

Iron & Special Iron Material Specifications

We cast a range of **Ductile** and **Austenitic** cast Iron alloys for high performance and safety critical applications for leading Automotive and Defence manufacturers. The integrity and quality of our material is analysed and qualified within our UKAS approved laboratory to meet all our customers mechanical objectives.

International Specification For Ductile Iron to EN 1563: 1997

Material Designation EN 1563		UK BS 2789 1985	Germany DIN 1693 1973	USA ASTM a536 1993	Tensile Strength	0.2% proof stress N/mm	Elongation %
Symbol	Number						
EN-GJL-150	EN-JL1020	-	GG15	150/175 20B	150 - 250	98 - 165	0.8 – 0.3
EN-GJL-200	EN-JL1030	200-220	GG20	200/225 25B	200 – 300	130 - 195	0.8 – 0.3
EN-GJL-250	EN-JL1040	250 - 260	GG25	250/275 35B	250 - 350	165 - 228	0.8 – 0.3
EN-GJL-300	EN-JL1050	300	GG30	300/325 40B	300 - 400	195 - 260	0.8 – 0.3
EN GJS 350-22	EN JS 1010	350-22	GGG35.3	-	350	220	22
EN GJS 350-22LT	EN JS 1015	350-22L40	GGG35.3LT	-	350	220	22
EN GJS 400-18	EN JS 1020	400-18	GGG40.3	60-40-18	400	250	18
EN GJS 400-18LT	EN JS 1025	100-18L20	GGG40	-	400	240	18
EN GJS 400-15	EN JS 1030	420-12	GGG40.15	65-45-12	400	250	15
EN GJS 450-10	EN JS 1040	450-10	GGG45.1	70-50-05	450	310	10
EN GJS 500-7	EN JS 1050	500-7	GGG50	80-55-06	500	320	7
EN GJS 600-3	EN JS 1060	600-3	GGG60	100-70-03	600	370	3
EN GJS 700-2	EN JS 1070	700-2	GGG70	-	700	420	2
EN GJS 800-2	EN JS 1080	800-2	GGG80	120-90-02	800	480	2
EN GJS 900-2	EN JS 1090	900-2	GGG	-	900	600	2

Mechanical properties as measured on the separate cast test bars

Special Cast Iron

We also cast High silicon Molybdenum (SiMo) and Austempered Ductile Iron (ADI) alloys for leading Automotive and Defence manufacturers. The integrity and quality of our material is analysed and qualified within our UKAS approved laboratory which provide us with the flexibility tailor mechanical specifications to meet all our customers mechanical objectives.

High Silicon - Molybdenum Irons

Chemical Analysis						Mechanical Analysis			
Finecast Designation	C %	Si %	Mn %	S %	Mo %	Mg %	Tensile Strength	0.2% proof Stress	Elongation %
0.5 to 0.7 SiMo	3.0 to 3.4	3.8 to 4.2	0.4 Max	0.15 Max	0.5 to 0.7	0.03 to 0.08	450	310	8
0.7 to 1.25 SiMo	3.2 to 3.8	4.0 to 5.0	0.4 Max	0.15 Max	0.7 to 1.25	0.03 to 0.09	550	480	5

Mechanical properties as measured on the separate cast test bars

ADI grades have been developed to provide lightweight properties that are cheaper than mild steel grades offering improved mechanical properties whilst retaining wear resistance. The combination of strength and resistance to abrasion whilst retaining ductility make it ideal within high performance applications within Automotive, Motorsport and Defence.

ASTM 897M-03 Austempered Ductile Iron (ADI)

Grade	Tensile Strength	0.2% Proof Stress	Elongation %	Brinell Hardness HB
1	900	650	9	269 to 341
2	1050	750	7	302 to 375
3	1200	850	4	341 to 444
4	1400	1100	2	388 to 477
5	1600	1300	1	402 to 512

Mechanical properties as measured on the separate cast test bars

BS EN 1564: 1997 Austempered Ductile Iron (ADI)

Material Designation	Tensile Strength	0.2% Proof Stress	Elongation %	Brinell Hardness HB	
Symbol	Number				
EN-GJS 800-8	EN-JS 1100	800	500	8	260 to 320
EN GJS-1000-5	EN-JS 1110	1000	700	5	300 to 360
EN GJS 1200-2	EN-JS 1120	1200	850	2	340 to 440
EN GJS-1400-1	EN-JS 1130	1400	1100	1	380 to 480

