Malleable iron and non-malleable iron

How to judge a cast iron is malleable iron, or it is not malleable iron? Or is there a clear definition between malleable cast iron?

Actually, the answer is very simple, but the judgment will be difficult.

Firstly, if client required producing malleable iron, then they will advise the cast iron grades, such as DIN 1692, A197, A338. So, if the cast iron grades are in these standards, then they will be malleable iron.

Secondly, the production process of malleable cast iron is different with ductile iron and grey iron. Malleable iron needs a key heat treatment process, but most of grey iron and ductile iron castings will not need heat treatment.

Thirdly, their metallographic is very different, the graphite of malleable iron is cotton-like, but the ductile iron is flaky.

As for their elongation, malleable iron could reach 2 to 12%, but grey iron is almost no elongation to 22%. So, from elongation, you could judge malleable iron with grey iron, but can not judge ductile iron.

Actually, if client choose the malleable iron, most likely, they prefer some special properties, such as resistance, abrasive resistance, good machining capability and shock absorption.

However, malleable cast iron can not be forged. Malleable is only meaning this cast iron has good elongation, and ductile iron is also meaning this point.

All in all, if client required to produce malleable iron, then you will have to produce the casting parts by malleable iron. However, if client just required the tensile strength, they may consider to produce the castings by ductile iron because of lots of reasons. If you just export the casting parts are belong malleable iron to fill in the HS code, then ductile iron is also belong to this range.

The followings are some typical casting parts made by malleable iron.