



aperam
made for life

Our stainless steels solutions,
the most complete range available
on the market

Our grades

	Grade designations	Standards		
		ASTM	UNS	EN
Alternative offer				
Ferritic stainless steels	K03 (F12N)		S41003	1.4003
	K09 (F12T)	409	S40900	1.4512
	K09D (F12TD)	409	S40900	1.4512
	K10 (F13S) ⁽⁴⁾	410S	S41008	1.4000
	K30 (F17)	430	S43000	1.4016
	K30D (F17) ⁽⁴⁾	430	S43000	1.4016
	K30ED (F17)	430	S43000	1.4016
	K39 (F18T)	439	S43035	1.4510
	K39M (F17T)	430Ti	S43036	1.4510
	K41 (F18TNb)	441 ⁽¹⁾	S43932 S43940	1.4509
	K36 (F17MnNb)	436	S43600	1.4526
	K44 (F18MT)	444	S44400	1.4521
	K44M (F19MnNb)	444	S44400	1.4521
	K44X (F19MnNb)	444	S44400	1.4521
	K45 (F20NbCu)	445 ⁽¹⁾	S44500	1.4621 ⁽²⁾
Austenitic stainless steel containing manganese	Aperam 201 (16-4Mn) ⁽⁴⁾	201	S20100	1.4372
	Aperam 201L (16-5MnL)	201LN	S20153	1.4371
	Aperam 201D (17-4Mn)	201.1	S20100 ⁽³⁾	1.4618 ⁽²⁾
Duplex	DX2205	22-05	S32205	1.4462
	DX1803	22-05	S31803	1.4462
	DX2304	23-04	S32304	1.4362
	DX2202 ⁽⁴⁾	22-02	S32202	1.4062 ⁽²⁾
Traditional offer				
Austenitic stainless steels	Aperam 301 (17-7A)	301	S30100	1.4310
	Aperam 301M (17-7C)	301	S30100	1.4310
	Aperam 301R (17-7E) ⁽⁴⁾	(301)	S30100	1.4310
	Aperam 301L (18-7L)	301L 301LN	S30103 S30153	1.4318
	Aperam 304 (18-9E)	304	S30400	1.4301
	Aperam 304H (18-9H)	304H	S30409	1.4301/1.4948
	Aperam 304D (18-9ED)	304	S30400	1.4301
	Aperam 304ED (18-9DDQ)	304	S30400	1.4301
	Aperam 304L (18-9L)	304L	S30403	1.4307
	Aperam 304M (18-10L)	304L	S30403	1.4306
	Aperam 321 (18-10T)	321	S32100	1.4541
	Aperam 321H (18-10TH)	321H	S32109	1.4541/1.4878
	Aperam 305 (18-12D)	305	S30500	1.4303
	Aperam 316L (18-11ML)	316 316L	S31600 S31603	1.4401/1.4404
	Austenitic stainless steels containing molybdenum	Aperam 316B (18-13MS)	316L	S31603
Aperam 316C (18-12MS)		316L	S31603	1.4432
Aperam 316T (17-11MT)		316Ti	S31635	1.4571
Aperam 309 (R20-12)				1.4828
Heat resisting stainless steels	Aperam 309S (R24-13S) ⁽⁴⁾	309S / 309H	S30908	1.4833
	Aperam MA1 ⁽⁴⁾	410	S41000	1.4006
Martensitic stainless steels	Aperam MA2			1.4021
	Aperam MA3	420	S42000	1.4028
	Aperam MA3M			1.4419
	Aperam MA4			1.4034

D: Drawing ED: Extra Drawing H: Hardening M: Modified R: Resistance improved B: Basler norm C: Corrosion resistance improved

- (1) Common designation. (2) Pending update of the standard. (3) With copper addition and 201.1 "rich side" properties per ASTM A240. (4) Available under certain conditions: check with your sales contact.

Other grades are available: consult us.

The choice

With our range,
the array of choices includes:

- > Our alternative offer, with our KARA nickel-free ferritics solutions, our austenitic manganese containing grades and our Duplex family,
- > Our traditional solutions such as austenitics and martensitics.

