



E20 - Hot dip galvanised steels

These steels can be used in a very wide range of applications, both indoors and outdoors. One example is this metallic ceiling for a railway station.

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Properties

ArcelorMittal's hot dip galvanised steels consist of a steel substrate with a metallic zinc coating applied by means of a continuous hot dip galvanising process. Metallic zinc coatings are available in steel grades ranging from steel for bending and deep drawing applications, to structural steels and high yield strength steels.

A glossy surface finish obtained under specific skin-pass conditions (either non-skin-passed or skin-passed with smooth cylinders to obtain low roughness) can be provided if required at time of enquiry.

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Advantages

Hot dip galvanised products offer excellent corrosion resistance combined with very good forming properties. The coating process can apply very thick zinc layers, up to 725 g/m² (total of both sides).

Applications

ArcelorMittal's hot dip galvanised steels can be used in a very wide range of applications for industrial markets, both indoors and outdoors. Some of the most common applications are:

- Building: wide sections for roofing and cladding, doors, door frames, metallic ceilings, partitions, structural members etc
- Domestic appliances: all appliances for this sector (both white and brown goods) are manufactured with hot dip galvanised steels
- Miscellaneous: electrical cabinets, aeraulic components, air conditioners, road signs etc

Zinc hot dip galvanised steel is suitable for contact with foodstuffs under certain conditions, as specified in the Regulation (EC) No. 1935/2004 and French standard NF A 36-712-1. Please contact us for further information on this subject.

Recommendations for use

Storage

Galvanised strips are usually supplied passivated or oiled to temporarily limit any risk of white rust formation. During transport and storage, all necessary precautions must be taken to keep the material dry and to prevent the formation of condensation. Improved protection can be achieved by the application of an Easyfilm® thin organic coating (please see data sheet E80 for the specific properties of Easyfilm®).

Forming and joining

The forming and joining techniques currently used for uncoated steel are also suitable for galvanised steel. It is essential to select a coating thickness that is compatible with the forming and joining processes envisaged, without compromising the desired degree of corrosion protection.

Painting

Hot dip galvanised steels can be painted after degreasing and surface treatment when supplied oiled. If an Easyfilm® thin organic coating has been applied, they can be painted directly, without any prior surface treatment. However, the paint must be compatible with the Easyfilm® resin.

Weldability

In electrical resistance welding, the welding current must be suitably regulated and regularly adjusted. Electrode life can be extended by regularly stepping up the welding current and periodically dressing (machining) the electrodes.

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Coating weight and typical thickness

Designation EN 10346	Coating weight – double sided (g/m ²)	Coating thickness (µm per side)
Z100	100	7.0
Z140	140	10.0
Z200	200	14.0
Z225	225	16.0
Z275	275	20.0
Z350	350	25.0
Z450	450	31.0
Z600	600	42.0
Not included in the standard		
Z80	80	5.5
Z725	725	51.0

For other coating weights, please contact us.

Brand correspondence

Steels for cold forming and deep drawing applications

	ASTM A653	EN 10346:2009	EN 10346:2015
DX51D +Z EN 10346	CS	DX51D+Z	DX51D+Z
DX52D +Z EN 10346	FS	DX52D+Z	DX52D+Z
DX53D +Z EN 10346	DDS	DX53D+Z	DX53D+Z
DX54D +Z EN 10346	EDDS	DX54D+Z	DX54D+Z
DX56D +Z EN 10346		DX56D+Z	DX56D+Z
DX57D +Z EN 10346		DX57D+Z	DX57D+Z

Structural steels

	ASTM A653	EN 10346:2009	EN 10346:2015
S220GD +Z EN 10346	CS Type B	S220GD+Z	S220GD+Z
S250GD +Z EN 10346	SS Grade 230	S250GD+Z	S250GD+Z
S280GD +Z EN 10346	SS Grade 255	S280GD+Z	S280GD+Z
S320GD +Z EN 10346	SS Grade 275	S320GD+Z	S320GD+Z
S350GD +Z EN 10346	SS Grade 340 Class 4	S350GD+Z	S350GD+Z
S390GD +Z EN 10346			S390GD+Z
S420GD +Z EN 10346	SS Grade 410		S420GD+Z
S420GD-HyPer [®] +Z**			
S450GD +Z EN 10346			S450GD+Z
S450GD-HyPer [®] +Z**			
S550GD +Z EN 10346		S550GD+Z	S550GD+Z
S550GD-HyPer [®] +Z***			

