



QUALITY EQUIPMENT

NEW ZEALAND ROPE AND TWINE

Mechanization and continuous Harvest Practice of the Modern Mussel Industry.

- The most Mechanized and Developed Mussel Cultivation system.
- Most Environmentally responsible.
- Sustainable Farming not Wild Fishing
- Quality and Added Value.

Presented by Joe Franklin Jnr.
Managing Director.

www.qe.co.nz



New Zealand



QE Continuous Mussel Farming System...

The 4 Key Components

- 1...Continuous Catching and Harvest Ropes.
- 2...Farm Structures.
- 3...Machines and Ancillary Equipment.
- 4...Vessels, A pictorial of some of the vessels used today in the Modern Mussel Industry.





House Keeping:

- Joe Franklin Jnr , Managing director. Quality Equipment Ltd (Marketing), and New Zealand Rope and Twine Ltd (Manufacturing).
- 43 years of family business in New Zealand.
- Largest 3 Strand Rope manufacturer in Australasia with a strong focus in the global aquaculture industries, especially Mussel Cultivation and Pearl Cultivation.
- Not a consultant, but someone willing to help.
- Working at the coal face to ensure a direct relationship.
- We are happy to Coordinate between all service providers, warehouse, arrange shipping and customs etc.

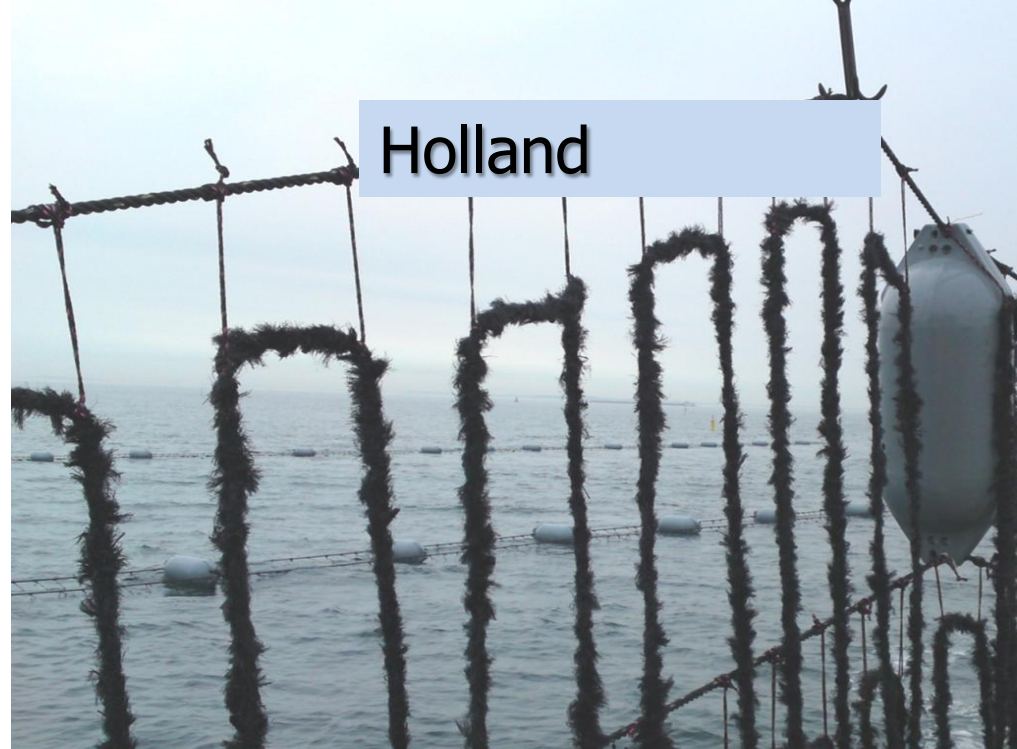


New Zealand



1...QE Continuous Catching & Grow Out Ropes.

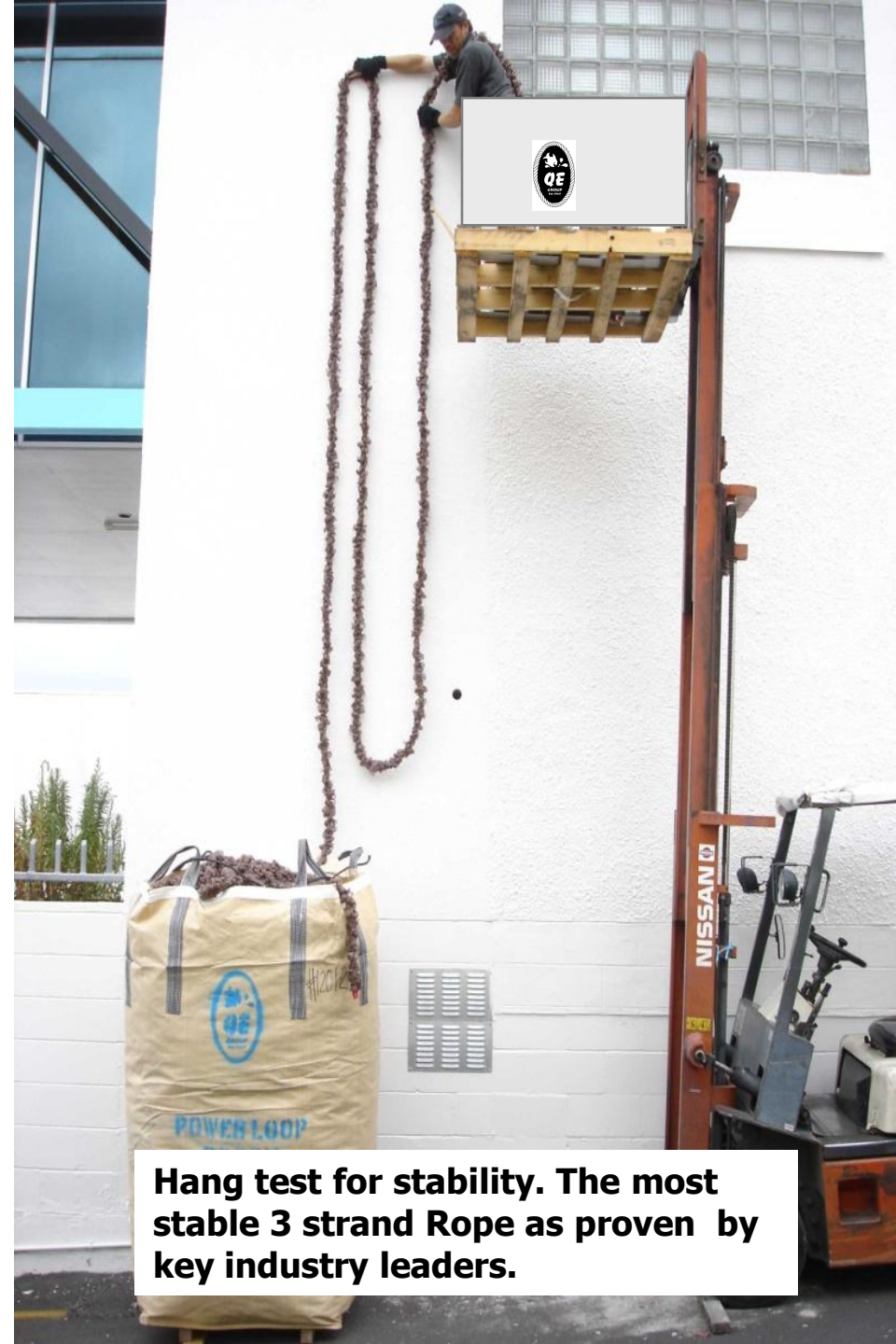
- QE Continuous Mussel Rope System
- QE Spat Catching Rope Designs.
- QE Crop Grow Out Rope Designs.
- Care and Maintenance.



