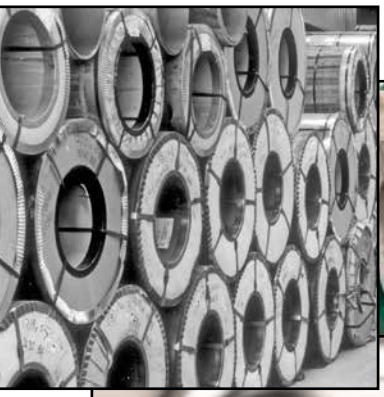
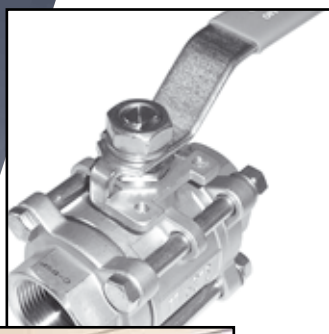
Austral Wright Metals

Stainless Steel

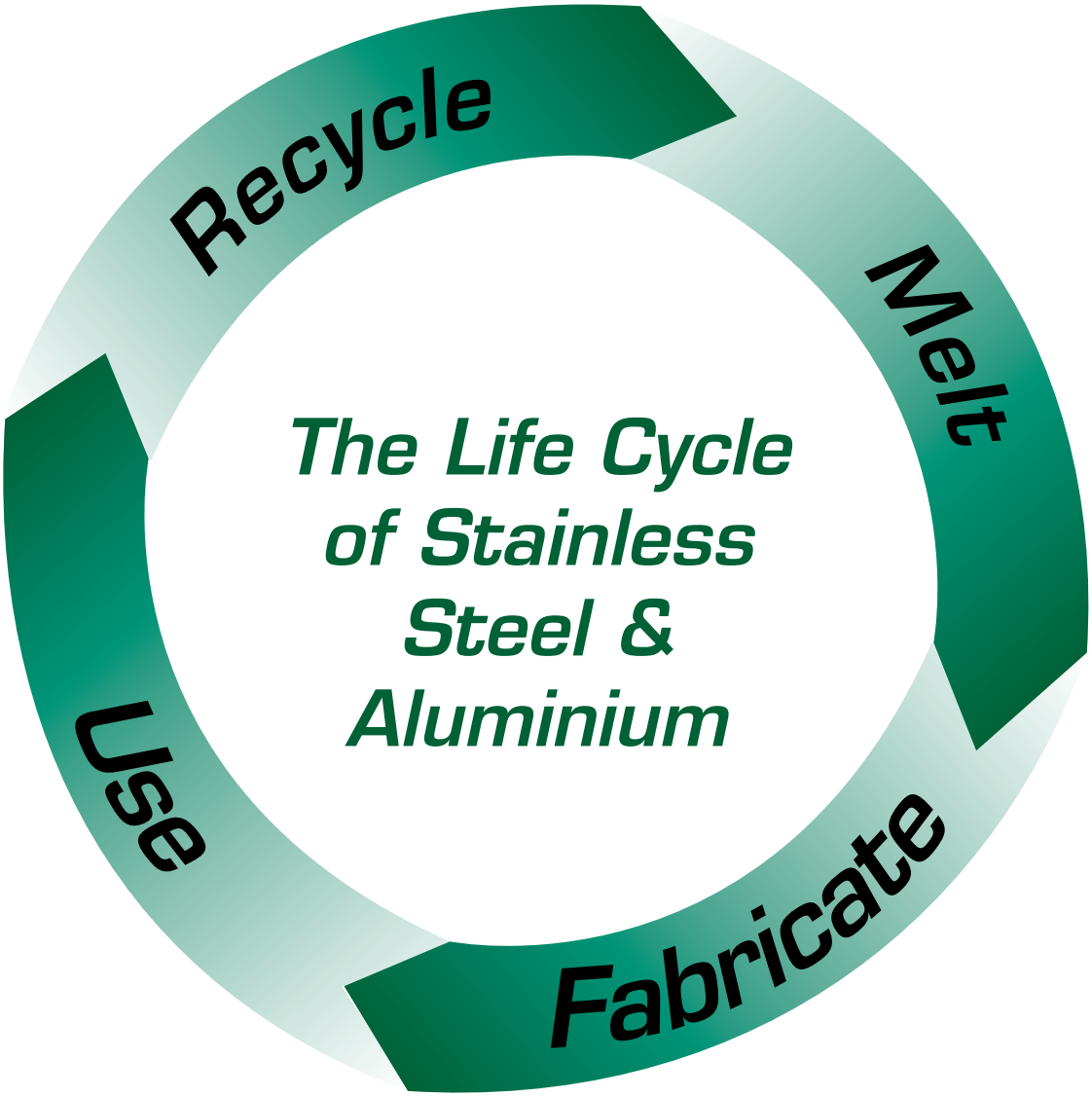




at the cutting edge

STAINLESS STEEL & ALUMINIUM

THE RIGHT MATERIALS FOR OUR ENVIRONMENT



A complete life cycle material for the Consumer, Industry and the Environment.

To ensure a high quality of life, the materials that we as consumers and manufacturers use, should meet not only technical performance standards, but have a long service life, be useable in a greater number of applications and be environmentally friendly. Once their service is complete, they should be 100% recyclable, thereby completing the life cycle to be used once again. *Stainless Steel and Aluminium are such materials.*

Quality System
Quality Endorsed Company
ISO 9001 Lic QEC 3491
SAI Global

Welcome to

Austral Wright Metals

Austral Wright Metals is the result of the merging, on 1st December 1997, of two long established well respected Australian owned metal distribution companies. Austral Bronze Crane Copper Limited (the metal distribution division of the Crane Group) and Wright and Company Pty Limited.

This brought together Australia's leaders in the distribution of:

Copper, brass and bronze – sheet, coil, bar, rod, extrusions and tube.
Stainless steel – sheet, coil, plate, bar, rod tube and fittings.
Aluminum – sheet, coil, plate and tread plate.
High Performance Alloys – including nickel based alloys, welding consumables and high technology metals.

Austral Bronze Crane Copper was incorporated in 1914 to manufacture non ferrous sheet, coil and extruded product. The business was restructured in 1990 to clearly focus on the distribution of non ferrous and specialty metals.

Incorporated in 1913, Wright and Company concentrated its efforts on the distribution of stainless steel and non ferrous alloys through its Australia wide warehouse network. In 1993, a state-of-the-art Metal Processing Centre was opened in Sydney.

Austral Wright Metals draws on nearly 100 years of experience in metal manufacturing and distribution to challenge industry standards and present a forward thinking, vibrant customer focused way to the future.

We can offer:
World leading sources in the supply of non ferrous metals and stainless steels.
In house processing for economical, speedy supply of customized product.
Technical knowledge and co-operative service from our employees.
Australia wide supply from our network of warehouses.

Austral Wright Metals is committed to fulfill its mission as your preferred business partner in the supply of Stainless Steel and Non Ferrous Metals and Alloys.

SERVICE CENTRES

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AUSTRAL WRIGHT METALS WELCOME YOUR ENQUIRIES FOR ANY OF THE FOLLOWING MATERIALS:

Aluminium	Coil, sheet, bar, tubing, welding wire
Aluminium Bronze	Bar, plate, castings, welding consumables
Aqualoy	Aqualoy boat shafting
Brass	Coil, sheet plate, shim, bar, engraving, tube, wire
Bearing Alloys	Leaded gunmetal, phosphor bronzes, aluminium bronzes
Bimetal	Coil, sheet
Beryllium Copper	Bar, flat, plate, hollow, castings, master alloys, coil
Cobalt	Alloy powder, granules, oxides and salts
Copper	Coil, sheet, plate, shim, busbar, free machining bar, tube, wire
Cupro Nickel	Pipe, tube, fittings, plate, sheet and welding consumables (70/30 & 90/10)
Hard Facing	Cobalt, nickel and iron based welding products in all forms, Stellite* Alloys
Heat Exchanger Tube	Stainless steel, brass, aluminium brass, copper nickel to AS1569, ASTM, BS and JIS Standards
Incoloy* Alloys	Heat and corrosion resistant material in wrought forms, welding consumables
Incomag*	Material for foundry use for production of SG cast iron
Inconel* Alloys	Heat and corrosion resistant material in wrought forms, welding consumables
Mumetal	Nickel iron alloys for use in the transformer and shielding applications
Molybdenum	Bar, sheet, wire, components and molybdenum compounds
Monel* Alloys	Corrosion resisting nickel alloy in bar, flat, plate, sheet, coil, tube and wire, welding consumables
Nickel	Primary nickel shot, pellets, squares, powder, oxides and salts
Nickel Alloys	Corrosion and heat resisting material in all wrought forms and welding consumables
Nickel Iron	Controlled expansion and electrical alloys in all wrought forms
Nickel Silver	Coil, sheet, bar, wire, in soft, hard, spring hard tempers
Nimonic Alloys	Coil, sheet, rod, wire sections
Nitronic*	Nitronic* grades of stainless steel
Phosphor Bronze	Coil, sheet, rod, wire
Powdered Metals	Nickel, tungsten, cobalt, iron, molybdenum, selenium, tellurium
Silicon Bronze	Sheet, bar, welding consumables
Stainless Steel	Coil, sheet, flats, angles, bar, tube, pipe fittings, welding consumables, all grades
Stellite*	Wear and corrosion resistant products
Tantalurn	Sheet, tube, rod, wire
Titanium	Sheet, tube, rod, wire, pipe, fittings and fasteners
Tungsten	Sheet, powder, wire, rod
Tungsten-Copper	Sintered bars
Welding Materials	Wire, electrode and fluxes for gas or electric welding nickel alloys, cupro-nickels, aluminium, bronzes, stainless steel, dissimilar metals.

**Registered Trade Names*

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STAINLESS STEEL

STAINLESS STEEL COIL

ASTM A240/A480

	304			316		430		Approx. kg per m²
Finish / Size mm	BA PC	2B	No4 PC	2B	No4 PC	BA PC	No4 PC	
0.45 x 1219		50004123						3.68
0.55 x 914		50004982						4.50
0.55 x 1219		50025446	50004137	50065760	50004138			
0.7 x 914		50004146	50098081			50004157	50005351	5.72
0.7 x 1219	50037479	50024678	50005114	50098694	50005266	50005346	50004178	
0.9 x 750			50005099					7.36
0.9 x 914		50004980	50004195			50005367	50005353	
0.9 x 1219	50004207	50004999	50005088	50005286	50004226	50004230	50005354	
1.2 x 750			50005095					9.81
1.2 x 914		50004243	50004250					
1.2 x 1050			50004260					
1.2 x 1219	50004266	50004271	50005097	50004283	50004285	50009394	50004290	
1.2 x 1500		50004960	50005092		50004300			

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.
Metric coil available on request ex Mill.
Weight in kg per m² given for the austenitic grades 304 and 316. The ferritic grade's 430, AWM 404GP® & 445M2 weighs about 3.5% less.

