> ***Until now, no experimental fish hyperbaric chambers have ever been built that could withstand more than four atmospheres of pressure. And that's where Waterco came in.***
>
> Dr John Stewart,
> senior research scientist,
> Wild Fisheries Program

Fishing for success

Wild Fisheries research program the world's most advanced, thanks to Waterco

- Waterco designed hyperbaric chamber a world first
- Replicates deep ocean conditions for accurate fisheries testing
- 8-Bar (800kPa) filter Waterco's highest pressure rating

Challenge

The Wild Fisheries Program, a division within the NSW Department of Industry & Investment has received funding from the NSW Saltwater Recreational Fishing Trust to conduct a series of tests into fish barotrauma over the next 18 months.

Barotrauma is the physical damage caused by a change in atmospheric pressure and is particularly dangerous for fish when they are brought to the surface from great ocean depths. The gases trapped in the fish's blood, tissues and swim bladder expand faster

The key challenge for the research team was that they needed a high pressure chamber that would replicate the exact pressure conditions of the deep ocean.

"Previously, no experimental fish hyperbaric chambers have ever been built that could withstand more than four atmospheres of pressure," explains Dr John Stewart, senior research scientist, Wild Fisheries Program. "As most of our offshore fish are captured from depths much greater than 30m, we needed a chamber that could withstand greater water pressures."

"Not only that, we needed a chamber that was large enough to keep big fish (up to 7kg snapper), it also had to have flow-through salt water, be able to handle internal pressures of more than seven atmospheres – and we had to be able to see the fish inside."

NSW Saltwater Recreational Fishing Trust to conduct a series of tests into fish barotrauma over the next 18 months.

Solution

Waterco is one of only a few companies worldwide which manufacture large high pressure rated filters, using the latest in fibreglass winding technology. This ensures superior mechanical and chemical resistance and tanks which weigh just one third that of steel and are non-rusting and non-corroding.

When the Wild Fisheries Program approached Waterco's distributor Aquasonic they knew they had come to the right place.

Waterco is one of only a few companies worldwide which manufacture large high pressure rated filters.

"Wild Fisheries needed a high pressure-rated filter and we knew we had just the right solution," says Bryan Goh, group marketing director, Waterco. "Using our 8-bar filter, the Wild Fisheries Program can now carry out tests to more than seven atmospheres - at least 60 metres - which they haven't been able to do in the past."

The 8-bar (800kPa) pressure rating is the highest that Waterco can currently achieve. "Its construction and multiple layers of continuous fibreglass enable the filter to with stand a high internal pressure," explains Goh. "A project such as this really demonstrates the strength of our commercial filters."

And after significant research and development, Waterco's proprietary technology and advanced manufacturing capabilities enabled it to incorporate sight glasses and large manholes into the high pressure filter.

"For two years, we tested various methods of installing large manholes and sight glasses," says Goh. "Generally, large manholes and sight glasses are harder to incorporate in high pressure filters, because any opening in a filter vessel creates a potential weak point or complicates the manufacturing process.The 80mm sight glasses Waterco has installed for this project were specially designed and developed by our fibreglass engineers."

Benefits

"One aspect of this research is into the survival of fish following being captured and then released," says Dr Stewart. "Catch and release fishing by recreational fishers is a practice designed to enhance the sustainability of fish stocks, but fish that are captured from even quite shallow waters can suffer from barotrauma injuries.

"Thanks to our new chamber, we're conducting a series of experiments on these species to examine their behaviour and survival following simulated pressure changes from different depths. We will investigate ways of improving the fish's health and survival rates.

"The chamber is working very well and maintains constant pressures of up to eight atmospheres indefinitely. We are using a submersible well pump to pump the seawater into the chamber under pressure and we are able to clearly observe the fish within the tank through the sight glasses."

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