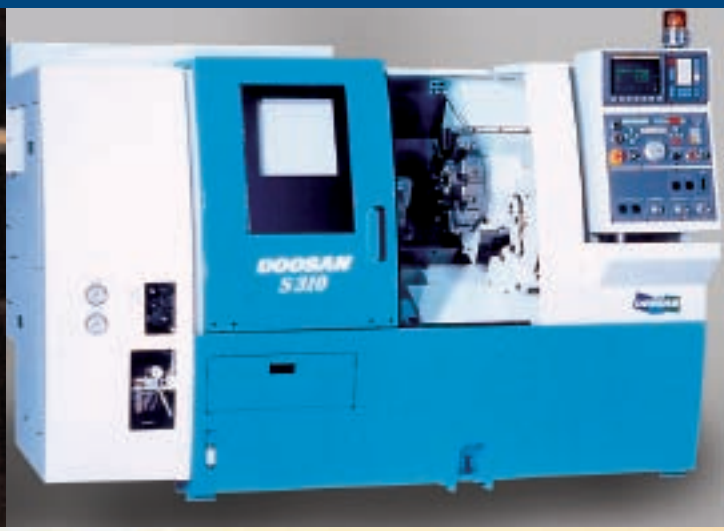
MAHER

Global Metal Solutions

Oil & Gas • Aerospace • Naval & Marine • Power Generation • Motor Sport • Metalworking • Medical



Our pedigree

Maher supplies advanced alloys for high performance applications.

Founded in Sheffield in 1932, the privately owned business has forged a reputation for supplying quality materials that meet your highest demands.

Historically Maher based its core business on supplying nickel superalloys to the oil and gas industries. Over the years the Company has diversified into supplying specialist alloys for the defence, power generation, motor sport and medical industries.

We supply bar, billet and plate and have the capability to manufacture specific components to meet our customers' precise requirements.

Quality Guarantee

Purchasing material from Maher is a guarantee of quality.

Our systems are continuously measured and monitored to ensure that our standards remain high. We hold the quality standard AS9100 Rev B which was awarded in 2002.

With all our products you can expect:

- **Full certification packs**
- **Full material traceability**
- **Technical support**

The quality of our products and processes are also demonstrated by an extensive list of customer approvals which include:

- **Rolls-Royce (Sabre)**
- **Airbus**
- **BAE Systems**
- **BAE Systems Marine**
- **AgustaWestland**
- **Honeywell**
- **Raytheon**
- **Messier-Dowty**
- **Smiths Aerospace**
- **Schlumberger**

Service Guarantee

Maher has a truly global presence, with a network of agents on every continent. We are able to conduct business in five major international languages from our Head Office at Sheffield.

Materials Handling and Logistics

Maher offers the most modern communications and technical support to ensure secure supplies and the most advanced equipment for machining, heat treatment and material testing.

We have specially designated storage areas that allow us to guarantee availability and supply of products for special projects or contracts. In some cases Maher is linked to major OEMs and delivers quantity and production data directly to their manufacturing operations.

Our Processes

CNC Machining, Boring and Trepanning
Our state-of-the-art CNC machines can produce a range of finished components directly from digital CAD drawings.

Bars up to 600mm in diameter can be bored or trepanned. Varying sizes of trepanning heads are used to improve efficiency and maximise value.

Hot Working
We offer a wide range of open die and closed die forging and rolling processes from small hammer forgings to press forgings including close tolerance rotary forging.

Heat Treatment
Heat Treatment facilities include computer controlled solution treatment and ageing cycles for individual components, with water quenching or air cooling. Heat-treatment charts are recorded for each cycle of treatment.

Inspection and Non-destructive materials testing
Our on-site facilities include ultrasonic and dye-penetrant testing. We have recently acquired cutting-edge metrology equipment, the ultra high-resolution submicron Talyrond 290, offering highly accurate measurements. Brinell and Rockwell hardness testing verify heat treatment responses and tight control of material properties while our staff are qualified to ASNT level III.

Sawing
Five modern CNC controlled bandsaws with the latest carbide blade technology offer close tolerance sawing up to 530mm diameter and allow us to despatch urgent orders.

Industries and sectors

The range of materials supplied by Maher may be applied to any conditions or specifications that demand high integrity or specialist alloys. We supply leaders in the major industry sectors:

Oil & Gas
Our range of certified and fully traceable nickel and copper based alloys is available in an extensive range of sizes to manufacture valves, pumps and bolting.

Aerospace
We stock fully-traceable aircraft steel, titanium, maraging and nickel based alloys. To meet customer requirements we can offer in-house facilities that enable machining to a wide range of sizes.

Naval & Marine
We supply materials for surface ship and submarine applications for new and refit projects. We select the correct grade of nickel and copper based alloy and stainless steel depending on the mix of corrosion resistance and strength needed for:
propeller shafts; pumps; valves, fittings and fasteners.

