspect.

This new generation system, optimized with **excellent self levelling characteristics and excellent air release**, is suitable for the manufacture of large composite tooling. It can be applied by brush while guaranteeing low toxicity working conditions to the users.

The high thermal conductivity & stability under temperature of the 2060 GC ALU enables it to be the product of choice for 250°C Acrylic sheet thermoforming.

The recommended application thickness ranges from 500 µm to 600 µm at 23°C, which it is possible to achieve in one coat on a vertical surface without sag.

Final thermomechanical properties will be obtained after a post curing cycle defined later in this technical datasheet.

# 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 | 2060 GC ALU / 2062 | 2060 GC ALU / 2066H |
|---|---|---|
| Mixing ratio by weight | 100 / 7 | 100/13 |

# APPLICATION

- It is recommended to have workshop temperature conditions between 18-25°C in order to facilitate the mixing and the application. A lower temperature will increase the viscosity of the mix as well as its pot life. On the contrary, a higher temperature will reduce the viscosity and the pot life of the mix.
- **Thoroughly mix the resin part before pouring in mixing cup.**
- It is recommended to mechanically mix the resin+hardener during 5 effective minutes to ensure effective mixing and do a double potting before use to ensure all the resin and hardener have been correctly mixed and that un-mixed resin or hardener left on the sides of the first mixing pot are not used.
- The standard procedure of working with epoxy gelcoats applies this system. The 2060 GC ALU / 2062 or 2066H system can be applied by brush.
- This gelcoat has been formulated for application of 500 to 600 µm without sag on vertical surfaces in one only coat. **Coverage: 0.8 - 1.0 kg/m² for a 500 - 600 µm thickness dry film.**
- **Over coating**:As an indication, it is possible to overcoat the gelcoat with a laminating resin as long as the surface still has tack (timing to be defined by workshop temperature & hardener choice). It is recommended to sand and degrease before laminating onto the gelcoat if the surface has cured and formed its film (tack-free surface).
- Other application methods such as delaying the gel by applying a coat of ultra slow laminating epoxy resin (1050 / 1053S RESOLTECH system is recommended for this use) onto the freshly applied gelcoat is a well proven method and ensures a good chemical bonding with the reinforcement laminated within 24h of the 1050 / 1053S coat.
- Lamination of the first layers of reinforcement may be done with the aluminium filled 2060 ALU 25 resin in order to improve mould print-through resistance and better thermal resistance of the mould surface.
- In all cases testing in production conditions should be conducted in order to validate the method before industrial size applications.

# PHYSICAL CHARACTERISTICS

## 1 Visual aspect

**2060 GC ALU:**
Grey filled gel

**2062 & 2066H :**
Transparent to orange liquids

**Mix :**
Grey filled gel

## 2 Density

| References | 2060 GC ALU | 2062 | 2066H |
|---|---|---|---|
| Density at 23°C | 1.74 | 0.94 | 0.99 |
| Mixed density at 23°C | - | 1.69 | 1.62 |

ISO 1675, ± 0.05 tolerance

## 3 Viscosity

| References | 2060 GC ALU | 2062 | 2066H |
|---|---|---|---|
| Viscosity at 23°C (mPa.s) | 39 690 | 6 | 315 |
| Mixed viscosity at 23°C (mPa.s) | - | 8 550 | 17 100 |

Measured with rheometer, shear rate 20s-1, 2 min

# REACTIVITIES

| Systems | 2060 GC ALU / 2062 | 2060 GC ALU / 2066H |
|---|---|---|
| Gel time on 70mL at 23°C * (4cm high mix) | 5h05min | 56min |
| Time at exothermic peak on 70 mL at 23°C | 3h40min | 1h |
| Temperature at exothermic peak on 70mL at 23°C | 29°C | 60°C |
| Gel time on a 1mm film at 23°C ** | 6h11min | 2h13min |
| Tack time, 500µm film at 23°C | 3-5h | 1h30min-2h15min |
| Touch dry, 500µm film at 23°C | 8h | 5h |

* Measured on Rhéotech
** Measured on a rheometer, tangents method

# CURING AND POST-CURING

The 2060 GC ALU system will cure at room temperature enabling to release moulds from the plugs/models at room temperature. However, further post-cure will enable the resin system to obtain 100% of its mechanical characteristics (post curing cycle given for a 2mm thick sample of resin)

| Systems | | 2060 GC ALU / 2062 | 2060 GC ALU / 2066H |
|---|---|---|---|
| 3h at 60°C + 3h at 90°C | $T_G$ (DSC) | 97°C | 89°C |
| | Shore D Hardness | 92 | 90 |
| 3h at 80°C + 3h at 120°C | $T_G$ (DSC) | 102°C | 89°C |
| | Shore D Hardness | 92 | 90 |

$T_G$ max : DSC, inflection point
Hardness : ISO 868

# MECHANICAL PROPERTIES

| Systems | | 2060 GC ALU / 2062 | 2060 GC ALU / 2066H |
|---|---|---|---|
| 3h à 60°C + 3h à 90°C | FLEXION<br>Modulus<br>Maximum strength<br>Elongation at break | <br>7.35 GPa<br>76 MPa<br>1.7 % | <br>6.80 GPa<br>76 MPa<br>1.6 % |

Flexion properties on pure resin according to ISO 178

## PACKAGING

- Box kit of 1kg + 0.07kg (2062) or 0.13 Kg (2066H)
- Bucket kit of 5kg + 0.35kg (2062) or 0.65 Kg (2066H)
- Bucket kit of 30kg + 3 x 0.7kg (2062)or 3.9Kg (2066H)
- Drum kit of 200kg + 14 Kg (2062) or 26 Kg (2066H)

## 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.

resoltech
ADVANCED TECHNOLOGY RESINS
resolving your enginering challenges
resoltech.com

249, Avenue Gaston Imbert
13790 ROUSSET
FRANCE

Tel. : +33 (0)4 42 95 01 95
Fax : +33 (0)4 42 95 01 98
export@resoltech.com

Datasheet V4 01.12.2021 - previous version 08.11.2021