Introduction

This leaflet is meant to help the manufacturers of commercial vehicle bodies. They will find here all kinds of advice for the use of GRP panels.

In the field of the guarantee on GRP Panels, it is important to follow the instructions written in this document.

The Panolit® » panels comply with the specifications of the standard NF-T-57-950-1

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We are certified ISO 9001-2000
1. General aspect of GRP panels

Due to the characteristics of raw materials and of the manufacturing process, the cosmetic finish of the surface, on the interior and the exterior of the panel, may show the marks of the products used in its manufacture. This will never affect the mechanical properties of the panel.

2. Painting GRP panels

Panels can be painted with polyurethane painting systems. It is important to have a previous careful cleaning and degreasing of the surface. **Grinding of the gel-coat is not recommended and should be avoided at all costs.** A soft rub down with household abrasive pad such as scotchbrite is enough.

For a high quality final aspect, please follow the specifications given by the paint manufacturers.

*Important:*

*In the production of glass reinforced polyester in any form, it is not always possible to guarantee a totally defect free surface.*

3. Colour impregnated gelcoat

On request, panels can be manufactured with a colour impregnated gelcoat on the exterior face. In this case, great care must be taken when unloading and storing the panels. Panels must also be handled with care during production. We would recommend that panels be ordered with a protective film.

*(see also : 4. Storing and Handling)*

It should also be noted that the final aspect of a colour impregnated panel does not reach the level of a painted panel.
4. Handling and Storing

We recommend that the panels be unloaded by overhead crane and that during the unloading the panels be supported by either a purpose built steel frame or by load straps positioned at a minimum of every 2500mm throughout the length of the panel. Carlier Plastiques will not accept responsibility for consequences such as cracks, breaks or any damage on the surface of the panels caused by any other method of unloading.

For the handling of small panels in sizes of door blanks or bulkheads, it is possible to use a forklift, but in this case the lower and the upper side of the panel should be protected.

The panels must be stored flat on wooden struts placed every 1500 mm max., sheltered from bad weather and kept in a dry place. As the process of polymerisation can last several weeks, we recommend to store the panels very carefully.

In the case of long storage of panels covered with a protection sheeting, we recommend to remove the sheeting, so as to avoid any colour variation.

5. Using GRP panels

All panels are supplied with a sticker "INTERIOR SURFACE". Please adhere to this advice.

In the case of panels higher than 2440 mm, follow the "TOP" sticker in order to ensure that the horizontal joint of the panel is always at the top.
6. Cutting

It is possible to cut the GRP panels using a circular carbide-tipped saw. To cut out an opening for a refrigeration unit, please use a carbide-tipped jig saw.

Always follow the instructions of the cutting system manufacturer, especially for advice on the number of teeth required on the blade and the cutting speed.

**Insulated panels:**
In the case of insulated panels, there is a risk of delamination on cutting a panel. This risk can be reduced if the cutting is made on a wooden insert.

Should the cutting be however made apart from a wooden insert, caution must be taken to the quality of the blade and the forwarding speed of the cutting facility.

After cutting, the edge of the panel must be inspected and a delamination should be repaired immediately with resin or polyurethane glue.

7. Washing

On delivery of a vehicle, the end user should be informed about the washing instructions of GRP panels. The wrong pH of the detergent, together with an excessive pressure, or an excessive temperature, at too short a distance to the panel, may destroy its surface.

As a general rule, please take the following values in account:

- Maximum temperature: 70°C (158°F)
- Maximum pressure: 80 bar (1160 psi)
- Minimum distance between sprayer and panel: 30 cm (12’’)
- Soft soaps or basic detergent: pH under 10
- Acid solutions: pH over 2.
8. Repairing

In the case of an accident on a GRP panel, it is possible to repair. This repair has to be performed very quickly, because of the ingress of moisture which will alter the mechanical characteristics of the panel, and consequently will make the guarantee clause unusable in case of necessity.

Please read carefully the repair procedure at the end of this leaflet and do not hesitate to contact the panel manufacturer for useful advice.