Power Generation
As a result of close relationships with power generation turbine manufacturers established over the years we stock an extensive range of blading bar - from high integrity titanium grades through to precipitation hardenable steels. We also stock fastener and bolting grades: Alloy A286 (660) and Maraging 250.

Motor Sport
We supply cobalt-based, high-strength maraging steels for transmission, drive shaft and suspension components to the motor sport industry. High temperature resistant nickel alloys such as Alloy 625 and Alloy A286 (660) are available for exhaust components. We also supply low alloy steels for roll cages.

Metalworking
Elevated working temperatures or high thermal stress demand high integrity materials. Many of our customers are involved in the manufacture and hot forming of a range of materials from structural steels to non-ferrous, nickel based alloys. Alloys supplied include: Alloy 718, Alloy A286, R41, Cobalt Alloys 3, 4, 6, 21.

Medical
Our expert knowledge in the supply of high performance specialist alloys has allowed us to develop excellent business relationships with global medical device OEMs who manufacture orthopaedic implants, dental devices and instruments. Maher supplies certified and fully traceable medical grade materials such as titanium 6Al-4V, CoCr and 17/4.

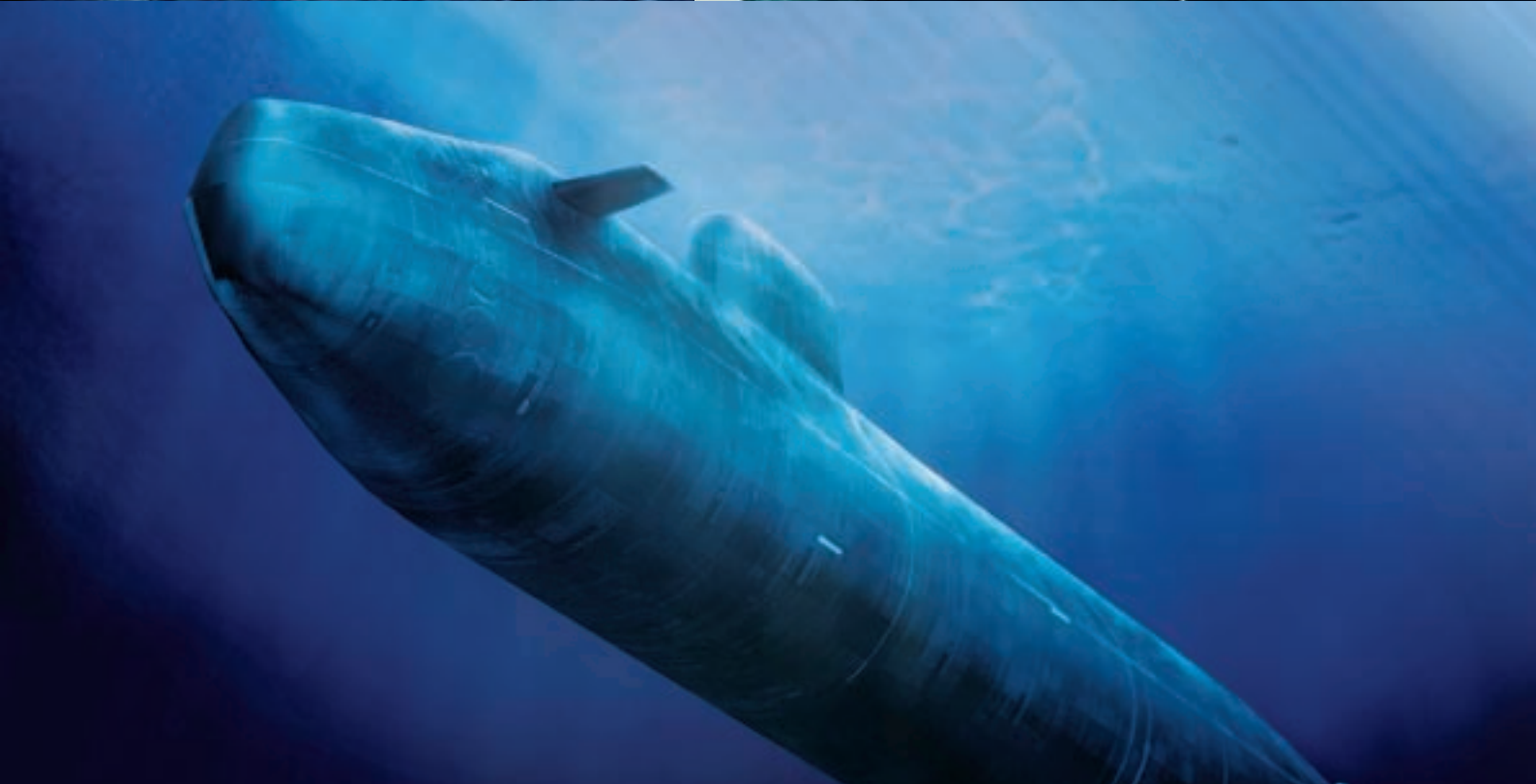
Contact Us

Can't see your industry or sector or application in the above list? Please contact us on **+44 (0) 114 290 9200** if you have any questions, or to discuss your requirements.

