
ACILAM
Group

ACILAM Group

THE STEEL STRIP ALTERNATIVE TO MEET YOUR REQUIREMENTS

EXCEPTIONAL RANGE OF WIDTHS

Thickness from 0.05 to 8 mm
Width from 2.5 to 650 mm
Wide range of steel grades
Coated or uncoated products
Complex finishing process

REACTIVITY

High level stock
Short lead time
Sales and technical staff always at your service

TECHNICAL SUPPORT

Product definition and fine-tuning
New product innovation and development

CUSTOMER SPECIFIC PRODUCTION

Tolerances, specific dimensions
Old standards
Outsourced production

ACILAM Group

PRECISION STEEL STRIP
Thickness from 0.05 to 8mm

Rolling
Coil coating (lacquering)
Roller-burnishing
Polishing
Shearing
Slitting
Galvanizing

Cut-to-length
Edge forming
Electro-copper
Winding (oscillated wound reels)
Straightening
Hardening
Annealing

STAINLESS STEEL
HIGH AND LOW CARBON - ALLOY STEEL - HSLA - PURE IRON

2015 INNOVATION :
Stainless steel Continuous Annealing Line

ACIERS COSTE — Located in Thiers 63

ETILAM — Located in Saint-Dizier 52
Located in Montigny/Chiers 54

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STAINLESS STEEL CONTINUOUS ANNEALING LINE

REELSTAND

OVEN

COOLER

Ferritic and Austenitic STAINLESS STEEL
Thickness : 0,10 to 1,5 mm
Width : 300 to 650 mm
Aspect 2R and 2B

CONTROL CABIN

Small quantities available

REWINDER

Production according to :
STANDARD
or
CUSTOM MADE
PRODUCTION AVAILABLE

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GROUP ACILAM SUMMARY

COLD ROLLING

COATING

FINISHING (completion)

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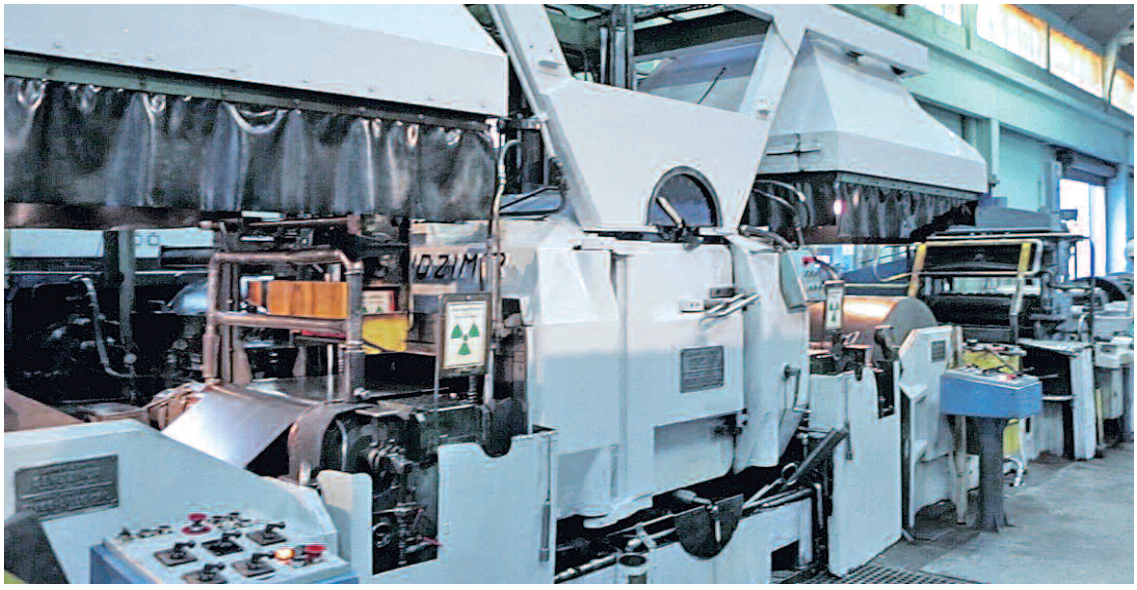
COLD ROLLING

Top hat annealing furnace

Stainless steel Continuous Annealing Line



Multiple cylinder roll-mill

Electro-copper plated steel strips

Precision shearing

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STAINLESS STEEL 1

EN 10088-2

MAIN STEEL GRADE

European designations		Approched conformities ASTM	Chemical composition									
Symbolic	Numerical		C	Si maxi	Mn maxi	P maxi	S maxi	N maxi	Cr	Mo	Ni	Ti
X10CrNi18-8	1.4310	301	0,05 to 0,15	2,00	2,00	0,045	0,015	0,11	16,00 to 19,00	≤ 0,80	6,00 to 9,50	
X5CrNi18-10	1.4301	304	≤ 0,07	1,00	2,00	0,045	0,015	0,11	17,50 to 19,50		8,00 to 10,50	
X2CrNi18-9	1.4307	304 L	≤ 0,03	1,00	2,00	0,045	0,015	0,11	17,50 to 19,50		8,00 to 10,50	
X4CrNi18-12	1.4303	305	≤ 0,06	1,00	2,00	0,045	0,015	0,11	17,00 to 19,00		11,00 to 13,00	
X6CrNiTi18-10	1.4541	321	≤ 0,08	1,00	2,00	0,045	0,015		17,00 to 19,00		9,00 to 12,00	5 x C to 0,70
X6CrNiMoTi17-12-2	1.4571	316 Ti	≤ 0,08	1,00	2,00	0,045	0,015		16,50 to 18,50	2,00 to 2,50	10,50 to 13,50	5 x C to 0,70
X2CrNiMo17-12-2	1.4404	316 L	≤ 0,03	1,00	2,00	0,045	0,015	0,11	16,50 to 18,50	2,00 to 2,50	10,00 to 13,00	
X2CrNiMo18-14-3	1.4435		≤ 0,03	1,00	2,00	0,045	0,015	0,11	17,00 to 19,00	2,50 to 3,00	12,50 to 15,00	
X6Cr17	1.4016	430	≤ 0,08	1,00	1,00	0,040	0,015		16,00 to 18,00			
X20Cr13	1.4021		0,16 to 0,25	1,00	1,50	0,040	0,015		12,00 to 14,00			
X30Cr13	1.4028	420	0,26 to 0,35	1,00	1,50	0,040	0,015		12,00 to 14,00			
X46Cr13	1.4034		0,43 to 0,50	1,00	1,00	0,040	0,015		12,50 to 14,50			

MECHANICAL PROPERTIES (longitudinal)

Austenitic		Softened condition (Annealed SKP) (+LC)				Hardered condition (+CR)							
European designations		Rm	Rp. 0,2	A 80%	5,65√So %	C 700	C 850	C 1000	C 1150	C1300	C1500 **	C1700 **	C1900 **
Symbolic	Numerical	Mpa	Mpa	th. < 3 mm	th. < 3 mm	Rm Mpa	Rm Mpa	Rm Mpa	Rm Mpa	Rm Mpa	Rm Mpa	Rm Mpa	Rm Mpa
X10CrNi18-8	1.4310	600 to 950	≥ 250	≥ 40	≥ 40	700 to 850	850 to 1000	1000 to 1150	1150 to 1300	1300 to 1500	1500 to 1700	1700 to 1900	1900 to 2200
						-	A80 > 25 % *	A80 > 20 % *	A80 > 15 % *	A80 > 10 %*	A80 > 5 %*	A80 > 2 % *	A80 > 1 %*
X5CrNi18-10	1.4301	540 to 750	≥ 230	≥ 45	≥ 45	700 to 850	850 to 1000	1000 to 1150	1150 to 1300	1300 to 1500			
						A80 > 25 % *	A80 > 12 % *	A80 > 5 % *	A80 > 3 % *	A80 >1 %*			
X2CrNi18-9	1.4307	520 to 700	≥ 220	≥ 45	≥ 45								
X4CrNi18-12	1.4303	500 to 650	≥ 220	≥ 45	≥ 45								
X6CrNiTi18-10	1.4541	520 to 720	≥ 220	≥ 40	≥ 40								
X6CrNiMoTi17-12-2	1.4571	540 to 690	≥ 240	≥ 40	≥ 40								
X2CrNiMo17-12-2	1.4404	530 to 680	≥ 240	≥ 40	≥ 40								
X2CrNiMo18-14-3	1.4435	550 to 700	≥ 240	≥ 40	≥ 40								

*** guaranteed elongation only according EN 10151**

**** only in EN 10151**

Ferritic		Softened condition (Annealed SKP) (+LC)			Hardered condition (+CR)	
European designations		Rm (MPa)	Rp. 0,2 (MPa)	A_{80} and $A_{5,65\sqrt{So}}$ %	C700 Rm (MPa)	C850 Rm (MPa)
Symbolic	Numerical					
X6Cr17	1.4016	430 to 600	≥ 260	≥ 20	700 to 850	850 to 1000

Martensitic		Annealed condition SKP (+LC)		Oils hardening on items
European designations		Rm (MPa)	A_{80} and $A_{5,65\sqrt{So}}$ %	Hardness gotten (indicative) HRC
Symbolic	Numerical			
X20Cr13	1.4021	≤ 700	≥ 15	44 to 50
X30Cr13	1.4028	≤ 740	≥ 15	45 to 51
X46Cr13	1.4034	≤ 780	≥ 12	48 to 58

