Specialist Tubing, performing in demanding environments

Pitting and crevice corrosion resistant

Fatigue resistant

O2 compatible

Compatible with all fitting types

ISO 9001

DNV REGISTERED

Tungum®

PROVEN PERFORMANCE

Tungum tubing: product summary

Tungum Tubing has been used in the field for over 25 years in demanding, safety critical applications. In fact, there are no recorded failures of Tungum when correctly used and installed. That is why we use the expression: 'fit and forget' due to its long life and excellent corrosion resistance.

Key Benefits: Pitting & Crevice Corrosion Resistant Tubing

Features:	Key Benefits
Long life	Significant down time savings
Excellent corrosion resistance	Leak free and no costly clean ups
Easy to bend	Fast installation times to reduce costs
Industry compatible	Easily installed with industry accepted tube fittings

Tungum Tubing is found around the world contributing to the success and longevity of applications in a wide cross section of industries, including:

High pressure gas
Offshore oil
Aerospace
Rail and transport
Defence
Civil engineering
Pharmaceutical
Medical
Nuclear

Note: Supporting this worldwide activity is our network of distributors strategically placed to offer first class service and technical support.

Compared to super duplex materials
Significantly easier and cheaper to install than super duplex materials.

Compared to 316 Stainless Steel
4-6 times working life. Does not suffer the same pitting issues and up to 1/3 less time to install.

Tungum Tubing lasts the working life of a typical offshore installation: in excess of 25 years

Tungum materials against competitive materials
Relative to other specialist tubing materials

Tungum is amongst a specialist group of super alloy tubing materials which operate at the top end of the technical performance scale. Tungum is used for its excellent corrosion fatigue properties and is also an ideal material for high pressure gas applications. It has a significantly longer working lifetime than mainstream tubing such as 316 stainless steel.

Competitive project costings

In comparison to material grades such as Alloy 6mo, Alloy 400, Alloy 625, Alloy 2507 and Alloy C276, Tungum Tubing has a highly competitive base material cost. In many cases Tungum has a better lifetime in operation cost. See Lifetime capital cost comparison chart on the next page.

Tungum Tubing can be used in combination with many types of fittings including 6Mo. However, in most cases 316 stainless steel. This provides major savings against using alloy tube and fittings combinations from 6Mo or other super alloys, which do not offer the same flexibility.

Excellent corrosion resistance

Independent testing shown in NACE 10305 paper (see corrosion resistance testing in technical data section) concludes that Tungum has the best localised corrosion resistance relative to other super alloy materials. It is worth noting that the standard corrosion tests for stainless steel are not applicable to Tungum Tubing as it is a copper based alloy – this includes PREN,ASTM G48 and CPT testing.

Ease of installation

Tungum tubing also scores well against other super alloys as it is easier to bend and install.