Mechanical properties as measured on the separate cast test bars

Material Specifications for Austenitic Cast Iron

Austenitic Irons have excellent resistance to heat and corrosion in comparison to standard grades. Other properties including thermal expansion, magnetic, permeability, impact value at low temperatures and erosion resistance will vary depending on the austenitic Iron grade. Our foundry and material scientist have both the expertise and the experience to successfully produce these demanding materials within our UKAS approved laboratory which provide us with the flexibility tailor mechanical specifications to meet all our customers mechanical objectives.

International Specification Equivalent to BS 3468: 1986

	International Trade Name	UK BS3468: 1974 & ISO 2892:1973	Germany DIN 1694	USA ASTM A436 & A439	Tensile Strength N/mm	0.2 % Proof Stress N/mm	Elongation %	Brinell Hardness
Flake Graphite	-	L-NiMn 13 7	GGG-NiMn 13 7	-	140-220	-	15	120 - 150
	Ni-Resist 1	L-NiCuCr 15 6 2	GGL-NiCuCr 15 6 2	A436 Type 1	170-210	-	2	120-215
	Ni-Resist 1b	L-NiCuCr 15 6 3	GGL-NiCuCr 15 6 3	A436 Type 1B	190-240	-	1-2	150-250
	Ni-Resist 2	L-NiCr 20 2	GGL-NiCr 20 2	A436 Type 2	170-210	-	2-3	120-215
	Ni-Resist 2b	L-NiCr 20 3	GGL-NiCr 20 3	Type 2b	190-240	-	1-2	160-250
	Nicrosilal	L-NiSiCr 20 5 3	GGL-NiSiCr 20 5 3	-	190-240	-	2-3	140-250
	Ni-Resist 3	L-NiCr 30 3	GGL-NiCr 30 3	A436 Type 3	190-240	-	1-3	120-215
	Ni-Resist 4	L-NiSiCr 30 5 3	GGL-NiSiCr 30 5 5	A436 Type 4	170-210	-	-	150-210
Spheroidal Graphite	-	S-NiMn 13 7	GGG-NiMn 13 7	-	390	-	15	
	Ni-Resist D2	S-NiCr 20 2	GGG-NiCr 20 2	A439 Type D 2	370-480	210-250	7-20	140-200
	Ni-Resist D-2W	S-NiCrNb 20 2	GGG-NiCrNb 20 2	-	370-490	210-250	8 - 20	140-200
	Ni-Resist D-2B	S-NiCrNb 20 3	GGG-NiCrNb 20 3	A439 Type D 2B	370	210-260	7-15	150-255
	Nicrosilal Spheronic	S-NiSiCr 20 5 2	-	-	370-440	210-260	10-18	180-230
	Ni-Resist D-2C	S-Ni 22	GGG-Ni 22	A439 Type D-2C	370-450	170-250	20-40	130-170
	Ni-Resist D-2M	S-Mn 23 4	GGG-NiMn 23 4	A439 Type D-2M	440-480	210-240	20-45	150-180
	Ni-Resist D-3A	S-NiCr 30 1	GGG-NiCr 30 1	A439 Type D-3A	370-450	210-270	13-18	130-190
	Ni-Resist D-3	S-NiCr 30 3	GGG-NiCr 30 3	A439 Type D-3	370 - 480	210-260	7 - 18	140-200
	Ni-Resist D-4A	S-NiSiCr 30 5 2	GGG-NiSiCr 30 5 2	A439 Type D-4A	380-500	210-270	10-20	130-170
	Ni-Resist D-4	S-NiSiCr 30 5 5	GGG-NiSiCr 30 5 5	A439 Type D-4	390-500	240-310	1-4	170-250
	Ni-Resist D-5	S-Ni 35	GGG-Ni 35	A439 Type D-5	370-450	210-290	7-10	140-190
	Ni-Resist D-5B	S-NiCr35 3	GGG-NiCr35 3	A439 Type D-5B	370-450	210-290	10-20	130-170
Ni-Resist D-5S	S-NiCr35 3 2	GGG-NiCr35 3 2	A439 Type D-5S	370 - 470	210-260	15-18	120-150	