



# QUALITY EQUIPMENT

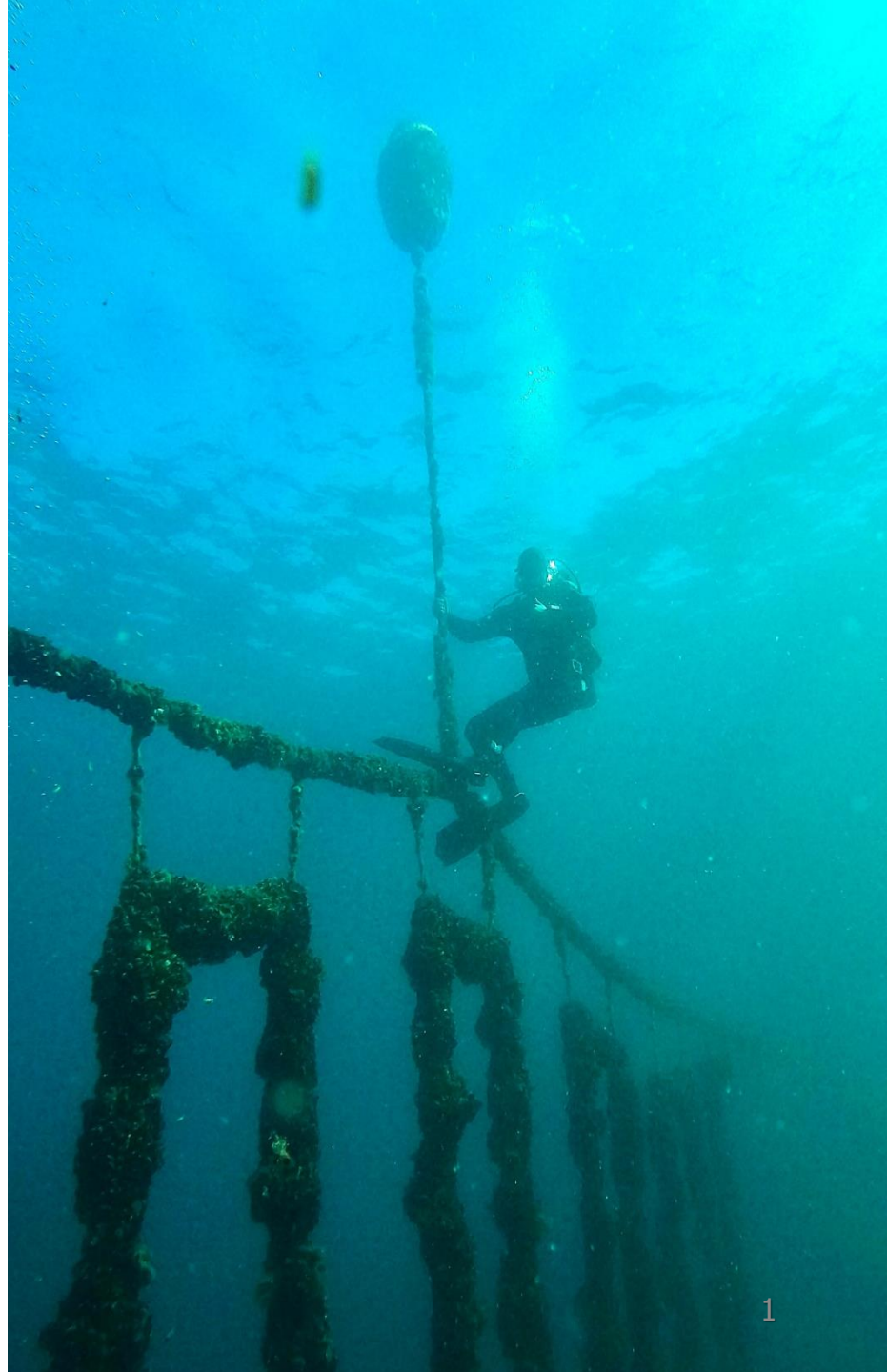
NEW ZEALAND ROPE AND TWINE.

**The continuous harvest practice of the modern Longline, aquaculture industry.**

- The most mechanized and developed continuous cultivation system.
- Lasts 10 to 15 cycles so carries the highest environmental awards for lowest carbon footprint as an aquaculture farm practice.
- Sustainable farming, not wild fishing.
- Quality and added value.

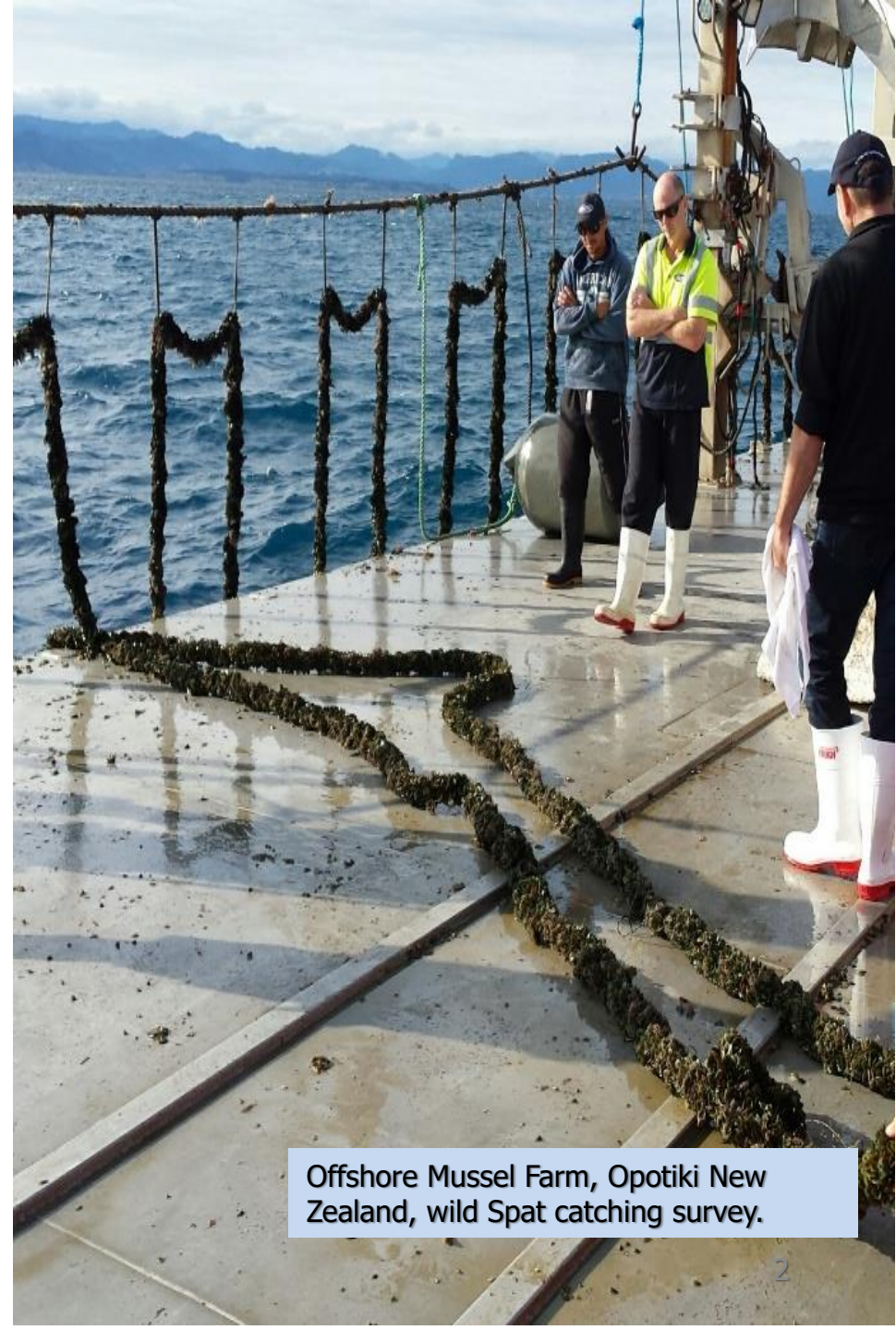
Presented by Joe Franklin Jnr.  
Managing Director

[www.qe.co.nz](http://www.qe.co.nz)



# QE Continuous Aquaculture Farming System.

- **PAGE 3 to 6:** Background introduction and pictorial overview of QE plants the Mussel industry.
- **PAGE 7 to 16:** Explanation of the continuous aquaculture system and the longline designs typically used for surface and subsea farming.
- **PAGE 17 to 36:** QE Spat Catching Rope designs and specifications including typical methods employed to catch and gather wild Spat.
- **PAGE 37 to 46:** QE Grow-out Rope designs and specifications.
- **PAGE 47 to 52:** QE Cotton Socking specifications and final re-seeding details.
- **PAGE 53 to 66:** Anchor types with QE Structure Rope, QE Lashings and specifications.
- **PAGE 67 to 84:** QE Mussel Floats and Buoy technology developed for these industries.
- **PAGE 85 to 99:** Typical Vessel equipment layout, Machines and Ancillary Equipment.
- **PAGE 100 to 114** Vessels, a pictorial view of vessel used in the modern aquaculture industry.



Offshore Mussel Farm, Opotiki New Zealand, wild Spat catching survey.

# Background


- Joe Franklin Jnr, Managing Director of Quality Equipment 1989 Ltd (Marketing), and New Zealand Rope and Twine Ltd (Manufacturing).
- A 53 year young family business in Auckland, New Zealand.
- We are the largest 3 strand Rope manufacturer in Australasia, with a strong focus on global aquaculture industries, especially Mussel, Seaweed and Pearl cultivation.
- We are driven to constantly innovate and develop for this industry. We consistently turn for example, 120 grams of plastic QE Mussel Rope/mtr into 30kg of high-quality protein meat over 10 years of services. True sustainability values verse our single use plastics competitors.
- We are not consultants, just someone willing to help others and working at the coal face to ensure a direct, practical transfer of knowledge and successful relationships.



QE1989 and New Zealand Rope and Twine, manufacturing plant and distribution warehouses. Our manufacturing plant works to a zero factory waste generation policy and we offset where possible our energy needs.



QE NZ Rope and Twine, 3 strand rope manufacturing plant. Producing QE Duradan PPE, Durashield PPE as required from diameters 3mm to 44mm.

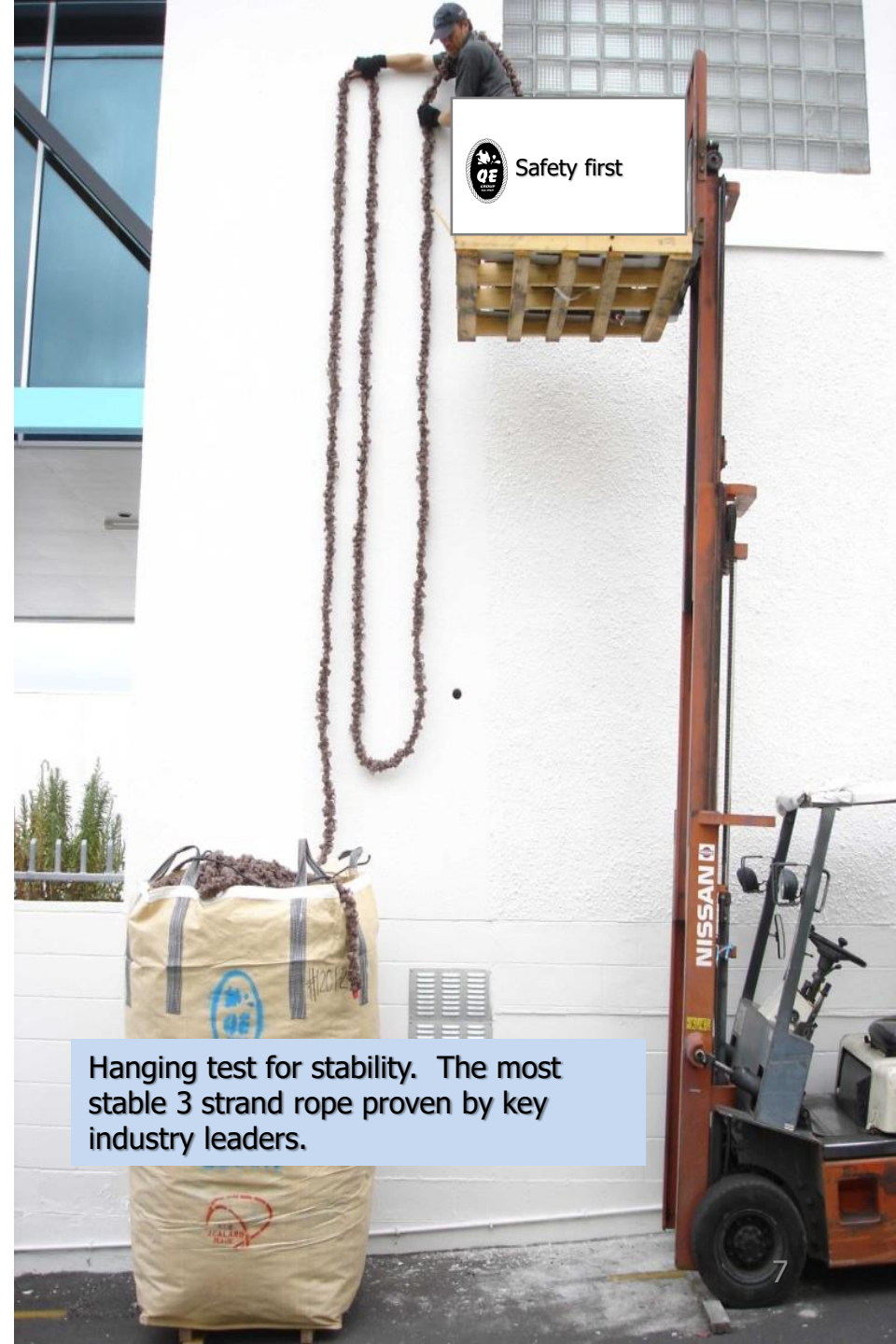


QE New Zealand Rope and Twine, Continuous Mussel Spat Catching and Cultivation Rope production.

# QE Continuous Mussel Rope system.

We farm the Mussels as if it were a land-based animal. Therefore, we are only going to farm a product we are going to get paid for. We offer the animal a secure medium to catch or grow on, we give it space to grow and walk to form an effective column. The results are a fast growing, healthy product where every animal is a premium animal. Therefore, less will give you more quality and size quickly, from the available food/energy source in the water column.

- Key point...stable continuous rope (no twisting) over long lengths.
- Fast to set, re seed and fast to harvest.
- Lasts 10 to 15 cycles so carries the highest environmental awards for aquaculture farm practice.
- Bulk packed direct from rope machine to avoid memory.



