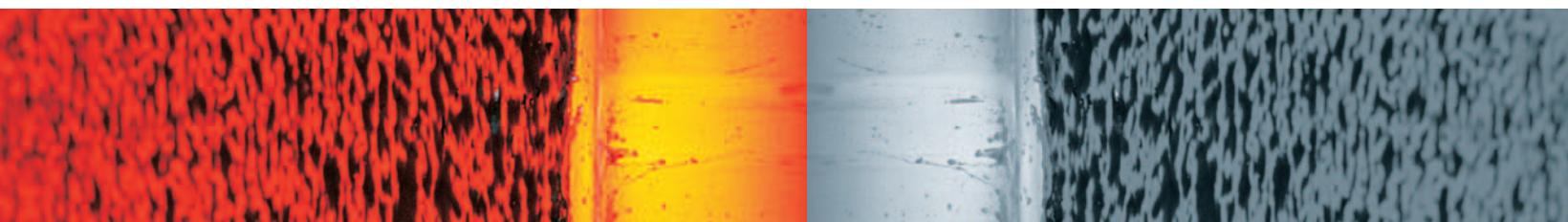


CARBON STEEL
QUENCHED & TEMPERED HEAVY PLATES
NON-ALLOYED STRUCTURAL STEEL
COLD FORMED OPEN SECTIONS



Stainless Steel



Born from fire,
made to
endure



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stainless steel

QUENCHED & TEMPERED HEAVY PLATES

HIGH STRENGTH STEELS

High-strength, quenched and tempered fine-grained heavy plates in the WUTMARC group are used where a slimline construction combines with the demands of high mechanical loads, therefore it is used in various application fields specially in constructional and hydraulic steelwork. Their chemical analysis and mechanical properties meet requirements according to EN 10025-6.

EN Number W.Nr.	Designation EN 10025-6	THICKNESS
1.8931	S690Q	8 – 60 mm
1.8928	S690QL	
1.8988	S690QL1	
1.8940	S890Q	8 – 45 mm
1.8983	S890QL	
1.8941	S960Q	8 – 30 mm
1.8933	S960QL	

WEAR RESISTANT STEELS

Wear resistant heavy plates in the WUTMARC group are used where unique combination of appropriate high hardness, high strength and good toughness make the material well suited for a wide variety of applications in which it is exposed to heavy wear by hard minerals and other abrasive materials, like bulldozers, dumptrucks, industrial trucks, lorries, machine parts and tools for mineral extraction (mining), buckets, slurry pipe systems, etc.

EN Number W.Nr.	THICKNESS
1.8702	8 – 40 mm
1.8705	
1.8715	
1.8721	



DIMENSIONS AND TOLERANCES

Width (mm)	1000- 2000
Length (mm)	2000-6000

DELIVERY CONDITION

- Quenched and tempered
- As rolled (ND 250, ND 300)

SURFACE CONDITION

- Black - unscaled
- Shot blasted
- Primed

STANDARDS

EN 10025-1	Hot rolled products of structural steels. General technical delivery conditions
EN 10025-6	Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition
EN 10163-1	Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections. General requirements
EN 10163-2:	Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections. Plate and wide flats
EN 10164	Steel products with improved deformation properties perpendicular to the surface of the product. Technical delivery conditions
EN 10160	Ultrasonic Testing of Steel Flat Product of Thickness Equal or Greater Than 6 mm (Reflection Method)

TOLERANCES ON DIMENSIONS AND SHAPE

EN 10029	Hot rolled steel plates 3mm thick or above - Tolerances on dimensions, shape and mass
FLATNESS	5mm/1m

HOT ROLLED STRIPS AND SHEETS AND HEAVY PLATES MADE OF NON-ALLOY STRUCTURAL STEELS

Non-alloy structural steels are steels intended for manufacturing specially welded constructions, this means bridges, factory halls, parts of agricultural mechanisation, pipes and sections.

For these steel grades a very important property is guaranteed strength combined with good weldability and the welding technique used must be suitable for intended application. Important properties are also good toughness, good formability and bending.

Steel group	Designation EN 10025-2	EN Number W.Nr.
Non-alloy structural steels	S 235 J0	1.0114
	S 235 JR	1.0038
	S 235 J2	1.0117
	S 275 J0	1.0143
	S 275 JR	1.0044
	S 275 J2	1.0145
	S 355 J0	1.0553
	S 355 JR	1.0045
	S 355 J2	1.0577
	S 355 K2	1.0596
Non-alloy structural steels for cold forming	S 235 J0C	1.0115
	S 235 JRC	1.0122
	S 235 J2C	1.0119
	S 275 J0C	1.0140
	S 275 JRC	1.0128
	S 275 J2C	1.0142
	S 355 J0C	1.0554
	S 355 JRC	1.0551
	S 355 J2C	1.0569
	S 355 K2C	1.0593

Designations:

S	structural steel
235, 355	minimum yield strength
JR	notch toughness at +20°C min 27 J
JO	notch toughness at +0°C min 27 J
J2	notch toughness at -20°C min 27 J
K2	notch toughness at -20°C min 40 J
C	intended for cold forming



DIMENSIONS OF HOT ROLLED STRIPS AND SHEETS AND HEAVY PLATES

	Hot rolled STRIP	Hot rolled SHEET	Heavy plates
Thickness (mm)	3 - 6	3 - 6	8 – 100*
Width (mm)	100-1000	800 – 1000	1000- 2000
Length (mm)		2000 - 6000	2000-12000
Weight (kg/mm width)	7 - 9		
ID (mm)	610		

* for thickness over 100 mm special agreement between customer and producer should be made

DELIVERY CONDITION

Hot rolled strips and sheets	As rolled (AR), normalized rolled (N)
Heavy plates	As rolled (AR), normalized rolled (N), normalized (N)

