

OIL & GAS TUBING

Corrosion resistant, precision tubes custom-engineered for critical subsea and topside oil and gas applications.

High quality, NORSOK-approved exotic alloy tubes deliver maximum corrosion and pressure resistance up to 60,000 psi for the most hostile downhole conditions. Key advantages include:

- Extended product life, reduced downtime, and maintenance costs
- NORSOK-approved 6 Moly and Super Duplex alloys
- Custom-made straight lengths and coils to exact specifications.
- Short lead times

TUBING EXCELLENCE

With more than 85 years of engineering expertise in manufacturing high precision tubes, Fine Tubes and Superior Tube work closely with customers worldwide, to solve their technical and metallurgical challenges.

We develop high performance tubing solutions in a range of stainless steel, titanium and nickel alloys for critical oil and gas applications.

TUBING INNOVATIONS

Fine Tubes and Superior Tube benefit from a world-class reputation for innovative and high quality tubing solutions geared towards the Oil & Gas industry. Here are a few examples:

**1970**

Technological advances for subsea developments in the 1970's.

**2013**

Fine Tubes awarded 9COM Approval with Saudi Aramco and to supply stainless steel, nickel alloy and titanium tube products.

**1988**

Fine Tubes manufacture data logging tubes for the downhole oil and gas markets.

**2015**

Fine Tubes contributes to the Advanced Well Equipments Standardization Group (AWES), setting industry standards for the manufacture of tubing encased conductor (TEC).

**2003**

Fine Tubes manufacture super pressure instrumentation tubing operating at up to 60,000 psi (4,100 bar).

**2015**

Superior Tube supply heat exchanger tubing for a new FPSO vessel operating in the Santos Basin Field Development, Brazil.

**2013**

Fine Tubes supply Parker Hannifin with corrosion-resistant 6Mo alloy tubes bound for use in the BP Schiehallion field, North Sea.

**2015**

Fine Tubes receives NORSOK M-650 approval to supply Super Duplex UNS S32750.

TUBING SOLUTIONS

OIL & GAS

Our tubular products have been successfully applied in some of the most aggressive subsea and downhole conditions. We have a long proven track record of supplying products that meet the strict quality and safety requirements of the oil and gas sector.

Fine Tubes and Superior Tube offer coiled and straight length tubing in a wide range of corrosion resistant stainless steels, titanium alloys and nickel alloys. We work with major energy companies worldwide to solve their deepwater challenges.

Downhole Hydraulic Control & Injection Lines

Fine Tubes and Superior Tube supply bare line or encapsulated coiled tubing for downhole hydraulic and chemical injection lines in a range of corrosion resistant stainless steel and nickel alloys.

Downhole Data Logging For Intelligent Well Completions

Welded & cold-drawn coiled tubing for the mechanical protection of Tubing Encased Conductor (TEC) and Tubing Encased Fibre (TEF) cables, control lines and sensing cables.

Subsea & Umbilicals

Superior Tube and Fine Tubes supply high quality umbilical control line and chemical injection tubing.

Our seam-welded and redrawn products provide a lower-cost alternative to traditional seamless subsea umbilicals, while delivering equal performance.

Topside Control & Instrumentation

Our expertise in processing special grade stainless steel and nickel alloys make us the ideal partners for the supply of instrumentation packages used in the topside construction of Offshore FPSO, FPSS's, Spars and TLP's.