Surface double mainline farm, Turkey.



# Surface, Double Mainline system.

- The most popular design allowing maximum rope usage in the water column from anchor to anchor.
- Typically suits farming site with less than 3-meter of swells and allows the farmer to deploy excess Mussel Float capacity if preferred, so reducing the frequency of needing to add additional floats.
- Easy to lift and walk with walking wheels if floats are removed or using side gantry cranes and hooks.
- Can also be set in a semi sub-sea format using a range of surface control floats and sub-sea spacer floats.

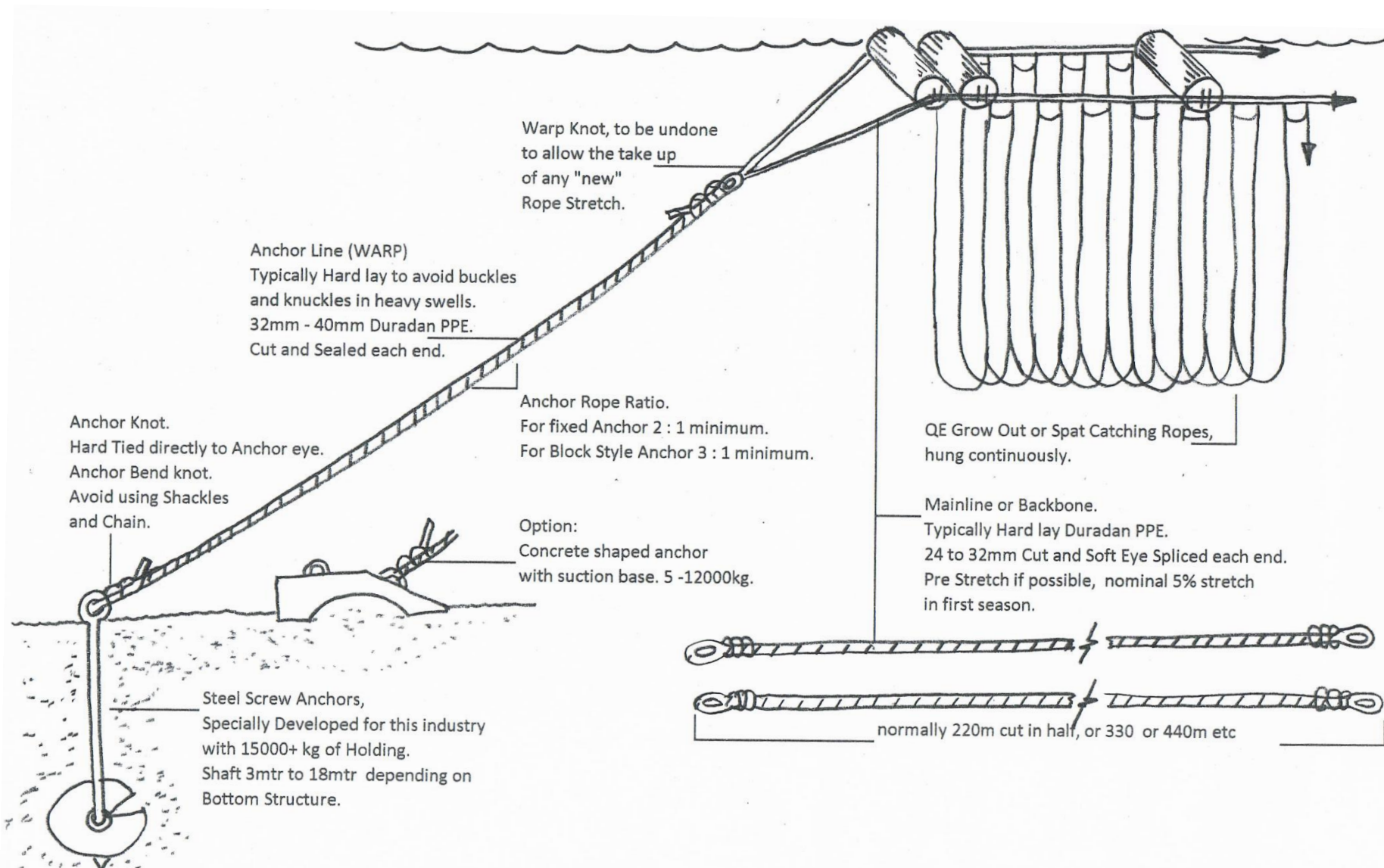
Surface longlines in Coromandel, NZ.



Coromandel NZ, double mainline harvest at 14kg per meter from QE Extreme XHD. Every Mussel float you can see represents 1000Kg of harvest product beneath this line.

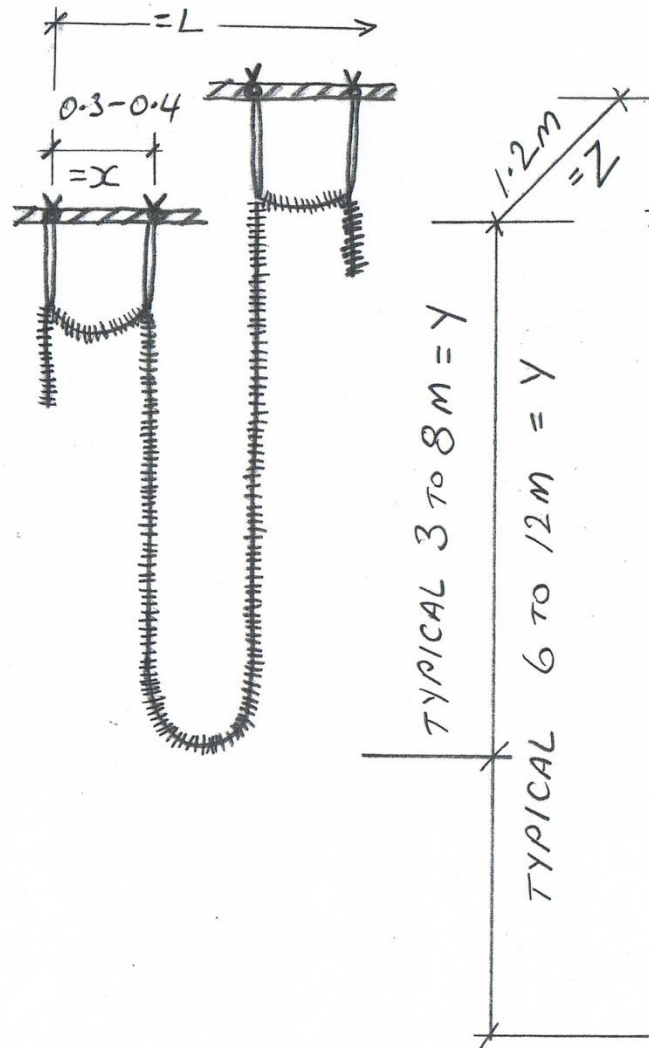


# Typical Double Mainline, 110m, 220m or as required.

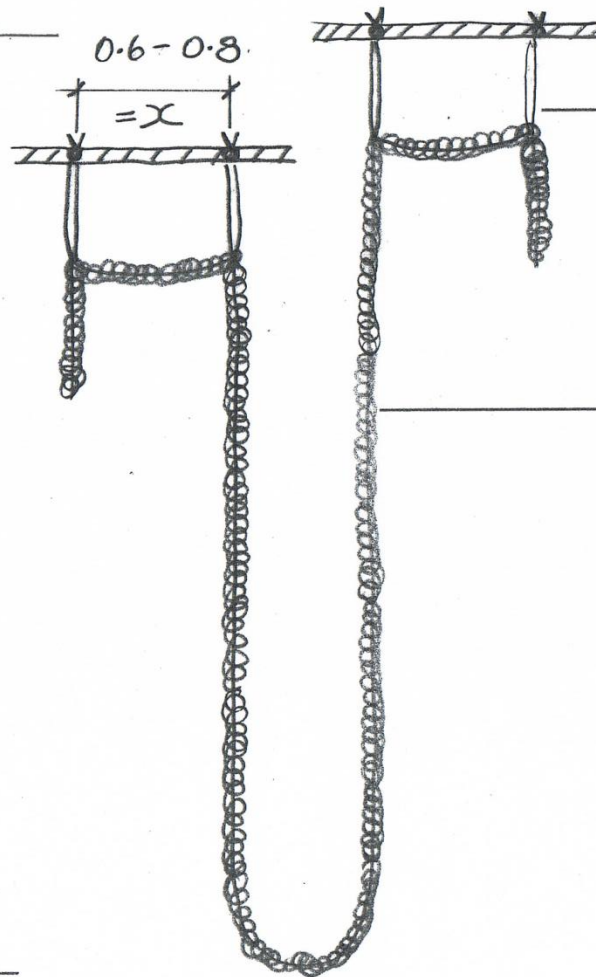


# Typical Double Line Set Up

## QE Spat Catching Rope.



## QE Grow Out Rope.



### Notes:

Lashing is used double to add strength, and avoid twist transfer to Mussel Ropes from Lashings. Typically 1.6m to 1.7m Doubled over and tied with simple knot. 1ply, 5, 6 or 7mm

Spat Rope and Grow Out Rope calculation.

Where :

$L$  = length of long line, First Float to Last Float. (100m etc)  
 $X$  = Spacing the Rope advances along the Mainline. (0.4m etc)  
 $Z$  = Typical Space between Mainline. (1.2m etc)  
 $Y$  = The depth Mussel Ropes to be deployed. (8.0m etc)

Then Mussel Rope per Long Line

$$= ((L/X) + 1) \times (X + 2Y + Z)$$

Example.

$$= ((100/0.4) + 1) \times (0.4 + (2 \times 8) + 1.2)$$

$$= \text{approx } 4417.60 \text{ mtrs.}$$

# Sub-sea, Single Mainline System.


- Single mainline system but can be double.
- Easier to install for exposed farm sties. The QE Waka floats are placed in a vertical format to absorb the energy from swells and rough water conditions if required or can be placed on the horizontally.
- The single mainline system can produce high yields and faster crop growth because of less competition from other Mussels with the available food source.
- Fast to walk using walking wheels.
- Vertical floats are only added as the farm nears the current float capacity used. This is a more dynamic control than surface lines (horizontal placed floats), as it is important to constantly balance the floatation to the conditions. We normally say minimum 50% of float capacity is used.



Sub-sea single mainline, at seeding time  
Coromandel, NZ.



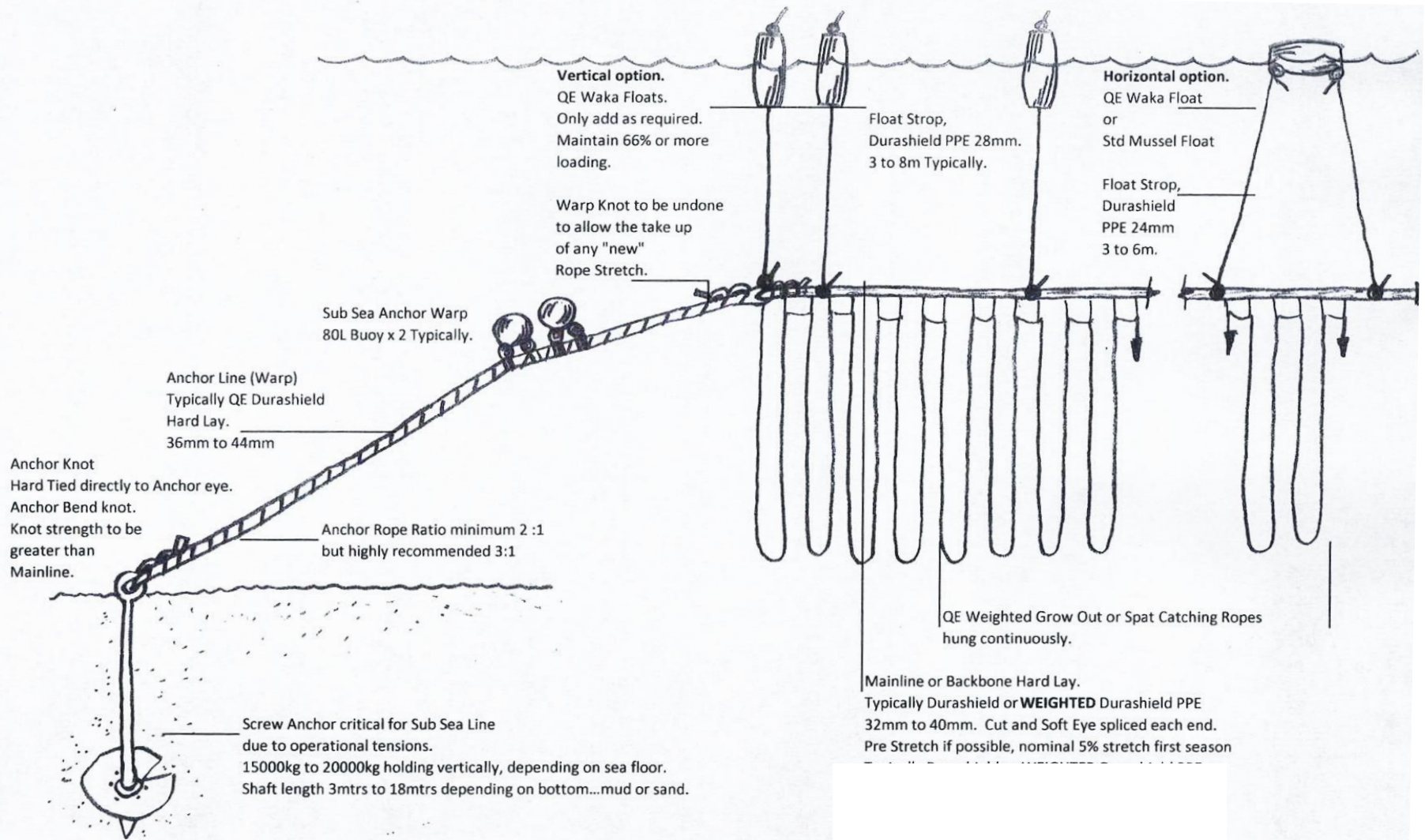
Sub-sea single mainline, close to harvest,  
Los Angeles, USA.



Sub-sea, single mainline, Los Angeles, USA.

8mtr (24ft) set depth from surface to mainline with float stop. Mussel rope dropper lengths then a further 10mtrs below mainline.

# Typical Single Sub Sea Mainline, 110m, 180m 220m or as required.





Nick Hajek, California, USA. Line survey of his QE Cut Loop 4L spat catching line. QE 220L Waka floats on the surface, 8mtr x 28mm QE Durashield float stop, tied to a 36mm weighted QE Durashield mainline.

