



## E50 Steels with Alusi® aluminium-silicon coating

Last update: 2011-6-10

*The presence of silicon allows the coating to be used at very high temperatures, making it ideal for all applications where parts are subjected to heat.*

### Properties

Alusi® is a flat carbon steel product coated on both sides with an aluminium-silicon alloy. The coating is composed of 90% aluminium and 10% silicon and is applied by means of a continuous hot dip galvanising process. Alusi® is available in a wide range of steel grades: steels for cold forming and deep drawing applications, and structural steels.

### Advantages

Alusi® is particularly suitable for applications requiring high resistance to oxidation at high temperatures. Up to 450°C, the top surface of the Alusi® coating does not alter and its thermal and light reflectivity remains at 80%, which is an important requirement for thermal shielding applications. The presence of silicon allows the coating to be used at temperatures as high as 650°C without flaking.

A passivating layer of aluminium oxide is formed instantly in contact with the oxygen present in air. Since this passivation protection renews itself naturally when damaged (scratches), the coating offers excellent resistance to corrosion and chemical attack.

### Applications

Because Alusi® can resist high temperatures, it is particularly suitable for use in thermal shielding. However, Alusi® also has many other applications:

General industry: exhaust systems, thermal shields, heating equipment, boilers, ducts, fume exhaust pipes, heat exchangers, industrial ovens etc

Building: fire doors etc

Domestic appliances: ovens, deep fryers, toasters, barbecues etc

Alusi® 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®).

Alusi® is also suitable for enamelling, under certain conditions. For further information, see data sheet C40.

Under certain conditions, Alusi® is suitable for food contact, as specified in European directive 89/109/EEC and French standard NF A 36-712-2. Please contact us for further information on this subject.

## Recommendations for use

Alusi® must be transported and stored in a sheltered, moisture-free environment.

The forming and joining techniques currently used for uncoated steel are also suitable for Alusi®.

Alusi® coated steel can be welded using various types of resistance welding processes (spot, seam, butt welding). TIG, MIG and MAG are also suitable.

When supplied oiled, Alusi® needs degreasing and surface treatment before painting.

Alusi® 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.

## Brand correspondence

Steels for cold forming and deep drawing applications

	NFA 36- 340	ASTM A463	JIS 3314	EN 10154:2002	EN 10292:2007	EN 10326:2004	EN 10327:2004	EN 10346:2009	Old brand names
DX51D +AS EN 10346	AS C/ AS TC	CS	SA 1 C	DX51D+AS			DX51D+AS	DX51D+AS	AL2/BM/ BO
DX52D +AS EN 10346	AS E	FS		DX52D+AS			DX52D+AS	DX52D+AS	AL3/BS
DX53D +AS EN 10346	AS ES	DDS	SA 1 D	DX53D+AS			DX53D+AS	DX53D+AS	(AL4)/ BSR
DX54D +AS EN 10346	AS EX	EDDS	SA 1 E	DX54D+AS			DX54D+AS	DX54D+AS	AL5/BX
DX55D +AS EN 10346				DX55D+AS			DX55D+AS	DX55D+AS	ALT/BHT
DX56D +AS EN 10346				DX56D+AS			DX56D+AS	DX56D+AS	AL6/BXS

Structural steels

	NFA 36- 340	ASTM A463	JIS 3314	EN 10154:2002	EN 10292:2007	EN 10326:2004	EN 10327:2004	EN 10346:2009	Old brand names
S250GD +AS EN 10346	C250	SS Grade 37		S250GD +AS		S250GD +AS		S250GD+AS	AL250
S280GD +AS EN 10346	C280	SS Grade 40		S280GD +AS		S280GD +AS		S280GD+AS	AL280/BJ
S320GD +AS EN 10346	C320			S320GD +AS		S320GD +AS		S320GD+AS	AL320/BK
S350GD +AS EN 10346	C350	SS Grade 50		S350GD +AS		S350GD +AS		S350GD+AS	AL350/BL

High strength low alloy steels

	NFA								Old
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	36-340	ASTM A463	JIS 3314	EN 10154:2002	EN 10292:2007	EN 10326:2004	EN 10327:2004	EN 10346:2009	brand names
HX260LAD +AS EN 10346					HX260LAD +AS			HX260LAD +AS	AL250NB
HX300LAD +AS EN 10346					HX300LAD +AS			HX300LAD +AS	AL280NB
HX340LAD +AS EN 10346					HX340LAD +AS			HX340LAD +AS	AL320NB
HX380LAD +AS EN 10346					HX380LAD +AS			HX380LAD +AS	AL380
HX420LAD +AS EN 10346					HX420LAD +AS			HX420LAD +AS	AL420

( ) Closest grade as no fully equivalent grade exists.

## Dimensions

Steels for cold forming and deep drawing applications

Thickness (mm)	DX51D +AS EN 10346, DX52D +AS EN 10346		DX53D +AS EN 10346		DX54D +AS EN 10346		DX55D +AS EN 10346		DX56D +AS EN 10346		
	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width	
0.30 th < 0.40	750	1150	750	1150	750	1150	750	1150	750	1150	
0.40 th < 0.50		1250		1250		1250		1250			
0.50 th < 0.55		1300		1300		1300		1300			
0.55 th < 0.60		1500		1400		1400		1410		1300	
0.60 th < 0.70		1525		1525		1525		1500		1525	
0.70 th < 2.00		1000									
2.00 th < 2.50		1220		1220		1240		-		600	750
2.65 th < 3.00		1200		1200							

