

2. Bending*

a) General recommendations

The techniques used for bending* REYNOBOND® are those generally used for working steel or aluminium sheet. However, the specific characteristics of the composite panel make certain precautions necessary.

Bending* techniques allow many different types of curved pieces to be formed, including fascias, parapets, airplane wing type profiles, cladding for posts and complex shapes (conical shapes).

When bending REYNOBOND®, the original protective film on the top surface must be left on. Depending on the conditions in the workshop, it is even advised that the protection be reinforced with another self-adhesive film or the insertion of polyethylene or PVC strips 1 to 2 mm thick. These essential precautions avoid marking and scratching that may only be discovered after installation, when the protective film is removed. Depending on the tools available and the type of application, one of the four following bending techniques will be used.

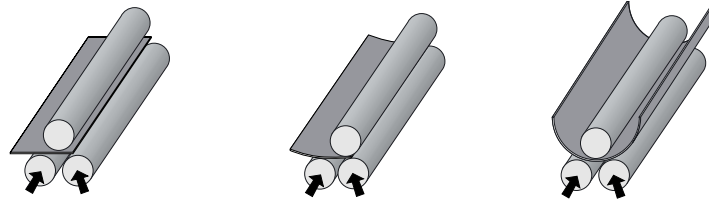
FABRICATION OF REYNOBOND®

Fabrication

b) Bending* methods

	Radius < 60 mm	Radius > 60 mm	Radius limited by diameter of rollers	Rotating part	Elliptical part
Ⓐ Rollforming		•	•	•	• ⁽¹⁾
Ⓑ Bending by press brake		•			•
Ⓒ Bending on an universal folding press with apron		•			
Ⓓ Bending after preliminary milling	• ⁽¹⁾	• ⁽¹⁾	•		•

⁽¹⁾ only if numerically controlled



Before starting any work, see the chapter “Recommendations before use”, paragraph “Storage and handling of panels”, page 7.

Ⓐ Rollforming

This operation consists of bending REYNOBOND® panels in a conventional bender with three symmetrical polished cylinder rollers.

Caution when using :

- When carrying out the work, check that the rollers are not exerting too much pressure on the material.
- To obtain the radius required progressively, it may be necessary to put the panel through the machine several times.
- Test runs can be used to determine the number of times and the position of the cylinders.

- The multi-layered structure of the REYNOBOND® panel causes a spring back effect that is more pronounced than that of steel or aluminium sheet.

- Feeding into and removal from the rollers may cause flattened sections at the ends of the panels. To eliminate this, it is a good idea to leave 60 to 80 mm extra length depending on the diameter of the rollers on either end of the panel, which can then be recut.

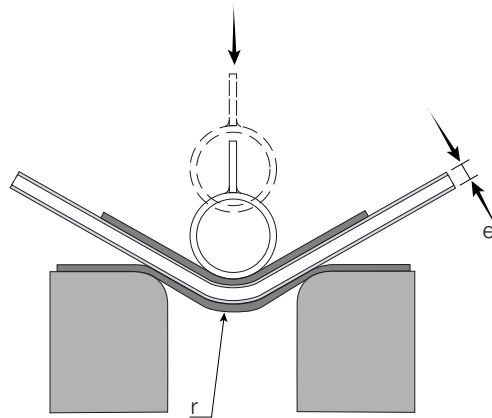
The use of a numerically controlled rollforming machine permits special fabrication operations such as the shaping of elliptical parts and also gives excellent repeatability.

*cf. glossary

Ⓑ Bending by press brake

Press brakes can also be used to bend REYNOBOND® panels by applying the techniques and experience gained from working with steel or aluminium sheet.

The bending operation is achieved by a die descending a given distance. The bending radius and angle depend on the diameter and travel of the upper punch as well as the width of the lower die. For this type of bending, the REYNOBOND® panel will be protected by placing a flexible sheet with a hardness of at least 60 shores and thickness of 1.5 mm or more on either side of the panel. This protective layer ensures that the panel is displaced into the hollow of the lower die without marking it at the points of contact of the upper punch and lower die.



$$PE : r_{\text{mini}} = 15 \times e$$

We recommend a minimum bending radius of 15 times the thickness of the panel.

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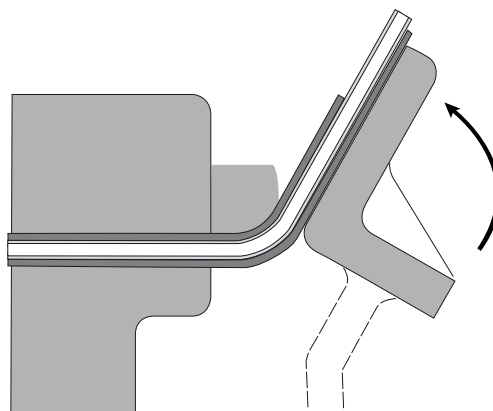
Ⓒ Bending with a folding press :

For this type of bending, the panel is held between two fixed beams on the folding bed. The folding apron bends the part of the panel sticking out around the upper beam of the folding tool. The bending radius depends on the radius of the interchangeable folding tools which are fixed on the upper sheet holder.

It is possible to obtain large bending radii using a stretching technique on a numerically controlled bending machine by combining the descent of the tool with the panel feed. In this case it is recommended that pads with protective shells be used to reduce the risk of facets forming. Extra protection must be used on the two outer surfaces of the REYNOBOND® to avoid any marking occurring during the movements in the stretching process. In all cases, one or more test bends will need to be performed in order to find the optimum adjustment of the feed and the depth of the pad descent. Here account must be taken of a spring back phenomenon known to occur in aluminium-polyethylene composite panels.

Ⓓ Bending after preliminary milling

Radii between 2 and 10 mm inclusive may be achieved by the rout and return technique. This consists of making V-shaped or straight grooves using shaped milling cutters on the reverse of the REYNOBOND® composite panel. See paragraphs "Milling" and "Folding".



Intermediate radii of 10 to 60 mm can be achieved using a specific machining technique.

This technique, known as "paring", consists of removing a strip of the aluminium sheet on the back of the composite panel. The width of this strip will be equal to the flat size of the radius to be obtained. The depth must be determined by making prototypes to ensure that this operation does not affect the appearance of the front of the panel.

NB :

The use of this technique requires considerable experience of fabrication and excellent knowledge of the properties of the composite panel. In most cases, a reinforcement system will be required to compensate for the loss of rigidity of the bent part caused by this technique

General remark :

Fully closed (360°) rotating parts can only be made by rollforming.