The logo is an oval emblem with a rope-like border. Inside, there is a stylized white fish jumping. Below the fish, the letters 'QE' are written in a large, bold, white sans-serif font. Underneath 'QE', the word 'GROUP' is written in a smaller, white, italicized sans-serif font. At the bottom of the emblem, 'Est.1969' is written in a small, white, sans-serif font.

## **QE SPAT CATCHING ROPE OPTIONS AND SPECIFICATIONS:**

# QE Catching Ropes, Short Cut Loop Spat Rope. Weighted wire type, 0L 3L, 4L, 5L, 6L

- QE Short Cut Loop Spat Ropes are considered an option when controlling the number of Spat settling is considered an advantage. This could be in Hatchery environments where larvae are settled at limited numbers. Other options such as wild catching sites where there could be other factors such as mud sediments or invasive organisms such as starfish larvae etc.
- Dewaxed, highly fibrillated, 12mm-25mm (or as required) cut loop fibers simulating natural algae environments.
- Controlled amounts of surface area can be adjusted to any length/volume across 1, 2 or 3 strands as requested.
- Plastic coated weighted wire or Rock wire content can be adjusted to customer's own preferred levels.
- Packing in 2000mtr continuous lengths in bulk bag or as requested.



# QE Catching Ropes

## Cut Loop Spat Rope

Weighted wire type, 0L 3L, 4L, 5L, 6L

- QE Cut Loop Spat Rope or as often referred to as Christmas Tree looking rope, is used by many farmers as their preferred style or medium to catch wild Spats.
- Dewaxed highly fribulated 55-65mm fibers (or length as required), simulating natural algae environments.
- Massive amounts of freely available surface area for settlement and attachment.
- 70% of rope structure is cut filaments offering ease of harvest for small animals with less stress.
- 30% of the inner rope structure is left as loop to offer support to developing mussels as they grow out to harvest size.
- Plastic coated weighted wires or Rock wire content can be added and adjusted to customers own preferred levels. We recommend presoaking bags of 3 wires.
- Packing is in 2000mtr continuous length bulk bags or as required.



# QE Catching Ropes, Short Loop Spat Rope.

**Weighted wire type, 0L 3L, 4L, 5L, 6L**

- QE Short Loop Spat Ropes like “Short Cut Loop” are considered an option when controlling the number of Spat settling is an advantage. This could be in Hatchery environments where Lave are settled at limited numbers. Other options such as wild catching sites where there could be other factors such as mud sediments or invasive organisms such as starfish lave etc.
- Dewaxed, highly fribulated, 12mm -25mm (or as required) cut loop fibers simulating natural algae environments.
- Controlled amounts of surface area can be adjusted to any length/volume across 1, 2 or 3 strands as requested.
- Plastic coated weighted wire or Rock wire content can be adjusted to customers own preferred levels.
- Packing in 2000mtr continuous lengths in bulk bag or as requested.



# QE Catching Ropes, Loop Spat Rope.

**Weighted wire type, 3L, 4L, 5L, 6L or  
as required.**

- QE Loop Spat Rope are used by farmers as an option to catch and hold smaller Spats where Cut Trim types maybe unsuitable or unable to hold larger sizes due to large settlements or rough environments.
- Dewaxed highly fribulated fibers, formed in a net like structure, simulating natural algae environments.
- 25mm or 50mm loops offering large surface area and offering loops to retain spats until harvest period.
- Plastic coated wire or Rock wire content can be adjusted to customers own preferred levels. We recommend presoaking bags of 3 wires.
- Packing is in 2000mtr continuous length bulk bag. 100% made in NZ by QE, New Zealand Rope and Twine.



# QE Catching Ropes, Mega Loop Spat Rope.

**Weighted wire type, 3L, 4L, 5L, 6L or as required.**

- QE Mega Loop Spat Rope is the preferred offshore Spat Catching Rope, either standard 14mm core or XHD 18mm core, Long 75mm loops that can be adjusted to farmers own preference. Ropes are used typically where there are large settlements that are held as long as possible on the farm in all whether conditions until the farmer is ready to reseed. Long loops offer the advantage of holding but will increase the breakages when stripping. Small disadvantage for big gains.
- Dewaxed highly fribulated fibers, formed in a net like structure, simulating natural algae environments.
- Strong 75mm loops offering the largest/holding surface area.
- Plastic coated wire or Rock content can be adjusted to customers own preferred levels. We recommend presoaking bags of 3 wires.
- Packing is in 1000m, 1500m or 2000mtr continuous lengths in bulk bag.



# QE Catching Ropes, Extreme Loop Rope

## Weighted Wire 4L,5L, 6L or as required

- QE Extreme Loop Spat Rope is the most robust format produced by us for the New Zealand Industry. The pre twisted loop yarns are 2 x more frequent than straight fribulated ropes yet offering high water flow properties.
- Normally use to settle Kaitaia Seaweed Spat (Page 32-33) and held in large numbers until reseedling.
- 45mm Loops have been the most requested Loop lengths to reduce stress at seed harvest, but 55mm, 65mm and 75mm are all available.
- Super heavy duty core diameter of 20mm.
- Dewaxed and twisted highly fribulated fibers, formed in a net like structure, simulating natural algae environments.
- Strong, twisted, Low linting loops offering a long life/holding surface area.
- Plastic coated wire or Rock content can be adjusted to customers own preferred levels. .
- Packing is in 1000m, 1500m lengths in bulk bag.



# QE Catching Ropes

## Mega Loop Catch and Grow Ropes. (75mm Mega Loop combined with Cut Loop.)

### Weighted Wire, 3L, 4L, 5L, 6L or as required.

- Catch and Grow has been developed to meet a new developing industry where holding catching or holding spats or both for longer periods or on more exposed site is required.
- Standard option with 14mm core or XHD option all with 75mm Loops and 65mm Cut Loops or as requested.
- Loop option offer the security while Cut Loops offer a good catching option. I.e. the best of both worlds.
- Cut loops also add a reducing factor in harvest stress. This is a good point on some offshore sites where catching can be limited or more hit and miss.
- The volume of Loops and Cut loops is as required, for the application. As shown in this XHD 3 Yarns For Loops in 2 strands and 3 Cut Loop Yarns for the 3<sup>rd</sup> strands.
- It is also the farmers preference to determine if the Rope construction is more Loop or more Cut Loop.
- Plastic coated wire or Rock content can be adjusted to customers own preferred levels.
- Core diameters around 18mm.
- Packing is in 1000m or 1500m lengths in bulk bag.



# QE Spat Catching Rope Specifications

Book Code	Type	Description	Package
R50QE- #SHCLS#L(or #R)#MBB	<b><u>Short Cut Loop Spat</u></b> plus Weight options 0L, 3L, 4L, 5L, or 6L. Or 3R, 4R, 5R or 6R. Heavier option on request.	Short Cut Loop Spat Catching, 14mm core x typically 2000mtr, Carbon Black, packed in Bulk bag. 12-25mm de-waxed, cut loops in 1 or 2 or 3 strands as required, non weighted or weighted with 33gm PVC Coated Wire or 22gm PVC infused Mineral Rock, placed in the core as required.	Bulk Bag
R50QE- #CLS#L(or #R)#MBB	<b><u>Cut Loop Spat</u></b> plus Weight options 0L, 3L, 4L, 5L, or 6L. Or 3R, 4R, 5R or 6R. Heavier options on request,	Cut Loop Spat Catching, 14mm core x typically 2000mtr, Carbon Black, packed in Bulk bag. 55-65mm de-waxed, cut loops in 2 or 3 strands as required, non weighted or weighted with 33gm PVC Coated Wire or 22gm PVC infused Mineral Rock, placed in the core as required.	Bulk Bag
R50QE- #SHLS#L(or #R)#MBB	<b><u>Short Loop Spat</u></b> plus Weight options 0L, 3L, 4L, 5L, or 6L. Or 3R, 4R, 5R or 6R. Heavier option on request.	Short Loop Spat Catching, 14mm core x typically 2000mt, Carbon Black, packed, in Bulk bags. 12-25mm de-waxed, short loops in 1 or 2 or 3 strands as required, non weighted or weighted with 33gm PVC Coated Wire or 22gm PVC infused Mineral Rock, placed in the core as required.	Bulk Bag

Specifications can be changed to suit customers own requirements. All lengths are machine measured at time of manufacture; some shrinkage may occur after a settling period due to the nature of this product.

[www.qe.co.nz](http://www.qe.co.nz)

# QE Spat Catching Rope Specifications

Book Code	Type	Description	Package
R50QE- #LS#L(or #R)#MBB	<b><u>Loop Spat</u></b> plus Weight options 3L, 4L, 5L, or 6L. Or 3R, 4R, 5R or 6R. Heavier option on request.	Short Cut Loop Spat Catching, 14mm core x typically 2000mtr, Carbon Black, packed in Bulk bag. 25mm or 50mm de-waxed, loop, 3 strand, weighted with 33gm PVC Coated Wire or 22gm PVC infused Mineral Rock, placed in the core as required.	Bulk Bag
R50QE- #MLS#L(or #R)#MBB	<b><u>Mega Loop Spat</u></b> plus Weight options 3L, 4L, 5L, or 6L. Or 3R, 4R, 5R or 6R. Heavier options on request.	Mega Loop Spat Catching, 14mm core x typically 2000mtr, Carbon Black, packed in Bulk bag. 75mm de-waxed, loop, 3 strand, weighted with 33gm PVC Coated Wire or 22gm PVC infused Mineral Rock, placed in the core as required.	Bulk Bag
R50QE- #MLXHDS#L(or #R)#MBB	<b><u>Mega Loop XHD Spat</u></b> Loop Spat plus Weight options 4L,5L, 6L. Or 6R, 7R, 8R 9R. Heavier option on request.	Mega Loop XHD Spat Catching, 18mm core x typically 1500mt, Carbon Black, packed in Bulk bags. 75mm de-waxed, loop, Strand, weighted with 33gm PVC Coated Wire or 22gm PVC infused Mineral Rock, placed in the core as required.	Bulk Bag

Specifications can be changed to suit customers own requirements. All lengths are machine measured at time of manufacture; some shrinkage may occur after a settling period due to the nature of this product.

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# QE Spat Catching Rope Specifications

Book Code	Type	Description	Package
R50QE- #ELS#L(or #R)#MBB	<b><u>Extreme Loop Spat</u></b> plus Weight options 4L, 5L, or 6L. Or 6R, 7R, 8R, 9R. Heavier option on request.	Extreme Loop Spat Catching, 20mm core x typically 1000mtr or 1500mtr, Carbon Black, packed in Bulk bag. 45mm de-waxed, loop, or other lengths on request, 3 strand, weighted with 33gm PVC Coated Wire or 22gm PVC infused Mineral Rock, placed in the core as required.	Bulk Bag
R50QE- #ML#CLS#L(or #R)#MBB	<b><u>Mega Loop Catch and Grow Spat</u></b> plus Weight options 3L, 4L, 5L, or 6L. Or 3R, 4R, 5R or 6R. Heavier options on request.	2 Mega Loop plus 1 Cut Loop Spat Catching, STD 14mm core x typically 1500mtr or 2000mtr, Brown/Carbon Black, packed in Bulk bag. 75mm loop/65mm cut Loop, de-waxed, 3 strand, weighted with 33gm PVC Coated Wire or 22gm PVC infused Mineral Rock, placed in the core as required. (number of Loops or cut loops can be configured as required)	Bulk Bag
R50QE- #MLXHDS#L(or #R)#MBB	<b><u>Mega Loop XHD Catch and Grow Spat</u></b> plus Weight options 4L, 5L, 6L. Or 6R, 7R, 8R 9R . Heavier option on request.	2 Mega Loop plus 1 Cut Loop Spat Catching, XHD 18mm core x typically 1000mtr or 1500mtr, Brown/Carbon Black, packed in Bulk bags. 75mm de-waxed, loop, 3 strand, weighted with 33gm PVC Coated Wire or 22gm PVC infused Mineral Rock, placed in the core as required. (number of Loops or cut loops can be configured as required)	Bulk Bag

Specifications can be changed to suit customers own requirements. All lengths are machine measured at time of manufacture; some shrinkage may occur after a settling period due to the nature of this product.


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Setting QE Cut Loop Spat 4L Catching Rope in Turkey. Using seeding wheel for accurate measuring of droppers, typically 8mtrs but that is farm specific.



6 months after a newly set, QE Cut Loop 3L Spat Rope in Wales, UK. Droppers ready to harvest and be declumped for reseeding at a lower density.

A man with white hair and glasses, wearing a red and white plaid shirt, yellow overalls, and orange gloves, is smiling while working on a boat. He is standing next to a large metal structure covered in mussels. The background shows the sea and the boat's equipment.

Mussel Spat harvest on QE Mega Loop 6L, offshore farm, Devon, England.



Harvesting NZ Green Shell Mussel Spat, wild catch, Offshore Opotiki on QE Catch and Grow Mega Loop 6L. Harvested in the early morning and then reseed all by early afternoon.



When declumping seed as per this perfect harvested Spat, Offshore, Opotiki farm photo demonstrates, it is critical for seeding density control the Spats are clean and in single form.



Beach, Kaitia Seed (Spat). New Zealand is the lucky country. It has such a diverse method of obtain Green Shell Mussel Spats. In this photo, one northern NZ west coast beach called 90 Mile Beach, we get a settlement of tiny larvae size spats attached to and supported by this drifted Seaweed. Under a quota authority, it is managed, gathered, transferred and sold all over New Zealand to waiting farmers. It is estimated 80% of New Zealand's industry is support in this way. New Zealand refers to this form, as Kaitia Spat.



Great example of Kaitia seed being set onto QE Cut Loop 4L Spat Rope. (right.) The Farmer (Jake) as seen above is directly "sprinkling" the Seaweed containing the tiny micro Spats (1mm-2mm) at a very low density onto the Ropes running through the seeding machine below. At the same time a very light gauge Cotton sock is run over the top, trapping the Seaweed to the Ropes. Over the course of a few weeks, the micro size spats, migrate out of the seaweed, walking down the Cut Loop fibers and settling close to the Rope core. From there on the Spat Ropes provide perfect medium to grow and walk, forming typically 2000-4000 25mm to 40mm Mussel Spats per meter within 6 to 12 months. When ready it is stripped, declumped and reseed at a very low density around 250-300 pcs per meter. (Rope, Farm and market dependent.)



