



Stainless Steel & High Performance Alloys



www.qualitygroup.in

QUALITY FOILS (INDIA) PVT LTD
E-mail: contactus@qualityfoils.com
Ph: +91-1662-220327, 28, 29 Fax: +91-1662-220330

QUALITY STAINLESS PVT LTD
E-mail: contactus@qualitygroup.in
Ph: + 91-1662-220249, 50 Fax: +91-1662-220251

REGISTERED OFFICE & WORKS
3 & Near 7, Industrial Development Colony, Hisar-125005, Haryana (India)

DELHI OFFICE
R-32, First Floor, South Extension Part-2, New Delhi-110049

MUMBAI OFFICE
D-4, 'O' Wing, 102, Satellite Garden Phase-II, Gen. A.K. Vaidya Marg, Film City Road Goregaon (East), Mumbai-400 063, India

Stainless Steel Coils & Strips, Flexible Hoses and Pipes & Tubes

The Group Companies

QUALITY FOILS (I) PVT. LTD.

CR COILS/STRIPS

QUALITY FLEXIBLES™

FLEXIBLE HOSES & ASSEMBLIES

QUALITY STAINLESS PVT. LTD.

TUBE/PIPE DIVISION

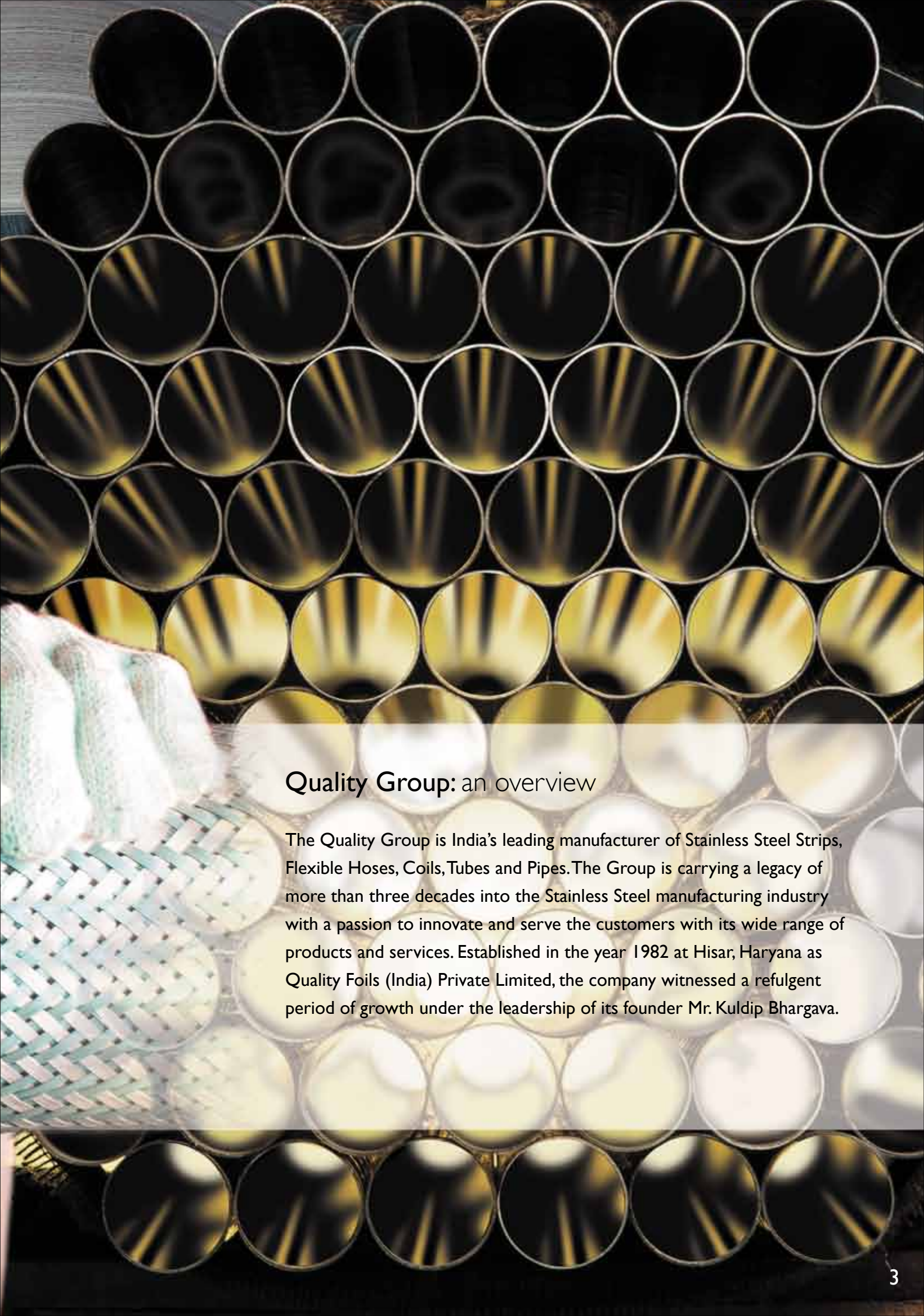
MD's Message



"We strive to create benchmarks in the industry in terms of quality maintenance and product improvement. With our unconventional outlook, we constantly innovate ways to maintain world-class quality standards in all our products to serve our customers better."