SPECIFIC PRODUCTIONS

1.4310	• SKP annealed state : Mechanical strength ≤ 820 MPa • Reduced strength ranges (80 MPa) Special castings with high elongation for difficult parts (e.g. in C1300, Elongation > 20%)
1.4301	• SKP annealed state : Mechanical strength ≤ 690 MPa • Reduced strength ranges (80 MPa) Cold-drawn states : T1 ➞ Mechanical strength = 800 to 950 MPa T2 ➞ Mechanical strength = 950 to 1100 MPa T3 ➞ Mechanical strength = 1100 to 1250 MPa T4 ➞ Mechanical strength = 1250 to 1400 MPa
1.4307	Cold-drawn states : T1 ➞ Mechanical strength = 780 to 920 MPa T2 ➞ Mechanical strength = 920 to 1050 MPa T3 ➞ Mechanical strength = 1050 to 1200 Mpa T4 ➞ Mechanical strength = 1200 to 1350 MPa Reduced strength ranges (100 MPa) - All intermediate cold-drawn states
1.4571 1.4404 1.4435	**AND OTHER ALLOY AUSTENITIC STAINLESS STEELS :** Cold-drawn states with strength by mutual agreement
1.4016	cold-drawn states : T1 ➞ Mechanical strength = 490 to 640 MPa T2 ➞ Mechanical strength = 640 to 790 MPa T3 ➞ Mechanical strength = 790 to 1000 MPa
1.4021 1.4028 1.4034	Special annealed state for deformation Cold-drawn states by mutual agreement

We can also produce according to DIN 17441, NFA 35-572, AISI

ACILAM Group

DIMENSIONAL AND OTHER TOLERANCES (Stainless steel)

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ACCORDING TO ISO 9445 - PRODUCTION WIDTHS < 600 mm

Thickness tolerances (mm)

Nominal thickness (e) (mm)	Width < 125 mm			125 mm ≤ Width < 250 mm			250 mm ≤ Width < 600 mm		
	NORMAL	FINE (F)	PRECISION (P)	NORMAL	FINE (F)	PRECISION (P)	NORMAL	FINE (F)	PRECISION (P)
0,05 [a] ≤ e < 0,10	± 0,10 e	± 0,06 e	± 0,04 e	± 0,12 e	± 0,10 e	± 0,08	± 0,15 e	± 0,10 e	± 0,08 e
0,10 ≤ e < 0,15	± 0,010	± 0,008	± 0,006	± 0,015	± 0,012	± 0,008	± 0,020	± 0,015	± 0,010
0,15 ≤ e < 0,20	± 0,015	± 0,010	± 0,008	± 0,020	± 0,012	± 0,010	± 0,025	± 0,015	± 0,012
0,20 ≤ e < 0,25	± 0,015	± 0,012	± 0,008	± 0,020	± 0,015	± 0,010	± 0,025	± 0,020	± 0,012
0,25 ≤ e < 0,30	± 0,017	± 0,012	± 0,009	± 0,025	± 0,015	± 0,012	± 0,030	± 0,020	± 0,015
0,30 ≤ e < 0,40	± 0,020	± 0,015	± 0,010	± 0,025	± 0,020	± 0,012	± 0,030	± 0,025	± 0,015
0,40 ≤ e < 0,50	± 0,025	± 0,020	± 0,012	± 0,030	± 0,020	± 0,015	± 0,035	± 0,025	± 0,018
0,50 ≤ e < 0,60	± 0,030	± 0,020	± 0,014	± 0,030	± 0,025	± 0,015	± 0,040	± 0,030	± 0,020
0,60 ≤ e < 0,80	± 0,030	± 0,025	± 0,015	± 0,035	± 0,030	± 0,018	± 0,040	± 0,035	± 0,025
0,80 ≤ e < 1,00	± 0,030	± 0,025	± 0,018	± 0,040	± 0,030	± 0,020	± 0,050	± 0,035	± 0,025
1,00 ≤ e < 1,20	± 0,035	± 0,030	± 0,020	± 0,045	± 0,035	± 0,025	± 0,050	± 0,040	± 0,030
1,20 ≤ e < 1,50	± 0,040	± 0,030	± 0,020	± 0,050	± 0,035	± 0,025	± 0,060	± 0,045	± 0,030
1,50 ≤ e < 2,00	± 0,050	± 0,035	± 0,025	± 0,060	± 0,040	± 0,030	± 0,070	± 0,050	± 0,035
2,00 ≤ e ≤ 2,50	± 0,050	± 0,035	± 0,025	± 0,070	± 0,045	± 0,030	± 0,080	± 0,060	± 0,040
2,50 ≤ e ≤ 3,00	± 0,060	± 0,045	± 0,030	± 0,070	± 0,050	± 0,035	± 0,090	± 0,070	± 0,045

NOTE : By agreement, tolerances may alternatively be totally + or totally - or fully distributed. In any case, the tolerance interval must remain as shown in this table.

[a] For thicknesses below 0,05 mm, the values for the tolerances must be agreed on the inquiries and the purchase orders.

Width tolerances (mm)

Nominal thickness (e) (mm)	Width ≤ 40 mm			40 mm < Width ≤ 125 mm			125 mm < Width ≤ 250 mm			250 mm < Width < 600 mm		
	NORMAL	FINE	PRECISION	NORMAL	FINE	PRECISION	NORMAL	FINE	PRECISION	NORMAL	FINE	PRECISION
e < 0,25	± 0,085	± 0,065	± 0,050	± 0,100	± 0,075	± 0,060	± 0,125	± 0,100	± 0,075	± 0,25	± 0,25	± 0,20
0,25 ≤ e < 0,50	± 0,100	± 0,075	± 0,060	± 0,125	± 0,100	± 0,075	± 0,150	± 0,110	± 0,085	± 0,30	± 0,25	± 0,20
0,50 ≤ e < 1,00	± 0,125	± 0,100	± 0,075	± 0,125	± 0,110	± 0,085	± 0,200	± 0,125	± 0,100	± 0,35	± 0,30	± 0,25
1,00 ≤ e < 1,50	± 0,125	± 0,110	± 0,075	± 0,150	± 0,125	± 0,085	± 0,250	± 0,150	± 0,110	± 0,50	± 0,35	± 0,30
1,50 ≤ e < 2,50				± 0,200	± 0,125	± 0,100	± 0,300	± 0,200	± 0,125	± 0,50	± 0,40	± 0,30
2,50 ≤ e ≤ 3,00				± 0,250	± 0,150	± 0,125	± 0,300	± 0,200	± 0,125	± 0,60	± 0,50	± 0,40

Straightness tolerances (*) in annealed state (+A)

Width (L) (mm)	NORMAL (mm/m)	REDUCED (mm/m)
L < 10 (*)	≤ 10	≤ 5
10 ≤ L < 25	≤ 4	≤ 1,5
25 ≤ L < 40	≤ 3	≤ 1,25
40 ≤ L < 125	≤ 2	≤ 1
125 ≤ L < 600	≤ 1,5	≤ 0,75

* 5 < L < 10 : Aciers Coste's values on straightened coils

Length tolerances for cut-to-length strips (mm)

Nominal length (L) (mm)	NORMAL (mm/m)	REDUCED (mm/m)
L ≤ 2000	+ 3 - 0	+ 1,5 - 0
2000 < L ≤ 4000	+ 5 - 0	+ 2 - 0

the tolerance may be shared in ± around nominal value

Tolerances for flatness and edge waviness for cut-to-length strips in annealed state (+A)

Standard flatness tolerance ≤ 6 mm
Special flatness tolerance ≤ 4 mm
In cold-drawn state (+ CR), tolerance by mutual agreement

ACCORDING TO PRODUCTION*

Thickness tolerances for width 2,5 to 600 mm

Thickness (e) (mm)	Tolerances (mm)			Thickness (e) (mm)	Tolerances (mm)		
	NORMAL	FINE	PRECISION		NORMAL	FINE	PRECISION
0,10 ≤ e < 0,15	± 0,020	± 0,015	± 0,010	0,60 ≤ e < 0,80	± 0,040	± 0,035	± 0,025
0,15 ≤ e < 0,20	± 0,025	± 0,015	± 0,012	0,80 ≤ e < 1,00	± 0,050	± 0,035	± 0,025
0,20 ≤ e < 0,25	± 0,025	± 0,020	± 0,012	1,00 ≤ e < 1,20	± 0,050	± 0,040	± 0,030
0,25 ≤ e < 0,30	± 0,030	± 0,020	± 0,015	1,20 ≤ e < 1,50	± 0,060	± 0,045	± 0,030
0,30 ≤ e < 0,40	± 0,030	± 0,025	± 0,015	1,50 ≤ e < 2,00	± 0,070	± 0,050	± 0,035
0,40 ≤ e < 0,50	± 0,035	± 0,025	± 0,018	2,00 ≤ e < 2,50	± 0,080	± 0,060	± 0,040
0,50 ≤ e < 0,60	± 0,040	± 0,030	± 0,020	2,50 ≤ e ≤ 3,00	± 0,090	± 0,070	± 0,045

UNLESS SPECIFIED WITH ORDER

- Width tolerances according to ISO 9445 above
- Strength according to NF EN 10088 (page1)
- Annealed states with widths ≥ 30 mm are usually delivered with interleaving paper (except for regularized thicknesses)
  - Bright or flat appearance according to stock
- Cold-drawn states are usually delivered without interleaving paper
  - Semi-bright to bright appearance, according to steel grade

* Products defined before 31 March 1999, whose repeatability is automatic, are not concerned