Wild Catch Seed (Spat). Aotea Harbour, New Zealand. Shallow water, extreme tidal, with a huge volume of set QE Spat Catching Rope. In this location Spat catching Ropes are "bundled" as the water depth is too shallow to set traditional 8-10mtr dropper. The farmer (Ross) has developed this method as an alternative to and additional support role to Kaitiaia Spats. Ross will contract to set 300-400km of 50mtr bundled QE Spat Ropes in this small farm area. After a period of 2 or 3 moon phases and counting settlement numbers, he then transfers the Mussel larvae loaded QE Spat Ropes to Coromandel farms, (5 hours drive) in bulk bags, for re-hanging the next day. The Ropes then go on to grow out the Spats to re-seedable size and then harvested. The Ropes are then cleaned and reconditioned and returned to Ross to repeat. Sometimes season dependent, there may be 2 good settlement periods in a year.



An example from Aotea Harbour of the 50mtrs bundled QE Cut Loop 4L Spat Catching Rope set at a very high meterage rate per longline on behalf of Coromandel farmers.

The logo is an oval emblem with a rope-like border. Inside, there is a stylized flame or flower-like shape at the top. Below it, the letters 'QE' are prominently displayed in a large, bold, sans-serif font. Underneath 'QE', the word 'GROUP' is written in a smaller, italicized, sans-serif font. At the very bottom of the emblem, 'Est.1969' is written in a small, sans-serif font.

## **QE GROW OUT ROPE OPTIONS AND SPECIFICATIONS:**

# QE Grow Out Ropes

## 25mm Super Loop

### Types: Light or Standard

- QE 25mm Super Loop Grow Out Ropes. Used by many farmers in areas where low density crops are expected i.e., in areas of low food, calm or high sediment areas. For a 25mm loop structure we expect up to 5Kg per meter of final product at harvest.
- Dewaxed highly fribulated loop fibers offering strong supporting medium for simulating a large diameter. This effect helps hold and support the mussels to prevent slumping through to the final harvest.
- Light option is manufactured with 12mm Core.
- Standard option is manufactured with 14mm Core.
- All yarns UV treated. Loop length set at approx 25mm.
- Packing is in 2000mtr continuous length in bulk bag. Where no torque is manufactured into the ropes to be the most stable 3 strand product. A vital feature in a continuous farm set up.



# QE Grow Out Ropes

## 50mm Power Loop.

### Types: Light or Standard

- QE 50mm Power Loop Grow Out Ropes. Used by many farmers in areas where medium density crops are expected, especially as expected in the Blue or Black Mussel Industry. This rope format is the most preferred rope in these industries. For a 50mm loop structure we expect up to 7Kg per meter of final product at harvest.
- Dewaxed highly fribulated loop fibers offering strong supporting medium to simulating a large diameter. This effect helps hold and support the mussels to prevent slumping through to the final harvest.
- Light option is manufactured with 12mm Core.
- Standard option is manufactured with 14mm Core.
- All yarns UV treated. Loop length set at approx 50mm.
- Packing is in 2000mtr continuous length in bulk bag. Where no torque is manufactured into the ropes to be the most stable 3 strand product. A vital feature in a continuous farm set up.



# QE Grow Out Ropes

## 75mm Mega Loop

### Types: Light, Standard

- QE 75mm Mega Loop Light Grow Out Ropes is the largest selling format globally, popular for NZ inshore sites but especially popular for the Mediterranean Blue Mussel, Gallow Provincilis.
- For a 75mm Mega loop structure we expect up to 10-12kg per meter of final product at harvest with consistent full yielding meat to shell ratio.
- Fribulated loop fibers offering strong supporting medium. This effect helps hold and support the mussels to prevent slumping through to the final harvest.
- Rock wires can also be added to assist with negative buoyancy aspects, especially when using on Sub-sea Mainlines or smaller seeds.
- Light option is manufactured with 14mm Core with less loop frequency.
- Standard option is manufactured with 14mm Core.
- Packing is in 2000mtr continuous lengths in bulk bags.



# QE Grow Out Ropes

## 75mm Mega Loop

### Types: XHD

- QE 75mm Mega Loop XHD Grow Out Ropes. Is one of NZ open water best performing Ropes, very popular Golden/Tasman Bay New Zealand where the frequency of short intense waves are prevailing. The long loop format ropes offering high volume success while support in this complicated sea state.
- As per Mega Loop, for the 75mm loop structure we expect up to 12-14kg per meter of final product at harvest.
- Dewaxed highly fribulated loop fibers offering strong supporting medium to simulating a large 18mm diameter which means seed size and volume needs to be matched to sink the Grow out Rope.
- Rock wires can also be added to assist with negative buoyancy aspects, especially when using on Sub-sea Mainlines or smaller seeds.
- All yarns UV treated.
- Packing is in 1500mtr continuous lengths in bulk bags



# QE Grow Out Ropes

## 65mm Extreme Loop

**Types: Standard, HD and XHD designs.**

- This format is New Zealand's premium, highest performing, Mussel Grow Out Rope. This typically large seed design is a significant upgrade from the open fribulated Mega Loop forms as we ply and twisted the loop yarns. The advantages have been very obvious that Mussel bial threads like to intertwine amongst these twisted stable fibers. This structures also allow higher water flow through the Ropes and is an “EXTREME” yielding Rope. In many circumstances harvesting in excess of 16kg per meter of final harvest product, when used in the largest formats.
- Dewaxed, plied twisted loop yarns offering the strongest and wear resistance of any Rope.
- Largest core diameter at 20mm plus.
- Loop lengths are as per each farmers own preference from 35mm to 80mm, but the most preferred length request by most farmers is 65mm.
- Rock wires can also be added to assist with negative buoyancy aspects, especially when using on Sub-sea Mainlines or smaller seeds.
- Packing is in 1000mtr or 1500m continuous lengths in bulk bags.



# QE Grow Out Rope Specifications

Code	Type	Description	Package
R50QESL#MBB	<b><u>Super Loop</u></b> Light or Standard.	25mm Loop, 12mm core for light options and normally packed 2800mtr or 14mm core for standard option, normally packed 2000mtr, All de-waxed, Carbon Black.	Bulk Bag
R50QEPL#MBB	<b><u>Power Loop</u></b> Light or Standard	50mm Loop, 12mm core for light option and normally packed 2400mtr or 14mm core for standard option, normally packed 2000mtr, all de waxed, Brown Colour.	Bulk Bag
R50QEML#MBB	<b><u>Mega Loop</u></b> Light or Standard	75mm Loop, 14mm core, for light options we lower the loop frequency and normally packed at 2000mtr. For standard option still with 14mm core but we increase the loop frequency. Again, normally packed 2000mtr, all de-waxed, Carbon Black or Carbon Black /Brown mixed.	Bulk Bag
R50QEMLXHD#MBB	<b><u>Mega Loop XHD.</u></b> Extra Heavy Duty.	75mm Loop, with increased core to 18mm core, increased loop frequency and normally packed 1500mtr, All de-waxed and Carbon Black.	Bulk Bag
R50QEELSTD#MBB	<b><u>Extreme Loop</u></b> Standard	65mm Twisted Yarn Loop, 18mm core, packed 1500mtr. All de waxed, Carbon Black. Loop length changed as required.	Bulk Bag
R50QEELHD#MBB	<b><u>Extreme Loop HD.</u></b> Heavy Duty.	65mm Twisted Yarn Loop, 20mm core, packed 1000mtr. All dewaxed, Carbon Black and Brown mixed. Loop length changed as required.	Bulk Bag
R50QEELXHD#MBB	<b><u>Extreme Loop XHD.</u></b> Extra Heavy Duty	65mm Twisted Yarn Loop, 22mm core, packed 1000mtr. All de-waxed, Carbon Black. Loop length changed as required.	Bulk Bag

Specifications can be changed to suit customers own requirements. All lengths are machine measured at time of manufacture; some shrinkage may occur after a settling period due to the nature of this product.

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QE Extreme XHD at 14 kg per meter.  
Happy days for this farmer. (Peter)



Local market fresh, live Mussel harvest,  
Coromandel, New Zealand.





Again, as per previous pages from Coromandel, 14kg per meter of harvest. The most important point we said from the beginning, less will give you more !! Every Spat was placed on the QE Extreme XHD at the correct density, and all have survived and "walked" the rope to find the space it needed to grow to its full required CONSISTANT market size of 100mm at the highest meat yielding % content. Profitable days. This QE Rope will continue to perform at this level for the next 10-15 times producing these sustainable proteins with such positive environmental and social benefits for us all.

The logo is an oval emblem with a rope-like border. Inside, there is a stylized white flame or flower shape at the top. Below it, the letters 'QE' are written in a large, bold, white serif font. Underneath 'QE', the word 'GROUP' is written in a smaller, white, italicized sans-serif font. At the very bottom of the emblem, 'Est.1969' is written in a small, white, sans-serif font.

## **QE COTTON SOCKING OPTIONS AND SPECIFICATIONS:**

# Mussel Re-Seeding Socking Cotton or Poly Cotton mix.

- Mussel Socking is one of the critical elements required for the continuous restocking system after the declumping of the Mussel Spats.
- The design of the NZ style knit is a format that can be used on any size reseedling pipe, (75mm, 110mm 125mm etc.) and any size declumped Mussel Seed, from Kaitaia seed at 1mm on Seaweed to late season stripping Green shell, as big as 60mm.
- Any combination in size and grade of cotton is possible, but the industry globally has generally settled on the following formats:
- 100% Cotton in grades 1/16 medium, 1/12 heavy, 1/9 extra heavy and 1/6 extreme heavy duty. These are typically knitted with 44 needles or 54 needles and an effective stretch of 330mm. (or variation that suit the farmer.)
- % Cotton mixed with % Polyester (Called Poly-Cotton), typically 1/20 Light or 1/30 Very light, but with different degrees of Polyester content. Normally again 330mm stretched widths. Polyester is used as a long-lasting structure that stays with the spats through to harvest. Can be used for difficult to hold spats, or difficult to harvest full size Mussels, during especially, later summer harvests.
- Combinations 2 Plied special, 100% Cottons knitted parallel with Poly-Cottons, typically 1/20 100% cotton plied with 1/20 85%/15% Poly-Cotton as a strong reseedling cotton but with the light but lasting ability of the 1/20 Poly-Cotton at harvest time.
- Special “to order” designs are possible, contact QE to discuss.

Example of special “to order” construction. 22 Needle with 2 x 100% 9/1 knitted for super strength and high water flow requirements.



Example 54 needle Poly Cotton Mix 20/1 85:15



Example 54 needle 100% Cotton 12/1



Example 44 needle 100% Cotton 9/1



Example 54 needle 2 plied 20/1 cotton with 20/1 Poly Cotton Mix 85:15



# Cotton Specifications


Book Code	Type	Description	Aprx.Package
COT54N100%No12x330	<b><u>Cotton</u></b> Heavy Duty	12/1 x 100% Cotton, 54 Needles knitting circumference with stitch length to produce stretched width of x 330mm or as requested at time of order. Normally yields 120mtrs per kilo.	10kg Plastic Bag
COT54N100%No09X330	<b><u>Cotton</u></b> Extra Heavy Duty	9/1 x 100% Cotton, 54 Needles knitting circumference with stitch length to produce stretched width of x 330mm or as requested at time of order. Normally yields 90mtrs per kilo.	10kg Plastic Bag
POLYCOT54N85:15%No20X330	<b><u>Poly-Cotton 85:15</u></b> Mix Light	20/1 x 85% Cotton, 15% Polyester, 54 Needles knitting circumference with stitch length to produce stretched width of x 330mm or as requested at time of order. Normally yields 200mtrs per kilo.	10kg Plastic Bag
POLYCOT54N60:40%No30X330	<b><u>Poly-Cotton 60:40</u></b> Mix Very Light	30/1 x 60% Cotton, 40% Polyester, 54 Needles knitting circumference with stitch length to produce stretched width of x 330mm or as requested at time of order. Normally yields 300mtrs per kilo.	10kg Plastic Bag
COTCOMB54N100%No20+85:15%No20x330	<b><u>Cotton 20/1</u></b> <b><u>plied with Poly-Cotton 85:15</u></b> Mix Extra Heavy Duty	20/1 x 100% Cotton plus 20/1 85% Cotton, 15% Polyester, 54 Needles knitting circumference with stitch length to produce stretched width of x 330mm or as requested at time of order. Normally yields 100mtrs per kilo.	10kg Plastic Bag
COTSPECIAL		Special constructions and combinations to customers own requirements.	10kg Plastic Bag

# Final Seeding Density



Seeding density example, Green Shell Mussels, Coromandel NZ, 20 pieces per kilo at harvest using QE Extreme HD typically yielding 12kg/mtr on this farm. Mortality expected 10%. Seeding density,  $20 \times 12$  plus 10% = approx. 264 pcs per meter. Example Blue Gallo Mussels, California USA, 45 pcs per kilo at harvest using weighted rock wire QE Mega loop It, expecting 8kg/mtr. Mortality 15%. Seeding density,  $45 \times 8$  plus 15% = approx. 414 pcs per meter. Only after knowing and understanding your environment and history will these factors be known. Then there will always be, the MOTHER NATURE FACTOR !!!

- As the Seeds (Spats) are clean and single after declumping and generally graded, one of the best way to check seeding density is to run the seeder for a short time and then check a section of 250mm by counting what is contained. Exact counting is very important, and then determine the number of seeds per meter. The seeding density is controlled by the species to be re seeded, the farm environment and how much energy it gives back, the size required at harvest and the type of size of the QE Mussel Rope used.
- New Zealand Green Shell Mussels are typically reseeded at 200-300 seeds per meter for a 100mm harvest size animal for processing into ½ shell export production. Blue Mussels typically from 400pcs to 800pcs depending on the exact species, farm locations and the market requirement, fresh, meat or ½ Shell.



Coromandel NZ, example of seeding a single Sub-sea mainline with NZ Green 40mm Spat at a seeding density of approx. 250 per meter onto QE Mega Loop XHD using Cotton type, 1/9 100% Cotton.

The logo is an oval emblem with a rope-like border. Inside, there is a stylized anchor and the letters 'QE' in a large, bold, sans-serif font. Below 'QE', the word 'GROUP' is written in a smaller, italicized sans-serif font, and 'Est.1969' is written in an even smaller sans-serif font.

## **ANCHOR TYPES WITH QE STRUCTURE ROPES AND LASHING OPTIONS AND SPECIFICATIONS:**

New double mainline farm established in Turkey. QE Duradan PPE 36mm Anchor Warps, QE Duradan PPE 28mm Double Mainlines, 5mm and 6mm QE Danlash, QE Cut Loop 4L Spat Catching Ropes and QE Mega Loop Lt Grow Out Ropes. QE Cotton 1/12 and 300L locally made NZ type Mussel Floats.



