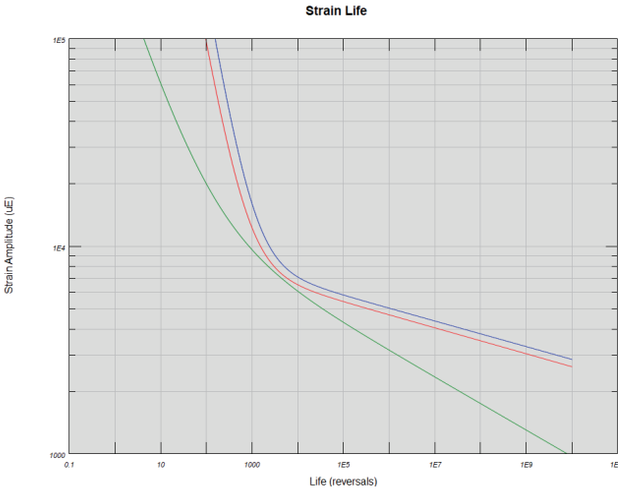
nCode by HBK
HOTTINGER BRÜEL & KJÆR

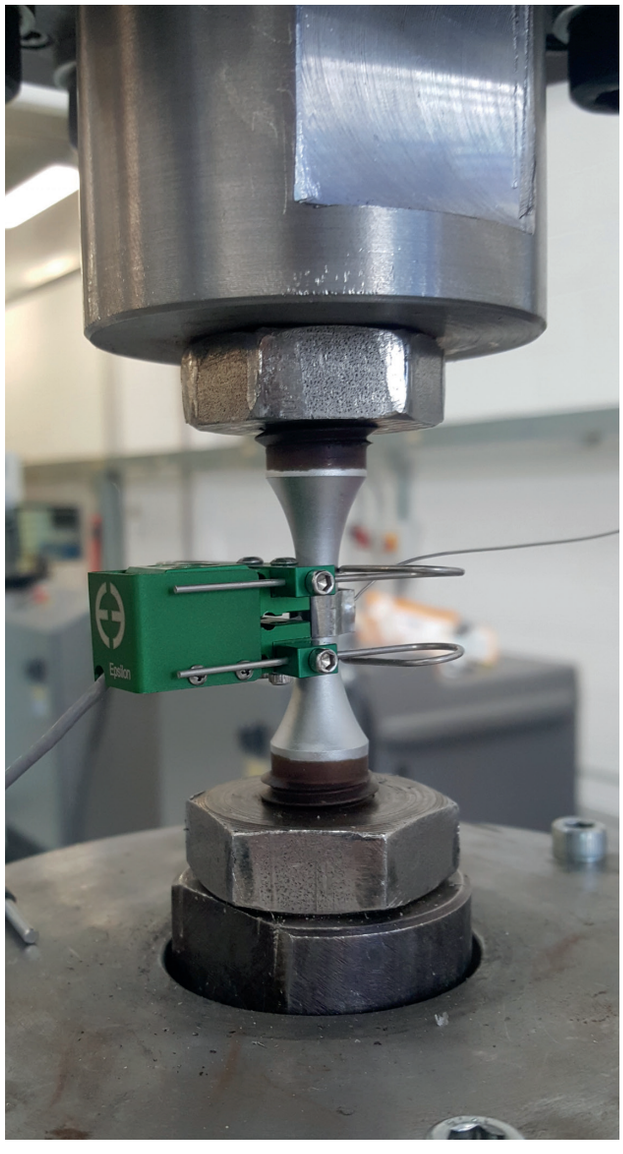
Premium materials database

The Premium Materials Database contains over 145 fatigue properties primarily for commonly used types of steel and aluminium alloys, plus some other non-ferrous materials. These high quality fatigue parameters include statistical estimates of scatter to enable reliability and certainty of survival to be assessed.

In order to achieve the closest fatigue estimation for design, we recommend using material parameters from material tested in the exact condition. This means using the composition, manufacturing route, and heat treatment condition (including strength) that is directly relevant to the component. These parameters should ideally come from test coupons machined from an actual component.

Please visit our website to learn more about the material characterisation and fatigue testing services offered at the ISO-9001 certified Advanced Materials Characterisation and Test Facility (AMCT) owned and operated by HBK.