** Steel grade with $R_m/R_e > 1.1$ in accordance with the requirements of Eurocode 3 (EN 1993-1-1)

*** Steel grade with $R_m/R_e > 1.05$ in accordance with the requirements of Eurocode 3 (EN 1993-1-12)

High strength interstitial free steels

	ASTM A653	EN 10346:2009	EN 10346:2015
HX180YD +Z EN 10346		HX180YD+Z	HX180YD+Z
HX220YD +Z EN 10346		HX220YD+Z	HX220YD+Z
HX260YD +Z EN 10346		HX260YD+Z	HX260YD+Z
HX300YD +Z EN 10346		HX300YD+Z	HX300YD+Z

High Strength Low Alloy steels

	ASTM A653	EN 10346:2009	EN 10346:2015
HX260LAD +Z EN 10346		HX260LAD+Z	HX260LAD+Z
HX300LAD +Z EN 10346		HX300LAD+Z	HX300LAD+Z
HX340LAD +Z EN 10346		HX340LAD+Z	HX340LAD+Z
HX380LAD +Z EN 10346		HX380LAD+Z	HX380LAD+Z
HX420LAD +Z EN 10346		HX420LAD+Z	HX420LAD+Z
HX460LAD +Z EN 10346		HX460LAD+Z	HX460LAD+Z
HX500LAD +Z EN 10346		HX500LAD+Z	HX500LAD+Z
HX700LAD +Z*			
* Steel grade HX700LAD +Z is not recommended for automotive applications.			

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Dimensions

Steels for cold forming and deep drawing applications

Thickness (mm)	Min width	DX51D +Z EN 10346, DX52D +Z EN 10346	DX53D +Z EN 10346, DX54D +Z EN 10346	DX56D +Z EN 10346	DX57D +Z EN 10346
		Max width	Max width	Max width	Max width
0.30 ≤ th < 2.00	600	2080	2080	2080	1840
2.00 ≤ th < 3.00				-	-
3.00 ≤ th < 3.50					
3.50 ≤ th < 6.00			-		

For the detailed feasibility, please contact us.

Structural steels

Thickness (mm)	Min width	S220GD +Z EN 10346, S250GD +Z EN 10346, S280GD +Z EN 10346, S320GD +Z EN 10346, S350GD +Z EN 10346, S390GD +Z EN 10346, S420GD +Z EN 10346, S420GD -HyPer® +Z**, S450GD +Z EN 10346, S450GD -HyPer® +Z**, S550GD +Z EN 10346, S550GD -HyPer® +Z***	
		Max width	
0.25 ≤ th < 6.00	600	1650	
** Steel grade with R _m /R _e > 1.1 in accordance with the requirements of Eurocode 3 (EN 1993-1-1)			
*** Steel grade with R _m /R _e > 1.05 in accordance with the requirements of Eurocode 3 (EN 1993-1-12)			

For the detailed feasibility, please contact us.

High strength interstitial free steels

Thickness (mm)	Min width	HX180YD +Z EN 10346, HX220YD +Z EN 10346, HX260YD +Z EN 10346		HX300YD +Z EN 10346
		Max width		Max width
$0.25 \leq th < 3.00$	600	2080		1750

For the detailed feasibility, please contact us.

High Strength Low Alloy steels

Thickness (mm)	Min width	HX260LAD +Z EN 10346	HX300LAD +Z EN 10346	HX340LAD +Z EN 10346, HX500LAD +Z EN 10346	HX380LAD +Z EN 10346	HX420LAD +Z EN 10346, HX460LAD +Z EN 10346	HX700LAD +Z*
		Max width	Max width	Max width	Max width	Max width	Max width
$0.30 \leq th < 6.00$	600	2080	1860	1680	1840	1780	1300
* Steel grade HX700LAD +Z is not recommended for automotive applications.							