We can also produce according to DIN 10259, NFA 35-540, AISI

LOW CARBON STEEL FOR COLD FORMING 3

ACCORDING TO EN 10139 - TOLERANCES ACCORDING TO EN 10140

Symbolic & numerical designations of steel grade	Chemical composition of tapping %					Delivery condition		Mechanical properties** (long direction)				
	C	P	S	Mn	Ti	Condition	Symbol	Thickness (Ep)	Thickness (%)		Re, ReL, Rp0,2	Rm
	max.	max.	max.	max.	max.			(mm)	Th. < 3	Th. ≥ 3	(MPa)	(MPa)
DC01 (1.0330)	0,12	0,045	0,045	0,60	-	annealed	A	-	≥ 28	≥ 32	-	270 / 390
						skin-passed	LC *	Th. ≤ 0,2	≥ 22	-	≤ 320	270 / 410
								0,2 < Th. ≤ 0,5	≥ 24	-	≤ 320	270 / 410
								0,5 < Th. ≤ 0,7	≥ 26	-	≤ 300	270 / 410
								0,7 < Th.	≥ 28	≥ 32	≤ 280	270 / 410
						hardered	**C 290**	-	≥ 18	≥ 24	200 / 380	290 / 430
							C 340	-	-	-	≥ 250	340 / 490
							C 390	-	-	-	≥ 310	390 / 540
							C 440	-	-	-	≥ 360	440 / 590
							C 490	-	-	-	≥ 420	490 / 640
							C 590	-	-	-	≥ 520	590 / 740
							C 690**	-	-	-	≥ 630	≥ 690
DC03 (1.0347)	0,10	0,035	0,035	0,45	-	annealed	A	-	≥ 34	≥ 37	-	270 / 370
						skin-passed	LC *	Th. ≤ 0,2	≥ 28	-	≤ 280	270 / 370
								0,2 < Th. ≤ 0,5	≥ 30	-	≤ 280	270 / 370
								0,5 < Th. ≤ 0,7	≥ 32	-	≤ 260	270 / 370
								0,7 < Th.	≥ 34	≥ 37	≤ 240	270 / 370
						hardered	**C 290**	-	≥ 22	≥ 26	210 / 355	290 / 390
							C 340	-	-	-	≥ 240	340 / 440
							C 390	-	-	-	≥ 330	390 / 490
							C 440	-	-	-	≥ 380	440 / 540
							C 490	-	-	-	≥ 440	490 / 590
							C 590	-	-	-	≥ 540	≥ 590
DC04 (1.0338)	0,08	0,030	0,030	0,40	-	annealed	A	-	≥ 38	≥ 40	-	270 / 350
						skin-passed	LC *	Th. ≤ 0,2	≥ 32	-	≤ 250	270 / 350
								0,2 < Th. ≤ 0,5	≥ 34	-	≤ 250	270 / 350
								0,5 < Th. ≤ 0,7	≥ 36	-	≤ 230	270 / 350
								0,7 < Th. ≤ 1,5	≥ 38	-	≤ 210	270 / 350
								1,5 < Th.	≥ 38	≥ 40	≤ 235	270 / 350
						hardered	**C 290**	-	≥ 24	≥ 28	220 / 325	290 / 390
							C 340	-	-	-	≥ 240	340 / 440
							C 390	-	-	-	≥ 350	390 / 490
							C 440	-	-	-	≥ 400	440 / 540
							C 490	-	-	-	≥ 460	490 / 590
							C 590	-	-	-	≥ 560	590 / 690
DC05 (1.0312)	0,06	0,025	0,025	0,35	-	skin-passed	LC *	Th. ≤ 0,2	≥ 34	-	≤ 220	270 / 330
								0,2 < Th. ≤ 0,5	≥ 36	-	≤ 220	270 / 330
								0,5 < Th. ≤ 0,7	≥ 38	-	≤ 200	270 / 330
								0,7 < Th.	≥ 40	≥ 42	≤ 180	270 / 330
DC06 (1.0873)	0,02	0,02	0,02	0,25	0,3	skin-passed	LC *	Th. ≤ 0,2	≥ 32	-	≤ 220	270 / 350
								0,2 < Th. ≤ 0,5	≥ 34	-	≤ 220	270 / 350
								0,5 < Th. ≤ 0,7	≥ 36	-	≤ 200	270 / 350
								0,7 < Th.	≥ 38	≥ 40	≤ 180	270 / 350

* For the LC condition with MB or MC finish : Re + 20 Mpa - Rm + 20 Mpa - Elongation - 2 points. ** Plastic anisotropy coefficient r available on request

SURFACE ASPECT			Surface finish
Symbolic	Specifications	**application fields**	
MA	Naked surfaces, without metallic defects Pores, little defects, light scratches admitted	All thicknesses All thermic treatments	RR (rough): Ra ≥ 1.5µm RM (matt) 0.6 < Ra ≤ 1.8 µm RL 2)(normal) Ra ≤ 0.6 µm
MB	Naked surfaces, without metallic defects Pores, little defects, light scratches admitted if it doesn't affect the smooth and uniform surface's aspect visible with a naked eye	Thicknesses ≤ 2,0 mm 1) All thermic treatments. Except A	RM (matt) 0.6 < Ra ≤ 1.8 µm RL 2) (normal) Ra ≤ 0.6 µm
MC	Naked surfaces, without metallic defects. Pores, little defects, light scratches admitted if it doesn't affect the mirror aspect of the surface.	Thicknesses ≤ 1,0 mm 1) All thermic treatments. Except A	RN 2) (bright) Ra ± 0.2µm

1) products with higher thickness can be delivered by specific agreement

2) symbolic doesn't have to be mentioned on designation

Surface finishings : RR (rough) : Ra ≥ 1,5 µm - RM (mat) : 0,6 µm < Ra ≤ 1,8 µm - RL (normal) : Ra ≤ 0,6 µm - RN (brilliant) : Ra ≤ 0,2 µm

We can also produce according to DIN 1624, NFA 37-501, ASTM A1008

PURE IRON 4

CHEMICAL COMPOSITION

Values	Chemical composition of casting %					
	C	Mn	P	S	Si	Al
Guarantees	≤ 0,006	≤ 0,25	≤ 0,02	≤ 0,02	≤ 0,03	0,02 / 0,08
RFe 60	≤ 0,03	≤ 0,2	≤ 0,025	≤ 0,015	≤ 0,05	0,04 / 0,1
RFe 80	≤ 0,05	0,2 / 0,35	≤ 0,03	≤ 0,035	≤ 0,1	0,04 / 0,1

MECHANICAL PROPERTIES –TOLERANCES ACCORDING TO AGREEMENT

Condition		Mechanical properties				
		Rm (MPa)	Rp0,2 (MPa)	Elongation (%)		Indicative hardness (HV)
				Thickness < 3 mm	Thickness ≥ 3 mm	
Annealed	mini.			35	38	
	maxi.	300	230			95
	average	280	180	40	43	
Annealed SKP	mini.			35	38	
	maxi.	320	230			105
	average	300	200	40	43	
Hardered *	T1	300 to 400		> 10	> 12	
	T2	400 to 500				
	T3	500 to 600				

HIGH ELASTIC LIMIT STEEL

ACCORDING to EN 10268- TOLERANCES ACCORDING to EN 10140

Symbolic designations of the steel grade (NF EN 10027)		Old designations EN 10268 (1999)	Chemical composition of tapping analysis %									Mechanical properties						
												direction	transverse direction			long direction		
Symbolic	Numerical		C	Si	Mn	P	S	Al	Ti	Nb	+Ti +Nb + V + B	thickness	A_{80}*	R_{eL} ($R_{p0,2}$)	R_m	A_{80}*	R_{eL} ($R_{p0,2}$)	R_m
			max.	max.	max.	max.	max.	min.	max.	max.	max.	mm	%	MPa	MPa	%	MPa	MPa
HC260LA	1.0480	H 240 LA	0.10	0.50	1.00	0.030	0.025	0.015	0.15	0.09	0.22	0,5 < e ≤ 0,7	24	260 to 330	350 to 430	25	240 to 310	340 to 420
												0,7 < e ≤ 3	26			27		
HC300LA	1.0489	H 280 LA	0.12	0.50	1.40	0.030	0.025	0.015	0.15	0.09	0.22	0,5 < e ≤ 0,7	21	300 to 380	380 to 480	22	280 to 360	370 to 470
												0,7 < e ≤ 3	23			24		
HC340LA	1.0548	H 320 LA	0.12	0.50	1.50	0.030	0.025	0.015	0.15	0.09	0.22	0,5 < e ≤ 0,7	19	340 to 420	410 to 510	20	320 to 410	400 to 500
												0,7 < e ≤ 3	21			22		
HC380LA	1.0550	H 360 LA	0.12	0.50	1.60	0.030	0.025	0.015	0.15	0.09	0.22	0,5 < e ≤ 0,7	17	380 to 480	440 to 580	18	350 to 450	430 to 550
												0,7 < e ≤ 3	19			20		
HC420LA	1.0556	H 400 LA	0.14	0.50	1.60	0.030	0.025	0.015	0.15	0.09	0.22	0,5 < e ≤ 0,7	15	420 to 520	470 to 600	16	390 to 500	460 to 580
												0,7 < e ≤ 3	17			18		
HC460LA	1.0574	/	0.14	0.60	1.80	0.030	0.025	0.015	0.15	0.09	0.22	0,5 < e ≤ 0,7	11	460 to 580	510 to 660	12	420 to 560	480 to 630
												0,7 < e ≤ 3	13			14		
HC500LA	1.0573	/	0.14	0.60	1.80	0.030	0.025	0.015	0.15	0.09	0.22	0,5 < e ≤ 0,7	10	500 to 620	550 to 710	11	460 to 600	520 to 690
												0,7 < e ≤ 3	12			13		

* For thickness ≤ à 0,5 mm, the nominal value of the elongation is reduced to 4 % with regards to the elongation given for a thickness in between 0.7 and 3 mm