•QE CONTINUOUS MUSSEL ROPE SYSTEM.

We farm the Mussel 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 is a fast growing, healthy product were every animal is a premium animal. Therefore Less will give you more quality and size quickly from the available food 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.



Hang test for stability. The most stable 3 strand Rope as proven by key industry leaders.

QE Catching Ropes.

Cut Loop Spat Rope

weighted wire type, 3L, 4L, 5L, or 6L.

- QE Cut Loop Spat Rope is used by many farmers as their preferred medium to catch spat.
- Dewaxed highly fribulated fibers 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 Rope structure is left as loop to offer support to developing mussels as they grow out to harvest size.
- Plastic Coated wire content can be adjusted to customer's own preferred levels. We recommend presoaking bags of 3 wires.
- 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. We do not recommend coils.
- 100% made in NZ by QE, New Zealand Rope and Twine.



QE Catching Ropes

Loop Spat Rope

weighted wire type, 3L, 4L, 5L, or 6L.

- QE Loop Spat Rope are also used by many farmers as their preferred medium to catch spat. Used where spat settlements are normally high.
- Dewaxed highly fibrillated fibers, formed in a net like structure, simulating natural algae environments.
- Strong 50mm Loops offering large surface area, and offering loops to retain spat until harvest period.
- Plastic Coated wire content can be adjusted to customers own preferred levels. We recommend presoaking bags of 3 wires.
- 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. We do not recommend coils.
- 100% made in NZ by QE, New Zealand Rope and Twine.
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QE Catching Ropes

Mega Loop Spat Rope

Weighted Wire 3L, 4L,5L,& 6L

- QE Mega Loop Spat Rope, Long Length of loops that can be adjusted to farmers own preference. Standard QE Long Loops are normally 75mm loops and have proved very successful in catching and retaining NZ Green Shell spats. Also an Ideal rope for intermediate seeding.
- Dewaxed highly fribulated fibers, formed in a net like structure, simulating natural algae environments.
- Strong 75mm Loops offering the largest surface area.
- Plastic Coated wire content can be adjusted to customers own preferred levels. We recommend presoaking bags of 3 wires.
- 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. We do not recommend coils.
- 100% made in NZ by QE, New Zealand Rope and Twine.
-



QE Spat Catching Rope Specifications

Book Code	Type	Description	Package
R50QECLS#L20000 BB	Cut Loop Spat 3L, 4L, 5L, or 6L.	Cut Loop Spat Catching, 14mm core x 2000mtr Carbon Black, 55-65mm de-waxed cut trims, PVC coated wires as required in core.	Bulk Bag
R50QECLS#LXHD2000 BB	Cut Loop Spat Extra Heavy Duty. 5L, or 6L.	Cut Loop Spat Catching, 18mm core x 2000mtr Carbon Black, 55-65mm de-waxed cut trims, PVC coated wires as required in core.	Bulk Bag
R50QEELS#L20000 BB	Loop Spat 3L, 4L, 5L, 6L.	Loop Spat Catching, 14mm core x 2000mtr Carbon Black, 50mm de-waxed loop trims, PVC coated wires as required in core.	Bulk Bag
R50QEMLS#L20000 BB	Mega Loop Spat 3L, 4L, 5L, 6L.	Cut Loop Spat Catching, 14mm core x 2000mtr Carbon Black, 70-75mm de-waxed cut trims, PVC coated wires as required in core.	Bulk Bag

Specifications can be changed to suit customers own requirements.
www.qe.co.nz

Proven... Catch and Retention.



- QE Spat Rope are proven in all main Mussel Cultivation regions of the world. The dewaxed net like filaments proving no impediments to settlements even when used for the first time.
- After settlement the proven yields from these Ropes also offer superior holding and support.

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, or 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 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 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. We do not recommend coils.
- 100% made in NZ by QE, New Zealand Rope and Twine.



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. We do not recommend coils.
- 100% made in NZ by QE, New Zealand Rope and Twine.



QE Grow Out Ropes

75mm Mega Loop.

types, Light, Standard, or XHD,

- QE 75mm Mega Loop Grow Out Ropes. Used by many NZ open water farmers. These long loop format ropes have become the preferred choice of almost every farmer because of their proven success in farming high density crops on New Zealand open water /rough water sites. For a 75mm Loop structure we expect up to 12kg 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 14mm Core with less loop frequency.
- Standard option is manufactured with 14mm Core.
- XHD Option is manufactured with 18mm Core
- All yarns UV treated. Loop Length set at approx 75mm.
- Packing is in 1500 or 2000mtr continuous length in Bulk bag depending on Ropes. Where no torque is manufactured into the ropes to be the most stable 3 strand product.
- 100% made in NZ by QE, New Zealand Rope and Twine.



