



E40



Steels with Aluzinc[®] aluminium-zinc coating

Thanks to its excellent corrosion resistance and spangled silver colour, Aluzinc[®] is very popular for roofing and cladding applications.

Last update: 2017-9-19

Properties

Aluzinc[®] is a flat carbon steel product coated on both sides with an aluminium-zinc alloy. The coating is composed of 55% aluminium, 43.4% zinc and 1.6% silicon and applied by means of a continuous hot dip galvanising process. Aluzinc[®] is available in a wide range of steel grades: steels for cold forming and deep drawing applications, and structural steels.

Advantages

The excellent corrosion resistance of Aluzinc[®] is a result of the properties of its two metallic constituents: the barrier effect of the aluminium present on the surface of the coating and the sacrificial protection of zinc.

The characteristic spangled silver colour of Aluzinc[®] gives it a very attractive appearance. Thanks to a thin transparent layer of aluminium oxide on the top surface of the coating, this appearance is preserved over time.

Aluzinc[®] offers additional advantages:

- Good corrosion resistance at high temperatures
- Good abrasion resistance because of its surface hardness
- Excellent thermal and light reflectivity

Applications

Aluzinc[®] coated steels are used widely in both indoor and outdoor applications:

- Construction: roofing, cladding, structural sections, composite panels, tiles etc
- Domestic appliances: washing machines, tumble dryers, refrigerators, toasters, microwave ovens etc
- Miscellaneous: boiler casings, air ducts, electrical cabinets, lighting, computer casings etc

Aluzinc[®] can be supplied oiled and/or with a chemical surface treatment, or with an Easyfilm[®] thin organic coating (please see data sheet E80 for the specific properties of Easyfilm[®]). DX56D AM FCE +AZHFX +Easyfilm[®] is suitable for standing seam applications in roofing and cladding.

Aluzinc[®] Florelis is a product with improved uniformity, with the result that there is no visible difference between the sheets. It is specially designed for facades of buildings with the highest aesthetic requirements.

Recommendations for use

Storage

Aluzinc[®] is supplied passivated or oiled to temporarily limit any risk of black 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 obtained by the application of an Easyfilm[®] coating.

Forming and joining

The forming and joining techniques currently used for uncoated steel sheets are also suitable for Aluzinc[®]. The coating thickness must therefore be compatible with both the desired degree of corrosion protection and the requirements of the forming and welding processes envisaged. Forming performance is improved if Aluzinc[®] is coated with an Easyfilm[®] thin organic coating.

Painting

Aluzinc[®] can be painted after degreasing and surface treatment when delivered oiled. Aluzinc[®] coated with an Easyfilm[®] thin organic coating 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.

Coating weight and typical thickness

Aluzinc® Coating weight - double sided (g/m²) Coating thickness (µm per side)

AZ100	100	13
AZ150	150	20
AZ165	165	23
AZ185	185	25
AZ200	200	26

Brand correspondence

Steels for cold forming and deep drawing applications

	ASTM A792	EN 10215:1995	EN 10326:2004	EN 10327:2004	EN 10292:2007	EN 10346:2009	EN 10346:2015	Old brand names
DX51D +AZ EN 10346	CS	DX51D+AZ		DX51D+AZ		DX51D+AZ	DX51D+AZ	AC2
<i>DX51D AM FCE +AZFlorelis +Easyfilm®</i>								
DX52D +AZ EN 10346	FS	DX52D+AZ		DX52D+AZ		DX52D+AZ	DX52D+AZ	AC3
DX53D +AZ EN 10346		DX53D+AZ		DX53D+AZ		DX53D+AZ	DX53D+AZ	(AC4)
DX54D +AZ EN 10346	DS	DX54D+AZ		DX54D+AZ		DX54D+AZ	DX54D+AZ	AC5
<i>DX54D AM FCE +AZHFX +Easyfilm®</i>								
DX56D +AZ EN 10346							DX56D +AZ	DX56D AM FCE +AZ
<i>DX56D AM FCE +AZHFX +Easyfilm®</i>								
<i>Grades in italics: not included in the standard</i>								