For the detailed feasibility, please contact us.

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Mechanical properties

Steels for cold forming and deep drawing applications: mechanical properties transverse to the rolling direction

Structural steels: mechanical properties in the rolling direction (longitudinal)

High strength interstitial free steels: mechanical properties transverse to the rolling direction

High Strength Low Alloy steels: mechanical properties transverse to the rolling direction

Steels for cold forming and deep drawing applications

	Notes	Direction	Thickness (mm)	R _e (MPa)	R _m (MPa)	A ₈₀ (%)	r ₉₀	n ₉₀
DX51D +Z EN 10346	1	T	0.2 - 0.35	-	270 - 500	≥ 15	-	-
			0.35 - 0.5			≥ 18		
			0.5 - 0.7			≥ 20		
			0.7 - 6			≥ 22		
DX52D +Z EN 10346	2+1	T	0.3 - 0.5	140 - 300	270 - 420	≥ 22	-	-
			0.5 - 0.7			≥ 24		
			0.7 - 6			≥ 26		
DX53D +Z EN 10346	1	T	0.3 - 0.5	140 - 260	270 - 380	≥ 26	-	-
			0.5 - 0.7			≥ 28		
			0.7 - 6			≥ 30		
DX54D +Z EN 10346	3	T	0.3 - 0.5	120 - 220	260 - 350	≥ 32	≥ 1.6	≥ 0.180
			0.5 - 0.7			≥ 34		
			0.7 - 1.5			≥ 36		
			1.5 - 2				≥ 1.2	
			2 - 3					
DX56D +Z EN 10346	3	T	0.3 - 0.5	120 - 180	260 - 350	≥ 35	≥ 1.9	≥ 0.210
			0.5 - 0.7			≥ 37		
			0.7 - 1.5			≥ 39		
			1.5 - 2				≥ 1.5	
			2 - 3					
DX57D +Z EN 10346	3	T	0.5 - 0.7	120 - 170	260 - 350	≥ 39	≥ 2.1	≥ 0.220
			0.7 - 1.5			≥ 41		
			1.5 - 2				≥ 1.9	
			2 - 3				≥ 1.7	

1. Guarantee for mechanical properties ≤ 1 month

2. For DX52D +Z EN 10346 the R_e-value only applies to skin-passed products (surface qualities B and C).

3. Guarantee for mechanical properties ≤ 6 months

Structural steels

	Notes	Direction	Thickness (mm)	R _e (MPa)	R _m (MPa)	A ₈₀ (%)
S220GD +Z EN 10346	1	L	0.25 - 0.35	≥ 220	≥ 300	≥ 13
			0.35 - 0.5			≥ 16
			0.5 - 0.7			≥ 18
			0.7 - 6			≥ 20
S250GD +Z EN 10346	1	L	0.25 - 0.35	≥ 250	≥ 330	≥ 12
			0.35 - 0.5			≥ 15
			0.5 - 0.7			≥ 17
			0.7 - 6			≥ 19
S280GD +Z EN 10346	1	L	0.25 - 0.35	≥ 280	≥ 360	≥ 11
			0.35 - 0.5			≥ 14
			0.5 - 0.7			≥ 16
			0.7 - 6			≥ 18
S320GD +Z EN 10346	1	L	0.25 - 0.35	≥ 320	≥ 390	≥ 10
			0.35 - 0.5			≥ 13
			0.5 - 0.7			≥ 15
			0.7 - 6			≥ 17
S350GD +Z EN 10346	1	L	0.3 - 0.5	≥ 350	≥ 420	≥ 12
			0.5 - 0.7			≥ 14
			0.7 - 6			≥ 16
S390GD +Z EN 10346	1	L	0.35 - 0.5	≥ 390	≥ 460	≥ 12
			0.5 - 0.7			≥ 14
			0.7 - 6			≥ 16
S420GD +Z EN 10346	1	L	0.35 - 0.5	≥ 420	≥ 480	≥ 11
			0.5 - 0.7			≥ 13
			0.7 - 6			≥ 15
S420GD-HyPer [®] +Z**	2+1	L	0.7 - 4	≥ 420	480 - 620	≥ 15
S450GD +Z EN 10346	1	L	0.35 - 0.5	≥ 450	≥ 510	≥ 10
			0.5 - 0.7			≥ 12
			0.7 - 6			≥ 14
S450GD-HyPer [®] +Z**	2+1	L	0.7 - 4	≥ 450	510 - 650	≥ 15
S550GD +Z EN 10346	1	L	0.2 - 3	≥ 550	≥ 560	-
S550GD-HyPer [®] +Z***	2+1	L	0.7 - 5	≥ 550	600 - 760	≥ 13
			5 - 6			≥ 14
** Steel grade with R _m /R _e > 1.1 in accordance with the requirements of Eurocode 3 (EN 1993-1-1)						
*** Steel grade with R _m /R _e > 1.05 in accordance with the requirements of Eurocode 3 (EN 1993-1-12)						
1. Guarantee for mechanical properties ≤ 1 month						
2. Upper limit of R _m for easier piercing and screwing.						