SURFACE CONDITION

- Unscaled
- Pickled (hot rolled strip)
- Shot blasted (heavy plates)

STANDARDS

EN 10025-1	Hot rolled products of structural steels. General technical delivery conditions
EN 10025-2	Technical delivery conditions for non-alloy structural steels
EN 10163-1	Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections. General requirements
EN 10163-2:	Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections. Plate and wide flats
EN 10164 *	Steel products with improved deformation properties perpendicular to the surface of the product. Technical delivery conditions
EN 10160	Ultrasonic Testing of Steel Flat Product of Thickness Equal or Greater Than 6 mm (Reflection Method)

TOLERANCES ON DIMENSIONS AND SHAPE

EN 10029	Hot rolled steel plates 3mm thick or above - Tolerances on dimensions, shape and mass
EN 10051	Continuously hot-rolled uncoated plate, sheet and strip of non-alloy and alloy steels - Tolerances on dimensions and shape

CARBON STEEL MATERIAL SELECTION

STEELS FOR QUENCHING AND TEMPERING



Strips, sheets and plates made of steels for quenching and tempering are intended for production of products with high strength and hardness and good toughness at the same time. The products are formed in annealed condition, the desired mechanical properties are achieved by quenching and tempering made by customer.

SPRING STEELS



Sheets, strips and plates made of spring steels are intended for production of all kinds of springs. The products are formed in spheroidization annealed condition, but the desired properties are obtained by proper heat treatment - quenching and tempering made by customer.

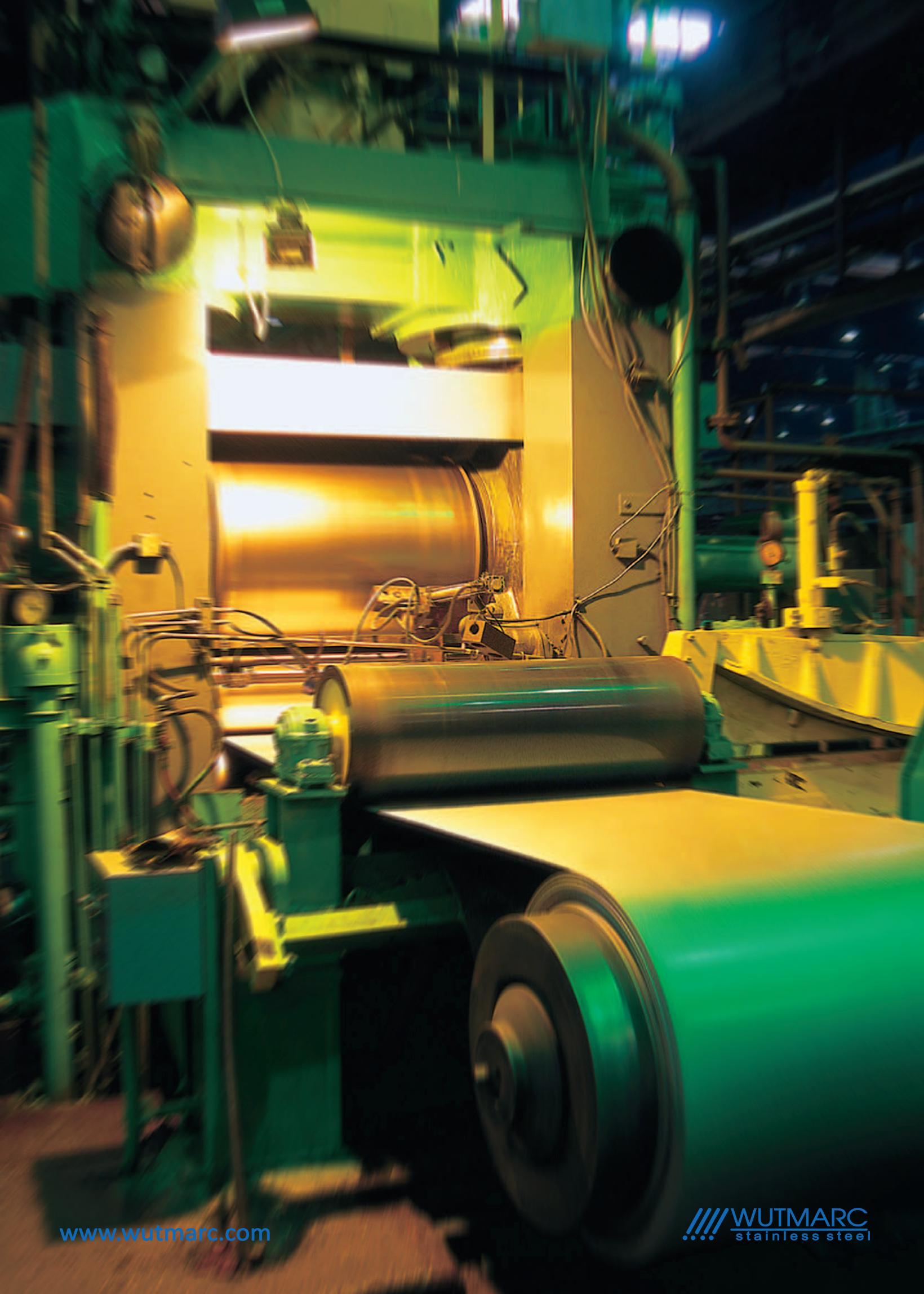
CASE HARDENING STEELS



Strips and sheets made of case hardening steels are used for parts with improved wear and fatigue resistance. Other benefits derived from surface hardening are resistance to plastic deformation of the part surface, good capacity for contact load, free of quench cracking, good dimensional control and greater ease in grinding and polishing to smooth surface.

