The old BS970 Parts 1 & 3: 1991 standards have been replaced by a number of EN Standards, the most important of which are shown below

EN10088-3Replaces BS970 Part 1: 1991 & BS970 Part 3: 1991 covering chemical composition & mechanical properties

EN10058 Tolerances for Hot Rolled Flat Bars

EN10059 Tolerances for Hot Rolled Square Bars

EN10060 Tolerances for Hot Rolled Round Bars

EN10061 Tolerances for Hot Rolled Hexagonal Bars

EN10278 Tolerances for Bright Bars (Drawn, Turned or Ground)

ISO186 Parts 1 & 2 Tolerance Classifications
(see page 4)
.
.

DIAMETER - SMOOTH TURNED

(These are H10 tolerances, which are 'all minus' tolerances)

Diameter (mm)	Tolerance (mm)
18 to 30	+0 / -0.084
31 to 50	+0 / -0.100
51 to 79	+0 / -0.120

DIAMETER - ROUGH TURNED

(These are 'all plus' tolerances)

Diameter (mm)	Tolerance (mm)
75 to 150	-0 / +1.5
151 to 225	-0 / +2.0
226 to 410	-0 / +3.0

DIAMETER - BRIGHT DRAWN

.
Note
These are H9 Tolerances
H9 Tolerances are 'all minus' tolerances:
+0mm / - Figure in table
.

Diameter (mm)	Tolerance (mm)
6 to 10	+0 / -0.036
11 to 18	+0 / -0.043
19 to 30	+0 / -0.052

WIDTH & THICKESS - HOT ROLLED SQUARE

.
.

Size (mm)	Tolerance (mm) + or -
75 to 150	1.5
151 to 225	2.0
226 to 410	3.0

THICKNESS - HOT ROLLED FLAT

.
.

Size (mm)	Tolerance (mm) + or -
Up to 20	0.5
20 to 40	1.0
40 to 80	1.5

WIDTH - HOT ROLLED FLAT

.
.

Size (mm)	Tolerance (mm) + or -
10 to 40	0.75
40 to 80	1.0
80 to 100	1.5
100 to 120	2.0
120 to 150	2.5

ANGLE BARS - LEG LENGTH

Leg (mm)	Leg Length Tol (mm) + or -	Thickness (mm) + or -
20	1.5	0.4
25	1.5	0.5
30	2.0	0.5
40 & 50	2.0	0.6
60, 70, 75, 80, 90, 100	3.0	0.75

[2 OF 8] CONTINUED

ANGLE BARS - INTERNAL RADIUS

Leg (mm)	Max Internal Radius (mm)
20, 25, 30	4
40	5
50, 60	7
65, 70, 75, 80	9
90, 100	10

[3 OF 8] CONTINUED

ISO 286 TOLERANCES IN MM

EXAMPLES:
H = All Minus Tolerance e.g. 45mm dia. H9 = +0 / -0.062
J = Tolerance Divided e.g. 45mm dia. J9 = +/- 0.031
K = All Plus Tolerance e.g. 45mm dia. K9 = +0.062/ -0
(The K tolerance is usually only applied to larger diameter bars - over 75mm

H8 = Precision Ground
H9 = Bright Drawn
H10 = Smooth Turned

In the following table:
TOLERANCE IN mm FOR GIVEN TOLERANCE NUMBER

Diameter (mm)	6	7	8	9	10	11	12	13
>1 to 3 inc.	0.007	0.009	0.014	0.025	0.040	0.060	0.090	0.140
>3 to 6 inc.	0.008	0.012	0.018	0.030	0.048	0.075	0.120	0.180
>6 to 10 inc.	0.009	0.015	0.022	0.036	0.058	0.090	0.150	0.220
>10 to 18 inc.	0.011	0.018	0.027	0.043	0.070	0.110	0.180	0.270
>18 to 30 inc.	0.013	0.021	0.033	0.052	0.084	0.130	0.210	0.330
>30 to 50 inc.	0.016	0.025	0.039	0.062	0.100	0.160	0.250	0.390
>50 to 80 inc.	0.019	-	0.046	0.074	0.120	0.190	0.300	0.460
>80 to 120 inc.	0.022	-	-	0.087	0.140	0.220	0.350	0.540
>120 to 180 inc.	0.025	-	-	0.100	0.160	0.250	0.400	0.630
>180 to 250 inc.	-	-	-	0.115	0.185	0.290	0.460	0.720
>250 to 315 inc.	-	-	-	-	-	0.320	0.520	0.810
>315 to 400 inc.	-	-	-	-	-	0.360	0.570	0.890
>400 to 500 inc.	-	-	-	-	-	0.400	0.630	0.970
> 500	-	-	-	-	-	0.440	0.700	1.100

[4 OF 8] CONTINUED

STRAIGHTNESS TOLERANCES FOR BRIGHT BARS

Taken from BS EN 10278:1999, applicable to Bright Bars only.