Structural steels

	ASTM A792	EN 10215:1995	EN 10326:2004	EN 10327:2004	EN 10292:2007	EN 10346:2009	EN 10346:2015	Old brand names
S220GD +AZ EN 10346			S220GD+AZ			S220GD+AZ	S220GD+AZ	
<i>S220GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>								
S250GD +AZ EN 10346	SS Grade 255 (37)	S250GD+AZ	S250GD+AZ			S250GD+AZ	S250GD+AZ	AC250
<i>S250GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>								
S280GD +AZ EN 10346	SS Grade 275 (40)	S280GD+AZ	S280GD+AZ			S280GD+AZ	S280GD+AZ	AC280
<i>S280GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>								
S320GD +AZ EN 10346		S320GD+AZ	S320GD+AZ			S320GD+AZ	S320GD+AZ	AC320
<i>S320GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>								
S350GD +AZ EN 10346	SS Grade 340 (50)	S350GD+AZ	S350GD+AZ			S350GD+AZ	S350GD+AZ	AC350
S550GD +AZ EN 10346	SS Grade 550 (80)	S550GD+AZ	S550GD+AZ			S550GD+AZ	S550GD+AZ	AC550
<i>Grades in italics: not included in the standard</i>								

High strength interstitial free steels

	ASTM A792	EN 10215:1995	EN 10326:2004	EN 10327:2004	EN 10292:2007	EN 10346:2009	EN 10346:2015	Old brand names
HX220YD +AZ EN 10346					HX220YD+AZ	HX220YD+AZ	HX220YD+AZ	

High Strength Low Alloy steels

	ASTM A792	EN 10215:1995	EN 10326:2004	EN 10327:2004	EN 10292:2007	EN 10346:2009	EN 10346:2015	Old brand names
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HX260LAD +AZ EN 10346					HX260LAD+AZ	HX260LAD+AZ	HX260LAD+AZ	AC250NB
HX300LAD +AZ EN 10346					HX300LAD+AZ	HX300LAD+AZ	HX300LAD+AZ	AC280NB
HX340LAD +AZ EN 10346					HX340LAD+AZ	HX340LAD+AZ	HX340LAD+AZ	AC320NB
HX380LAD +AZ EN 10346					HX380LAD+AZ	HX380LAD+AZ	HX380LAD+AZ	AC380
HX420LAD +AZ EN 10346					HX420LAD+AZ	HX420LAD+AZ	HX420LAD+AZ	AC420
() Closest grade as no fully equivalent grade exists.								

Dimensions

Steels for cold forming and deep drawing applications

Thickness (mm)	Min width	DX51D +AZ EN 10346	DX51D AM FCE +AZFlorelis +Easyfilm®	DX52D +AZ EN 10346, DX53D +AZ EN 10346, DX54D +AZ EN 10346, DX54D AM FCE +AZHFX +Easyfilm®, DX56D +AZ EN 10346, DX56D AM FCE +AZHFX +Easyfilm®
		Max width	Max width	Max width
$0.20 \leq th < 0.25$	700	1000	-	-
$0.25 \leq th < 0.30$		1200		
$0.30 \leq th < 0.36$		1350		
$0.36 \leq th < 0.60$		1500	1500	1400
$0.60 \leq th < 0.70$				1500
$0.70 \leq th < 1.20$				
$1.20 \leq th < 2.00$			-	

Structural steels

Thickness (mm)	Min width	S220GD +AZ EN 10346, S250GD +AZ EN 10346, S280GD +AZ EN 10346	S220GD +AZ AM FCE +AZFlorelis +Easyfilm [®] , S250GD +AZ AM FCE +AZFlorelis +Easyfilm [®] , S280GD +AZ AM FCE +AZFlorelis +Easyfilm [®]	S320GD +AZ EN 10346, S350GD +AZ EN 10346	S320GD +AZ AM FCE +AZFlorelis +Easyfilm [®]	S550GD +AZ EN 10346
		Max width	Max width	Max width	Max width	Max width
$0.20 \leq th < 0.25$	700	1000		-	-	1000
$0.25 \leq th < 0.30$		1200				1100
$0.30 \leq th < 0.36$		1350				1250
$0.36 \leq th < 0.46$		1500	1350	1250		
$0.46 \leq th < 0.60$			1450			
$0.60 \leq th < 1.00$			1500		1250	
$1.00 \leq th < 1.20$		1500		-		
$1.20 \leq th < 2.00$		-		-		

High strength interstitial free steels

Thickness (mm)	Min width	HX220YD +AZ EN 10346
		Max width
$0.36 \leq th < 0.46$	700	1250
$0.46 \leq th < 0.70$		1400
$0.70 \leq th < 2.00$		1500

High Strength Low Alloy steels

Thickness (mm)	Min width	HX260LAD +AZ EN 10346, HX380LAD +AZ EN 10346, HX420LAD +AZ EN 10346	HX300LAD +AZ EN 10346, HX340LAD +AZ EN 10346
		Max width	Max width
$0.30 \leq th < 0.36$	700	-	1350
$0.36 \leq th < 0.46$		1250	1500
$0.46 \leq th < 0.70$		1400	
$0.70 \leq th < 2.00$		1500	