High strength interstitial free steels

	Notes	Direction	Thickness (mm)	R _e (MPa)	R _m (MPa)	A ₈₀ (%)	r ₉₀	η ₉₀
HX180YD +Z EN 10346	1	T	0.45 - 0.5	180 - 240	330 - 390	≥ 30	≥ 1.3	≥ 0.140
			0.5 - 0.7			≥ 32	≥ 1.5	≥ 0.170
			0.7 - 3			≥ 34	≥ 1.7	≥ 0.180
HX220YD +Z EN 10346	1	T	0.45 - 0.5	220 - 280	340 - 420	≥ 28	≥ 1.1	≥ 0.130
			0.5 - 0.7			≥ 30	≥ 1.3	≥ 0.160
			0.7 - 3			≥ 32	≥ 1.5	≥ 0.170
HX260YD +Z EN 10346	1	T	0.45 - 0.5	260 - 320	380 - 440	≥ 26	≥ 1	≥ 0.120
			0.5 - 0.7			≥ 28	≥ 1.2	≥ 0.150
			0.7 - 3			≥ 30	≥ 1.4	≥ 0.160
HX300YD +Z EN 10346	1	T	0.45 - 0.5	300 - 360	390 - 470	≥ 23	≥ 0.9	≥ 0.110
			0.5 - 0.7			≥ 25	≥ 1.1	≥ 0.140
			0.7 - 3			≥ 27	≥ 1.3	≥ 0.150
1. Guarantee for mechanical properties ≤ 6 months								

High Strength Low Alloy steels

	Notes	Direction	Thickness (mm)	R _e (MPa)	R _m (MPa)	A ₈₀ (%)
HX260LAD +Z EN 10346	1	T	0.3 - 0.5	260 - 330	350 - 430	≥ 22
			0.5 - 0.7			≥ 24
			0.7 - 6			≥ 26
HX300LAD +Z EN 10346	1	T	0.3 - 0.5	300 - 380	380 - 480	≥ 19
			0.5 - 0.7			≥ 21
			0.7 - 6			≥ 23
HX340LAD +Z EN 10346	1	T	0.3 - 0.5	340 - 420	410 - 510	≥ 17
			0.5 - 0.7			≥ 19
			0.7 - 6			≥ 21
HX380LAD +Z EN 10346	1	T	0.3 - 0.5	380 - 480	440 - 560	≥ 15
			0.5 - 0.7			≥ 17
			0.7 - 6			≥ 19
HX420LAD +Z EN 10346	1	T	0.3 - 0.5	420 - 520	470 - 590	≥ 13
			0.5 - 0.7			≥ 15
			0.7 - 6			≥ 17
HX460LAD +Z EN 10346	1	T	0.4 - 0.5	460 - 560	500 - 640	≥ 11
			0.5 - 0.7			≥ 13
			0.7 - 6			≥ 15
HX500LAD +Z EN 10346	1	T	1.5 - 6	500 - 620	530 - 690	≥ 13
HX700LAD +Z*	1	T	2 - 3	700 - 840	750 - 950	≥ 10
* Steel grade HX700LAD +Z is not recommended for automotive applications.						
1. Guarantee for mechanical properties ≤ 6 months						

