

Star performance

Staying one step ahead with double-walled net design

With a number of carefully chosen global partners, Garware Wall Ropes (GWR) of India has been developing new products for the aquaculture industry, primarily to improve on stock containment and protection from predators.

As is the case around the world, containment of valuable stock is of prime importance and most of the major players in Scotland have been adopting GWR's new technology in an effort to enhance their profitability as well as security.

Abrasion on pen collars, foreign objects drifting in the tide, snagging while working with the net and predator attacks have long been accepted as the main causes of fish escapes.

Net tensioning, sacrificial abrasion and security panels, along with anti-predator nets, have also been recognised as the most practical responses to all of these problems.

W&J Knox of Ayrshire in Scotland and Garware Wall Ropes have pooled their knowledge and expertise to produce a double-walled net design, using a combination of Garware's market leading HDPE netting products.

Knox and Garware sat down with Graham Smith, area manager of Scottish Sea Farms in Shetland, with a view to providing one solution.

A double layered net was the final outcome, the main stock holding element of the net being constructed from Garware's knotless HDPE Star Netting, with an outer layer of heavier Sapphire Ultracore, which features strands of marine grade stainless steel as an integral part of the netting twine.

The waterline area of these nets also benefits from a heavy abrasion panel constructed with 4.2mm Sapphire twine, hung on the diamond.

The Star Netting has enhanced rigidity compared to like-for-like nylon, making it easier to clean with in-situ net washers, while the abrasion resistance inherent in Star makes regular washing processes a much safer proposition.

As well as the stainless steel in the Ultracore netting, the twine is injected with a hot wax

treatment that further enhances the stiffness of the material and helps to lock the geometry of the twine during the process to autoclave the mesh to a square pattern.

The generic stiffness of the Ultracore netting makes it more difficult for marauding seals to isolate individual fish within the cage, reducing the potential for stock loss as well as damage to the inner net during the attacks.

Graham Smith said: 'We have been working on optimising our stock security for some time now and have been impressed with the technical specifications of the new Garware products brought to us through Knox.'

'We had intense discussions with Knox over the design of the final nets and have been delighted with their performance to date.'

Garware's Star knotless netting has been in the marketplace for some time, with similar breaking strengths to wet nylon and a massive advantage in relation to abrasion and chemical resistance.

Initial fears regarding the positive buoyancy of the product were overcome with a unique and novel lead pattern on the base of the net that

provided a balance to the inherent floatation plus a little more.

The additional weighting assists the ability to resist predation and also helps to maximise the volume of the net during bath treatments.

'Star yarn benefits from controlled elongation for balanced net construction during usage, unlike most Polyethylene netting currently on the market, hence preventing 'creep', said Kanwal Malik, European sales manager at GWR.

'Normal knotted HDPE will tend to pull back towards the diamond and is readily malleable to the mouth of a seal.'

At the Scottish Salmon Company, the team believes in collaborative working and at the beginning of the year a full farm trial was carried out so they could experience first-hand the benefits of Star netting.

The weighting system was adapted to meet the environmental needs of their specific sites, providing an effective solution to be rolled out further in the future.

David Taylor, head of Production North at SSC, said: 'We are extremely committed to reviewing new technologies and firmly believe in the ben-



efits of working closely with our manufacturing partners.

'Knox quickly understood our requirements and developed an adapted netting system that will complement our overall containment strategy across the business.'

Fully enclosed, box-style, anti-predator nets have proven to be fairly successful over the years at protecting groups of square cages, but have fallen out of fashion in recent years.

However, Loch Duart in Sutherland has dusted down the idea and is trialling this on some of its sites in the north west of Scotland using Garware's Sapphire Ultracore. Initial reports seem to suggest that this has paid off handsomely, with a total exclusion of seals on the sites where they are installed.

They also have Star knotless 80m nets with an enhanced specification for durability over their previous specifications and are monitoring the performance of these too.

The new netting developments were spring-boarded from Canada where the farming companies were looking for new ideas on sea lion exclusion and abrasion resistance.

Marine Harvest in Scotland have been the trailblazers in using knotted HDPE netting on their sites in Scotland, but in a 'hybrid' configuration, with the base of the net still constructed from knotless nylon, which they consider to be more salmon friendly.

"The generic stiffness of the netting makes it more difficult for marauding seals to isolate individual fish within the cage"

They believe that any new materials and net designs that reduce seal predation and improve fish welfare have got to be beneficial all round.

'Salmon farmers in Scotland have certainly woken up to some of the new materials that are available and are looking forward to further advancements,' said Finlay Oman of W&J Knox.

'We are fortunate to have a close working partnership with Garware, with direct access to the efforts of their excellent research and development team, and they are happy to take on board ideas developed through our relationships with our own customer base.'

A further option for pens is to produce the complete net in Sapphire Seal Pro netting. Sapphire Seal Pro is HDPE like Ultracore, but without the stainless steel. Instead, it has specially stiffened polymer filaments at the core, enhanced by hot wax injection technology.

Like Sapphire Ultracore, this netting has the benefit of Locked Geometry Technology which helps to keep the mesh square, making it harder for small fish (in both directions) to exploit the variable shape associated with non-tensioned, soft nylon or standard braided HDPE netting.

Kanwal Malik said: 'Garware's continual development of Star knotless and Sapphire knotted netting has ensured that we have kept one step ahead in the market and drawn interest from around the world.'

Above: Adapted systems
Opposite above: Diamond abrasion net
Left: Tailor made designs