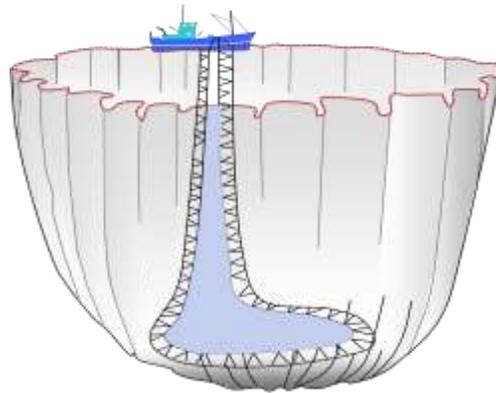


GEAR TECHNOLOGY NOTE – Encircling Gear

This type of gear is where the net is in a circular form to enclose a shoal of fish or a large area of water / seabed, gradually closing up the circle until the fish enclosed within it are captured.



Purse seine being closed up by 60m vessel

Ring Net	<i>Net operated by surrounding a shoal of pelagic fish with a “wall” of netting, sometimes operated by two boats.</i>
Purse Seine	<i>A large net used to surround a shoal of pelagic fish, the bottom of which is then drawn together to enclose them</i>
Beach Seine	<i>An encircling net shot from a small boat then drawn ashore by ropes.</i>
Anchor Seine	<i>An encircling net shot in the open sea using very long ropes to lay out the net and ropes on the seabed prior to hauling from a boat at anchor. Sometimes called Danish seine.</i>
Scottish Seine	<i>An encircling net shot in the open sea using very long ropes to lay out the net and ropes on the seabed prior to towing the net closed and hauling from a boat under its own power. Sometimes called fly dragging or fly shooting.</i>
Pair Seine	<i>Originally a seine net that was shot by one vessel then towed between 2 vessels for several hours before being hauled by one vessel as a seine net. It has developed into a version of pair trawling – see pair trawl for more details.</i>

Seine Net

The seine net method of fishing dates from around 1848 in Denmark where it was first used to catch plaice. The principle of the operation of seine net was that of using ropes to keep the net open and herd the fish towards the net. It originates from the beach seine, then shot from an anchored sail boat with longer ropes which were all hauled by hand.

With the coming of power driven boats with winches aboard, longer ropes and larger nets could be worked with smaller crews. In the 1920s Danish anchor seining was introduced to Scotland but they quickly dispensed with the anchor by using the vessel's own power to maintain its position while hauling the ropes and net. This method called fly shooting, proved more successful for catching round fish (whiting, haddock, cod etc).

Fly dragging is a very skilful operation requiring extensive knowledge in locating fish within the grounds, accurate rigging of the gear and consideration of tidal streams with relation to the gear throughout the shooting, towing and hauling operation.

The modern seine net vessel can work anything up to 16 coils of rope each side of the net. Each coil consists of 120 fathoms (220m) of lead cored, abrasion resistant rope, from 19mm up to 32mm diameter depending on the size of vessel. One end of the ropes is shot, with a dhan [buoy] attached. The vessel then steams round in a triangular shaped course shooting one side of the ropes, dropping the net half way round before shooting the second side of ropes, finishing close to the dhan, picking it up, leading both ropes to the winch and starting to tow the gear. The vessel will tow until strain is on both ropes, then engage the winch to begin heaving slowly. At this stage the vessel is moving ahead at about one or two knots, the winch speed is gradually increased from 50ft per minute to begin with to about 300 ft per minute, when around half the ropes are in and the gear has closed up. At this stage the vessel is maintaining its position or getting hauled astern by the net.

When all the ropes are in, the net is usually hauled aboard using a power block, the fish emptied into a deck pound or hopper and the gear made ready for the next shot. Originally the ropes were coiled on deck but nowadays they are usually stored on large reels. When the vessels had open decks with coils of rope snaking across the deck and over the side this was a fairly dangerous method of fishing but with the advent of rope reels and shelter decks, allowing the ropes to be shot well clear of the crew, safety has been dramatically improved. It is a more fuel-efficient method than trawling and usually yields a better quality of end product due to the short time that the fish are in the net before being taken aboard the boat. As it becomes more mechanised with rope reels, more powerful winches and power blocks and improved rope construction, the skippers are tending to work harder bottoms and deeper water in an attempt to improve catches.

Purse Seine

The purse seine is used mainly for catching dense, mobile schools of pelagic fish and includes all the elements of searching, hunting down and capture. The schools of fish are surrounded and impounded by means of large pursed surround nets called either ring nets or purse seines according to design. A purse seine is a wall of netting with a mesh size to suit the target species and a headrope carrying numerous floats to keep the net on the surface. The net is equipped with rings (purse rings) along its lower edge through which a special cable (purse wire) is passed to enable the fisherman to close off the space surrounded by the purse seine from below, preventing the fish from escaping downwards and forming a bowl-like shape of net in the water containing the fish.

After the closure of the net by hauling in the purse line the net is gradually hauled aboard using a power block and net stacking system. The size of the bowl like shape is slowly reduced leaving the captured fish to accumulate in the strengthened part of the net (the bunt) ready to be taken aboard the vessel using a brail or more commonly nowadays a pumping system. While the fish are being pumped aboard, the vessel is kept clear of the net using side thrusters or towed clear of the net by another vessel because as the net is hauled there is a tendency for the boat to be hauled into the middle of the net. Once all the fish are aboard the vessel, the net is hauled aboard and made ready for the next shot.

The origins of the purse can be traced back to one of the most basic types of fishing gear, the beach seine, which has been used through the ages almost all over the world. A deep beach seine operated offshore could be regarded as an early ring net, made deeper still and fitted with primitive purse rings and purse line it could be regarded as an early purse seine.

Purse seines are operated throughout the world by vessels of almost any size, from large canoes (6m long) in Israel and Africa right up to ocean going tuna seines (100m long) with the size of net adapted to suit the vessel size, degree of mechanisation and target species. Both nets and boats have evolved to suit local conditions.

The pursers in Northern Europe (Scotland, Ireland, Norway etc) mainly target mackerel, herring and scad, further south in the Mediterranean they are commonly used to catch sardine, anchovy and tuna.

In the tropical waters of the Atlantic and Indian Oceans large ocean going seiners, based mainly in France and Spain, target tuna.

Modern vessels tend to be designed to deliver a quality product rather than excessive quantity to the market. They are built with the ability to steam faster to reach the best markets as quickly as possible storing the catch in refrigerated seawater tanks (RSW) to keep them in good condition. The latest class of seiners are designed to be more versatile with the ability to pelagic trawl as well as purse to cope with the changing behaviour patterns of the fish.

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