We can also produce according to DIN SEW-093, NFA 36-232, ASTM A1008-1

CARBON STEEL (C ≤ 0,35% et C > 0,35%) 5

ACCORDING TO EN 10132 - TOLERANCES ACCORDING TO EN 10140

Designations		Chemical composition %								Mechanical properties (0,3 mm ≤ thickness < 3 mm)			
										Annealed condition (+A) or skin-passed (+LC)			Hardered condition*
Symbolic	Numérical	C	Si maxi	Mn	P maxi	S maxi	Cr maxi	Mo maxi	Ni maxi	Rm maxi (Mpa)	Rp0,2 maxi (Mpa)	A80 mini (%)	Rm maxi (Mpa)
C10E	1.1121	0,07 to 0,13	0,40	0,30 to 0,60	0,035	0,035	0,40			430	345	26	830
C15E	1.1141	0,12 to 0,18	0,40	0,30 to 0,60	0,035	0,035	0,40			450	360	25	870
C22E	1.1151	0,17 to 0,24	0,40	0,40 to 0,70	0,035	0,035	0,40	0,10	0,40	500	400	22	900
C30E	1.1178	0,27 to 0,34	0,40	0,50 to 0,80	0,035	0,035	0,40	0,10	0,40	520	420	20	920

* Hardened conditions: with minimum range of 150 Mpa

Steel grades		Chemical composition %								Mechanical properties (0,3 mm ≤ thickness < 3 mm)			
										Annealed condition (+A) or skin-passed (+LC)			Hardered condition** (+CR)
Symbolic	Numérical	C	Si*	Mn	P* maxi	S* maxi	Cr maxi	Mo maxi	Ni maxi	Rm maxi (Mpa)	Rp0,2 maxi (Mpa)	A 80 mini (%)	Rm maxi (Mpa)
C40E	1.1186	0,37 to 0,44	≤ 0,40	0,50 to 0,80	0,035	0,035	0,40	0,10	0,40	550	440	18	970
C45E	1.1191	0,42 to 0,50	≤ 0,40	0,50 to 0,80	0,035	0,035	0,40	0,10	0,40	570	455	18	1020
C50E	1.1206	0,47 to 0,55	≤ 0,40	0,60 to 0,90	0,035	0,035	0,40	0,10	0,40	580	465	17	1050
C55E	1.1203	0,52 to 0,60	≤ 0,40	0,60 to 0,90	0,035	0,035	0,40	0,10	0,40	600	480	17	1070
C60E	1.1221	0,57 to 0,65	≤ 0,40	0,60 to 0,90	0,035	0,035	0,40	0,10	0,40	620	495	17	1100
C67S	1.1231	0,65 to 0,73	0,15 to 0,35	0,60 to 0,90	0,025	0,025	0,40	0,10	0,40	640	510	16	1140
C75S	1.1248	0,70 to 0,80	0,15 to 0,35	0,60 to 0,90	0,025	0,025	0,40	0,10	0,40	640	510	15	1170
C85S	1.1269	0,80 to 0,90	0,15 to 0,35	0,40 to 0,70	0,025	0,025	0,40	0,10	0,40	670	535	15	1190
C90S	1.1217	0,85 to 0,95	0,15 to 0,35	0,40 to 0,70	0,025	0,025	0,40	0,10	0,40	680	545	14	1200
C100S	1.1274	0,95 to 1,05	0,15 to 0,35	0,30 to 0,60	0,025	0,025	0,40	0,10	0,40	690	550	13	1200

*** Composition for springs and special applications from C55S to C125S : Reduced content of : Si = 0,15% to 0,35% • P ≤ 0,025% • S ≤ 0,025%**
**** Cold-drawn state : with minimum range of 150 Mpa**

ALLOY STEEL

According to EN 10132- Tolerances according to EN 10140

Designations		Chemical composition %								Mechanical properties in annealed condition (+A) or skin-passed (+LC) for thickness 0,3 to < 3 mm		
Symbolic	Numérical	C	Si	Mn	P maxi	S maxi	Cr	Mo	V	Ni maxi	Rm maxi (Mpa)	Rp0,2 maxi (Mpa)	A80 mini (%)
16MnCr5	1.7131	0,14 to 0,19	≤ 0,40	1,00 to 1,30	0,035	0,035	0,80 to 1,10				550	420	21
25CrMo4	1.7218	0,22 to 0,29	≤ 0,40	0,60 to 0,90	0,035	0,035	0,90 to 1,20	0,15 to 0,30			580	440	19
34CrMo4	1.7220	0,30 to 0,37	≤ 0,40	0,60 to 0,90	0,035	0,035	0,90 to 1,20	0,15 to 0,30			600	460	16
42CrMo4	1.7225	0,38 to 0,45	≤ 0,40	0,60 to 0,90	0,035	0,035	0,90 to 1,20	0,15 to 0,30			620	480	15
51CrV4	1.8159	0,47 to 0,55	≤ 0,40	0,70 to 1,10	0,025	0,025	0,80 to 1,20	≤ 0,10	0,10 to 0,25	0,40	700	550	13
56Si7	1.5026	0,52 to 0,60	1,60 à 2,00	0,60 to 0,90	0,025	0,025	≤ 0,40	≤ 0,10		0,40	740	600	12

We can also produce according to DIN 17222, NFA 37-505, ASTM A108

ACCORDING TO EN 10132- TOLERANCES ACCORDING to EN 10140

Steel grade	Hardening temperatures (environment : oil)	Minimum hardness of quenched condition without temper		Hardness quenched and tempered condition (+QT) (0,3 mm ≤ thickness < 3 mm)						
	° C	HRC	HV	HRC	HV (thickness en mm)					
					0,30 ≤ 0,50 mm	0,50 ≤ 0,75 mm	0,75 ≤ 1,00 mm	1,00 ≤ 1,50 mm	1,50 ≤ 2,00 mm	2,00 < 3,00 mm
C60S	825 to 855	57	640	35 to 51,5	485 to 535	465 to 515	455 to 505	445 to 495	425 to 475	415 to 465
C67S	815 to 845	59	670	38,5 to 54	485 to 535	465 to 515	455 to 505	445 to 495	425 to 475	415 to 465
C75S	810 to 840	60	700	38,5 to 54	520 to 570	500 to 550	480 to 530	465 to 515	440 to 490	435 to 485
C85S	800 to 830	61	720	38,5 to 55	520 to 570	500 to 550	480 to 530	465 to 515	440 to 490	435 to 485
C90S	790 to 820	61	720	38,5 to 55	555 to 605	525 to 575	505 to 555	485 to 535	465 to 515	455 to 505
C100S	790 to 820	61	720	38,5 to 57	555 to 605	525 to 575	505 to 555	485 to 535	465 to 515	455 to 505
25CrMo4*				31,5 to 44						
34CrMo4	840 to 870	48	480	32 to 46						
42CrMo4	840 to 870	51	530	35 to 48,5						
51CrV4	840 to 870	57	640	38,5 to 52,5	520 to 570	500 to 550	480 to 530	465 to 515	440 to 490	435 to 485
56Si7	840 to 870	55	600	38,5 to 50,5	485 to 535	465 to 515	455 to 505	445 to 495	425 to 475	415 to 465

HARDNESS HRC ≤ 40 ➡ Range of 5 HRC minimum HARDNESS HRC > 40 ➡ Range of 4 HRC minimum

* Water hardening : 840-870 = • 44 HRC • 430 HV

ACCORDING TO STANDARD PRODUCTION -THICKNESS TOLERANCES ACCORDING TO ISO 18265

Used steel grade	THICKNESS 0,15 to 3 mm					
	C60S to C85S				C90S to C100S	
Hardness ROCKWELL (HRC)	**35 to 40**	**40 to 43**	**43 to 46**	**47 to 51**	**51 to 55**	**> 55**
Hardness VICKERS (HV)	**340 to 390**	**390 to 430**	**430 to 470**	**480 to 530**	**530 to 600**	**> 600**
indicative Rm (MPa)	**1100 to 1270**	**1270 to 1390**	**1390 to 1500**	**1550 to 1700**	**1700 to 1850**	**> 1850**

ADDITIONAL INFORMATIONS

Recommended measurements :
HV FOR THICKNESS ≤ 1 mm - HRC FOR THICKNESS ≥ 1 mm
For thickness < 0,15 et > 3 mm (PRODUCTIONS POSSIBILITIES ARE RELATED TO THE GRADE, HARDNESS AND APPEARANCE REQUIRED)

APPEARANCE : bluish grey (as quenched) - burnished (bright) bluish
scratch brushed (special finish)

DECARBURIZATION ≤ 1% Thickness

We can also produce according to following standards : DIN 17222, NFA 37-505, ASTM A108

DIMENSIONAL AND OTHER TOLERANCES (excluding stainless steels)

EN 10140

Nominal thickness (mm)		Thickness tolerances (mm)					
		Width < 125 mm			≥ 125 mm and < 600 mm a)		
>	≤	A NORMAL	B FINE	C PRECISION	A NORMALE	B FINE	C PRECISION
	0,10	± 0,008	± 0,006	± 0,004	± 0,010	± 0,008	± 0,005
0,10	0,15	± 0,010	± 0,008	± 0,005	± 0,015	± 0,012	± 0,010
0,15	0,25	± 0,015	± 0,012	± 0,008	± 0,020	± 0,015	± 0,010
0,25	0,40	± 0,020	± 0,015	± 0,010	± 0,025	± 0,020	± 0,012
0,40	0,60	± 0,025	± 0,020	± 0,012	± 0,030	± 0,025	± 0,015
0,60	1,00	± 0,030	± 0,025	± 0,015	± 0,035	± 0,030	± 0,020
1,00	1,50	± 0,035	± 0,030	± 0,020	± 0,040	± 0,035	± 0,025
1,50	2,50	± 0,045	± 0,035	± 0,025	± 0,050	± 0,040	± 0,030
2,50	4,00	± 0,050	± 0,040	± 0,030	± 0,060	± 0,050	± 0,035
4,00	6,00	± 0,060	± 0,050	± 0,035	± 0,070	± 0,055	± 0,040
6,00	8,00	± 0,075	± 0,060	± 0,040	± 0,085	± 0,065	± 0,045
8,00	10,00	± 0,090	± 0,070	± 0,045	± 0,100	± 0,075	± 0,050

a) Can be obtained at 650 mm

The thickness measurement is made at 10 mm from the edge (on the middle of the strip for the widths ≤ 20 mm)