The Premium Materials Database contains an unprecedented collection of fatigue properties using data derived from tests performed at the AMCT

STANDARD CURVES

The standard material curves (SN and EN) are defined at a 50% Certainty of Survival, that is, 50% of specimens would be expected to fail below this curve. The Confidence Interval accounts for the sample size tested. The smaller the sample size, the lower the confidence and hence the larger the modification factor required. In the case of the standard curve, a 50% confidence interval has been used. Standard Error values are included with all the standard material curves and allow results for different certainty of survivals to be calculated in the fatigue analysis.

DESIGN CURVES

Some of the material entries found in the Premium Materials Database are defined as a Design Curve. Unless specified in the material, the design curve is specified at a 97.7% Certainty of Survival with a 95% Confidence Interval.

Certainty of Survival is used to specify the acceptable failure rate, for example, a 97.7% certainty of survival would anticipate only 2.3% of all test specimens to fail below the design curve.

The Confidence Interval accounts for the sample size tested. The smaller the sample size the lower the confidence and hence the larger the modification factor required. The 97.7/95 design curve, for example, estimates the life at which only 2.3% of all samples will fail with 95% confidence, based on the sample size analysed.

Note that the statistical assurance offered by the material design curve is, in addition to all other safety factors, applied in design. For example, if the user applies independent safety factors on input load, residual stress and FE convergence, then these factors combine to form a very significant margin against failure. This is the reason why most people accept the 97.7/95% design curve on materials because they also consider additional factors elsewhere. The combination of all factors is then within the design tolerance, that is, 4.5-sigma or 6-sigma.

When specified as a Design Curve, the standard error is set to 0; this ensures that any analysis carried out is not affected by the Certainty of Survival setting, and that the design curve is used as entered.

MATERIAL NAMES AND CORRESPONDING SPECIFICATIONS

Often, material names are shared by several Standards bodies making it possible to provide exact equivalents. For others, it can be difficult to find an equivalent as the material may share the same alloy family basis but with detailed compositional or microstructural differences and heat or surface treatments, and with static properties which overlap those of the material as measured. Such materials could be considered comparable but not equivalent. For this reason, this document includes a list of searchable equivalents.

STEEL – STEEL AND CAST IRON

Steel		
100Cr6 Steel	BS970 080M40 Steel	EN10204 3.2 EH36 Steel
13-8 PH Stainless Steel	BS970 212A42 Steel	Hardox 400
17-4 PH Stainless Steel	BS970 605M36 Steel	HR1 Steel
2205 Duplex Stainless Steel	BS970 655M13 Steel As-received	HR340 Steel (1.6mm)
2507 Duplex Stainless Steel	BS970 709M40 Steel T Condition	HR340 Steel (2.0 mm)
409 Stainless Steel Sheet; Longl	BS970 817M40 Steel Normalised	Nitronic 60 Stainless Steel
409 Stainless Steel Sheet; Trans	BS970 817M40 Steel T Condition	Ovako 225A Steel
AISI 4140 Steel; Modified	BS970 835M30 Steel	Ovako 277Q Steel
AISI 4140 Steel	BS970 En19 Steel T Condition	Ovako 677 Steel
AISI 4140 Steel; Modified		
AISI 4145H Mod Steel	BS970 En25 Steel	SAE 8620H – As-rolled
AISI 4330V Steel	BS970 En45 Steel	SAE J2340 700R Steel
AISI 4330v Steel (New)	C55 Steel	SPHN440R – DS Steel
ASTM A36 Steel	C70 Steel	SPHN540R – DS Steel
Boehler VMR W403 Steel	Corten B Steel Longl	USI RW450 Steel
Boehler W302 Isobloc Steel	Corten B Steel Trans	USI RW500 Steel
Boehler W302 Isodisc Steel	CR180P Steel	X3CrNiMo 13-4 Stainless
BS Aerospace 5 S99 Steel	CR210P Steel	
BS EN10025 Grade S275JR Steel Longl	CR3 Steel	
BS EN10025 Grade S275JR Steel Trans	CR340 Steel	
BS EN10025 Grade S355J2 Steel Longl	CR4 Steel	
BS EN10025 Grade S355J2 Steel Trans	DC01 Steel	**Cast Iron**
BS EN10025 Grade S355J2_12mm Steel Longl	DC05 Steel (1mm)	FCD450-10 Cast Iron
BS EN10025 Grade S355J2_12mm Steel Trans	DC05 Steel (2mm)	GJS400-18 Cast Iron
BS EN10025 Grade S355JR Steel Longl	DC05 Steel (3mm)	GJS500 Cast Iron
BS EN10025 Grade S355JR Steel Trans	Docol 900M Steel – Longl	GJS600 Cast Iron
BS EN10088-3 X2CrNiMo17-12-2 Stainless Steel	Docol 900M Steel – Trans	
BS EN10088-3 X5CrNi18-9 Stainless Steel	Docol 1000DP Steel; Longl	
BS EN10088-3 X6CrNiTi18-10 Stainless Steel	Docol 1000DP Steel; Trans	
BS EN10088-3 X8CrNiS18-9 Stainless Steel	Domex 700MC Steel; Longl	
BS3100 Grade A4 Cast Steel	Domex 700MC Steel; Trans	
BS4360 Grade 40A Steel	Domex 960 Steel Longl	
BS4360 Grade 50A Steel	Domex 960 Steel Trans	