CARBON STEEL - HOT AND COLD ROLLED STRIPS AND SHEETS

GRADES	Designation EN	EN Number W.Nr.	Standard
STEELS FOR QUENCHING AND TEMPERING	C22E	1.1151	EN 10083-2 EN 10132-3
	C35E	1.1181	
	C45E	1.1191	
	C55E	1.1203	
	C60E	1.1221	
	CK67	1.1231	EN 10132-4
	CK75	1.1248	
STEELS FOR QUENCHING AND TEMPERING - WITH Mn	28Mn6	1.1170	EN 10083-2
	37Mn6	1.1235	
	40Mn4	1.1157	
	80Mn4	1.1259	
	46Mn6	1.0912	
	50Mn7	1.0913	
	42MnV7	1.5223	
STEELS FOR QUENCHING AND TEMPERING - WITH Cr	34Cr4	1.7033	EN 10083-3
	41Cr4	1.7035	
	74NiCr2	1.2703	
STEELS FOR QUENCHING AND TEMPERING - WITH Cr and Mo	25CrMo4	1.7218	EN 10083-3 EN10132-3
	34CrMo4	1.7220	
	42CrMo4	1.7225	
	42CrMoS4	1.7227	EN 10083-3
	50CrMo4	1.7228	EN 10083-3
	34CrMo44	1.7341	
STEELS FOR QUENCHING AND TEMPERING - WITH Cr AND V	51CrV4	1.8159	EN 10132-4 EN 10083-3
	58CrV4	1.8161	
STEELS FOR QUENCHING AND TEMPERING - WITH Si WITH Si and Cr (SPRING STEELS)	38Si6	1.5022	
	46Si7	1.5024	
	51Si7	1.5025	
	55Si7	1.5026	
	65Si7	1.5028	
	54SiCr6	1.7102	
	67SiCr5	1.7103	
STEELS FOR QUENCHING AND TEMPERING - WITH B	28MnB5	1.0871	
	27MnCrB5	1.7182	EN 10083-3
	30MnB5	1.5531	EN 10083-3
	40MnB4	1.5527	
CASE HARDENING STEELS	C10E	1.1121	EN 10084 EN 10132-2
	C15E	1.1141	
	16MnCr5	1.7131	
	20MnCr5	1.7147	
	17Cr3	1.7016	
	15CrNi6	1.5919	
	18CrNi8	1.5920	



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DIMENSIONS OF HOT AND COLD ROLLED STRIPS AND SHEETS

	Hot rolled STRIP	Hot rolled SHEET	Cold rolled STRIP	Cold rolled SHEET
Thickness (mm)	3 - 6*	3 - 6*	0,3 - 3,0	0,5 - 2,0
Width (mm)	100-1000	800 - 1000	30-1000	1000
Length (mm)		2000 - 6000		2000 - 6000
Weight (kg/mm width)	Coil weight: 7 - 9		Coil weight: 6 - 8	
ID (mm)	610		508 and 610	

DELIVERY CONDITION

HOT ROLLED STRIP	COLD ROLLED STRIP
Hot rolled - black	Annealed, skin passed**
Hot rolled, pickled, annealed*	Cold rolled - hardened

* pickled and annealed condition - max. thickness of hot rolled strip/plate is 5mm

** Surface finish of cold rolled strips and sheets: MA RL ($R_a \leq 0,6\mu m$)**CARBON STEEL STANDARDS****MATERIAL STANDARDS**

EN 10132-1	Cold rolled narrow strip for heat treatment - Technical delivery conditions - Part1: General
EN 10132-2	Cold rolled narrow strip for heat treatment - Technical delivery conditions - Part 2: Case hardening steels
EN 10132-3	Cold rolled narrow strip for heat treatment - Technical delivery conditions - Part 3: Steels for quenching and tempering
EN10132-4	Cold rolled narrow strip for heat treatment - Technical delivery conditions - Part 4: Spring steels and other applications
EN 10083-1	Steels for quenching and tempering - Part 1: General technical delivery conditions
EN 10083-2	Steels for quenching and tempering - Part 2: Technical delivery conditions for non alloy steels
EN 10083-3	Steels for quenching and tempering - Part 3: Technical delivery conditions for alloy steels
EN 10084	Case hardening steels - Technical delivery conditions

TOLERANCES ON DIMENSIONS AND SHAPE

EN 10140	Cold rolled narrow steel strip - Tolerances on dimensions and shape
EN 10131	Cold rolled uncoated low carbon and high yield strength steel flat products for cold forming - Tolerances on dimension and shape
EN 10029	Hot rolled steel plates 3mm thick or above - Tolerances on dimensions, shape and mass
EN 10051	Continuously hot-rolled uncoated plate, sheet and strip of non-alloy and alloy steels - Tolerances on dimensions and shape

COLD FORMED OPEN SECTIONS

Cold formed open sections are produced from hot-rolled strips at sections lines. We produce standard U, L, C, Ω, rainwater stacks and special sections according to customer specification.

Cold formed sections can be produced from following steels grades:

- general structural steels - EN 10 025 (S 235 JR, S355J2G3...)
- steels for cold forming - SEW 092 (S 380MC...)
- structural steels with improved atmospheric corrosion resistance (Jekor 350, S235JOW, S355J2W)
- Stainless austenitic steels - EN 10 088 (X5CrNi18-10,X6CrNiMoTi 17-12-2,X6CrNiTi18-10)

Production programme:

STANDARD SECTIONS

- thickness: 2 – 6 mm
- standard length : 6 m, max. length 16 m



RAINWATER STACKS

- standard length : 3 – 6 m



Tolerances: EN 10 162.

Test certificate: EN 10 204

SPECIAL SECTIONS

We offer to our customers development of new sections according to customer's plans.