QE Grow Out Ropes

80mm Extreme Loop.

types, Standard, HD or XHD,

- QE 80mm Extreme Loop Grow Out Ropes. Used by a handful of global farmers who have the technology and infrastructure to handle the “EXTREME” yields this rope offers. The construction is made up of a multitude of twisted or plied yarns which offer the most wear resistant and holding properties over any other Ropes produced today. For this EXTREME Rope it is possible to farm full crop loads in excess of 16kg per meter of final product at Harvest.
- Dewaxed, plied yarn loops offering strong, wear resistant, high yielding support loops. Largest core diameter.
- Standard option is manufactured with 20mm Core with 9 loops per lay.
- HD option is manufactured with 20mm Core and 12 loops per lay.
- XHD Option is manufactured with 20mm Core and a massive 15 loops per lay.
- All yarns are UV treated. Loop Length set at approx 80mm but can be made to order.
- Packing is in 1000mtr continuous length in Bulk bag.
- The most EXTREME rope for the most EXTREME farmers only.
- 100% made in NZ by QE, New Zealand Rope and Twine.



QE Grow Out Rope Specifications

Code	Type	Description	Package
R50QESLLT2400 BB	Super Loop Light.	25mm Loop, 12mm core x 2400mtr Carbon Black Carbon Black, weight 200kg/2400mtr	Bulk Bag
R50QESL2000 BB	Super Loop Standard.	25mm Loop, 14mm core x 2000mtr Carbon Black weight 200kg/2400mtr	Bulk Bag
R50QEPLLT2400 BB	Power Loop Light.	50mm Loop, 12mm core x 2400mtr Brown weight 240kg/2400mtr	Bulk Bag
R50QEPL2000 BB	Power Loop Standard.	50mm Loop, 14mm core x 2000mtr Brown Carbon Black, weight 240kg/2000mtr	Bulk Bag
R50QEMLLT2000 BB	Mega Loop Light.	75mm Loop, 14mm core x 2000mtr Carbon Black/Brown weight 240kg/2000mtr	Bulk Bag
R50QEML2000 BB	Mega Loop Standard.	75mm Loop, 14mm core x 2000mtr Carbon Black/Brown weight 280kg/2000mtr	Bulk Bag
R50QEMLXHD1500 BB	Mega Loop X .H. Duty.	75mm Loop, 18mm core x 1500mtr Brown weight 270kg/1500mtr	Bulk Bag
R50QEEL2000 BB	Extreme Loop Standard.	80mm Loop, 20mm core x 1000mtr Carbon Black plus Blue Fleck, weight 250kg/1000mtr	Bulk Bag
R50QEELHD1000 BB	Extreme Loop Heavy Duty.	80mm Loop, 20mm core x 1000mtr Carbon Black plus Red Fleck, weight 275kg/1000mtr	Bulk Bag
R50QEELXHD1000 BB	Extreme Loop Extra Heavy Duty	80mm Loop, 20mm core x 1000mtr Carbon Black weight 300kg/1000mtr	Bulk Bag

Specifications can be changed to suit customers own requirements.
www.qe.co.nz

Proven...Yields and Quality



The selection of the Rope depends on:

- How Big is your seed and what is the maximum size you can reseed at.
- What is the seeding density you plan to use.
- How productive is your farm site.
- What are the sea conditions on your farm site.

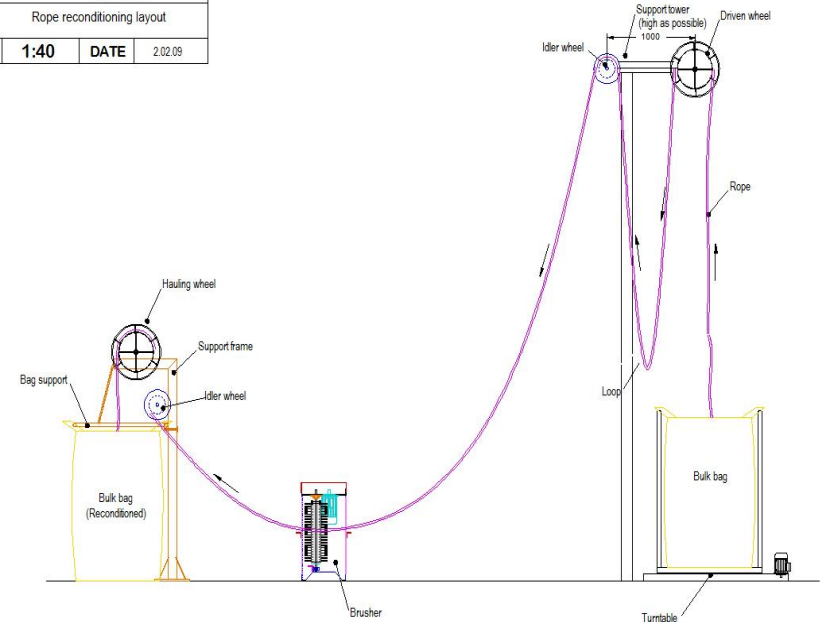
Final Seeding Density.



- Rope Capacity 5 to 12kg per mtr with a harvesting speed of 5 to 15 tonnes per/hour depending on Rope type selected and Mussel species to be farmed.
- Select a rope when seeded with Spat will sink the Grow rope.
- Seeding Density is related back to Market Size requirements, For example in the Blue/Black industry,
6kg at harvest time and you want 60 pcs per kilo, then seed at 360 plus 5-10% (6 x 60)
6kg at harvest time and you want 70 pcs per kilo, then seed at 420 plus 5-10% (6 x 70)
- Factor in other competing settlements.

Care and Maintenance.

- After Harvest it is typical that the Spat Catching and harvest Ropes are washed only or Washed and Brushed. (what ever 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 visually inspect the Ropes and to make sure it has not acquired any torque from the harvesting process. If such 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 the 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.



Turkey



2...Farm Structures.

- QE Farm Rope Selection
- Anchor design.
- Mussel Floats.
- Sub Sea Floats.
- Surface Line design.
- Semi Sub Surface design
- Typical Mussel Long Line Construction.

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QE Farm Rope Selection.

Farm Ropes, Anchor Warps and Mainlines:

- These Ropes should be QE Duradan PPE types, Preferably Hard Laid Ropes were possible for best abrasion resistance. (However Soft to Extra Hard lay is also available)
- Should be made from blended resins of Virgin Polypropylene and Polyethylene.
- Yarn Profile should be embossed. (Rolled flat monofilaments.)
- Coil lengths to customers own requirements.
- All Yarns must be fully twisted and be of the same yarn throughout the entire structure of the 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, or as indicated.