Recent trends: lifetime operating cost impact

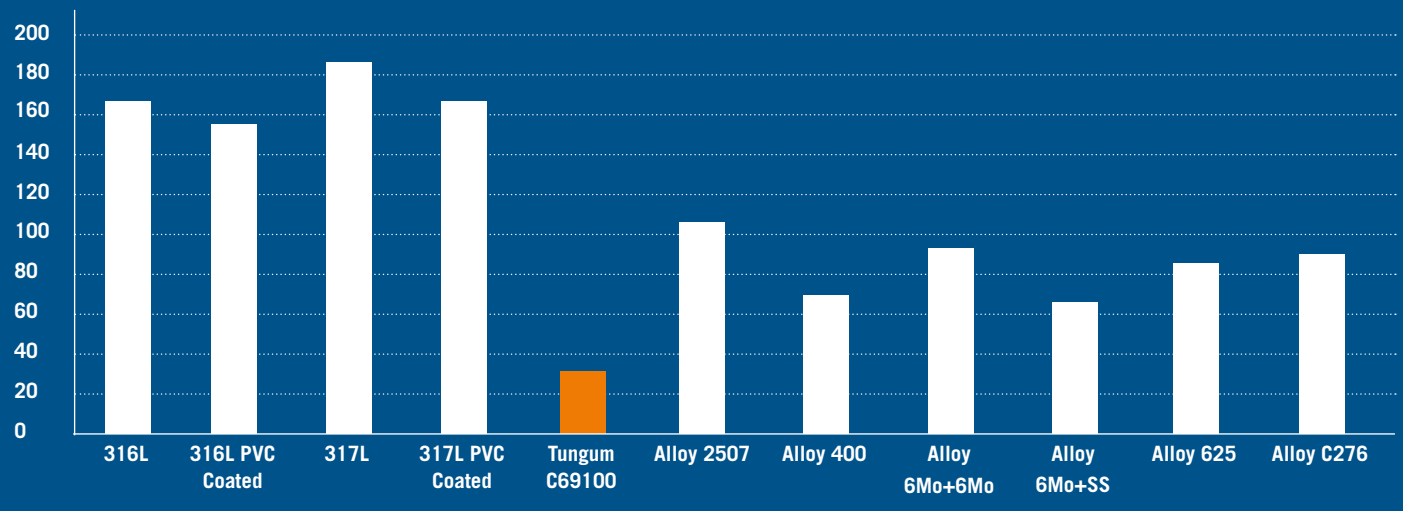
In recent years standard 316 and 317L Stainless Steel tubing has been replaced in many applications. This includes offshore and marine, where long-term operating costs have become more important than initial project build costs. Tungum Tubing has been specified on many projects for this reason. For example, the price of instrumentation tubing for a standard rig using stainless steel compared with using Tungum Tubing is approximately half initially. However, by using stainless steel you can expect anything from 5-10 refits over the life of a rig, not to mention the massive downtime costs and disposal of old tube.

Lifetime cost comparison of tubing material, fitting type and installation

Facility life: 30 years

Tubing material	Wall thickness (inches) 5,000 psi WP	Material Cost $/ft (10,000 ft)	Fitting type (Typical 1/2" Straight Union)	Fitting Cost ea $	Fitting cost $/ft (2 fitting per 20ft length Av)	Installation Cost, $/ft	Time to failure (yrs)	Total lifetime capital cost $/ft
316L	0.083	6.38	316L Twin Ferrule	25.80	2.58	12	4	167.68
316L PVC coated	0.083	7.88	316L Twin Ferrule	25.80	2.58	15	5	152.76
317L	0.083	8.66	316L Twin Ferrule	25.80	2.58	12	4	185.92
317L PVC coated	0.083	10.16	316L Twin Ferrule	25.80	2.58	15	5	166.44
Tungum C69100	0.083	17.92	316L Twin Ferrule	25.80	2.58	12	30	32.50
Alloy 2507	0.083	19.13	Alloy 2507 Twin Ferrule	171.87	17.19	15	20	102.63
Alloy 400	0.049	21.61	Alloy 400 Twin Ferrule	44.47	4.45	12	20	76.11
Alloy 6Mo+6Mo	0.049	19.40	Alloy 6Mo Twin Ferrule	159.00	15.90	12	20	94.60
Alloy 6Mo+SS	0.049	19.40	316L Twin Ferrule	25.80	2.58	12	20	67.96
Alloy 625	0.065	51.33	Alloy 625 Twin Ferrule	124.23	12.42	18	30	81.75
Alloy C276	0.049	33.70	Alloy C276 Twin Ferrule	393.21	39.32	18	30	91.02

Total lifetime capital cost $ / ft



Telephone: +44 (0)1684 271290
Fax: +44 (0)1684 291714
Email: sales@tungum.com
www.tungum.com
Company Registration: No. 00282202

Address:
Tungum Limited, Number One,
Ashchurch Parkway, Tewkesbury,
Gloucestershire, United Kingdom
GL20 8TU

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