We have experience to meet the requirements of individual customers (construction, electricity industry, machine manufacture, production of vehicles and containers, shipbuilding, equipment of roads, metal processing industry and other steel constructions for general and special use).

We have developed also special sharp-edged cold formed sections, which have several advantages compared to hot rolled sections:

- weight by the same dimensions is lower
- tolerances are narrower
- better manufacturing
- better welding
- better surface

We offer

- cutting to exact length
- welding for special purposes
- perforation

QUALIFICATION

System ISO 9001	Quality management systems
ISO 14001	Environmental management systems
OHSAS 18001	Occupational Health and Safety management systems

COLD ROLLED FULLY-PROCESSED ELECTRICAL STEELS

Cold rolled fully-processed electrical steels may be delivered without insulation or insulated on both sides with insulation in order to achieve desired properties for various fields of application (higher surface insulation resistance, improvement of punchability and corrosion resistance, annealing).

FULLY-PROCESSED ELECTRICAL STEELS-DINAMO (GUARANTEED VALUES)

Grade EN 10106	Nominal thickness (mm)	Specific total loss ^{1), 4)} (max.)		Magnetic polarisation (min.) for field strength A/m ^{2), 4)}			Stacking factor (min.)	Density (assumed) (kg/dm ³)
		at 1.5T (W/kg)	at 1T ³⁾ (W/kg)	2500 (T)	5000 (T)	10000 (T)		
M250-35A	0,35	2,5	1,00	1,49	1,60	1,70	0,95	7,60
M270-35A		2,7	1,10	1,49	1,60	1,70		7,65
M300-35A		3,0	1,20	1,49	1,60	1,70		7,65
M330-35A		3,3	1,30	1,49	1,60	1,70		7,65
M310-50A	0,50	3,1	1,25	1,49	1,60	1,70	0,97	7,65
M330-50A		3,3	1,35	1,49	1,60	1,70		7,65
M350-50A		3,5	1,50	1,50	1,60	1,70		7,65
M400-50A		4,0	1,70	1,53	1,63	1,73		7,70
M470-50A		4,7	2,00	1,54	1,64	1,74		7,70
M530-50A		5,3	2,30	1,56	1,65	1,75		7,70
M600-50A		6,0	2,60	1,57	1,66	1,76		7,75
M700-50A		7,0	3,00	1,60	1,69	1,77		7,80
M800-50A		8,0	3,60	1,60	1,70	1,78		7,80
M400-65A	0,65	4,0	1,70	1,52	1,62	1,72	0,97	7,65
M470-65A		4,7	2,00	1,53	1,63	1,73		7,65
M530-65A		5,3	2,30	1,54	1,64	1,74		7,70
M600-65A		6,0	2,60	1,56	1,66	1,76		7,75
M700-65A		7,0	3,00	1,57	1,67	1,76		7,75
M800-65A		8,0	3,60	1,60	1,70	1,78		7,80

1) In accordance with IEC 60404-8-4 and EN 10106, the values are specified and guaranteed for magnetic polarisation at 1.5 T unless otherwise agreed

2) In accordance with IEC 60404-8-4 and EN 10106, the values are specified and guaranteed for field strength at 2500 A/m, 5000 A/m and 10000 A/m unless otherwise agreed

3) These are only informative values

4) Valid for testing in A. C. field in the 25 cm Epstein frame according to IEC 60404-2

**FULLY-PROCESSED HIGH PERMEABILITY ELECTRICAL STEELS - PERMAG FP
(GUARANTEED VALUES)**

Nominal thickness (mm)	Specific total loss ²⁾ (max.)		Magnetic polarisation (min.) for field strength A/m ²⁾		
	at 1.5T (W/kg)	at 1T ¹⁾ (W/kg)	2500 (T)	5000 (T)	10000 (T)
0,35	3,30	1,30	1,55	1,64	1,76
0,50	4,00	1,70	1,61	1,70	1,81
	5,30	2,30	1,63	1,72	1,83
	6,00	2,60	1,64	1,73	1,84
	7,00	3,00	1,67	1,76	1,78
	4,70	2,00	1,58	1,67	1,79
0,65	6,00	2,60	1,62	1,71	1,82
	7,00	3,00	1,65	1,73	1,84
	8,00	3,60	1,67	1,76	1,87

1) These are only informative values

2) Valid for testing in A. C. field in the 25 cm Epstein frame according to IEC 60404-2

INSULATION COATINGS ON FULLY-PROCESSED ELECTRICAL STEELS

AISI Designation ASTM A976	C - 6	C - 3	C-5, suitable for C-3
TYPE OF INSULATION	L1	L2	L3
THERMAL CLASS (IEC 60085)	H	H	H
THICKNESS OF LAYER ON EACH SIDE (µm) (ISO 2178)	3 to 6	0,5 to 3	0,5 to 3
COMPOSITION	ORGANIC WITH FILLERS	ORGANIC WITHOUT FILLERS	ORGANIC/INORGANIC WITH FILLERS
SURFACE INSULATION RESISTANCE ¹⁾ (Ohm cm ²) (ASTM A717)	40 to 500	up to 15	5 to 70
HEAT RESISTANCE	180°C ²⁾	180°C ²⁾	180°C ²⁾ / 850°C ³⁾
INFLUENCE ON PUNCHABILITY	FAVOURABLE	VERY FAVOURABLE	VERY FAVOURABLE
INFLUENCE ON WELDABILITY	CONDITIONAL	CONDITIONAL	GOOD
RESISTANCE TO MEDIUM ⁴⁾	GOOD	GOOD	GOOD
COLOUR ⁵⁾	LIGHT GREY TO DARK GREY	YELLOW	COLOURLESS TO GREEN

1) Surface insulation resistance depends on coating thickness

2) In air long time (testing for 20000 hours at a given temperature in accordance with IEC 60085)

3) In protective gas atmosphere (as stress-relief annealing)

4) It relates to the resistance to the most of lubricants, refrigerating mediums and oils. The varnish producer tests the resin only after the customer's requirement

5) Colour shades depend on the coating thickness and type of varnish applied

COLD ROLLED SEMI-PROCESSED ELECTRICAL STEELS

Semi-processed electrical steels have especially favourable properties for punching. Desirous magnetic properties can be achieved after final annealing by the customer.