Mechanical properties

Steels for cold forming and deep drawing applications

	Notes	Direction	Thickness (mm)	R _e (MPa)	R _m (MPa)	A ₈₀ (%)	Bending ratio (th)	r 90	n 90
DX51D +AZ EN 10346		T	0.2 - 0.35	-	270 - 500	≥ 15	-	-	-
			0.35 - 0.5			≥ 18			
			0.5 - 0.7			≥ 20			
			0.7 - 2			≥ 22			
<i>DX51D AM FCE +AZFlorelis +Easyfilm®</i>		L	< 1.2	-	-	-	< 0	-	-
		T	< 0.6	-	-	-	< 0	-	-
DX52D +AZ EN 10346	1	T	0.35 - 0.5	140 - 300	270 - 420	≥ 22	-	-	-
			0.5 - 0.7			≥ 24			
			0.7 - 2			≥ 26			
DX53D +AZ EN 10346		T	0.35 - 0.5	140 - 260	270 - 380	≥ 26	-	-	-
			0.5 - 0.7			≥ 28			
			0.7 - 2			≥ 30			
DX54D +AZ EN 10346		T	0.35 - 0.5	120 - 220	260 - 350	≥ 32	-	-	-
			0.5 - 0.7			≥ 34			
			0.7 - 2			≥ 36			
<i>DX54D AM FCE +AZHFX +Easyfilm®</i>		L	< 2	-	-	-	< 0	-	-
		T	< 0.2	-	-	-	< 0	-	-
			0.2 - 0.7	120 - 220	260 - 350	≥ 34		≥ 1.4	≥ 0.180
			0.7 - 2			≥ 36			
DX56D +AZ EN 10346		L	< 2	-	-	-	< 0	-	-
		T	0.35 - 0.5	120 - 180	260 - 350	≥ 35	< 0	≥ 1.3	≥ 0.200
			0.5 - 0.7			≥ 37		≥ 1.5	
			0.7 - 2			≥ 39		≥ 1.7	
<i>DX56D AM FCE +AZHFX +Easyfilm®</i>		T	0.2 - 0.7	120 - 180	260 - 350	≥ 37	-	≥ 1.5	≥ 0.200
			0.7 - 2			≥ 39		≥ 1.7	

Grades in italics: not included in the standard

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

Structural steels

	Notes	Direction	Thickness (mm)	R _e (MPa)	R _m (MPa)	A ₈₀ (%)	Bending ratio (th)	r 90	n 90
S220GD +AZ EN 10346		L	0.2 - 0.35	≥ 220	≥ 300	≥ 13	< 0	-	-
			0.35 - 0.5			≥ 16			
			0.5 - 0.7			≥ 18			
			0.7 - 2			≥ 20			
		T	< 2	-	-	-	< 0	-	-
<i>S220GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>		L	0.6 - 0.7	≥ 220	≥ 300	≥ 18	-	-	-
			0.7 - 1.2			≥ 20			
S250GD +AZ EN 10346		L	0.2 - 0.35	≥ 250	≥ 330	≥ 12	-	-	-
			0.35 - 0.5			≥ 15			
			0.5 - 0.7			≥ 17			
			0.7 - 2			≥ 19			
<i>S250GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>		L	0.6 - 0.7	≥ 250	≥ 330	≥ 17	-	-	-
			0.7 - 1.2			≥ 19			
S280GD +AZ EN 10346		L	0.2 - 0.35	≥ 280	≥ 360	≥ 11	-	-	-
			0.35 - 0.5			≥ 14			
			0.5 - 0.7			≥ 16			
			0.7 - 2			≥ 18			
<i>S280GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>		L	0.6 - 0.7	≥ 280	≥ 330	≥ 16	-	-	-
			0.7 - 1.2			≥ 18			
S320GD +AZ EN 10346		L	0.3 - 0.5	≥ 320	≥ 390	≥ 13	-	-	-
			0.5 - 0.7			≥ 15			
			0.7 - 2			≥ 17			
<i>S320GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>		L	0.6 - 0.7	≥ 320	≥ 390	≥ 15	-	-	-
			0.7 - 1			≥ 17			
S350GD +AZ EN 10346		L	0.3 - 0.5	≥ 350	≥ 420	≥ 12	-	-	-
			0.5 - 0.7			≥ 14			

		0.7 - 2			≥ 16			
S550GD +AZ EN 10346	L	0.2 - 0.55	≥ 550	≥ 560	-	-	-	-
<i>Grades in italics: not included in the standard</i>								

