

James W Shenton Ltd

Iron Foundry & Engineering Services



Due to investment in a new metal testing laboratory and new spectrometer we can now offer a wider range of metal grades. We have expanded our Ductile Iron range to include Low Temperature Grades, Ni-Resist and ADI. All grades can be certified with Chemical Analysis. Tensile and Charpy Impact Certificates issued by independent UKAS laboratory. Microscopy images can be done in-house and included in Certification of castings. This is the list of our full range of new and existing metals.

METAL GRADES DATA SHEET

British Standards for GREY IRON : to BS EN 1561 : 1997
Casting weight range: 1kg up to 8000kg’s

Grade	Minimum Tensile Strength N/mm2	Maximum Tensile Strength N/mm2	Typical Hardness HB 10/300 (usual range)	BS 1452 1990 N/mm2	BS 1452 1961
EN-GJL-150	150	250	150-183	180	12
EN-GJL-200	200	300	159-194	220	14
EN-GJL-250	250	350	180-222	250	17
EN-GJL-300	300	400	200-280	300	20
GM241*	300	400	220-290	300	-
Hematite**	300	400	200-280	300	-

*Machine Press Tool Grade Cast Iron alloyed to maximise high impact and wear resistant applications.
**Ideal for heat resistant applications such as ingot moulds and melting pots.

British Standards for DUCTILE IRON (S.G.) : to BS EN 1563 : 1997
Casting weight range: 2kg up to 1100kg’s

GRADE	TENSILE STRENGTH N/MM2	0.2% PROOF STRESS N/MM2	ELONGATIO N (%)	TYPICAL HARDNESS HB	BS2789 1985
EN-GJS-350-22LT	350	220	22	<175	
EN-GJS-400-18	400	250	18	<175	400/18
EN-GJS-400-18-LT	400	240	18	<175	-
EN-GJS-400-15	400	250	15	<180	-
EN-GJS-450-10	450	310	10	<212	420/12
EN-GJS-500-7	500	320	7	170-241	500/7
EN-GJS-600-3	600	370	3	192-269	600/3
EN-GJS-700-2	700	420	2	229-302	700/2
EN-GJS 800-2	800	480	2	229-302	800/2

International Specifications for our SG Ductile Iron Range - Equivalent to EN 1563:1997

MATERIAL DESIGNATION EN 1563		UK BS 2789 1985	GERMANY DIN 1693 1973	NETHERLANDS NEN 6002-D 1966	ITALY UNI 4544 1979	SWEDEN SS 1407 1981	USA ASTM A536 1993	INTERNATIONAL ISO 1083 1987
SYMBOL	NUMBER							
EN-GJS 350-22	EN JS1010	350-22						350-22
EN-GJS 350-22LT	EN JS1015	350-22L40	GGG 35.3	GN 38	GS 370-17	17-15		350-22L
EN-GJS 400-18	EN JS1020	400-18		GN 42			60-40-18	400-18
EN-GJS 400-18LT	EN JS1025	100-18L20	GGG 40.3			17-02		400-18L
EN-GJS 400-15	EN JS1030	420-12	GGG 40		GS 400-12	17-00	65-45-12	400-15
EN-GJS 450-10	EN JS1040	450-10					70-50-05	450-10
EN-GJS 500-7	EN JS1050	500-7	GGG 50	GN50	GS 500-7	27-02	80-55-06	500-7
EN-GJS 600-3	EN JS1060	600-3	GGG 60	GN60	GS 600-3	32-03	100-70-03	600-3
EN-GJS 700-2	EN JS1070	700-2	GGG 70	GN70	GS 700-2	37-01		700-2
EN-GJS 800-2	EN JS1080	800-2	GGG 80	GN80	GS 800-2		120-90-02	800-2

EN 1563:1997 SG Ductile Iron specifications continued. (Classifications in terms of tensile and hardness)