Pressure Housing

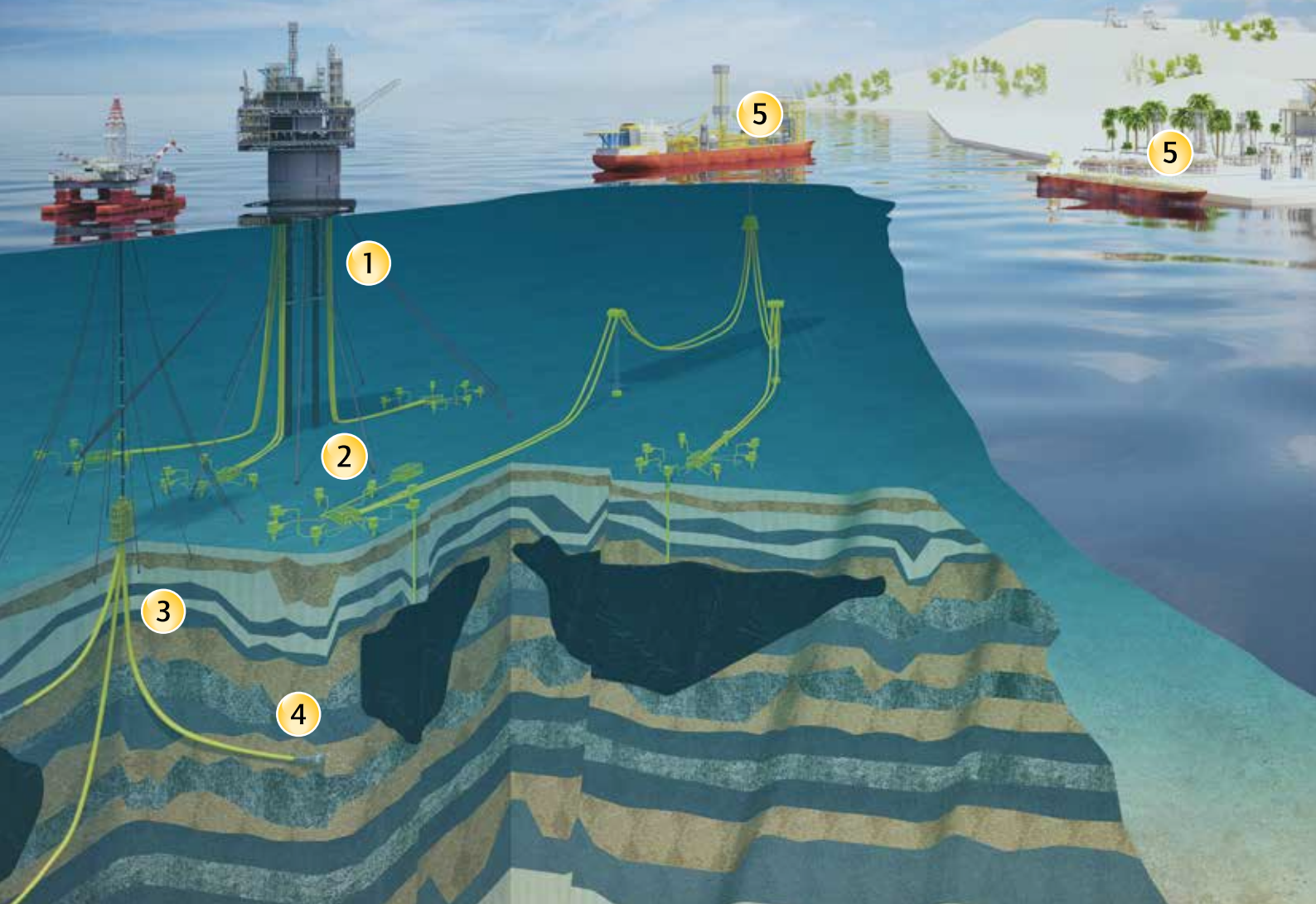
Fine Tubes and Superior Tube supply casing for down hole drilling sensors for directional drilling tools Measurements While Drilling (MWD) and Logging While Drilling (LWD).

Subsea Control & Instrumentation

Up to 2,000 m under the sea, our corrosion resistant tubes are deployed in critical control units for hydraulic pumps, subsea Christmas trees and manifolds. Operating conditions can require our products to be rated up to 60,000 psi operating pressure.

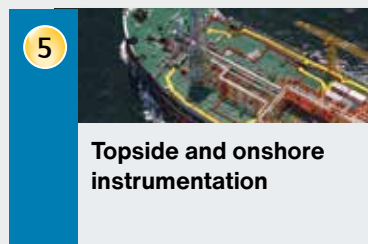
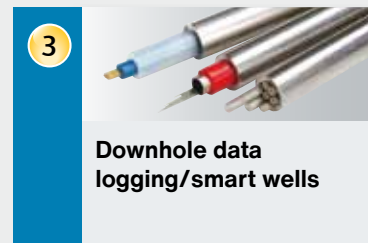
ADDITIONAL OIL & GAS APPLICATIONS

- Downhole, hydraulic and chemical injection control lines
- Control lines in subsea umbilicals
- Flowline control line tubing for pipe-in-pipe bundles
- Downhole gauge cables
- Pressure housings for MWD/LWD tools
- Wellhead control panel
- Well monitoring
- Coriolis flow meters
- Hydraulic tubing for control measuring devices and pumps
- Topside Umbilical Termination Units (tutu)
- Autoclave and high pressure applications
- Well chemical injection units
- Topside instrumentation and impulse lines
- Control and injection line tubing for subsea equipment



TUBING CAPABILITIES

Fine Tubes and Superior Tube offer a full range of tubing solutions for multiple oil and gas applications.