STAINLESS STEEL COIL

ASTM A240/A480

Finish / Size mm	304			316		430		Approx. kg per m²
	BA PC	2B	No4 PC	2B	No4 PC	BA PC	No4 PC	
1.5 x 914		50004316	50005098					12.27
1.5 x 1219		50024515	50005104	50004318	50004317			
1.5 x 1500		50004312	50004310					
1.6 x 914		50004320	50005093					13.08
1.6 x 1219		50004334	50005119	50004347	50004341			
1.6 x 1500		50004345	50005105	50004349				
2.0 x 1219		50004366	50004372	50004377				16.35
2.0 x 1500		50004974	50004384	50005277				
2.5 x 1219		50004450						20.44
2.5 x 1500		50004391		50005275				
3.0 x 1219		50004396		50005274				24.53
3.0 x 1500		50004405		50004404				

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

Metric coil available on request ex Mill.

Weight in kg per m² given for the austenitic grades 304 and 316. The ferritic grade's 430, AWM 404GP® & 445M2 weighs about 3.5% less.

STAINLESS STEEL COIL

Finish / Size mm	404GP		445M2	
	2B	No4 PC	2B	No4 PC
0.55 X 1219	50132349	50126136		50126224
0.55 X 940 R				
0.7 X 1219	50132348	50126137	50118092 PI	50120932
0.7 X 914		50129522		
0.9 X 1219	50132347	50126138		50120934
0.9 X 914		50129523		
1.2 X 1000		50132344		
1.2 X 1219	50129951	50126140		50120936
1.2 X 914		50129525		
1.5 X 1219	50132346	50126141	50126713 PI	50129049
1.5 X 914		50129526		
1.6 X 1219			50118093 PI	50120938
2 X 1219	50132345	50126142		50130117
2 X 914		50129527		

STAINLESS STEEL SHEET

ASTM A240/A480

Finish / Size mm	304		316		430		Approx. Weight (kg/sheet)
	2B	No4 PC	2B	No4 PC	BA PC	No4 PC	
0.45 x 1219 x 2438	50008569						10.94
0.55 x 914 x 1829	50008979						7.52
0.55 x 914 x 2438	50008980						10.02
0.55 x 1219 x 1829	50008613		50096943				10.03
0.55 x 1219 x 2438	50008614	50024922	50009325	50009356			13.37
0.7 x 914 x 1829	50008623	50008635			50008650	50008652	9.57
0.7 x 914 x 2438	50008624	50009176			50008660	50008654	12.75
0.7 x 1219 x 1829	50008627	50009104			50008674	50008655	12.76
0.7 x 1219 x 2438	50008629	50008643	50008648	50008649	50008675	50097307	17.01
0.9 x 914 x 1829	50008976	50024842					12.30
0.9 x 914 x 2438	50008679	50008698			50008725		16.40
0.9 x 1219 x 1829	50008680	50098381	50008715	50025090	50008558		16.41
0.9 x 1219 x 2438	50008962	50009125	50009327	50098477	50008726	50008729	21.87
0.9 x 1219 x 3048		50024924					27.34
0.9 x 1219 x 3658		50024926					32.82
1.2 x 914 x 1829	50008972	50024843					16.40
1.2 x 914 x 2438	50008736	50008748					21.87
1.2 x 1219 x 1829	50094342	50009161	50009322	50009369	50011283		21.88
1.2 x 1219 x 2438	50008740	50008752	50009329	50009363	50008775	50008776	29.16
1.2 x 1219 x 3048	50094340	50008758					36.46
1.2 x 1219 x 3658		50011065					43.75
1.2 x 1500 x 2438	50008932	50008762	50008889				35.88
1.2 x 1500 x 3000	50009051	50009164	50009343	50008769			44.16
1.2 x 1500 x 3658	50008743	50009165		50008770			53.84

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

A range of 304 BA is also available.

Weight in kg per m^2 given for the austenitic grades 304 and 316. The ferritic grade's 430, AWM 404GP® & 445M2 weighs about 3.5% less.

STAINLESS STEEL SHEET

ASTM A240/A480

	304		316		430		Approx. Weight (kg/sheet)
Finish / Size mm	2B	No4 PC	2B	No4 PC	BA PC	No4 PC	
1.5 x 914 x 1829		50008803					20.50
1.5 x 914 x 2438	50009001	50008805					27.33
1.5 x 1219 x 1829	50066432						27.35
1.5 x 1219 x 2438	50098579	50008791	50009330	50009364			36.45
1.5 x 1219 x 3048	50008995	50009169		50008565			45.57
1.5 x 1219 x 3658	50009022	50008783					54.69
1.5 x 1500 x 3000	50009002	50008817					55.20
1.6 x 914 x 1829	50008967	50009115					21.87
1.6 x 914 x 2438	50008968	50009116					29.15
1.6 x 1219 x 1829	50008969	50009203	50009333	50011435			29.17
1.6 x 1219 x 2438	50008971	50008816	50008831	50008837			38.88
1.6 x 1219 x 3048	50008568	50097016	50008829	50008834			48.61
1.6 x 1219 x 3658		50009194		50009371			58.34
1.6 x 1500 x 3000	50008982	50008818	50009318	50009357			58.87
2.0 x 1219 x 1829	50008991	50009172					36.46
2.0 x 1219 x 2438	50008844	50009128	50009346	50009367			48.60
2.0 x 1219 x 3048	50008845	50009208	50008866	50008855			60.76
2.0 x 1219 x 3658		50009139					72.92
2.0 x 1500 x 2438	50008852						59.81
2.0 x 1500 x 3000	50008992	50009173	50008865				73.59
2.5 x 1219 x 2438	50008869		50009316				60.75
2.5 x 1500 x 3000	50008966		50009310				91.99
3.0 x 1219 x 2438	50008879	50009174	50009315	50009368			72.90
3.0 x 1219 x 3048	50008882	50008886	50008894	50008895			91.15
3.0 x 1500 x 3000	50008965	50008827	50009347				110.39

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.
Weight in kg per m^2 given for the austenitic grades 304 and 316. The ferritic grade's 430, AWM 404GP® & 445M2 weighs about 3.5% less.

STAINLESS STEEL SHEET

	404GP		445M2	
Finish / Size mm	2B	No4 PC	2B	No4 PC
0.55 X 1219 X 2438	50128567	50126133	50117914	50130228
0.7 X 1219 X 2438	50128568	50125954	50117915	50120933
0.9 X 1219 X 1829		50128123		
0.9 X 1219 X 2438	50128569	50126075	50117916	50120935
0.9 X 1219 X 3048		50128507		
0.9 X 1219 X 3658		50128508		
0.9 X 914 X 2438		50131412		
1.2 X 1219 X 1829		50128124		
1.2 X 1219 X 2438	50128570	50125938	50009431	50120937
1.2 X 1219 X 3048		50128509		50128522
1.2 X 1219 X 3658		50128510		
1.2 X 914 X 2438		50131411		
1.5 X 1219 X 1829				50131387
1.5 X 1219 X 2438	50126620	50126134	50126712	50126715
1.5 X 1219 X 3048	50130244	50129647		
1.5 X 1219 X 3658		50129648		
1.6 X 1219 X 2438			50117917	50120939
2 X 1219 X 2438	50128572	50126135	50125995	50125990
2 X 1219 X 3048	50130541	50130543		
2.5 X 1219 X 2438			50125994	50125991
3 X 1219 X 2438			50125993	50125992

STAINLESS STEEL MIRROR SHEET

ASTM A240/A480

Size mm	304	Approx. Weight (kg/sheet)
1.0 x 1219 x 2438	50009231	24.30
1.0 x 1219 x 3048	50009217	30.38
1.2 x 1219 x 2438	50009228	29.16
1.2 x 1219 x 3048	50008760	36.46
1.5 x 1219 x 2438	50009232	36.45
1.5 x 1219 x 3048	50109727	45.57
2.0 x 1219 x 2438	50009436	48.60
2.0 x 1219 x 3048	50099838	60.76

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

Grade 316 available ex mill.

OTHER STAINLESS STEEL SHEET PRODUCTS AVAILABLE

- PERFORATED SHEETS

- WELDED AND WOVEN MESH

- WEDGE WIRE

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STAINLESS STEEL PLATE

ASTM A240/A480

Hot Rolled, Annealed and Pickled

Grade	304/L	316/L	Duplex 2205 (S31803)	Super Duplex (S32750)	Approx. Weight (kg/plate)
3.0 x 1500 x 6000	▲	▲	▲		221
3.0 x 2000 x 6000	50008511	50008512	50004098	▲	294
4.0 x 1500 x 6000	50032918	50008897	▲	▲	294
4.0 x 2000 x 6000	50008547	50008513	▲	▲	392
5.0 x 1500 x 6000	50032917	50008900	▲	▲	368
5.0 x 2000 x 6000	50008515	50008517	50004101	▲	492
6.0 x 1500 x 6000	50008903	50032916	▲	▲	442
6.0 x 2000 x 6000	50008518	50008520	50004103	50024902	589
8.0 x 2000 x 6000	50008521	50008522	50004105	50024901	785
10.0 x 2000 x 6000	50008524	50008525	50004107	50004078	981
12.0 x 2000 x 6000	50008528	50008526	50004109	50024903	1177
16.0 x 2000 x 6000	50008907	50008908		▲	1570
20.0 x 2000 x 6000	50063192	50032915		50024904	1962
25.0 x 2000 x 6000	50008533	50008534			2453

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

▲ Available ex Mill

Full Plasma service available from our Perth Office.

SUBCONTRACTED METAL PROCESSING SERVICES

We can arrange for processing of our product's by quality third-party processing centres. This processing includes, but not limited to;

Cut-to-length	(sheet from coil) thickness 0.5 to 3.0mm, widths 400 to 1500mm, coil size up to 12 tonnes
Blanking	to your requirements
Slitting	(coil) thickness 0.3 to 3.0mm, widths 6 to 1200mm
Bar	(from coil) thickness 3 to 15mm, widths 15 to 75mm
Shearing	(flat sheet) thickness 0.7 to 3.0mm, lengths up to 3.6 metres
Polishing	(sheet or coil) thickness 0.5 to 3.0mm, widths 400 to 1500mm, coil size up to 12 tonnes
Plastic coating	(sheet or coil) PVC or polyethylene (PE)
De-coiling / re-coiling widths	400 to 1500mm, coil size up to 12 tonnes
Packing and strapping	to your requirements, pallets, cases and crates

STAINLESS STEEL WELDED TUBE

DEFINITIONS

LEGEND	AW	AS WELDED
	AWP	AS WELDED POLISHED
	AWA	AS WELDED ANNEALED
	AWAP	AS WELDED ANNEALED POLISHED
	CW	COLD WORKED
	CWP	COLD WORKED POLISHED

AW & AWP are manufactured to ASTM A554.
Tubes of this quality are for use in decorative applications.

POLISHED TUBE (all supplied in plastic sleeves)
Our standard polish is :
Round tube 320 grit
Square tube 180 grit

Round tube also available in Mirror (600 grit)
Available in grade T316, limited stock in grade T304

CW & CWP FOOD GRADE are manufactured to AS1528
Tubes of this quality are suitable for use in the food industry
Available in grades T304 & T316

Standard stock length for all stainless steel tubes is 6m. Other lengths may be available on request.