WIDTH TOLERANCES (mm)

Nominal thickness (mm)	Width < 125 mm		125 mm ≤ Width < 250 mm		250 mm ≤ Width < 600 mm	
	A NORMAL	B PRECISION	A NORMAL	B PRECISION	A NORMAL	B PRECISION
e ≤ 0,60	± 0,15	± 0,10	± 0,20	± 0,13	± 0,25	± 0,18
0,60 < e ≤ 1,50	± 0,20	± 0,13	± 0,25	± 0,18	± 0,30	± 0,20
1,50 < e ≤ 2,50	± 0,25	± 0,18	± 0,30	± 0,20	± 0,35	± 0,25
2,50 < e ≤ 4,00	± 0,30	± 0,20	± 0,35	± 0,25	± 0,40	± 0,30
4,00 < e ≤ 6,00	± 0,35	± 0,25	± 0,40	± 0,30	± 0,45	± 0,35
6,00 < e ≤ 8,00	± 0,45		± 0,50		± 0,55	
8,00 < e ≤ 10,00	± 0,50		± 0,55		± 0,60	

Note 1 : For strip with edges as rolled see § 7.2.3 of standard EN 10140.

Note 2 : For thicknesses greater than 6 mm, the measurement method should be agreed on order.

Straightness tolerances (camber, saber, cambering)

Measurement length of 1000 mm

Nominal width (L) (mm)	Division A NORMAL (mm/m)	Division B PRECISION (mm/m)
10 ≤ L < 25	≤ 5,00	≤ 2,00
25 ≤ L < 40	≤ 3,50	≤ 1,50
40 ≤ L < 125	≤ 2,50	≤ 1,25
125 ≤ L < 600	≤ 2,00	≤ 1,00

Note 1 : *The above tolerances apply to strip whose width is at least 10 times the thickness.*

Note 2 : *For strips with width< 10 mm and for strips whose cross-section ratio is not standardised, special agreements are possible.*

Thickness measurement (mm)

THE THICKNESS TOLERANCES GIVEN ONLY APPLY FOR MEASUREMENTS CARRIED OUT ACCORDING TO THE SPECIFICATIONS BELOW :

	Nominale width (L) (mm)	Minimum distance of measuring points from edges
Sheared edges	L ≤ 20	Middle of strip
	20 < L < 600	10 mm

Length and flatness tolerances for length section strips

Nominale length (L) (mm)	More tolerances in relation to the nominal length (mm)	
	Division A NORMAL	Division B PRECISION
L ≤ 1000	+ 10	+ 6
1000 < L ≤ 2500	+ 0,01 L	+ 6
L > 2500	+ 0,01 L	+ 0,003 L

The tolerance can be divided ± in relation to the nominal length
Reduced tolerance by mutual agreement

Flatness tolerances

ANNEALED STATE :
FLATNESS TOLERANCE IN ROLLING DIRECTION,
10 MM MAXIMUM ON 1000 MM

COLD-DRAWN STATE
TOLERANCE BY MUTUAL AGREEMENT

CROSS FLATNESS

T ≤ 0,15 % of the width	W ≤ 0,25 % of the width

We can also produce according to
DIN 1544, NFA 47-501, ASTM

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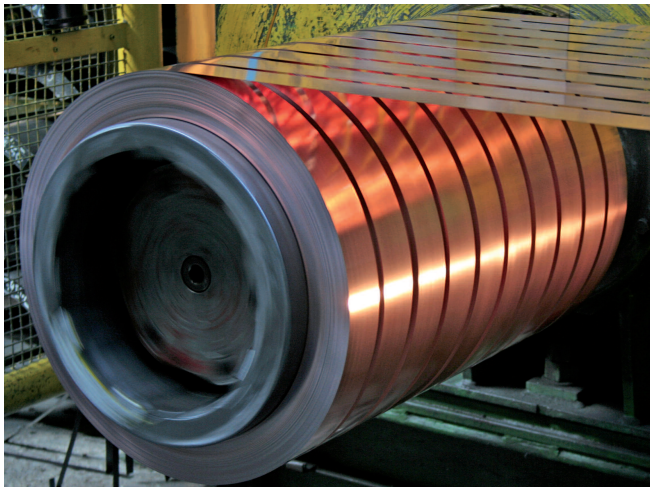
COATINGS

2 different coated faces



Electro-copper plated steel

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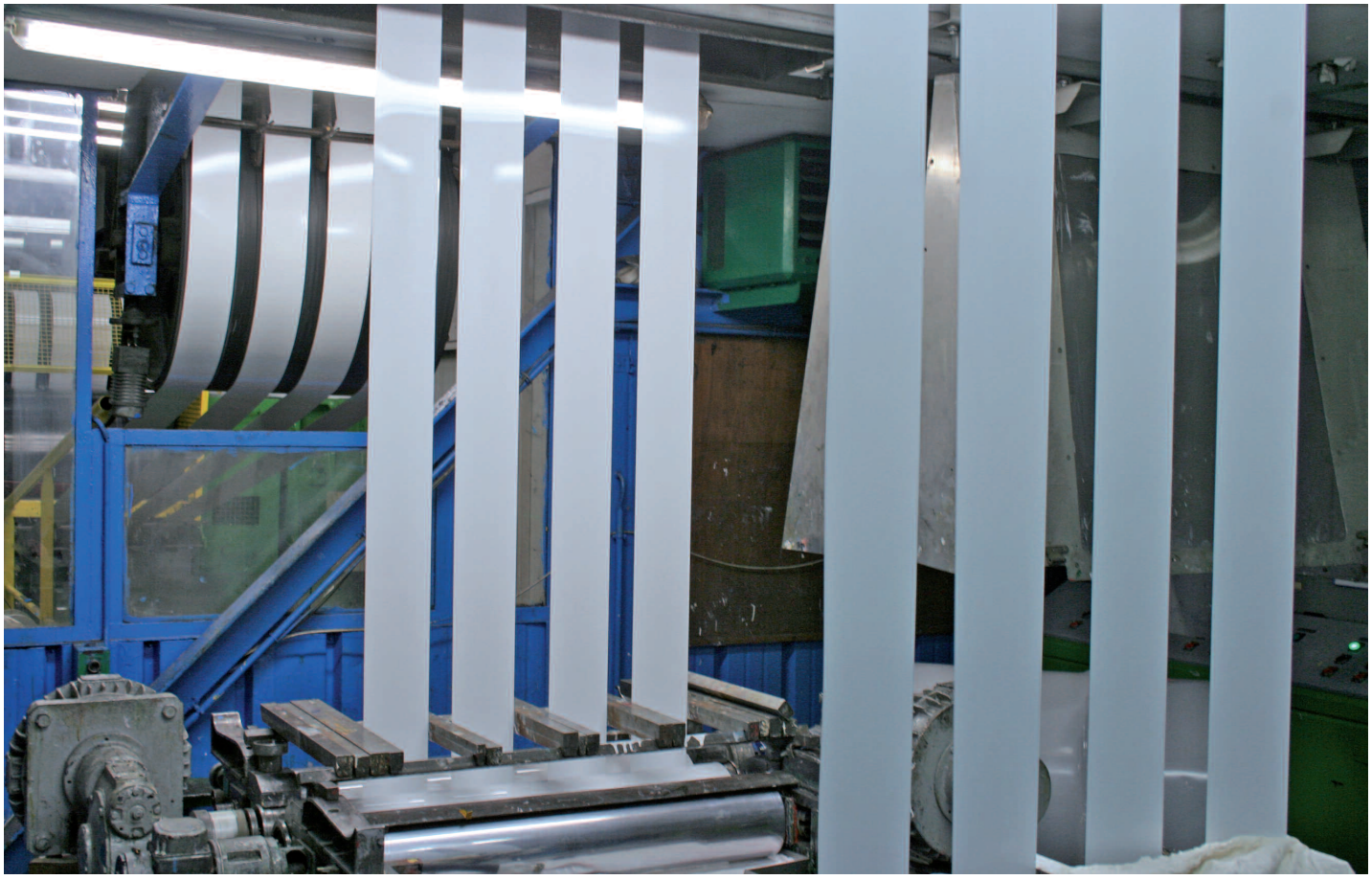
ORGANIC COATED COIL 8



Organic coating line

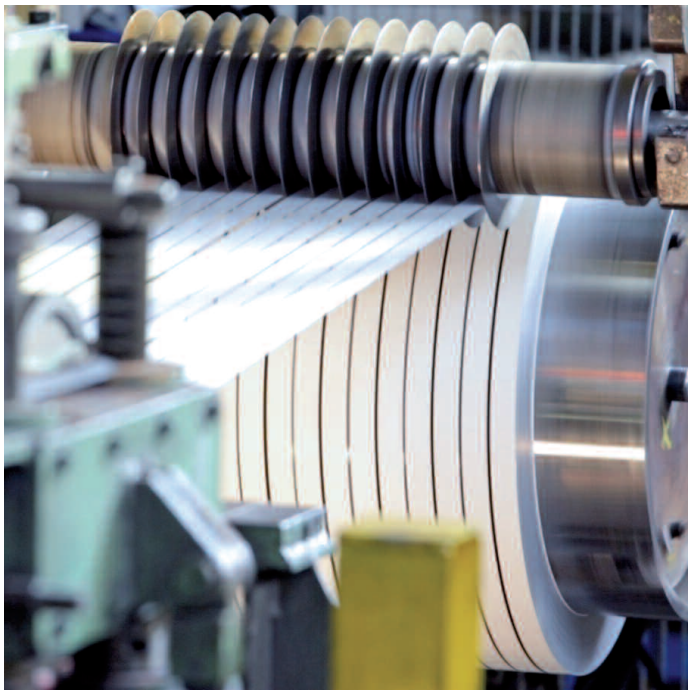
POSSIBILITY

coating options : lacquer, varnish
Possibility of **2 different** coated faces

→ Type of coating, range of colour, plating thickness
Coating on **one** or **two sides**
Coating on edges **according to thickness**