# Anchor Design

- In the past, the wedged shaped Concrete block was the most preferred of passive anchoring methods. It was always important to add a concave base to “suck” the anchor into the seafloor to help resist sliding.
- When using concrete or other passive type anchors, the Anchor line (warp) length is best calculated as a minimum 3 x water depth. I.e., 3 to 1 ratio. Even better, start longer initially, as 5% -7% of a total new longline will stretch this much over a few season and it is always best to remove this excess, from the Anchor warps.
- A typical concrete block is between 5000kg and 12000kg.
- FMS Screw Anchors have become the preferred method over the past 20 years. They offer higher holding power i.e., 20000kg. They are faster to install and allow for accurate farm placements with the advantage of supporting higher set tension loads. They can be used in mud, sand, broken rock and even solid rock. (With the right drill head.)
- A minimum of 2 to 1 ratio on the Anchor warps are required for these types of anchors. However as above, longer always remains better for line maintenance reasons.
- Diver-less is possible for deep and dangerous sites and maximum depth that can be considered is 60mtrs. (Maybe 100m with some additional engineering support.)
- Installation is transferable to any well set up Mussel operation vessel, anywhere in the world. However, a continuous supply of quality Red Wine is part of any supply and instillation contract.
- For more information about Screw Anchors, contact FMS, Graham Fielder, [www.fieldermarine.com](http://www.fieldermarine.com) .





# QE Duradan PPE Farm Rope.

## Anchor Warps and Mainlines:

- Many farmers select QE Duradan PPE. Typically, in Hard Laid specification for best abrasion resistance. (Soft, Medium, Firm and Extra Hard lay is also available at time of order).
- Made from blended resins of virgin Polypropylene and Polyethylene.
- Yarn profile is be embossed, rolled flat monofilaments.
- Coiled or Bulk Bags to customers own requirements. NZ typically uses 220mtr as standard.
- All yarns are fully twisted, and the same yarn is used throughout the entire structure of the ropes. I.e. there is no bloated semi twisted filler yarns used in our Ropes.
- For long life, ropes must be Carbon Black when used in a aquaculture application where they are exposed to UV light.
- 100% made in by QE, New Zealand Rope and Twine.



# QE Duradan PPE Specifications

Code	Type	Description	Package
R00QE18220C	<u>Duradan</u>	18mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 5900kg, weight 26.77kg	Coil
R00QE20220C	<u>Duradan</u>	20mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 7000kg, weight 41.37kg	Coil
R00QE22220C	<u>Duradan</u>	22mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 8420kg, weight 50.82kg	Coil
R00QE24220C	<u>Duradan</u>	24mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 9950kg, weight 60.06kg	Coil
R00QE28220C	<u>Duradan</u>	28mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 13600kg, weight 82.00kg	Coil
R00QE32220C	<u>Duradan</u>	32mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 16800kg, weight 106.05kg	Coil
R00QE36220C	<u>Duradan</u>	36mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 20600kg, weight 133.00kg	Coil
R00QE40220C	<u>Duradan</u>	40mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 25700kg, weight 163.00kg	Coil
R00QE44220C	<u>Duradan</u>	44mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 31500kg, weight 202.00kg	Coil

Specifications can be changed to suit customers own requirements. Weight shown are based on Hard lays.  
 Breaking loads are maximum and safe working loads are 1/6<sup>th</sup> of maximum load. [www.qe.co.nz](http://www.qe.co.nz)

# QE Durashield PPE Farm Rope.

## Anchor Warps and Mainlines:

- Farmers in exposed and extreme farming environments select QE Durashield PPE. Typically, Hard Laid Ropes for best abrasion resistance. (Soft, Medium, Firm and Extra Hard lay is also available).
- Same structural composition as QE Duradan PPE but with the “only in the world”, specific, Plastic Shielding that sits within the top 2 layers of the stranding construction. This development is a direct result of QE’s understanding and initiative to support the aquaculture industry with the best possible support structure Ropes.
- The plastic shielding has allowed these additional benefits:
- Shielding protects from sediments and bio fouling from invading the core of the structure Ropes, preventing the core filaments from breaking down.
- Shielding offers storm resistance to buckling and knuckling of Ropes when exposed to these extreme conditions preserving the Ropes.
- Shielding offers a supporting membrane that reduces the effect of storm surge stretch and compression loads, which can lead to rope fatigue.
- Coil or Bulk bag lengths to customers own requirements.
- 100% made in NZ by QE, New Zealand Rope and Twine.



# QE Durashield PPE Specifications

Code	Type	Description	Package
R05QE20220C	<b><u>Durashield</u></b>	20mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 7000kg, weight 44.37kg	Coil
R05QE22220C	<b><u>Durashield</u></b>	22mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 8420kg, weight 53.82kg	Coil
R05QE24220C	<b><u>Durashield</u></b>	24mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 9950kg, weight 63.06kg	Coil
R05QE28220C	<b><u>Durashield</u></b>	28mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 13600kg, weight 85.00kg	Coil
R05QE32220C	<b><u>Durashield</u></b>	32mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 16800kg, weight 109.05g	Coil
R05QE36220C	<b><u>Durashield</u></b>	36mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 20600kg, weight 136.00kg	Coil
R05QE40220C	<b><u>Durashield</u></b>	40mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 25700kg, weight 166.00kg	Coil
R05QE44220C	<b><u>Durashield</u></b>	44mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 31500kg, weight 203.45kg	Coil

Specifications can be changed to suit customers own requirements. Weight shown are based on Hard lays.  
Breaking loads are maximum and safe working loads are 1/6<sup>th</sup> of maximum load. [www.qe.co.nz](http://www.qe.co.nz)

# QE Weighted Durashield PPE Farm Rope.

## Anchor Warps and Mainlines:


- With many new offshore and exposed coastal Marine Farms, there is sometimes a risk of exposure to “floating” unloaded Mainlines at times when there is no Spat or Crop Ropes suspended below. This can also so be part of the permitting requirements that unattended, unloaded structure Ropes are not left exposed or floating and potentially a hazard to marine vessel passing over the Farm.
- Both QE Duradan PPE and QE Durashield PPE can be weighted as required to achieve the negative buoyancy required.
- Negative buoyancy is achieved by adding the unique mineral Rock Wires QE has developed for this environmental sensitive industry.
- Rock Wires are added at any required level, but specification as showing is typical to achieve a good level of negative buoyancy.
- Coil lengths to customers own requirements.
- 100% made in NZ by QE, New Zealand Rope and Twine.



# QE Weighted Duradan PPE Specifications

Code	Type	Description	Package
R00QE184R220C	<b><u>Duradan</u></b> <b><u>4R</u></b>	18mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 5130kg, weight 54.00kg	Coil
R00QE204R220C	<b><u>Duradan</u></b> <b><u>4R</u></b>	20mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 6160kg, weight 61.37kg	Coil
R00QE224R220C	<b><u>Duradan</u></b> <b><u>4R</u></b>	22mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 7409kg, weight 70.82kg	Coil
R00QE245R220C	<b><u>Duradan</u></b> <b><u>5R</u></b>	24mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 8760kg, weight 85.06kg	Coil
R00QE286R220C	<b><u>Duradan</u></b> <b><u>6R</u></b>	28mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 11970kg, weight 112.00kg	Coil
R00QE328R220C	<b><u>Duradan</u></b> <b><u>8R</u></b>	32mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 14780kg, weight 145.05kg	Coil
R00QE3610R220C	<b><u>Duradan</u></b> <b><u>10R</u></b>	36mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 18120kg, weight 182.00kg	Coil
R00QE4012R220C	<b><u>Duradan</u></b> <b><u>12R</u></b>	40mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 22610kg, weight 222.00kg	Coil
R00QE4415R220C	<b><u>Duradan</u></b> <b><u>15R</u></b>	44mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 27280kg, weight 277.45kg	Coil

Specifications can be changed to suit customers own requirements. Weight shown are based on Hard lays.  
 Breaking loads are maximum and safe working loads are 1/6<sup>th</sup> of maximum load. [www.qe.co.nz](http://www.qe.co.nz)



QE Duradan PPE or QE Durashield PPE  
28mm – 44mm can be packed direct  
from Rope machine into bulk bags in  
lengths that suit the farm operation or  
as long length as possible.

# QE Weighted Durashield PPE Specifications

Code	Type	Description	Package
R05QE204R220C	<b><u>Durashield</u></b> <b><u>4R</u></b>	20mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 6160kg, weight 64.37kg	Coil
R05QE224R220C	<b><u>Durashield</u></b> <b><u>4R</u></b>	22mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 7409kg, weight 73.82kg	Coil
R05QE245R220C	<b><u>Durashield</u></b> <b><u>5R</u></b>	24mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 8760kg, weight 88.06kg	Coil
R05QE286R220C	<b><u>Durashield</u></b> <b><u>6R</u></b>	28mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 11970kg, weight 115.00kg	Coil
R05QE328R220C	<b><u>Durashield</u></b> <b><u>8R</u></b>	32mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 14780kg, weight 148.05kg	Coil
R05QE3610R220C	<b><u>Durashield</u></b> <b><u>10R</u></b>	36mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 18120kg, weight 185.00kg	Coil
R05QE4012R220C	<b><u>Durashield</u></b> <b><u>12R</u></b>	40mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 22610kg, weight 225.00kg	Coil
R0QE4415R220C	<b><u>Durashield</u></b> <b><u>15R</u></b>	44mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 27280kg, weight 280.45kg	Coil

Specifications can be changed to suit customers own requirements. Weight shown are based on Hard lays.  
Breaking loads are maximum and safe working loads are 1/6<sup>th</sup> of maximum load. [www.qe.co.nz](http://www.qe.co.nz)

# QE Farm Rope

## Selection

### Sacrificial Lashing:

- Apart from the cotton, the only consumable used on the farm is the lashings that support the Spat/Crop ropes to the mainlines or used to lash floats on.
- Typically. a 1.8mtr to 2.2m lengths of 5mm, 6mm or 7mm, 8mm or 9mm lashing double over with a simple knot at the end. Only a small tail should be left exposed.
- Rope selection depends on site. In calm water film lashing is suitable and offers a tight firm knot which bites tight into the mainlines. For exposed sites, we recommend Danlash type lashings because of high strength and abrasion resistant properties.
- Lashings must be Carbon Black, UV treated.
- 100% made in by QE, New Zealand Rope and Twine.



# QE Lashing Specifications

Code	Type	Description	Package
R50QEDAN04700PW	<u>Danlash</u>	4mm x 700mtr Soft Carbon Black with White fleck B/load 338kg, weight 6.00kg	Shrink Wrapped spool
R50QEDAN05500PW	<u>Danlash</u>	5mm x 900mtr Soft Carbon Black with Red fleck B/load 465kg, weight 9.90kg	Shrink Wrapped spool
R50QEDAN06500PW	<u>Danlash</u>	6mm x 500mtr Soft Carbon Black with Yellow fleck B/load 727kg, weight 8.25kg	Shrink Wrapped spool
R50QEDAN07500C	<u>Danlash</u>	7mm x 500mtr Soft Carbon Black with Green fleck B/load 945kg, weight 11.00kg	Shrink Wrapped coil
R50QEDAN09330C	<u>Danlash</u>	9mm x 300m Soft Carbon Black B/load 1545kg. Weight 11.50kg	Shrink Wrapped coil
R50QEFLM1PLYPW	<u>Filmlash</u>	3mm x 1000mtr Soft Carbon Black Single ply. B/load 250kg, weight 9.25kg	Shrink Wrapped spool
R50QEFLM05500PW	<u>Filmlash</u>	5mm x 500mtr Soft Carbon Black with no fleck B/load 312, weight 5.00kg	Shrink Wrapped spool
R50QEFLM06500PW	<u>Filmlash</u>	6mm x 500mtr Soft Carbon Black with Blue fleck B/load 468kg, weight 7.50kg	Shrink Wrapped spool
R50QEFLM07500C	<u>Filmlash</u>	7mm x 500mtr Soft Carbon Black with White fleck B/load 624kg, weight 10.00kg	Shrink Wrapped coil

Specifications can be changed to suit customers own requirements.

Breaking loads are maximum and safe working loads are 1/6<sup>th</sup> of maximum load. [www.qe.co.nz](http://www.qe.co.nz)

The logo is an oval emblem with a rope-like border. Inside, there is a stylized white flame or flower shape above the large letters 'QE'. Below 'QE' is the word 'GROUP' in a bold, italicized sans-serif font, and at the bottom is 'Est.1969' in a smaller sans-serif font.

## **QE MUSSEL FLOATS AND BUOY OPTIONS AND SPECIFICATIONS:**

# QE Pegged Mussel Floats

- In 2022 QE NZ Rope and Twine Ltd purchased the assets of Marine Farm Products Ltd. MFP for the previous 25 years had been the preferred manufacturer to the New Zealand North Island industry. As the owner wished to retire QE saw this as ideal synergy and supported well with the QE Mussel Ropes we produced.
- Traditional barrel type Mussel Floats with pegged non lashing required slots. 180l 24/28mm slot and 300l 24/28mm slots are the standard size.
- Heavy walled roto molded construction. Pressurized. Although the primary function is to “float” the mussel farms, the mechanical strength is very important. Most applications require these floats to maintain the separation in the double mainline method. Often the boat cranes will hook onto or close to the attachment area of the floats and be the point where the lines and crop is lifted from the sea. Hence many 100’s of kilogram of force may be been supported by the floats at this point.
- Roto molded in Carbon Black or Colours that suit the farmers preference, all UV stabilized.
- Pegged Wedges that allow for fast on/off transfer of floats.
- Rope slots are always used below the centre line of gravity to give floats maximum stability..



Small Peg option or can be hard lashed or both to farmers own preference.

# QE Pegged Fat Buoy

## Mussel Floats

- After the purchase of the Marine Farm Products business in 2020, Quality Equipment saw an immediate need to format a new style of heavy duty Pegged, Lashing free Mussel Buoy. The NZ industry has moved to more line loadings with larger QE Mussel Ropes and more exposed conditions, so the “Fat Buoy” design was developed to meet these new extreme conditions. Now Coromandel’s most popular design.
- Two float sizes: 180 Ltr or 300 Ltr
- Two Rope slots sizes: 24mm and 32mm
- A very special large 3 rail Peg with compression support nodules that assist holding the Pegs firmly to the Ropes with the minimum of wear surface. Pegs are constructed from a super strength engineering plastic.
- The shoulders of this float has been flared to move end pressures more evenly into the greater body of the float while giving more end floatation support.
- The 32mm or 24mm rope slots are some of the widest in this industry, giving more contact area to protect the mainline ropes.
- Heavy walled roto molded construction. Pressurized to 0.8 Bar typically.
- Roto molded has been the preferred method of molding as it better allows for placement of plastics resin where it is best required.
- Molded in Carbon Black and other colours to suit customer or regulator preference.

