

Compoflex® documentation

FD infusion – Case story MAGBOAT

The purpose was here in full scale to produce a 9 m taxiboat using infusion at Cantiere Nautico with Anselmo Mauri and Resintex Technology in Sirmione Italy. Compoflex® 150 SB RF was used to substitute peelply, release film and flow mesh.

Magboat owned by Anselmo Mauri has a programme of producing 9 m taxiboats. These boats are at Garda used for local and tourist transport. The boat is built from epoxy and the process is infusion. Laura Fabi (Resintex Technology) and Keld Lauridsen (Fibertex Nonwovens) attended this trial in July 2011.

Preparation and lay-up

The Compoflex® 150 SB RF was glued into the form directly on top of the glass fibre (1000 – 4000 g/m²)

1



Picture 1

The infusion was done across the hull of the boat. Each hull (left and right) were prepared at the same time.

On picture 1 and 2 we can see the “resin-brake” at the top of the mould. Sheets of mats from Lantor. App. 50% of the flow front is stopped

by these sheets where air can flow, but the resin is highly stopped to line up the flow front in the end of the infusion, and to avoid filling the vacuum system with resin.

Distribution of the vacuum around the edge of the mould was done using a tube flow grid. To fix the Compoflex® 150 SB RF, a red spray of glue was used (3M).

Due to the functionality of the Compoflex® 150 SB RF in this case replacing 3 layers: peel ply, release film and flow mesh, 70% of the time of preparing the consumable was saved.

2



Picture 2

The infusion channels (ENKA Channel) from Colbond were placed in the bottom of the hull, and at half way to the end of the infusion. This splits the distance of 1.6 m to 2 x 0.8 m of flow distance.

3



Picture 3 and 4 / ENKA

The ENKA Channels are flow channels, made from Col-bond nonwovens wrapped around a high volume flow mesh. This is placed in the mould over the Compoflex® 150 SB RF. It distributes resin coming from the inlet tubes. It is placed equally out over the mould surface giving max app. 0.8 – 1 m of flow distance of resin in the Compoflex® 150 SB FR.

4



Just after the lay-up and app. 14 hours before the infusion, vacuum was applied as final preparation. This vacuum was kept at app. 0.9 bar overnight compressing the laminate. This is done to compress the glass and thereby volume and weight of the construction.

This also has the effect that the flow speed in the glass will be reduced.

Lay-up

- The moulds are thereby prepared having high amount of glass at the bottom (4000 g/m²) dropping to 1000 g/m² at the edges.
- Compoflex® 150 SB RF direct on top of the glass.
- ENKA Channels on top of the Compoflex® 150 SB RF.
- A vacuum bag covers the entire mould.

Infusion

Vacuum 0.9 bar

Gurit Epoxy resin SP Prime 20 LV app. 400cP at 30°C

Glass: app 1000 - 4000 g/m²

Inlet tube in general: Ø 10 mm.

The bottoms of both moulds were infused at the same time, and through each four points into the central bottom flow channel. During the infusion the speed decreased due to the pressure drop and distance from the inlet to the flow front. After reaching the next infusion point (0.8 m from the bottom) the next infusion channel was connected and the infusion of the last 0.8 m began.

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Picture 5, 6 and 7

The entire infusion of the two moulds lasted app 50 min. According to Anselmo Mauri this is normal and fully sufficient, as there is a similar resistance in the release film set up he is normally using. (Blue Diatex type 5 x 0.4 mm).

The low speed 0.5 m/30 minutes seems to be very low, and it is, compared to direct infusion, through peel ply without release film as a flow brake.

The use of a release film as control of the infusion is, however, used throughout the industry. The speed as shown in cm/minutes is not directly to compare from time to time, as it is the volume of resin infused. After the infusion of the moulds, the two parts were moved to a heated chamber to cure.

Peeling

Two days later the consumables were peeled off. This process went very well. The peeling lasted app. five minutes leaving a nice surface for secondary bonding.



Picture 8

Stringers of PU foam were moulded directly into the bottom of the boat, after peeling of consumables. Further construction was built on top of the PU foam (see picture 9)

Further building and final result of the MAGBOAT taxi boats:

Picture 9 and 10



Conclusion

Compoflex® 150 SB RF used for boatbuilding / infusion of epoxy has here shown that it is fully useable giving the advantages of:

- Easy and fast lay-up (in this case 70% of the time was saved)
- Sufficient speed of infusion
- Easy peeling without resin dust
- Secondary bonding properties avoiding grinding

However, we see here at MAGBOAT that the Compoflex® 150 SB RF having the 100g flow mesh is enough and gives better control!

Fibertex Nonwovens has a new additional product for higher speed infusion in the programme: Compoflex® RF 3, or Compoflex® SB RF 3 for secondary bonding.