



Grey Cast Iron in EN 1561

Grey Iron castings in EN 1561 is mainly iron and carbon based, carbon being present mainly in the form of flake (lamellar) graphite particles, also named known as flake graphite cast iron, and less commonly as lamellar graphite cast iron. It's popular gray iron material in European standard.

www.castingquality.com

Reference Casting Standards:

EN 1561:2023 Founding – Grey cast irons

Grey Iron castings can be produced in Casting Quality Industrial:

- Sand Casting
- Shell Casting
- Lost Form Casting



Material Physical Property of Grey Iron:

Property of grey cast irons	EN-GJL-150	EN-GJL-200	EN-GJL-250	EN-GJL-300	EN-GJL-350
Mass Density; kgs/dm³	7.10	7.15	7.20	7.25	7.30
Specific heat capacity; J/(kgK)					
Between 20°C and 200°C	460				
Between 20°C and 600°C	535				
Linear expansion coefficient; um/(mK)					
between -100°C and +20°C	10.0				
between 20°C and 200°C	11.7				
between 20°C and 400°C	13.0				
Thermal Conductivity; W/(mk)					
At 100°C	52.5	50.0	48.5	47.5	45.5
At 200°C	51.0	49.0	47.5	46.0	44.5
At 300°C	50.1	48.0	46.5	45.0	43.5
At 400°C	59.0	47.0	45.0	44.0	42.0
At 500°C	48.5	46.0	44.5	43.0	41.5
Resistivity; Ω-mm²/m	0.80	0.77	0.73	0.70	0.67
Coercivity; A/m	560 to 720	560 to 720	560 to 720	560 to 720	560 to 720
Maximum permeability; μ H/m	220 to 330	220 to 330	220 to 330	220 to 330	220 to 330
Hysteresis losses at B=1T; J/m³	2500 to 3000	2500 to 3000	2500 to 3000	2500 to 3000	2500 to 3000



Grey Iron Chemical Requirements in EN 1561:

No standard specifies the chemical composition, so we only recommend the following composition based on actual production.

Grade	Wall Thickness (mm)	C	Si	Mn	P ≤	S ≤
EN-GJL-100	-	3.4~3.9	2.1~2.6	0.5~0.8	0.3	0.15
EN-GJL-150	<30	3.3~3.5	2.0~2.4	0.5~0.8	0.2	0.12
	30~50	3.2~3.5	1.9~2.3	0.5~0.8	0.2	0.12
	>50	3.2~3.5	1.8~2.2	0.6~0.9	0.2	0.12
EN-GJL-250	<30	3.2~3.5	1.6~2.0	1.7~0.9	0.15	0.12
	30~50	3.1~3.4	1.5~1.8	0.8~1.0	0.15	0.12
	>50	3.0~3.3	1.4~1.6	0.8~1.0	0.15	0.12
EN-GJL-300	<30	3.0~3.3	1.4~1.7	0.8~1.0	0.15	0.12
	30~50	2.9~3.2	1.3~1.6	0.9~1.1	0.15	0.12
	>50	2.8~3.1	1.2~1.5	1.0~1.2	0.15	0.12
EN-GJL-350	<30	2.9~3.2	1.4~1.7	0.8~1.0	0.15	0.10
	30~50	2.9~3.2	1.2~1.5	0.9~1.1	0.15	0.10
	>50	2.8~3.1	1.1~1.4	1.0~1.2	0.15	0.10

EN 1561 Grey Iron Machinability

Very good, easy for machining such as milling, turning or drilling.

Grey Iron Mechanical Requirements in EN 1561: castingquality.com

The material can be defined using two methods: a) the tensile strength in separately casting; b) the hardness of material.

Material Designation		Wall thickness mm		Tensile strength Value to be obtained	
Symbol	Number	Over	Up to	In separately cast or side-by-side casting sample (N/mm ²)	In cast-on samples (N/mm ²)
EN-GJL-100	5.1100 (EN-JL1010)	5	40	100 to 200	-
EN-GJL-150	5.1200 (EN-JL1020)	2.5	5	150 to 250	-
		5	10		-
		10	20		-
		20	40		125
		40	80		110
		80	150		100
		150	300		90



EN-GJL-200	5.1300 (EN-JL1030)	2.5	5	200 to 300	-
		5	10		-
		10	20		-
		20	40		170
		40	80		155
		80	150		140
		150	300		130
EN-GJL-250	5.1301 (EN-JL1040)	5	10	250 to 350	-
		10	20		-
		20	40		210
		40	80		190
		80	150		170
		150	300		160
EN-GJL-300	5.1302 (EN-JL1050)	10	20	300 to 400	-
		20	40		250
		40	80		225
		80	150		210
		150	300		190
EN-GJL-350 (Removed in EN 1561: 2023)	(EN-JL1060)	10	20	350 to 450	315
		20	40		280
		40	80		250
		80	150		225
		150	300		-