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STAINLESS STEEL ROUND WELDED TUBE (T304)

ASTM A554

6 metre lengths

Size, OD		Wall Thickness		Weight	T304			
mm	inch	mm	gauge	kg/mtr	AW	AWP	AWA	AWAP
6.35	¼	0.70	22	0.10			50007910	
7.94	5/16	0.90	20	0.16			50007913	
7.94	5/16	1.20	18	0.20			50007915	
9.53	3/8	0.70	22	0.16		50007918	50011211	
9.53	3/8	1.20	18	0.25		50007927		
9.53	3/8	1.60	16	0.32		50007929		
12.70	½	0.70	22	0.21			50007932	
12.70	½	0.90	20	0.27		50007935		
12.70	½	1.20	18	0.35		50007939	50007938	
12.70	½	1.60	16	0.45		50007944		50007945
15.88	5/8	1.20	18	0.44		50007949		
15.88	5/8	1.60	16	0.58		50007952	50007951	
19.05	¾	0.90	20	0.41		50007959		
19.05	¾	1.20	18	0.54	50008293	50007964	50011213	
19.05	¾	1.60	16	0.70		50007967		
22.20	7/8	1.20	18	0.64	50007972	50007973		
22.20	7/8	1.60	16	0.83	50008301	50007980		
25.40	1	1.20	18	0.73	50007988	50007989	50007991	50007992
25.40	1	1.60	16	0.96	50011052	50007994		50007997
31.75	1¼	1.20	18	0.92	50008295	50008012	50008016	
31.75	1¼	1.60	16	1.22		50008025		50008026
38.10	1½	1.20	18	1.12		50008036	50008039	50008040
38.10	1½	1.60	16	1.47		50008041	50008045	50008046
44.45	1¾	1.60	16	1.73		50008056		
50.80	2	1.20	18	1.50		50008060		50008296
50.80	2	1.60	16	1.99		50008064	50008068	50008069
63.50	2½	1.60	16	2.50		50008089		
76.20	3	1.60	16	3.01	50008105	50008106		
88.90	3½	1.60	16	3.82	50008118			
101.60	4	1.60	16	4.03	50008121	50008122		
101.60	4	2.03	14	5.02	50008134	50008135		
127.00	5	1.60	16	5.06		50008142		
152.40	6	1.60	16	6.08	50011215	50008148		
203.20	8	2.03	14	10.15	50008153			
254.00	10	2.03	14	12.71				

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

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STAINLESS STEEL ROUND WELDED TUBE (T316)

ASTM A554

6 metre lengths

Size, OD		Wall Thickness		Weight	T316			
mm	inch	mm	gauge	kg/mtr	AW	AWP	AWA	AWAP
9.53	3/8	1.20	18	0.25		50007925		
9.53	3/8	1.60	16	0.32		50007930		
12.70	½	1.20	18	0.35		50007942		50007943
12.70	½	1.60	16	0.45		50007946		50007948
15.88	5/8	1.20	18	0.44		50007950		
15.88	5/8	1.60	16	0.58		50007954		
19.05	¾	1.20	18	0.54		50007966		
19.05	¾	1.60	16	0.70		50007969		50007971
22.20	7/8	1.20	18	0.64		50007976		
22.20	7/8	1.60	16	0.83		50007984		
25.40	1	1.20	18	0.73		50007993		
25.40	1	1.60	16	0.96		50008000		50008003
31.75	1¼	1.20	18	0.92				
31.75	1¼	1.60	16	1.22		50008027		50008032
38.10	1½	1.60	16	1.47		50008048		50008054
50.80	2	1.60	16	1.99		50008072		50008080
63.50	2½	1.60	16	2.50		50008094		50008100
76.20	3	1.60	16	3.01		50008111		50008116
88.90	3½	1.60	16	3.52				
88.90	3½	2.03	14	4.45				
101.60	4	1.60	16	4.03		50008129		
101.60	4	2.03	14	5.10		50008137		
127.00	5	1.60	16	5.06	50008138	50008143		
152.40	6	1.60	16	6.08		50008147		
203.20	8	2.03	14	10.30				
254.00	10	2.03	14	12.90	50008158			

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

SINGLE AND DOUBLE SLOTTED HANDRAIL TUBE (T316)

Tube	Size, OD		Wall Thickness	Slot Size	T316
	mm	inch	mm		
Single Slot	50.8	2	1.5	15 x 15	50024705
Single Slot	63.5	2	1.5	20 x 20	50024706
Double Slot	50.8	2	1.5	15 x 15	50024708

Single Slot

Double Slot

Quality System
Quality Endorsed Company
ISO 9001 Lic QEC 3491
SAI Global

STAINLESS STEEL ROUND WELDED TUBE

FOOD GRADE to AS1528

6 metre lengths

Size, OD		Wall Thickness		Weight	T304		T316	
mm	inch	mm	gauge	kg/mtr	CW	CWP	CW	CWP
12.70	½	1.60	16	0.45		50106919		50106923
19.05	¾	1.60	16	0.70		50106920		50106924
25.40	1	1.60	16	0.96		50106921		50106925
31.75	1¼	1.60	16	1.22		50024511		50008029
38.10	1½	1.60	16	1.47		50008044		50008052
50.80	2	1.60	16	1.99		50008067		50008077
63.50	2½	1.60	16	2.50		50008092		50008098
76.20	3	1.60	16	3.01		50008108		50008113
101.60	4	1.60	16	4.03		50008123		50008131
152.40	6	1.60	16	6.08		50106922		50106926

Annealed tube available ex mill.

STAINLESS STEEL MIRROR TUBE 600 GRIT

ASTM A554 (T316 only)

6 metre lengths

Size, OD		Wall Thickness		Weight kg/mtr	T316
mm	inch	mm	gauge		
12.70	½	1.60	16	0.45	50106928
15.88	⅝	1.60	16	0.58	50007953
19.05	¾	1.60	16	0.70	50100186
25.40	1	1.60	16	0.96	50008086
31.75	1¼	1.60	16	1.22	50008087
38.10	1½	1.60	16	1.47	50008051
50.80	2	1.60	16	1.99	50008075
63.50	2½	1.60	16	2.50	50008097
76.20	3	1.60	16	3.01	50008110
101.60	4	1.60	16	4.03	50106929

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.
All tubes supplied in protective plastic sleeves.

Quality System
Quality Endorsed Company
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SAI Global

STAINLESS STEEL SPIRAL WELDED TUBE

ASTM A778

6 metre lengths

Size, OD mm	Wall Thickness mm	Weight kg/mtr	T304	T316
127.00	1.60	5.1	50008141	
152.40	1.60	6.1	50008149	50008312
152.40	2.00	7.6		50008151
203.20	2.00	10.2	50033064	
254.00	2.00	12.7	50008159	50008150
304.80	2.00	15.3	50033065	

Limited range shown above for full range contact your local sales office.

Full range available from 76mm to 1528mm in diameter and wall thickness from 1.6 to 5mm.

STAINLESS STEEL ROUND SEAMLESS TUBE

ASTM A269

6 metre lengths

Size, OD		Wall Thickness		Weight kg/mtr	T316
mm	inch	mm	gauge		
4.76	3/16	0.90	20	0.09	50008160
6.35	¼	0.90	20	0.12	50008163
6.35	¼	1.60	16	0.19	50008165
9.53	⅜	0.90	20	0.20	50008172
9.53	⅜	1.60	16	0.32	50008175
12.70	½	0.90	20	0.27	50008176
12.70	½	1.20	18	0.35	50008177
12.70	½	1.60	16	0.45	50008178
15.88	⅝	1.20	18	0.44	50008181
19.05	¾	1.20	18	0.54	50008183
19.05	¾	1.60	16	0.70	50008184
25.40	1	1.60	16	0.96	50008186

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

Annealed tube available ex mill.

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Quality Endorsed Company
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SAI Global

STAINLESS STEEL SQUARE TUBE

ASTM A554
6 metre lengths

Size mm			Wall Thickness mm	Weight kg/mtr	T304 Polished	T316 Polished
12.70	x	12.70	1.2	0.44	50008190	
19.05	x	19.05	1.2	0.67	50008192	
19.05	x	19.05	1.6	0.88	50008193	50008195
25.40	x	25.40	1.2	0.92	50008196	
25.40	x	25.40	1.6	1.21	50008200	50008202
25.40	x	25.40	2.0	1.49	50008212	
31.75	x	31.75	1.2	1.17	50008203	
31.75	x	31.75	1.6	1.55	50008206	50008207
31.75	x	31.75	2.0	2.02	50011217	
38.10	x	38.10	1.2	1.40	50008208	
38.10	x	38.10	1.6	1.85	50008210	50008211
38.10	x	38.10	3.0	3.30	50008220	50099618
50.80	x	50.80	1.6	2.49	50008216	50008215
50.80	x	50.80	3.0	4.48	50008222	50011216
80.00	x	80.00	3.0	7.30	50008223	50099617
100.00	x	100.00	3.0	9.73	50008227	50011652
100.00	x	100.00	4.0	12.98	50094053	
100.00	x	100.00	5.0	16.22	50007956	

STAINLESS STEEL RECTANGULAR TUBE

ASTM A554
6 metre lengths

Size mm			Wall Thickness Mm	Weight kg/mtr	T304 Polished	T316 Polished
50.80	x	25.40	1.2	1.41	50008234	
50.80	x	25.40	1.6	1.85	50008233	50008236
50.80	x	25.40	3.0	3.30	50008224	
80.00	x	40.00	1.6	3.00	50008241	
80.00	x	40.00	3.0	5.42	50008225	50008243
76.20	x	25.40	1.6	2.63	50008240	
100.00	x	50.00	2.0	4.62	50008245	
100.00	x	50.00	3.0	6.95	50008249	

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

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TUBE BENDS

Diameter mm	Diameter inch	Wall Thickness mm	Wall Thickness gauge	T304 90 deg UNPOL	T304 90 deg POL	T316 90 deg UNPOL	T316 90 deg POL	T316 45 deg POL	T316 180 deg POL
12.70	½	1.6	16			50000428	50000429		
19.05	¾	1.6	16	50000431	50000432	50000434	50000435	50011230	50000436
25.40	1	1.6	16	50000440	50000441	50000442	50000443	50000438	50000445
31.75	1¼	1.6	16	50000446	50000447	50000449	50000450	50000439	50000244
38.10	1½	1.6	16	50000455	50000456	50000457	50000458	50000454	50000461
50.80	2	1.6	16	50000466	50000467	50000468	50000469	50000465	50000471
63.50	2½	1.6	16	50000473	50000474	50000475	50000476	50000478	50000480
76.20	3	1.6	16	50000481	50000482	50000483	50000484	50000488	50000486
101.60	4	1.6	16	50000492	50000493	50000494	50000495	50000490	50000497
127.00	5	1.6	16	50000501	50011378	50000502	50000503	50000500	
152.40	6	1.6	16	50000507	50011221	50000508	50000509	50000506	
152.40	6	2.03	14			50000510			
203.20	8	2.03	14					50033753	
254.00	10	2.03	14	50033073		50000514			

90° Bend

45° Bend

180° Bend

½" to 4" Bends all with extended legs.
6, 8 & 10" X 14#, 90 deg Bends are "PRESSED"

TUBE TEES - EQUAL LEG

Diameter mm	Diameter inch	Wall Thickness mm	Wall Thickness gauge	T304 UNPOL	T304 POL	T316 UNPOL	T316 POL
12.70	½	1.6	16				50000516
19.05	¾	1.6	16		50000517		50000518
25.40	1	1.6	16		50000519		50000520
31.75	1¼	1.6	16		50000521		50000522
38.10	1½	1.6	16		50000528		50000529
50.80	2	1.6	16		50000532		50000533
63.50	2½	1.6	16		50000534		50000535
76.20	3	1.6	16		50000536		50000537
101.60	4	1.6	16		50000538		50000539
127.00	5	1.6	16			50000540	
152.40	6	1.6	16	50000541	50000542	50000543	50000544