We can also provide subcontracted organic services on different steel grades :

- **low carbon**
- **stainless steel**
- **HSLA**
- **HC**
- **aluminium**
- **non-ferrous metals…**



White lacquered steel slitting

SURFACE FINISH

- **Range of colour** : On demand
- **Aspect** : smooth, granulated
  with polish finish on request

SIZE SPECIFICATIONS

	Minimum width	Maximum width	Minimum thickness	Maximum thickness
ORGANIC COATED	4 mm	500 mm	0,10 mm	1,5 mm

LE POINT-THIERS
AC 08 c

GALVANIZED STEEL STRIPS (two faces)

Slit galvanized low carbon steel strips for cold forming, as **EN 10346** material standard and **EN 10143 / EN 10140** dimensional and shape tolerance standards.

TECHNICAL SPECIFICATIONS :

- Raw material technical specifications according to EN 10346 standards, low carbon grades for cold forming from DX51D to DX54D and DX56D to DX57D.

COATING SPECIFICATIONS :

- Appearance A, B or C
- No spangle : M (or Normal : N)
- Ecological passivation (free of hexavalent chromium)
- Zinc values from Z100 to Z275

SIZE SPECIFICATIONS

	Minimum width	Maximum width	Maximum thickness
Galvanized 2 faces	5 mm	1 480 mm	1,8 mm

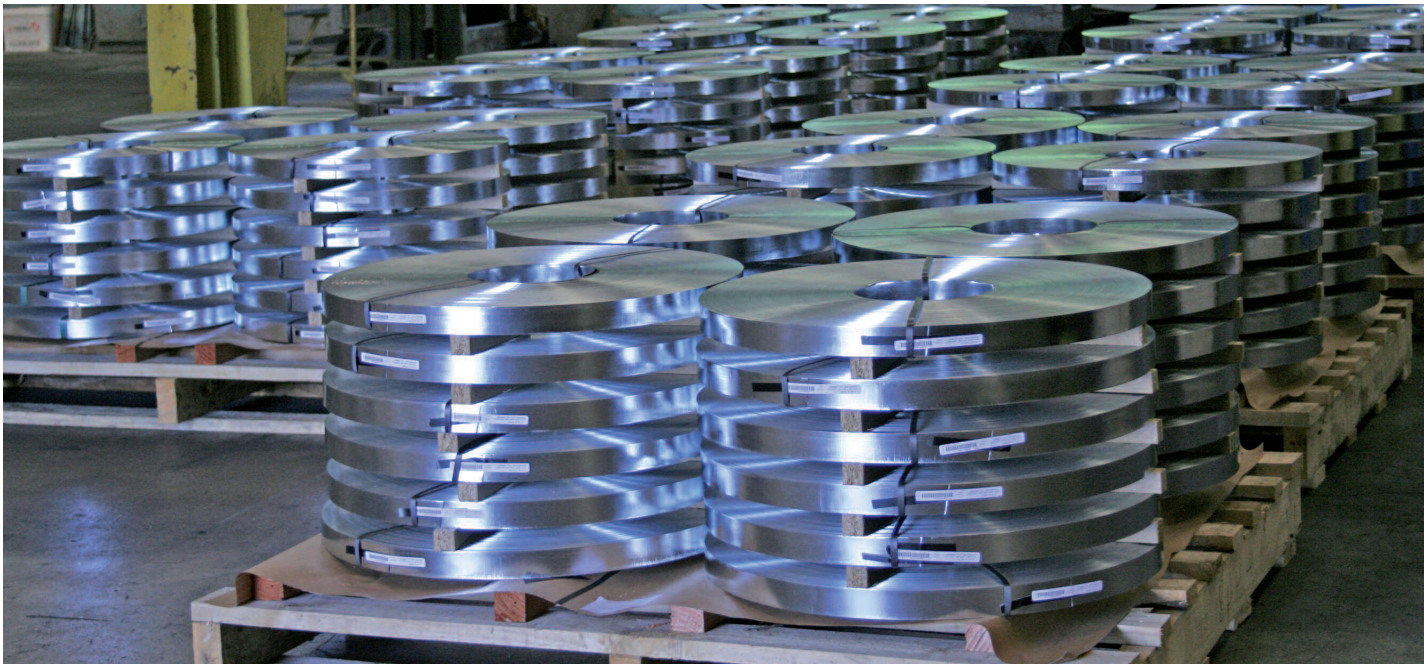
GALVANIZED STEEL STRIPS (four faces)

TECHNICAL SPECIFICATIONS :

- 4 coated edges (with galvanized edges)
- Standard base metal EN 10139/EN10140
- Special magnetic specifications on request (high permeability)
- Coating characteristics : zinc weight % from 70 to 250 g/m² by surface

SIZE SPECIFICATIONS

	Minimum width	Maximum width	Minimum thickness	Maximum thickness
Galvanized 4 faces	10 mm	80 mm	0,15 mm	0,8 mm



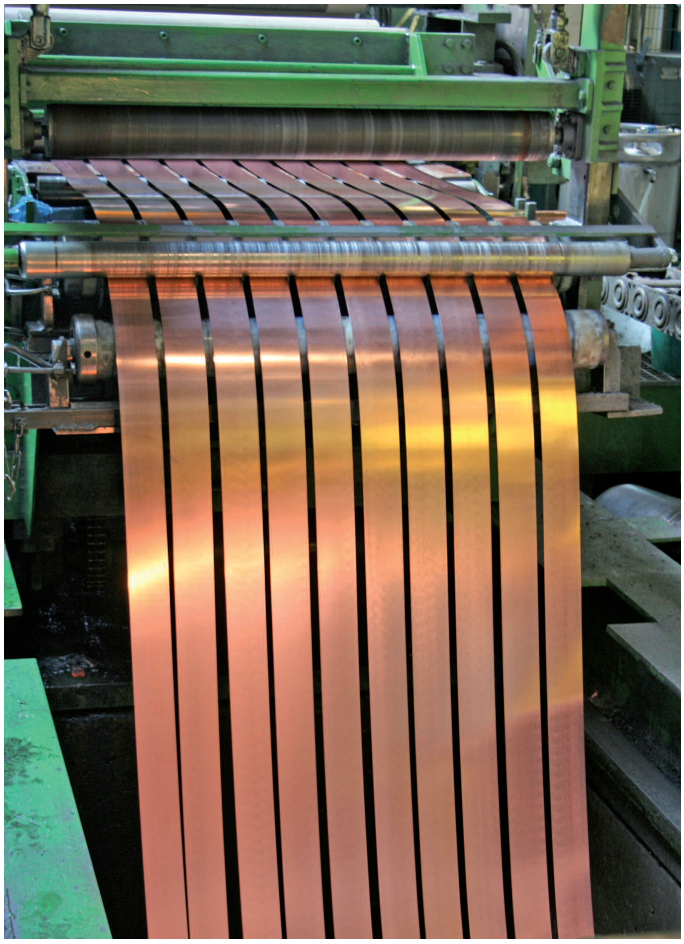
ELECTRO-COPPER PLATED STEEL STRIPS

This process, in an acid environment, free of cyanide, is **environmentally-friendly**.

The copper plating is compatible with distortion and results in an improved surface conductivity.

Plating specifications :

- Copper thickness on request : from **1** to **5** µm by face
- Surface appearance : brushed or non-brushed
- Surface treatment : Anti-tarnishing on request



Electro-copper strip

SIZE SPECIFICATIONS

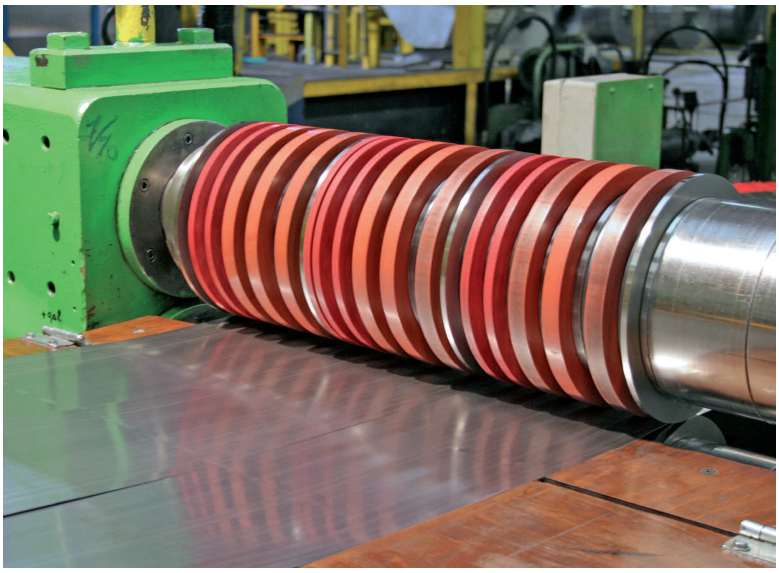
	Min	Max
thickness	0,2 mm	1,2 mm
width	5 mm	620 mm

Electro-zinc Plated steel strip (electrogalvanized)

Zinc coating on both faces of the strip.

