

# STAINLESS STEEL



PRODUCT CATALOGUE



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# STAINLESS STEEL

*"The finest steel has to go through the hottest fire."*  
Richard M. Nixon

## SPECIFICATION RANGE

### GRADES

Structure	International Designation			Chemical Composition (%)									
	AISI	EN	GOST*	C	Si	Mn	P	S	Cr	Ni	Mo	Ti	Other
AUSTENITICS	201	1.4372	12X15Г9НД	≤0,120	≤0,75	5,50-7,50	≤0,045	≤0,015	16,00-18,00	3,50-5,50	-	-	N=0,05-0,15
	202	1.4373	12X17Г9АН4	≤0,120	≤0,75	7,50-10,00	≤0,045	≤0,015	17,00-19,00	4,00-6,00	-	-	-
	204Cu	1.4597	-	≤0,10	≤2,00	6,50-8,50	≤0,040	≤0,015	16,00-18,00	≤2,00	≤1,00	-	Cu=2,00-3,50
	301	1.4310	15X17H7	≤0,120	≤0,75	≤2,00	≤0,040	≤0,030	16,00-18,00	6,00-8,00	-	-	-
	302	1.4310	12X18H9	≤0,120	≤0,75	≤2,00	≤0,040	≤0,015	17,00-19,00	8,50-9,50	≤0,60	-	-
	303	1.4305	-	≤0,10	≤0,75	1,50-2,00	≤0,040	≤0,30	17,00-19,00	9,00-10,00	-	-	-
	304	1.4301	08X18H10	≤0,070	≤0,75	≤2,00	≤0,040	≤0,015	17,50-19,00	8,00-10,00	-	-	-
	304L	1.4306	03X18H11	≤0,030	≤0,75	≤2,00	≤0,040	≤0,030	18,00-20,00	10,00-11,00	-	-	-
	304Cu	1.4567	-	≤0,030	≤0,75	≤1,50	≤0,045	≤0,015	17,00-19,00	8,50-9,00	-	-	Cu=3,00-3,50
	309S	1.4833	08X23H13	≤0,080	≤0,75	≤2,00	≤0,045	≤0,015	22,00-24,00	12,00-14,00	-	-	-
	310S	1.4845	20X23H18	≤0,080	≤0,75	≤2,00	≤0,035	≤0,015	24,00-26,00	19,00-21,00	-	-	-
	314	1.4841	20X25H20C2	≤0,20	1,50-3,00	≤0,20	≤0,045	≤0,015	24,00-26,00	19,00-22,00	-	-	-
	316	1.4401	08X16H11M3	≤0,050	≤0,75	≤2,00	≤0,040	≤0,015	16,00-18,00	10,00-12,00	2,00-2,50	-	-
	316L	1.4432	03X17H14M3	≤0,030	≤0,75	≤2,00	≤0,040	≤0,015	16,50-18,00	10,50-13,00	2,50-3,00	-	-
	316Ti	1.4547	08X17H13M2T	≤0,060	≤0,75	≤2,00	≤0,040	≤0,015	16,50-18,00	11,00-12,50	2,00-2,50	≥5(C+N)	-
	321	1.4541	08X18H10T	≤0,070	≤0,75	≤2,00	≤0,040	≤0,030	17,00-19,00	9,00-10,00	-	5xC-0,70	-
321H	1.4878	12X18H10T	≤0,060	≤0,75	≤2,00	≤0,040	≤0,015	17,00-19,00	9,00-11,00	-	≥5(C+N)	-	
347	1.4550	08X18H12B	≤0,080	0,65-1,00	1,00-2,50	≤0,030	≤0,020	19,00-21,00	9,00-11,00	≤0,50	-	Cu≤0,5; Nb≤1,0	
FERRITICS	409L	1.4512	-	≤0,030	≤0,75	≤0,80	≤0,040	≤0,015	10,50-12,25	-	-	≥6(C+N)	-
	430	1.4016	12X17	≤0,080	≤1,00	≤1,00	≤0,040	≤0,030	16,00-18,00	-	-	-	-
	430Ti	1.4510	08X17T	≤0,050	≤1,00	≤1,00	≤0,040	≤0,015	16,00-18,00	-	-	≥0,80	-
	430Nb	1.4511	-	≤0,050	≤1,00	≤1,00	≤0,040	≤0,015	16,00-18,00	-	-	-	Nb=0,30-0,60
	434	1.4115	-	≤0,080	≤1,00	≤1,00	≤0,040	≤0,030	16,00-18,00	-	0,90-1,40	-	-
444	1.4521	-	≤0,025	≤1,00	≤1,00	≤0,040	≤0,015	17,50-18,50	-	1,80-2,00	0,12-0,40	Nb=0,25-0,50	
MARTENSITICS	410	1.4006	12X13	≤0,080	≤1,00	≤1,00	≤0,040	≤0,030	11,50-13,50	≤0,75	-	-	-
	420	1.4031	40X13	0,36-0,42	≤0,75	≤1,00	≤0,040	≤0,015	12,50-14,50	-	-	-	N=0,06-0,09
	420Mo	1.4116	-	0,45-0,55	≤0,75	≤1,00	≤0,040	≤0,015	14,00-15,00	-	0,50-0,80	≥0,80	V=0,10-0,20
	431	1.4057	14X17H2	≤0,20	≤1,00	≤1,00	≤0,040	≤0,030	15,00-17,00	1,50-2,50	-	-	-
DUPLEX	S32304	1.4362	03X23H6	≤0,030	≤1,00	≤2,00	≤0,035	≤0,015	22,00-24,00	3,50-5,50	0,10-0,60	-	N=0,05-0,20
	S31803	1.4462	-	≤0,030	≤1,00	≤2,00	≤0,035	≤0,015	22,00-23,00	4,50-6,50	3,00-3,50	-	N=0,14-0,20
	S32001	1.4482	-	≤0,030	≤0,75	4,00-5,00	≤0,030	≤0,010	19,50-21,50	1,00-3,00	0,10-0,60	-	-