Grade designations	Chemical compositions (typical values)						
	C	Si	Mn	Cr	Mo	Ni	Others
K03 (F12N)	0.020	0.50	0.60	11.00		0.40	
K09 (F12T)	0.010	0.45	0.30	11.30			Ti = 0.190
K09D (F12TD)	0.010	0.45	0.30	11.30			Ti = 0.190
K10 (F13S) (4)	0.050	0.40	0.30	12.70			
K30 (F17)	0.040	0.35	0.30	16.50			
K30D (F17) (4)	0.030	0.35	0.40	16.50			
K30ED (F17)	0.015	0.35	0.40	16.50			
K39 (F18T)	0.020	0.40	0.30	17.50			Ti = 0.35
K39M (F17T)	0.020	0.40	0.30	16.50			Ti = 0.40
K41 (F18TNb)	0.015	0.60	0.30	17.80			Ti + Nb = 0.65
K36 (F17Mnb)	0.020	0.40	0.25	17.50	1.25		Nb = 0.5
K44 (F18MT)	0.015	0.50	0.30	17.70	1.85		Ti + Nb = 0.45
K44M (F19Mnb)	0.015	0.40	0.30	19.00	1.90		Nb = 0.6
K44X (F19Mnb)	0.015	0.40	0.30	19.00	1.90		Nb = 0.6
K45 (F20NbCu)	0.015	0.25	0.20	20.20			Nb = 0.45 - Cu = 0.45
Aperam 201 (16-4Mn)	0.090	0.50	6.50	16.30		4.15	
Aperam 201L (16-5MnL)	0.025	0.50	7.00	16.30		4.75	N = 0.18 - Cu = 0.3
Aperam 201D (17-4Mn)	0.050	0.35	6.00	16.80		4.60	N = 0.10 - Cu = 1.6 - S ≤ 0.002
DX2205	0.020	0.30	1.80	22.80	3.10	5.50	N = 0.17
DX1803	0.020	0.30	1.80	22.10	2.70	5.10	N = 0.17
DX2304 (4)	0.020	0.40	1.50	23.00	0.50	4.90	N = 0.1
DX2202	0.020	0.40	1.30	23.00	0.30	2.50	N = 0.21
Aperam 301 (17-7A)	0.100	0.90	1.30	16.80		6.60	
Aperam 301M (17-7C)	0.100	0.60	0.90	17.30		7.30	
Aperam 301R (17-7E) (4)	0.100	1.15	1.20	16.70	0.70	6.65	
Aperam 301L (18-7L)	0.025	0.50	1.70	17.50		6.60	N = 0.110
Aperam 304 (18-9E)	0.050	0.40	1.10	18.20		8.05	
Aperam 304H (18-9H)	0.050	0.40	1.10	18.20		8.05	C mini 0.04
Aperam 304D (18-9ED)	0.040	0.40	1.20	18.20		8.10	
Aperam 304ED (18-9DDQ)	0.045	0.40	1.10	18.20		9.10	
Aperam 304L (18-9L)	0.025	0.40	1.40	18.20		8.05	
Aperam 304M (18-10L)	0.025	0.40	1.30	18.20		10.10	
Aperam 321 (18-10T)	0.025	0.40	1.10	17.15		9.10	Ti = 0.30
Aperam 321H (18-10TH)	0.045	0.40	1.10	17.15		9.10	Ti = 0.30
Aperam 305 (18-12D)	0.025	0.40	1.30	18.50		12.60	
Aperam 316L (18-11ML)	0.025	0.40	1.20	16.80	2.10	10.10	
Aperam 316B (18-13MS)	0.020	0.40	1.35	17.30	2.60	12.70	
Aperam 316C (18-12MS)	≤0.03	0.40	1.35	16.80	2.60	11.10	
Aperam 316T (17-11MT)	0.035	0.40	1.20	16.80	2.10	10.70	Ti = 0.350
Aperam 309 (R20-12)	0.050	1.60	1.35	19.30		11.40	
Aperam 309S (R24-13S) (4)	0.060	0.40	1.30	22.20		13.60	
Aperam MA1 (4)	0.115	0.35	0.35	12.30			
Aperam MA2	0.220	0.35	0.35	13.30			
Aperam MA3	0.320	0.35	0.30	13.70			
Aperam MA3M	0.380	0.30	0.30	14.00	0.80		
Aperam MA4	0.460	0.40	0.30	13.80			

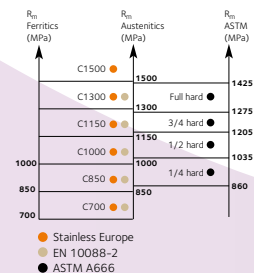
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(4) Available under certain conditions: check with your sales contact.