TECHNICAL SPECIFICATIONS :

- Mechanical specifications according to EN10139
- On request zinc thickness: from 1 to 7.5 µm by face
- Optional treatment : a thin **organic coating improves corrosion resistance**, protects from **finger print markings** and brings a **lubricant effect** that aids **slitting** and **shaping**.



Electro-zinc strip

SIZE AND TOLERANCE SPECIFICATIONS

	Min	Max
Thickness	0,09 mm	2 mm
Width	5 mm	650 mm

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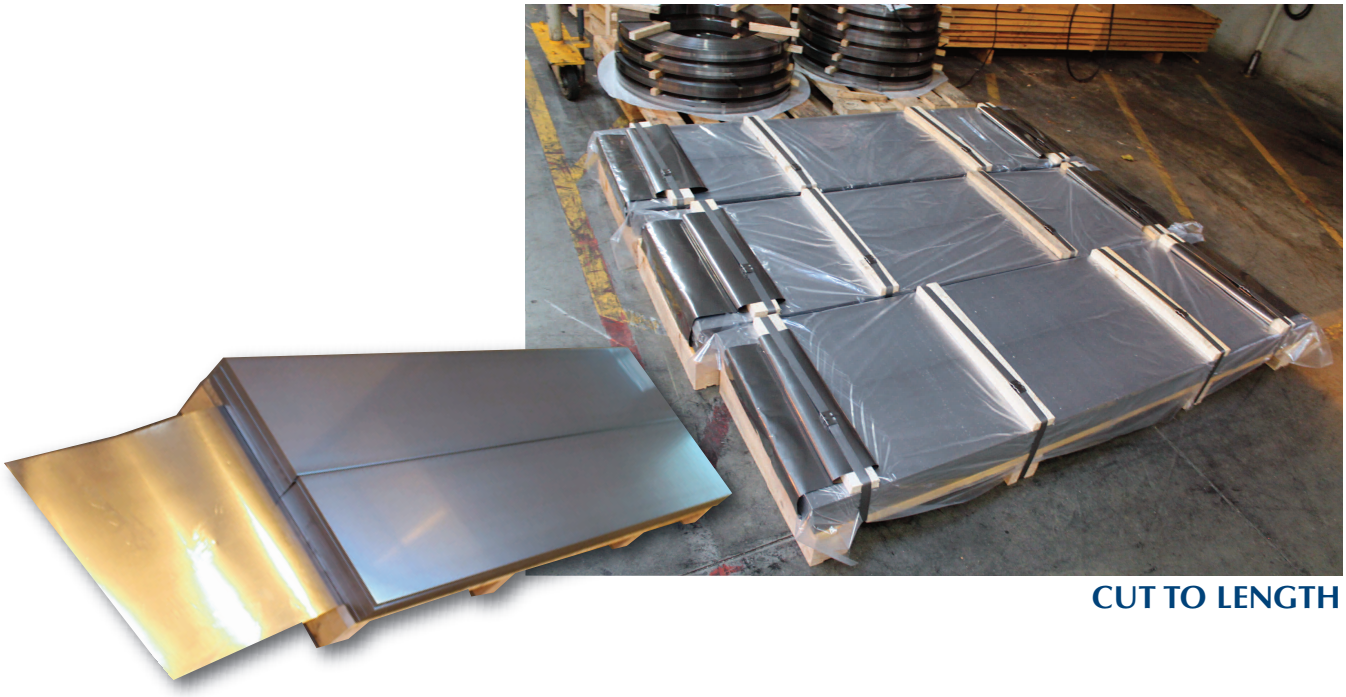
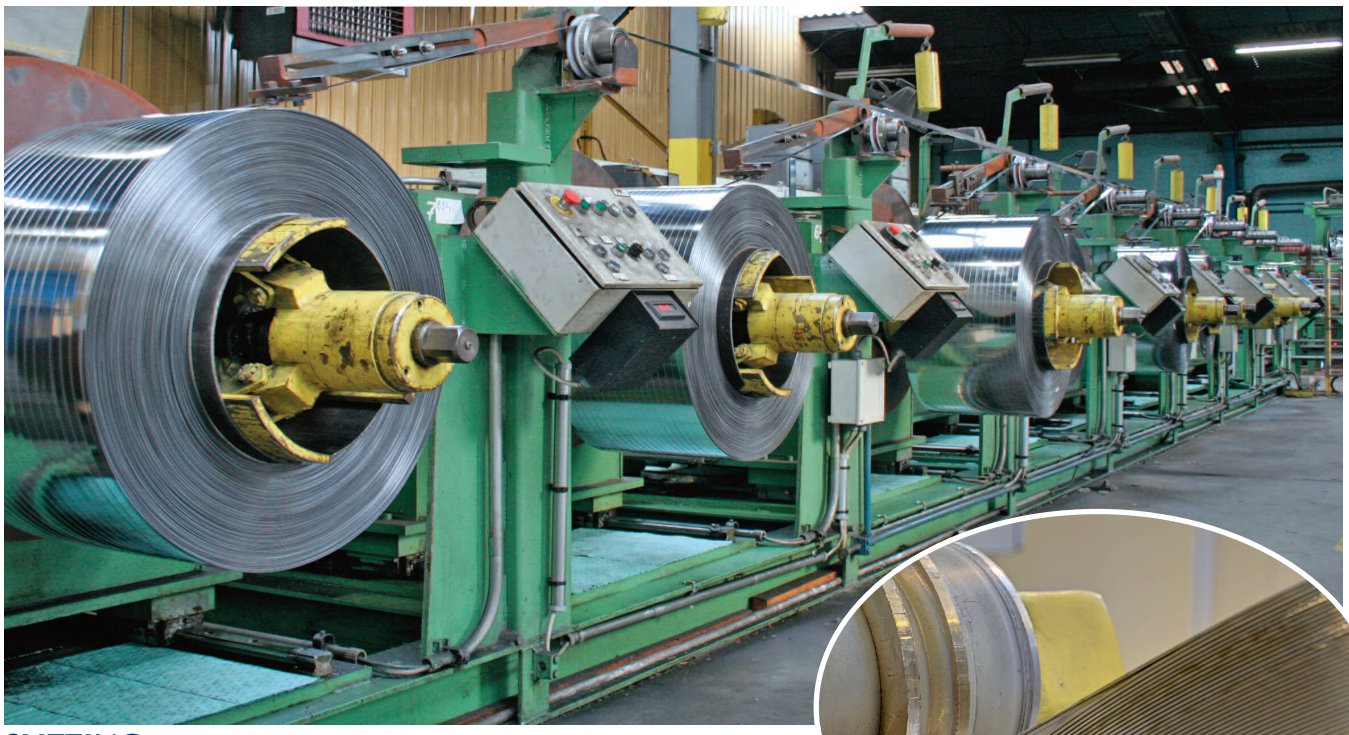
FINISHING PROCESS



CUT TO LENGTH



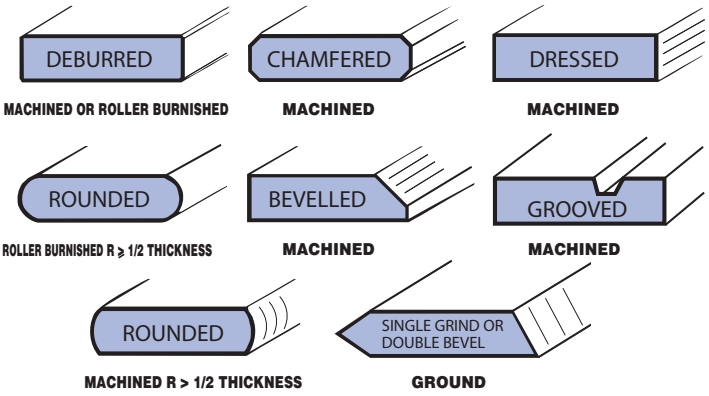
SLITTING

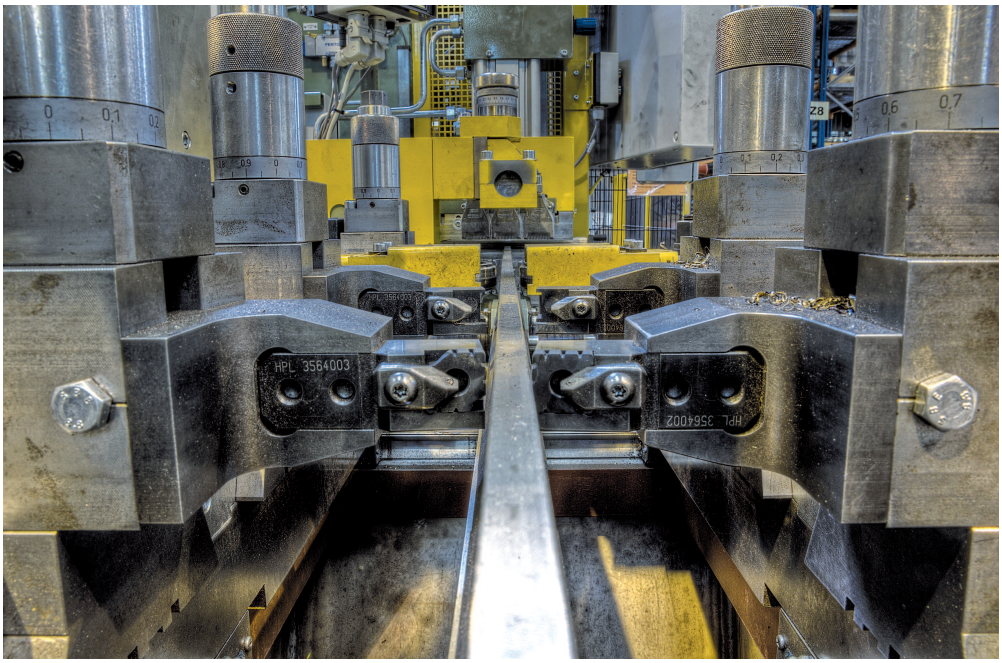
EDGE FORMING

EDGE FORMING

- rounded, deburred,chamfered on one or 2 edges
- width from 5 to 80 mm
- thickness from 0.3 to 5 mm