Method of measuring deviation - Preferred Method B.1 from BS EN 10278:
1. The bar shall be supported on a suitable surface so as to eliminate or minimise sagging.
2. A 1 metre long straight edge shall be placed on the surface of the bar at any position along it's length. No part of the straight edge shall be within 150mm of the ends of the bar.
3. Straightness shall be determined by measuring the gap between the bar and the straight edge by suitable means such as a feeler guage.

The following table indicates:
DEVIATION FROM STRAIGHTNESS

Product	Dimension	Max Deviation in mm within a 1mtr length measured at least 150mm from either end of bar
Round		1.0mm
Square & Hexagon	< or = 75mm	1.0mm
Square & Hexagon	> 75mm	1.5mm
Flat	Width < 120mm	On Width: 1.5mm
Flat	Width < 120mm	On Thickness: 2.0mm
Flat	Width > or = 120mm	On Width: 2.0mm
Flat	Width/Thickness < 10.1	On Thickness: 2.5mm
Flat	Width > or = 120mm	On Width: 2.5mm
Flat	Width/Thickness > or = 10.1	On Thickness: 3.0mm

[5 OF 8] CONTINUED

STAINLESS STEEL GRADES

The following Table lists:

Stainless Steel Grades, Compositions & Typical Mechanical Properties

Mechanical Properties apply to Rolled Products

EN	BS	AISI	EN No.	Comp	Comp	Comp	Comp	Comp	Mech	Mech	Mech
			Obsolete	C	Cr	Ni	Mo	Other	Proof 0.2%N mm	Tensile Nmm	Elong %
1.4000	403S17	410S	-	0.08x	12	-	-	-	20-250	400-600	19
1.4002	405S17	405	-	0.08x	12	-	-	0.2 Al	210-250	400-600	17
1.4003	-	-	-	0.03x	11	0.5	-	-	250-320	450-650	18-20
1.4016	430S17	430	60	0.08x	17	-	-	-	240-280	430-630	18-20
1.4113	434S17	434	-	0.08x	17	-	1	-	260-280	450-630	18
1.4509	-	-	-	0.015x	18	-	-	Nb, Ti	-	-	-
1.4510	-	430Ti	-	0.05x	17	-	-	0.6 Ti	230-240	420-600	23
1.4511	-	430Nb	-	0.05x	17	-	-	0.6 Nb	230-240	420-600	23
1.4512	409S19	409	-	0.03x	11	-	-	0.5 Ti	210-220	380-560	25
1.4521	-	(444)	-	0.025x	17	-	2	0.6 Ti	-	-	-
1.4006	410S21	410	56A	.08-.15	12	-	-	-	400-450	550-850	12-20
1.4005	416S21	416	56AM	.08-0.15	12	-	-	.35xS	450	650-850	12
1.4021	420S29	420	56B	.16-.25	12	-	-	-	450-550	650-950	10-15
1.4028	420S45	420	56D	.26-.35	12	-	-	-	600	740-1000	10-15
1.4029	416S37	416	56CM	.25-.32	12	-	-	.35xS	-	-	-
1.4057	431S29	431	57	.12-.22	15	2	-	-	-	-	-
1.4104	416S29	416	56BM	.10-.17	16	-	0.4	.35xS	500	650-850	10
1.4112	-	440B	-	.85-.95	17	-	1.0	0.1V	-	900max	12
1.4125	-	440C	-	.95-1.2	17	-	0.6	-	-	900max	12
1.4594	460S52	-	-	0.7x	14	5	1.5	1.5 Cu	700-1000	930-1270	10
1.4749	-	446	-	.15-.20	26	-	-	0.2N	-	-	-
1.4301	304S31	304	58E	0.07x	18	8	-	-	210-260	520-750	45
1.4303	305S19	305	-	0.06x	18	11	-	-	200-250	500-650	45
1.4305	303S31	303	58M	0.10x	18	8	-	0.35xS	190-230	500-700	35
1.4306	-	304L	-	0.030x	18	10	-	-	200-250	500-670	45
1.4307	304S11	304L	-	0.030x	18	8	-	-	200-250	500-670	45
1.4310	301S21	301	-	0.05/0.1	17	6	-	-	250-280	600-950	40
1.4311	304S61	304LN	-	0.030x	18	9	-	0.22xN	270-320	550-750	40
1.4372	-	201	-	0.15x	17	4.5	-	6.5Mn	330-380	750-950	40

