

Technical Data: Cast Iron (Gray and Ductile)

Product Description

What Is Cast Iron (Gray and Ductile)?

Gray iron is a type of cast iron known for its gray color when fractured. It is made by melting pig iron and adding scrap iron, steel, graphite, and other alloying elements. The critical feature of gray iron sand castings is their excellent damping capacity, which means they can absorb and dissipate vibrations, making them suitable for components in machinery and power tools. It is also readily machinable, making it cost-effective for parts that require precision machining.

Ductile iron, or nodular or spheroidal graphite iron, is another form of cast iron. It is created by adding small amounts of magnesium or cerium to molten iron before casting. Ductile iron sand castings are characterized by high tensile strength and good ductility, meaning they can deform without breaking. It makes it valuable in applications where components must withstand significant loads, such as automotive and aerospace industries.



Chemical Comparison of Cast Stainless Steel

Elements	Carbon (C)	Silicon (Si)	Manganese (Mn)	Phosphorus (P)	Sulfur (S)	Magnesium (Mg)	Copper (Cu)	Nickel (Ni)	Chromium (Cr)
Cast Iron Gray	2.7% - 3.8%	1.0% - 3.0%	0.5% - 1.5%	0.07% maximum	0.12% maximum	Not typically added	Not typically added	Not typically added	Not typically added
Cast Iron Ductile	3.2% - 4.0%	1.8% - 2.8%	0.15% - 0.40%	0.03% maximum	0.03% maximum	0.04% - 0.06%	0.20% maximum	0.03% maximum	0.02% maximum

Physical and Mechanical

Grade	Tensile Strength	Yield Strength	Hardness	Shear Strength	Impact Strength	Fatigue Strength	Thermal Conductivity	Density	Melting Range
	(MPa)	(MPa)	(Brinell)	(MPa)	(J)	(MPa)	(W/m·K)	(g/cm³)	(°C)
Gray Cast Iron	414	276	440	345	7	160	65	7.8	1200
Ductile Cast Iron	800	600	230	600	25	350	50	7.3	1350

Typical Properties

Features and Applications

Gray Cast Iron sand castings offer key features that make them indispensable in various industries. Notably, their excellent machinability and vibration-damping characteristics make them a popular choice for applications in consumer electronics and power tools. With a thermal conductivity that rivals most materials, Gray Cast Iron dissipates heat efficiently, making it ideal for components such as motor housings and machinery bases. Its wear resistance is another standout feature, ensuring longevity in demanding environments.

Gray Cast Iron finds its place in producing speaker enclosures in consumer electronics, providing superior acoustic properties. Furthermore, its exceptional corrosion resistance makes it an excellent candidate for outdoor lighting solutions. Whether in streetlight poles or intricate decorative fixtures, Gray Cast Iron sand castings have proven their mettle in various applications where durability and precision are paramount.

Ductile Cast Iron sand castings offer unique features and excel in various industrial applications. Their exceptional elasticity and high tensile strength, typically ranging from 60,000 to 100,000 psi, set them apart. Ductile Cast Iron is preferred for components subjected to heavy loads and stresses, as seen in the automotive and locking system industries. Its microstructure, with spherical graphite nodules, enhances its toughness and ensures that it can withstand substantial mechanical forces, making it ideal for components like gears and shafts.

Furthermore, Ductile Cast Iron is prized for its precision, often reaching an impressive range of ±0.001 inches. This level of accuracy is precious in applications where tight tolerances are essential, such as within the telecommunication and lighting solutions sectors. In summary, Ductile Cast Iron's combination of strength, flexibility, and precision makes it a go-to material for demanding applications, ensuring the reliability and performance of critical components in various industries.

Note

The above data are reference material science data. This data reference is not binding and is not considered as authoritative test data. If your material requirements are extremely precise, please contact our material engineers. Tel | +86 18926788217 | Web | www.newayprecision.com | Contact Neway