High strength interstitial free steels

	Notes	Direction	Thickness (mm)	R _e (MPa)	R _m (MPa)	A ₈₀ (%)	Bending ratio (th)	r 90	n 90
HX220YD +AZ EN 10346		L	< 3	-	-	-	< 0	-	-
	T		0.35 - 0.5	220 - 280	340 - 410	≥ 28	< 0	≥ 0.9	≥ 0.140
			0.5 - 0.7			≥ 30		≥ 1.1	≥ 0.160
			0.7 - 1.5					≥ 1.3	≥ 0.170
			1.5 - 2					≥ 1.1	

High Strength Low Alloy steels

Notes	Direction	Thickness (mm)	R _e (MPa)	R _m (MPa)	A ₈₀ (%)	Bending ratio (th)	r 90	n 90
HX260LAD +AZ EN 10346	T	0.35 - 0.5	260 - 330	350 - 430	≥ 20	-	-	-
		0.5 - 0.7			≥ 22			
		0.7 - 2			≥ 24			
HX300LAD +AZ EN 10346	T	0.35 - 0.5	300 - 380	380 - 480	≥ 17	-	-	-
		0.5 - 0.7			≥ 19			
		0.7 - 2			≥ 21			
HX340LAD +AZ EN 10346	T	0.35 - 0.5	340 - 420	410 - 510	≥ 15	-	-	-
		0.5 - 0.7			≥ 17			
		0.7 - 2			≥ 19			
HX380LAD +AZ EN 10346	T	0.35 - 0.5	380 - 480	440 - 560	≥ 13	-	-	-
		0.5 - 0.7			≥ 15			
		0.7 - 2			≥ 17			
HX420LAD +AZ EN 10346	T	0.35 - 0.5	420 - 520	470 - 590	≥ 11	-	-	-
		0.5 - 0.7			≥ 13			
		0.7 - 2			≥ 15			

Chemical composition**Steels for cold forming and deep drawing applications**

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
DX51D +AZ EN 10346	≤ 0.180	≤ 1.20	≤ 0.120	≤ 0.045	≤ 0.50	-	-	≤ 0.300
<i>DX51D AM FCE +AZFlorelis +Easyfilm®</i>	≤ 0.180	≤ 1.20	≤ 0.120	≤ 0.045	≤ 0.50	-	-	≤ 0.300
DX52D +AZ EN 10346	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	-	-	≤ 0.300
DX53D +AZ EN 10346	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	-	-	≤ 0.300
DX54D +AZ EN 10346	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	-	-	≤ 0.300
<i>DX54D AM FCE +AZHFX +Easyfilm®</i>	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	-	-	≤ 0.300
DX56D +AZ EN 10346	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	-	-	≤ 0.300
<i>DX56D AM FCE +AZHFX +Easyfilm®</i>	≤ 0.120	≤ 0.60	≤ 0.100	≤ 0.045	≤ 0.50	-	-	≤ 0.300
<i>Grades in italics: not included in the standard</i>								

Structural steels

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
S220GD +AZ EN 10346	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
<i>S220GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
S250GD +AZ EN 10346	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
<i>S250GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
S280GD +AZ EN 10346	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
<i>S280GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
S320GD +AZ EN 10346	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
<i>S320GD +AZ AM FCE +AZFlorelis +Easyfilm®</i>	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
S350GD +AZ EN 10346	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
S550GD +AZ EN 10346	≤ 0.200	≤ 1.70	≤ 0.100	≤ 0.045	≤ 0.60	-	-	-
<i>Grades in italics: not included in the standard</i>								

High strength interstitial free steels

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
HX220YD +AZ EN 10346	≤ 0.010	≤ 0.90	≤ 0.080	≤ 0.025	≤ 0.20	≥ 0.015	≤ 0.090	≤ 0.120

High Strength Low Alloy steels

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
HX260LAD +AZ EN 10346	≤ 0.110	≤ 1.00	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.090	≤ 0.150
HX300LAD +AZ EN 10346	≤ 0.120	≤ 1.40	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.090	≤ 0.150
HX340LAD +AZ EN 10346	≤ 0.120	≤ 1.40	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.100	≤ 0.150
HX380LAD +AZ EN 10346	≤ 0.120	≤ 1.50	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.100	≤ 0.150
HX420LAD +AZ EN 10346	≤ 0.120	≤ 1.60	≤ 0.030	≤ 0.025	≤ 0.50	≥ 0.015	≤ 0.100	≤ 0.150

For commercial information (quotations, deliveries, product availability):

- Europe: <http://industry.arcelormittal.com/agencies>
- Other countries: international@arcelormittal.com

For technical questions about these products: flateurope.technical.assistance@arcelormittal.com

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