QE Duradan PPE specifications

Code	Type	Description	Package
R00QE04220R	Duradan	4mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 338kg, weight 1.86kg	Coil
R00QE06220R	Duradan	6mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 727kg, weight 4.00kg	Coil
R00QE07220R	Duradan	7mm x 220mtr Medium or Hard Lay Carbon Black, or Std Colours, B/load 945kg, weight 5.20kg	Coil
R00QE08220R	Duradan	8mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 1236kg, weight 6.80kg	Coil
R00QE10220C	Duradan	10mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 1908kg, weight 10.50kg	Coil
R00QE11220C	Duradan	11mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 2308kg, weight 12.70g	Coil
R00QE12220C	Duraline	12mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 2654kg, weight 14.60.00kg	Coil
R00QE14220C	Duraline	14mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 3636kg, weight 20.00kg	Coil
R00QE16220C	Duraline	16mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 4600kg, weight 25.50kg	Coil

Specifications can be changed to suit customers own requirements. Weights shown are based on Medium lays. Breaking loads are maximum and safe working loads are 1/6th of maximum load. www.qe.co.nz

QE Duradan PPE specifications

Code	Type	Description	Package
R00QE18220C	Duradan	18mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 5900kg, weight 26.77kg	Coil
R00QE20220C	Duradan	20mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 7000kg, weight 41.37kg	Coil
R00QE22220C	Duradan	22mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 8420kg, weight 50.82kg	Coil
R00QE24220C	Duradan	24mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 9950kg, weight 60.06kg	Coil
R00QE28220C	Duradan	28mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 13600kg, weight 82.00kg	Coil
R00QE32220C	Duradan	32mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 16800kg, weight 106.05g	Coil
R00QE36220C	Duraline	36mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 20600kg, weight 133.00kg	Coil
R00QE40220C	Duraline	40mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 25700kg, weight 163.00kg	Coil
R00QE48220C	Duraline	48mm x 220mtr Medium or Hard Lay Carbon Black or Std Colours, B/load 37600kg, weight 240.45kg	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 1/6th of maximum load. 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 length of 5mm, 6mm or 7mm lashing double over with a simple Knot at the end. (only a small tail should be left exposed.)
- Rope selection depend on site,. Where calm water then Film lashing are suitable and offer a tight firm knot which bites tight into the Mainlines. However for Exposed sites, we recommend Danlash types Lashings because of high strength and abbrasion 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	Danlash	4mm x 700mtr Soft Carbon Black with White fleck B/load 338kg, weight 6.00kg	Shrink Wrapped spool
R50QEDAN05500PW	Danlash	5mm x 500mtr Soft Carbon Black with Red fleck B/load 465kg, weight 5.50kg	Shrink Wrapped spool
R50QEDAN06500PW	Danlash	6mm x 500mtr Soft Carbon Black with Yellow fleck B/load 727kg, weight 8.25kg	Shrink Wrapped spool
R50QEDAN07500C	Danlash	7mm x 500mtr Soft Carbon Black with Green fleck B/load 945kg, weight 11.00kg	Shrink Wrapped coil
R50QEFLM1PLY PW	Filmlash	3mm x 1000mtr Soft Carbon Black Single ply. B/load 300kg, weight 9.25kg	Shrink Wrapped spool
R50QEFLM05500 PW	Filmlash	5mm x 500mtr Soft Carbon Black with no fleck B/load 312, weight 5.00kg	Shrink Wrapped spool
R50QEFLM06500 PW	Filmlash	6mm x 500mtr Soft Carbon Black with Blue fleck B/load 468kg, weight 7.50kg	Shrink Wrapped spool
R50QEFLM07500 C	Filmlash	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 1/6th of maximum load. www.qe.co.nz

Anchors design.

- Wedged Shaped Blocks are the most preferred of the concrete methods. Important to add concave base to suck Anchor into seafloor
- For Concrete 3 to 1 (3 x water depth) is the minimum required Anchor rope length.
- Typical block is between 5000kg and 12000kg,
- Screw Anchors have become the preferred method in recent years as they offer higher holding power, (20000kg), faster to install and allow for accurate farm placements. Can be used in Mud, Sand, Broken Rock and solid Rock.
- Only 2 to 1 Anchor warps are required for these types of Anchors.
- Diver-less is possible for Deep and Dangerous sites.
- For more information about Screw Anchors, contact Graham Fielder, www.fieldermarine.com



Mussel Floats

- The traditional barrel type Mussel Floats are the typical design used in the NZ industry. Many other countries now follow with similar designs. 115l, 180l, and 300l are all standard size.
- Heavy walled Rota 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 time.
- Rota molded has been the preferred method of molding as it allows the manufacturer to place plastics resin where it is best required.
- Rota molded in Carbon Black also offers the best UV resistance .
- NZ has two main methods of attachment. Pegged Wedges that allow for fast on/off transfer of floats or hard lashed with typically 5mm Lashings Danlash.
- Rope locators for different size mainlines are used and always placed below the centre line of gravity to give floats maximum stability. Floats can be used in the vertical or horizontal plane.