In accordance to a well chosen process of final annealing and decarburising, excellent values of electromagnetic properties can be achieved. Upon request, we shall gladly assist in advising the optimal conditions of final annealing. Semi-processed electrical steels are produced with a rough surface. R_a -value is from 1 to 3 μm .

COLD ROLLED SEMI-PROCESSED ELECTRICAL STEELS-ELMAG (GUARANTEED VALUES)

Grade EN 10341	Nominal thickness (mm)	Reference annealing temperature ($\pm 10^\circ\text{C}$)	Specific total loss (max.) ^{1),4),5)}		Magnetic polarisation (min.) for field strength A/m ^{2),4),5)}			Density (assumed) (kg/dm ³)
			at 1, 5T (W/kg)	at 1T ³⁾ (W/kg)	2500 (T)	5000 (T)	10000 (T)	
M340-50K	0,50	840	3,40	1,42	1,45	1,62	1,72	7,65
M390-50K		840	3,90	1,62	1,56	1,64	1,74	7,70
M450-50K		790	4,50	1,92	1,57	1,65	1,75	7,75
M560-50K		790	5,60	2,42	1,58	1,66	1,76	7,80
M660-50K		790	6,60	2,80	1,62	1,70	1,79	7,85
M390-65K	0,65	840	3,90	1,62	1,54	1,62	1,72	7,65
M450-65K		840	4,50	1,92	1,56	1,64	1,74	7,70
M520-65K		790	5,20	2,22	1,57	1,56	1,75	7,75
M630-65K		790	6,30	2,72	1,58	1,66	1,76	7,80
M800-65K		790	8,00	3,30	1,62	1,70	1,79	7,85

1) In accordance with IEC 60404-8-3 or EN 10341. The values are specified and guaranteed for magnetic polarisation at 1.5 T unless otherwise agreed

2) In accordance with IEC 60404-8-3 or EN 10341. The values are specified and guaranteed for field strength at 2500 A/m, 5000 A/m and 10000 A/m, unless otherwise agreed

3) These are only informative values

4) Valid for testing in A.C. field in the 25 cm Epstein frame according to IEC 60404-2

5) These values are valid only for test specimens in the reference condition in accordance with IEC 60404-8-3 or EN 10341

SEMI-PROCESSED HIGH PERMEABILITY ELECTRICAL STEELS - PERMAG SP (GUARANTEED VALUES)

Nominal thickness (mm)	Reference annealing temperature ($\pm 10^\circ\text{C}$) (°C)	Specific total loss (max.) ²⁾		Magnetic polarisation (min.) for field strength A/m ²⁾		
		at 1,5T (W/kg)	at 1T ¹⁾ (W/kg)	2500 (T)	5000 (T)	10000 (T)
0,50	840	3,40	1,42	1,58	1,66	1,78
	840	3,90	1,62	1,60	1,69	1,80
	790	4,00	1,70	1,62	1,71	1,82
0,65	790	5,20	2,20	1,62	1,71	1,82

1) These are only informative values

2) Valid for testing in A.C. field in the 25 cm Epstein frame according to IEC 60404-2

COMPARISON OF GRADE DESIGNATIONS

FULLY-PROCESSED ELECTRICAL STEELS

EN 10106 (2007)	IEC 60404-8-4 (1998)	AISI*	JIS C 2552 (2000)	GOST* 21427 0-75
M250-35A	M250-35A 5	M 15	35A250	2411
M270-35A	M270-35A 5	M 19	35A270	2412
M300-35A	M300-35A 5	M 22	35A300	2411
M330-35A	M330-35A 5	M 36	---	---
M330-50A	M330-50A 5	M 27	---	---
M350-50A	M350-50A 5	M 36	50A350	2411
M400-50A	M400-50A 5	M 43	50A400	2312
M470-50A	M470-50A 5	---	50A470	2311
M530-50A	M530-50A 5	M 45	---	2212
M600-50A	M600-50A 5	---	50A600	2112
M700-50A	M700-50A 5	M 47	50A700	---
M800-50A	M800-50A 5	---	50A800	2111
M400-65A	M400-65A 5	M 27	---	---
M470-65A	M470-65A 5	M 43	---	---
M530-65A	M530-65A 5	---	---	2312
M600-65A	M600-65A 5	M 45	---	2212
M700-65A	M700-65A 5	---	---	2211
M800-65A	M800-65A 5	---	65A800	2112

SEMI-PROCESSED ELECTRICAL STEELS

EN 10341 (2006)	IEC 60404-8-3 (2005)
M340-50K	M340-50K 5
M390-50K	M390-50K 5
M450-50K	M450-50K 5
M560-50K	M560-50K 5
M660-50K	M600-50K 5
M390-65K	M390-65K 5
M450-65K	M450-65K 5
M520-65K	M520-65K 5
M630-65K	M630-65K 5
M800-65K	M800-65K 5