MATERIAL SPECIFICATIONS – ALUMINIUM/TITANIUM/MAGNESIUM/BRONZE/COPPER/NICKEL

Aluminium	**Titanium**
AA 2024 – T851 Aluminium Alloy – Longl	Ti6Al4V – bar
AA 2024 – T851 Aluminium Alloy – Trans	Ti6Al4V – Sheet
AA 1050-H14 Aluminium Alloy Longl	Ti-6Al-4V PM HIP
AA 1050-H14 Aluminium Alloy Trans	Ti6Al4V – EBM; Vertical Non Heat Treated
AA 2014-T651 Aluminium Alloy	Ti6Al4V – EBM; Vertical Standard HIP
AA 2014A – T 6511 Aluminium Alloy	Ti6Al4V – EBM; 45deg Standard HIP
AA 2024 - T851 Aluminium Alloy - Longl	
AA 2024 - T851 Aluminium Alloy - Trans	
AA 2024 Aluminium Alloy	Ti6Al4V – Wire-DED (Horizontal)
AA 2124-T851 Aluminium Alloy	Ti6Al4V – Wire-DED (Vertical)
AA 5083 Aluminium Alloy	**Magnesium**
AA 5251-H22 Aluminium Alloy	AZ61AF Magnesium Alloy
AA 5251-H22 Aluminium Alloy Longl	AZ91D Magnesium Alloy
AA 5251-H22 Aluminium Alloy Trans	MgAl2Mn Magnesium Alloy
AA 6061-T6511 Aluminium Alloy	MgAl4Mn Magnesium Alloy
AA 6063-T6 Aluminium Alloy	MgAl5Mn Magnesium Alloy
AA 6082-T6 Aluminium Alloy	MgAl6Mn Magnesium Alloy
AA 7049-T73 Aluminium Alloy	
AA 7050-T74 Aluminium Alloy	**Bronze**
AA 7050-T7451 Aluminium Alloy	Aluminium Bronze Def Std D833
AA 7050-T7651 Aluminium Alloy	C95400 Aluminium Bronze
AA 7075 - T7351 Aluminium Alloy	AMS4625G Phosphor Bronze
AA 7075-T73 Aluminium Alloy	CW451K Phosphor Bronze
AA 7175-T74 Aluminium Alloy	**Copper**
AA 7475-T7351 Aluminium Alloy - Longl	C106 OFHC Copper
AA 7475-T7351 Aluminium Alloy - Trans	
AlMg5Si2Mn Cast Aluminium Alloy	
AlSi9Cu3 Cast Aluminium Alloy	
AlSi9Cu3Fe Cast Aluminium Alloy	**Nickel**
C355 Cast Aluminium Alloy	Monel 400 20pcld
LM27 As Cast Aluminium Alloy	Inconel IN718 L-PBF 45-Degree Stress Relieved
LM27M Cast Aluminium Alloy	Inconel IN718 L-PBF 45-Vertical Stress Relieved
LM27TF Cast Aluminium Alloy	Inconel IN718 L-PBF Vertical HIP
	Inconel IN718 L-PBF 45-Horizontal Stress Relieved
	Inconel IN718 L-PBF 45-Horizontal Stress Relieved

Note	The entries for 2024 – T851 Aluminium Alloy – Longl and 2024 – T851 Aluminium Alloy – Trans have been given an AA prefix for naming consistency with other Aluminium alloys.

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Note

Fatigue properties may not be identical between the equivalent specifications. If a specification is marked by an asterisk, then it is not an exact equivalent. For example, 40CrNiMo Steel > WNR Specification = 1.6562*.