> Legend

R_m	Tensile strength (MPa)
R_{p0.2}	Proof strength at 0.2% (MPa)
A	Elongation (%)
	Sample according to ISO 6892-1:
	20x80mm (thickness < 3mm)
	Lo = 5.65√S ₀ (thickness ≥ 3mm)
	Sample according to ASTM A370:
	12.5x50mm
1 MPa	= 1 N/mm ²
	= 145 PSI
	= 0.1 kg/mm ²

> Definition of cold worked conditions



Grade designations	Mechanical properties annealed condition (typical values)			Standard cold worked conditions according EN 10088-2 (5)					
	R _m	R _{p0.2}	A%	C700 (R _m)	C850 (R _m)	C1000 (R _m)	C1150 (R _m)	C1300 (R _m)	
K03 (F12N)	490	350	28						
K09 (F12T)	420	250	32						
K09D (F12TD)	410	240	34						
K10 (F13S) (4)	480	290	29						
K30 (F17)	500	330	26	700-850	consult us				
K30D (F17) (4)	480	320	29						
K30ED (F17)	480	300	32						
K39 (F18T)	460	300	30						
K39M (F17T)	450	290	31						
K41 (F18TNb)	480	310	30						
K36 (F17MnNb)	500	350	29						
K44 (F18MT)	520	370	29						
K44M (F19MnNb)	540	370	29						
K44X (F19MnNb)	540	370	29						
K45 (F20NbCu)	510	360	29						
Aperam 201 (16-4Mn)	780	400	53						
Aperam 201L (16-5MnL)	720	360	55						
Aperam 201D (17-4Mn)	665	320	52						
DX2205	840	620	29						
DX1803	840	620	29						
DX2304 (4)	730	550	30						
DX2202	710	530	30						
Aperam 301 (17-7A)	860	340	52	consult us	850-1000 (6)	1000-1150 (6)	1150-1300 (6)	1300-1500 (6)	
Aperam 301M (17-7C)	750	330	53		850-1000 (6)	1000-1150 (6)	1150-1300 (6)	1300-1500 (6)	
Aperam 301R (17-7E) (4)	830	350	51		850-1000 (6)	1000-1150 (6)	1150-1300 (6)	1300-1500 (6)	
Aperam 301L (18-7L)	765	360	50		850-1000	1000-1150			
Aperam 304 (18-9E)	650	300	54		850-1000	1000-1150			
Aperam 304H (18-9H)	670	320	52						
Aperam 304D (18-9ED)	630	285	57						
Aperam 304ED (18-9DDQ)	610	270	57						
Aperam 304L (18-9L)	630	300	54						
Aperam 304M (18-10L)	590	260	55						
Aperam 321 (18-10T)	600	270	50	consult us	consult us				
Aperam 321H (18-10TH)	620	290	49						
Aperam 305 (18-12D)	560	260	50						
Aperam 316L (18-11ML)	620	300	52						
Aperam 316B (18-13MS)	600	290	51						
Aperam 316C (18-12MS)	610	310	50						
Aperam 316T (17-11MT)	600	300	50						
Aperam 309 (R20-12)	640	310	52						
Aperam 309S (R24-13S) (4)	590	310	47						
Aperam MA1 (4)	530	310	27				Quenched at 950/975°C	≥40	1300
Aperam MA2	550	320	28		Quenched at 1050°C Tempered at 250°C	45	1500		
Aperam MA3	600	340	26			51	1700		
Aperam MA3M	690	410	22			55	1800		
Aperam MA4	650	380	22			55	1800		
				Hardness after oil quenching of finished components (typical values)					
				Heat treatment		HRC Hardness		R _m	


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(5) Tensile values given in the rolling direction, according to ISO 6892-1. Cold worked properties according to customer specifications available on request.

(6) In addition for this grade: C1500: R_m 1500-1700.