\*Note: in the GOST box the nearest russian equivalents are stated. Please contact us for detailed examination of the grade and specification that you are looking for. Specific chemical composition can be supplied by mutual agreement.

## STAINLESS STEEL FROM VOJAY

Stainless steel represents a group of corrosion-resistant steel that contains at least 10,5 % of chromium. Apart from chromium, stainless steel is alloyed with nickel, molybdenum, titanium, niobium and other elements. Mechanical properties and application depend on the chemical composition. Stainless steels are commonly grouped into four major types depending on their microscopic structure: austenitic, ferritic, duplex and martensitic. Each grade family is designed to enhance material characteristics across a particular range of uses.

To ensure the optimal mix of corrosion resistance, strength, fabricability, hygiene and appearance it is vital to choose the right grade. With extensive experience from different industries, we are ready to help you make the best choice.

# WIRE & WIRE ROD

DELIVERY PROGRAMM

TYPE OF WIRE	SIZE RANGE	APPLICABLE GRADES (*AISI)
Fine wire	0,09 - 0,70 mm	302,304,304L,305,309,310,314,316,316L,316Ti,321,430
EPQ wire	0,80 - 12,00 mm	201,204,304,316
Cold heading wire	0,80 - 16,00 mm	201Cu,302,304,304Cu,316,316Cu,410,430
Redraw wire	0,60 - 5,00 mm	302,304,314,316,321,430, etc
Nail wire	1,00 - 16,00 mm	304,316,430
Spring wire	0,10 - 16,00 mm	302,304,316,631
Conveyor belt wire	1,20 - 4,00 mm	301,304,316,316L,630
Rope wire	0,10 - 4,00 mm	304,316

TYPE OF WIRE	APPLICATION AREA
Fine wire	Meshes, nets, screens, kitchen appliances, wire cloth, filters, etc
EPQ wire	Kitchen ware, staples, trolleys, spokes, decorative handles, wire baskets, etc.
Cold heading wire	Bolts, nuts, screws, rivets, etc.
Redraw wire	Farther drawing into thinnest diameters.
Nail wire	Corrosion-resistant nails.
Spring wire	Various types of springs, wire forms, straight pin, etc.
Conveyor belt wire	Different types of conveyor belts.
Rope wire	Corrosion and wear resistant wire ropes.

\* Equivalents of W.N. / DIN / AFNOR / B.S / JIS / GOST / UNI can be supplied.  
 \* In the table the most suitable grades are stated. Other specification is upon customer request.

PACKAGING STANDARDS

SIZE RANGE	TYPE OF PACKING	SUPPLY CONDITIONS
0,09 - 0,70 mm	DIN125, DIN160, DIN200, DIN250, etc. 	- Soft Annealed; Finish: matte/bright.
0,80 - 1,60 mm	Coil 	- 1/8 Hard, 1/4 Hard (for EPQ), 1/2 Hard, 3/4 Hard, Full Hard.
0,70 - 16,00 mm	Euro Coil, Cardboard drum, Carrier 	Finish: coated.

