Resin transfer moulding

What is resin transfer moulding?

Resin transfer moulding involves liquid plastic resin being injected into a closed mould around a preform; a reinforcement material (eg. glass or carbon fibre) that the resin saturates.

By embedding the reinforcement material, a complex structure can be achieved that is both light in weight and high in strength.

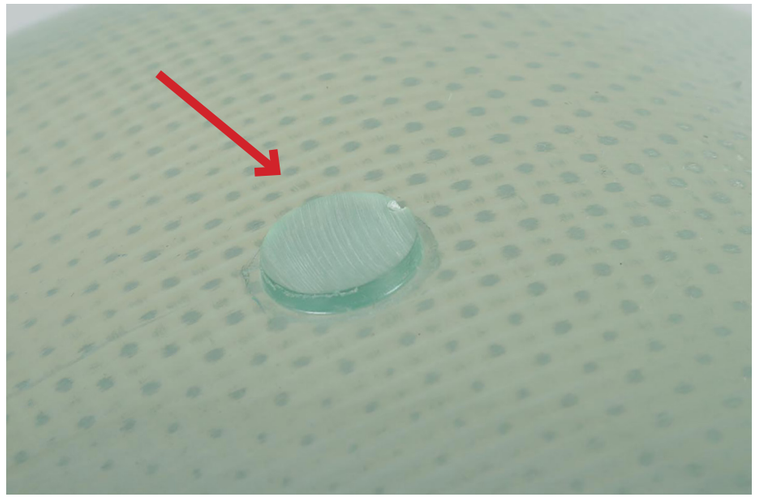
How does the process work?

- A sheet of fibres, the preform, is placed into a two-part mould, which is then clamped shut.
- The closed mould is injected with thermosetting resin under low, positive hydraulic pressure. The mould will often have vents at the furthest points to allow air to escape.
- The material hardens and cools in the mould.
- The object is removed and finished.

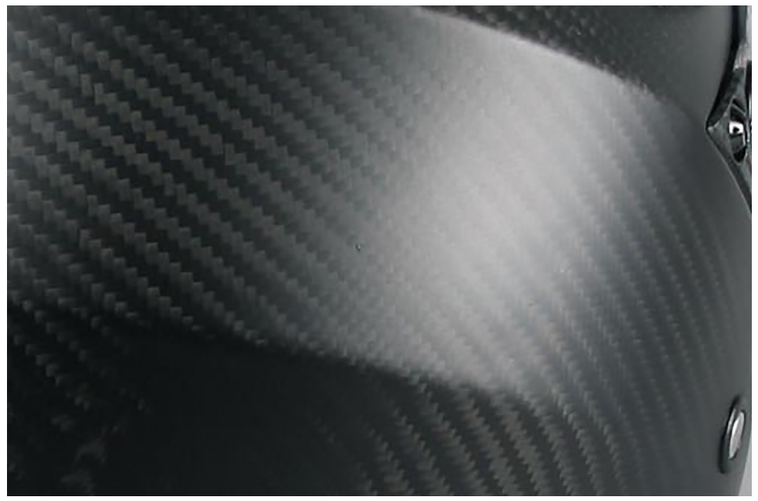
What plastics materials can be used?

Carbon fibre composite and glass-reinforced plastics. The plastics materials that can be reinforced in this way include polyester, phenolic, and polymethyl methacrylate.

What are the clues?



A rough spot shows the injection gate where the sprue is removed



Reinforcing fibres can often be seen.

When was the process first introduced?

In 1976, Osborne Industries, Inc. originated and initiated the closed-mould process that was later known in the plastics industry as resin transfer moulding or RTM.

Advantages:

- Medium production rate.
- Good suface finish on both sides.
- Large structural components can be fabricated.

Disadvantages:

- High tooling costs.
- Uneven resin flow can result in unimpregnated areas.
- Sensitive to leaks (air paths) in the mould.

Uses:

Used for furniture, automotive and aeronautical applications, as well as sports equipment and casings for power tools.

Find objects with resin transfer moulded elements in the MoDiP collection. View the animation to see how the process works.

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