MATERIAL NAMES AND CORRESPONDING SPECIFICATIONS

Material	ISO	WNR	EN	UNS	BS	US	DIN	NF	JIS	Trade name
100Cr6 Steel	ISO 4957 (12/1999) 102Cr8	1.2067	EN 10132-4 (02/2000 +AC 12/2002)	T61203	BS EN 0132-4 (02/2000 + AC 12/2002) 102Cr6		102Cr6 and 100Cr6	AFNOR NF EN 10132-4 (02/2000 + AC 12/2002) 102Cr6 and AFNOR NF A 35-590 (1992) 100Cr6	JIS G 4805 (2008) SUJ 2	
13-8 PH Stainless Steel				S13800		AMS 5629				
17-4 PH Stainless Steel	X5CrNi-CuNb 16.4	1.4542		S17400		AMS 5643, ASTM A564				
21CrMoV5-7 Steel			21CrMoV5- 7		21CrMoV5-7		(04/ 2006) 21CrMoV5-7	(04/2006) 21CrMoV5-7		56 TG, BGH 7709, DE 7709, Remy 1.7709
2205 Duplex Stainless Steel		1.4462	EN 10083:part3 :2005 1.4462	S32205	BS 970 318S13	ASTM S31803 or S32205	X2CrNiMoN 22 5 3	Z3 CND 22-05 Az		
2507 Duplex Stainless Steel			EN 10083:part3 :2005 1.4410	S32750		ASTM A182 Grade F53	X2CrNiMoN 25 7 4			
409 Stainless Steel Longl										
409 Stainless Steel Trans										
40CrNiMo Steel	ISO 14737 (2003) G35CrNi-Mo6-6	1.6562*		G43370	BS970 817M40	ASTM E 4340			G4053:20 03 Grade SNCM	
AA 1050-H14 Aluminium Alloy Longl		3.0255	EN 485-1	A91050	1050A to BS1474	AA 1050- H14	Al99.5 to DIN 1725-1	A5	A1050	
AA 1050-H14 Aluminium Alloy Trans		3.0255	EN 485-1	A91050	1050A to BS1474	AA 1050- H14	Al99.5 to DIN 1725-1	A5		
AA 2014-T651 Aluminium Alloy	AlCu4SiMg	3.1255	EN AW-2014	A92014	BS 2L93	2014-T651	AlCuSiMn		A 2014 BE	
AA 2014A-T6511 Aluminium Alloy	AlCu4SiMg	3.1255	EN AW-2014	A92014	BS 2L93	2014-T6511	AlCuSiMn		A 2014 BE	
AA 2024-T851 Aluminium Alloy - Longl			AW-2024	A92024		AMS QQ-A-250/4A, T851				
AA 2024-T851 Aluminium Alloy-Trans			AW-2024	A92024		AMS QQ-A-250/4A, T851				
AA 2024 Aluminium Alloy	AlCu4Mg1	3.1355	EN AW-2024	A92024	BS 2L97	2024	AlCuMg2	A-U4G1	A 2024 BE	
AA 2124-T851 Aluminium Alloy	AlCu4Mg1	3.1254	EN2422	A92124	AA2124-T851	AMS 4101, AMS QQ-A-250/29, ASTM B209				
AA 5083 Aluminium Alloy	AlMg4.5Mn 0.7	3.3547	EN AW-5083	A95083	NE8	5083		5083	A 5083 BE	

