

# Calian composites process options

## Vacuum Infusion Process (VIP)

Vacuum infusion uses vacuum pressure to drive resin into a laminate. This process has several benefits:

- Wide range of possible part sizes
- Strong end-product due to minimal voids
- Consistent resin usage and less resin waste
- High consistency and easy repeatability
- Unlimited set-up time—no resin clock to work against
- Minimal to no voids in the finished laminate
- Ability to use standard composite tooling
- Lower styrene emissions, which lead to a better work environment



The vacuum infusion process is one of many closed-mold processes but is the only one that uses atmospheric pressure to push resin into the mold. This results in a controllable process because only three variables can affect the resin flow:

1. Laminate permeability
2. Resin viscosity
3. Cavity pressure in relation to atmospheric pressure

If all three variables stay constant, then products will be consistent every time.

## Light Resin Transfer Molding (LRTM)

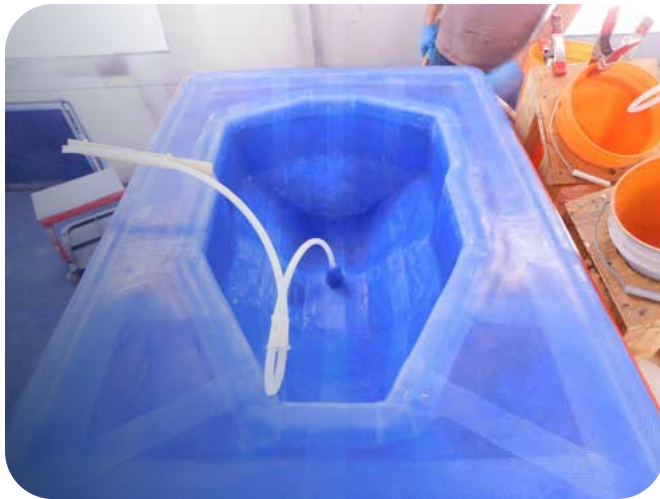
Light Resin Transfer Molding uses a closed-mold system and provides a Class A finish on both sides of the part. The closed mold consists of an “A” side mold, or base mold, and a semi-rigid “B” side mold, or counter mold. The molds are sealed together using vacuum pressure and a vacuum draws resin into the resulting cavity.

Once the base mold is cured, the counter mold is removed, and the product is removed from the base mold. The results are a consistently stiff and strong product because the pressure helps to compress the fibers in the pre-form.

## Reusable bag molding

Reusable bag molding uses silicone vacuum bags. This method reduces labour and material costs because the bags are durable and can be re-used—depending on the size of the part—100+ times a year. This method also has a fast fabrication time as silicone vacuum bags are ready for service immediately after the part is cured.

Reusable bag molding is a hybrid process that borrows features from both VIP and LRTM. But it is especially useful in applications with complex geometry and where high glass-to-resin ratios are needed.



The bags are created from a variety of different processes but the most popular are:

- Closed cavity bag molding (CCBM), a process that features tooling with one rigid mold half and one very flexible mold half made by applying silicone material with a brush to a reinforcement.
- Silicone bag molding (SBM), a process that features one rigid mold half with one flexible mold half, but the flexible mold half is made by adding silicone through specially designed equipment.

Ask us what process is best suited to your project.



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