GRADES OF NON-ORIENTED ELECTRICAL STEELS SUITABLE FOR VARIOUS APPLICATIONS

	APPLICATION	M270-35A to M330-35A M310-50A to M400-50A M400-65A M340-50K to M390-50K M390-65K	M470-50A to M600-50A M470-65A to M600-65A M450-50K to M660-50K M450-65K to M630-65K	M700-50A to M800-50A M700-65A to M800-65A M800-65K
ROTATING MACHINES	Large rotating machines (2 and 4 poles)	•		
	Large rotating machines (many poles)	•		
	Small generators Medium rotating machines	•	•	
	Hermetic motors	•	•	•
	General duties A.C. electric motors, domestic appliance motors		•	•
	Small D.C. intermittent motors, compressor motors	•	•	•
STATIC MACHINES	Audio transformers	•	•	•
	Saturable reactors and magnetic amplifiers	•	•	
	Voltage regulator transformers, distribution transformers	•		
	Power transformers	•		
	Current transformers	•		
	Welding transformers	•	•	•
	Fluorescent lamp ballasts	•	•	•
	Magnetic switches	•		
	Pole pieces and relay cores			•

GENERAL INFORMATION

STRIPS

Width of coil	30 do 1000 mm
Inside nominal diameter	508 mm (20")
Outside nominal diameter	1300 mm (max)

Dimensions and weights

	Coil weight (kg/mm of width)	Outside diameter (mm)
Entire coil	6 to 8,6	1100 to 1300
1/2 coil	3 to 4,5	870 to 1000
1/3 coil	2 to 2,9	770 to 850

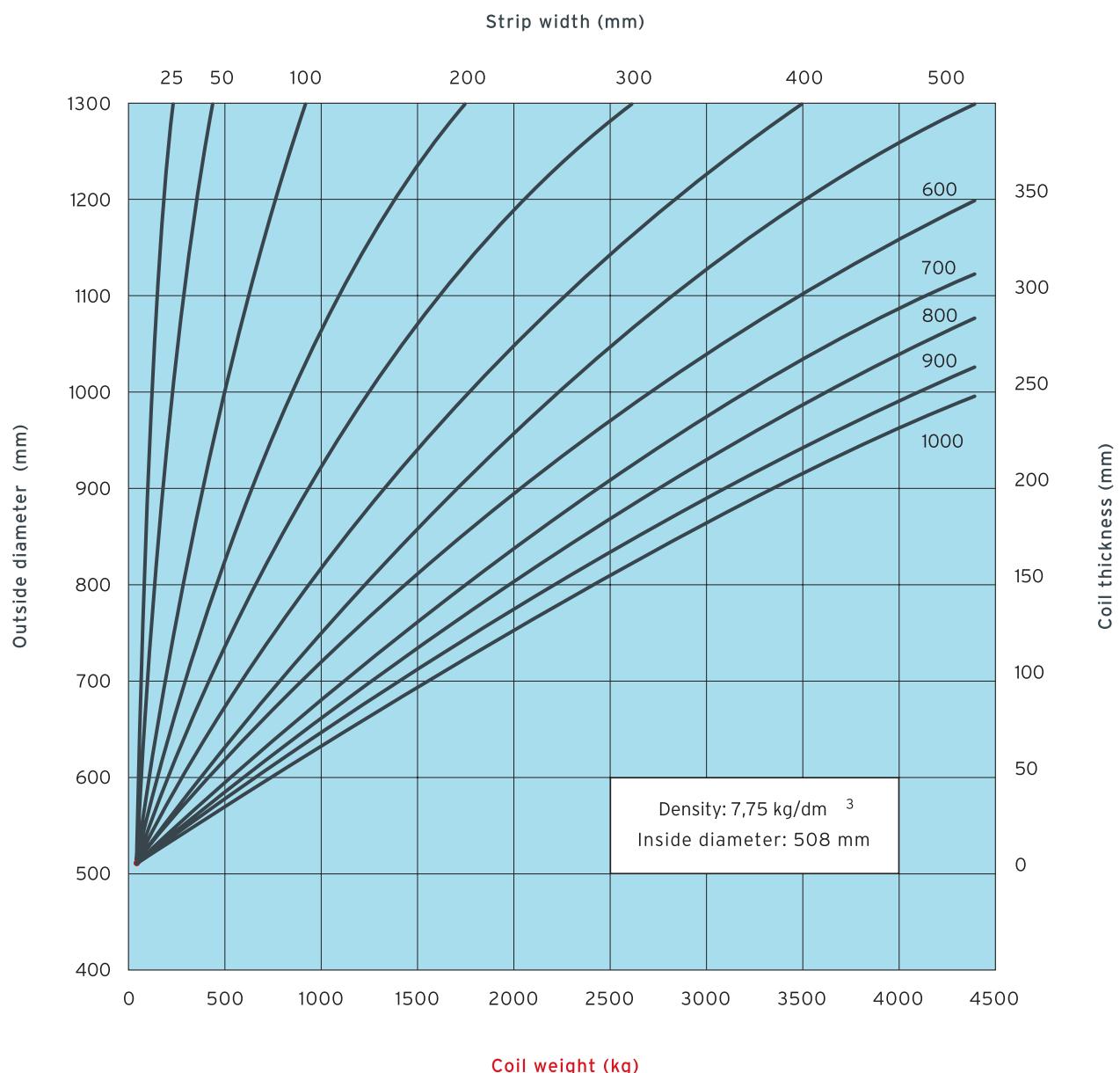
Tolerances

TOLERANCES ON NOMINAL WIDTH		TOLERANCES ON NOMINAL THICKNESS		
Nominal width "w" (mm)	Tolerance (mm)	Nominal thickness (mm)	Tolerance (mm)	%
w ≤ 150	0 to +0,2	0,35	±0,03	±8
150 < w ≤ 300	0 to +0,3	0,50	±0,04	±8
300 < w ≤ 600	0 to +0,5	0,65	±0,04	±6
600 < w ≤ 1000	0 to +1,0	1,00	±0,06	±6