\* Please check with us for specifications not listed above.

Diameter, mm	0,10 - 0,20	0,20 - 0,30	0,30 - 0,80	0,80 - 1,50	1,50 - 2,00	2,00 - 4,00	4,00 - 16,00
Tolerance, mm	+/-0,005	+/-0,008	+/-0,010	+/-0,013	+/-0,015	+/-0,025	+/-0,030

\* Wires with closer tolerances can be supplied upon request.

TOLERANCE



SPRINGS



NAILS



FASTENERS



WIRE ROPES



BRAIDING HOSES



WIRE MESH



CONVEYOR BELTS



STAPLES



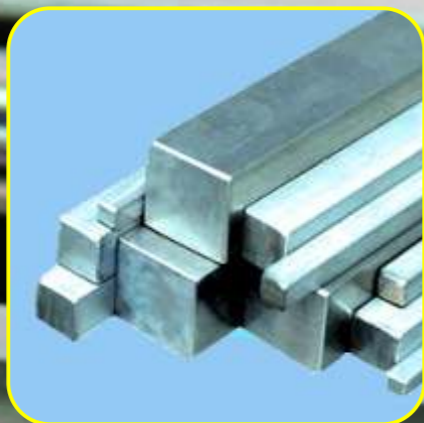
KITCHEN & BATH WARE

# BAR PRODUCTS

## DELIVERY PROGRAMM



ROUND BAR



SQUARE BAR



HEXAGON BAR

### BRIGHT STEEL

FORM	DIMENSION	TOLERANCE
Cold Drawn & Polished		
Round	2,00 - 5,00 mm	H9, H11
Square	5,00 - 40,00 mm	H11
Hexagon	5,00 - 40,00 mm	H11
Cold Drawn & Ground & Polished		
Round	6,00 - 22,00 mm	H9
Cold Drawn & Ground & Polished (Straightened)		
Round	10,00 - 40,00 mm	H9, H11
Peeled & Ground & Polished		
Round	20,00 - 85,00 mm	H9
Peeled & Polished		
Round	85,00 - 140,00 mm	H11
Peeled (Rough Turned)		
Round	25,00 - 140,00 mm	K12, K13

### ROLLED STEEL

FORM	DIMENSION	TOLERANCE
Hot Rolled & Peeled		
Round	10,00 - 160,00 mm	DIN 1013
Square	10,00 - 65,00 mm	DIN 1013

### FORGED STEEL

FORM	DIMENSION	TOLERANCE
Forged & Rough Peeled		
Round & Square	160,00 - 600,00 mm	DIN 1013

\* We are able to provide superior surface finish and straightness tolerance for Pump Shaft Quality by additional processes such as straightening, roller burnishing and centreless grinding.

### PACKING:

Bars can be packed in 100 - 1500 kg bundles wrapped in HDPE cloth strapped along with labels or in wooden boxes with plastic rings to avoid bending and scratches.

INDUSTRIES	APPLICATION AREA
Architecture & Building	Fittings, concrete rebar, balustrades, bridges, balconies, elevators, structural beams, etc.
Automotive & Railway	Road & rail tankers, coaches, wagons, vehicles, head gaskets, engine components, etc.
Chemical industry	Components of chemical storage tanks and tanker compartments.
Oil & Gas	Components of flowlines, manifolds, heat exchangers, burners, structural details, etc.
Energy	Components of heaters, air handling units, ventilation and cooling systems.
Food processing industry	Sinks, dish washers, freezers, refrigerators, grills and cookers, kitchen baskets, etc.
Consumer goods	Washing machines, dryers, dish washers, ovens, sinks, washbasins, kitchen cabinets, etc.
Heavy industry	Agricultural equipment, bearings, hinges, gears, pressure vessels in pulp industry, etc.
Decorative & Furniture	Door handles, holders, openers, furniture components, window sections, etc.



