

## Galvanizing section :



Hot galvanizing is made through immersion of the cold rolled steel sheet in a tank containing zinc in fusion. The ultimate aim is to cover the surface of the cold-rolled coil with a fine zinc layer to protect steel from corrosion.

The hot galvanizing line also has a surface treatment process -chromate treatment-used to increase resistance to corrosion (white rust). Below are the standards of the galvanizing line:

	<b>Thickness</b>	<b>Width</b>	<b>Inner diameter</b>	<b>Max. weight</b>
<b>Line1</b>	0.18 – 2.00 mm	650 – 1250 mm	508 - 610 mm	12T : width 1000 13T : width 1250
<b>Line2</b>	0.18 – 3.0 mm	600 – 1500 mm	508 - 610 mm	23T : width 1000 25T : width 1250 : width 1250

### **a -Standards references and equivalence systems**

The galvanized products are manufactured according to the standards:

EN 10 142 (soft steel)

EN 10 147 (construction steel)

<b>Norm</b>	<b>EN 10 142/00</b>	<b>EN 10 142/90</b>	<b>NFA 36 321</b>	<b>NFA 36 321</b>	<b>DIN 17 162- 1</b>	<b>ASTM A 653- 97</b>	<b>JIS 3302</b>
<b>Symbolic Designation</b>	Dx51 D	GC	Fe P02G	Fe P02G	St 01 Z	CS	SGCC
	Dx52 D	GE	Fe P03G	Fe P03G	St 02 Z	CS	SG CD 1
	Dx53 D	GES	Fe P05G	Fe P05G	St 03 Z	FS	SG CD 2
	Dx54 D	-	Fe P06G	Fe P06G	St 04 Z ou	DDS	SG CD 3
	Dx56 D	-	-	-	St 05 Z	-	-

<b>Norm</b>	<b>EN 10 147/00</b>	<b>EN 10 147/90</b>	<b>NFA 36 321</b>	<b>DIN 17 162-2</b>	<b>ASTM A 653- 97</b>	<b>JIS 3302</b>
<b>Symbolic Designation</b>	S220 GD	Fe E220GD	-	-	-	-
	-	-	C 230	-	SQ-230	-
	S250 GD	Fe E250GD	C 250	St E 250-2Z	CQ-255	SGC340
	S280 GD	Fe E280GD	C 280	St E 280-2Z ou 3Z	CQ-275	SGC400
	S320 GD	Fe E320GD	C 320	St E 320-3Z	-	SGC400
	S350 GD	Fe E350GD	C 350	St E 350-3Z	CQ-340	SGC490
	S550 GD	Fe E550GD	C 550	-	CQ-550	SGC570

<b>Maghreb Steel references</b>	<b>Corresponding to the standard</b>	
	Norm reference	Symbolic designation
MS 2.000	EN 10.142	Dx51 D
MS 2.002		Dx52 D
MS 2.003		Dx53 D
MS 2.004		Dx54 D
MS 2.006		Dx56 D
MS 2.100	EN 10.147	Fe E220 GD
MS 2.125		Fe E250 GD

MS 2.128		Fe E280 GD
MS 2.132		Fe E320 GD
MS 2.135		Fe E350 GD
MS 2.155		Fe E550 GD
MS 2.200	Without normative reference	

MS 2000, MS 2100 et MS 2200 references are the standard products manufactured by Maghreb Steel. Any other designation must be subject to a particular agreement. MS 2.200 class is adapted to corrugated sheets.

### b - Technical and mechanical characteristics

Maghreb Steel references	Elasticity limit Rp 0.2 N/mm <sup>2</sup> or MPA		Resistance to tension Rm N/mm <sup>2</sup> or MPA		Extension to break or 80% (min)		Index of plastic anisotropy r90min			index of cold working n90 min		Garantee of mechanical characteristics(*)
	min	max	min	max	e≤0,7 mm	e>0,7 mm	e≤0,7 mm	e>0,7 mm	e>1,5m	e≤0,7m	e>0,7m	
MS 2.000	Without no specification		270	500	20	22						8 days
MS 2.002	140	300	270	420	24	26						
MS 2.003	140	260	270	380	28	30						
MS 2.004	140	220	270	350	34	36	1.4	1.6	1.4	0.17	0.18	6 months
MS 2.006	120	180	270	350	37	39	1.70	1.90	1.70	0.20	0.21	
MS 2.100	220		300	Min+140	18	20						
MS 2.125	250		330	Min+140	17	19						
MS 2.128	280		360	Min+140	16	18						
MS 2.132	320		390	Min+140	15	17						
MS 2.135	350		420	Min+140	14	16						
MS 2.155	550		560									
MS 2.200	Without no specification											

(\*)A diminution in the forming aptitude of all galvanized products can occur with ageing. Therefore it is recommended for customer's benefit to use them quickly.

### c - Coating

The minimal total mass of zinc put on the two sides of the sheet are expressed in grams and reported to the square meter of the steel sheet. The coating masses are not uniformly divided on the two faces of the product. Therefore, we may expect in any point of the face a coating mass of at least 40% of the value indicated in the table below. Tolerances for folding tests, and for the control of the adherence of coating are indicated in the table below:

Nominal coating mass in g/m <sup>2</sup> including both sides	Trial in 3 points	Trial in one point	Chuck diameter for folding tests for MS references (a : thickness of product)			
			MS2000 to MS2006	MS2100 and MS2125	MS2200 and MS2128	MS 2132 and MS 2135
<b>100</b>	<b>100</b>	85	0	1a	2a	3a
<b>140</b>	<b>140</b>	120				
<b>200</b>	<b>200</b>	170				
<b>225</b>	<b>225</b>	195				
<b>275</b>	<b>275</b>	235				
<b>(350)</b>	<b>350</b>	300	1a			
<b>(450)</b>	<b>450</b>	385	2a			
<b>(600)</b>	<b>600</b>	510		2a	3a	4a

The coating mass ( ) must be subject to a particular agreement.

