

Actuators in stainless steel

Since the beginning of the offshore industry one of the main challenges has been corrosion due to the salt laden atmosphere. Valve actuators have traditionally been a focus point as they are often exposed to atmospheric conditions without any protection.



This image shows a fully stainless steel actuator during the final assembly in a workshop at Elland.

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Over the years specifications have been developed which require exposed external components such as fasteners to be made from 316 St.St. Other grades of stainless steel such as 304 St.St. have been found to be unsuitable for a salt laden environment.

Traditionally diaphragm actuators components such as the yoke and the diaphragm case have normally been made from carbon steel, which in itself, if not treated, is subject to high levels of corrosion. Over the years paint systems have been developed to protect exposed components from the atmospheric conditions. These days, most EPC's have their own paint specification which generally states the requirements for the application, thickness and number of coats of the paint system.

When applying the paint, actual component design also impacts on the effectiveness of the coating system. For example, paint applied to right handed corners will tend to stretch and pull away from the corners when it is drying.



It is not only important to apply the right paint and paint system at the factory but also maintain the paint when the valves are offshore. Invariably when valves are being installed, no matter how much care is taken, the paint will be chipped or damaged. If it is not repaired in a timely manner then the damaged area becomes a point of weakness which could ultimately lead to penetration of the steel (typically as shown above). Maintaining the paint system is therefore an important aspect for long term offshore functionality.

Although less severe, onshore valve applications can also be subject to corrosive environments, especially when the valves are near the coast or in a tropical environment. Although invariably paint systems last much longer, they still need to be maintained or ultimately events as depicted in the picture below can occur.



Historically actuators manufacturers have shied away from manufacturing diaphragm actuators in stainless steel mainly due to the prohibitive costs of manufacture, however, given the positive benefits of manufacturing a fully 316 st.st. actuator Weir have now released a competitively priced 316 St. St. version of their diaphragm actuator.

This means no special painting, no paint damage and no long term paint maintenance, but most importantly no concerns about perforation due to corrosion which ultimately improves plant reliability.

ProMetal A/S is one of the only suppliers of diaphragm actuators in stainless steel in Denmark.

[Please contact ProMetal A/S for further information regarding the new actuators.](#)

The original article is written by Adrian Croft, Weir Valves & Controls UK and can be found [here](#).

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