Equal Tee

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

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TUBE REDUCERS

All made from T316 Material

mm			Wall Thickness mm	gauge	Concentric	Eccentric
½	x	¼	1.6	16	50011222	
¾	x	½	1.6	16	50000546	
1	x	½	1.6	16	50000548	50000581
1	x	¾	1.6	16	50000549	
1 ¼	x	1	1.6	16	50000550	50000583
1 ½	x	¾	1.6	16	50000551	
1 ½	x	1	1.6	16	50000552	50000584
1 ½	x	1 ¼	1.6	16	50000553	50000585
2	x	1	1.6	16	50000554	50000586
2	x	1 ¼	1.6	16	50000555	
2	x	1 ½	1.6	16	50000556	50000587
2 ½	x	1	1.6	16	50000557	
2 ½	x	1 ½	1.6	16	50000558	50000588
2 ½	x	2	1.6	16	50000559	50000589
3	x	1	1.6	16	50000560	
3	x	1 ½	1.6	16	50000561	
3	x	2	1.6	16	50000563	50000591
3	x	2 ½	1.6	16	50000564	50000592
4	x	1 ½	1.6	16	50000566	50000593
4	x	2	1.6	16	50000565	50000594
4	x	2 ½	1.6	16	50000569	50000595
4	x	3	1.6	16	50000567	50000596
5	x	2	1.6	16	50000568	
5	x	2 ½	1.6	16		50000597
5	x	3	1.6	16	50000572	50000598
5	x	4	1.6	16	50000570	50000599
6	x	2	1.6	16	50000574	50011056
6	x	2 ½	1.6	16		
6	x	3	1.6	16	50000577	50000600
6	x	4	1.6	16	50000571	50000601
6	x	5	1.6	16	50000573	
8	x	6	2.03	14	50000576	

Concentric Reducers

Eccentric Reducers

Reducers with extended legs available on special order.
Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

TUBE CLAMPS

All Grade T304

For Tube Size mm	inch	Plain Clamp	Bossed Clamp
12.70	½	50000734	50000748
19.05	¾	50000735	50000749
25.40	1	50000736	50000750
31.75	1¼	50000737	50000751
38.10	1½	50000738	50000752
50.80	2	50000739	50000753
63.50	2½	50000740	50000754
76.20	3	50000741	50000755
101.60	4	50000742	50000756
127.00	5	50000743	
152.40	6	50000744	50000757
203.20	8	50000745	

Plain Clamp

Bossed Clamp

Also available for pipe.

Other styles and sizes available on request.

HAND RAIL ACCESSORIES

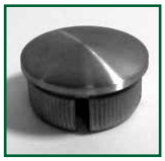
All Grade T316

DOMED TUBE CAP

Grade T316									
12.7	19.05	25.4	31.75	38.1	50.8	63.5	76.2	101.6	152.4
	50095872	50095904	50095905	50095907	50095908	50095909	50095910	50095912	

SOLID END CAPS

Grade T316									
25.4	31.75	38.1	50.8	63.5	76.2				
50112058	50065477	50065490	50065493	50065494	50065495				



BASE PLATE AND COVER

Grade T316									
12.7	19.05	25.4	31.75	38.1	50.8	63.5	76.2		
50037444	50000914	50000917	50000920	50000923	50000926	50095928	50095929		

NOTE: Cover is Grade 316. Base plate is 304, not intended for immersion in water.

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

STAINLESS STEEL ADJUSTABLE FEET

Size	Description	Stock
32mm	Standard Leg - Circular base with Holes.	50000935
50mm	Standard Leg - Circular base with Holes.	50000936
65mm	Standard Leg - Circular base with Holes.	50000937
32mm	Machined Leg - Circular base with Holes.	
50mm	Machined Leg - Circular base with Holes.	
65mm	Machined Leg - Circular base with Holes.	50000934
32mm	Standard Leg - Plastic Capped Base.	
50mm	Standard Leg - Plastic Capped Base.	
	Standard Leg - Plastic Capped Base.	
65mm	Pinfoot Machined Leg	5000931
25/50	Standard Leg - Lugged Foot	50000933
25/50	Machined Leg - Lugged Foot	
25mm	Plastic Insert for 25mm Square Tube	50000940
32mm	Plastic Insert for 32mm Square Tube	50000943
38mm	Plastic Insert for 38mm Square Tube	50000944
38mm	Plastic Insert for 38mm Round Tube	

Circular Base

Pinfoot

Lugged Foot

Plastic Insert

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

STAINLESS STEEL TABLE FLANGES T304L

AS2129, Tables D and E

Size, ID		Table D			Table E		
NB	inch	Tube	Pipe	Blind	Tube	Pipe	Blind
15	½				50000403	50107907	
20	¾		50000332		50000405	50107908	
25	1	50000378	50000333		50000407	50107909	
32	1¼				50000409	50107910	
40	1½	50000380	50000334		50000411	50107911	
50	2	50000383	50107873		50000414	50000194	
65	2½	50000386			50000416	50000344	
80	3	50000389	50000897		50000418	50000195	
100	4	50000392	50000335		50000420	50000193	
125	5	50000395			50000423	50107913	
150	6	50000397	50000901		50000424	50000905	
200	8	50000400			50000426	50000848	
250	10				50107891	50107914	
300	12				50107893	50107915	

STAINLESS STEEL TABLE FLANGES T316L

AS2129, Tables D and E

Size, ID		Table D			Table E		
NB	inch	Tube	Pipe	Blind	Tube	Pipe	Blind
15	½						
20	¾	50000377			50000406	50000337	50107926
25	1	50000379	50000328	50107876	50000408	50000338	50107927
32	1¼				50000410	50000339	50107928
40	1½	50000382	50000886	50107877	50000412	50000341	50107929
50	2	50000385	50000887	50000353	50000415	50000891	50000356
65	2½	50000388			50000417	50000849	50107930
80	3	50000391	50000899	50107878	50000419	50000900	50107931
100	4	50000394	50000888	50000354	50000421	50000911	50107855
125	5	50000396			50000422	50107920	50107932
150	6	50000399	50000889	50107879	50000425	50107921	50107933
200	8	50000401			50104904	50107922	50107934
250	10				50107905	50107923	50107935
300	12				50107906	50107924	50107936

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

Table Flange

BSM FITTINGS
AS 1528 – BS1864

Diameter, mm

HEX NUT **T304**

25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000669	50000670	50000671	50000672	50000673	50000674	50000675

Hex Nut

RJT MALE PART **T316**

25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000662	50000663	50000664	50000665	50000666	50000667	50000668

Male Part+"O" Ring

RJT LINER **T316**

25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000677	50000679	50000680	50000681	50000682	50000685	50000686

Liner

EPDM "O" RING FOR RJT FITTINGS

25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000707	50000708	50000709	50000710	50000711	50000712	50000713

RJT = Ring Joint Type

CIP MALE PART (LIP REMOVED) **T316**

25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000805	50000806	50000807	50000808	50000809	50000810	

CIP Male Part+"O" Ring

CIP LINER (FLAT FACED) **T316**

25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000799	50000800	50000801	50000802	50000803	50000804	

CIP Liner

EPDM FLAT FACED SEAL FOR CIP FITTING

25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000811	50000812	50000813	50000814	50000815	50000816	

Refer to your local Sales Office for availability of current stock
and other sizes which are not listed.
CIP =Clean In Place

BSM ACCESSORIES
AS 1528

Diameter, mm

BLANK NUT **T316**

25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000714	50000715	50000716	50000717	50000718	50000719	50000720

Blank Nut

BLANK CAP **T316**

25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000693	50000694	50000695	50000696	50000697	50000699	50000704

Blank Cap

Refer to your Sales Office for availability of current stock and other sizes which are not listed.
BSM =British Standard Milk

CLAMP FITTINGS

Diameter, mm

HINGED CLAMP **T304**

12.7	19.05	25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000758		50000759		50000760	50000761	50000762	50000763	50000764

LONG FERRULE **T316L**

12.7	19.05	25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000765	50000766	50000767	50000768	50000769	50000770	50000771	50000773	50000774

END CAP **T316**

12.7	19.05	25.4	38.1	50.8	63.5	76.2	101.6	152.4
		50000693	50000694	50000695	50000696	50000697	50000699	50000704

EPDM SEAL

12.7	19.05	25.4	38.1	50.8	63.5	76.2	101.6	152.4
50000782	50000783	50000784	50000785	50000786	50000787	50000788	50000789	50000790

Refer to your Sales Office for availability of current stock and other sizes which are not listed.

Hinged Clamp

Long Ferrule

End Cap

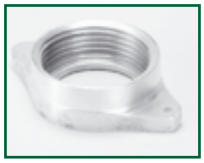
Seal

WINE FITTINGS

Diameter, mm

WINE NUT **BRASS**

25.4	38.1	50.8	63.5	76.2	101.6
	50003476	50003474		50003475	50003477


Brass Wine Nut

HOSE TAIL **T316**

25.4	38.1	50.8	63.5	76.2	101.6
50000643	50000642	50000639	50024885	50000640	50000641

Hose Tail

SLIP ON SLEEVE **T304**

25.4	38.1	50.8	63.5	76.2	101.6
	50000676			50000678	

Slip On Sleeve

B/W MACHINED LINER **T304**

25.4	38.1	50.8	63.5	76.2	101.6
		50000959		50000649	50000960

B/W Liner

B/W MALE PART (WINE THREAD **T316**

25.4	38.1	50.8	63.5	76.2	101.6
	50000658	50000659		50000660	50000661

Male Part (Wine)

LOCKABLE SAMPLE COCK

15 NB Butt Weld Fitting.

50000950					

B/W Sample Cock

15mm BSP Fitting.

50000947					

BSP Sample Cock

Refer to your Sales Office for availability of current stock and other sizes which are not listed.

