1 CHARACTERISTICS

Norester® 1000/50 is an unsaturated polyester resin, especially formulated for mould making. **Norester® 1000/50** is filled and pre-accelerated.

- Product ready to use.
- Rapid cure and rapid manufacture of the mould (in one day).
- Very low shrinkage, good surface appearance.
- Polyester resin which cures at ambient temperature with the addition of MEKP peroxide (e.g. Butanox M50 from Akzo).
- Low viscosity, easy wet out.
- Good mechanicals properties.
- Filled resin; speed of production cuts mould making costs.

2 PROPERTIES OF THE LIQUID RESIN

Aspect	Beige
Flammability	Inflammable
Brookfield viscosity (ISO 2555 - 20°C – sp4)	100 rpm : 1100 - 1350 mPa.s
Specific gravity (ICON 012)	1.44 - 1.48 g/cm^3
Gel time (ICON 002) (20°C - 1% MEKP on 100 g)	35 - 45 minutes
Non volatile content (ICON 003)	72 - 74 %
Peak temperature (20°C – 1% MEKP on 100 g)	110 - 130 °C

3 MECHANICAL PROPERTIES OF THE CURED RESIN

Flexural strength* (ISO 178)	191.7 MPa
Flexural modulus* (ISO 178)	7.080 GPa
Tensile strength* (ISO 527-4)	118.7 MPa
Tensile modulus* (ISO 527-4)	1.863 GPa
Elongation at break * (ISO 527-4)	6.23 %
Temperature of deflection under load ° (HDT) (ISO 75-3)	81°C
Barcol Hardness (4 layers 450g/m2) (ASTM 2583)	40 - 45 after 24h
Glass transition temperature (NF EN ISO 11357-2)	104°C

* Mechanical tests realized on a laminate: 4 mats 450g/m2. Post cure : 3H at 80°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 manufactured parts with the resin **NORESTER 1000/50**, if the application conditions specified are not respected.*
The user must also ensure that his application is appropriate for this product to be used.
We hereby the conformity of our products with the above specifiations. We cannot be responsible for any damage caused by misuse of this product.

4 VERSIONS

Norester® 1000/50 is available in long gel time version (**LGT**) with a gel time of 50 - 60 minutes.

5 RECOMMENDATIONS BEFORE USE

As the **NORESTER® 1000/50** resin 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 **Norester® 842** as follows :

- 1 mat 100g/m2 and 2 mats 300/gm2 with a level of catalyst Butanox M50 between 1% and 2%, wet on wet. Before laminating, check that the temperature of the resin **Norester® 842** is between 18°C and 25°C.

Application of the tooling resin

Before laminating, make sure that the temperature of the resin, of the mould and of the room is between 18°C and 25°C. Low temperature will affect the curing and properties of the resin, and high temperature will give a too short gel time.
Before use, mix the resin well to achieve a homogeneous product. We recommend to catalyst the **RM 1000/50** at 1% of MEKP.
Don't catalyze under 1% of MEKP to avoid undercutting of the laminate.
Don't catalyze over 1,5% of MEKP to avoid distortion of the laminate.

Hand lay up

The following days, after the good curing of the laminate made with **Norester® 842**, put a thin layer of catalysed resin **RM 1000/50** with a brush.
Then apply 4 layers of 450 g/m² mat with **RM 1000/50**, consolidating each layer. It is important to laminate 4 layers of 450 g/m² mat, wet on wet in order to generate enough exotherm to activate the anti shrink resin components in the resin.
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.

Spray up

Tests were made using equipment from **GLAS-CRAFT LPAIIS/SP 85 EC.**
System pump = 11:1
Gun with Air Assist Containment.

- Like in the hand lay-up, the following day, apply some catalysed resin on the polymerised **R 842** to wet the surface.

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- 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 **RM 1000/50**.
- Proceed like this until you achieve the thickness you require.

Remove air voids with a roller between each layer.

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

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 then be carried out 24 hours after the peak exotherm of the last layers of **RM 1000/50**.

8 PACKAGING

Available in cans of 25 Kg and drums of 250 Kg.

9 STORAGE CONDITIONS AND HANDLING

Storage life: **Norester® 1000/50** resin is stable for 3 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.