HEALTH & SPORT EQUIPMENT



CONVEYOR SHAFTS



AUTOMOTIVE PARTS



DOOR HINGES



DOOR HANDLES



ARCHITECTURAL ARTICLES



TROLLEYS



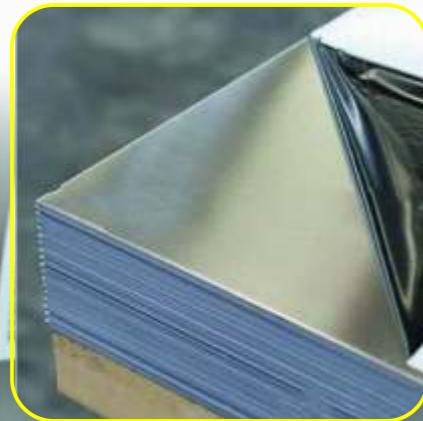
PUMPS & ELECTRIC MOTOR

# FLAT PRODUCTS

## DELIVERY PROGRAMM



COIL & STRIP



SHEET



PLATE

PRODUCT TYPE	THICKNESS	WIDTH	LENGTH	FINISH
Precision Strip	0,05 - 1,50 mm	3,00 - 650,00 mm	-	1D, 1E, 1U, 2D, 2B, 2R, 2G, 2K, 2F, 2M, 2H, etc
Cold Rolled Strip (Coil)	0,05 - 8,00 mm	3,00 - 2000,00 mm	-	
Hot Rolled Strip (Coil)	2,00 - 10,00 mm	50,00 - 1500,00 mm	-	
Cold Rolled Sheet	0,20 - 8,00 mm	1000,00 - 2000,00 mm	1000,00 - 6000,00 mm	
Hot Rolled Sheet	2,00 - 10,00 mm	1000,00 - 1500,00 mm	1000,00 - 6000,00 mm	
Hot Rolled Plate	8,00 - 110,00 mm	1000,00 - 3000,00 mm	1000,00 - 6000,00 mm	

\* The specifications of certain products may vary depending on the grade and finish. Other sizes or specifications are available upon request.

## STANDARD SURFACE FINISHES

ASTM*	EN*	DESCRIPTION	NOTES
<b>Hot Rolled</b>			
No.1	1D	Hot rolled, annealed and pickled.	Rough and dull surface.
<b>Cold Rolled</b>			
2D	2D	Cold rolled, annealed and pickled.	Surface not as smooth as 2B or 2R.
2B	2B	Cold rolled, annealed & pickled, skin-passed.	Smooth surface with low gloss. Smoother than 2D.
BA	2R	Cold rolled, bright annealed, skin-passed.	Smooth, bright, reflective, high image clarity.
<b>Hard Tempered</b>			
1/4, 1/2, 3/4, 4/4	2H	Temper rolled, annealed & pickled.	Higher gloss than 2B and 2D.

\* ASTM A 480/A 480M - 09 / EN 10088-2:2005

## SPECIAL SURFACE FINISHES

ASTM*	EN*	DESCRIPTION	NOTES
<b>Hot Rolled</b>			
-	1U	Hot rolled, not heat treated, not descaled.	Surface is covered with the rolling scale.
-	1C	Hot rolled, heat treated, not descaled.	Surface is covered with the rolling scale.
-	1E	Hot rolled, heat treated, descaled.	Surface is free of scale.
<b>Cold Rolled</b>			
No.3	2G	Cold rolled, annealed & pickled, polished with 80 - 120 grit.	Uniform finish with a coarse texture.
No.4		Cold rolled, annealed & pickled, polished with 150 - 400 grit.	Unidirectional abrasive texture with little reflectivity.
Scotch bright	2K	2B or BA finish, polished to satin finish, skin-passed.	Similar to No. 4 dull polish, but with a smoother surface texture with a little more reflectivity.
-	2F	Cold rolled, annealed & pickled, skin-passed.	Uniform non-reflective matt surface.
Emboss	2M	Patterned, design is to be agreed.	A fine texture finish mainly used for architecture.

\* ASTM A 480/A 480M - 09 / EN 10088-2:2005  
\* Other special finishes is object to enquiry.