- Mr. Kuldip Bhargava

With Quality as our imbibed attitude, we have been ceaselessly striving towards "Total Quality Management". Constant innovations in product development and technology upgradation have helped us achieve market leadership in Stainless Steel Coils, Strips, and Stainless Steel Pipes & Tubes. We have a track-record of securing 100% customer delight by staying focused on our customers' requirements.



Quality Group: an overview

The Quality Group is India's leading manufacturer of Stainless Steel Strips, Flexible Hoses, Coils, Tubes and Pipes. The Group is carrying a legacy of more than three decades into the Stainless Steel manufacturing industry with a passion to innovate and serve the customers with its wide range of products and services. Established in the year 1982 at Hisar, Haryana as Quality Foils (India) Private Limited, the company witnessed a refulgent period of growth under the leadership of its founder Mr. Kuldip Bhargava.



Our Competitive Edge

The Quality Group has always stayed one step ahead of its competitors in terms of high quality products, competitive pricing and on time delivery. The group's solid infrastructure with backward and forward integration enjoys the best locational advantages too for being located in Hisar, Haryana, aptly known as the "Stainless" city of India, close by the national capital New Delhi.

- World-class manufacturing plant with state-of-the-art technology
- Optimized raw material supply chain management due to proximity to India's largest stainless steel producer.
- Incorporation of indigenous technical know-how
- Skilled, experienced manpower





Quality: Our Core Value

At the core of the group lies Quality, the driving force of the company. Right from the very inception, stringent quality standards have always been maintained. The Quality Group is committed to develop manufacturing processes that combine indigenous technology with world-class production process.

Well-equipped testing laboratories with world-class testing equipment in each division of the group facilitates various tests such as Metallurgical, Mechanical and Chemical that is carried out by a skill-set of technicians.

Strict environment policies are also followed throughout the production process besides efficient usages of precious resources, setting up of water treatment plant and recycling of water.

The Group holds third party clearances & approvals for its products & manufacturing facilities.





OUR PRODUCTS & TECHNICAL DATA

COLD ROLLED PRODUCTS

Coil

Sr. No.	Thickness (mm)	Thickness Tolerance (mm)	Width (mm) (Width in Inches also)	Width Tolerance Mill Edge
1	4.00	+ / - 0.10	710 (max.)	+/- 5mm
2	3.00	+ / - 0.08	710 (max.)	+/- 5mm
3	2.00	+ / - 0.07	710 (max.)	+/- 5mm
4	1.15	+ / - 0.06	710 (max.)	+/- 5mm
5	1.00	+ / - 0.05	710 (max.)	+/- 5mm
6	0.90	+ / - 0.045	710 (max.)	+/- 5mm
7	0.80	+ / - 0.04	710 (max.)	+/- 5mm
8	0.60 / 0.50	+ / - 0.03	710 (max.)	+/- 5mm

Precision Strips

Sr. No.	Thickness (mm)	Thickness Tolerance (mm)	Width (mm)	Width Tolerance Mill Edge
1	0.50	+ / - 0.025	500 (max.)	+/- 5mm
2	0.30	+ / - 0.020	500 (max.)	+/- 5mm
3	0.20	+ / - 0.020	500 (max.)	+/- 5mm

SLITTING :We can Slit from 10mm to 710mm width

TOLERANCE ON SLIT WIDTH

Thickness (mm)		Width Tolerance (+ / -) on nominal Width (mm)			
		< 150	150 < 250	250 < 500	500 < 710
0.20	0.60	0.10	0.15	0.20	0.20
0.60	1.00	0.15	0.15	0.20	0.20
0.10	1.50	0.20	0.20	0.25	0.25
1.50	2.50	0.20	0.20	0.25	0.25
2.50	4.00	0.25	0.25	0.30	0.30

