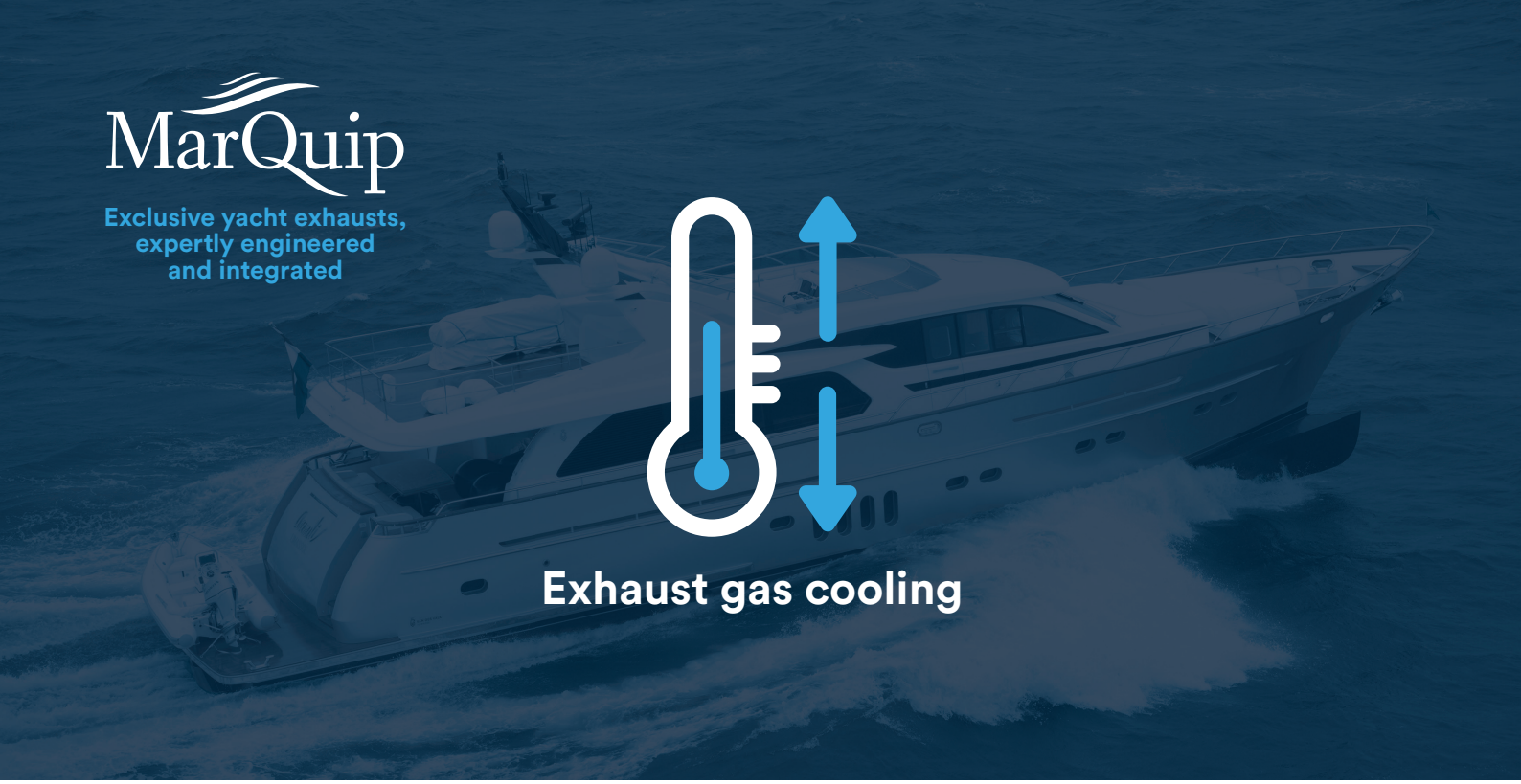
MarQuip

Exclusive yacht exhausts, expertly engineered and integrated



Exhaust gas cooling

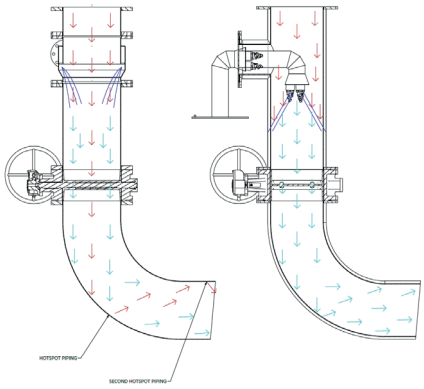
Exhaust gas cooling

In the water injection piece, the hot exhaust gases are cooled through the injection of seawater: a spray nozzle is used to cool them down from the inside out. This gives us a much greater control over the size of water droplets, making the cooling of exhaust gas more effective by avoiding hot spots in the pipe.

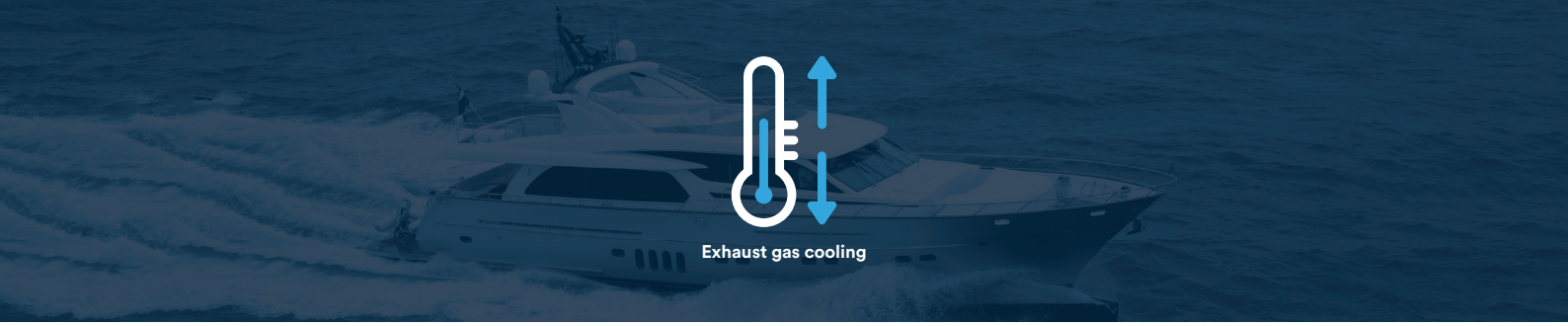
The diagram shows a system in which cooling water is unable to reach the centre of the piping, allowing hot gases to pass without cooling. On the right we see the same injection pipe with an injection nozzle configuration. This clearly shows how hotspots are prevented by breaking up the exhaust gas stream and cooling from the inside out.

The nozzles have a relatively large free passage to prevent clogging. A dual-cone spray pattern of small droplets ensures fast and efficient cooling and the best soot washing capacity.

All nozzles are tested before being installed inside an injection piece. The tests consist of a visual check of the spray pattern at different pressures to assure no back spray occurs.

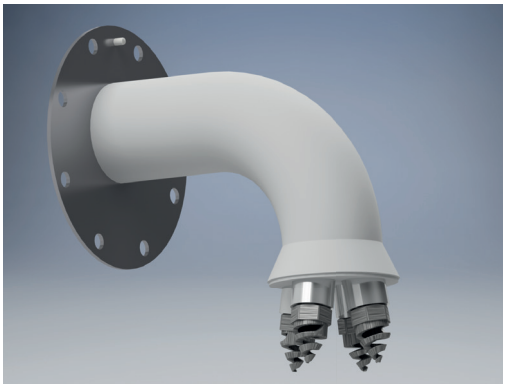


This illustration shows a possible negative side effect of the water ring.



Nozzles which pass the test are provided with a certificate and stamped for traceability. Here is an example illustration of a water injection piece and an injection rod which holds the nozzle.

Water injection piece for a main engine, including relatively large bypass pipe.