## TYPICAL APPLICATIONS

SURFACE (EN/ASTM)	APPLICATION AREA
1D / No.1	Machines & instruments, buses, railway vehicles, profiles, electrical cabinets, tubes, cut ware laboratory cabinets, press plates, stamping parts, tank construction, commercial kitchens, building industry, automotive, boiler, etc.
2E / No.1	
2D / 2D	Tubes, tanks, busses, railway, structural parts, conveyers.
2B / 2B	The same as for 1D & 2E, clever clamps, surgical instruments, pumps manufacturer, beer kegs, chimney pipes, heat exchangers, sinks, elevators etc.
2R / BA	Sinks, dishwashers, dryer, washing machines, cookers, microwave, cookware, profiles, electrical cabinets, laboratory cabinets, tubes, cutlery, stamping parts, commercial kitchens, automotive, boiler, clever clamps, pumps manufacturer, chimney pipes, heat exchangers, etc.
2H / TR	Automotive, chains, machines / instruments, tank construction, press plates, building industry, boiler, cut ware, surgical instruments, implants, railway vehicles, profiles, stamping parts etc.
2G / No.3, No.4	Kitchen utensils, building construction, medical equipment, etc.
2M / Emboss	Architectural & decoration applications.
2K / Scotch bright	Architecture, railway cabins, elevators, lifts, doors, panels & cladding, shields, kitchen, etc.

# PIPE & TUBE

## DELIVERY PROGRAMM



SEAMLESS TUBE & PIPE



WELDED PIPE



U-TUBE

PRODUCT TYPE	DIAMETER	WALL THICKNESS	DELIVERY CONDITIONS
Seamless tube & pipe	6,00 - 830,00 mm	0,50 - 45,00 mm	Solution: Annealed, Pickled, Polished. Ends: plain ends/bevel edges.
Welded tube & pipe	10,00 - 2500,00 mm	0,50 - 50,00 mm	Test: Ultrasonic, X-ray, Eddy current, Intergranular Corrosion, Elongation, Roughness, Impact, Hardness, Tensile, Yield, Flattening, Flaring, etc.
U-Tube	12,00 - 38,00 mm	0,50 - 4,00 mm	

\* The specifications of certain products may vary depending on the grade and finish. Other sizes are available upon request.