SURFACE FINISHES AND SURFACE CONDITION

Designation to ASTMA 480 / BS 1449 Part 2	Designation to DIN 17 440	Description	Surface Condition	Uses
No. 1 Finish	II a or c 1 II a or c 2	Hot rolled annealed, shot blasted and pickled	Mechanically & chemically clean	Used for general fabrication application including tubing / piping where finish is not so important
CR	III a or f	Work hardened	Smooth and bright smoother than by process c 2 or II a	Used where high yield and tensile strength are required and corrosion resistance is not so important
CR - Unpickled	III s or g	Cold rolled annealed and not pickled	Thin layer of mill scale	Used for high resistant steel
2D	III b or h	Cold rolled annealed and pickled	Dull, but smoother than by process II a	Uniformly dull finish, normally used in forming deep drawn articles which may be polished after fabrication
2B	III c or n	Cold rolled annealed and pickled and skin passed	Dull, but smoother than by process II b	Commonly produced the same way as 2D except that cold rolled pass is given on polished rolls on 2D finish. More readily polished than No. 1 & 2D





Flexible Hoses & Hose Assemblies

With the brand name "QUALITY FLEXIBLES™" a business unit of Quality Group, is set up to facilitate our forward integration drive to manufacture full range of Stainless Steel Corrugated Flexible Hoses & Hose Assemblies (10mm to 250mm) in AISI 304, 321 & 316L grade conforming to international quality standards and other grades can be manufacture on order.

Our Stainless Steel Corrugated Flexible Hoses conform to BS 6501 part-1 2004 and ISO 10380 Standard.

Quality and R&D

QUALITY FLEXIBLES™ has complete in-house laboratory, as per international standards specified for metallic flexible hoses, for testing facilities.

Every single hose assembly is tested hydraulically at 1.5 times working pressure before dispatch. Pneumatic testing is also carried out whenever necessary. All raw material used in the manufacture of Hoses, Braiding and End Connections undergo rigid inspection to ensure highest quality standards.

Testing Facilities:

- Flex Fatigue or Cycle Life Test
- Burst Pressure or Yield Test
- Bend Radius Test
- Flame Test



World Class Stainless Steel Corrugated Flexible Hoses & Hose Assemblies

Technical Data for Braided Hoses & Assemblies

NOMINAL BORE	MINIMUM BEND RADIUS		SINGLE BRAID		DOUBLEBRAID	
	STATIC	FLEXING	Max. working pressure	Test pressure	Max. working pressure	Test pressure
mm	mm	mm	kg/cm ²	kg/cm ²	kg/cm ²	kg/cm ²
6	25	100	100	150	160	240
10	40	150	90	135	144	216
12	50	200	80	120	128	192
16	50	200	70	105	112	168
20	70	200	64	96	102	153
25	90	200	50	75	80	120
32	110	250	40	60	64	96
40	130	250	30	45	48	72
50	175	350	28	42	44	66
65	200	410	24	36	38	57
80	205	450	18	27	28	42
100	230	560	16	24	26	39
125	280	660	12	18	20	30
150	320	815	10	15	16	24
200	435	1015	08	12	12	18
250	560	1220	06	09	10	15

Hose

We offer Stainless steel corrugated flexible hoses & hose assemblies from 6mm (1/4") to 250 mm (10mm). We also manufacture highly flexible close-pitch hose for Special Applications.

Braid

Braiding is normally manufactured in high tensile stainless steel AISI 304 wire, stainless steel AISI 316 wire. In case of bulk requirement, we also manufacture braids as per client's requirements.