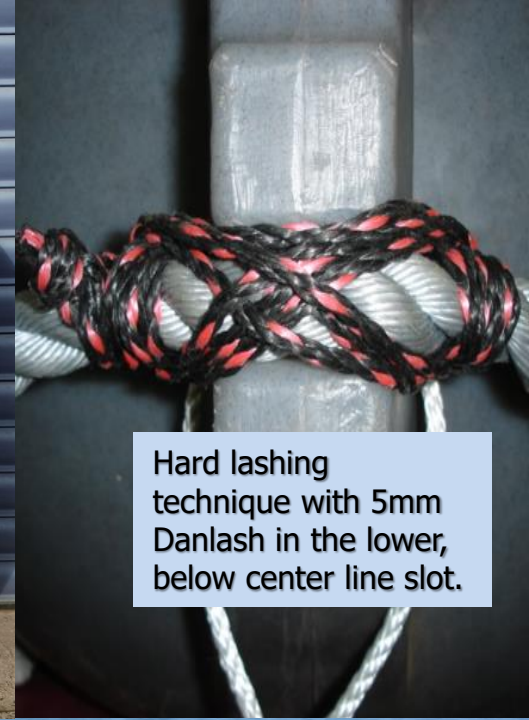


# QE Handle Mussel Floats

- The most popular design around the world is the NZ Handle Mussel Float, very universal with a “handle like grip hole” each end.
- Normally has universal size Rope locators for lashing Floats to the Mainlines. Note that these locator lugs are not on the center line deliberately. The mainline is always hard lashed into this locator lug BELOW the center line so the direction of lift is from below the center of gravity forcing an upward force and preventing the float from turning on itself.
- The handle allows the float to be used with float strop Ropes to set Sub-sea single or double mainline farms.
- 300L is the standard size.
- Heavy walled roto molded construction and with all the same construction specifications as QE Pegged Mussel Floats.



QE 300L Handle Float



Hard lashing technique with 5mm Danlash in the lower, below center line slot.



QE copied 300L Handle Float in Turkey, hard lashed to Mainlines



QE 300L Handle Floats used with 24mm Duradan Rope strops each end on an offshore, exposed, single line farm in New Zealand.



# QE Oyster Line Floats

- When Quality Equipment Ltd obtained the assets of Marine Farm Products in 2020, it acquired the Oyster Line barrel float. A specialist float that is requested from time to time by Oyster Growers and now Seaweed farmers.
- 120L and 4 corner Lug configuration which allows it to be used in many different configurations.
- Vertical
- Horizontal
- Or Spacer.
- We recommend Carbon Black colour to maximize UV treatment, but colour options are available.



QE 120L Oyster Float

# QE Double Mainline Mussel/Oyster Float Specifications.

Book Code	Type	Description	Package
F10QEMFSTD180L	<b><u>180L MFP Pegged Mussel Float.</u></b>	180ltr small peg with 24mm/28mm slot. 180L which will support approx. 540 kilos of green weight product in the sea. Available in different weight options but typically 14 or 15kg. Pressure 0.80bar for heavy duty floats. Colours as required.	Each
F10QEMFSTD300L	<b><u>300L MFP Pegged Mussel Float.</u></b>	300ltr small peg with 24mm/28mm slot. 300L which will support approx. 900 kilos of green weight product in the sea. Available in different weight options but typically 16kg, 18kg and 20kg. Pressure 0.80bar for heavy duty floats. Colours as required.	Each
F10QEMFFAT180L	<b><u>180L Fat Buoy Pegged Mussel Float.</u></b>	180ltr Large peg with 24mm/32mm slot. 180L which will support approx. 540 kilos of green weight product in the sea. Available in different weight options but typically 12kg or 15kg. Pressure 0.80bar for heavy duty floats. Colours as required.	Each
F10QEMFFAT300L	<b><u>300L Fat Buoy Pegged Mussel Float.</u></b>	300ltr Large peg with 24mm/32m slot. 300L which will support approx. 900 kilos of green weight product in the sea. Available in different weight options but typically 16kg, 18kg and 20kg. Pressure 0.80bar for heavy duty floats. Colours as required.	Each

# QE Double Mainline Mussel/Oyster Float Specifications.

Book Code	Type	Description	Package
F10QEMFHAND300L	<b><u>300L Handle Mussel Float.</u></b>	300L Universal rope locators with Handle hole for lashing. 300L which will support approx. 900 kilos of green weight product in the sea. Available in different weight options but typically 16kg, 18kg and 20kg. Pressure 0.80bar for heavy duty floats. Colours as required.	Each
F10QEOFSTD120L	<b><u>120L Oyster Float.</u></b>	120L 4 corner lugs. Pressurized and molded to weights as required but typically 8kg. Colours as required.	Each
<p>Specifications can be changed to suit customers own requirements.  <a href="http://www.qe.co.nz">www.qe.co.nz</a></p>			

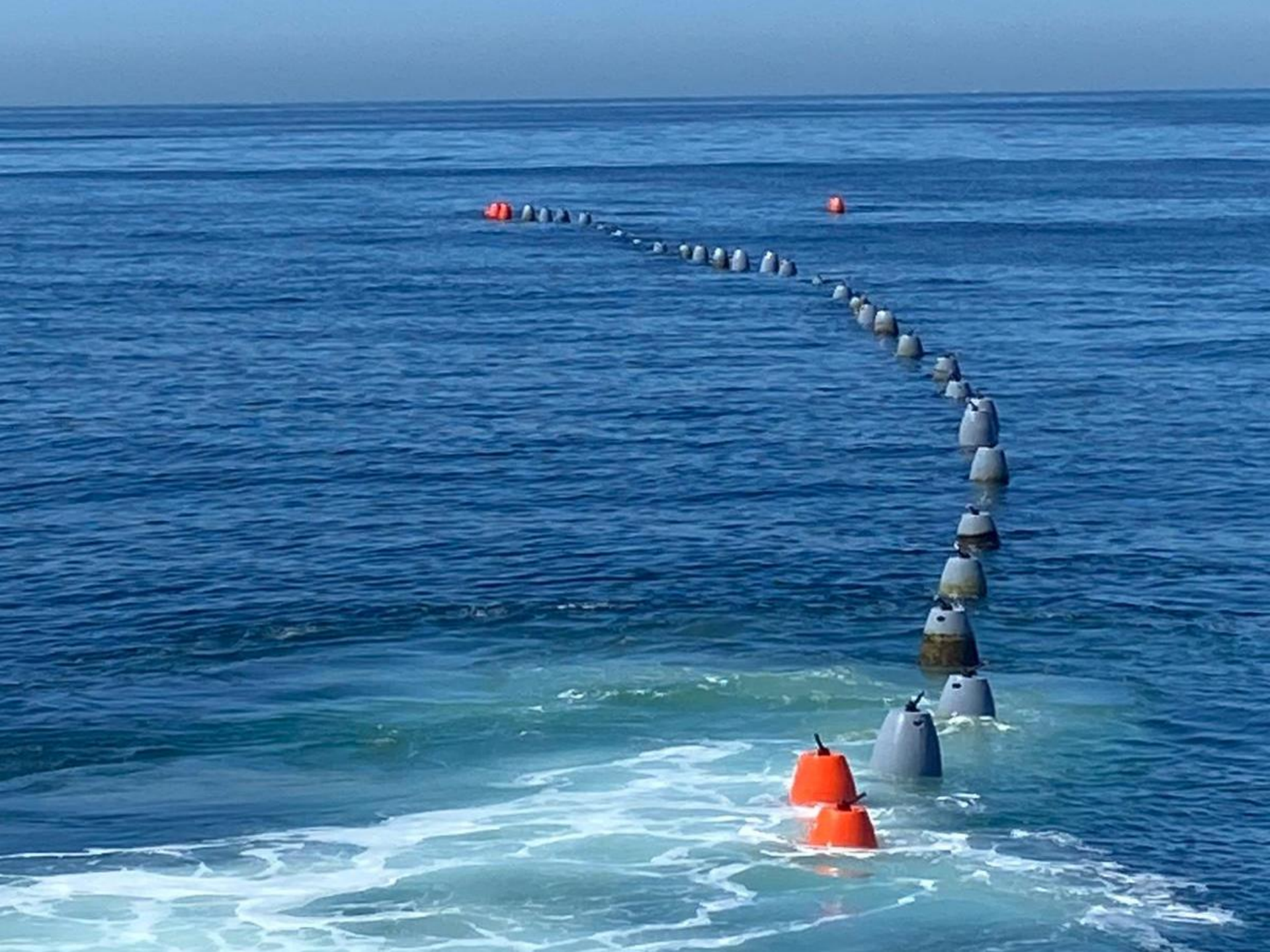
# QE Waka Mussel Floats

- Quality Equipment saw the need to use its experience and understanding in this industry and working alongside some of the most experienced offshore Mussel Farmers, developed the high-pressure QE WAKA Mussel Float. This design can be used vertically or horizontally.
- Its unique design allows the float/mussel line to be easily recovered if buoyancy is lost to overloaded/sunk lines by self Inflating with out damage.
- Three available sizes, 300L, 255L and 220L.
- The preference when dealing with extreme conditions, is to place the QE Waka floats vertically. Vertically and with the correct balance of line loading allows the floats to absorb the energy developed through the swells and severe weather conditions. The addition of extra flotation on offshore farms is a dynamic, regular event. The farm is monitored, and flotation is ONLY added as necessary . Normally a farm will fluctuate between 50% and 90% used flotation capacity before additional QE Waka floats are added.
- Horizontal placement using the two supporting Rope Strop Handles is also a popular format as the QE Waka floats offer a sleek, low resistance format to farm drag. Floats can be used with more reserve capacity so no need to be as dynamically constantly loaded as the Vertical format. However, that does lead to increased farm stress. That balance is best developed on the farm with the circumstances presented to the management team.
- Heavy walled, roto molded construction. Central 50mm Pipe to provide easy attachment for vertical farm practice and two extra heavy duty Rope Strop Handles inside the body of the float for horizontal configuration.
- Lighter colours are recommended for hotter climates.
- 100% made in NZ by QE, New Zealand Rope and Twine.





QE 220L Waka Floats used on sub-sea,  
single mainline, Los Angeles, USA.  
180mtr first float to last float.  
Float strop length 8mtr (24ft) set depth  
from surface to mainline.



# QE Waka Mussel Float Specifications

Book Code	Type	Description	Package
F10QEWAKA1.2	Waka 220	220ltr of flotation, 1.2mtr long, which will support approx. 660 kilos of green weight product in the sea. Available in different weight and different pressure options from 1bar to 2bar pressure. Both 220L and 255L used on lighter offshore structures for Blue Mussels. Typical colours, Black, Grey, Orange and Yellow.	Each
F10QEWAKA1.33	Waka 255	255ltr of flotation, 1.33mtr long, which will support approx. 765 kilos of green weight product in the sea. Available in different weight and different pressure options from 1bar to 2bar pressure. Both 220L and 255L used on lighter offshore structures for Blue Mussels. Typical colours, Black, Grey, Orange and Yellow.	Each
F10QEWAKA1.50	Waka 300	300ltr of flotation, 1.5mtr long, which will support approx. 900 kilos of green weight product in the sea. Available in different weight and different pressure options from 1bar to 2bar pressure. This 300L model is used on NZ's larges and most exposed Offshore Mussel farm. Typical colours, Black, Grey, Orange and Yellow.	Each

Specifications can be changed to suit customers own requirements.

[www.qe.co.nz](http://www.qe.co.nz)

# PP and ABS Sub-Sea Floats

- For 53 years Quality Equipment Ltd and companies have been involved in Fishing Floats in one way or another, and that knowledge allowed us to Manufacture or encourage others to manufacture a range of highly successful Sub-sea floats for aquaculture.
- 3 Sizes dominate the range over all else.
- QE 315mm ABS, Pearl Float, Single Lug, 16L, Maximum working depth 100mtrs.
- QE 470mm PP, Pearl Float, Double Lug, 55L, Maximum working depth 45mtrs.
- QE 550mm PP, Mussel Line or Sub-sea float, 80L, Double lug plus lifting lug. Maximum working depth 45mtrs.
- Can be used as Sub-sea Anchor line support floats, or float Surface or Subsurface Mainlines for any number of lighter type crops such as Mussels, Oysters, Pearl Cultivation Oysters or Seaweed etc.
- We recommend Carbon Black colour to maximize UV treatment, but colour options are available when required.





Sub-sea Pearling longlines, Manihiki, Northern Cook Islands. (middle of the Pacific Ocean.) This example using QE 315mm ABS Pearl floats, 12mm QE Duradan and 6mm QE Danlash to support the Pearl Oyster shells.



Pearl farming is a major industry in the northern regions of Australia and the South Pacific. Quality Equipment has maintained and developed significant relationships in this industry to become a leader with our technology in terms of Ropes and Floats. Longline structures tend to be much longer than Mussel Farms and tend to be subjected to the most extreme cyclone events regularly. This example is with the largest Pearling Co in the world working out of Darwin, Northern Australia. We are using here Fielder Marine Screw Anchors, QE 470MM PP Pearl floats and 36mm QE Durashield, 540m, Anchor to Anchor.





Cultivated Black Pearls, The rewards after 18 months of sub-sea longline cultivation. The pleasure, the excitement and a lifetime of wonderful relationships can not be forgotten or taken away, as these experiences helped and directed the development of so many of our QE products today. I will always remain truly grateful for the relationships made and friendships gained while been so involved in the global longline seafood/culture industry.