SHEETS

Cut lengths	600 to 6000 mm
Cut length tolerances	0 do + 0,5%
Widths of sheets	420 do 1000 mm
Package weights	1000 do 2500 kg
Dimensional and geometrical tolerances are in accordance with standards	EN 10106, EN 10341

OUTSIDE DIAMETER IN DEPENDENCE OF COIL WEIGHT



WUTMARC		MECHANICAL PROPERTIES					
	European Standard EN 10088	ASTM	Tensile Strength	Yield point at 0,2% min.	Elongation min.	Max. Hardness	
1.4310	X10CrNi18-8	301	600-950	250	40	200	
1.4301	X5CrNi18-10	304	540-720	230	45	190	
1.4301	X5CrNi18-10	304	540-720	230	45	190	
1.4307	X2CrNi18-9	304 L	520-700	220	45	190	
1.4301	X5CrNi18-10	304	540-720	230	45	190	
1.4301	X5CrNi18-10	304 DDQ	540-750	230	45	190	
1.4307	X2CrNi18-9	304 L	520-700	220	45	190	
1.4404	X2CrNiMo17-12-2	316L	530-670	240	45	200	
1.4401	X5CrNiMo17-12-2	316	530-670	240	45	200	
1.4432	X2CrNiMo17-12-3	316 L	530-670	240	45	200	
1.4571	X6CrNiMoTi17-12-2	316 Ti	540-670	240	45	200	
1.4541	X6CrNiTi18-10	321	520-700	220	45	200	
1.4833	X12CrNi23-13	309S	515-700	205	40	215	
1.4845	X8CrNi25-21	310 S	515-700	205	40	200	
1.4000	X6Cr13	410S	400-600	250	19	180	
1.4016	X6Cr17	430	450-600	280	22	180	
1.4510	X3CrTi17	430 Ti	420-600	240	23	180	
1.4511	X3CrNb17	430 Nb	420-600	240	23	180	
1.4113	X6CrMo17-1	434	450-630	280	22	180	
1.4513	X2CrMoTi17-1	---	400-550	220	23	180	
1.4512	X2CrTi12	409L	380-560	220	25	180	
1.4509	X2CrTiNb18	---	430-630	250	18	180	
1.4028	X30Cr13	420	740max	350	15	240	
1.4034	X46Cr13	420	780max	350	15	245	
1.4116	X50CrMoV15	420 MoV	850max	350	15	280	
1.4006	X12Cr13	410	600max	250	20	200	

FINISHES

	ASTM	EN 10088-2	Description
Hot Rolled	Nº 1	1D	Hot rolled, Annealed and Pickled
	1D	-	Hot rolled, annealed and pickled with a small cold reduction
Cold Rolled	2D	2D	Cold rolled, annealed and pickled
	2B	2B	Cold rolled, annealed and pickled and skin-passed
Grindings	BA	2R	Cold rolled, annealed in vertical type furnace with cracked ammonia
	Nº 3	2J	Polished with abrasive mesh of 80 – 120 grain
Embossed	Nº 4	2J	Polished with abrasive mesh of 150 – 400 grain
	Nº 6	2K	Satin-finished
Hard Temper	HL	2J	Hair line with mesh of 150 - 240 grain
	SCOTCH BRITE	2J	Scotch brite polished
	EMBOSS	2M	Cold rolled grinding
	1/4 hard	2H	2D finish with reductions between 10 to 45% which increase the tensile strength
	1/2 hard	2H	2D finish with reductions between 10 to 45% which increase the tensile strength
	3/4 hard	2H	2D finish with reductions between 10 to 45% which increase the tensile strength
	4/4 hard	2H	2D finish with reductions between 10 to 45% which increase the tensile strength
	Other Finishes		Subject to enquiry

