Infusion boat building methods are increasingly being used in production facilities including those of several popular Florida fishing boat brands.

Just what exactly is infusion? Well, some manufacturers see it as the next step in the evolution of fiberglass boat building.

The most popular method of fiberglass hull construction—dating back to the 1940s—is open-molding, where layers of fiberglass are wet out with catalyzed resin. Workers commonly referred to as laminators use hand rollers and brushes to squeeze out the air trapped within the fiberglass cloth. This process can be messy and consistency depends on the human element, the laminator using the proper amount of resin.

A newer method, closed-molded resin infusion (sometimes referred to as vacuum infusion), allows for more precision. The mold is loaded with layers of dry fiberglass cloth, as well as carbon fiber or Kevlar, depending on the lamination schedule. The dry laminate layers are then covered with a clear bag-like material that is sealed to the top of the mold flange with two-sided tape. Flow media placed strategically under the plastic bag, covering the mold, aids in the distribution of the resin flow that enters the bag through a series of plastic tubes. These flow tubes are attached to a manifold that controls the delivery of the catalyzed resin.

The placement of the tubes on the bag depends on the lay-up schedule, the complexity of the mold and the various cores used. The resin is then pulled into the mold, under the clear plastic, and through the layers of fiberglass cloth by a vacuum that is introduced to other plastic tubes attached to the bag.

The closed-molded infusion process is more expensive than traditional, hand-laid open-molding, but for some builders the benefits outweigh the cost. With precise control over the resin-to-cloth ratio, structural components built using infusion methods may be stronger yet lighter than those laid-up by hand.

Hydra-Sports chose the infusion process to manufacture the new 23 foot Bay Bolt. Alex Leva, Hydra-Sports President, said, “Infusion is the natural evolution in leading edge technology in the boat building industry. We have always added Kevlar to our hulls for strength but now we can control the resin better.”

Other manufacturers, like Stuart Boatworks, are also using infusion but for a different reason. Bob Chew, Stuart Boatwork’s President, wanted to increase the strength of his 25-foot center console hull to handle the demands of the unforgiving rental market over in the islands. “The result was a boat hull calculated to be eight and half times stronger than the previous built models, using open molds, with an increase in weight by a mere 5 percent,” said Chew.

Watching the process through the clear plastic, builders are able to monitor the distribution of resin as it saturates the fiberglass cloth. Waste is reduced because there is no need for brushes and hand rollers. No overspray from a wet-out or chopper gun makes cleanup quicker, plus the working conditions for employees are safer and more comfortable (good news for builders reckoning with ever-increasing EPA restrictions on styrene emissions).

Turnaround time for the mold is cut significantly with the infusion process, which increases the throughput of the plant without sacrificing consistency.

At the same time, many boat manufacturers continue to use open molds with the hand-laid process. Skilled laminators can produce hulls which hold up amazingly well over time, judging by the number of 30- and 40-year old fiberglass hulls still running strong on Florida waters. Also, many small parts, such as consoles, storage compartments, livewells, and top caps are still built today with tried-and-true open molding.

But as the boating industry continues to evolve and the government cracks down on regulations for the environment, we expect that resin infusion will gain in popularity. Already, some manufacturers are using infusion for the construction of mission-specific models within their line, while others have switched over entirely to the infusion process.