Material	ISO	WNR	EN	UNS	BS	US	DIN	NF	JIS	Trade name
AA 5251-H22 Aluminium Alloy	ISO 6361-2 5251	3.3525	EN AW-5251	A95251	BS EN AW-5251	5251-H22	AlMg2Mn0.3	A-G2M	A 5251T	
AA 5251-H22 Aluminium Alloy Longl	ISO 6361-2 5251	3.3525	EN AW- 5251	A95251	BS EN AW- 5251	5251-H22	AlMg2Mn0.3	A-G2M	A 5251T	
AA 5251-H22 Aluminium Alloy Trans	ISO 6361-2 5251	3.3525	EN AW- 5251	A95251	BS EN AW- 5251	5251-H22	AlMg2Mn0.3	A-G2M	A 5251T	
AA 6061-T6511 Aluminium Alloy	AlMg1SiCu	3.3211		A96061	6061	AA 6061-T6511	AlMg1SiCu	6061	A6AISI 4140 Steel; Modified	
AA 6063-T6 Aluminium Alloy	AlMg0.7Si		EN AW- 6063	A96063	HE9	6063			A 6063 BE	
AA 6082-T6 Aluminium Alloy	AlSi1MgMn	3.2315	AA-6082	A96082	6082	AA 6082-T6	AlMgSi			
AA 7049-T73 Aluminium Alloy	AlZn8MgCu			A97049	AA 7049-T73	AA 7049- T73, AMS 4111				
AA 7050-T74 Aluminium Alloy	AlZn-6CuMgZr	3.4144		A97050	AA 7050-T74	AA 7050- T74				
AA 7050-T7451 Aluminium Alloy	AlZn-6CuMgZr	3.4144		A97050	AA7050-T7451	AA7050-T7451, AMS 4050H				
AA 7050-T7651 Aluminium Alloy	AlZn-6CuMgZr	3.4144		A97050	AA7050-T7651	AA7050-T7651, AMS4201F-2014				
AA 7075-T7351 Aluminium Alloy	Zn6MgCu	3.4365	EN AW- 7075	A97075	AA 7075-T 7351	AA 7075-T 7351	AlZnMg-Cu1,5			
AA 7075-T73 Aluminium Alloy	Zn6MgCu	3.4365	EN AW- 7075	A97075	AA 7075-T73	AA 7075-T73	AlZnMg-Cu1,5			
AA 7175-T74 Aluminium Alloy	AlZn5.5Mg-Cu	3.4334		A97175	AA 7175-T74	AA 7175- T74, AMS4149				
AA 7475-T7351 Aluminium Alloy Longl				A97475		AMS 4202				
AA 7475-T7351 Aluminium Alloy Trans				A97475		AMS 4202				
AISI 4140 Steel	ISO 683-18 (1996) Grade 42CrMo4	1.7225	EN 10083-3 (08/2006) Grade 42CrMo4	G41400	BS EN 10083-3 (08/2006) Grade 42CrMo4	SAE 4140 (AISI 4140)	DIN EN 10083-3 (01/2007) Grade 42CrMo4	NF EN 10083-3 (08/2006) Grade 42CrMo4	JIS G 4052 (2008) Grade SCM 440H	
AISI 4140 Steel; Modified										
AISI 4145H Modified Steel	ISO 683-18 42CrMo4	1.7225	EN 10083-1 42CrMo4	H41450	BS 970 En19, En 19A, 709M40	AISI 4145H	42CrMo4	42 CD 4*	JIS G 4053 SCM 440	
AISI 4330V Steel				K23080		SAE 4330 mod				4330+V VAC-ARC
AISI 4330V Steel (New)				K23080		SAE 4330 mod				4330+V VAC-ARC

Material	ISO	WNR	EN	UNS	BS	US	DIN	NF	JIS	Trade name
AISI 8630 Steel (Modified)			30CrNiMo6 (modified) meets mechanical properties for SEW550-34CrN-iMo6 / EN 1.6582							
AlMg5Si2Mn Cast Aluminium Alloy	AlMg-5Si2Mn		EN AB-51500							Magsimal 59
AlSi9Cu3 Cast Aluminium Alloy	AlSi8Cu3	3.2163.01	EN AB- 46200				G-AlSi9Cu3		AC4B	
AlSi9Cu3Fe Cast Aluminium Alloy	Al-Si9Cu3(Fe)		EN AB- 46000				G-AlSi9-Cu3(Fe)			
Al-Bronze Def Std D833	*CuAl10Fe-5Ni5 -GC to ISO 1338:1977	2.0966	*CW304G	C63000	*CA105 to BS 2875	C63000	2.0966	NFL 14705/ NF A 51-115	*C6301 to JIS H 3100	
AMS462G Phosphor Bronze										
ASTM A36 Steel			EN 10025-2 S235							
ASTM B166 Inconel 600		2.4816		N06600	BS3072-76: NA14	ASTM B166-168, B564; ASME SB166-168, SB564; AMS 5540, 7232	17742:NiCr 15Fe	AFNOR NC 15Fe		
AZ61AF Mag-nesium Alloy										
AZ91D Mag-nesium Alloy			EN 1753 MC21120	M11916		ASTM B94 AZ91D			H2222 and H5303 MD11D	AZ91D
Boehler VMR W403 Steel										Boehler VMR W403
Boehler W302 Isobloc Steel										Boehler W302 Isob- loc
Boehler W302 Isodisc Steel										Boehler W302 Iso-disc
BS Aerospace 5 S99 Steel		1.6944*		G43370	BS Aerospace 5 S 99	AISI 4337 SAE 4335 (mod)	40Ni-MoCr10-5 (W.Nr. 1.6745)	30 NCD 16 (W. Nr. 1.6604*)		
BS EN10025 Grade S275JR Steel Longl		1.0044	EN 10025:part2 :2004 Grade S275JR		BS EN 10025:part2 :2004 Grade S275JR		St44-2			
BS EN10025 Grade S275JR Steel Trans		1.0044	EN 10025:part2 :2004 Grade S275JR		BS EN 10025:part2 :2004 Grade S275JR		St44-2			
BS EN10025 Grade S355J2 Steel Longl		1.057	EN 10025:part2 :2004 Grade S355J2		BS EN 10025:part2 :2004 Grade S355J2		Fe 510 D1 FF (St 52-3)	E 36-4	SM 520B	
BS EN10025 Grade S355J2 Steel Trans		1.057	EN 10025:part2 :2004 Grade S355J2		BS EN 10025:part2 :2004 Grade S355J2		Fe 510 D1 FF (St 52-3)	E 36-4	SM 520B	