Quality System
Quality Endorsed Company
ISO 9001 Lic QEC 3491
SAI Global

STAINLESS STEEL WELDED PIPE

ASTM A312
Dimensions to ANSI B36.19
6.1 metre lengths

SCHEDULE 10S

Size NB		Outside Diameter mm	Wall Thickness mm	Weight kg/mtr	304L	316L
mm	inch					
15	½	21.3	2.11	1.01	50007828	50007829
20	¾	26.7	2.11	1.30	50007835	50007836
25	1	33.4	2.77	2.12	50007840	50007841
32	1¼	42.2	2.77	2.73	50007849	50007850
40	1½	48.3	2.77	3.16	50007853	50007855
50	2	60.3	2.77	3.99	50007862	50007863
65	2½	73.03	3.05	5.34	50007867	50007868
80	3	88.9	3.05	6.56	50007872	50007873
100	4	114.3	3.05	7.52	50007882	50007883
150	6	168.3	3.40	8.50	50007891	50007892
200	8	219.1	3.76	11.70	50007896	50007897

SCHEDULE 40S

Size NB		Outside Diameter mm	Wall Thickness mm	Weight kg/mtr	304L	316L
mm	inch					
15	½	21.3	2.77	1.28	50007830	50007831
20	¾	26.7	2.87	1.71	50007837	50007838
25	1	33.4	3.38	2.54	50007847	50007848
32	1¼	42.2	3.56	3.44	50007851	50007852
40	1½	48.3	3.68	4.11	50007856	50007858
50	2	60.3	3.91	5.52	50007864	50007865
65	2½	73.03	5.16	8.75	50007869	50007870
80	3	88.9	5.49	11.47	50007875	50007876
100	4	114.3	5.74	16.31	50007884	50007885
150	6	168.3	6.02	28.68	50007893	50007894
200	8	219.1	6.55	43.16	50007898	50007899

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

Quality System
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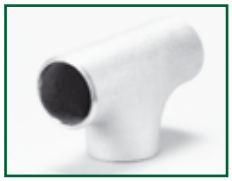
STAINLESS STEEL BUTT WELD FITTINGS

ASTM A403, Dimensions to ANSI B16.9
90 deg Elbows, Equal Tees

Size		90 Deg LR Elbow		Equal Tee	
NB	Schedule	304	316L	304	316L
15	10	50107838	50000203	50107856	50000231
15	40	50107846	50000204	50107880	50000232
20	10	50107839	50000205	50107857	50000233
20	40	50107847	50000206	50107881	50000234
25	10	50107840	50000208	50107858	50000235
25	40	50000207	50000209	50107882	50000236
32	10	50000212	50000210	50107859	50000237
32	40	50107848	50000211	50107883	50000238
40	10	50107841	50000213	50107860	50000239
40	40	50107849	50000214	50107885	50000240
50	10	50000216	50000217	50107864	50000241
50	40	50107850	50000218	50107886	50000242
65	10	50107842	50000220	50107865	50000243
65	40	50000219	50000221	50107887	50000245
80	10	50107843	50000223	50107866	50000246
80	40	50000222	50000224	50107888	50000247
100	10	50000227	50000225	50107867	50000249
100	40	50107851	50000226	50107889	50000250
150	10	50107844	50000228	50107868	50000253
150	40	50107852	50000229	50107890	50000254
200	10	50107845	50000230	50107870	50000255
200	40	50107853	50107854	50107894	50107897

90° Elbow

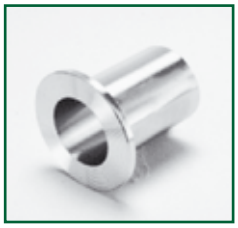


Tee

Caps, Stub Ends

SIZE		Caps	Stub Ends
NB	Schedule	316L	316L
25	10	50000290	50000312
25	40	50000291	50000313
32	10	50000292	50000314
32	40	50000293	50000315
40	10	50000295	50000316
40	40	50000296	50000317
50	10	50000297	50000318
50	40	50000298	50000319
65	10	50000299	50000320
65	40	50000300	50000321
80	10	50000301	50000322
80	40	50000302	50000323
100	10	50000303	50000324
100	40	50000304	50000325
150	10	50000306	50000326
150	40	50000307	50107817

Cap



Stub End

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

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STAINLESS STEEL BUTT WELD FITTINGS

ASTM A403, Dimensions to ANSI B16.9
Concentric Reducers Grade 316L

SIZE		
NB mm	Schedule 10	Schedule 40
20 x 15	50000256	50000257
25 x 15	50000258	50107812
25 x 20	50000259	50000260
32 x 25	50000261	50000262
40 x 25	50000264	50000265
40 x 32	50000266	50000267
50 x 25	50000268	50000269
50 x 32	50000271	50107814
50 x 40	50000272	50000273
65 x 40	50066029	50000275
65 x 50	50000276	50000277
80 x 50	50000278	50000279
100 x 50	50000281	50000282
100 x 80	50000283	50000284
150 x 100	50000287	50000288

Concentric Reducer

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.
Eccentric reducers available on request

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BSP SCREWED FITTINGS - GRADE 316 - 150LB

DIMENSIONS – ISO 4144
THREADS – ISO 7-1 (MALES TAPERED, FEMALE PARALLEL)

Diameters

SOCKET

1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
50000140	50000141	50000142	50000143	50000144	50000145	50000146	50000147	50000148	50000149	50000150	50000151

BARREL NIPPLE, T.O.E.

1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
50000093	50000094	50000100	50000096	50000095	50000098	50000097	50000101	50000102	50000103	50000104	50000105

BARREL NIPPLE, T.B.E.

1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
50000081	50000082	50000083	50000084	50000085	50000086	50000087	50000088	50000089	50000090	50000091	50000092

F & F ELBOW

1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
50000059	50000060	50000061	50000062	50000063	50000064	50000065	50000066	50000067	50000069	50000070	

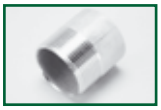
HEX PLUG

1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
50000130	50000131	50000132	50000133	50000134	50000135	50000136	50000137	50000138		50000139	50011053

HEX NIPPLE

1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
50000106	50000107	50000108	50000109	50000110	50000111	50000112	50000113	50000114	50000115	50000116	

Socket


TOE Nipple

TBE Nipple

F&F Elbow

Hexagonal Plug

Hexagonal

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

STAINLESS STEEL BSP BALL VALVES

1000 W.O.G. (1,000 psi, 69 bar)
SS Grade 316

Size inch	One Piece	Two Piece	Three Piece
¼”	✲	✲	✲
1⅜”	✲	✲	✲
½”	✲	✲	✲
¾”	✲	✲	✲
1”	✲	✲	✲
1¼”	✲	✲	✲
1½”	✲	✲	✲
2”	✲	✲	✲
2½”	✲	✲	✲
3”	✲	✲	✲
4”	✲	✲	✲

✲ Denotes ex Stock

One piece Ball Valves are reduced bore.
For all valve dimensions and specifications please contact your local sales office.

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STAINLESS STEEL FORGED ANSI FLANGES

ANSI 150, 300, 600
Available in grades 304, 316, 2205
Sizes from 1/2 inch to 36 inch

Currently not part of our general stocking range
Please inquire at your local branch for availability and expected delivery.

GALVANISED BACKING FLANGES

Stainless Flat Faced and Angle Rings

Flanges Bored for Angle Rings
Flat Faced and Angle Rings to suit Tubing

Size		Table D Flange M/S Galvanised	Flat Faced Ring T316	Angle Ring T316
mm	inch			
25.40	1	50000626		
31.70	1¼			
38.10	1½	50000627		
50.80	2	50000628		
63.50	2½			
76.20	3	50000630		50000650
101.60	4	50000631		50000651
127.00	5	50000632		50000653
152.40	6	50000633		50000654
203.20	8	50000634		50000655
254.00	10	50000635		50000656
300.00	12	50000636		50000652
358.00	14	50000637		50000657

Gal B/Flange

Flat Faced Ring

Angle Ring

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

STAINLESS STEEL ROUND BAR

Random lengths, approximately 4 metres

ASTM A276, A444
Grades 304, 316

ASTM A582
Grade 303

Size		Grade T303	Grade T304	Grade T316	Approx kg/mtr
Dia mm	Dia inch				
3.18	1/8		50004487	50004490	0.06
4.76	3/16		50004494	50004496	0.15
6.00			50004498	50004499	0.23
6.35	1/4	5004502	50004504	50004506	0.26
7.94	5/16		50004509	50004511	0.41
8.00			50004486		0.41
9.53	3/8		50004513	50004515	0.56
10.00		50004516	50004518	50004519	0.64
12.00			50004527	50004530	0.92
12.70	1/2	50004533	50004535	50004537	1.04
15.88	5/8	50004543	50004545	50004546	1.62
16.00			50024564	50024565	1.64
19.05	3/4	50004551	50004553	50004556	2.33
20.00			50004560	50004561	2.57
22.23	7/8	50004562	50004563	50004566	3.17
25.00			50004571	50004569	4.01
25.40	1	50004574	50004576	50004578	4.14
30.00			50004583	50005335	5.78
31.75	1 1/4	50011249	50004586	50004587	6.47
38.10	1 1/2		50004596	50004598	9.32
40.00			50004604	50004600	10.28
44.45	1 3/4		50004607	50004609	12.69
50.00			50004613	50004611	16.06
50.80	2		50004612	50004618	16.57
63.50	2 1/2		50004622	50004626	25.90
76.20	3	50004943	50004629	50004631	37.29
88.90	3 1/2			50004932	50.76
101.60	4		50004633	50004634	66.29

Grades 304 and 316 have improved machinability due to an addition of calcium.
Grade 303 has excellent machinability due to an addition of sulphur, but this reduces the corrosion resistance. The grade should not be used in water.
Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

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STAINLESS STEEL FLAT BAR

Random lengths, approximately 4 metres

ASTM A276

Size		T304		T316		Approx kg/ mtr
Width	Thickness	SRE	HRAP	SRE	HRAP	
12	3	50098434		50004668		0.29
20	3	50004672		50004747		0.49
25	3	50004674	50004673	50004748	50011045	0.61
30	3	50004675	50037093	50004751	50004750	0.74
40	3	50004679	50004676	50004752	50011046	0.98
50	3	50004678	50004677	50004754	50004753	1.22
20	5	50004685		50004759		0.82
25	5	50004687		50004758		1.02
30	5	50060354		50004760		1.23
40	5	50004689		50004762		1.63
50	5	50004691		50004756		2.05
65	5	50098438		50004764		2.66
75	5	50004693		50004765		3.07
20	6		50004695		50066040	0.98
25	6		50005239		50004768	1.23
30	6		50004699		50004770	1.47
40	6		50004701		50011048	1.96
50	6	50004704	50004703		50004773	2.45
65	6		50004705		50004775	3.19
75	6		50004707		50004778	3.68
100	6		50004709		50004780	4.91
20	10		50107690		50004789	1.64
25	10		50004719		50004790	2.04
30	10		50004722		50107691	2.45
40	10		50004727		50004792	3.27
50	10		50004729		50004786	4.09
65	10		50004732		50004788	5.32
75	10		50004717		50004794	6.13
100	10		50004724		50004796	8.18
150	10		50005253		50107692	12.27
25	12		50004735		50107693	2.45
40	12		50004736		50107694	3.92
50	12		50004737		50004798	4.91
65	12		50004739		50107695	6.38
75	12		50004741		50025078	7.36
100	12		50004743		50004802	9.81

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.
Polished bar available on request.

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STAINLESS STEEL ANGLE (HRAP)

Random Lengths, approximately 6 metres

ASTM A276

Size		Grade	Grade	Approx
Width mm	Thickness mm	T304	T316	kg/mtr
20 x 20	3	50004806	50004831	0.89
25 x 25	3	50004807	50004832	1.13
30 x 30	3	50004808	50004833	1.36
40 x 40	3	50004809	50004835	1.85
50 x 50	3	50004810	50004836	2.36
25 x 25	5	50004813	50004838	1.77
30 x 30	5	50004814	50004840	2.17
40 x 40	5	50004815	50004839	2.98
50 x 50	5	50004816	50004841	3.79
25 x 25	6	50004817	50004843	2.06
30 x 30	6	50004819	50004844	2.53
40 x 40	6	50004820	50004842	3.49
50 x 50	6	50004821	50004845	4.46
65 x 65	6	50004822	50004847	5.95
75 x 75	6	50004825	50004848	6.89
100 x 100	6	50004828	50004849	9.28
50 x 50	10	50004827	50004853	7.43
75 x 75	10	50004829	50004851	11.10
100 x 100	10	50004830	50004850	15.00

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

Angle also available polished to your requirements with minimum lead times.