European Standard EN 10088				ASTM				CHEMICAL COMPOSITION						APPLICATIONS	
Steel Code	Designation	AISI	C	Si	Mn	Pmax	Smax	Cr	Ni	Mo	Ti	Others			
1.4310	X10CrNi18-8	301	0,05-0,15	≤ 1,00	≤ 2,00	0,045	0,015	16,00-18,00	6,00-8,00	---	---	---	AUSTENITIC	Food industry, tableware, holloware	
1.4301	X5CrNi18-10	304	≤ 0,070	≤ 0,75	≤ 2,00	0,045	0,015	18,00-19,00	8,00-10,00	---	---	---		Food industry, tableware, holloware	
1.4301	X5CrNi18-10	304	≤ 0,070	≤ 0,75	≤ 2,00	0,045	0,015	17,50-19,00	8,00-10,00	---	---	---		Food industry, tableware, holloware	
1.4307	X2CrNi18-9	304 L	≤ 0,030	≤ 0,75	≤ 2,00	0,045	0,015	18,00-19,00	8,00-10,00	---	---	---		Tubers, boilers	
1.4301	X5CrNi18-10	304	≤ 0,070	≤ 0,75	≤ 2,00	0,045	0,015	18,00-19,00	8,50-10,00	---	---	---		Food industry, tableware, holloware	
1.4301	X5CrNi18-10	304 DDQ	≤ 0,070	≤ 0,75	≤ 2,00	0,045	0,015	17,50-19,00	8,50-10,00	---	---	---		Normal and deep drawing	
1.4307	X2CrNi18-9	304 L	≤ 0,030	≤ 0,75	≤ 2,00	0,045	0,015	18,00-19,00	8,50-10,00	---	---	---		Nuclear industry, tubes and boilers	
1.4404	X2CrNiMo17-12-2	316 L	≤ 0,030	≤ 0,75	≤ 2,00	0,045	0,015	16,50-18,00	10,00-13,00	2,0-2,5	---	---		Chemical industries	
1.4401	X5CrNiMo17-12-2	316	≤ 0,070	≤ 0,75	≤ 2,00	0,045	0,015	16,50-18,00	10,00-12,00	2,0-2,5	---	---		Chemical industries	
1.4432	X2CrNiMo17-12-3	316 L	≤ 0,030	≤ 0,75	≤ 2,00	0,045	0,015	16,50-18,00	10,50-13,00	2,5-3,0	---	---		Tubes, boilers	
1.4571	X6CrNiMoTi17-12-2	316 Ti	≤ 0,080	≤ 0,75	≤ 2,00	0,045	0,015	16,50-18,00	10,00-12,50	2,0-2,5	5(C+N)-0,70	---	Chemical and petrochemical industries	Chemical and petrochemical industries	
1.4541	X6CrNiTi18-10	321	≤ 0,080	≤ 0,75	≤ 2,00	0,045	0,015	17,00-19,00	9,00-11,00	---	5(C+N)-0,70	---		Tubes, welded constructions	
1.4833	X12CrNi23-13	309 S	≤ 0,080	≤ 0,75	≤ 2,00	0,045	0,015	22,00-24,00	12,00-15,00	---	---	---		Electrical resistances	
1.4845	X8CrNi25-21	310 S	≤ 0,080	≤ 0,75	≤ 2,00	0,045	0,015	24,00-26,00	19,00-21,00	---	---	---		Furnaces, high temperature uses	
1.4000	X6Cr13	410 S	≤ 0,080	≤ 1,00	≤ 1,00	0,040	0,015	11,50-13,50	---	---	---	---		Petrochemical industries	
1.4016	X6Cr17	430	≤ 0,080	≤ 1,00	≤ 1,00	0,040	0,015	16,00-18,00	---	---	---	---		Tableware, holloware, interior decor applications	
1.4510	X3CrTi17	430 Ti	≤ 0,050	≤ 1,00	≤ 1,00	0,040	0,015	16,00-18,00	---	---	0,15+4(C+N)-0,80	---		Washing machines, tubes	
1.4511	X3CrNb17	430 Nb	≤ 0,050	≤ 1,00	≤ 1,00	0,040	0,015	16,00-18,00	---	---	---	Nb=0,3-0,6		Holloware bonding, washing machines	
1.4113	X6CrMo17-1	434	≤ 0,080	≤ 1,00	≤ 1,00	0,040	0,015	16,00-18,00	---	0,9-1,25	---	---		Architectural exteriors, trims & profiles	
1.4513	X2CrMoTi17-1	--	≤ 0,025	≤ 1,00	≤ 1,00	0,040	0,015	16,00-18,00	---	0,8-1,4	0,3-0,6	---		Exhaust systems	
1.4512	X2CrTi12	409 L	≤ 0,030	≤ 1,00	≤ 1,00	0,040	0,015	10,50-11,70	---	---	6(C+N)-0,65	---		Exhaust systems	
1.4509	X2CrTiNb18	--	≤ 0,030	≤ 1,00	≤ 1,00	0,040	0,015	17,50-18,50	---	---	0,10-0,60	Nb=(0,3+3C)-1,0		Exhaust systems	
1.4028	X30Cr13	420	0,28-0,35	≤ 1,00	≤ 1,00	≤ 0,040	≤ 0,015	12,50-14,00	---	---	---	---	MARTENSITIC	Cutting tools	
1.4034	X46Cr13	420	0,43-0,48	≤ 1,00	≤ 1,00	≤ 0,040	≤ 0,015	12,50-14,00	---	---	---	---		Cutting tools, knife blades	
1.4116	X50CrMoV15	420 MoV	0,45-0,55	≤ 1,00	≤ 1,00	≤ 0,040	≤ 0,015	14,00-15,00	---	0,50-0,80	---	V=0,10-0,20		High quality knife blades	
1.4006	X12Cr13	410	0,08-0,15	≤ 1,00	≤ 1,00	≤ 0,040	≤ 0,015	11,50-13,50	---	---	---	---		Cutlery	

Plastic Coatings

Material	Thickness (microns)	Colour
POLYETHYLENE	55	BLUE / COLOURLESS
POLYETHYLENE	60	BLUE
POLYETHYLENE	70	BLUE
POLYETHYLENE	80	WHITE
POLYETHYLENE	100	WHITE / BLACK
POLYETHYLENE	110	WHITE
PVC	70	BLUE

FLAT PRODUCT ALLOY SURCHARGE

STAINLESS STEEL GRADE		SURCHARGE EUROS
AISI	EURO NORM	
201	1.4372	1,000
301	1.4310	1,264
301	1.4310	1,181
304	1.4301	1,360
304	1.4301	1,360
304	1.4301	1,360
304L	1.4307	1,360
304L	1.4307	1,360
302	1.4301	1,360
304L	1.4306	1,515
316L	1.4404	2,034
316	1.4401	2,034
316L	1.4432	2,223
316Ti	1.4571	2,034
321	1.4541	1,516
317L	1.4438	2,513
309S	1.4833	1,998
310S	1.4845	2,610
430	1.4016	0,451
430Ti	1.4510	0,453
430Nb	1.4511	0,453
434	1.4113	0,631
	1.4513	0,673
444	1.4521	0,812
409	1.4512	0,372
845	1.4509	0,536
420	1.4028	0,398
420	1.4034	0,397
420MoV	1.4116	0,531
420	1.4031	0,401
410	1.4006	0,393
410S	1.4000	0,393
S32205	1.4462	1,614
S32001	1.4482	0,763
S32304	1.4362	1,030
3Cr12	3Cr12	0,426
3Cr12Ti	3Cr12Ti	0,459
316L	1.4435	2,253
	1.4828	1,789

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