



3.4 Corrosion prevention

Steel's versatility as a construction material allows items fabricated from XLERPLATE® steel to be subjected to a wide range of service environments. The service environment determines whether there is a need for the protection of XLERPLATE® steel against corrosion and which corrosion prevention method should be used. Other factors to be considered include the required service life of the structure and whether an increased thickness of XLERPLATE® steel can be designed into the structure to make allowance for corrosion.

The various environments to which structural steel is exposed can be broadly categorised as follows:

- Interior atmospheric (buildings, containers)
- Exterior atmospheric
- Immersed (salt and fresh water)
- Buried in soil
- Chemical (fume, splash, solids and immersion)

As a general rule, corrosion is negligible in atmospheric environments where the relative humidity is below 60-70% at normal temperatures and where the steel is not contaminated with salts. Therefore, XLERPLATE® steel within buildings and containers and in dry, rural environments does not require corrosion protection and surface treatment is carried out for aesthetics only.

For other atmospheric environments where moisture, airborne contamination and corrosion may be significant, the best approach to corrosion prevention usually involves the use of protective coatings.

AS/NZS 2312 'Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings', provides comprehensive advice on the selection and specification of various coating systems including organic coatings, galvanising and hot metal spray. It also provides advice on corrosiveness of various atmospheric environments in Australia and New Zealand and on structural design to minimise the effects of corrosion. Advice can also be obtained from protective coating manufacturers on the selection of coating systems for various environments.



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XLERPLATE® steel subjected to immersion in salt and fresh water can be at risk to higher corrosion rates, however, organic coatings such as high build epoxies and vinyl esters applied over abrasive blast cleaned surfaces have provided good service life. Galvanising can also be effective in fresh water as can corrosion inhibitors in re-circulating non-potable fresh waters.

Corrosion rates of XLERPLATE® steel buried in soils are largely dependent on soil chemistry and on the availability of atmospheric oxygen at the steel surface. Compacted soils typically have very low corrosion rates while moist, salt laden loosely compacted soils will have a much higher corrosion rate. Use of protective coatings and encasement in concrete can substantially reduce corrosion. A number of proprietary processes are available for the protection of pipelines including shop-applied coatings and cathodic protection.

There are numerous chemicals and chemical environments in the form of gases, solutions and solids that can have different effects on the corrosion of steel.

Although many chemicals are not corrosive to XLERPLATE® steel, specialist advice should be obtained from chemical suppliers before exposing structural steel to a chemical environment.



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