B10 – COLD REDUCED

AMEREX LIMITED

PROPERTIES

This is a range of cold rolled non-alloyed mild steel grades with guaranteed maximum yield and tensile strength, guaranteed minimum ductility (elongation at fracture) and good formability (n and r values). These grades comply with the requirements of the EN 10130:2006 standard and are obtained after either batch or continuous annealing.

ADVANTAGES

These steel grades have excellent formability, which facilitates cold forming operations, and are ideal for deep drawing.

Amerex's range of steels for cold forming offer excellent forming performance, due to the low scattering of their chemical composition and their mechanical properties, which guarantees processing consistency.

APPLICATIONS

They are used for bending and deep drawing forming processes for applications where strength, rigidity and ductility are required. Typical applications are to be found in the automotive industry, the domestic appliance sector, metal furniture, drums, radiators, fans, tubes and small profiles. Uncoated cold rolled steels for cold forming are suitable for food contact, under certain conditions laid down in the Regulation (EC) No. 1935/2004 and the French standard NF A 36-714. Please contact us for further information on this subject.

SURFACE QUALITY

Surface appearance
Amerex offers two types of surface quality for these grades:
A: for non-visible parts
B: for visible parts

Surface roughness
A wide range of roughness levels according to the EN 10130 standard can be supplied. Unless otherwise specified when ordering, coils will be supplied with standard roughness (0.6 µm < Ra < 1.9 µm).

FORMABILITY

Amerex steels for cold forming (grades DC03 to DC07) have good or even excellent drawability in all types of forming processes. They can be used to manufacture complex, multifunctional parts, and allow significant savings.

Forming limit curves can be used to define the maximum strains not to be exceeded when forming steel by various methods, so as to avoid the risk of incipient necking. These curves are available on request.

WELDABILITY

Weldability is guaranteed when using the usual processes. Please specify which process you intend to use when ordering.

FATIGUE RESISTANCE

Fatigue resistance is generally expressed as an endurance limit, corresponding to the maximum stress resisted for a given number of cycles before failure. The table below gives some examples of 5 million cycle endurance limits under fluctuating tension with a stress ratio Rs = 0.1.

	Thickness	5 million cycle endurance limit (MPa)
DC04 AM FCE	2 mm	267
DC05 AM FCE	1.2 mm	235
DC06 AM FCE	1 mm	211

A complete database of fatigue resistance data on this range of steels is available on request.

BRAND CORRESPONDENCE

	EN 10130:2006	CSN	PN-81/H-92121:1981	PN-87/H-92143:1987	ASTM	JIS G3141:1996	EN 10027-2:1992	Old brand names
DC01 EN 10130	DC01	11331	(B,G)		A 366 CQ	SPCC	1.0330	
DC02 AM FCE								
DC03 EN 10130	DC03							
DC03 AM FCE	DC03	11301		(SB)	A 619 DQ	SPCD	1.0347	Solstamp 03
DC04 EN 10130	DC04							
DC04 AM FCE	DC04	11305		(SSB)	A 620 DQSK	SPCE	1.0338	Solstamp 04
DC05 EN 10130	DC05			(USB)			1.0312	Solstamp 05
DC06 EN 10130	DC06						1.0873	Solstamp 06
DC07 EN 10130	DC07						1.0898	

Grades in italics: not included in the standard

() Closest grade as no fully equivalent grade exists.

DIMENSIONS

Thickness (mm)	Min width	DC01 EN 10130, DC02 AM FCE	DC03 EN 10130, DC03 AM FCE, DC04 EN 10130, DC04 AM FCE	DC05 EN 10130	DC06 EN 10130	DC07 EN 10130
		Max width	Max width	Max width	Max width	Max width
0.40 ≤ th < 0.45	600	1635	1635	1635	1480	-
0.45 ≤ th < 0.50						
0.50 ≤ th < 0.55		1675	1675	1650	1590	1640
0.55 ≤ th < 0.60		1865	1860	1860	1640	1750
0.60 ≤ th < 0.65			1880	1880	1835	1865
0.65 ≤ th < 0.70		1885				
0.70 ≤ th < 0.75		1975	1975	1975	1920	
0.75 ≤ th < 0.80		2065	2065	2065	2000	
0.80 ≤ th < 2.85					2065	
2.85 ≤ th < 3.00						