Mussel Float Specifications

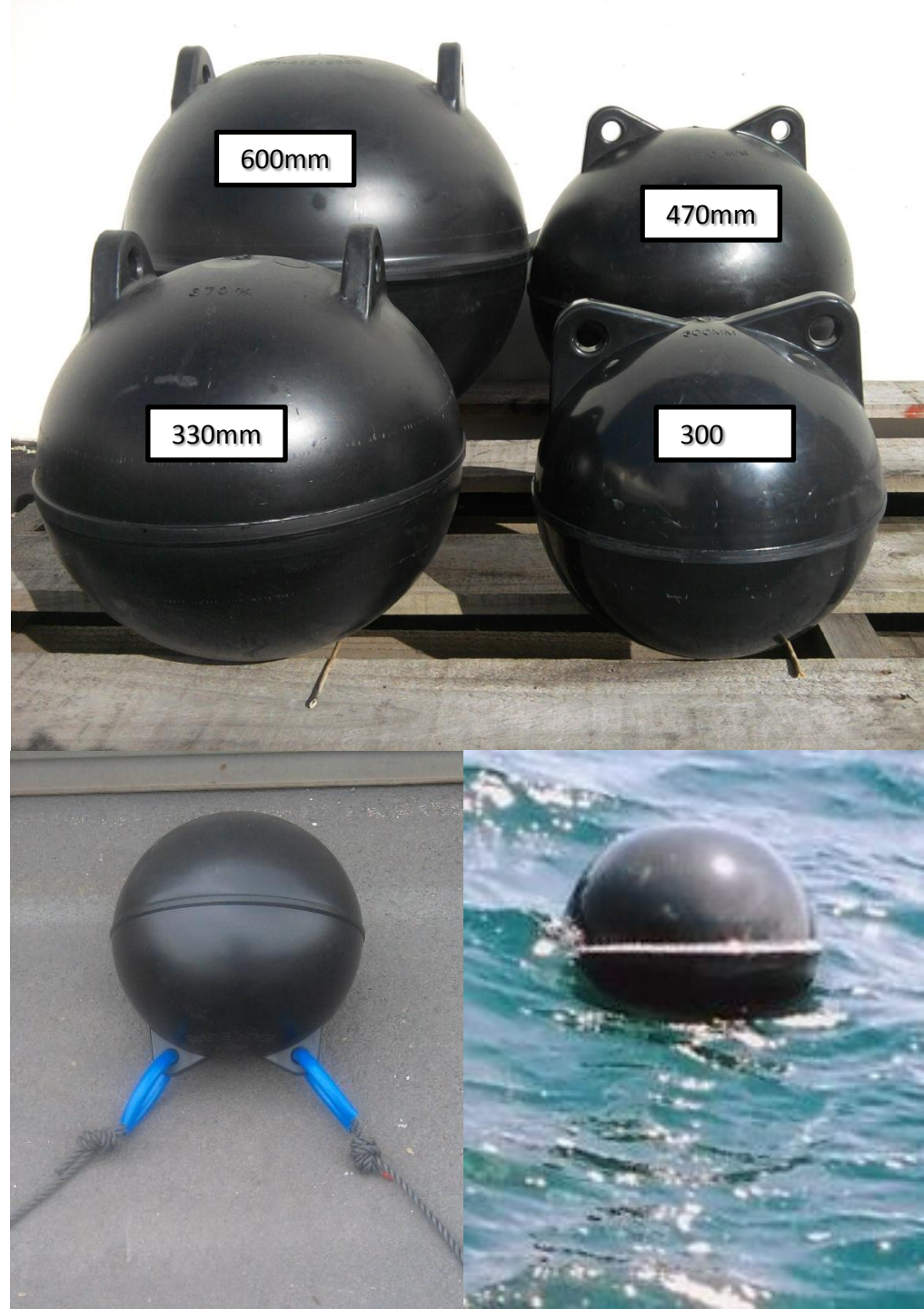
Book Code	Size	Description	Package
ALSMFP115	115l	110ltr of flotation, which will support approx 330 kilos of green weight product in the sea. Typically used as a shallow sub sea float spacer.	Each
ALSMFP180	180l	180ltr of flotation, which will support approx 540 kilos of green weight product in the sea. Typically used as a shallow sub sea float spacer or surface floats on shallow water farms with low yielding crops.	Each
ALSMFP300	300l	300ltr of flotation, which will support approx 900 kilos of green weight product in the sea. Typical surface float used on most farm applications. Where open sea and large swells are possible they are placed can be placed in the Vertical plane.	Each

Specifications can be changed to suit customers own requirements.

www.ge.co.nz

HD PPE Sub-Sea Floats.

- On farm applications where it is not possible to surface farm, and lines are subject to extreme weather and swells, then single long lines tend to be preferred operation to allow efficient farm seeding and harvest practice.
- Lines are set up with a combination of Surface floats and smaller Sub sea Heavy Duty PPE floats. These floats are either hard tied, or short dropper tied to the main lines.
- PPE Floats are heavy walled, injection molded and vary working depth from 40mtrs to 100mtrs depending on the size.
- PPE like our Duradan Ropes is a very durable Plastic offering a very robust exterior and good working depth ability.
- Eyes or lugs in these injection molded Floats are solid plastic, this offer very strong rope supports and extreme long life.
- We recommend Carbon Black colour to maximize UV treatment, but colour options are available.



HD PPE Subsea Float Specifications

Book Code	Size	Description	Package
F10QESS300	300MM	14.00ltr of flotation, 300mm dia with solid double lugs. Heavy wall construction. Virgin Plastic only. Max working depth appx 100m Carbon Black or Colours on request. 1200 pcs = 20ft FCL	Each
F10QESS330	330MM	20.00ltr of flotation, 330mm dia with solid double lugs. Heavy wall construction. Virgin Plastic only. Max working depth appx 60m Carbon Black or Colours on request. 940 pcs = 20ft FCL	Each
F10QESS470	470MM	55ltr of flotation, 470mm dia with solid double lugs. Heavy wall c construction. Virgin Plastic only, Max working depth appx 40m Carbon Black or Colours on request. 330 pcs = 20ft FCL	Each
F10QESS600	600MM	90.00ltr of flotation, 600mm dia with solid double lugs. Heavy wall construction. Virgin Plastic only, Max working depth appx 40m Carbon Black or Colours on request. 150 pcs = 20ft FCL	Each

Surface Design.

- Double Main line system.
 - Most Popular design allowing maximum Rope usage in the water column from Anchor to Anchor.
 - Easy to lift and walk with Gantry.
-
- Single Mainline System.
 - Easy to install on exposed farm sties. The floats are place in a vertical format to absorb the energy from Swells and rough water conditions.
 - The single Mainline system can produce high yields and faster crop growth because of less competition form the mussels with the available food source.
 - Fast to walk using Walking Wheels.
-
- A key point is to Limit the Floats...I.e. Not over float lines to cause excessive shake.