Assemblies & End Connections

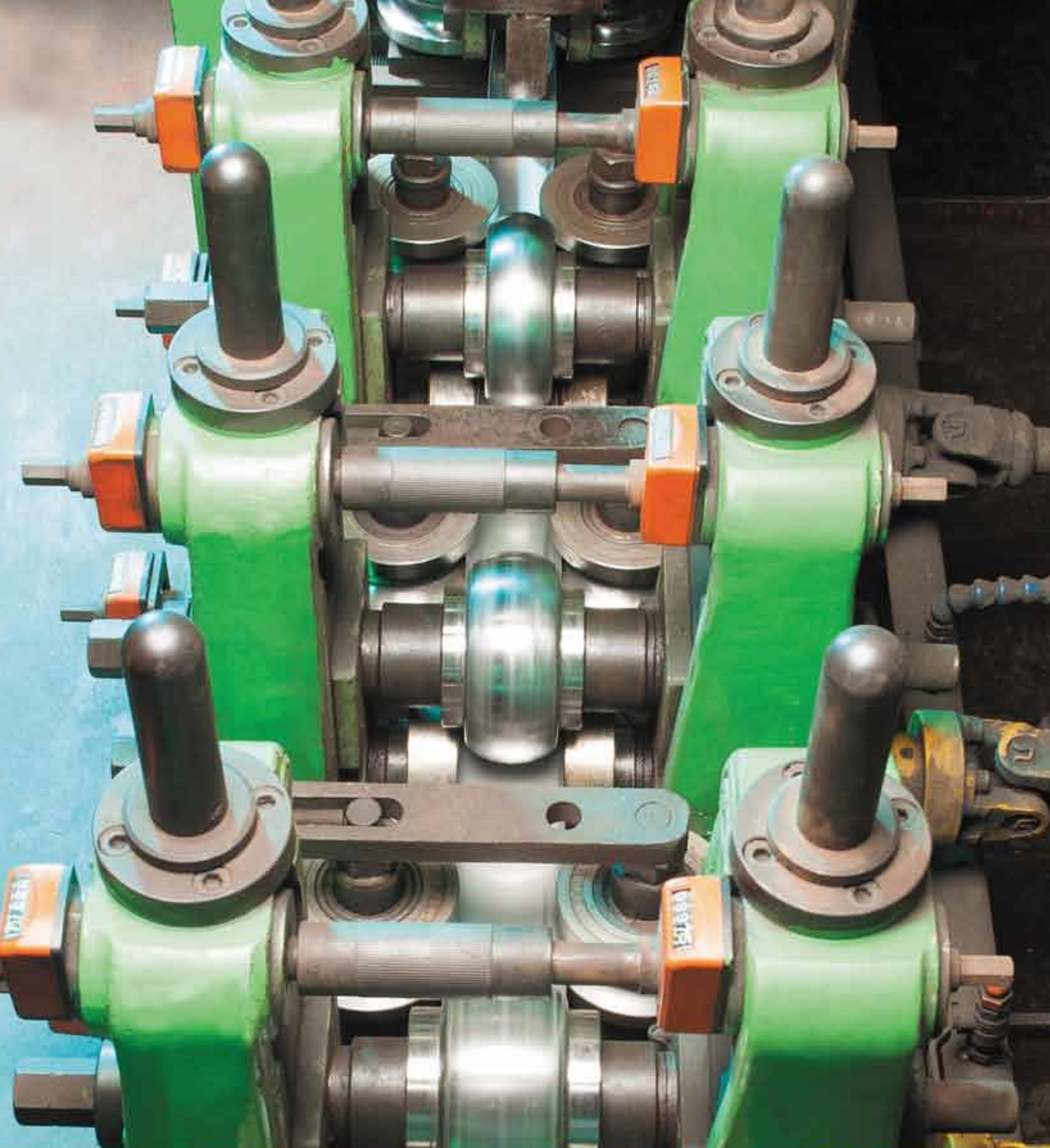
We have our own design and development department to make all kind of hose assemblies as per the customers specification.

Flexible Exhaust Connectors

Flexible connector design offers an excellent vibration and durability characteristic. Multi-ply construction available in all materials including special alloys for corrosion and temperature resistance.

Note:

1. The above technical details are subject to change without notice
2. The above value applies only to braided hose and assemblies at an ambient temperature of 20 °C
3. The burst pressure is 4 times the Max. Working pressure



Stainless Steel Welded & Seamless Tubes, Pipes & U-Tubes

Quality Stainless (India), an ISO 9001:2008 and PED 97/23/EC& AD 2000 MERKBLATT W0/W2 Certified from TUV, is recognized and revered as the most qualified and capable manufacturer of finest quality Stainless Steel Seamless and welded Tubes, Pipes & U-Tubes conforming to ASTM / ASME, DIN, EN, JIS, GHOST specifications.

The company offers various surface finishes such as Bright Annealed, Pickled/Passivated and Polished.

Our products cater to various sectors like Petro-chemical, Refinery, Fertilizer, Thermal Power, Nuclear Power, Water Distribution, Food & Dairy, Paper, Pharmaceutical, Automobile, Aeronautics & Space, Steel plants, Sugar units, Oil & Gas Industry, Engineering Contractors & Railways, Food & Beverage Processing, Ornamental & Decorative fabrication.

The company has integrated plant equipped with state-of-art technology and facility supported by most qualified and sound professionals to meet specific customer needs with quality assurance, attractive product pricing and on-time delivery. Satisfactory quality supported by extraordinary service enables us to secure preferable position with our customers.



