

6 Materials and finishes

A - Selection table

STANDARDS ENVIRONMENT	Hot-dip mill Galvanised Steel sheet	Electro-zinc galvanising	Continuous pre-galvanised wire	Hot Dip Galvanized after fabrication	Coating on EZ	GEOMET	Aluminium alloy EN AW 5754	Stainless steel 1.4307 (V2A) grade X2CrNi18-9	Stainless steel 1.4404 (V4A) grade X2CrNiMo17-12-2	COATING	
	G	EZ	PG	HDG	ZINC +	500B GM	AG3	304 L	316 L	Epoxy	Polyester
	EN 10 327 BS 2989 ASTMA 653	EN 12329 EN 12330 NFA 91-472 ASTM B633	EN 10244-2	EN ISO 1461 BS 729 ASTM A 123			EN 573 EN 485 ASTM B 275 ASTM B 209	EN 10088-2 AISI 304L ASTM A380 DIN 17440	EN 10088-2 AISI 316L ASTM A380 DIN 17440	ASTM B633	
INDOOR	●	●	●		●					●	
OUTDOOR - URBAN	■	■		●	●	●					●
OUTDOOR - INDUSTRIAL				■	●		■	■	●		●
OUTDOOR - MARINE				■	■	■	●	■	●		●
MINERAL ACID				■		■	■	■	●	■	■
ORGANIC ACID				■		■	■	■	●	●	●
BASES				■		■	■	●	■	●	
HALOGENS							■	■		●	●
OIL & GAS				■			●	●		■	■
FOOD INDUSTRY		■					●	■	■	●	●

● RECOMMENDED ■ POSSIBLE

B - Description

ZINC ON STEEL COATING

• G : HOT-DIP MILL GALVANIZED STEEL SHEET

(EN 10327/ ASTM A653 / BS 2989)

The galvanized steel sheet is obtained by immersing a previously-treated steel sheet in a bath of molten zinc at 450-460°C. The current grade of Z 275 NA is of a thickness of 18-20 µ per face, or 275 g/m² per double face, normal zinc formation N, finishing grade A. Contrary to wide-spread belief, no corrosion is possible in sections of the metal when a galvanized metal sheet of current thickness is sheared or stamped. Iron is protected through the battery phenomenon consisting of the Iron-ZINC ELECTROLYTIC system.

• HDG : HOT-DIP GALVANIZED AFTER FABRICATION

(EN ISO 1461/ ASTM A123M / BS 729)

After a surface treatment, the steel is immersed in a bath of molten zinc. This gives a zinc thickness ranging from 49 to 70 µ depending on the thickness of the metal sheet.

ISO 1461 Zinc thickness (HDG)		
thickness mm	mini thickness of zinc µ	medium thickness of zinc µ
3 < e < 6	55	70
1,5 < e < 3	45	55
e < 1,5	35	45

• ZINC + : COATING ON EZ

This special zinc protection process allows a better corrosion resistance than hot-dip galvanization (saline spray test ISO 9227: 1500 hours). Appearance : silk finish. No droplets after drying.

• EZ : ELECTRO-ZINC GALVANISING

(EN 12 329- EN 12 330 - NFA 91472/ ASTM B 633)

Electrolytically, a zinc coating is deposited on the steel. The baths used consist of acid alkali solutions of zinc salts. The anodes are in zinc (generally to 99.99 % of purity) and the parts to coat, previously degreased and cleaned, are connected to the cathode.

After galvanizing, the parts are chromed to increase the protection.

• PG : CONTINUOUS HOT-DIP GALVANISED WIRE

(EN 10244-2)

The wire is continuous hot dip galvanized (220 g of zinc/m²).

Then a wire drawing is processed in addition. For UNIFIL products, this is a very economic and high corrosion resistance proceeding.

• GEOMET 500 B :

Geomet components are very thin strips of zinc and aluminium into a mineral binder. This structural passivation allows a better corrosion resistance than hot-dip galvanization (saline spray test ISO 9227: 1000 hours).

ZINC LOSSES THROUGH CORROSION :

Industrial environment : 5 - 10 µ / year
Urban environment : 3 - 7 µ / year
Sea environment : 3 - 8 µ / year
Rural environment : 0,8 - 1 µ / year

WHITE RUST

Under what conditions does white rust appear ?

A fast oxidation is needed, either under a heterogeneous film of water, or under permanent condensation (for example by differential aeration). This fast oxidation can be local or general. It is the precipitation of basic salts of zinc Zn (OH) 2. These basic salts are powdery, not very adherent and provide no protection. However, they quickly combine with components of the surrounding air to form a protective layer of basic zinc carbonate. The basic salts formed are not very soluble in water and they accumulate in the surface patina until reaching a state of balance between their elimination in the form of soluble salts and their generation by oxidation of the metal.

White rust has no effect on zinc coating lifetime.