Material designation		Brinell hardness range HB	Other properties (for information only)		
Symbol	Number		R _m N/mm ²	R _{p0.2} N/mm ²	R _{p 0.2} N/mm ²
EN-GJS-HB130	EN-JS2010	Less than 160	350	220	220
EN-GJS-HB150	EN-JS2020	130 to 175	400	250	250
EN-GJS-HB155	EN-JS2030	135 to 180	400	250	250
EN-GJS-HB185	EN-JS2040	160 to 210	450	310	310
EN-GJS-HB200	EN-JS2050	170 to 230	500	320	320
EN-GJS-HB230	EN-JS2060	190 to 270	600	370	370
EN-GJS-HB265	EN-JS2070	225 to 350	700	420	420
EN-GJS-HB300 ¹⁾	EN-JS2080 ¹⁾	245 to 335	800	480	480
EN-GJS-HB330 ¹⁾	EN-JS2090 ¹⁾	270 to 360	900	600	600
¹⁾ EN-GJS-HB300 (EN-JS2080) and EN-GJS2090) are not recommended for thick section castings.NOTE 1. 1 N/mm ² is equivalent to 1 MPa.					

ASTM - 897M Austempered Ductile Iron Specifications (ADI)
Casting weight range: 2kg to 1000kg’s

ADI is stronger per unit weight than aluminium and as wear resistant as steel, ideal for mining, construction, agricultural and similar high abrasion high strength applications. The austempering heat treatment process converts ductile iron to austempered ductile iron (ADI), bringing about excellent strength, toughness, and fatigue characteristics. Ideal as a cheaper alternative to steel forgings & castings.

GRADE	TENSILE STRENGTH N/MM ² MINIMUM	0.2% PROOF STRESS N/MM ² MINIMUM	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	130	1	402 TO 512

BS EN 1564: 1997 Austempered Ductile Iron (ADI) Specifications Cont'd.

MATERIAL DESIGNATION		TENSILE STRENGTH N/MM ² MINIMUM	0.2% PROOF STRESS N/MM ² MINIMUM	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

BS 3468 1986 Austenitic Iron Grades & Specifications
Casting weight range: 2kg to 1000kg's.

Austenitic irons have greater resistance to heat and corrosion when compared to standard grades. Other properties include thermal expansion, magnetic permeability, impact value at low temperatures and erosion resistance will vary with the grade of austenitic iron.

TYPE	Grade	C (max) %	Si %	Mn %	Ni %	Cu %	Cr %	Nb %	P (max) %	Mg %	tensile strength N/mm ² minimum	0.2% proof stress N/mm ² minimum	elongation %	Charpy impact strength (min) J@20±5°C
FLAKE GRAPHITE	F1	3.0	1.5 to 2.8	0.5 to 1.5	13.5 to 17.5	5.5 to 7.5	1.0 to 2.5		0.2		170	-	-	-
	F2	3.0	1.5 to 2.8	0.5 to 1.5	18.0 to 22.0	0.5 max	1.0 to 2.5		0.2		170	-	-	-
	F3	2.5	1.5 to 2.8	0.5 to 1.5	28.0 to 32.0	0.5 max	2.5 to 3.5		0.2		190	-	-	-
SPHEROIDAL GRAPHITE	S2	3.0	1.5 to 2.8	0.5 to 1.5	18.0 to 22.0	0.5 max	1.5 to 2.5		0.8		370	210	7	
	S2W	3.0	1.5 to 2.2	0.5 to 1.5	18.0 to 22.0	0.5 max	1.5 to 2.5	0.2 to 1.2	0.8	0.06 max	370	210	7	
	S2B	3.0	1.5 to 2.8	0.5 to 1.5	18.0 to 22.0	0.5 max	2.5 to 3.5		0.8		370	210	7	4
	S2C	3.0	1.5 to 2.8	0.5 to 2.5	21.0 to 24.0	0.5 max	0.5 max		0.8		370	170	20	20
	S2M	3.0	1.5 to 2.5	4.0 to 4.5	21.0 to 24.0	0.5 max	0.2 max		0.8		420	200	25	15
	S3	2.5	1.5 to 2.8	0.5 to 1.5	28.0 to 32.0	0.5 max	2.5 to 3.5		0.8		370	210	7	
	S5S	2.2	4.8 to 5.4	1.0 max	34.0 to 36.0	0.5 max	1.5 to 2.5		0.8		370	210	7	
	S6	3.0	1.5 to 2.8	6.0 to 7.0	12.0 to 14.0	0.5 max	0.2 max		0.8		390	200	15	