

STAINLESS STEEL FOR SAILING

WHITE PAPER

Stainless steel, which has now clocked up 100 years of valuable service to industry, has become a vital resource for a wide range of applications, not least as a result of its exceptional capability to resist corrosion. This article looks at the rise of stainless steel, how manufacturers have used it to solve a series of problems for their customers and, in particular, how Ormiston Wire advanced the replacement of galvanised steel with stainless steel in the yachting industry over 50 years ago.

It was Harry Brearley's experiments in adding varying levels of chromium to steel that resulted in the development of stainless steel in 1913. A key property of stainless steel is its resistance to corrosion; the thin oxide layer on the steel's surface, which forms due to the level of chromium (at least 10.5%), effectively causes a protective barrier against corrosive environments.

As a result of this resistance, stainless steel was soon adopted for hygiene-critical products, such as stainless steel cutlery, surgical scalpels and tools, before being applied in the manufacture of surgical implants, chemical tanks and fermenting vessels in breweries.



In the 1930's stainless steel was increasingly popular in kitchens, where it became the material of choice for sinks, instead of the traditional porcelain-enamelled cast iron. And as the century moved on stainless steel was capitalised upon to provide more robust machines and equipment across industry, from motor vehicles to the oxygen tanks that helped Hilary and Tensing to conquer Everest.

Over the last century, Ormiston Wire has brought stainless steel to many applications, some very ordinary, and some extraordinary, such as weird and wonderful artistic sculptures. In 1957, Ormiston Wire pioneered the replacement of galvanised steel with stainless steel in the yachting industry, a welcome innovation and one that was not easy to introduce, since poor specification had given stainless steel a somewhat bad reputation in the marine industry during the early years.

As was commented upon in the March 1957 edition of *Yachting World* by the appropriately-named reported Peter P. Riggs, rigging such as lower shrouds and spinnaker halyards need replacing every few years at least.

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Stainless steel was identified as a cost-effective option that would pay off in the long term if correctly specified but only the correct grade, 18/8 (18% chromium, 8% nickel) was suitable. However, because nickel was scarce in the post-war years, 18/8 grade stainless steel was prohibited for home-market yacht rigging customers until 1953 by a Ministry of Supply Order. In the absence of 18/8, many unsuitable grades of stainless steels were applied within the yachting market,

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which inevitably lead to many problems and, ultimately, a growing mistrust of stainless steel ropes in the marine sector.

The corrosion-resistant oxide film generated by stainless steel is broken down by prolonged stationary contact with damp wood, rope and sailcloth if the grade is incorrectly specified. This is known as shielding or contact corrosion. Another weakness of the poorly specified ropes was fatigue, which caused needling (strands breaking and sticking up). However, as Yachting World reported, Ormiston Wire came up with a solution. "After considerable research," Peter R Riggs said, "a London firm has now developed a grade of stainless ropes to be known as 'Ormarine' which largely overcome all the common faults. The stainless used in their construction is 18/8 containing molybdenum, which has been found to give a considerable immunity against contact corrosion. The ropes suitable for standing rigging are of anti-corrosion construction with a very high initial

polish. Wires for flexible rigging are in 7 x 19 construction carefully processed to eliminate needling and should give service previously not expected from flexible stainless ropes. During extensive tests on these new ropes excellent results have been obtained... it certainly seems that stainless rigging may now well be a very much more economical and attractive proposition than the traditional galvanised steel rigging."

And Ormiston Wire continues to provide reliable service to customers in the marine industry.

At the Redgrave-Pinsent rowing lake in South Oxfordshire there were corrosion problems with the existing rowing lane cables, which had been incorrectly specified. Ormiston Wire was brought in to solve the problem because of its extensive experience in supplying lane cable assemblies to prestigious rowing venues such as Dorney Lake, where British rowers scored such success in the London 2012 Olympics.

Ormiston Wire supplied 250 metre lengths of stainless steel strands, with interchangeable stainless steel ferrules every 12.5 meters. The ferrules feature a swaged eye one end and a fork the other. The 1.5 meter buoy lines feature a snood clip one end and a soft eye the other, which enables them to be easily changed or serviced. It also ensures automatic release from the strand in the event of a collision, thus preventing damage to the whole lane. The lane assemblies have a projected ten-year lifespan and have been successfully in place now since 2012.

As specifiers in all industries have discovered, stainless steel is a powerful ally but only when correctly specified, since its contact with other elements affects its capability to resist corrosion. Suppliers such as Ormiston Wire, with centuries of experience, can get the specification right first time and bring enhanced efficiency to any application.