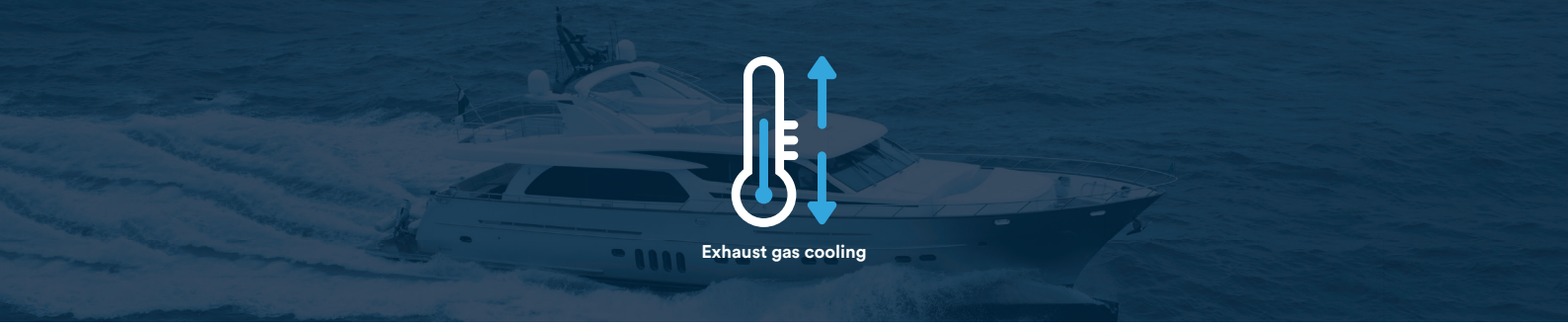
Typical injection rod with nozzle.

Materials and corrosion resistance

The water injection piece is produced in stainless steel 304 (1.4301), 316 (1.4401 - 1.4436) and high-grade stainless steel (HGSS). Commercial considerations mean MarQuip never discloses the exact composition of our HGSS.

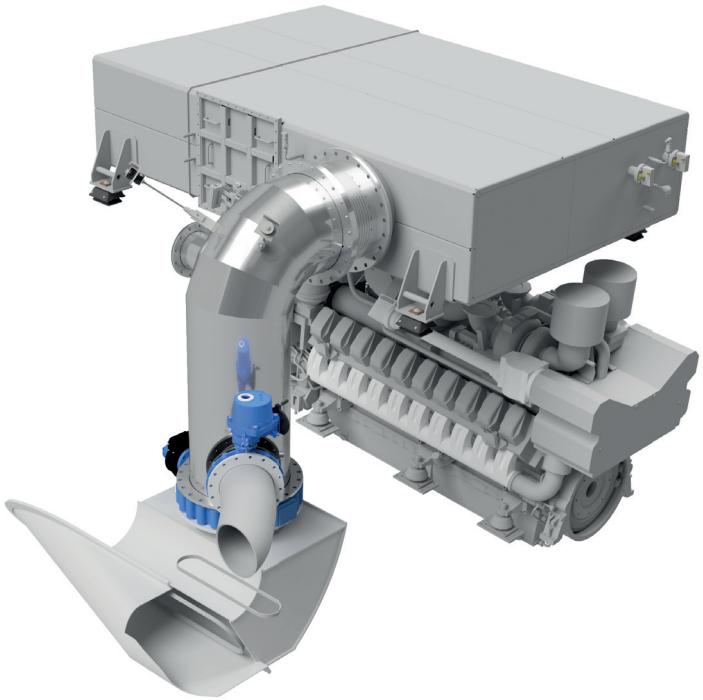
Stainless steel 316 is used for both welded flanges and certain piping parts which are not in contact with the injected sea water. Stainless steel 304 is only used in combination with HGSS stub ends, and never comes into contact with exhaust gases or injected water.

All parts that might come into contact with seawater are made of HGSS, an austenitic stainless steel designed for maximum resistance to corrosion. Containing high levels of chromium, molybdenum and nitrogen, HGSS is especially suitable for high-chloride environments such as brackish water and seawater.



Exhaust gas cooling

The presence of a crevice on a stainless steel surface greatly reduces resistance to chlorides. It is difficult to avoid crevices in construction and operation, although good design and conscientious maintenance can help. As with pitting, high levels of chromium, molybdenum and nitrogen in HGSS retard crevice corrosion. The water injection pieces are welded in conformity with quality standard NEN 5817 Class B.



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