

Queen Mary 2 Technical Information

Key Dates:

Project Announcement:	June 8, 1998
Letter of Intent Signed:	March 10, 2000
Contract Signed:	November 6, 2000
First Steel Cut:	January 16, 2002
Keel Laid:	July 4, 2002
Mast Coin Ceremony:	March 16, 2003
Float Out:	March 21, 2003
Shipyard Sea Trials:	September 25-29, 2003
Owners' Sea Trials:	November 7-11, 2003
Naming Ceremony:	January 8, 2004
Maiden Voyage:	January 12, 2004

Technical Data:

In order to propel *Queen Mary 2* at speeds of up to 30 knots (34 miles per hour), a great deal of power and technology is needed. The ship is powered by an advanced, environmentally friendly plant and electricity generated by four diesel engines and two gas turbines.

Gas Turbines:

The gas turbines are situated below and behind the funnel because of their requirement for large air intake. Such a location reduces the need for space being taken up by ducting. The two General Electric LM2500+ gas turbines will generate 25MW of electricity each, which is equivalent to 81,000 shp. They run at 3,600 rpm and turn a generator through a reduction gearbox. The turbines burn marine gas fuel oil and are generally only run when the ship needs to achieve higher speeds.

Diesel Engines:

The four diesel engines generate electricity and are located low down in the ship due to their size and weight. Each engine is 12.5 metres long, 4.4 metres wide, 5.5 metres high and weighs 217 tons. The diesel engines were built by Wartsila and are V engines with 16 cylinders. They have a bore of 460mm and a stroke of 580 mm. Each engine runs at 514 rpm and produces 16.8 MW of power. They run on conventional heavy fuel

oil. The engines are of the enviro-engine design that uses commonrail technology utilising water injection into the chambers to reduce noxious emissions.

Mermaid Pods:

Queen Mary 2 features four Mermaid pods built by Rolls Royce-owned Kamewa and Alstom Powers Motors. She is the first passenger ship to be driven by four pods. The forward two pods are fixed in place while the aft two are able to turn through 360-degrees to steer and manoeuvre the ship. Each of the pods weighs 250 tons – the largest and most powerful ever made at 21.5 MW each. This gives a total propulsion power of 86 MW. The pods are individually hydrodynamically shaped to help attain the speeds required of *Queen Mary 2*. Unusually, the propellers themselves are stainless steel and have a highly skewed fixed pitch.

Thrusters:

Queen Mary 2 has three thrusters of 3.2 MW each allowing the ship to turn in her own length in port without the use of tugs. These operate with a fingertip touch by an officer on the Bridge. The total plant is capable of producing nearly 118MW of electricity – that is about twice the power of a 100,000-ton conventional cruise ship.

Speed:

Normal cruising speed: between 24 and 26 knots (approximately 30 mph) with the power being obtained from the four diesels.

Maximum speed: approximately 30+ knots (34.5 mph), which is obtained from both the diesels and gas turbines.

Stabilisers:

Queen Mary 2 has four 'VM Series' folding fin stabilisers built by Brown Brothers of Edinburgh, Scotland. They are a one-piece, passive-type design (which means they don't have flaps) and when combined reduce the ship's roll by 90%.

Each stabiliser:

- weighs approximately 70 tons
- is 8.2 feet wide
- extends beyond the ship's side by 20.5 feet
- has a surface area of 168 square feet
- provides 1070 kN lift
- takes approximately 30 seconds to extend or house

Anchors:

There are three 23-ton anchors provided, two working and one spare – the latter mounted on top of the forward end of the breakwater. The U3 anchor chains are collectively 843 yards long of 4.5 inch section, 2 weigh 273 tons and have a breaking strain of 9300kN.

Dynamic Positioning:

Queen Mary 2 is the most technically advanced ship ever built with regard to manoeuvre control. She is capable of being manoeuvred by a single joystick on the bridge that can move the ship sideways or at an angle or even keep station over a fixed spot on earth by use of satellite and wind gauges. The system involves the pods at the rear of the ship and the bow thrusters.

The Bridge:

The bridge of *Queen Mary 2* is almost 164 feet wide. Equipment was provided by Kelvin Hughes. Flat screens are used to show radar, navigation displays, safety management systems, manoeuvring systems, power management displays, water consumption, ballast transfer and weather systems. All the same screens can be inter-switched at the operators' discretion. Close-circuit camera pictures show in the corner of the screens a picture similar to picture-in-picture television.

QM2's Whistles:

Queen Mary 2 has two traditional 'Typhon' style whistles that are located at the forward end of the funnel. The starboard side whistle is an original from *Queen Mary*, which was mounted on that ship's middle funnel. Since *Queen Mary* became a hotel and attraction in Long Beach, CA, the whistle had been in storage inside the ship. The whistle was offered on permanent loan to Cunard and has been reconditioned by the original manufacturers, Kockums Ab of Sweden. A replica of the whistle was ordered as part of the shipbuilding contract and the original and facsimile are now mounted on the funnel on small platforms. The two whistles sound a characteristic deep bass 'A' note are now driven by 30 bar compressed air from the diesel engine start air system rather than by steam. The sound can be heard up to 10 miles away.

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