ISO 9001:2008



AD 2000 W0/W2 | PED 97/23/EC
Merkblatt - TUV | Pressure equipment directive





Testing facility:



SPECTROMETER



EDDYCURRENT TEST



HYDRO TEST

The plant is well equipped with In-house testing facilities for Physical, Mechanical, Chemical, Destructive & Non Destructive testing such as:

- Eddy Current Testing-Online / Offline
- Microscope - Surface and Weld Structure
- Surface Roughness Testing for RA & RZ Value
- Spectro Meter for product analysis to detect 48 different elements
- Hi pressure Hydro Testing M/c's
- Universal Testing M/c - All Purpose Mechanical Testing
- IGC Testing Equipment- For Inter-Granular-Corrosion Test
- Rockwell Hardness Testing M/c
- Digital Photo Calorimeter
- Electronic Balance
- Muffle Furnace (0-1200°C)
- Pickling Acid Testing Facility
- Go & No Go Gauges
- EC & TDS Tests

Infrastructure

- High Precision TIG welding Tube Mills having On-line Bright Annealing & Eddy Current testing facility.
- High Performance German SMS Mannesmann Meer Pilger machines to produce seamless tubes.
- Off-line Bright Annealing/ Solution Annealing & U-Bend Annealing
- In house work shop equipped with tool room.
- Air under water testing.
- OD polishing lines to achieve Matt, Stain & Mirror Finish.
- 100% power back-up.

◀ Packaging:

- Wooden Box Packing
- Wooden Crate Packing
- Sea Worthy Wooden Box Packing
- Bundle Packing
- Jute or Hessian Cloth Packing
- Plastic Wrapping
- Individual Tube Marking & Grade wise packing for better trace ability



Our Global Reach

Apart from being the market leader in domestic stainless steel market with extensive market share, the Quality Group is strengthening its Global presence through a strategic export policy. Keeping the ever-growing penetration of such high demand products abroad, Quality Group is regularly exporting its products successfully to various countries of Europe, North American and South Asian continents.

ASTM Specification

Wall Thickness in mm/ Wall Thickness in mm/Bwg	0.711 22 Swg	0.914 20 Swg	1.219 18 Swg	1.626 16 Swg	1.829 15 Swg	2.032 14 Swg	2.612 12 Swg	3.251 10 Swg
	0.711 22 Bwg	0.889 20 Bwg	1.245 18 Bwg	1.651 16 Bwg	1.829 15 Bwg	2.108 14 Bwg	2.769 12 Bwg	2.769 12 Bwg
O.D. in mm	Weight in kg / mt.							
6.32	0.100	0.124	0.155	0.191	0.205			
6.32	0.100	0.121	0.158	0.193	0.205			
10.00	0.165	0.208	0.268	0.340	0.374	0.405	0.482	0.549
10.00	0.165	0.202	0.272	0.340	0.374	0.416	0.501	0.561
12.70	0.213	0.269	0.350	0.450	0.497	0.542	0.659	0.768
12.70	0.213	0.262	0.357	0.456	0.497	0.558	0.687	0.791
15.875	0.270	0.342	0.447	0.579	0.642	0.703	0.866	1.026
15.875	0.270	0.333	0.455	0.587	0.642	0.726	0.907	
19.05	0.326	0.411	0.543	0.708	0.787	0.865	1.073	
19.05	0.326	0.404	0.554	0.718	0.787	0.839	1.127	
23.00		0.505	0.664	0.896	0.986	1.065	1.331	
23.00		0.491	0.677	0.881	0.968	1.101	1.400	
25.40		0.560	0.737	0.999	1.078	1.187	1.488	
25.40		0.545	0.752	0.980	1.078	1.227	1.567	
31.75			0.930	1.225	1.368	1.510	1.903	
31.75			0.949	1.242	1.368	1.562	2.006	
38.10			1.124	1.483	1.658	1.832	2.317	
38.10			1.147	1.504	1.658	1.897	2.446	
45.00			1.334	1.763	1.974	2.183	2.768	
45.00			1.362	1.789	1.974	2.260	2.923	
50.80				1.999	2.239	2.477	3.147	
50.80				2.029	2.239	2.566	3.325	
63.50					2.820	3.123	3.976	
63.50					2.820	3.123	3.976	
76.20						3.768	4.805	
76.20						3.905	5.083	
88.90						4.413	5.635	
88.90						4.574	5.962	
101.60						5.058	6.464	
101.60						5.243	6.842	

Stainless Steel Pipe Series (ANSI B 36.10; B 36.19)