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Chemical composition

Steels for cold forming and deep drawing applications

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Ti (%)
DX51D +Z EN 10346	≤ 0.180	≤ 1.20	≤ 0.120	≤ 0.045	≤ 0.50	≤ 0.300
DX52D +Z EN 10346	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	≤ 0.300
DX53D +Z EN 10346	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	≤ 0.300
DX54D +Z EN 10346	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	≤ 0.300
DX56D +Z EN 10346	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	≤ 0.300
DX57D +Z EN 10346	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	≤ 0.300

Structural steels

	Notes	C (%)	Mn (%)	P (%)	S (%)	Si (%)
S220GD +Z EN 10346	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S250GD +Z EN 10346	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S280GD +Z EN 10346	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S320GD +Z EN 10346	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S350GD +Z EN 10346	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S390GD +Z EN 10346	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S420GD +Z EN 10346	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S420GD-HyPer [®] +Z**	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S450GD +Z EN 10346	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S450GD-HyPer [®] +Z**	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S550GD +Z EN 10346	1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60
S550GD-HyPer [®] +Z***	2+1	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60

** Steel grade with $R_m/R_e > 1.1$ in accordance with the requirements of Eurocode 3 (EN 1993-1-1)

*** Steel grade with $R_m/R_e > 1.05$ in accordance with the requirements of Eurocode 3 (EN 1993-1-12)

1. If, by agreement at the time of enquiry and order, other chemical elements are added, they shall be mentioned on the inspection document which may need a change of classification.

2. Nb ≤ 0.100% and Ti ≤ 0.08%

High strength interstitial free steels

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
HX180YD +Z EN 10346	≤ 0.010	≤ 0.70	≤ 0.060	≤ 0.025	≤ 0.30	≥ 0.010	≤ 0.090	≤ 0.120
HX220YD +Z EN 10346	≤ 0.010	≤ 0.90	≤ 0.080	≤ 0.025	≤ 0.30	≥ 0.010	≤ 0.090	≤ 0.120
HX260YD +Z EN 10346	≤ 0.010	≤ 1.60	≤ 0.100	≤ 0.025	≤ 0.30	≥ 0.010	≤ 0.090	≤ 0.120
HX300YD +Z EN 10346	≤ 0.015	≤ 1.60	≤ 0.100	≤ 0.025	≤ 0.30	≥ 0.010	≤ 0.090	≤ 0.120

High Strength Low Alloy steels

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
HX260LAD +Z EN 10346	≤ 0.110	≤ 1.00	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.090	≤ 0.150
HX300LAD +Z EN 10346	≤ 0.120	≤ 1.40	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.090	≤ 0.150
HX340LAD +Z EN 10346	≤ 0.120	≤ 1.40	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.100	≤ 0.150
HX380LAD +Z EN 10346	≤ 0.120	≤ 1.50	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.100	≤ 0.150
HX420LAD +Z EN 10346	≤ 0.120	≤ 1.60	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.100	≤ 0.150
HX460LAD +Z EN 10346	≤ 0.150	≤ 1.70	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.100	≤ 0.150
HX500LAD +Z EN 10346	≤ 0.150	≤ 1.70	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.100	≤ 0.150
HX700LAD +Z*	≤ 0.100	≤ 2.10	≤ 0.025	≤ 0.010	≤ 0.35	≥ 0.020	≤ 0.090	≤ 0.150

* Steel grade HX700LAD +Z is not recommended for automotive applications.

Any questions?

Ask them via our contact form on <https://industry.arcelormittal.com/getintouch>

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