- Depending on the steel grade, please consult us with regards to your production process, specifying the end use of your product
- **Customer specific chamfered edges on request**

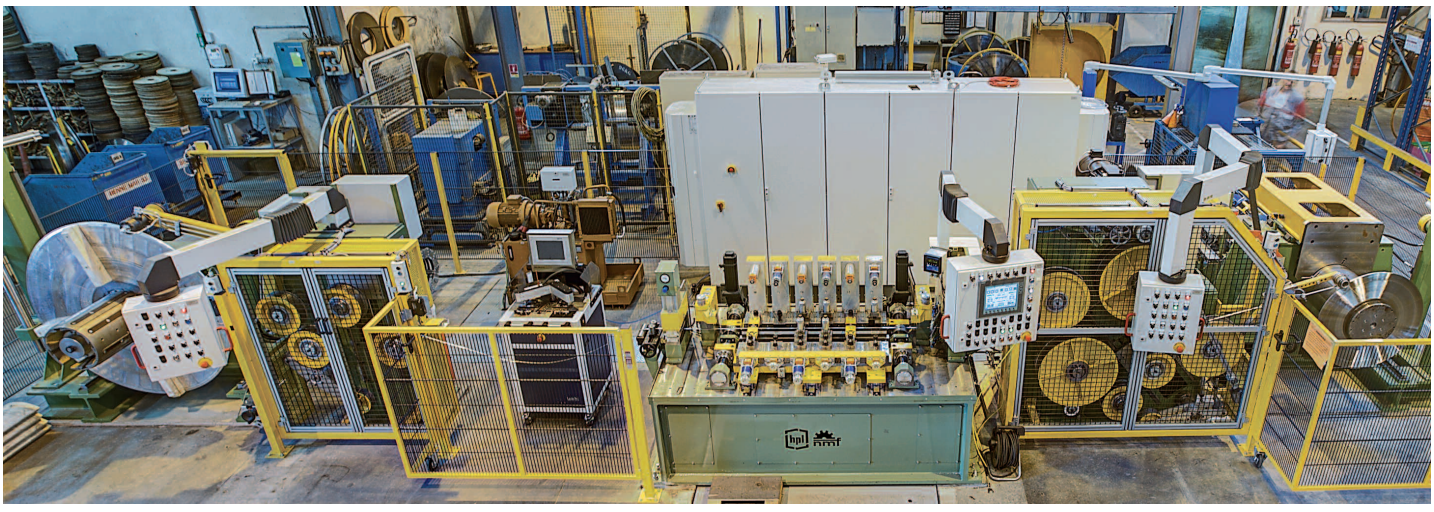




Rounding

EDGING + CONTINUOUS OSCILLATING

- width from 5 to 25 mm
- thickness from 0.3 to 2.5 mm



LE POINT-THIERS

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OSCILLATED WOUND REELS 12

Oscillated reel 1500 kg

PRODUCTION AND SPECIAL ORDER WORK

- All metals and alloys
- Strips from 3 mm to 50 mm wide and from 0,1 mm to 2,5 mm thick
- Welds marked by no increase in thickness or width
- TIG and butt welding with guaranteed characteristics, optional annealing

RECOMMENDED PACKAGING

width (L) (mm)	HOLDER	
	TYPE	USEFULL WIDTH
3 ≤ L < 5	DIN REELS	90 to 180 mm
5 ≤ L < 8	HOOP + FLANGES	200 to 500 mm
8 ≤ L ≤ 35	HOOP	300 to 500 mm

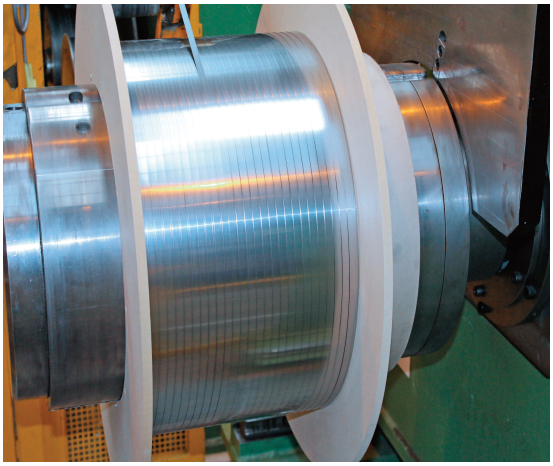
- Special packaging according to needs

Oscillated wound line with 8 coilers

APPROXIMATE STEEL CONTENTS

DIN REELS				
DIN n°	Total outside diameter	Totale oscillated width	weight	Unwiding inside diameter
8559	300 mm	90 mm	20 kg	51 mm
355	355 mm	160 mm	50 kg	36 mm
500	500 mm	250 mm	120 kg	36 mm
710	710 mm	250 mm	200 kg	51 mm

CARBOARD OR METAL BAND INSIDE DIAMETER 400 mm				
OSCILLATED WOUND USEFULL WIDTHS				OUTSIDE DIAMETER WITHOUT FLANGES
200 mm	300 mm	400 mm	500 mm	
120 kg	175 kg	250 kg	300 kg	550 mm
250 kg	375 kg	500 kg	600 kg	650 mm
400 kg	600 kg	800 kg	1000 kg	750 mm
550 kg	850 kg	1000 kg	/	850 mm

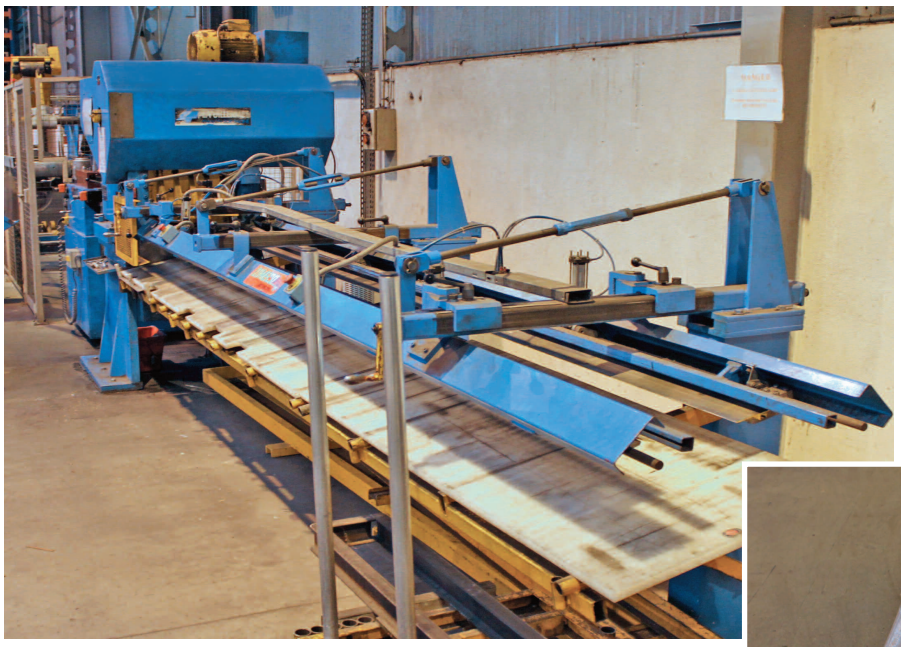


Oscillated reel with round edges

CUT TO LENGTH

SIZE SPECIFICATIONS

	WIDTH	THICKNESS	LENGTH
CUT TO LENGTH	10 to 610 mm	0,5 to 8 mm	350 mm to 8 m



Cut to length bench

SPECIFIC PRODUCTIONS / OUTSOURCED PRODUCTIONS

- Special Annealing and hardening on all steel grades
- Tightened strength ranges (from 50 to 200 Mpa, according to grade and state)
- High precision tolerances for width, thickness and cut to length
- High precision tolerances for width, thickness and cut to length
- Plastic coating on sheets, with greater or lesser adhesion
- Subcontracting on all steel grade (contact us)

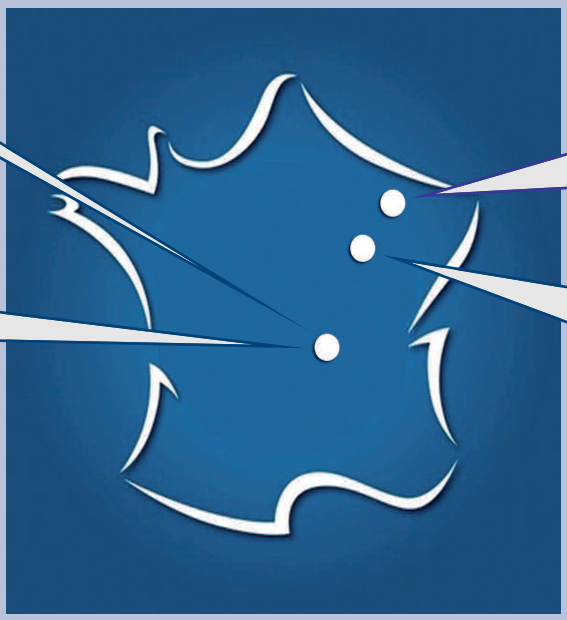
ACILAM Group

Your cold rolling partner
Our business : precision steel strip

Our production sites

ACILAM head office

ACIERS COSTE
Rue du Collongeau
Z.I. de Felet
F-63307 Thiers



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