

Material properties of cast iron
Spheroidal graphite cast iron (GJS)



Europe-Standard DIN EN 1563			EN-GJS-350-22-LT	EN-GJS-400-18-LT	EN-GJS-400-15	EN-GJS-500-7	EN-GJS-600-3	EN-GJS-700-2
Designation according to DIN 1693			GGG-35.30	GGG-40.30	GGG-40.00	GGG-50.00	GGG-60.00	GGG-70.00
Tensile strength	Rm min.	N/mm²	350	400	400	500	600	700
0.20% yield strength	Rp 0,1 min.	N/mm²	220	240	250	320	380	440
Ultimate strain	A ₅ min.	%	22	18	15	8	4	3
Brinell hardness	HB30	-	110-150	120-160	140-190	170-220	200-250	230-180
Framework			ferritic	ferritic	mainly ferritic	ferritic Pearlitic	Pearlitic ferritic	mainly Pearlitic
Notched impact work (Medium of 3 samples) at -40°C at -20°C at +20°C	Av min.	J	12,00					
	Av min.	J		14,00				
	Av min.	J	17,00	17,00	14,00			
Shear strength	σaB	N/mm²	315,00	360,00	360,00	450,00	540,00	630,00
Torsional strength	Ttb	N/mm²	315,00	360,00	360,00	450,00	540,00	630,00
DVM Impact Work	Ab	J	-	110,00	80,00	60,00	40,00	30,00
Modulus of elasticity	E	kN/mm²	169,00	169,00	169,00	169,00	174,00	176,00
Shear modulus	G	kN/mm²	-	68,00	68,00	69,00	70,00	70,00
Poisson number	ν	-	0,28					
0.20% dust limit	σd 0,2	kN/mm²	-	275,00	275,00	350,00	380,00	425,00
Flexural fatigue strength	σbW	N/mm²	-	+/-200	+/-200	+/-225	+/-250	+/-280
Tensile-compressive fatigue	σzdW	N/mm²	+/-100	+/-110	+/-110	+/-150	+/-175	+/-200
Fatigue strength (Wöhler) (Circulating bending test) unnotched sample (Diameter 10.60 mm)		kN/mm²	180,00	195,00	195,00	224,00	248,00	280,00
Fatigue strength (Wöhler) (Circulating bending test) slotted sample (Diameter 10.60 mm)		kN/mm²	114,00	122,00	122,00	134,00	149,00	168,00
Fatigue strength at Tensile-compressive stress	σzdW	N/mm²	+/-100	+/-110	+/-110	+/-150	+/-175	+/-200
Compressive strength	σdB	N/mm²	-	700,00	700,00	800,00	870,00	1000,00
Fracture toughness	KIc	N/mm ^{3/2}	310,00	300,00	300,00	250,00	200,00	150,00
Density (20°C)	ρ	g/cm³	7,10	7,10	7,10	7,10	7,17	7,20
Specific heat at 20 to 500°C	c	J/(kg·K)	515,00					
Thermal expansion at 20 to 400°C	α	1/(10⁶K)	12,50					
Thermal conductivity at 300°C	λ	W/(m·K)	36,20			35,20		31,10
specific heat capacity 20 to 500°C	c	J/(kg·K)	515,00					
Thermal Coefficient of linear expansion 20 to 400°C	α	µm/(m·K)	12,50					
specific electrical Resistance	ρ	Ωmm²/m	5,00			0,51-0,53		0,54
Coercive field strength	H _o	A/m	-	160,00		450-790		875,00
Remanence	B _r	T	-	0,56		0,58-0,60		0,62
Maximum permeability	µ	µH/m	2100,00			1596-866		501,00
Hysteresis losses at B=1T		J/m³	600,00			1345-2248		2700,00