Nominal	Nominal Pipe Size	Outside Diameter	Wall Thickness and Weight									
			Sch. 5 S		Sch. 10 S		Sch. 20 S		Sch. 40 S		Sch. 80 S	
Inches	mm	mm	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m
1/8	6	10.29	-	-	1.24	0.281	1.50	0.330	1.73	0.370	2.410	0.475
1/4	8	13.72	-	-	1.65	0.498	2.00	0.580	2.24	0.643	3.02	0.808
3/8	10	17.15	-	-	1.65	0.639	2.00	0.740	2.31	0.857	3.20	1.116
1/2	15	21.34	1.65	0.812	2.11	1.014	2.50	1.150	2.77	1.286	3.73	1.642
3/4	20	26.67	1.65	1.032	2.11	1.296	2.50	1.490	2.87	1.708	3.91	2.225
1	25	33.40	1.65	1.310	2.77	2.121	3.00	2.900	3.38	2.537	4.55	3.282
1.1/4	32	42.16	1.65	1.671	2.77	2.728	3.00	2.900	3.56	3.435	4.85	4.524
1.1/2	40	48.26	1.65	1.923	2.77	3.680	3.00	3.350	3.15	4.101	5.08	5.484
2	50	60.33	1.65	2.421	2.77	3.986	3.50	4.900	3.91	5.515	5.54	7.588
2.1/2	65	73.03	2.11	3.741	3.05	5.336	3.50	6.000	5.16	8.755	7.01	11.570
3	80	88.90	2.11	4.578	3.05	6.546	4.00	8.370	5.49	11.448	7.62	15.484
3.1/2	90	101.60	2.11	5.248	3.05	7.514	4.00	9.620	5.74	13.756	8.08	18.891
4	100	114.30	2.11	5.918	3.05	8.483	4.50	12.180	6.02	16.296	8.56	22.628
5	125	141.30	2.77	9.593	3.40	11.722	5.00	16.8000	6.55	22.065	9.52	31.364
6	150	168.28	2.77	11.462	3.40	14.015	5.50	22.080	7.11	28.648	10.97	43.142
8	200	219.08	2.77	14.979	3.76	20.240	6.35	33.820	8.18	43.129	12.70	65.526
10	250	273.00	3.40	22.920	4.19	27.780	6.35	41.770	9.27	60.310	15.09	96.010
12	300	323.80	3.96	31.250	4.57	36.000	6.35	49.730	10.31	79.730	17.48	132.080
14	350	355.60	3.96	34.360	6.35	54.690	7.92	67.900	11.13	94.550	19.05	158.100
16	400	406.40	4.19	41.560	6.35	62.640	7.92	77.830	12.70	123.300	21.44	203.530
18	450	457.00	4.19	46.810	6.35	70.570	7.92	87.710	14.27	155.800	23.83	254.550
20	500	508.00	4.78	59.250	6.35	78.550	9.53	117.150	15.09	183.420	26.19	311.170
22	550	559.00	4.78	65.240	6.35	86.540	9.53	129.130	STD.	STD.	STD.	STD.
24	600	610.00	5.54	82.470	6.35	94.500	9.53	141.120	STD.	STD.	STD.	STD.

