What is malleable cast iron?

Malleable cast iron is produced from white cast iron, which is made from hot liquid iron with certain chemical components. The white cast iron needs to be treated by malleablizing, such as graphitizing or oxidation and decarbonization, then its metallographic structures or chemical components will be changed, so can become into malleable cast iron.

Comparing with the gray cast iron, malleable cast iron has better strength and ductility, especially better impact resistance in low temperatures.

Comparing with cast steel, malleable cast iron has better abrasive resistance and shock absorption.

Comparing with the ductile iron, both of them have good strength and ductility, but malleable iron has better impact resistance, but ductile iron has better abrasive resistance.

There are several types of malleable cast iron.

Black heart malleable cast iron is mainly used to produce the iron casting parts with impact, shake or torsion functions. Normally used to produce rear axle housing castings, spring bracket, low pressure valve body, pipe fittings, tools and wrenches. Black heart malleable cast iron is also called as ferritic malleable cast iron.

Pearlite malleable cast iron has higher strength, hardness and abrasive resistance. So, it is mainly used to produce the abrasion resistant parts for motive power machinery and agricultural machinery.

White heart malleable cast iron is seldom used because of its long malleablizing process.

The good physical properties of malleable cast iron is because of its microstructures. Its inside graphite is existed as the regiment floe, so the graphite has lower tearing function to the iron body. The following is the metallographical photo to the micro structures of graphite in malleable cast iron.

In the past, many foundries produced malleable iron castings, however, with the development of ductile iron, most of malleable iron casting parts could be replaced by ductile iron. So, only few iron foundries in China are still producing this material.