Data sheet: EG 1

Electro-Galvanised Steel Sheet

General description

Electro-galvanised steel sheet consists of a cold rolled steel substrate coated with zinc by electrolytic deposition on a continuous line. The electro-galvanising process not only allows accurate control of the thickness of the zinc coating, but also permits the coating of either one or both sides of the sheet, and the coating of different thicknesses of zinc on the two sides of the sheet.

Electro-galvanised steel sheet is intended for applications involving all forming, drawing, stretching and bending processes during the manufacture of articles. A range of coating thicknesses is offered, with a corresponding increase in corrosion protection. The maximum coating thickness is equivalent to that of a Z100 hot-dip galvanised sheet. The selection of a desired thickness of the zinc coating depends on the specific requirements of the application.

Electro-galvanised sheet is suitable for welding provided the substrate meets the relevant requirements. Thick zinc or phosphate coatings may require changes in welding parameters.

Electro-galvanised sheet is eminently suitable for painting, provided the paint manufacturers' prescribed methods for pre-treatment and final coating are adhered to. A phosphate surface treatment also improves the adherence and protective effect of paint coatings applied by the fabricator. A chromate rinse is not recommended for subsequent painting processes.

Normally the drawability and formability of electro-galvanised sheet are functions of the properties of the steel substrate and are equivalent to those of the uncoated cold rolled sheet. Phosphating, in conjunction with a suitable lubricating agent, may improve the workability of the sheet and reduce wear on the working dies.

Steel specifications

Two groups of specifications namely ArcelorMittal South Africa's Drawing and Structural steels with improved formability can be supplied. The electro-galvanising process increases the mechanical properties of the cold rolled steel substrate by approximately 10 MPa. The selection of cold rolled steel substrate grades for specific applications of electro-galvanised sheet should be made with reference to the following data sheets: Cold Rolled Products (file reference B2.1) and Electro-galvanised Products (file reference EG 2 and file reference EG 3)

Strain ageing

Drawing steel range is stabilised and is therefore guaranteed to be resistant to strain ageing for a period of six months. No deterioration in the as supplied mechanical properties due to strain age hardening will take place during this period.

For further information, contact:
ArcelorMittal South Africa Limited, PO Box 2, Vanderbijlpark 1900. T +27 (0) 16 889 9111
https://www.arcelormittalsa.com/Products.aspx

Surface texture

The following textures are available depending on the steel specification.

Table 1. Surface texture

Standard surface	Light matte - general exposed applications
	Normal - general purpose applications
	Matte - unexposed drawing and pressing applications

The standard surface texture permits small imperfections, which do not impair the forming process and the application of subsequent paint coatings.

Surface treatment

Electro-galvanised sheet may be supplied with one of the following surface treatments:

- oiled
- chromate rinsed
- chromate rinsed and oiled
- phosphated
- phosphated, chromate rinsed (oiling optional)
- as coated (untreated)

Surface treatment reduces the risk of corrosion occurring during transport and storage, due to humidity fluctuations, which could cause wet storage stain.

a. Oiled

For severe stamping and drawing applications, such as those found in the automotive industry, the usual post-treatment will be oiling only. It is a prerequisite that the customer has an alkaline bath and a phosphating facility, for cleaning and pre-treatment after fabrication.

b. Chromate rinsed and oiled (double side coated sheet only)

Although available, this surface treatment is not generally recommended where the fabricated articles are to be painted. If the material is to be painted the customer must first consult his paint supplier.

c. Phosphate treatment (double side coated sheet only)

For less severe drawing and bending applications, for example in the manufacturing of domestic appliances, steel furniture and electrical applications, oiling is not normally a requirement. Under normal handling and storage conditions, the phosphate coating available from the ArcelorMittal South Africa electro-galvanising line will provide adequate corrosion protection. The inherent lubrication properties of the phosphate and zinc coatings combined should eliminate the need for oiling of in-process stock, rendering the fabricated panels ready for painting after only a light water based detergent wash.

Please note that the ArcelorMittal South Africa phosphate coating is not intended for alkaline bath cleaning, as the coating will be attacked by the alkaline treatment.

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d. Phosphated and chromate rinsed (double side coated sheet only)

For prolonged storage under more corrosive conditions, for example coastal areas, the phosphate treatment may be supplemented with a light chromate rinse after phosphating. Please note that some paint systems are not compatible with chromate treated surfaces. Compatibility must be verified with the paint supplier.

e. Phosphated, chromate rinsed and oiled (double side coated sheet only)

When the subsequent removal of oil is required, the oiling of phosphated material is not recommended.

f. Untreated

Untreated sheet is primarily intended for continuous coil coating lines. Products are supplied without surface treatment at the express wish of the purchaser only, and the purchaser must accept liability for corrosion and/or scratching of surfaces during de-coiling and handling.

Zinc coatings

Table 2. Zinc coatings.

Coating designation	Description	Nominal coating Thickness per side (micrometres)	Nominal coating mass per unit area per side (g/m^2)	Minimum coating mass per unit area per side (g/m^2)
ZE 25/25	Normal coating	2,5/2,5	18/18	12/12
ZE 50/50 ZE 75/75	Heavy coating	5,0/5,0 7,5/7,5	36/36 54/54	28/28 47/47

Note:
In accordance with international nomenclature, the numerical part of the coating designation is ten times the nominal thickness of the coating, measured in micrometers.

Adhesion of zinc coating

After bending flat through 180° (0-T bend test) at room temperature, the test pieces will show no flaking of the coating further than 6mm from the edge of the test specimen.

Dimensional tolerances

Electro-galvanised sheet is produced to the same tolerances as for cold rolled sheet. Refer to Data Sheet: Cold Rolled Product Tolerances (file reference B1.1).

Coil inside diameter

The standard inside diameter is 610mm.

Certification

Test and analysis certificates are supplied.

Supply conditions

Electro-galvanised sheet is supplied in terms of Price List 148 and ArcelorMittal South Africa's General Conditions of Sale.

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