9. Field of application

General information can be found on our web site:

www.carlier-plastiques.com

The body builder must ensure that the panel and its dimensions are correct and adequate for the purpose for which it is to be used.

Regarding the dimensions of the side walls, please use following rules to determine thickness according to the sizes of the panels:

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Dimensions of the body</th>
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<tbody>
<tr>
<td>6 to 11 mm</td>
<td>Depending on the specific use</td>
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<tr>
<td>14 mm</td>
<td>3,5 T only</td>
</tr>
</tbody>
</table>
| 17 mm     | Maximum length: 13600 mm  
             | Maximum height: 2440 mm   |
| 20 mm     | Maximum length: 13600 mm  
             | Maximum height: 3150 mm   |

No guarantee will be given outside of the above limits.

In the case of insulated vehicles, type and thickness of panels is governed by the use of the vehicle (i.e. refrigerated or chilled) and the type of refrigeration unit required for the operation.
10. Return of panels

Should for any reason one or several panels have to be returned to the supplier, they must be treated in the same manner of handling, storing and loading as with normal panels.

Any damage caused by loading, storage and transportation whilst in the care of the customer will not be covered by the supplier.

It is therefore advised that the customer indicates on the return voucher that the panel has been passed over to the haulier in good condition (except the reason of the claim). Should any damage occur during the return transport, this will then discharge the customer and enable Carlier to ask the haulier for indemnity.

11. Inside equipment

In order to meet the end user’s requirements, it is possible to fit equipment on the inside of the panel:

- metallic or GRP rub strip
- horizontal load restraint rails
- vertical rails for double deck
- meat hanging device on the roof
- fridge units and evaporator on the bulkhead or on the roof.

(This is an open list)

The body builder is responsible for and must ensure that the panels specified are correct and adequate for the purpose for which they are to be used.

The fastening by screwing or riveting, with or without bonding, has to be made in accordance with the specifications issued by the fastening manufacturers.

Caution: Should the equipment be fitted with screws on a panel with plywood core, check carefully the length of the screw. The end of the screw has to stop before the 2nd ply from outside...

If the fitting of load restraint rails is not made carefully, it may cause waves on the side walls

The specifications of use of all equipment have to be respected.
Appendix

12. Repairing procedure for small blemishes
   (scratches, small gelcoat cracks, small impacts…)

Required products:
- Thickened and pre-accelerated gelcoat
- Polyester film
- Catalyst (do not forget to protect your eyes, and wear gloves)
- Wax

Repairing:
1. Wax and shine the surface to be repaired (the wax helps to stop any surplus gelcoat sticking on the surface around the area of the repair)

2. Rub down the area around the surface of the fault, ensuring that the edges are smooth and the whole area is dust free

3. Prepare the gelcoat: one button of gelcoat and 4 drops of catalyst and mix carefully

4. Apply the mixed gelcoat on the damaged area, and lay polyester film over the area, then level the film and gelcoat out with a flat scraper.

5. After the gelcoat is hardened (times of hardening may differ due to atmospheric conditions), take the polyester film off, clean with a solvent and wipe off the excess of gelcoat.
13. Repairing procedure for major blemishes
*(cracks until the core material, deep impacts..)*

1. Grind down an area of about 70 mm in circumference around the area to be repaired ensuring that the core of the panel is revealed

2. Grind down in a slope about 30 mm around the first area

3. Dry the core if necessary

4. Apply a 300 g/m² woven roving glass against the core, over the 70 mm

5. Impregnate with white resin

6. Apply a 450 g/m² chopped strand mat glass over the whole area of the repair (100 mm)

7. Impregnate with white resin

8. Equalise and roll out the air bubbles

9. After the area of the repair has hardened (times of hardening may differ due to atmospheric conditions), grind down in order to obtain a flat surface

10. Cover and fill the area fill up with polyester mastic and Rub down with a fine sheet of wet and dry in order to obtain a good finish

11. Finish with white gelcoat using the same procedure for small blemishes