Size range

An unique offer: from 0.3 to 13 mm thick, up to 2 m wide

	Size range		
	Surface condition and appearance	Thickness in mm	Width in mm
Ferritic stainless steels  key for value	HRAP	1.50 - 2.49	1 000
		2.50 - 2.99	1 250
		3.00 - 6.50	1 524
	2B - 2D	0.40 - 0.59	1 300
		0.60 - 4.00	1 524
		0.30 - 0.39	1 000
	2R	0.40 - 0.69	1 300
		0.70 - 2.00	1 500
		2.00 - 2.50	1 000
Austenitic stainless steels containing manganese	HRAP	2.50 - 3.50	1 250
		3.50 - 5.00	1 500
		4.99 - 13.00	2 000
	HRC	4.00 - 4.99	2 000
	2D - 2B	0.60 - 1.00 ⁽⁷⁾	1 500
		1.00 - 8.00	2 000
	Duplex	HRAP	4.00 - 10.00
7.00 - 10.00			2 000
2B - 2E		1.00 - 6.00	1 500
		2.00 - 6.00	2 000
Austenitic stainless steels	HRAP	1.85 - 2.49	1 000
		2.50 - 2.99	1 250
		3.00 - 4.99	1 524
		5.00 - 13.00	2 000
	HRC	4.00 - 4.99	2 000
	2B - 2D	0.40 - 0.59	1 250
		0.60 - 0.79	1 500
		0.80 - 0.99	1 524
		1.00 - 8.00	2 000
	2R	0.30 - 0.39	1 000
		0.40 - 0.79	1 250
0.80 - 2.00		1 524	
Austenitic stainless steels containing molybdenum	HRAP	2.50 - 2.99	1 000
		3.00 - 4.39	1 250
		4.40 - 6.99	1 524
		7.00 - 13.00	2 000
	HRC	3.00 - 4.39	1 524
		4.00 - 6.99	2 000
	2B - 2D	0.40 - 0.79	1 250
		0.80 - 1.49	1 524
1.50 - 8.00		2 000	
2R	0.30 - 0.39	1 000	
	0.40 - 2.00	1 250	
Heat resisting stainless steels	HRAP	3.50 - 7.99	1 250
		8.00 - 13.00	2 000
	2D - 2B	0.40 - 0.79	1 250
		0.80 - 1.49	1 250
Martensitic stainless steels	2B - 2H	1.50 - 8.00	2 000
		0.40 - 3.50	1 000

(7) Consult us for thicker than 1.0 mm.

Strip - Coil		
Supply possibilities according to thickness and width in the annealed condition		
Thickness in mm	Min. width in mm	Max. width in mm
0.3 ≤ e < 0.4	8	1 000
0.4 ≤ e < 0.6	8	1 250
0.8	8	1 524
1.0	8	1 524
1.5	10	2 000
2.0	10	2 000
2.5	10	2 000
4.0	15	2 000
8.0	20	2 000
10.0	30	2 000
12.0	40	2 000
13.0	40	2 000

Discs (Press blanked discs)		
Around 200 diameters are available		
Thickness in mm	Minimal diameter in mm	Maximum diameter in mm
0.37 ≤ t ≤ 2.50	80	740

Please consult us for other dimensions (between Ø 704 mm and Ø 1500 mm and/or thicknesses between 2.50 mm and 5 mm)

Blank - Sheet - Plate		
Thickness according to width		
Thickness in mm	Min. width in mm	Max. width in mm
0.30 - 0.74	50	1 250
0.75 - 1.49	50	1 524
1.50 - 2.99	50	2 000
3.00 - 8.00 LAF	670	2 000
3.00 - 13.00 LAC	500	2 000

Length: min. 275 mm/max. 16,000 mm

This table contains widest possible ranges. Actual dimensions per grade can be subject to restrictions.

Flat bar (cut-to-length strip)		
Supply possibilities according to thickness and width in the annealed condition		
Thickness in mm	Min. width in mm	Max. width in mm
2	10	500
3	13	500
4	15	500
5	15	500
6	15	500
8	20	500
10	30	500
12	40	500

For precise information on specific grades and surface finishes: consult your correspondent.

Surface aspects

Standard finishes with the most innovative appearances, available from our service centres and mills.