Structural steels

Thickness (mm)	Min width	S250GD +AS EN 10346, S280GD +AS EN 10346		S320GD +AS EN 10346, S350GD +AS EN 10346	
		Max width		Max width	
0.30 th < 0.35	800	1150		-	
0.35 th < 0.45		1240		1240	
0.45 th < 0.55		1300		1300	
0.55 th < 0.60		1490		1490	
0.60 th < 1.00				1520	
1.00 th < 1.60		1000		1500	
1.60 th < 2.00				-	
2.00 th < 2.50					

High strength low alloy steels

		HX260LAD +AS EN 10346, HX300LAD +AS EN 10346, HX340LAD +AS EN 10346,
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Thickness (mm)	Min width	HX380LAD +AS EN 10346, HX420LAD +AS EN 10346	
		Max width	
0.35 th < 0.45	800	1240	
0.45 th < 0.55		1300	
0.55 th < 0.60		1490	
0.60 th < 2.50		1520	

## Mechanical properties

### Steels for cold forming and deep drawing applications

	Direction	Thickness (mm)	R <sub>e</sub> (MPa)	R <sub>m</sub> (MPa)	A <sub>80</sub> (%)	r 90	n 90
DX51D +AS EN 10346	T	0.5 - 0.7	-	270 - 500	20	-	-
		0.7 - 3			22		
DX52D +AS EN 10346	T	0.5 - 0.7	140 - 300	270 - 420	24	-	-
		0.7 - 2.5			26		
DX53D +AS EN 10346	T	0.5 - 0.7	140 - 260	270 - 380	28	-	-
		0.7 - 2.5			30		
DX54D +AS EN 10346	T	0.5 - 0.7	120 - 220	260 - 350	32 - 50	1.4	0.180
		0.7 - 2.5			34 - 50		
DX55D +AS EN 10346	T	0.5 - 0.7	140 - 240	270 - 370	30	-	-
		0.7 - 2.5			32		
DX56D +AS EN 10346	T	0.5 - 0.7	120 - 180	260 - 350	37	1.7	0.200
		0.7 - 2.5			39		

### Structural steels

	Direction	Thickness (mm)	R <sub>e</sub> (MPa)	R <sub>m</sub> (MPa)	A <sub>80</sub> (%)	r 90	n 90
S250GD +AS EN 10346	L	0.5 - 0.7	250	330	17	-	-
		0.7 - 3			19		
S280GD +AS EN 10346	L	0.5 - 0.7	280	360	16	-	-
		0.7 - 3			18		
S320GD +AS EN 10346	L	0.5 - 0.7	320	390	15	-	-
		0.7 - 3			17		
S350GD +AS EN 10346	L	0.5 - 0.7	350	420	14	-	-
		0.7 - 3			16		

### High strength low alloy steels

	Direction	Thickness (mm)	R <sub>e</sub> (MPa)	R <sub>m</sub> (MPa)	A <sub>80</sub> (%)	r 90	n 90
HX260LAD +AS EN 10346	T	< 3	260 - 320	350 - 430	24	-	-
HX300LAD +AS EN 10346	T	< 3	300 - 380	380 - 480	21	-	-
HX340LAD +AS EN 10346	T	< 3	340 - 420	410 - 510	19	-	-
HX380LAD +AS EN 10346	T	< 3	380 - 480	440 - 560	17	-	-
HX420LAD +AS EN 10346	T	< 3	420 - 520	470 - 590	15	-	-

## Chemical composition

### Steels for cold forming and deep drawing applications

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
DX51D +AS EN 10346	0.120	0.60	0.100	0.045	0.50	-	-	0.300
DX52D +AS EN 10346	0.120	0.60	0.100	0.045	0.50	-	-	0.300
DX53D +AS EN 10346	0.120	0.60	0.100	0.045	0.50	-	-	0.300
DX54D +AS EN 10346	0.120	0.60	0.100	0.045	0.50	-	-	0.300
DX55D +AS EN 10346	0.120	0.60	0.100	0.045	0.50	-	-	0.300
DX56D +AS EN 10346	0.120	0.60	0.100	0.045	0.50	-	-	0.300

### Structural steels

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
S250GD +AS EN 10346	0.200	1.70	0.100	0.045	0.60	-	-	-
S280GD +AS EN 10346	0.200	1.70	0.100	0.045	0.60	-	-	-
S320GD +AS EN 10346	0.200	1.70	0.100	0.045	0.60	-	-	-
S350GD +AS EN 10346	0.200	1.70	0.100	0.045	0.60	-	-	-

### High strength low alloy steels

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
HX260LAD +AS EN 10346	0.120	0.60	0.030	0.025	0.50	0.015	0.090	0.150
HX300LAD +AS EN 10346	0.110	1.00	0.030	0.025	0.50	0.015	0.090	0.150
HX340LAD +AS EN 10346	0.110	1.00	0.030	0.025	0.50	0.015	0.090	0.150
HX380LAD +AS EN 10346	0.110	1.40	0.030	0.025	0.50	0.015	0.090	0.150
HX420LAD +AS EN 10346	0.110	1.40	0.030	0.025	0.50	0.015	0.090	0.150

## Coating properties

Alusi®	Coating weight - double sided (g/m)	Coating thickness (µm per side)
AS50	50	8.5
AS60	60	10
AS80	80	13
AS100	100	17
AS120	120	20
AS150	150	25

For other coating thicknesses, please contact us.

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

Europe: [http://www.arcelormittal.com/fce/prg/agencies\\_map.html](http://www.arcelormittal.com/fce/prg/agencies_map.html)

Other countries: [contact@arcelormittal.com](mailto:contact@arcelormittal.com)

For technical questions about these products: [fce.technical.assistance@arcelormittal.com](mailto:fce.technical.assistance@arcelormittal.com)

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