Material	ISO	WNR	EN	UNS	BS	US	DIN	NF	JIS	Trade name
BS EN10025 Grade S355J2_12 mm Steel Longl		1.057	EN 10025_part 2:2004 Grade S355J2		BS EN 10025:part2 :2004 Grade S355J2		Fe 510 D1 FF (St 52-3)	E 36-4	SM 520B	
BS EN10025 Grade S355J2_12 mm Steel Trans		1.057	EN 10025:part2 :2004 Grade S355J2		BS EN 10025:part2 :2004 Grade S355J2		Fe 510 D1 FF (St 52-3)	E 36-4	SM 520B	
BS EN10025 Grade S355JR Steel Longl		1.0045	EN 10025:part2 :2004 Grade S355JR		BS EN 10025:part2 :2004 Grade S355JR					
BS EN10025 Grade S355JR Steel Trans		1.0045	EN 10025:part2 :2004 Grade S355JR		BS EN 10025:part2 :2004 Grade S355JR					
BS EN10088-3 X2CrNi-Mo17-12-2 Stainless Steel	ISO 16143-2 (2004) X2CrNi-Mo17-12-2*	1.4404	EN 10088-3 (6/2005) X2CrNi-Mo17-12-2	S31603*	BS EN 10088-3 (6/2005) X2CrNi-Mo17- 12-2	AISI/SAE 316L	DIN EN 10088-3 (6/2005) X2CrNi-Mo17-12-2	NF EN 10088-3 (6/2005) X2CrNi- Mo17-12-2	JIS G 4303 (2005) SUS 316L*	IMCO316L
BS EN10088-3 X5CrNi18-9 Stainless Steel	ISO 16143-2 (2004) X5CrNi-18-9*	1.4307 (also meets 1.4301)	EN 10083-3 (6/2005) X5CrNi18-9	S30403*	BS EN 10083-3 (6/2005) X5CrNi18-9	AISI/SAE 304L	DIN EN 10083-3 (6/2005) X5CrNi18-9	NF EN 10083-3 (6/2005) X5CrNi18-9	JIS G 4303 (2005) SUS304L*	Roldamax - 229
BS EN10088-3 X6CrNi-Ti18-10 Stainless Steel	ISO 16143-2 (2004) X6CrNi-Ti18-10 *	1.4541	EN 10088-3: 2005 X6CrNi-Ti18-10	S32100 *	BS EN 10088-3 (6/2005) X6CrNiTi18-10	AISI/SAE 321	DIN EN 10088-3 (6/2005) X6CrNiTi18-10	AFNOR NF EN 10088-3 (6/2005) X6CrNiTi18-10	JIS G 4303 (2005) SUS321 *	Valbruna VALSTOCK 2010 1.451/ 321 A
BS EN10088-3 X8CrNiS18-9 Stainless Steel	ISO 16143-2 (2004) X10CrNi-S18-9 *	1.4305	EN 10088-3 (6/2005) X8CrNiS18- 9	S30300	BS EN 10088-3 (6/2005) X8CrNiS18-9	AISI/SAE 303/303L	DIN EN 10088-3 (6/2005) X8CrNiS18-9	AFNOR NF EN 10088-3 (6/2005) X8CrNiS18- 9	JIS G 4303 (2005) SUS 303	
BS3100 Grade A4 Cast Steel						AISI C1027				
BS4360 Grade 40A Steel			EN 10025:1993 Grade S235		BS EN 10025:1993 Grade S235					
BS4360 Grade 50A Steel			EN 10025:1993 Grade S355		BS EN 10025:1993 Grade S355					
BS970 080M40 Steel		1.1186			BS 970 080M40	AISI/ SAE1040	C40E			
BS970 212A42 Steel		1.0727	En 10277:part3:		BS970 212A42	SAE1141	46S20	45MF4		BGOH727
BS970 605M36 Steel					BS970 En16 Normalised					
BS970 655M13 Steel As received	ISO 683-11 (1987) 15NiCr13	1.5752	EN 10084 (6/2008) 15NiCr13	UNS G33106*	BS EN 10084 (6/2008) 15NiCr13		DIN EN 10084 (6/2008) 15NiCr13	AFNOR NF EN 10084 (6/2008) 15NiCr13	JIS G4053 (2008) SNC815*	BS 970 Part1 (1996) 655M13, EN36A
BS970 709M40 Steel T Condition		1.7225	EN 10083:part 3		BS 970 709M40		42CrMo4	42 CD 4*		
BS970 817M40 Steel Normalised		1.6562*	EN 10083:part1 :1991 Grade 817M40		BS EN 10083:part1: 1991Grade 817M40"N" Condition	SAE 4337 (SAE4340*)	34CrNiMo6	34CrNiMo8 (35NCD6*)		Monix 15