Other sizes can be made on request

Stainless Steel Tubing Series

CONDENSED ASTM SPECIFICATIONS FOR STAINLESS STEEL TUBING AND PIPING									
Specification	Allowable Outside Diameter Variations in mm				Allowable wall		Exact Length		Testing
	Nominal Diameter	Over	Under	Over%	Under%	Over%	Under%		
ASTM A - 213 Seamless Boiler Superheater and Heat Exchanger Tubes	under 25.4 25.4 - 38.1 incl. 38.1 - 50.8 excl. 50.8 - 63.5 excl. 63.5 - 76.2 excl. 76.2 - 101.6 incl.	0.1016 0.1524 0.2032 0.254 0.3048 0.381	0.1016 0.1524 0.2032 0.254 0.3048 .381	+20 +20 +22 +22 +22	-0 -0 -0 -0 -0	3.175 3.175 3.175 3.76 4.76 4.76	0 0 0 0 0 0	Tension Test Flattening Test Flaring Test Hardness Test 100% Hydrostatic Test Refer to ASTM-A1016	
ASTM A-249 Welded Boiler Superheater, Heat Exchanger and Condenser tubes	under 25.4 25.4 - 38.1 incl. 38.1 - 50.8 excl. 50.8 - 63.5 excl. 63.5 - 76.2 excl. 76.2 - 101.6 incl.	0.1016 0.1524 0.232 0.254 0.3048 0.381	0.1016 0.1524 0.2032 0.254 0.3048 0.381	+10 +10 +10 +10 +10 +10	-10 -10 -10 -10 -10 -10	3.175 3.175 3.175 4.76 4.76 4.76	0 0 0 0 0 0	Tension Test Flattening Test Flange Test * Reverse Bend Test Hardness Test 100% Hydrostatic Test Refer to ASTM-A1016 * Wherever applicable	
ASTM A-269 Seamless & Welded Tubing for General Service	upto 12.7 12.7 - 38.1 excl. 38.1 - 88.9 excl. 88.9 - 139.7 excl. 139.7 - 203.2 excl.	0.13 0.13 0.25 0.38 0.76	0.13 0.13 0.25 0.38 0.76	+15 +10 +10 +10 +10	-15 -10 -10 -10 -10	3.2 3.2 4.8 4.8 4.8	0 0 0 0 0	Flare Test (Seamless Tube) Flange Test (Welded only) Hardness Test Reverse Flattening test 100% Hydrostatic Test Refer to ASTM-A1016	
ASTM A-270 Seamless & Welded Sanitary Tubing	25.4 38.1 50.8 63.5 76.2 101.6	0.005 0.008 0.008 0.010 0.010 0.015	0.005 0.008 0.008 0.010 0.010 0.015	+12.5 +12.5 +12.5 +12.5 +12.5 +12.5	-12.5 -12.5 -12.5 -12.5 -12.5 -12.5	3.2 3.2 3.2 3.2 3.2 3.2	0 0 0 0 0 0	Reverse Flattening test 100% Hydrostatic Test External polish on all tubes general reqmts. Refer to ASTM-A1016	
ASTM A-312 Seamless & Welded Pipe	13.7 - 48.3 incl. 48.3 - 114.3 incl. 114.3 - 219.18 incl.	0.4 0.8 1.6	0.8 0.8 0.8	Minimum Value 12.5% under nominal wall Specified		6.4 6.4 6.4	0 0 0	Tension Test flattening test, 100% Hydrostatic Test Refer to general requmt. ASTM A-999 (Normally Random Lengths ordered)	
ASTM A-268 Seamless & Welded Ferritic Stainless Steel tubes	under 12.7 12.7 - 38.1 excl. 38.1 - 88.9 excl. 88.9 - 139.7 excl.	0.13 0.13 0.25 0.38	0.13 0.13 0.25 0.38	+15 +10 +10 +10	-15 -10 -10 -10	3.2 3.2 4.8 4.8	0 0 0 0	Tension Test flaring test, flange test, (ERW only) hardness test, reverse flattening test, 100% hydrostatic test, Refer to ASTM A - 1016	
ASTM A-358 for Welded big Diameter Pipe	For all sizes 5" NB & above	+0.5%	-0.5%	-	-0.3 min	Customer's Specification		Transverse tension test, Transverse guided bend test Hydrostatic test radiographic examination (as specified) dye penetrant (optional)	
ASTM A-688 For welded Feed Water heater 'U' tubes	15.875 to 25.40 mm	0.1016	0.1016	+20 +10	-0(for min wall thk) -10 (for Avg wall thk)	3 to 13	0	Tension, Hardness, Corrosion, Reversebend, Flange, Flattening, Hydrostatic Test, Pneumatic Test	
ASTM A-409 Welded Large Diameter Austenitic Steel pipe	Wall thickness ≤ 4.8mm ± 0.2% ≥ 4.8mm ± 0.2% Ovality	0.2% 0.4% ≤1.5% of O/D	0.2% 0.4%	0.46mm	0.46mm	less than NPS 22" 9 to 12 feet NPS 22" minimum 5ft.		Bend Test Hydro Test	
ASTM A-778 Austenitic Stainless Steel Tubuler Product	As per Table I Welded Unannealed of ASTM A - 530			12.5%	12.5%	RL 10ft > (3 meter & over)FL + 6mm - 0mm		Transverse Tension Test Transverse guided bend General reqmt. ASTM- A999	