ALLOYS

Superior Tube and Fine Tubes produce a wide range of custom-sized tubing in an ever expanding range of alloys – available in four different product forms, i.e. seamless, welded, welded & plugdrawn, welded & redrawn (Weldrawn®) finish.

SEAMLESS, WELDED, WELDED & PLUGDRAWN, WELDED & REDRAWN

STAINLESS STEEL

316	316L	316Ti	317L	321	6Mo	17-4PH®	15-5PH®
904L	Nitronic® 50		Duplex (S31803)		Super Duplex (S32750)		

NICKEL

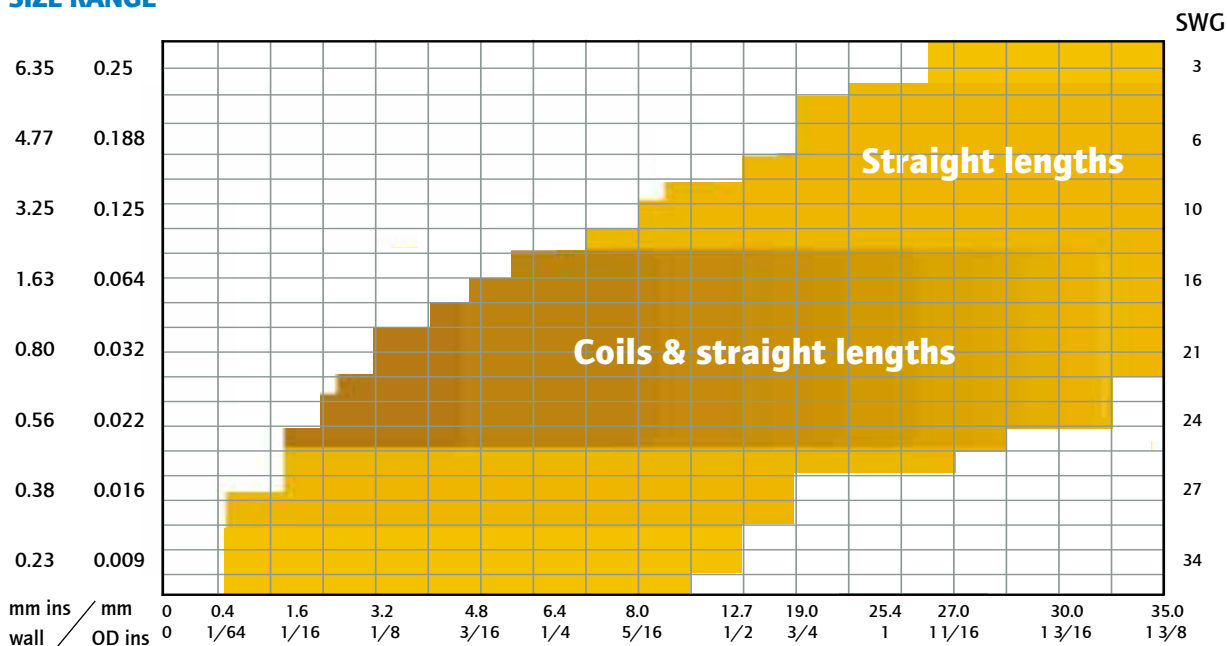
59	400	625	718	800
825	C22	C276	MP35N®	

TITANIUM

Ti CP (Grade 1 and Grade 2)

We also manufacture tubing in many other grades. Please contact us for more details.

SIZE RANGE



Our tubing sizes typical for oil and gas applications range from 3 mm (0.118 in) outer diameter (OD) up to 31 mm (1.22 in) OD in seamless, welded, welded & plugdrawn and welded & redrawn.

Coil lengths without orbital joints are supplied up to 1,500 m (5,000 ft), and up to 13,500 m (45,000 ft) with orbital joints.