Material	ISO	WNR	EN	UNS	BS	US	DIN	NF	JIS	Trade name
BS970 817M40 Steel T Condition		1.6562*	EN 10083:part1 :1991 Grade 817M40"		BS EN 10083:part1 :1991 Grade 817M40"T" Condition	SAE 4337 (SAE4340*)	34CrNiMo6	34CrNiMo8 (35NCD6*)		Monix 15
BS970 835M30 Steel		1.6773			BS 970 835M30		36NiCrMo16			
BS970 En19 Steel T Condition		1.7225	EN 10083:part3		BS 970 709M40		42CrMo4	42 CD 4*		
BS970 En25 Steel		1.6743	32NiCrMo1 0-4	BGH 6743	BS 970-3: 1991 826M31, BS Aerospace S153*, S154		32NiCrMo1 0-4			BGH 6743
BS970 En45 Steel		1.5026	EN 10089 (12/2002) 56Si7	G92550	BS 970 251A58	SAE J 1249 (2008) 9255		AFNOR NF A35-571 (1996) 56 SC 7		
C106 0FHC Copper	Cu-DHP		Cu-DHP			ASTM C12200				
C355 Cast Aluminium Alloy	AlSi-5Cu1Mg		EN AC- 45300	A03550	LM16	C355.0			AC4D.1	
C55 Steel	ISO 683-18 (1996) C55*	1.0535	EN 10083-2 (08/2006) C55		BS970 Pt3 (1991) 080M50 or En43A		DIN EN 10083-2 (10/2006) C55	AFNOR NF EN 10083-2 (08/2006) C55 or AFNOR NF A 35-552-2	S 55 C- CSP	
C95400 Aluminium Bronze				C95400		ASTM B148				
C70 Steel		1.1249					C70G	C70		
Corten B Steel Longl										
Corten B Steel Trans										
CR180P Steel										GWM3032 M-ST-S CR180P
CR210P Steel										GWM3032 M-ST-S CR210P
CR3 Steel	ISO 3574 (2012) Grade CR3*									GWM2M-ST-S CR3
CR340 Steel	ISO 13887 (2011) 340Y*	1.0548	EN 10268 (10/2006) HC340LA		BS EN 10268 (7/2006) HC340LA	ASTM A 1008-11 (HSLAS Grade 50 (340) Class 1)	DIN EN 10268 (10/2006) HC340LA	AFNOR NF EN 10268 (7/2006) HC340LA	SPFC490*	GWM3032 M-ST-S CR340
CR4 Steel	ISO 3574 (2012) Grade CR4*									GWM2M-ST-S CR4
CW451K Phosphor Bronze										
DC01 Steel	ISO 3574 (2012) Grade CR1"	1.033	EN 10130 (02/2007)	G10080		AISI 1008	DIN EN 10130 (02/2007)	Afnor NF EN 10130 (12/2006)	JIS G 3141 (2011) Grade SPCC	