New Zealand

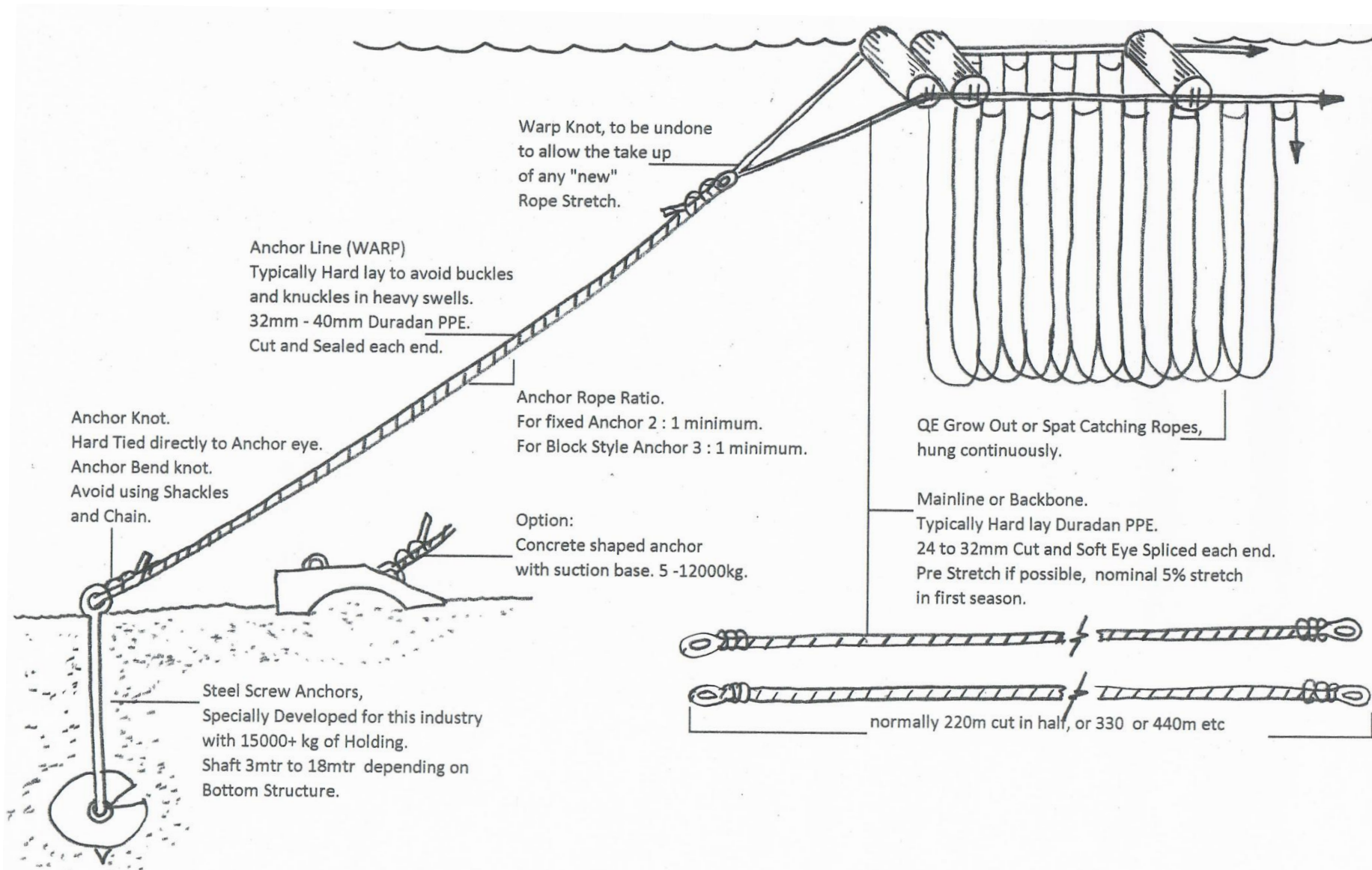
Semi Sub Sea – Open Water.

Semi Sub Surface Design.

- Can be Double Mainline or Single type.
- Proven design for Rough water, open water sites.
- As the set number of Surface floats (300l) become deeper in the water with the increasing load, the line is lifted and more sub sea floats (115 or 180l) are added.
- Where the sights are extreme open water, the surface floats are placed in a Vertical manner.