Conditions	Designation Stainless Europe	Description of surface finish	International equivalents	
			ASTM	EN 10088
HR	HRAP	Hot-rolled, annealed and pickled	N°1	1D
	DIN embossed	Hot-rolled with embossed DIN tear-plate pattern, annealed and pickled		1M
	ASTM embossed	Hot-rolled with embossed ASTM tear-plate pattern, annealed and pickled	pattern B	
CR ANNEALED	HRC	Cold-rolled, rough, matt		2E
	2D	Cold-rolled, annealed and pickled, not skinpassed	2D	2D
	2B	Cold-rolled, annealed, pickled and skinpassed	2B	2B
	2R	Cold-rolled, bright-annealed and skinpassed	BA	2R
CR WORK HARDENED	Work hardened ⁽⁸⁾	Cold-rolled without subsequent anneal for various hardness levels	TR	2H
CR ANNEALED	N°3 or P80D	No. 3 polished / Dry polished with 80-grit abrasive belts	N°3	2G
	N°4 or P120D-P150D	No. 4 polished / Dry polished with 120/150-grit abrasive belts	N°4	2G
	N°5 or P180D-P220D	No. 5 polished / Dry polished with 180/220-grit abrasive belts		2G
	N°6 or P240D	No. 6 polished / Dry polished with 240-grit abrasive belts		2G
	N°7 or P320D	No. 7 polished / Dry polished with 320-grit abrasive belts		2G
	P400D	Dry polished with 400-grit abrasive belts		2G
	Duplo P220	Dry polished with 220-grit abrasive belts + brushed with wire rolls		2G
	Duplo P320	Dry polished with 320-grit abrasive belts + brushed with wire rolls		2G
	UGILINE®	240-grit polish look like obtained by rolled-on process		2J
Scotch-Brite	Lightly brushed with wire rolls		2J	
CR ANNEALED	UGINOX® TT3	Etched linen finish obtained by cold rolling with special rolls, followed by a final anneal		2M
	UGINOX® TT4	Etched chequer patterned finish obtained by cold rolling with special rolls, followed by a final anneal		2M
	UGINOX® TT5	Etched lozenge patterned finish obtained by cold rolling with special rolls, followed by a final anneal		2M
	UGISAND®	Finish obtained by etching with special rolls	-	-
	UGITOP®	Matt low-reflectance finish obtained by cold rolling with special rolls	2D	2F
	UGIPASS	Matt finish obtained by cold rolling with special rolls	2D	2D
	UGIBAT	2B finish for construction industry	2B	2B
	UGIBRIGHT	2R finish for construction industry	BA	2R
CR WORK HARDENED	UGITEX	Shotpeened finish obtained by cold rolling with special rolls		2M
	UGINOX® TG5	Etched textured finish obtained by cold rolling with special rolls		2M
CR ANNEALED	UGINOX® Tinned (FME/FTE)	Surface coated with a continuous layer of tin in accordance with standard NFA 36332		2S

(8) Special finishes possible - consult us.

This table does not take into account the availability of grades or dimensional restrictions: check with your sales contact.

Our commitment

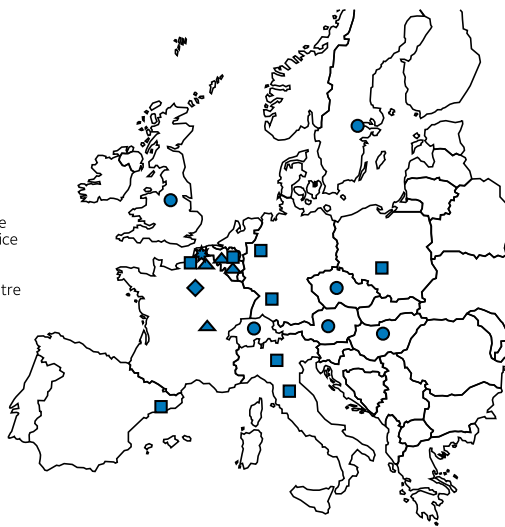
To offer you a solution that is precisely tailored to your requirement, with the properties you need for your project and its success, due to:

- > **Ongoing support**, solutions tailored to each market, expert advice on the choice of the right grade, responsive technical assistance, logistical offers and pooled expertise to work on joint development projects.
- > **The most complete and innovative range** on the market.
- > **Specialities**: ferritic and bright annealed stainless steels, proven hot-rolled quality and strip width of up to 2,000 mm.

Contacts

Flat Products

- ◆ Head office
- ▲ Plant
- Service centre and Sales Office
- Sales office
- ★ Research Centre



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