You can also contact us via fax on **+44 (0) 114 290 9290** or email: **info@maher.com**

For more information about Maher Ltd please visit our website: **www.maher.com**


P68
P68



Product Reference Guide

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Alloy	ASTM	UNS	SEA AMS	British Standard	Werkstoff	Mechanical Properties			
						0.2% PS MPA Minimum	UTS MPA Minimum	Hardness Minimum	
Alloy 718	B637	N07718	5662 5663		2.4668	Oil Patch 825 Aero 1150	1034 1425	40Rc Max 41Rc Min	Nickel Based
Alloy 625	B564 B446	N06625	5666	3076 NA21	2.4856	Up to & incl 100mm 413	827		
						Over 100mm 344	758		
Alloy 825	B425	N08825		3076 NA16	2.4858	241	586		
Alloy 400	B164	N04400		3076 NA13	2.4360	170	480		
Alloy K500	B865	N05500	4676	3076 NA18	2.4375	Up to & incl 25mm 620 Over 25mm to 110mm 585	900 900		
						Over 110mm to 300mm 500	830		
						Available in various heat treated conditions. Refer to www.maher.com for mechanical properties			
Alloy R41®		N07041	5712 5713		2.4973	793	1241	38-42Rc	
Waspaloy		N07001	5708 5706		2.4654	1040	1430	42Rc Max	
Alloy 80A	B637	N07080		3076 NA20 HR HR 601	2.4952 2.4631	590	980		
Maraging C250	A646		6512 6520	S162	1.6359	1760	1815		Maraging
Maraging C300	A579		6514 6521		1.6358 1.6354	1975	2020		
Maraging C350	A579		6514		1.6356	2275	2340		
A286	A453 A638 Grade 660B Grade 660D	S66286	5731 5732	HR 52/650	1.4943 1.4944	724	1000	30-35Rc	Specialist Alloys
Titanium 6Al-4V Grade 5	B348		4928 T-9047	TA11 TA12 TA7252	3.7164	828	897		Titanium
Titanium 6Al-4V ELI	F136 B265		4907	7252		759	828		
Kovar ®	F15				1.3981	345	517		Controlled Expansion Alloys
Invar ®	F1684				1.3912	276	448		
Super Invar®	F1684					276	483		
Alloy 42®	F30				1.3917	250	490		

For technical datasheets, please refer to www.maher.com

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Round Bar  Billet  Plate  Blanks & Rings  Step-Down Forging  Machined Components 

Alloy	ASTM	UNS	SEA AMS	British Standard	Werkstoff	Mechanical Properties		
						Diameter mm	0.2% PS MPA Minimum	UTS MPA Minimum
NES 833 DEF STAN 02-833		C63000		2874 EN12163		Over 15 Up to 25	325	680
						Over 25 Up to 100	295	635
						Over 100	245	620
NES 834 DEF STAN 02-834						Over 15 Up to 50	275	525
						Over 50 Up to 100	235	525
						Over 100	220	525
NES 838 DEF STAN 02-838		C51000		2874 PB102		6 to 18	410	500
						18 to 40	380	460
						40 to 60	320	380
						60 to 75	250	350
NES 835 Hiduron 191®						Over 15 Up to 125	430	725
						Over 125	400	710
NES 780 DEF STAN 02-780 (70/30)		C71500		2874 CN107		Over 28 Up to 180	130	350
						Over 180 Up to 500	120	330
BS B23 DTD 197 CA104		C63000		2874 CA104 EN12163		Over 6 Up to 18	400	700
						Over 18 Up to 80	370	700
						Over 80	320	650
DTD 498				B25			416	586
AMS 4616			4616				138	386
AMS 4640	B124	C63000	4640			Up to 25.4 Over 25.4 Up to 50.8	469 414	758 758
						Over 50.8 Up to 76.2	379	724
						Over 76.2 Up to 127	345	689
AMS 4590		C63020	4590		1.4534 1.4548	Up to 25.4	689	931
						Over 25.4 Up to 50.8	655	896
						Over 50.8 Up to 101.5	621	896
MSRR 8501				B25			385	555
MSRR 8503			4640	B23			410	695
MSRR 8506		C90700		1400 PB1				280
PH 13/8 Mo		S13800	5629		1.4545	Available in various heat treated conditions. Refer to www.maher.com for mechanical properties		
17/4 PH	A564-XM12 A693-AM12` A705-XM12		5643 5622		1.4548			
15/5PH	A564-XM12 A693-AM12 A705-XM12		5659		1.4545			

Copper Based

PH Grades

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To download this brochure, a product reference guide or for more information please visit our website:

www.maher.com

Rev 3