SRE=Slit, rolled edge. Made by slitting coil, and the edge may not be suitable for decorative applications.
HRAP=Hot rolled, annealed and pickled. Suitable for polishing for decorative applications.

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STAINLESS STEEL SQUARE BAR

Random Lengths

ASTM A276

Size mm	Grade T304	Grade T316	Approx kg/ mtr
6.35	50004652	50004656	0.33
9.53		50004657	0.74
12.00	50004654	50004658	1.18
12.70		50004659	1.32
16.00	50004655	50004660	2.09
19.05		50004661	3.04
25.40		50004663	5.28
32.00		50004664	8.04
40.00		50004665	13.08
50.00		50004666	20.44

Refer to your local Sales Office for availability of current stock and other sizes which are not listed.

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TYPES OF STAINLESS STEEL

Stainless steels are steel alloys that contain more than 10.5% chromium with excellent corrosion resistance. Chromium reacts strongly with oxygen to form a very thin, invisible, stable oxide film on the surface of the stainless steel. This film is called the passive layer and forms rapidly in ordinary atmospheres. If it is damaged, the film usually heals spontaneously. It is this passive layer that gives stainless steel its corrosion resistance.

There are many different stainless steels, with different amounts of alloying elements added to give the best balance of corrosion resistance, mechanical properties and cost. Although straightforward for most applications, choosing the optimum grade of stainless steel can sometimes be complex, and Austral Wright Metals engineers and metallurgists will be pleased to provide assistance.

The stainless steels can be divided into five groups – austenitic, ferritic, duplex, martensitic and precipitation hardening. Each group has different dominant characteristics, and there are several grades within each group.

AUSTENITIC GRADES

Austenitic stainless steels are easy to work and weld, and have excellent ductility, toughness and corrosion resistance with good strength. They contain 17 to 25% chromium and 8 to 20% nickel, and may contain other elements to achieve the desired properties. The most common extra element is molybdenum, which greatly improves corrosion resistance. Austenitic stainless steels are usually used in the annealed condition, when they have a useful range of mechanical and physical properties. Strength can be increased by cold working, but not by heat treatment. Welding of this group is straightforward, although welding procedures are a little different to those used for carbon steel. Austenitic stainless steels are non-magnetic in the annealed condition, but will become slightly magnetic when cold worked.

304 Grade 304 is the most widely used stainless steel with good resistance to atmospheric corrosion and to many organic and inorganic chemicals. This grage has excellent workability, weldability and impact strength. It is sometimes known as 18/8 stainless steel, since it contains 18% chromium and 8% nickel. It is suitable for use in a variety of applications, in fact it is the most common stainless steel, and about 60% of all stainless steel used in the world is grade 304.

304L Grade 304L is a low carbon (<0.030%) variant of 304 with the same corrosion resistance, but with less susceptibility to sensitisation when welded at thicknesses of 4 mm or greater, or after heat treatment. Sensitisation can allow intergranular corrosion to occur. Grade 304L is used in parts of 4mm and thicker which will be welded but not post weld annealed. Parts made from this grade are generally limited to service at temperatures up to 425ºC. The physical properties and thermal treatments are similar to those of grade 304.

316 Grade 316 is known as the marine alloy. The corrosion resistance is improved by an addition of 2 to 3% of molybdenum, as well as 18% chromium and 10% nickel. Grade 316 has better corrosion resistance than grade 304 in many chemicals as well as in marine atmospheres. Grade 316 also has applications in the chemical, textile and paper industries. It has similar strength to grade 304, and gives better performance in deep drawing.

316L Grade 316L is a low carbon (<0.030%) variant of 316 with the same corrosion resistance, but with less susceptibility to sensitisation when welded at thicknesses of 4 mm or greater, or after heat treatment. Sensitisation can allow intergranular corrosion to occur. Grade 316L is used in parts of 4mm and thicker which will be welded but not post weld annealed. Parts made from this type are generally limited to service at temperatures up to 425ºC. The physical properties and thermal treatments are similar to those of grade 316.

303 Grade 303 was developed to improve the machinability of grade 304. It is used where production involves extensive machining in automatic screw machines. It contains 18% chromium and 8% nickel. Sulphur or selenium is added to give excellent free machining and nonseizing properties. The addition of sulphur or selenium lowers corrosion resistance and grade 303 should not be used in water. Grade 303 is non hardenable and not recommended for welding. Austral Wright Metals standard stock of round bar in grades 304 and 316 has a controlled addition of calcium to improve machinability, and grade 303 is used less nowadays.

253 MA® Grade 253MA® is used at high temperatures. It has excellent resistance to oxidation and excellent strength at elevated temperatures. This grade has very good high temperature corrosion and erosion resistance in most environments. It also has good formability and weldability properties. Most suitable temperature range is 850-1100ºC (standard grade 304 is qualified for pressure applications up to 800ºC). 253MA® contains about 22% chromium, 11% nickel and 0.09% carbon, with about 0.05% of the rare earth metal cerium added to improve the protective ability of the oxide.

FERRITIC GRADES

Ferritic stainless steels have similar strength, ductility and fabrication characteristics to carbon steels, with much better corrosion resistance. This group contains grades with 10.5% up to 22% chromium, which do not have the nickel addition made to austenitic grades. The amount of chromium controls the corrosion resistance, and there are some special grades where there is an extra addition of molybdenum. The limitation of the ferritic grades is that welds in some grades lack toughness, and they are rarely used in structural applications - hence they are mainly available as sheet and coil up to about 1.6 mm in thickness. Ferritic grades canot be strengthened by heat treatment, and are not much strengthened by cold work, so they are usually used in the annealed condition. All the ferritic grades are magnetic in all conditions.

409 Grade 409 is a utility grade of stainless steel containing about 10.5% of chromium. It is mainly used in automotive exhaust systems, and other applications where appearance is not important. The surface soon stains, but the rate of metal loss is much lower than with carbon steel.

430 Grade 430 is the most common ferritic stainless steel, used for mild indoor environments, dishwasher liners and automotive trim. It contains 17% of chromium, and hence the corrosion resistance is a little less than that of grade 304. In architectural applications it is usually only used indoors.

DUPLEX and SUPER DUPLEX GRADES

This group of stainless steels typically consists of equal parts of austenite and ferrite. This group has 18 to 29% chromium, 3 to 8% nickel and various other elements, particularly molybdenum and nitrogen. The duplexes offer advantages over austenitic grades. They are strong, with twice or more the yield strength of the common austenitic grades, and are highly resistant to chloride stress corrosion cracking. The higher alloyed grades have excellent resistance to pitting and crevice corrosion in many environments. The duplex grades are not heat treatable and have a low response to cold work, so are used in the annealed condition. They are easy to weld and fabricate, although not as easy as the austenitic grades. The duplex grades are magnetic in all conditions.

2205 Grade 2205 is a duplex stainless steel containing 22% chromium, 5% nickel and 3% molybdenum. The high alloy content gives it superior resistance to pitting and crevice corrosion, and the duplex structure gives excellent resistance to stress corrosion cracking. The grade has high strength. The steel is well-suited for high chloride environments. Applications include heat exchangers, chemical tankers, chemical reactor vessels, flue gas filters, acetic acid distillation, oil and gas industry equipment.

S32750 Grade S32750 is a super duplex stainless steel containing 25% chromium, 7% nickel and 4% molybdenum. It has the highest resistance to pitting and crevice corrosion of the duplex grades, with high resistance to stress corrosion cracking and very high strength. Applications include oil and gas industries, off-shore, petrochemical plants, desalination plants and mechanical and structural components demanding high strength combined with high corrosion resistance.

MARTENSITIC GRADES

This group contains 12% to 16% chromium and 0.08% to 2.00% carbon. The high carbon content makes the martensitic grades respond well to heat treatment to give high mechanical strength and hardness. However, the carbon is detrimental when welding and these grades are difficult to weld. The ductility of these grades is limited and they are not cold worked. In the heat treated condition, this group of stainless steels show a useful combination of corrosion resistance and mechanical properties that qualify them for a wide range of application. The martensitic grades are magnetic in all conditions.

410 Grade 410 is the general purpose corrosion and heat resisting stainless steel. It contains 12.5% chromium and can be used in mildly corrosive environments. It is the most inexpensive corrosion resistant steel for general purposes, but is not suitable under severe corrosion conditions. Frequently used for stainless steel cutlery, furnace parts, bolts, bushings, and uses requiring high strength and wear resistance such as chutes, screens and mineral processing equipment.

420C Grade 420C also has 12.5% chromium, with a higher carbon content than 410 (0.25%) to increase hardness to a maximum of approximately 500 Brinell (50 HRC). It has optimum corrosion resisting qualities when hardened and tempered. Used for springs, shafts, valves.

431 Grade 431 is a 16% chromium martensitic stainless steel with a small (2%) addition of nickel. It can be heat treated to the highest mechanical properties, and is mainly used for fasteners and shafts. Its corrosion resistance is superior to that of grades 410 and 420C.

PRECIPITATION HARDENING GRADES

This group contains 12% to 16% chromium and 3 to 9% nickel, with small additions of precipitate forming elements such as aluminium, copper, niobium and titanium. They are designed to be heat treatable to very high strength, with better ductility than the martensitic grades. They are usually machined and fabricated in the soft, solution annealed condition, then tempered up to the required combination of strength, ductility and toughness. Because the chromium content is limited, most of the precipitation hardening grades have similar corrosion resistance to 304. Most applications are in the aerospace and other high-technology industries, and in boat shafting.

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POPULAR MYTHS ABOUT STAINLESS STEEL
TECHNICAL INFORMATION

"All Stainless Steel is the same"
Actually, stainless steels are a family of alloys, which can have a great range of properties, depending on what they are to be used for. Stainless steels are often used for their appearance or corrosion resistance, but they are also used for heat resistance, strength or toughness, and for their magnetic properties. The best grade of stainless is chosen to suit the application. The grades fit into branches of the family, called austenitic, ferritic, duplex, martensitic or precipitation hardening, depending on their crystal structure.

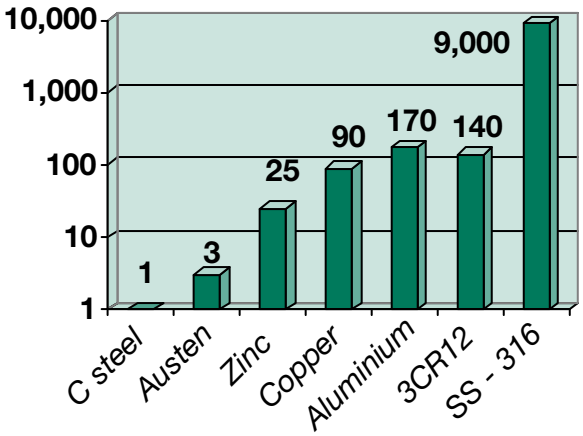
"Stainless steel doesn't rust"
Strictly speaking, stainless doesn't rust. Some industry publications even say it can't. But like all materials, there are some environments which are just too corrosive and it will be attacked - after all, even gold will dissolve in aqua regia, a potent mixture of nitric and hydrochloric acids. And sometimes, when stainless is attacked, the corrosion product looks just like the rust you get on carbon steel.

