

STEEL Fact File

An information source for design professionals

FF1 – Galvanised steel essentials

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Fast Facts

- Manufactured by continuous hot dip galvanising to apply zinc coating to a steel base
- Relies mainly on sacrificial protection which ceases when the zinc is consumed
- Widely used in current form since 1936
- Available in a range of coating classes
- Can be used unpainted, prepainted or field painted
- Application of a primer required for effective paint adhesion
- Thermal performance of unpainted product deteriorates when weathered
- Preferred product solution for cladding in intensive animal farming applications



Galvanised steel purlins



The distinctive "spangle" pattern of galvanised steel

Behind the Facts

Q. What is continuous hot dip galvanised steel?

A. Galvanised steel is mild steel with a hot dipped coating of almost pure zinc. The addition of a small amount of antimony provides its characteristic spangled appearance.

Continuously hot dipped galvanised steel is used extensively in the automotive, whitegoods and agricultural industries as well as in the building sector.

Q. How does the zinc coating work in protecting the steel substrate?

A. The zinc coating protects the steel in two ways, by acting as both a barrier coating and as a sacrificial coating. The overall zinc coating corrodes slower than the steel to which it is applied, so it acts as a barrier to the steel surface. Additionally, where the steel is exposed to the air (ie at cut edges, scratches etc), the zinc coating will also sacrifice itself (give itself up) to prevent the steel from rusting. Over time, the zinc coating will be consumed, leaving the steel unprotected – and that is when red rust begins.





Galvanized steel purlins

Q How is continuously hot dip galvanized different to batch galvanized product?

A. Batch galvanized coating uses pure zinc, and in this process, a very thick iron/zinc compound layer forms in the coating. The result is a coating that is not ductile. Batch galvanising is predominantly used for protecting pre-fabricated steel articles.

Q. What is the expected service life of galvanized steel?

A. The life of galvanized steel will principally depend on the amount of zinc coating applied to the steel (referred to as its coating class or coating mass) and the environmental factors to which the galvanized steel is exposed.

A reliable guiding principle is that in any given environment, if you double the amount of zinc coating (ie double the coating class) you will double the life of the product. The converse is also true. If you halve the amount of zinc coating (ie half the coating class) you will halve the life of the product.

Q. What zinc coating (class) is recommended for exposed applications?

A. Galvanized steel is produced in a range of coating classes – traditionally the most common coating class for exposed applications in the western world has been Z275 – based on considerations of cost, performance and aesthetics. As referred to above

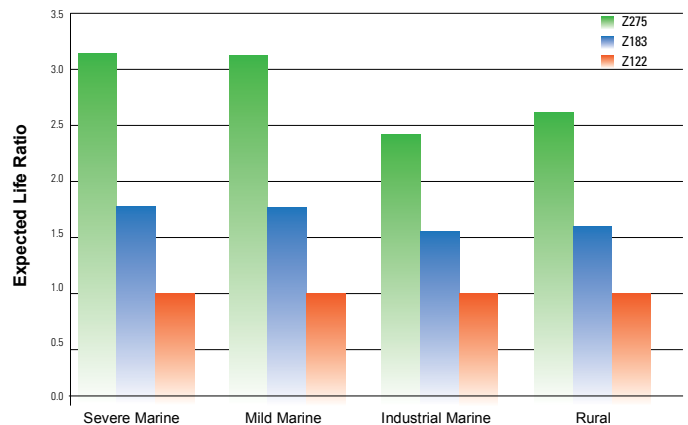


Galvanized steel decking

in 'expected service life', a galvanized zinc coating of Z183 for roofing and walling would severely compromise its performance.

Resistance to Atmospheric Corrosion

Galvanized Steel: Expected Life Ratio Comparison of Z275, Z183 and Z122 Coating Mass



This graph shows the relative differences in expected life of Z275, Z183 and Z122 galvanized steel, after exposure at East Coast Australia test sites, conditions ranging from rural to severe marine.

- Z275 galvanized steel has at least 2.4 times the life of Z122 galvanized steel
- Z275 galvanized steel has at least 1.5 times the life of Z183 galvanized steel
- Z183 galvanized steel has at least 1.5 times the life of Z122 galvanized steel.

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 BlueScope Steel (AIS) Pty Ltd ABN 19 000 019 625

**BlueScope Steel Middle Eastern Agent
 Steel Masters International**

PO Box 17603, LOB 16, Office 617, Jebel Ali Free Zone, Dubai. UAE
 Phone: + 971 4 8872882 Fax: + 971 4 8872884
 Mobile: + 971 50 6242634 Email: mandeep@smi.ae