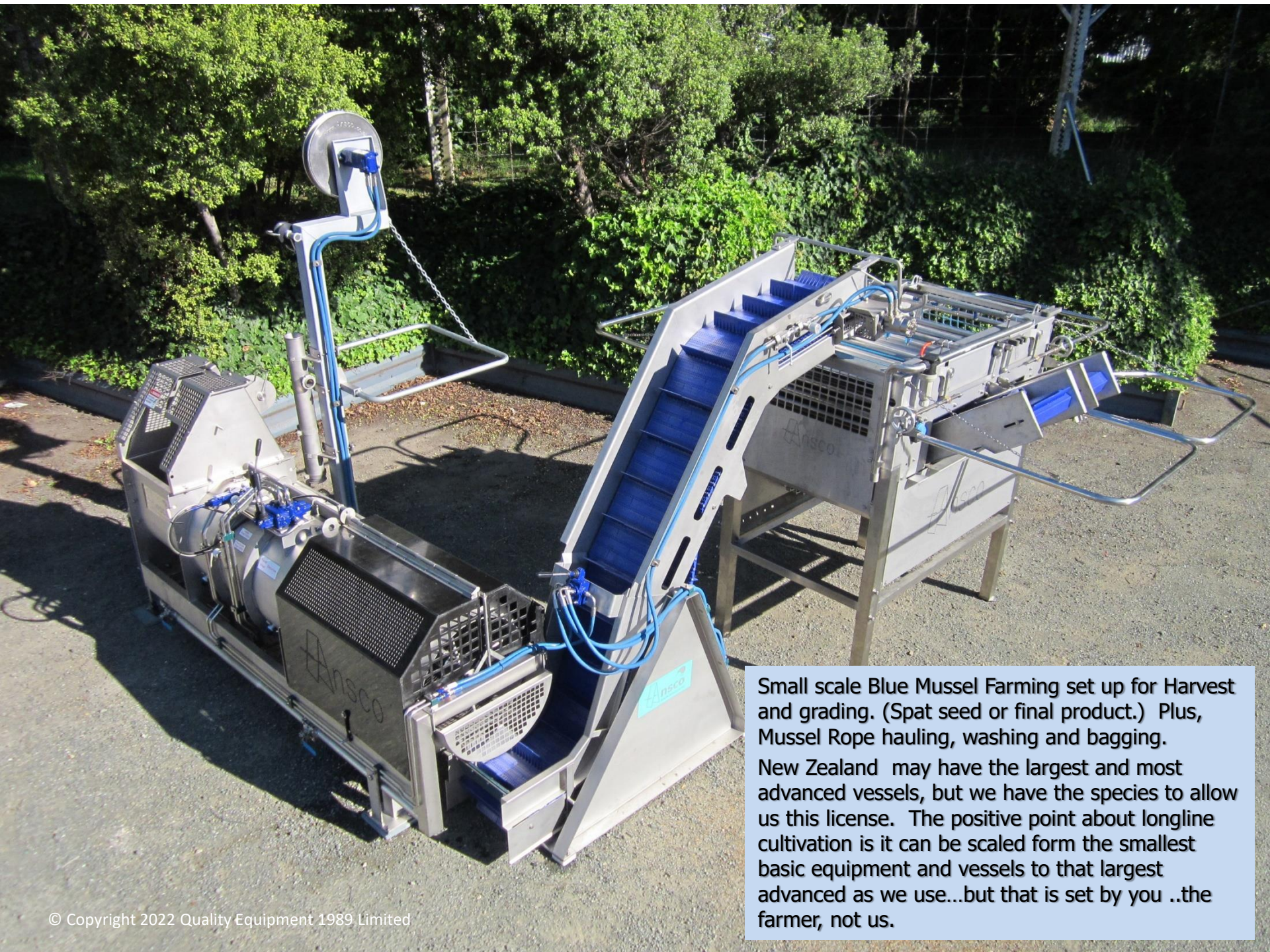
This photo, Manihiki, Northern Cook Island Group with a wonderful farmer/friend, Apii Piho and my self (Joe Jnr)

# HD PP and ABS Subsea Float Specifications

Book Code	Size	Description	Package
F10QEPF1315	315MM	16.00ltr of flotation, 315mm dia with solid single lug. . ABS construction. Virgin Plastic only. Max working depth appx 100m Carbon Black or Colours on request. 1200 pcs = 20ft FCL	Each
F10QESS470	470MM	55ltr of flotation, 470mm dia with solid double lugs. Heavy wall c construction. Virgin PP Plastic only, Max working depth appx 45m Carbon Black. 330 pcs = 20ft FCL	Each
F10QESS550	550MM	80ltr of flotation, 550mm dia with solid double lugs and lifting lug. Heavy wall construction. Virgin PP Plastic only, Max working depth appx 45m Carbon Black. 150 pcs = 20ft FCL	Each
<a href="http://www.ge.co.nz">www.ge.co.nz</a>			

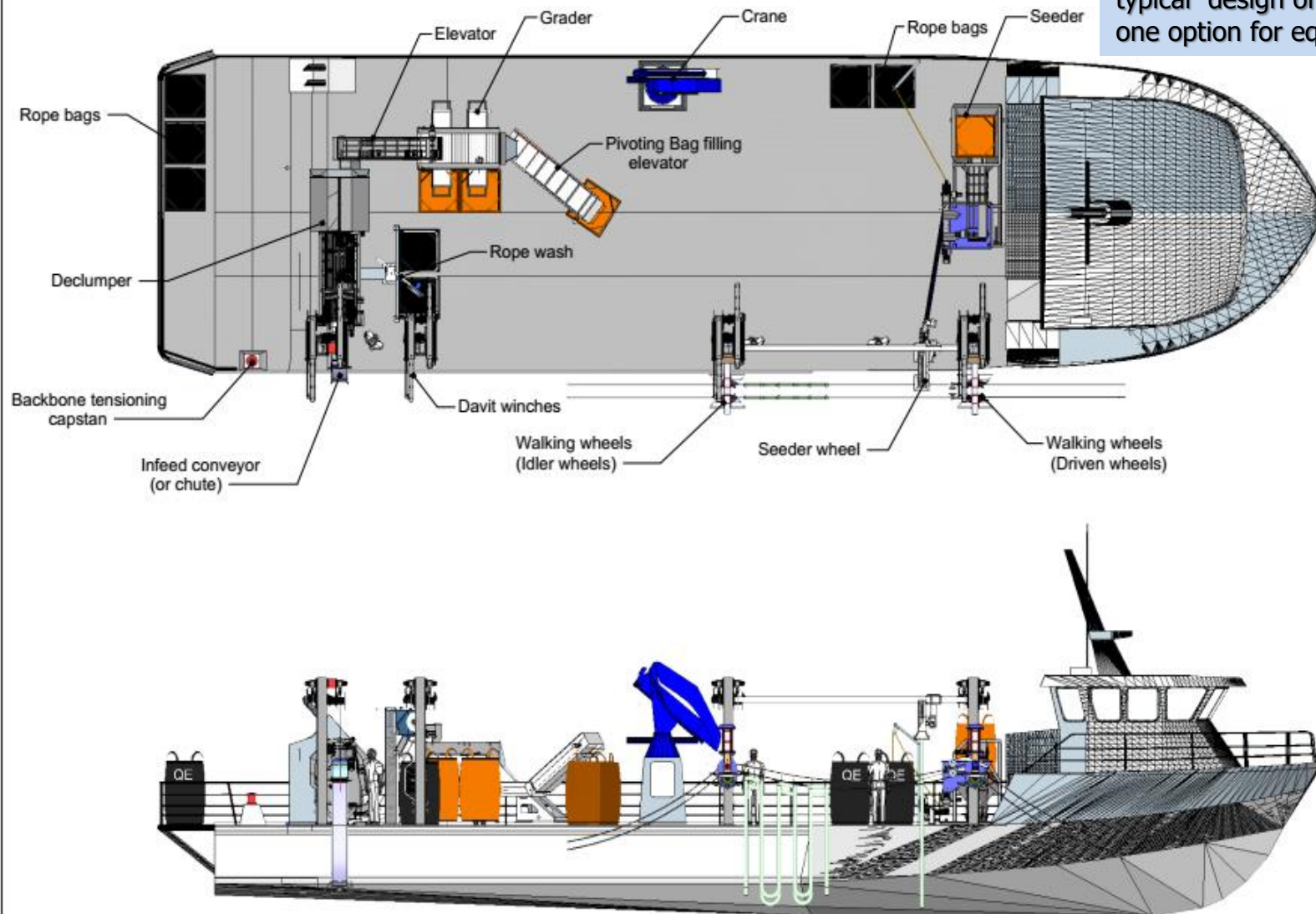
The logo is an oval emblem with a rope-like border. Inside, there is a stylized white flame or flower-like shape at the top. Below it, the letters 'QE' are written in a large, bold, white serif font. Underneath 'QE', the word 'GROUP' is written in a smaller, white, italicized sans-serif font. At the very bottom of the emblem, 'Est.1969' is written in a small, white, sans-serif font.

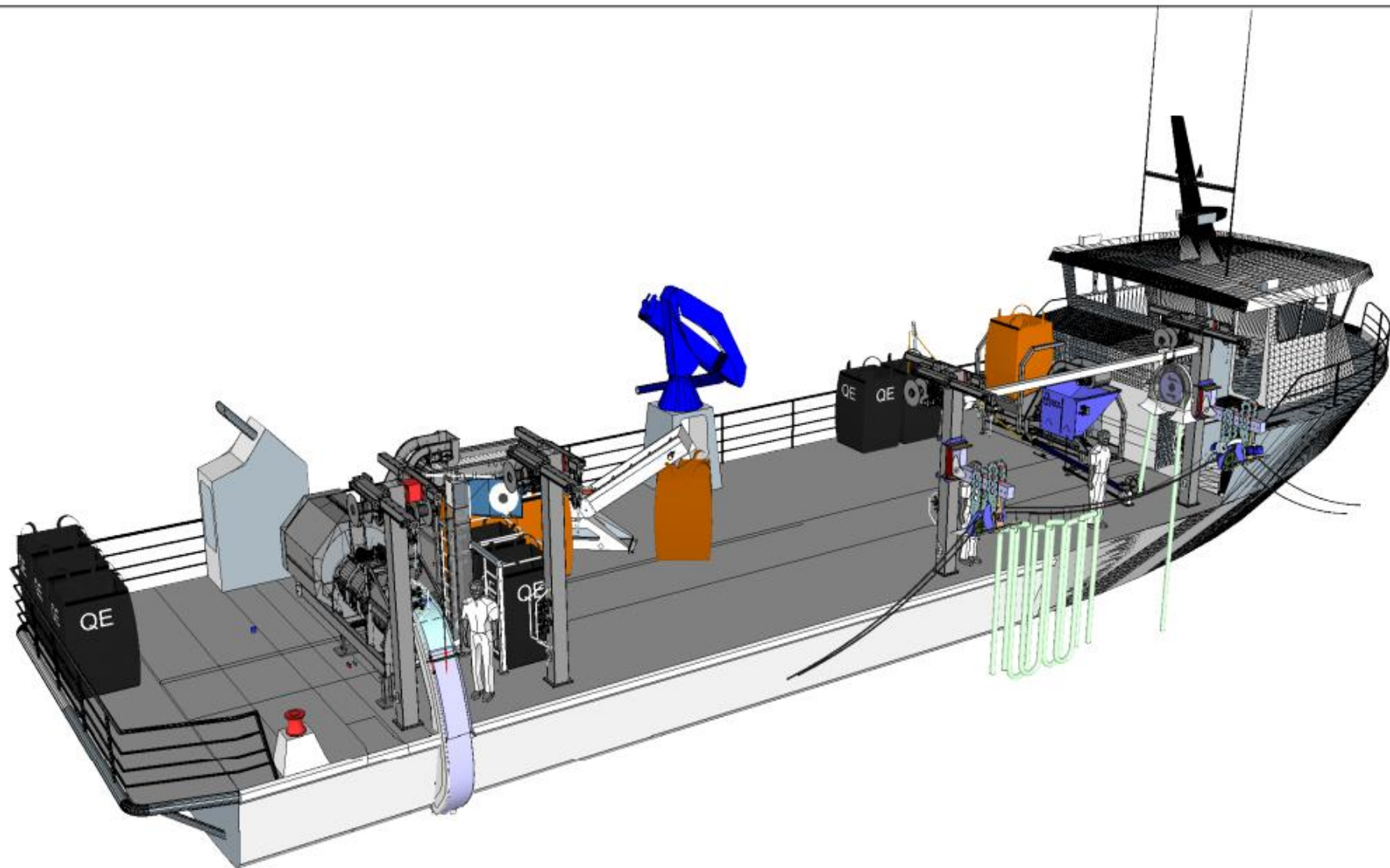
## **DECK MACHINES AND ANCCILARY EQUIPMENT:**

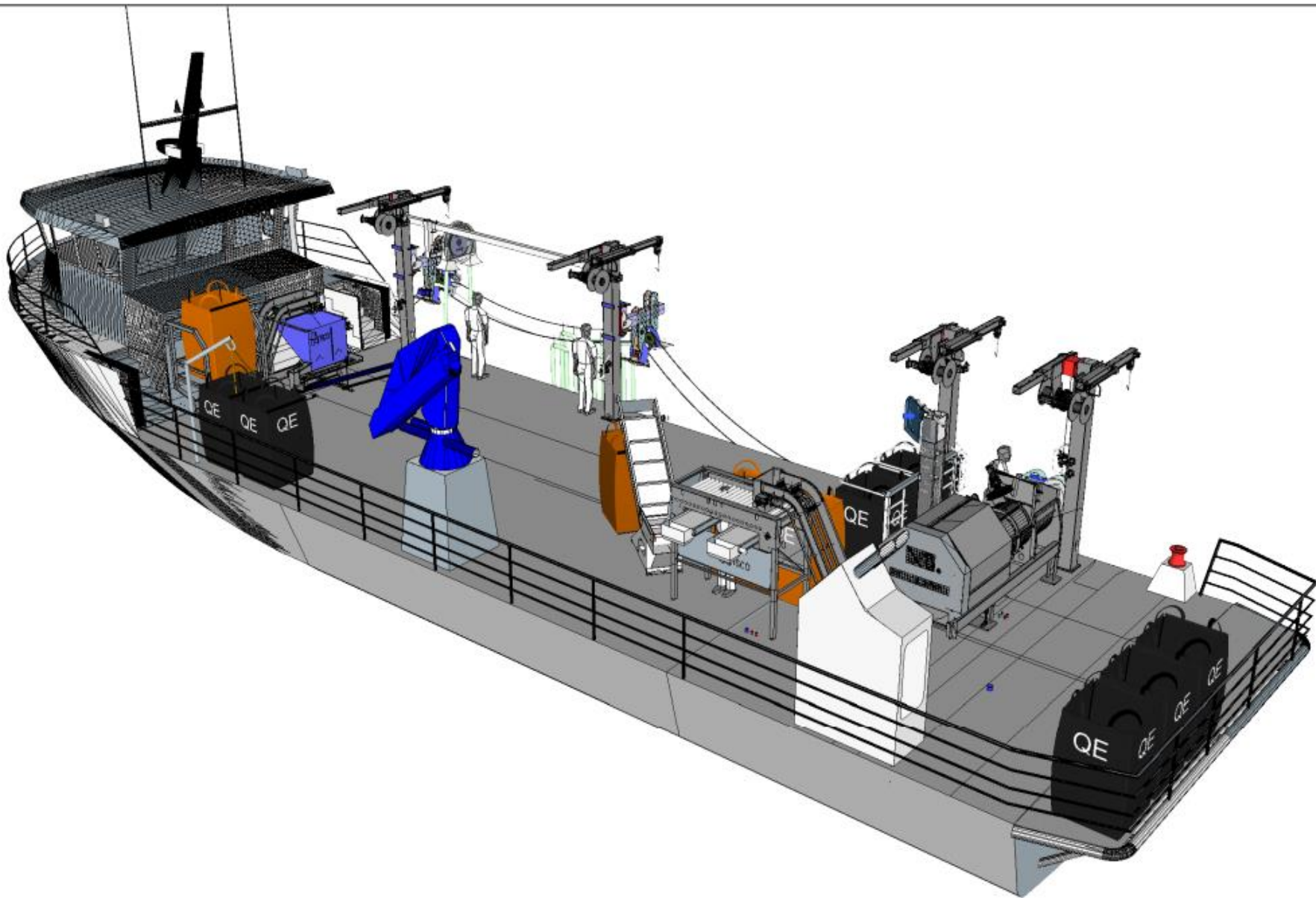


Small scale Blue Mussel Farming set up for Harvest and grading. (Spat seed or final product.) Plus, Mussel Rope hauling, washing and bagging. New Zealand may have the largest and most advanced vessels, but we have the species to allow us this license. The positive point about longline cultivation is it can be scaled from the smallest basic equipment and vessels to that largest advanced as we use...but that is set by you ..the farmer, not us.