MECHANICAL PROPERTIES

	Direction	Thickness (mm)	R_e (MPa)	R_m (MPa)	A_{80} (%)	**MP guarantees** (Months)	**r 90**	**n 90**
DC01 EN 10130	T	0.3 - 0.5	140 - 320	270 - 410	≥ 24	-	-	-
		0.5 - 0.7	140 - 300		≥ 26			
		0.7 - 3	140 - 280		≥ 28			
DC02 AM FCE	T	0.3 - 0.5	170 - 320	270 - 400	≥ 26	-	-	-
		0.5 - 0.7	170 - 300		≥ 28			
		0.7 - 3	170 - 280		≥ 30			
DC03 EN 10130	T	0.3 - 0.5	140 - 280	270 - 370	≥ 30	≥ 6	-	-
		0.5 - 0.7	140 - 260		≥ 32		≥ 1.3	
		0.7 - 2	140 - 240		≥ 34			
		2 - 3					≥ 1.1	
DC03 AM FCE	T	0.3 - 0.5	140 - 280	**280 - 360**	≥ 30	≥ 6	-	-
		0.5 - 0.7	140 - 260		≥ 32		≥ 1.3	**≥ 0.160**
		0.7 - 2	**180 - 230**		≥ 34			
		2 - 3					≥ 1.1	
DC04 EN 10130	T	0.3 - 0.5	140 - 250	270 - 350	≥ 34	≥ 6	-	-
		0.5 - 0.7	140 - 230		≥ 36		≥ 1.6	≥ 0.180
		0.7 - 2	140 - 210		≥ 38			
		2 - 3					≥ 1.4	
DC04 AM FCE	T	0.3 - 0.5	140 - 250	270 - 350	≥ 34	≥ 6	-	-
		0.5 - 0.7	140 - 230		≥ 36		**≥ 1.8**	**≥ 0.190**
		0.7 - 2	140 - 210		≥ 38			
		2 - 3					**≥ 1.6**	
DC05 EN 10130	T	0.3 - 0.5	140 - 220	270 - 330	≥ 36	≥ 6	-	-
		0.5 - 0.7	140 - 200		≥ 38		≥ 1.9	≥ 0.200
		0.7 - 2	140 - 180		≥ 40			
		2 - 3					≥ 1.7	
DC06 EN 10130	T	0.3 - 0.5	120 - 210	270 - 330	≥ 37	≥ 6	-	-
		0.5 - 0.7	120 - 190		≥ 39		≥ 2.1	≥ 0.220
		0.7 - 2	120 - 170		≥ 41			
		2 - 3					≥ 1.9	
DC07 EN 10130	T	0.5 - 0.7	100 - 170	250 - 310	≥ 42	≥ 6	≥ 2.5	≥ 0.230
		0.7 - 2	100 - 150		≥ 44			
		2 - 3					≥ 2.3	

Grades in italics: not included in the standard

Values in bold: tighter than the standard

CHEMICAL COMPOSITION

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Ti (%)	Galvanisation
DC01 EN 10130	≤ 0.120	≤ 0.60	≤ 0.045	≤ 0.045	-	-	-	No
DC02 AM FCE	0.020 - 0.100	≤ 0.60	≤ 0.025	≤ 0.025	≤ 0.03	≥ 0.020	-	Class 1
DC03 EN 10130	≤ 0.100	≤ 0.45	≤ 0.035	≤ 0.035	-	-	-	-
DC03 AM FCE	≤ 0.100	≤ 0.45	**≤ 0.025**	**≤ 0.025**	**≤ 0.03**	**≥ 0.020**	-	Class 1
DC04 EN 10130	≤ 0.080	≤ 0.40	≤ 0.030	≤ 0.030	-	-	-	-
DC04 AM FCE	≤ 0.080	≤ 0.40	**≤ 0.025**	**≤ 0.025**	**≤ 0.03**	**≥ 0.020**	-	Class 1
DC05 EN 10130	≤ 0.060	≤ 0.35	≤ 0.025	≤ 0.025	-	-	-	-
DC06 EN 10130	≤ 0.020	≤ 0.25	≤ 0.020	≤ 0.020	-	-	≤ 0.300	-
DC07 EN 10130	≤ 0.010	≤ 0.20	≤ 0.020	≤ 0.020	-	-	≤ 0.200	-
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Values in bold: tighter than the standard								