Chemical Composition

CHEMICAL COMPOSITION													
Grade	USA - Canada/ AISI - ASTM-ASME	% C (Max)	% Mn (Max)	% P (Max)	% S (Max)	% Si (Max)	% Cr	% Ni	% Mo	% N (Max)	% Cu (Max)	OTHERS	
												Ti	Cb
AUSTENITIC	301	301	0.15	2.00	0.045	0.030	1.00	16.00 - 18.00	6.00 - 8.00	-	0.10	-	-
	304	304	0.080	2.00	0.045	0.030	0.75	18.00 - 20.00	8.00 - 10.50	-	0.10	-	-
	304H	304H	0.04 - 0.10	2.00	0.045	0.030	0.75	18.00 - 20.00	8.00 - 10.50	-	-	-	-
	304L	304L	0.030	2.00	0.045	0.030	0.75	18.00 - 20.00	8.00 - 12.00	-	0.10	-	-
	304LN	304LN	0.030	2.00	0.045	0.030	0.75	18.00 - 20.00	8.00 - 12.00	-	0.10 - 0.16	-	-
	309	309	0.20	2.00	0.045	0.030	0.75	22.00 - 24.00	12.00 - 15.00	-	-	-	-
	309S	309S	0.08	2.00	0.045	0.030	0.75	22.00 - 24.00	12.00 - 15.00	-	-	-	-
	310	310	0.25	2.00	0.045	0.030	1.50	24.00 - 26.00	19.00 - 22.00	-	-	-	-
	310S	310S	0.08	2.00	0.045	0.030	1.50	24.00 - 26.00	19.00 - 22.00	-	-	-	-
	316	316	0.08	2.00	0.045	0.030	0.75	16.00 - 18.00	10.00 - 14.00	2.00 - 3.00	0.10	-	-
	316L	316L	0.030	2.00	0.045	0.030	0.75	16.00 - 18.00	10.00 - 14.00	2.00 - 3.00	0.10	-	-
	316LN	316LN	0.030	2.00	0.040	0.030	0.75	16.00 - 18.00	10.00 - 14.00	2.00 - 3.00	0.10 - 0.16	-	-
	316Ti	316Ti	0.08	2.00	0.045	0.030	0.75	16.00 - 18.00	10.00 - 14.00	2.00 - 3.00	0.10	-	Ti = 5X(C=N)Min., 0.70Max.
	317	317	0.08	2.00	0.045	0.030	0.75	18.00 - 20.00	11.00 - 15.00	3.00 - 4.00	0.10	-	-
317L	317L	0.030	2.00	0.040	0.030	0.75	18.00 - 20.00	11.00 - 15.00	3.00 - 4.00	0.10	-	-	
317LN	317LN	0.030	2.00	0.045	0.030	0.75	18.00 - 20.00	11.00 - 15.00	3.00 - 4.00	0.10 - 0.22	-	-	
321	321	0.08	2.00	0.045	0.030	0.75	17.00 - 19.00	9.00 - 12.00	-	0.10	-	Ti=5X(C-N)Min., 0.70Max.	
347	347	0.08	2.00	0.045	0.030	0.75	17.00 - 19.00	9.00 - 13.00	-	-	-	Cb=10XC Min., 1.00 Max.	
FERRITIC + MARTENSITIC	409	409	0.080	1.00	0.040	0.020	1.00	10.50 - 11.75	0.50 max.	-	0.030	-	Ti=6X(C=X)Min. 0.75 Max.
	409RC	-	0.02	1.00	0.040	0.030	1.00	10.50 - 11.75	0.50max.	-	0.020	-	Ti=5X C Min., 0.75Max.
	409M	-	0.03	0.8-1.5	0.03	0.030	1.00	10.80 - 12.50	1.50max	-	0.030	-	Ti=0.75Min.,
	410	410	0.15	1.00	0.040	0.030	1.00	11.50 - 13.50	0.75max	-	-	-	-
FERRITIC	410S	410S	0.08	1.00	0.040	0.030	1.00	11.50 - 13.50	0.60max	-	-	-	-
	405	405	0.80	1.00	0.04	0.030	1.00	11.50 - 14.50	0.60	-	-	-	Al=0.10 - 0.30
	430	430	0.12	1.00	0.04	0.030	1.00	16.00-18.00	0.75max	-	-	-	-
	430Ti	430	0.030	1.00	0.40	0.030	1.00	16.00-19.00	-	-	-	-	Ti=0.10-1.0
MARTENSITIC	436	436	0.12	1.00	0.040	0.030	1.00	16.00-18.00	-	0.75-1.25	-	-	Cb=5X C Min., 0.80max.
	420	420	0.15min.	1.00	0.040	0.030	1.00	12.00-14.00	0.75 max	-	-	-	Mo=0.50Max.
LOW NICKEL AUSTENITIC	JBS	-	0.6-0.75	1.00	0.04	0.030	0.75	12.00-1400	-	0.75max	-	-	-
	JSL AUS(J1)	-	0.80	7.00-8.00	0.075	0.030	0.75	15.00-17.00	4.00-5.00	-	0.10	1.5	-
	J3	-	0.80	9.00-10.50	0.075	0.030	0.75	14.00-16.00	2.00-3.00	-	0.15	2.0	-
J4	-	0.10	8.50-10.00	0.090	0.030	0.75	15.00-16.00	1.2Max	-	0.20	2.0	-	

200 Series

Grade	-	C%	Min%	S%	P%	Si%	Ni%	Cr%	Cu%	Nppm	UTS, Mpa	YS, Mpa	El%	Hardness, HRB
JSLU-SD	Min	-	9.5	-	-	-	0.4	13.25	1.25	-	700	350	40	-
	Max	0.15	-	0.02	0.1	0.75	0.75	-	-	-	2000	-	-	-
JSLU-SD	Min	-	9.7	-	-	-	0.45	15.0	1.9	-	700	325	40	-
	Max	0.15	-	0.02	0.1	0.75	-	-	-	2000	-	-	-	100
JT	Min	-	9.75	-	-	-	0.2	14.0	0.6	-	725	350	40	-
	Max	0.15	-	0.02	0.1	0.75	-	-	-	2000	-	-	-	100