Stainless steel resists corrosion better than most other metals because of a very thin, colourless passive layer that forms spontaneously on the surface.When the passive layer is breached, it usually forms again spontaneously. In aggressive environments, such as very close to the beach, where there is a lot of salt in the air, the passive layer may not be able to form, and some corrosion may take place. Although the stainless steel may look 'rusty', it will corrode so much more slowly than most other metals that it will still be serviceable long after any other common engineering metal.

The graph at right shows the results of a 20 year corrosion study from a very corrosive environment near a beach in South Africa: an even more severe environment than the most aggressive in Australia, such as Newcastle Beach.

Stainless steel grade 316 gave about 9,000 times the life of carbon steel. Grade 304 would be similar, although not quite as much. And this in an environment where each millimetre of carbon steel would corrode away completely in about four years.

Life, compared to carbon steel



The technical advice and recommendations made in this Product Data Sheet should not be relied or acted upon without conducting your own further investigations, including corrosion exposure tests where needed. Please consult current editions of standards for design properties.
Austral Wright Metals assumes no liability in connection with the information in this Product Data Sheet.

Of course, the passive layer that stainless steel relies on for protection has to be allowed to form. Blue and black visible oxides formed during heat treating, welding and heavy grinding interfere with the formation of the passive layer. They must be removed to get the full corrosion resistance of each grade of stainless steel.

Often, when stainless steel appears to be rusting, it has actually been contaminated with carbon steel – which rusts, of course! And the stainless steel gets the blame. The secret is to fabricate the stainless steel in a dedicated area and make sure there is no contamination with carbon steel from tools, equipment and storage fixtures. And if there is carbon steel contamination, treat the stainless with a passivating acid to remove it.

"Stainless steel is not magnetic"
Some types of stainless steel, including the most common ones, the austenitics, aren't magnetic. But most types – the ferritics, martensitics, duplexes and most of the precipitation hardening grades – are magnetic. The corrosion resistance is not affected in any way by whether the grade of stainless is magnetic or not – corrosion resistance depends on how much of the key alloying elements you have, especially chromium and molybdenum.

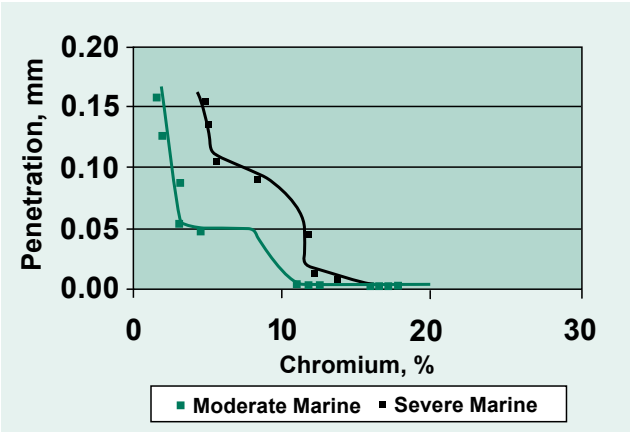
Even the austenitics can become somewhat magnetic when they are deformed. Try putting a magnet in the corner of a stainless steel sink – some magnetism can usually be detected. The amazing ability of austenitic stainless steel to deform without breaking is used to deep draw sinks in one piece – without heating!

"Stainless steel is expensive"
Stainless steels do cost more than carbon steels, in dollars per tonne. With the extra alloys, they are bound to. But the extra performance of stainless steels more than pays for the difference, and stainless often works out as the cheapest way to do the job. Carbon steel usually needs to be painted for corrosion protection, and even if their first installed cost is lowest, their advantage disappears on the day they have to be repainted. The cost of stainless in dollars per day for the life of the job will be much lower.

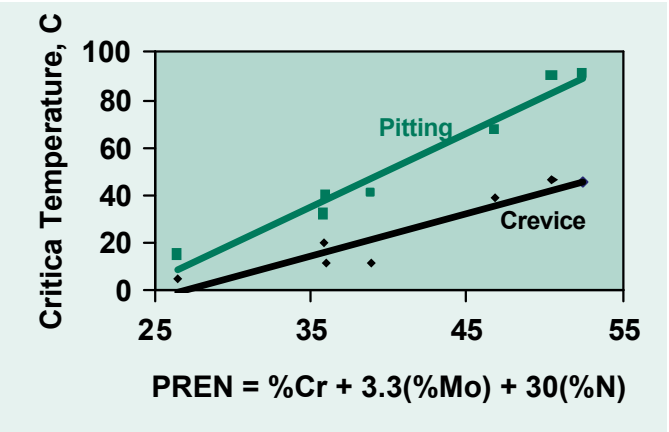
"18/10 Stainless steel is better than 18/8 stainless steel"
Actually they are both the same. The common austenitic grades contain about 18 to 20% of chromium, and 8 to 10% of nickel. Europeans often refer to them as 18/10 stainless, while the English speaking world – Australia, USA, UK – call them 18/8 stainless. There are minor differences between the standard stainless steel compositions in different parts of the world, but the performance of the grades are effectively the same wherever in the world they are made.

"All stainless steels have the same corrosion resistance"
The corrosion resistance of stainless steels mostly depends on their content of the alloying elements chromium and molybdenum, plus a few other factors, depending on the specific application. The surface finish and fabrication practice can have a major effect.

Eight years exposure to atmosphere



Resistance to pitting & crevice corrosion



NOTES

SECTION 2

NEW GENERATION STAINLESS STEELS

GENERAL PURPOSE FERRITIC GRADE AWM 404GP® STAINLESS STEEL

Available exclusively from Austral Wright Metals

New generation general-purpose ferritic grade AWM 404GP® can be used to replace the workhorse austenitic grade 304 in most applications. It is a corrosion resistant ferritic stainless steel with excellent strength, toughness, fabrication characteristics and weldability. The general corrosion resistance of AWM 404GP® is at least as good as grade 304, with better resistance to atmospheric corrosion, stress corrosion cracking and sensitization to intergranular corrosion. Grade AWM 404GP® compared to grade 304.

Chemical Composition (typical)		Chromium	Nickel	Carbon	Titanium	Copper
	AWM 404GP®	21%	0.2%	0.009%	0.3%	0.4%
	304	18.2%	8.2%	0.05%		

Mechanical Properties (typical)		Yield Stress MPa	Tensile Strength MPa	Elongation %	Hardness HV
	AWM 404GP®	310	475	31	157
	304	290	600	55	157

Physical Properties		Density	Young's Modulus	Thermal Conductivity	Thermal Expansion	Magnetism
		Kg / m3	MPa	W/m.ºC	X 10-6 /ºC	
	AWM 404GP®	7,750	199,000	22.5	10.0	Magnetic
	304	8,027	193,000	16.3	15.9	Non magnetic

Typical Applications Benchwork, cold-water tanks, whitegoods, refrigeration cabinets, chemical and food processing, water treatment plant, street furniture, electrical cabinets. AWM 404GP® can be substituted for 304 in most applications except structures and pressure vessels.

Description Grade AWM 404GP® contains 21% of chromium and 0.5% of copper, which give it excellent resistance to corrosion in many environments. AWM 404GP® has at least the corrosion resistance of grade 304, and is increasingly replacing 304 in sheet metal applications. Many users of AWM 404GP® make significant savings from the ease of fabrication – ferritic grades give less tool & machine wear than 304. Better quality products, with crisper, neater bends are achievable with AWM 404GP®. AWM 404GP® is magnetic, which does not affect the excellent corrosion resistance given by the high chromium content. Thermal expansion is lower, so there is less thermal distortion of panels in fabrication and in service.

Austral Wright Metals stock this grade as sheet and coil in thicknesses 0.55, 0.7, 0.9, 1.2, 1.5 and 2.0 mm, all 1219 mm wide. 914 mm wide is available in some thicknesses. 2B and No 4 finish. The finishes are brighter than for 304 – ferritic grades have a brighter surface finish than austenitic grades. The 2B finish may be variable across the width and should not be used where this is unacceptable.

Toughness AWM 404GP® has the same ferritic microstructure as carbon steel, so undergoes a ductile-to-brittle fracture mode transition at low temperatures. AWM 404GP® is tough in the welded condition down to 0ºC, and can be used for non-structural purposes at lower temperatures.

Pressure Vessels AWM 404GP® can be used for pressure vessels at elevated temperatures, but it is not pre-qualified in pressure vessel codes.

Heat Treatment AWM 404GP® is not hardenable by heat treatment. Heat treatment is rarely required in sheet metal applications, but AWM 404GP® can be annealed at 820 – 900ºC, rapid air cool.

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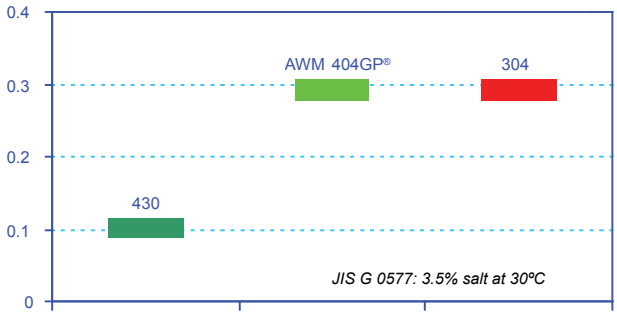
Corrosion Resistance The chemical composition of AWM 404GP® gives it a higher Pitting Resistance Equivalent (PRE) than 304, which indicates at least equivalent pitting corrosion resistance. Pitting is the form of corrosion stainless steels are often least resistant to. Laboratory tests and service experience have not identified circumstances in which the corrosion resistance of AWM 404GP® is inferior to 304, except pitting propagation rates, which are 3 – 4 times faster. Unfortunately, once initiated, pitting corrosion propagation is rapid for both grades, and practical selection of stainless steels aims to avoid pitting corrosion rather than achieve low propagation rates.

Resistance to the initiation of pitting corrosion in artificial seawater at 30ºC. Shows equivalent resistance to pitting corrosion initiation for the general purpose grades 304 and AWM 404GP®



Atmospheric Corrosion – Actual Exposure Test

Test Conditions: *Marine Industrial atmosphere at Chiba, Tokyo, Japan (10m from a bay bigger than Melbourne Bay) Samples polished to #600 grit. Exposed for 12 months. Note: these grades would not normally be specified for these aggressive conditions, which require 316 or 445M2.*

As a ferritic grade, AWM 404GP® does not stress corrosion crack in drinking water, unlike 304 which may stress corrosion crack above about 50ºC. The titanium in AWM 404GP® prevents sensitization to intergranular corrosion by welding.

High Temperature Service The high chromium content of AWM 404GP® gives excellent oxidation and sulphidation resistance, and similar grades are used extensively in automotive muffler systems. AWM 404GP® can be used in air up to 980ºC for continuous service, 1035ºC for intermittent service. The strength of ferritic grades above about 600ºC is generally less than that of austenitic grades. Where later ambient temperature toughness and corrosion resistance are important, the service temperature should be restricted to 400ºC to avoid precipitation reactions.