After folding, coating should not present any scaling, however a zone of 6mm width at each extremity is not taken into consideration in the appreciation of the results in such a manner as to eliminate the influence of cutting. Fissuring and ruggedness are acceptable.

### d - Surface characteristics

#### Coating aspect :

There are two types of spangle :

Normal spangle (N): obtained by the normal crystallization of the coating at the output of the galvanization bath. (There may be no spangle or simply some zinc crystals with a heterogeneous size and brilliance). For this type, only the surface with an ordinary finishing (A) is applicable.

Deleted spangle (M): aspect of minimized, smooth, and homogenous spangle, without any flower.

#### Finishing quality :

Two finishing qualities are suggested:

Ordinary finishing surface (A): some imperfections as small craters, spangle heterogeneity, black points, slight stripes and small alteration marks are acceptable. We may observe some marks in bands and some punctual over thickness at the level of the zinc coating.

Improved finishing surface (B): some localized defects such as those emanating from the stoppage of mechanical treatment, cylinder marks, spangle irregularities, over thickness in zinc coating, as well as some slight alteration defects may be accepted. B quality is obtained through a slight cold working (skinpass).

### Surface treatment :

Hot galvanized products receive a superficial protection, chemical treatment (C). The latter protects the surface from humidity and decreases the risk of “white rust”. The duration of protection vary according to the atmospheres. This treatment may provoke some local colorations which won't affect the quality of the product.

Maghreb steel is equipped to provide an oiled galvanized product(O) or with a chemical treatment followed by oiling (CO) when a reinforced protection is required. As to non-treated product(U), it may be manufactured and delivered under the customer's responsibility .

### e -Basic steel

Full hard cold-rolled steel: used for fine thickness or upon customer's request.  
 Hot-rolled pickled steel: used for hard thickness ( $e \geq 1,50\text{mm}$ ). thickness tolerances, in this case, are those of the hot rolled steel sheets.

### f - Production table and dimensional tolerances

Nominal thickness forgalvanized metal (mm)	Normal tolerances for a nominal width		Reduced tolerances for a nominal width		Severe tolerance
	$\leq 1200$	$> 1200 \leq 1500$	$\leq 1200$	$> 1200 \leq 1500$	
<b>0,18 to <math>\leq</math> 0,40</b>	$\pm 0,05$	$\pm 0,06$	$\pm 0,03$	$\pm 0,04$	$\pm 0,02$
<b><math>&gt;0,40</math> to <math>\leq</math> 0,60</b>	$\pm 0,06$	$\pm 0,07$	$\pm 0,04$	$\pm 0,05$	$\pm 0,03$
<b><math>&gt;0,60</math> to <math>\leq</math> 0,80</b>	$\pm 0,07$	$\pm 0,08$	$\pm 0,05$	$\pm 0,06$	
<b><math>&gt;0,80</math> to <math>\leq</math> 1,00</b>	$\pm 0,08$	$\pm 0,09$	$\pm 0,06$	$\pm 0,07$	
<b><math>&gt;1,00</math> to <math>\leq</math> 1,20</b>	$\pm 0,09$	$\pm 0,10$	$\pm 0,07$	$\pm 0,08$	$\pm 0,05$
<b><math>&gt;1,20</math> to <math>\leq</math> 1,60</b>	$\pm 0,11$	$\pm 0,12$	$\pm 0,08$	$\pm 0,09$	
<b><math>&gt;1,60</math> to <math>\leq</math> 2,00</b>	$\pm 0,13$	$\pm 0,14$	$\pm 0,09$	$\pm 0,10$	
<b><math>&gt;2,00</math> to <math>\leq</math> 2,50</b>	$\pm 0,15$	$\pm 0,16$	$\pm 0,11$	$\pm 0,12$	$\pm 0,08$
<b><math>&gt;2,50</math> to <math>\leq</math> 3,00</b>	$\pm 0,17$	$\pm 0,18$	$\pm 0,12$	$\pm 0,13$	

Nominal width (mm)	Tolerances for réf. MS 2200 (mm)		Normal tolerances (mm)		Reduced tolerances (mm)	
	In less	Moreover	In less	Moreover	In less	Moreover
$\geq 600 \leq 1000$	-3	+5		+5		
$> 1000 \leq 1200$	-3	+6	0	+6	0	+2
$> 1200 \leq 1500$						

Galvanized coils may have an inner diameter of 508 or 610mm. The weight should be agreed at the time of the order. All these productions may be delivered:

In coils

In cut sheet loads

In strips and bands

Maghreb Steel plants are equipped in such a manner to meet the specific orders not listed in the production sheet.

#### **g -Special conditions**

Sheets adequately delivered and stored are guaranteed for 15 days against white rust. Claims may be sent to Maghreb Steel within 30 days after delivery date. All deliveries presenting defects below 2% of the weight of the coil or load are considered normal and can not give rise to any claim. The minimal mass of zinc shall be strictly observed, however a tolerance of -5% is considered as an exceptional anomaly that should not give rise to any claim.