

Spheroidal Graphite (SG) Cast Irons

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Technical Data

Spheroidal Graphite Cast Irons	Standard	5.3100	5.3103	5.3105	5.3106	5.3107	5.3200	5.3201	5.3300	5.3301	5.3302	5.3108	5.3109	5.3110	
	BS EN 1563 (2018)	EN-GJS-350-22-LT	EN-GJS-400-18-LT	EN-GJS-400-18	EN-GJS-400-15	EN-GJS-450-10	EN-GJS-500-7	EN-GJS-600-3	EN-GJS-700-2	EN-GJS-800-2	EN-GJS-900-2	EN-GJS-450-18	EN-GJS-500-14	EN-GJS-600-10	
Characteristic	SI unit														
Tensile strength R _m (min)	MPa	350	400	400	400	450	500	600	700	800	900	450	500	600	
0.2% proof stress R _{p0.2} (min)	MPa	220	240	250	250	310	320	370	420	480	600	350	400	470	
Elongation A (min)	%	22	18	18	15	10	7	3	2	2	2	18	14	10	
Brinell hardness (typical)	HB	max 163	max 179	max 187	max 201	160/221	170/241	192/269	229/302	248/352	302/359	-	-	-	
Impact resistance values (min) at (-40 ± 2)°C	J	12 ₁ (9 ₂)		Not specified									-	-	-
at (-20 ± 2)°C	J		12 ₁ (9 ₂)										-	-	-
Compression strength	MPa	-	700	700	700	700	800	870	1000	1150	-	-	-	-	
Shear strength	MPa	315	360	360	360	405	450	540	630	720	810	-	-	-	
Torsional strength	MPa	315	360	360	360	405	450	540	630	720	810	-	-	-	
Modulus of elasticity E (tension and compression)	GN/m ²	169	169	169	169	169	169	174	176	176	176	170	170	170	
Poisson's ratio ν	-	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.28-0.29	0.28-0.29	0.28-0.29	
Fatigue limit (Wöhler) (rotating bending) unnotched (dia ≤ 25 mm)	MPa	168	188	188	188	207	225	258	287	312	333	207	225	258	
Fatigue limit (Wöhler) (rotating bending) notched (dia ≤ 25 mm)	MPa	115	128	128	128	139	150	168	182	192	198	139	150	168	
Density ρ	g/cm ³	7.1	7.1	7.1	7.1	7.1	7.1	7.2	7.2	7.2	7.2	7.1	7.0	7.0	
Specific heat capacity c between 20°C and 500°C	J/(kg.K)	515	515	515	515	515	515	515	515	515	515	-	-	-	
Linear expansion coefficient α between 20°C and 400°C	μm/(m.K)	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	-	-	-	
Thermal conductivity λ at 300°C	W/(m.K)	36.2	36.2	36.2	36.2	36.2	35.2	32.5	31.1	31.1	31.1	-	-	-	
Resistivity ρ	μΩ.m	0.50	0.50	0.50	0.50	0.50	0.51	0.53	0.54	0.54	0.54	-	-	-	
Maximum permeability μ	μH/m	2136	2136	2136	2136	2136	1596	866	501	501	501	-	-	-	
Hysteresis losses at B = 1T	J/m ³	600	600	600	600	600	1345	2248	2700	2700	2700	-	-	-	
Predominant Matrix Structure	-	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite - Pearlite	Pearlite - Ferrite	Pearlite	Pearlite or Tempered Martensite	Tempered Martensite or Bainite	Ferrite	Ferrite	Ferrite	
Note 1: Mean value from 3 tests Note 2: Individual value															