TUBING QUALITY

QUALITY SYSTEMS APPROVAL

- ISO 9001
- ISO 14001 (Environmental)
- TUV Directive 97/23/EC
- P.E.D. Pressure Equipment Directive
- NORSOK M-650
- Statoil TR2385 Compliance
- NADCAP Ultrasonic Testing
- NADCAP Heat Treatment
- NADCAP Fusion Welding

CUSTOMER APPROVALS

- ADGAS
- ADMA
- ADNOC
- KNPC
- KOC
- NPCC
- ONGC
- PDO
- Saipem Spa
- Saudi Aramco
- Technip
- ZADCO

PROJECT LIST

WORLD PROJECTS

- BP Claire Ridge (North Sea)
- BP Quad 204 (Shetlands)
- Egina Oil Field (Nigeria)
- Golden Eagle (North Sea)
- Goliath (Norway)
- Ichthys (Australia)
- Jasmine Conoco Philips (North Sea)
- Santos Basin Field Development (Brazil)

GCC PROJECTS

- Ruwais 4th NGL Train Project (U.A.E)
- Satah FFD Project (U.A.E)
- Shell Majnoon (Iraq)
- Umm Lulu Field Development (U.A.E)
- Zakum Oil Field Development (U.A.E)
- Badra Oilfield (Iraq)
- Barzan Gas Field (Qatar)
- Manifa FDP (Saudi Arabia)
- Nasr FFD (U.A.E)

PRODUCTION FACILITIES

- Pilger mills
- Draw benches
- Tube welding mills - In-line weld mills
- Controlled atmosphere heat treatment
- Bright annealing
- Pickling & passivation plant
- NDT ultrasonic & eddy current testing
- Hydrostatic testing
- Radiographic examination
- Polishing capabilities
- Full chemical and physical laboratory analysis