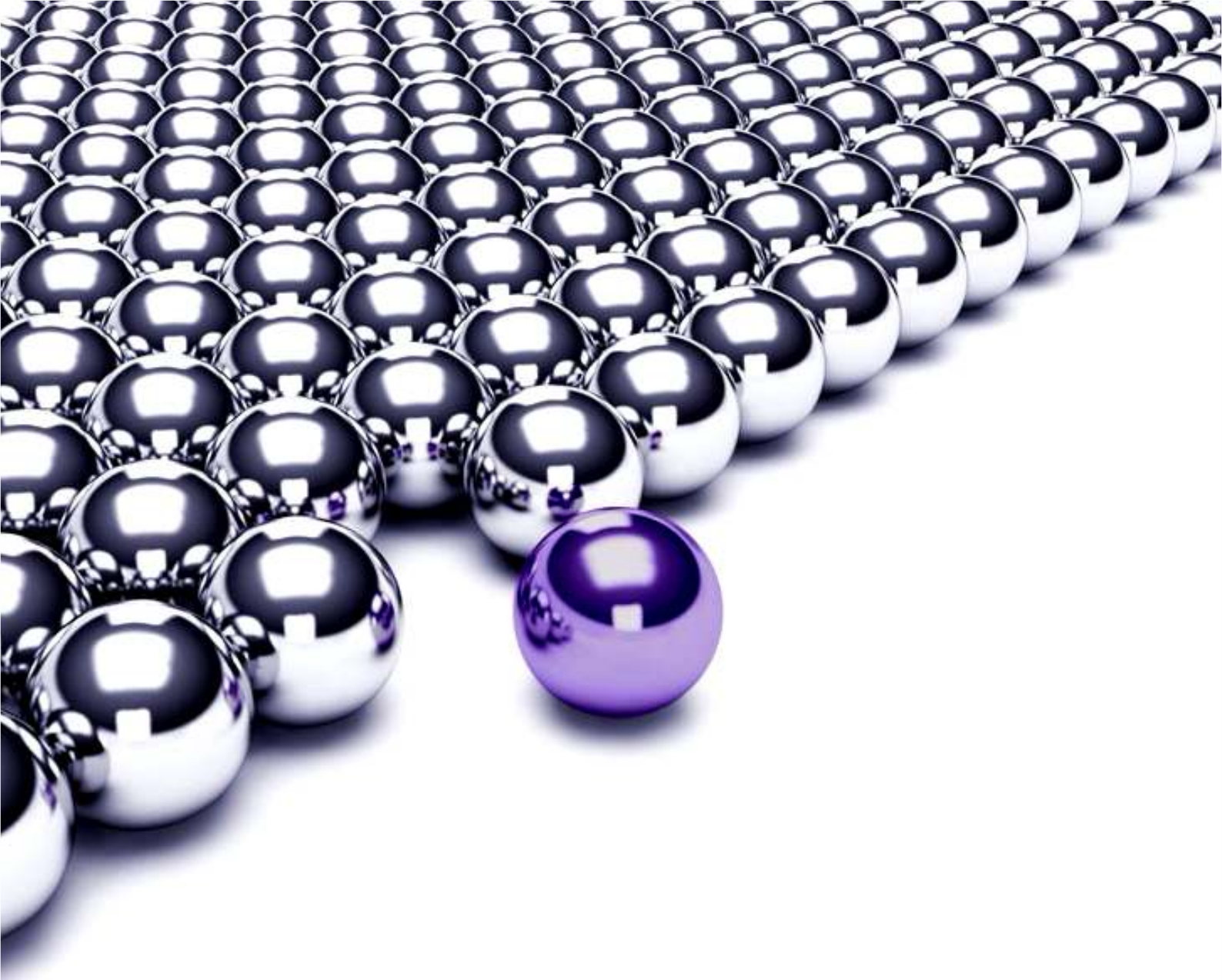
## PRODUCTION STANDARDS

TYPE	STANDARD
Seamless tube & pipe	
EN	EN10216-5, EN10216-2.
DIN	DIN 17456, DIN 17458.
ASTM ASME	ASTM A312, A213, A269, A511, A789, A790, B163, B423, B407, B668. ASME SA213, SA312, SA789, SA790; SB163, SB423, SB407, SB668.
JIS	JIS G3459, G3463.
GB	GB/T 14975, GB/T 14976, GB 13296, GB 5310, GB 9948.
GOST	GOST 9941, GOST 5632.
Welded tube & pipe	
ASTM ASME	ASTM A312, A249, A269, A688, A778, A789, A790, A358. ASME SA312, SA249, SA269, SA688, SA778, SA789, SA790, SA358.
GB	GB/T 12771, GB/T 12770, GB/T 21832.
HG	HG 20537.1, 20537.2, 20537.3, 20537.4.

## MAIN PRODUCT APPLICATIONS

GRADE	STANDARD	SPECIFICATION	APPLICATION
Boiler Tubes			
304H, 310H, 316H, 321H, 347H, 347HFG	EN10216-5, ASTM A213, ASME SA213, GB 5310, GB 13296	OD: 33,00 - 273,00 mm WT: 2,00 - 20,00 mm	Power generation (high pressure boiler, superheater, reheater), industrial furnace, etc.
Heat Exchanger Tubes			
304, 304L, 304H, 309S, 310S, 316, 316L, 316Ti, 321, 321H, 347H.	DIN 17458, EN10216-5, ASTM A213, ASME SA213, GB 13296, JIS 3463	OD: 12,70 - 159,00 mm WT: 0,50 - 8,00 mm	Refineries, (petro-) chemical and pharmaceutical industry, etc.
Oil and Gas Tubes			
304H, 304L, 321, 321H, 347H, 316LMo	ASTM A312, A269, GB/T 14976, JIS G3459	OD: 6,00 - 273,00 mm WT: 0,50 - 16,00 mm	Subsea applications, onshore and offshore oil & gas exploration.
Duplex Tubes			
S31500, S31803, S32900, S31260, S32550, S32750.	ASTM A789, A790, A450, A530, GB/T 14975, GB/T 14976	OD: 10,00 - 273,00 mm WT: 0,50 - 20,00 mm	Onshore and offshore oil & gas exploration, chemical industry, power generation, etc.
General Tubes			
304, 304L, 304H, 316, 316H, 316Ti, 316L, 316LMo, 321	DIN 17456, DIN 17458, EN 10216-5, ASTM A312, GB/T 14976, JIS G3459	OD: 10,00 - 830,00 mm WT: 1,65 - 45,00 mm	General corrosive service.
Instrumentation Tubes			
304, 304L, 304H, 316, 316Ti, 316L, 317L, 321.	DIN 17456, DIN 17458, EN 10216-5, ASTM A269, GB/T 14976, JIS G3459	OD: 6,00 - 76,00 mm WT: 0,50 - 6,00 mm	Transportation systems (automotive, railway, shipping, aircraft), mechanical engineering (factory facilities, high pressure applications).

Note: The above sizes and specifications are most frequently used, other can be produced upon request.



*UK & EUROPE & USA*

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