

INSTALL+™

Dual Certified (BS EN 10255 & 10217-1)

Life expectancy and corrosion prevention

Our robust and reliable steel conveyance products have earned their reputation for quality over many decades.

Our INSTALL+™ (dual certified to BS EN 10255^[1] & 10217-1^[2]) products build on the success of our INSTALL™ brand, which has been used in many installations over many years throughout the world and has consistently given long service life*.



INSTALL+™ life expectancy

Life expectancy

The lifespan of any carbon steel tube is dependant on:

- The specific service conditions
- A satisfactory installation practice
- A proper maintenance practice
- The use of appropriate corrosion protection, inhibitors or other suitable system additives

In situations of poor installation practices, premature failure may occur, due to adverse conditions. Normally, properly installed and protected carbon steel tube would be expected to have a service life in excess of 20 years.

This view assumes that:

- The tube is properly installed in accordance with best practices and with any standards or regulatory requirements
- No aggressively corrosive fluids are introduced into the system
- Levels of corrosion inhibitor and additives are adequately maintained
- The service conditions are maintained throughout this period
- Any protective coatings are applied in accordance with coating manufacturers instructions
- Any breach of such coatings is made good before any corrosion can take place

* **NOTE:** The working life of any system depends upon its inherent durability and the prevailing environmental conditions. A clear distinction should be made between the (declared) working life for a product, based on the assessment of durability in technical specifications, and the actual working life of a product. The latter depends on many factors beyond the control of the tube manufacturer, such as installation design, environmental location, handling, use, and maintenance etc.

Corrosion prevention

The combined presence of oxygen and moisture is normally necessary for corrosion of carbon steel to occur. Several environmental factors will have an effect on the rate of corrosion, such as the fluid involved, it's flow rate, temperature, pH, dissolved oxygen and carbon dioxide contents, whether the system is closed or open etc. For water conveyance, soft or hard water content, the presence of bacteria and use of corrosion inhibitors etc are also relevant. The interaction between these various factors is complex.

Longevity will be improved for particular applications by using red-painted or galvanised tube. Galvanised tube provides improved corrosion resistance as the protective coating is applied to both external and internal surfaces. Note that BS EN 12502^[3] gives guidance on the likelihood of corrosion of galvanised products in water distribution and storage systems.

Galvanising protects steel sacrificially; in contact with a conducting aqueous solution, zinc behaves as a cathode whereas steel acts as an anode. In this way, even bare carbon steel areas are protected. However, at temperatures around 60°C a polarity reversal occurs such that any exposed carbon steel corrodes preferentially to zinc. For this reason, galvanised tubes are not recommended for hot water systems, especially in soft water areas.

The presence of certain types of bacteria can also result in the rapid corrosion of galvanised tube in cold-water conditions. Generally soft water conditions are more corrosive than hard water conditions.

Galvanised tubes should not be used in contact with copper based alloy tubing, fittings or washers, due to possible galvanic corrosion reaction.

INSTALL+™ galvanising specification

INSTALL+™ tube is hot dip galvanised in accordance with BS EN 10240^[4] (quality B.2 or A.1)/BS EN ISO 1461^[5]. The minimum external coating thickness (quality B.2) is 40 microns with a typical coating thickness normally 55-75 microns. The composition of zinc shall not contain impurities (other than iron and tin) exceeding 1.5%.

Where A.1 quality is specified the chemical composition of the galvanised coating shall not exceed: lead 0.8 % max, antimony 0.01 % max, arsenic 0.02 % max, bismuth 0.01 % and cadmium 0.01% max.

INSTALL+™ galvanised tube is NOT passivated after the galvanising process. Under damp storage conditions, prior to or post delivery, white rust can form on galvanised coatings. The formation of white rust, although unsightly, has no significant effect on the service life of the product.

For particularly arduous conditions, where preferential corrosion of the weld line, sometimes known as groove or trench corrosion, has been known to occur, the use of INSTALL+™ tubes with EN 10240^[4] Quality A.1 galvanizing should be considered.

INSTALL+™ tube is supplied with significantly lower sulphur levels than the EN 10255^[1] maximum limits. It is supplied in sizes up to 125mm nominal bore in the stretch reduced condition, ensuring a consistent microstructure around the tube including the seam weld.

Quality A.1 guarantees an internal coating thickness of 55 microns and tubes are supplied with internal weld bead treated (maximum bead height 0.3mm + 0.05 x nominal tube thickness) thus avoiding the potential formation of anodic areas that would be necessary for galvanic corrosion to occur.

References

- [1] BS EN 10255: 2004-A1: 2007 Non-alloy steel tubes suitable for welding and threading. Technical delivery conditions.
- [2] BS EN 10217-1: 2002-A1: 2006 Welded steel tubes for pressure purposes. Technical delivery conditions. Part 1: Non-alloy steel tubes with specified room temperature properties.
- [3] BS EN 12502-3: 2002 Protection of metallic materials against corrosion. Part 3: Guidance on the assessment of corrosion likelihood in water distribution and storage systems. Influencing factors for hot dip galvanised ferrous materials.
- [4] BS EN 10240: 1998 Internal and/or external protective coatings for steel tubes. Specification for hot dip galvanized coatings applied in automatic plants.
- [5] BS EN ISO 1461: 2009 Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods.

Corus Tubes

PO Box 101
Weldon Road
Corby, Northants
NN17 5UA
T: +44 (0)1536 402121
F: +44 (0)1536 404111

www.corusgroup.com/conveyance
marketing@corusgroup.com

Care has been taken to ensure that this information is accurate but Tata Steel Europe Limited and its subsidiaries, does not accept responsibility or liability for errors or information which is found to be misleading.

Copyright 2009
Corus