Cleanability AWM 404GP® is excellent for food equipment, where cleanability for the removal of bacteria is vital. AWM 404GP® resists corrosion by food and cleaning chemicals, and harbours very low levels of bacteria after cleaning. Fabrication and Formability As a ferritic stainless steel, AWM 404GP® behaves like carbon steel (G300). Bends are neater, with low springback and forming loads. Wear on cutting and forming tools is typically 3 – 5 times better. Cutting tool clearances are similar to carbon steel. The minimum radius for bending is 1t. Deep drawability is better than 304, but stretch capability is lower. Please consult Austral Wright Metals for deep drawing applications.

Machinability AWM 404GP® is easier than 304 to machine due to lower work hardening rate and better thermal properties. Cleaner cuts and flatter panels are obtained, with better cutting tool life.

Weldability AWM 404GP® can be welded by the common methods (TIG, MIG, spot, seam), without preheat, post heat or post weld heat treatment. Heat input needs to be 10 – 30% higher than for grade 316 as heat is conducted away from the weld pool more quickly by AWM 404GP®. Manual Metal Arc welding (MMAW or stick welding) is not recommended – AWM 404GP® is used in light gauges, not easy to stick weld. AWM 404GP® can be TIG welded without filler metal, or with 308L(Si) or 309L(Si) filler metal. Avoid introducing carbon into the weld by degreasing before welding – degreasing is as important with AWM 404GP® as it is with aluminium. Gas shielding must be excellent – use argon, or argon plus helium or up to 3% CO_2. Never use nitrogen or hydrogen in welding or backing gases. For best pickling after welding, ensure oxidation is minimised and use the pickling paste for longer than with 304. Portable electroplating equipment is very effective in removing residual oxide colour.

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FERRITIC MARINE GRADE 445M2 STAINLESS STEEL

Available exclusively from Austral Wright Metals

New generation ferritic marine grade 445M2 can be used to replace the traditional marine grade 316 in most applications. It is a ferritic, corrosion resistant steel with excellent strength, toughness, fabrication characteristics and weldability. The general corrosion resistance of 445M2 is at least as good as grade 316, with better resistance to atmospheric corrosion, stress corrosion cracking and sensitization to intergranular corrosion.
Grade 445M2 compared to grade 316.

		Chromium	Molybdenum	Carbon	Nickel	Others
Chemical Composition (typical)	445M2	22%	1.05%	0.007%	0.2%	Aluminium, niobium, & titanium
	316	17%	2.1%	0.04%	10%	

		Yield Stress MPa	Tensile Strength MPa	Elongation %	Hardness HV
Mechanical Properties (typical)	445M2	345	500	32	168
	316	315	560	55	155

		Density	Youngs Modulus	Thermal Conductivity	Thermal Expansion	Magnetism
Physical Properties		kg / m3	MPa	W/m.°C	X 10-6 /°C	
	445M2	7,750	199,000	22.5	10.0	Magnetic
	316	8,027	193,000	16.3	15.9	Non magnetic

Typical Applications Roofing, walling, awnings and fascias, hot water tanks, drums, barrels, heat exchangers, chemical and food processing, water treatment plant, chemical processing equipment, architectural and boat fittings exposed to marine and polluted a tmospheres, street furniture, electrical cabinets, freezer trays.

Description Grade 445M2 contains 22% of chromium and over 1% of molybdenum, which give it excellent resistance to corrosion in most environments. 445M2 has at least the corrosion resistance of grade 316, and is increasingly replacing 316 in sheet metal applications. Many users of 445M2 make significant savings from the ease of fabrication of 445M2, which is ferritic and gives less tool & machine wear than 316. Better quality products, with crisper, neater bends and less thermal distortion of panels are also achievable with 445M2.

Austral Wright Metals stock this grade as sheet and coil in thicknesses 0.55, 0.7, 0.9, 1.2, 1.5, 1.6, 2.0, 2.5 and 3.0 mm, all 1219 mm wide. 2B and No 4 finish. 0.55 x 940 mm with a low gloss 2DR finish is also stocked for architectural applications. Note the finishes are brighter (2DR excepted) than for 316 – ferritic grades have a brighter surface finish than austenitic grades.

Toughness Grade 445M2 has the same ferritic microstructure as carbon steel, so undergoes a ductile-to-brittle fracture mode transition at low temperatures. 445M2 is tough in the welded condition down to 0°C, and can be used for non-structural purposes at lower temperatures.

Pressure Vessels Grade 445M2 has been used for pressure vessels used at elevated temperatures, but it is not pre-qualified in pressure vessel codes.

Heat Treatment 445M2 is not hardenable by heat treatment. Heat treatment is rarely required in sheet metal applications. 445M2 can be annealed at 820 – 900°C, rapid air cool.

Corrosion Resistance. The chemical composition of 445M2 gives it a similar, but typically higher Pitting Resistance Equivalent (PRE) than 316, which indicates at least equivalent pitting corrosion resistance. Laboratory tests and service experience have not identified circumstances in which the corrosion resistance is inferior to 316, except pitting propagation rates, which are 3 – 4 times faster. Pitting corrosion propagation is rapid for both grades, and selection of stainless steel grades aims to avoid pitting corrosion rather than achieve low propagation rates.

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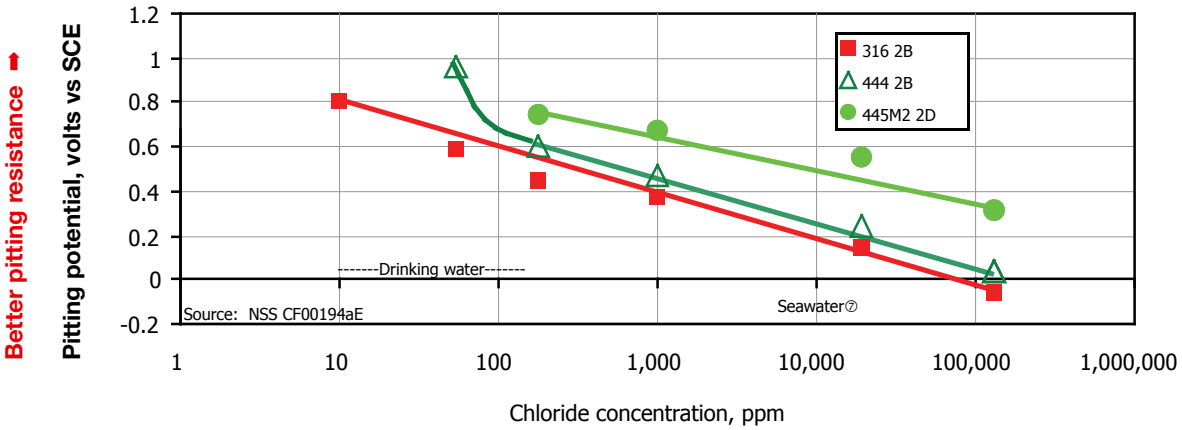
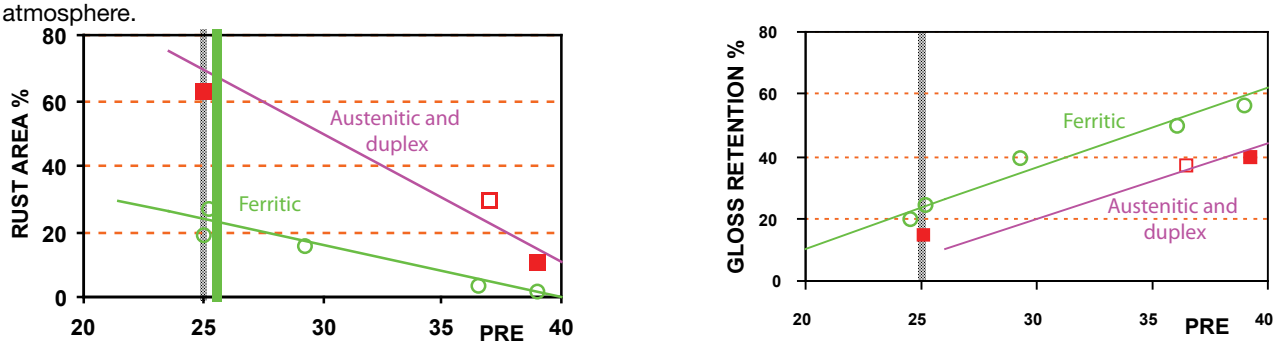


This graph shows the results of results of pitting corrosion tests in water at a range of chloride contents at 80°C. Higher volts indicate greater resistance to pitting initiation. The advantage of 445M2 over 316 is about the same as the advantage of 316 over 304. 444 is from the previous generation of ferritic grades. 445M2 will resist pitting corrosion in drinking water up to about 1,000ppm of chloride at room temperature, 200ppm at 100°C.
New generation ferritic stainless steels like 445M2 resist atmospheric corrosion better than austenitic or duplex grades of the same PRE, particularly with regard to rust area (i.e. tea staining) and gloss retention. This figure compares new generation ferritic stainless steels with austenitic grades and a duplex after three years exposure in a marine industrial atmosphere.



Source: Y.Yazawa et al, International Congress Stainless Steels 96, Dusseldorf.

As a ferritic grade, 445M2 does not undergo stress corrosion cracking in drinking water, unlike 316 which may stress corrosion crack above about 50°C. 445M2 has additions of titanium and niobium, which prevent sensitization to intergranular corrosion when welded.

High Temperature Service. The high chromium content of 445M2 gives excellent oxidation resistance, and similar grades are used extensively in automotive muffler systems. 445M2 can be used in air up to 980°C for continuous service, 1035°C for intermittent service. The high temperature strength of ferritic grades is generally less than that of austenitic grades. Where later ambient temperature toughness and corrosion resistance are important, the service temperature should be restricted to 400°C to avoid precipitation reactions.

Cleanability 445M2 is excellent for food equipment, where cleanability for the removal of bacteria is vital. 445M2 resists corrosion by cleaning chemicals, and harbours very low levels of bacteria.

Fabrication As a ferritic stainless steel, 445M2 behaves like carbon steel (G300). It gives neat bends with low springback, low forming loads and exceptionally low wear on cutting and forming tools – typically 3 – 5 times better life. Cutting tool clearances are similar to carbon steel.

Machinability 445M2 is easier than 316 to machine due to lower work hardening rate and better thermal properties. Cleaner cuts and flatter panels are obtained, with better cutting tool life.

Weldability 445M2 can be welded by the common methods (TIG, MIG, spot, seam), without preheat, post heat or post weld heat treatment. Heat input needs to be 10 – 30% higher than for grade 316 as heat is conducted away from the weld pool more quickly by 445M2. Manual Metal Arc welding (MMAW or stick welding) is not recommended – 445M2 is used in light gauges, not easy to stick weld. 445M2 can be TIG welded without filler metal, or with 316L(Si) filler metal.
Gas shielding must be excellent – use argon, or argon plus helium or up to 3% CO2. Never use nitrogen or hydrogen in welding or backing gases. For best pickling after welding, ensure oxidation is minimised and leave the pickling paste on the weld for 50% longer than with 316. Portable electroplating equipment is very effective in removing residual oxide colour.

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NOTES

OTHER PRODUCT CATALOGUES AVAILABLE FROM AUSTRAL WRIGHT METALS.

Brass & Copper

- Including sheet, strip, coil, bar, rod and tube.

High Performance Alloys

- Including nickel based alloys, welding consumables and high technology metal.

Aluminium

- Including sheet, coil, treadplate and propellor plate.

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