Brinell hardness of castings of grey cast irons:

Grade material		Wall thickness (mm)		Brinell hardness (HB 30)	
Symbol	Number	Over	Up to	Min	Max
EN-GJL-HB155	5.1101 (EN-JL2010)	2.5	5	-	210
		5	10		185
		10	20		170
		20	40		160
		40	80		155
EN-GJL-HB175	5.1201 (EN-JL2020)	2.5	5	170	260
		5	10	140	225
		10	20	125	205
		20	40	110	185
		40	80	100	175
EN-GJL-HB195	5.1304 (EN-JL2030)	5	10	170	260
		10	20	150	230
		20	40	135	210
		40	80	120	195
EN-GJL-HB215	5.1305 (EN-JL2040)	5	10	200	275
		10	20	180	255
		20	40	160	235
		40	80	145	215



EN-GJL-HB235	5.1306 (EN-JL2050)	10	20	200	275
		20	40	180	255
		40	80	165	235
EN-GJL-HB255	5.1307 (EN-JL2060)	20	40	200	275
		40	80	185	255

EN 1561 Grey Iron Equivalent Material:

EN-GJL-100 equivalent: DIN1691 GG10; GB/T 9349 GR HT100; JIS G5501 GR FC100; ASTM A48 Class No.20; ISO 185 GR JL/100

EN-GJL-150 equivalent: DIN1691 GG15; GB/T 9349 GR HT150; JIS G5501 GR FC150; ASTM A48 Class No.25; ISO 185 GR JL/150

EN-GJL-200 equivalent: DIN1691 GG20; GB/T 9349 GR HT200; JIS G5501 GR FC200; ASTM A48 Class No.30; ISO 185 GR JL/200

EN-GJL-250 equivalent: DIN1691 GG25; GB/T 9349 GR HT250; JIS G5501 GR FC250; ASTM A48 Class No.35; ISO 185 GR JL/250

EN-GJL-300 equivalent: DIN1691 GG30; GB/T 9349 GR HT300; JIS G5501 GR FC300; ASTM A48 Class No.45; ISO 185 GR JL/300

EN-GJL-350 equivalent: DIN1691 GG35; GB/T 9349 GR HT350; JIS G5501 GR FC350; ASTM A48 Class No.50; ISO 185 GR JL/350

Gray Iron Heat treatment in EN 1561:

Generally, the castings are supplied without heat treatment. For some special applications, the heat treatment shall be agreed at the time of ordering, it can be to reduce internal stress or hardening, quenching and tempering for improving machinability.

Grey Iron castings Weldability:

Very bad. Generally, castings welding require the purchaser's approval. The welding process and the filler metals should be appropriated to the use of the casting in manner intended.

Grey Iron Typical Casting Application:

- Pumps and valves
- Lathe bed, engineer blocks.
- Industrial machinery parts.
- Flywheels.
- Automotive.
- Construction.
- Cookware, electrical boxes, bearing, bushing.



As a professional manufacturer in China, We Casting Quality focus on Metal Parts OEM industry, and provide solutions and services in Metal Casting field as following:

1. **Sand Casting**
2. **Investment Casting, Lost Wax process**
3. **Shell Casting**
4. **Lost Form Casting**
5. **CNC Machining**
6. **CAD Design**
7. **Tools/Mold Design**

Material Supplied

- Cast Iron Castings (Grey Iron, Malleable Iron, Ductile Iron)
- Carbon Steel and Alloy Steel Castings
- Stainless Steel and Duplex Stainless Steel Castings
- Aluminum Castings
- Bronze and Brass Castings
- Titanium and Cobalt Alloy Castings

What We Can Do

➤ Design Ability

Our engineers will help you to improve the designs based on casting technology, then The simulation software will be processed to verify the casting pouring system. Pro/E, Solidworks, AutoCAD and ProCast are available in Casting Quality Industrial.

➤ Saving Cost

Some manufacture processes may lead high cost. We will analyze the designs and advise the suitable methods to our customers. The best solution will be adopted.

➤ Quality Control

From the raw material selecting to bulk production processing, all procedures will follow PPAP program if necessary. The certificates will be provided including chemistry, hardness, mechanical property or NDT testing.

➤ Production Capacity

The max iron/steel castings can reach 30tons in weight, meanwhile the minus casting is around 1 gram only.

We also have prototyping and 3D scanning ability for sample plan.

➤ Logistic Service

The products will be delivered directly to customer's workshop, which will save plenty of work for clients.

Contact with Us Immediately

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