[6 OF 8] CONTINUED

STAINLESS STEEL GRADES - CONT'D

The following Table lists:

Stainless Steel Grades, Compositions & Typical Mechanical Properties

Mechanical Properties apply to Rolled Products

EN	BS	AISI	EN No Obsolete	Comp C	Comp Cr	Comp Ni	Comp Mo	Comp Other	Mech Proof 0.2% Nmm	Mech Tensile Nmm	Mech Elong %
1.4401	316S31	316	58J	0.07x	17	11	2	-	220-270	520-680	40
1.4404	316S11	316L	-	0.030x	17	11	2	-	220-270	520-680	40
1.4406	316S61	316LN	-	0.030x	17	11	2	0.22xN	280-330	580-780	40
1.4432	316S13	316L	-	0.030x	17	11	2.5	-	220-270	520-700	40
1.4435	316S13	316L	-	0.030x	17	13	2.5	-	220-270	520-700	40
1.4436	316S33	316	58J	0.05	17	11	2.5	-	220-270	500-730	40
1.4438	317S12	317L	-	0.030x	18	13	3	-	220-270	520-720	35
1.4439	-	-	-	0.030x	17	13	4	0.22xN	270-320	580-780	35
1.4541	321S31	321	58B	0.08x	18	9	-	0.5Ti	200-250	500-720	40
1.4550	347S31	347	58F	0.08x	18	9	-	0.5Nb	200-250	500-720	40
1.4571	320S31	(316Ti)	-	0.08x	17	11	2	0.5Ti	220-270	520-690	40
1.4539	904S13	-	-	0.020x	19	24	4	2xCu	220-270	520-730	35
1.4547	-	-	-	0.020x	20	18	6	1xCu	300-350	650-850	35
1.4833	309S16	309	-	0.15x	22	12	-	-			
1.4845	310S24	310	-	0.10x	25	20	-	-			
1.4878	321S51	321H	-	0.10x	18	9	-	0.6TI			

TOLERANCES

~ The ISO tolerances shown are taken from ISO 286.

~ All other tolerances shown in this document are based upon the relevant part's of the applicable EN Standard's.

~ For tolerances on Rolled Edge Flat Bar please refer to separate Datasheet

[7 OF 8] CONTINUED

CONTACT

Address:	Gould Alloys Ltd Markham Lane Markham Vale Chesterfield S44 5HS United Kingdom
Tel:	+44 (0) 1246 263300
Email:	sales@gouldalloys.co.uk
Web:	www.gouldalloys.co.uk

REVISION HISTORY

Datasheet Updated	14 November 2018

DISCLAIMER

This Data is indicative only and as such is not to be relied upon in place of the full specification. In particular, mechanical property requirements vary widely with temper, product and product dimensions. All information is based on our present knowledge and is given in good faith. No liability will be accepted by the Company in respect of any action taken by any third party in reliance thereon.

Please note that the 'Datasheet Update' date shown above is no guarantee of accuracy or whether the datasheet is up to date.

The information provided in this datasheet has been drawn from various recognised sources, including EN Standards, recognised industry references (printed & online) and manufacturers' data. No guarantee is given that the information is from the latest issue of those sources or about the accuracy of those sources.

Material supplied by the Company may vary significantly from this data, but will conform to all relevant and applicable standards.

As the products detailed may be used for a wide variety of purposes and as the Company has no control over their use; the Company specifically excludes all conditions or warranties expressed or implied by statute or otherwise as to dimensions, properties and/or fitness for any particular purpose, whether expressed or implied.

Advice given by the Company to any third party is given for that party's assistance only and without liability on the part of the Company. All transactions are subject to the Company's current Conditions of Sale. The extent of the Company's liabilities to any customer is clearly set out in those Conditions; a copy of which is available on request.