

1 CHARACTERISTICS

NORESTER® 2000/50 is formulated from an unsaturated polyester resin. It is filled, promoted and pre-accelerated.

- Ready to use.
- Formulated for mould making.
- Good surface appearance.
- Low shrinkage.
- Rapid cure and rapid manufacture of the mould in one day.
- Good Barcol hardness.
- Polymerise at room temperature following addition of MEKP.
- Filled resin, good rigidity of the mould and gain on the cost of the mold.

2 PROPERTIES OF THE LIQUID RESIN

Aspect	Beige liquid
Brookfield viscosity (ISO 2555 - 23°C - sp4)	50 rpm : 1500 - 1900 cP
Specific gravity (ICON 012)	1.44 - 1.50 g/cm ³
Gel time (ICON 002) (23°C - 1% MEKP on 100 g)	30 - 40 minutes
Non volatile content (ICON 003)	72 - 74 %
Peak Exotherm (20°C - 1% MEKP M50 on 100 g)	100 - 125°C

3 MECHANICAL PROPERTIES OF THE CURED RESIN

Flexural strength * (ISO 178)	141.3 MPa
Tensile strength * (ISO 527)	100 MPa
Tensile modulus* (ISO 527)	1.42 GPa
Elongation at break * (ISO 527)	7.08 %
Temperature of deflection under load ° (HDT) (ISO 75-3)	84°C
Barcol hardness * (ASTM 2583)	40 - 45
Glass transition temperature* (NF EN ISO 11357-2)	114.6°C

*Test realised on laminated reinforced with 4 layers of 450 g/m², post cured during 16 hours at 40°C.

° Pure resin, post cured during 3 hours at 80°C.

IMPORTANT

All of the results obtained according to trials in our laboratory. However, we don't be responsible of manu factured parts with the resin **NORESTER® 2000/50**, if the application conditions specified are not respected.

It is imperative that the user must also ensure that his application and his process are appropriate for this product to be used. We hereby the conformity of our products with the above specifications. We cannot be responsible for any damage caused by misuse of this product or use of the product for an application not covered in the design.

4 VERSION

NORESTER® 2000/50 is available in long gel time version (**LGT**) with a gel time of 40 - 50 minutes (23°C - 1% MEKP on 100 g).

5 RECOMMENDATIONS BEFORE USE

As this resin **NORESTER® 2000/50** is a filled product, the user must absolutely well mix the resin for each new application before using it to have a homogenous product.

6 PROCEDURE FOR MOULD PRODUCTION

Application of the gel coat

Apply 800µ of tooling vinyl ester **GC 206 / GC 207** with several thin layers from 150µ to 200µ. The gel coat must be applied at a temperature between 18°C and 25°C and catalysed with Butanox M50 at a level between 1,5% and 2%.

Application of the barriercoat

When the gel coat is well cured (for optimum conditions, wait at least 4 hours before starting lamination), laminate with vinyl ester resin **R 842** as follows:

1 powder mat 100g/m² and 2 powder mats 300g/m² with a level of catalyst Butanox M50 between 1% and 2%, wet on wet. Before laminating, check that the temperature of the resin **R 842** is between 18°C and 25°C.

Application of the tooling resin

Then next day, on cured gel coat, laminated with the resin **NORESTER® 2000/50**. Before laminating, make sure that the temperature of the resin, the mould and the room is between 18°C and 25°C.

Before use, mix the resin few minutes to obtain a homogeneous product. We recommend to catalyst the **NORESTER® 2000/50** at 1% of MEKP.

Don't catalyze under 1% of MEKP to avoid undercuring of the laminate.

Don't catalyze over 1,5% of MEKP to avoid distortion of the laminate.

Low temperature will affect the curing and properties of the resin, and high temperature will give a too short gel time.

Hand lay up

After the good curing of the laminate made with **R 842**, put a thin layer of catalysed resin with a brush.

Apply a first layer of 4 Mats of 450 g/m² to obtain a thickness of 3 to 4 mm. It is important to make a thickness at once time in order to activate the anti shrinkage effect.

Wait about 1 hour – 1 hour 30 after the complete whitening of the first layer of 4 x 450 g/m² mat to start the second layer.

For the second layer, apply again 4 Mats 450 g/m² (40 tex) and wait about 1 hour - 1 hour 30 after the complete whitening to make the following layers.

Repeat the process 2 or 3 times until the required thickness is achieved.

Remove air voids with a roller between each layer.

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Spray up

Tests were made using equipment from **GLAS-CRAFT (LPAIS/SP 85 EC)**. External blend, “Air Assist Containment” system. System pump = 11:1. Diameter nozzle 43, angle 40.

- Like in the hand lay-up, the following day, apply some catalysed resin on the polymerised **R 842** to wet the surface.
- Spray a layer of 3 to 4 mm of resin and chopped fibres.
- After it has turned white and the exotherm has died down (about 1 hour), apply the following layer of **NORESTER® 2000/50**.
- Proceed like this until you achieve the thickness you require.

NB : Avoid problem of adhesion between the layers of 4 mm, do not wait more than 12 hours between the different layers. Avoid contaminating the surface of the mould with dust between laminates as this will affect the interlaminar adhesion.

The regular and homogeneous whitening of the laminate ensures that the product is being used carefully.

7 RECOMMANDATIONS FOR DEMOULDING AND POST-CURING

According to the size, and application of the mould, it is strongly recommended to reinforce the mould with ribs and to demould between 2 and 5 days after laminating, to avoid any marks from the ribs.

If the installation of ribs is not necessary, then release of the mould can be carried out 24 hours after the peak exotherm of the last layers of **NORESTER® 2000/50**.

In most cases, when the resin **NORESTER® 2000/50** is used at normal temperatures (between 18 and 25°C), it is not necessary or possible to post cure, in case of very high molds.

A good Barcol hardness is obtained after 24 hours at ambient temperature.

However in some cases it may be necessary to post cure the mold. In this case, it is imperative to make the post cure gradually and follow the recommendations:

- 24 hours at ambient temperature,
- Then 6 hours at 40°C
- Then 6 hours at 60°C
- Then 6 hours at 80°C
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The resin **NORESTER® 2000/50** should not be cured at a temperature higher than 80°C.

8 PACKAGING

Available in cans of 25 kg or in drums of 250 kg.

9 STORAGE CONDITIONS AND HANDLING

Storage life: **NORESTER® 2000/50** resin is stable for 4 months from date of production. The product must be stored in original closed packaging at a temperature between 15°C and 25°C, away from direct sunlight.

It is the responsibility of the customer to assure that the product is used in good conditions overall before the date limitation mentioned on the keg.

This resin is subject to the Highly Flammable Liquids Regulations.

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