Material	ISO	WNR	EN	UNS	BS	US	DIN	NF	JIS	Trade name
DC05 Steel (1 mm)		1.0312	EN 10130 Grade DC05				FeP05 (DIN 1623 Part 1 St 15)			
DC05 Steel (2 mm)		1.0312	EN 10130 Grade DC05				FeP05 (DIN 1623 Part 1 St 15)			
DC05 Steel (3 mm)		1.0312	EN 10130 Grade DC05				FeP05 (DIN 1623 Part 1 St 15)			
Domex 700MC Steel Longl										
Domex 700MC Steel Trans										
Domex 960 Steel Longl										
Domex 960 Steel Trans										
Docol 900M Steel–Longl										Docol 900M
Docol 900M Steel–Trans										Docol 900M
Docol 1000DP Steel–Longl										Docol 1000DP
Docol 1000DP Steel–Trans										Docol 1000DP
Domex 960 Steel Longl										
Domex 960 Steel Trans										
FCD450-10 Cast Iron	JS 450-10/S	5.3107	EN GJS- 450-10	F33100		ASTM A536 65-45-12		Old NF A 32-201 Grade FGS350-22	FCD 450- 10	
GJS400-18 Cast Iron			EN GJS- 400-18						FCD 400-18	
GJS500 Cast Iron			EN-GJS-500-7		EN-GJS-500-7		EN-GJS-500-7	ENGJS-500- 7		
GJS600 Cast Iron	JS600-3/S		EN-GJS-600-3		EN-GJS-600-3		EN-GJS-600-3	EN-GJS- 600-3	FCD 600-3	
Hardox 400										Hardox400
HR1 Steel										GWM2M-ST-S HR1
HR340 Steel (1.6 mm)										GWM3032 M-ST-S HR340
HR340 Steel (2.0 mm)										GWM3032 M-ST-S HR340
Inconel IN718 45deg Stress Relieved										
Inconel IN718 L-PBF; Vertical HIP										
Inconel IN718 Vertical Stress Relieved										
Inconel IN718 Horizontal Stress Relieved										
LM27 As Cast Aluminium Alloy			EN AB-46400	A03280	LM27	328				
LM27M Cast Aluminium Alloy			EN AB-46400	A03280	LM27	328				
LM27TF Cast Aluminium Alloy			EN AB-46400	A03280	LM27	328				
MgAl2Mn Magnesium Alloy	ISO 16220:2005 MgAl2Mn		EN 1753 AM20							AM20

Material	ISO	WNR	EN	UNS	BS	US	DIN	NF	JIS	Trade name
MgAl4Mn Magnesium Alloy										AM40
MgAl5Mn Magnesium Alloy	ISO 16220: 20050 MgAl5Mn		EN 1753 MC21220							AM50
MgAl6Mn Magnesium Alloy		3.5662	EN 1753 MC21230	M10602						AM60B
Monel 400 20pcld		2.4360		N04400						
Nitronic 60 Stainless Steel				S21800		AMS 5848D				Nitronic 60, Gall-Tough Plus
Ovako 225A Steel										Ovako 225A
Ovako 277Q Steel										Ovako 277Q
Ovako 677 Steel										Ovako 677
SAE 8620H – As-rolled	ISO 683-18 20NiCr-MoS2	1.6526	EN 10277-4 20NiCrMoS 2-2	H86200	BS EN 10277-4 20NiCrMoS2-2	ASTM A 304-11 8620H	DIN EN 10277-4 20NiCr-MoS 2-2	NF EN 10277-4 20NiCrMoS 2-2	JIS G 4052 SNCM 220H	
SAE J2340 700R Steel										
SPHN440R – DS Steel										
SPHN540R – DS Steel										
Ti6Al4V – EBM; Vertical Non Heat Treated										
Ti6Al4V– EBM; Vertical Standard HIP										
Ti6Al4V – EBM; 45deg Standard HIP										
Ti6Al4V – EBM; Horizontal Standard HIP										
Ti6Al4V – bar		3.7164		R56400	BS 3TA 11:2009	AMS 4928		T-A6V		IMI 318
Ti6Al4V – Sheet		3.7164	EN 10204-3.1	R56400		AMS 4911				IMI 318
Ti-6Al-4V PM HIP										
Ti-6Al-4V – Wire-DED (Horizontal)										
Ti-6Al-4V – Wire-DED (Vertical)										
Ti6Al4V – L-PBF; 45 Degree Annealed										
Ti6Al4V – L-PBF; Horizontal Annealed										
Ti6Al4V – L-PBF; Horizontal HIP										
Ti6Al4V – L-PBF; Vertical Annealed										
Ti6Al4V – L-PBF; Vertical HIP										
USI RW450 Steel										
USI RW500 Steel										
X3CrNiMo 13-4 Stainless Steel										

ABOUT US

We help engineers deliver durable and reliable products and avoid the cost of unexpected failures. Our software brands for durability and reliability, nCode and ReliaSoft, empower data-driven confidence through accurate analysis and simulation, enabling customers to achieve success through failure prediction.

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