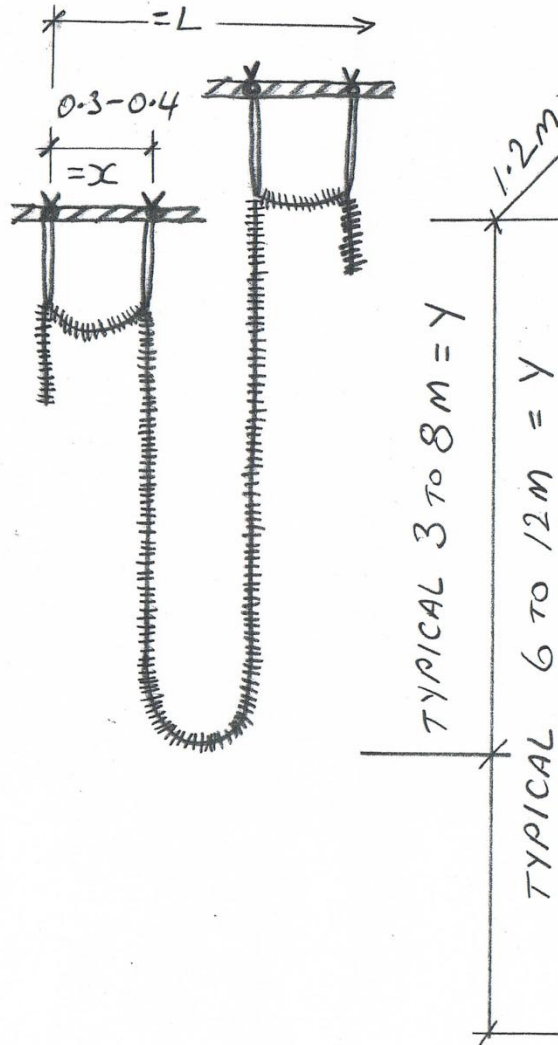


Typical Double Mainline

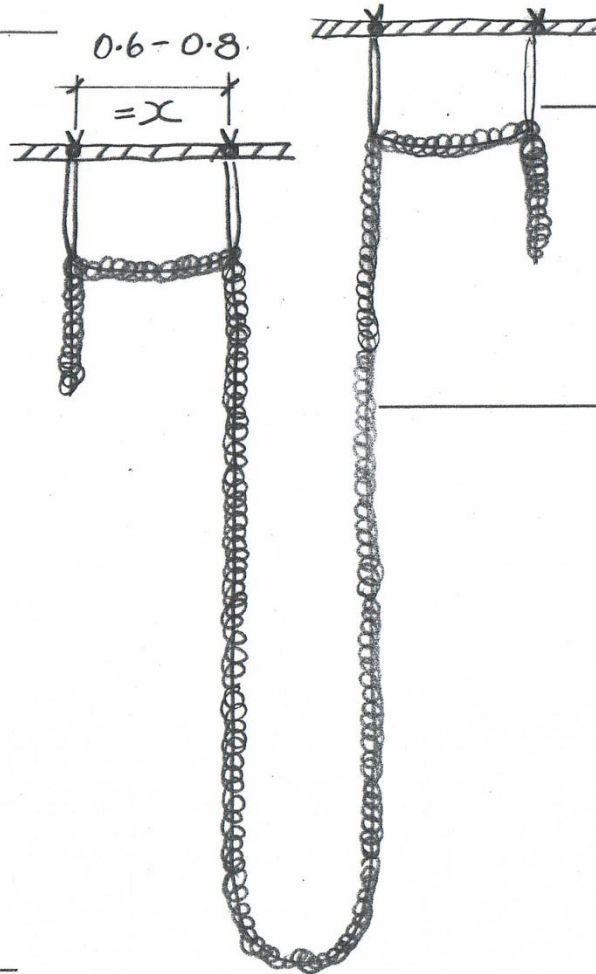


Typical Double Line Set Up

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 1.6 m to 1.7 m 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. (100 m etc)
 X = Spacing the Rope advances along the Mainline. (0.4 m etc)
 Z = Typical Space between Mainline. (1.2 m etc)
 Y = The depth Mussel Ropes to be deployed. (8.0 m etc)

Then Mussel Rope per Long Line

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

Example.

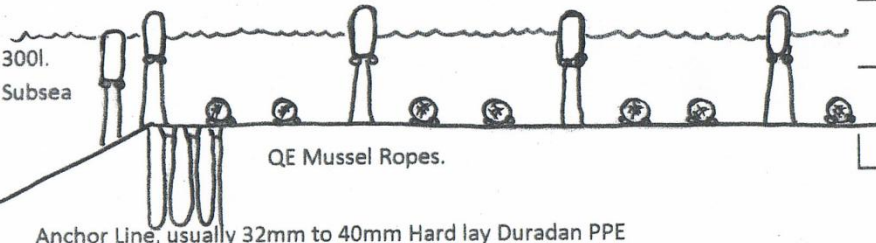
$$= ((100/0.4) + 1) \times (0.4 + (2 \times 8) + 1.2)$$

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

Other Typical Long Line Methods

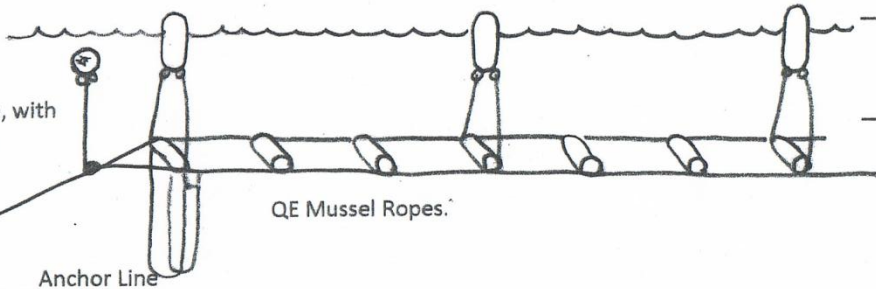
1. Single Long Line.

With Surface only floats 90l to 300l.
or Surface control floats with Subsea Pressure Floats added as Long Line gains weight.



90 to 300l Surface control Floats.
Either Round or Barrel types are common.
3 mtr Float Double Dropper Ropes.
55l or 90l Injection Molded Sub Sea Float.
Typical max working depth of 40m.
Mainlines usually 24-32mm Hard lay Duradan PPE

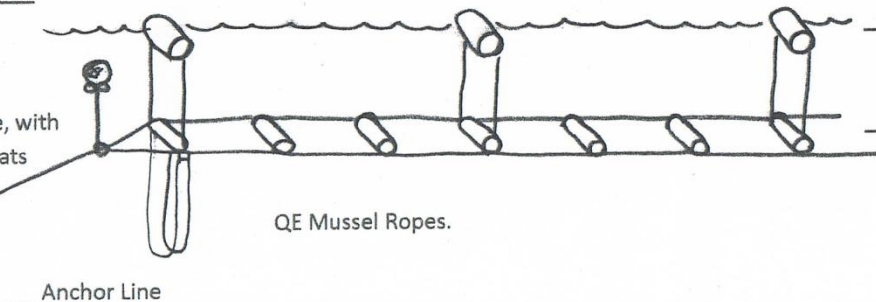
On extreme exposed farm site, with Vertical Surface control Floats and pressurized Subsea Barrel Floats.



300l Surface control Floats.
115l to 180l Pressurized Subsea Barrels.

3. Sub Sea Double Long Line.

On extreme exposed farm site, with Horizontal Surface control Floats and pressurized Subsea Barrel Floats.



300l Surface control Floats.
115l to 180l Pressurized Subsea Barrels.

Turkey



3...Machines and Ancillary Equipment.

- Gantry Cranes.
- Declumpers.
- Auto Seeding Machines.
- Lifting or Inspection Elevators.
- Graders.
- Socking Loaders.
- Cotton Socking Knitting Machine.

For more details on the machines listed please contact directly the manufacturer, ANSCO Ltd. Dave or Murray at, www.ansco.co.nz



Gantry Crane..

- Possible the most 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.
- 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.
- For more information contact Ansko Ltd.



Declumper

- 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.
- New designs incorporating Rope washers and Rope bagger as all part of the one unit.
- It is important not to underestimate the water requirements for this type of machine.
- Manufacturer, Ansko Ltd.



Auto Seeding Machine

- This is a typical design, the bin size shown is a ANSCO 650l bin. However any size bin is possible.
- Seeding density is controlled by the Hoper 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 feed constant tension into the machine and the Mussel Seed (Spat) must be singulated so we constant flow around the Grow Out Ropes.
- The Seeding Pipes and Seeding Cone must be maintained to a high level of polish and care.
- For more information contact Anasco Ltd.



Lifting or Inspection Elevators.

- After the Declumper, there are many combinations available. You can either have the mussels fall straight into a Bin, or be Elevator lifted into Bag/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 Ansco Ltd.