Courtesy of Ansko engineering, a typical design of a NZ Vessel and one option for equipment layout.







# Line Tension Winch

- In Mussel farming there are some key points that are always worth repeating, “Less will give you more”, but at this end of the farming operation, the critical point about any Longline farming structures is, “TENSION IS YOUR FRIEND”. The NZ industry knows this so well, that the latest vessels entering the market have now dedicated powerful Winch Drums. SWL 5000Kg SWL.
- We need to do all we can to settle longlines to be at there most elastic operating tension. New ropes no matter how much we pre-stretch and harden the lay, will stretch in the first few seasons. Typically, in the 5% to 7% range. Once this “new rope” stretch is removed and settled, it becomes elastic in tension. This means the farm will stay in tension through its life cycle and help to prevent shock loads and knuckling. It is typical to tighten lines every season in the first 3-4 years, but will be less each time.
- Where possible, start with over length Anchor warps, as that is the best place to remove excess Rope stretch and with out removing productive line space. Noting this should be alternated between each ends so as to not shorten too dramatically more than the other. (Assumed Farms are anchored with Screw Anchors)



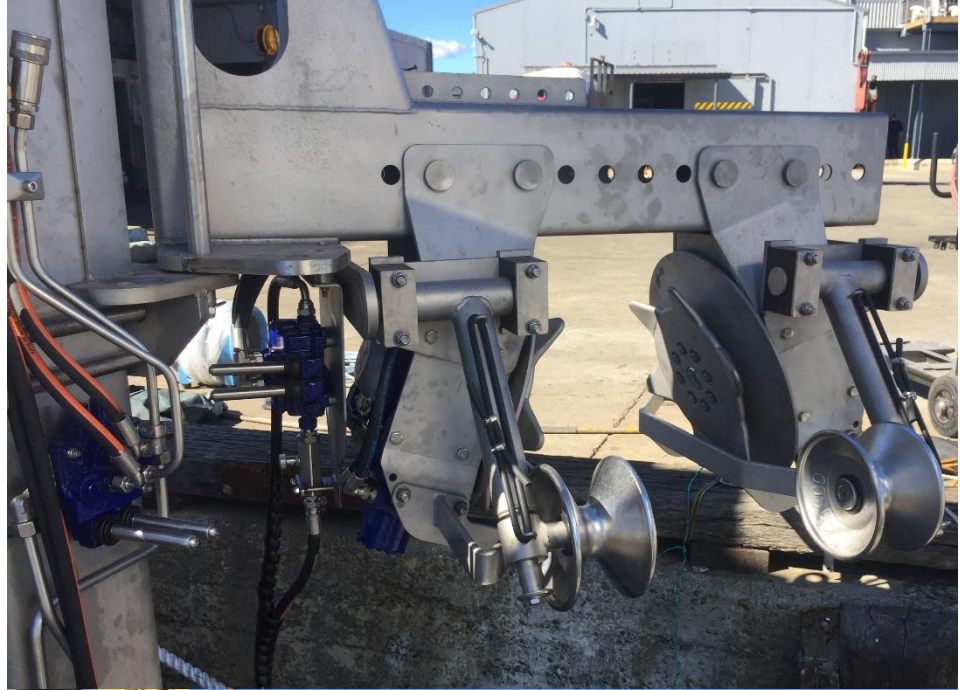
# Gantry Crane

- A critical part of this system is to have the ability to lift the mussel lines, fast and high to allow control of the long lines.
- They need to be powerful and strong, typically safe working loads of 1000Kg SWL to 1500Kg SWL.
- Controls need to be locally mounted and main gantry posts need to be set back on the deck to allow a suitable working area in front.
- A single gantry post can have 1 or 2 hydraulic crane posts.
- Always allow lots of Cleats for assisting with tying of with safety lines etc.
- For more information contact Ansko Engineering Ltd.



# Walking Wheels

- The option is to use the side Gantry Cranes as per previous page or move along the line with Double Walking Wheels as shown, or Single Walking Wheel.
- Where Double and Surface controlled the floats are removed from the Line apart from the very beginning or very end floats. As the line is seeded then floats are readded to the mainline. Where Single and on float strops then floats can be left in place.
- One set of the Walking Wheels is the driver (Hydraulic) with a compression roller to help keep the Ropes in the driving wheel. The other end is undriven, free rolling as a guidee to hold parallel to the vessel.
- Walking Wheels are normally mounted to the main Gantry post, with the Gantry assisting to lift the Ropes to be placed in the Walking Wheels. As with most of the deck equipment, this is removable when not required.
- For more information contact Ansco Ltd.



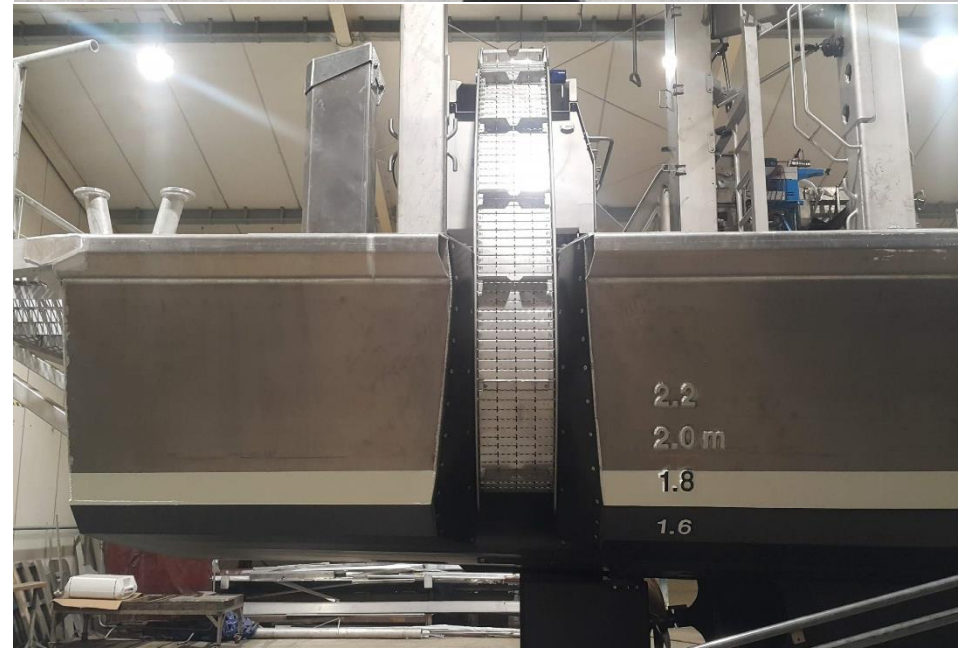
# Declumpers

- The New Zealand style Declumpers are designed to declump Spats and/or harvest size products. All that is required is to change the cleaning screen.
- There are two main stages, the front declumping chamber and the back single stage grading/cleaning/washing screen.
- The key is to fill the front of the machine with mussel and only enough water to keep the shells mixing with shells. Too much water will push the mussels through to fast.
- Typical ANSCO 600mm dia Declumper will declump 5000kg per hour of harvest size products.
- The capacity of these machines is different between Green shell and Blue shell type products. the vessel size and volumes required.
- Lots of different configurations and layouts to suit
- It is important not to underestimate the water requirements for this type of machine.
- Manufacturer, Ansko Engineering Ltd.



# Declumper Chutes

- The most basic and common Chute is the simple Slide Chute. Very effective and no other complicating factor required.
- There are some species, times of year (Late summer) and environmental changes that cause excessive weight or “slippery” harvest where a mechanical Chute is an advantage. This Chute by Ansko engineering offers that opportunity.
- The only issue when lifting with a driven mechanical Chute is to ensure harvesting Rope speed is time exactly to the lifting Chute speed. Too fast or too slow can result in pushing Mussel off rather than harvest.
- For more details and design option contact Ansko Engineering Ltd.



# Lifting or Inspection Elevators

- Located after the Declumper, there are many combinations available. You can either have the mussels fall straight into a bin, or be elevator lifted into bags/bins or up into a grader. You get the added advantage of inspection with an elevator. The lifting elevator allows the unit to be lowered to prevent breakage as the bag/bin starts to fill. As the bag/bin fills the elevator is raised. When the bag/bin is full the elevator is able to swing to the next bag with out stopping.
- An alternative to the bag lift elevator is the buck lift wheel that can be mounted at the end of the declumper.
- For more information contact Ansko Engineering Ltd.



# Graders

- There are two main types of Graders, the scroll type or the Cam roller type.
- The more preferred grader today is the Cam roller grader. They are capable at running at high speeds and having a greater range of width measure. From 2mm to 25mm. Typically, 3 Way Grading. (Photo Grading Graders a different story.)
- The Scroll type is considered the more accurate but is relatively low in capacity, especially on small spats.
- Graders are considered advantageous when sorting seed so that if there are too many classes of seed size, the different sizes are directed to different lines when reseeding.
- For Harvest sizes, sometime there is a premium size that is preferred more than others, this allows harvest to be taken and undersize reseed back to the lines for harvesting at a later date.
- For more information contact Ansko Engineering Ltd.



# Auto Seeding Machine.

- This is a typical design, the bin size shown is a ANSCO 650l bin. However, any size bin is possible.
- With our bigger offshore boats, Ansko Engineering has developed a Conveyor Feed Seder which is better suited to vessels working regularly rough or swell conditions. There is no one design, configuration or layout. So, like the rest of the deck equipment, best to plan with the engineers the designs that best suit your applications.
- Seeding density is controlled by the hopper belt speed and rope hauling wheel speed.
- The length of rope droppers can be controlled manually or electronically.
- The hauling wheel can be fixed to the machine or can be mounted remotely.
- The cotton pipe holder can also be custom made to suit customer requirements.
- One of the key points is that the rope must be fed at a constant tension into the machine and the mussel seed (Spat) must be cingulated, so we get a constant flow around the Growout Ropes.
- The seeding pipes and seeding cone must be maintained to a high level of polish and care.
- For more information contact Ansko Engineering Ltd.



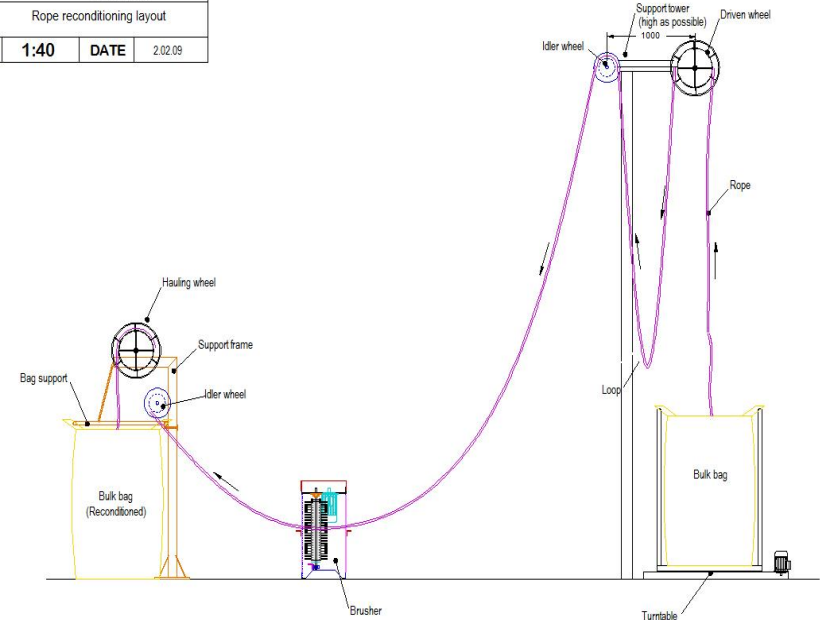
# Cotton Socking Loaders

- If loading many cotton pipes, then it is necessary to purchase a socking pipe loading machine. Many different designs are possible.
- The cotton is pulled up and over a loading head at the front of the pipe. The cotton is pulled in “handful” lots onto the pipe and packed in “clock” fashion to maximise the amount the pipe can hold.
- It is important to realize that the cotton when knitted has a natural spiral. Therefore, when loading onto the pipes, the cotton bags need to be spun to take this twist out.
- The length of socking pipe can be made to any length and is usually a custom-made design to suit auto seeding machine and Vessel.
- For more information contact Ansco Engineering Ltd Ltd.



# Care and Maintenance

- After harvest, it is typical that the Spat catching and harvest Ropes are washed only or washed and brushed, whichever is the farmers preference. The ropes are inspected and where necessary old lashing and or fouling is removed.
- Normally this process is done immediately after harvest. The ropes are transferred from one bulk bag to another allowing the operator to visually inspect the ropes and to make sure it has not acquired any torque from the harvesting process. If twists are noticeable, then using a turntable the bags can be spun left or right to remove any problem areas. However, care and a suitably high tower should be used to ensure the ropes are allowed to hang free at a reasonable distance.
- Brushing has the added advantage of re vitalizing the cut or loop trims to ensure the best presentation to the mussels when re deployed. However, care should be used not to “over brush” to allow maximum life of the ropes.
- For more information contact Ansko Engineering Ltd.



The logo is an oval emblem with a rope-like border. Inside, there is a stylized white fish silhouette at the top. Below it, the letters 'QE' are prominently displayed in a large, bold, white sans-serif font. Underneath 'QE', the word 'GROUP' is written in a smaller, white, italicized sans-serif font. At the very bottom of the emblem, 'Est.1969' is written in a small, white, sans-serif font.

## **VESSELS FROM THE MODERN AQUACULTURE INDUSTRY:**

New Zealand



# New Zealand



# New Zealand



# New Zealand



# New Zealand



# New Zealand



New Zealand



# New Zealand



England



USA



# Turkey



# Scotland



Bulgaria.



# Chile





# Quality Equipment Limited

## New Zealand Rope and Twine

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