

Started on	Monday, 9 October 2023, 11:02 AM
State	Finished
Completed on	Monday, 9 October 2023, 2:06 PM
Time taken	3 hours 3 mins
Grade	3.00 out of 3.00 (100%)

Question 1

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Mark 1.00 out of 1.00

Complete

What is a core in sand casting?

The core shapes the hollow features of the component. The primary purpose of a core therefore is to create internal features in a casting that cannot be formed by the pattern alone. The internal features may include cavities and holes. Cores are made of a sand mixture but they often contain a stronger binder to ensure they retain their shape when molten metal is poured into the mold. After the metal has solidified and the casting is removed from the mold, the core is broken up and removed from the casting

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Question 2

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Complete

From the naming, explain with details of 'EN-GJS-500-7'

EN-GJS-500-7C, also known as GGG50, is a material with a predominantly ferritic/pearlitic structure and is one of the most commonly used in the ductile iron family. This grade offers good tensile strength and a satisfactorily high yield point combined with good toughness, which makes this the grade of choice across many industries [1]

EN: This stands for "EuroNorm," indicating that the material specification follows a European standard.

GJS: This stands for "spheroidal graphite iron". Resistance and ductility are two of the most important characteristics of ductile iron (GJS). Thanks also to the spheroidal shaped graphite nodules, spheroidal graphite iron (GJS) not only boasts superior mechanical properties with respect to grey cast iron, but is also higher performing and more ductile. Unlike the flake-like structure of grey cast iron, the spheroids of ductile iron GJS inhibit the spread of cracks, thus making it possible to obtain parts that are more resistant and high-performing over time. [2]

500: This number represents the minimum tensile strength of the material in megapascals (MPa), which means the ductile iron has a minimum tensile strength of 500 MPa.

7: This number represents the minimum elongation percentage. The material has a minimum elongation of 7% when subjected to a tensile test.

References

[1] <https://www.tasso-bar.com/en-gjs-500-7c/>

[2] <https://zanardifonderie.com/en/spheroidal-graphite-iron-gjs/#:~:text=Thanks%20also%20to%20the%20spheroidal,higher%20performing%20and%20more%20ductile.>

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Question 3

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Complete

Why cast aluminum alloys are widely used nowadays?

Aluminum alloys are widely used nowadays due to these properties:

- Suitable for complex thin-walled parts
- High dimensional accuracy and low weight with high rigidity
- Good strength-weight ratio
- Smooth surfaces and edges and good machinability
- High thermal conductivity and high electrical conductivity
- Corrosion and weathering resistance
- Several surface treatments possible

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