Alloy Group	Alloy UNS No.	Werkstoffe	Chemical Analysis %													Temper	Tensile Rm (min)		Yield Rp 0.2% (min)		Elong. % min	Hardness HV	Application
			C	Mn	Ni	Cr	Fe	Mo	Ti	Nb	N	Al	Other	g/cm³	lb/in³		ksi	MPa	ksi	MPa			
STAINLESS STEEL	316L S31603	1.4404	0.035 max	2.0 max	10.0-13.0	16.0-18.0	bal	2.0-5.3						7.93	0.286	ANN	70	485	25	170	35	200 max	Standard oil and gas CRA.
		1.4435						2.5/2.6-3.0														316L with minimum molybdenum content of 2.6%.	
	316Ti S31635	1.4571	0.080 max	2.0 max	10.0-14.0	16.0-18.0	bal	2.0-3.0	5XC+N -0.700		0.10 max			7.93	0.286	ANN	70	485	25	170	35	200 max	Austenitic stainless steel with addition of 0.5% Ti to improve alloy stability at temperatures above 800 °C.
	317L S31703	1.4438	0.035 max	2.0 max	11.0-15.0	18.0-20.0	bal	3.0-4.0					7.9	0.29	ANN	75	515	30	205	35	200 max	Austenitic stainless steel with higher corrosion resistance than 316L.	
	904L N08904	1.4539	0.020 max	2.0 max	23.0-28.0	19.0-23.0	bal	4.0-5.0				Cu 1.0-2.0	8	0.289	ANN	70	485	40	275	35	200 max	Stainless steel with higher resistance to general, pitting & crevice corrosion than 316L.	
	6Mo S31254	1.4547	0.020 max	1.0 max	17.5-18.5	19.5-20.5	bal	6.0-6.5		0.18-0.22		Cu 0.5-1.0	8	0.289	ANN	98	675	45	310	35	230 max	Superaustenitic stainless steel with good resistance to pitting and crevice corrosion.	
	Duplex S31803	1.4462	0.030 max	2.0 max	4.5-6.5	21.0-23.0	bal	2.5-3.5		0.08-0.20			7.8	0.281	ANN	90	620	65	450	25	290 max	High mechanical strength and good resistance to localised cracking & chloride stress corrosion.	
	Super Duplex S32750	1.441	0.030 max	1.2 max	6.0-8.0	24.0-26.0	bal	3.0-5.0		0.24-0.32		Cu 0.5 max	7.79	0.28	ANN	116	800	80	550	15	310 max	Superduplex alloy combining excellent strength with good corrosion resistance in high chloride and seawater environments.	
	N50 S20910	1.3964	0.060 max	4.0-6.0	11.5-13.5	20.5-23.5	bal	1.5-3.0		0.2-0.4		V 0.1-0.3	7.880	0.285	ANN	100	690	55	380	35	285 max	Nitrogen strengthened austenitic grade with exceptional strength in the cold worked condition & low magnetic permeability.	
									0.1-0.3				7.450	0.270	CW	170	1170	150	1034	20	528 max		
NICKEL ALLOYS	Alloy 800 N08800	1.4876	0.15 max	1.5 max	30.0-35.0	19.0-23.0	39.5 min		0.15-0.60				8	0.289	ANN	75	517	30	207	30	200 max	Resistant to stress corrosion & good in aqueous media.	
		2.4858	0.05 max	1.0 max	38.0-46.0	19.5-23.5	bal	2.5-3.5	0.6-1.20		0.20 max	Cu 1.5-3.0	8.1	0.292	ANN	85	586	35	241	30	209 max	Very good sour well and chloride stress corrosion cracking resistance.	
	Alloy 718 N07718	2.4668	0.08 max	0.4 max	50.0-55.0	17.0-21.0	bal	2.80-3.30	0.65-1.15	4.75-5.50		Co 1.0 max	8.19	0.296	HT	150	1084	120	827	20	382 max	Age hardenable, high strength nickel alloy with good sour well corrosion resistance.	
	Alloy 625 N06625	2.4856	0.10 max	0.5 max	bal	20.0-23.0	5.0 max	8.0-10.0	0.40 max	3.15-4.15			8.44	0.305	ANN	120	827	60	414	30	260 max	Nickel alloy with very good resistance to pitting, crevice corrosion & sour well environments.	
															SLN ANN	100	690	40	276	30	222 max		
	Alloy 276 N10276	2.4819	0.02 max	1.0 max	bal	14.5-16.5	4.0-7.0	15.0-17.0				W 3.0-4.5	8.9	0.321	ANN	100	690	41	283	40	210 max	Excellent sour service corrosion resistance.	
	Alloy 22 N06022	2.4602	0.015 max	0.5 max	bal	20.5-22.5	2.0-6.0	12.5-14.5				W 2.5-3.5	8.61	0.311	ANN	100	690	45	310	45	270 max	Excellent sour service corrosion resistance combined with a very high pitting index.	
	Alloy 59 N06059	2.4605	0.010 max	0.5 max	bal	22.0-24.0	1.5 max	15.0-16.5				Co 0.3 max	8.60	0.311	ANN	100	690	45	310	45	270 max	Excellent in Sour Service Environments. Highly resistant to Chloride, Sea Waters and Acids.	
	MP35N R30035		0.03 max	0.2 max	33.0-37.0	19.0-21.0	1.0 max	9.0-10.5				Co bal	8.43	0.304	HT	220	1514	200	1380	10	528 max	Nickel cobalt alloy with very high strength, toughness and outstanding corrosion resistance.	
	Alloy 400 N04400	2.436	0.30 max	2.0 max	63.0-70.0		2.5 max					Cu bal	8.83	0.319	ANN	70	480	28	195	35	180 max	General purpose Ni alloy with a good combination of strength, ductility & corrosion resistances.	
TITANIUM	CP Grade 2 R50400	3.7035	0.08 max				0.30 max		bal		0.03 max		O 0.25 max	4.51	0.163	ANN	50	345	4065	275-450	20		Very high strength to weight ratio combined with excellent seawater corrosion resistance.
	Ti 3Al/2.5V Grade 9 R56320	3.7194	0.08 max				0.25 max		bal		0.03 max		V 2.0-2.5	4.48	0.162	CWSR	125	860	105	725	10		High strength to weight ratio. Excellent corrosion resistance.
	Ti 6Al/4V Grade 5 R56401	3.7165							bal			6.0	V 4.0	4.33	0.156	CWSR	159	1100	141	980	8		Very high strength to weight ratio.



ABOUT AMETEK SPECIALTY METAL PRODUCTS

AMETEK Specialty Metal Products (SMP) is a business unit of AMETEK, Inc. a leading global manufacturer of electronic instruments and electromechanical devices with annualized sales of approximately \$5.5 billion.

The Specialty Metal Products business unit consists of five businesses and operating facilities in the United States and the United Kingdom.

These businesses are proven experts in the manufacture of advanced metallurgical products including roll bonded clad plate, precision metal strip, ultra-thin foil, shaped wire, engineered components, thermal management materials, water atomized powders and precision tube.

Our high performance metal products are used around the world for critical applications in a range of industries including aerospace, automotive, defense, electronics, industrial, medical, nuclear, oil and gas, and space and satellites.



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