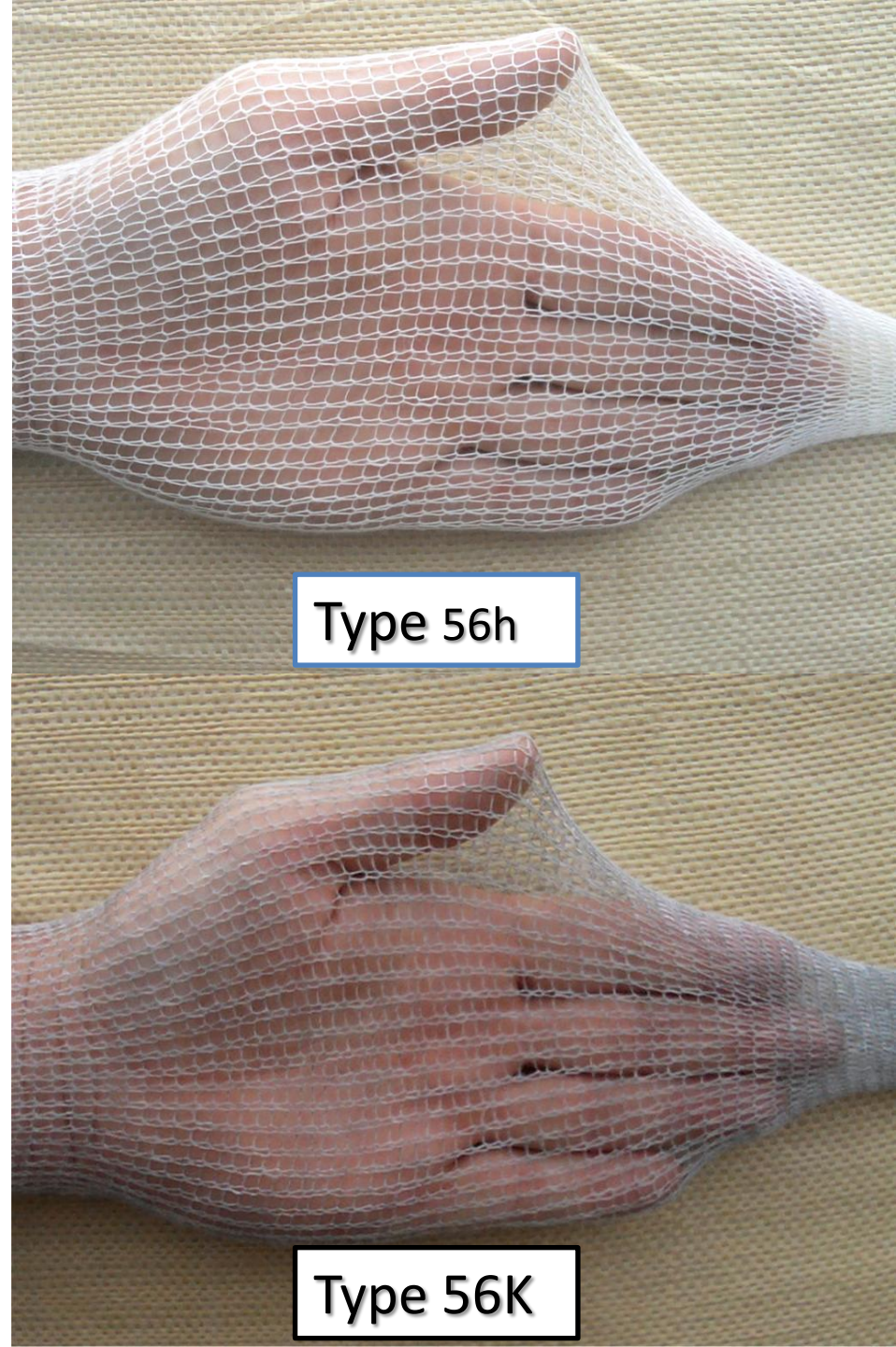
Graders.

- There are two main types of graders, the Scroll type or the Roller type.
- The more preferred Graders today is the Roller graders. They are capable at running at high speeds and havingg a greater range of width measure. From 0mm to 25mm.
- The Scroll type is considered the more accurate but is relatively low in capacity, especially on small spats.



Mussock Cotton

- Andy Joins from Mussel Products Ltd was one of the earliest pioneers in developing the continuous Mussel Socking technology. Known to the industry as “Mussock”. This design of cotton knit allows the cotton to easily stretch over the Auto seeding pipes of 110mm diameter and then draw down very quickly to hold even the smallest of spats to the Mussel Ropes.
- Any combination of size and grade of cotton is possible but the industry globally has generally settled on 3 main formats.
- 56H, Standard lay flat of 330mm, 100% cotton and constructed from 1/16 threads.
- 56K, Standard lay flat of 330mm, 85% Cotton and 15% Polyester. Constructed from 1/20 threads.
- 56KHP. Standard lay flat of 330mm, 65% Cotton and 35% Polyester. Constructed from 1/20 threads.
- For More information contact Andy on www.mussock.co.nz



Type 56h

Type 56K

Cotton Specifications

Book Code	Type	Description	Package
MUSSOCK 56H/330	Cotton	100% Cotton, 56h x 330w specification with 1/16 filaments. Natural White. Seeding yield 160mtr per Kilo approx.	Plastic Bag
MUSSOCK56K/330	Poly Cotton	85% Cotton, 15% Polyester, 56k x 330w specification with 1/20 filaments. Grey Colour, Seeding yield 200mtr per Kilo approx.	Plastic Bag
MUSSOCK44KHP/330	High Poly Cotton	65% Cotton, 35% Polyester, 44k x 300w specification with 1/20 filaments. Natural White. Seeding yield 200mtr per Kilo approx.	Plastic Bag

Specifications can be changed to suit customers own requirements.

www.ge.co.nz

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 Ltd.



New Zealand



4...Pictorial of Vessels from the modern Mussel Industry.

- Important Points.
- This system can be scaled to suit any level of operation. It is the farmers choice as to the level of commitment that is required to meet his expectations.
- All ways consult with the engineers as to the Hydraulic requirements. It is important there is clear understanding from the beginning.
- Also it is important not to underestimate the water pumping requirements. Again I suggest you make sure this is discussed with the engineers.



New Zealand



New Zealand



New Zealand



New Zealand



Australia



Turkey



Ireland



Scotland



Scotland



France



Chile





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