1.3 Metals and alloys: 10-minute Pack

AQA 8552 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions.

1 A workshop needs a material for a hand-filed bracket. State whether mild steel is ferrous or non-ferrous, and name the element that makes it ferrous.

(Total for Question 1 is 2 marks)

2 A prototype workshop needs one complex metal handle with a hollow internal shape. Explain why investment casting could be suitable.

(Total for Question 2 is 2 marks)

3 A folding camping utensil must be stiff, resist corrosion when washed, and have low mass. Choose either stainless steel or mild steel. Explain your choice using two requirements.

(Total for Question 3 is 3 marks)

4 A manufacturer must make a small batch of 30 steel mounting plates. Each needs a different hole position for a prototype. Recommend a process from laser cutting, die casting or rolling, and justify it.

(Total for Question 4 is 2 marks)

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Mark scheme · 1.3 Metals and alloys: 10-minute Pack

Question 1

Ferrous	**B1**
Contains iron	**B1**

Answer: Mild steel is ferrous because it contains iron.

Question 2

Suitable for complex shapes / pattern and mould reproduce detail	**B1**
Explains hollow feature can be formed with suitable core/design	**B1**

Answer: Investment casting can form a complex shape around a sacrificial pattern, including a hollow feature if the pattern and core are designed for it.

Question 3

Chooses stainless steel	**B1**
Links strength/stiffness to utensil use	**B1**
Links corrosion resistance to washing	**B1**

Answer: Stainless steel is a suitable choice: it is stiff/strong enough for a utensil and resists corrosion better than uncoated mild steel when washed. Its mass depends on the design dimensions.

Question 4

Laser cutting	**B1**
Links flexible computer-controlled cutting / no dedicated die to small varied batch	**B1**

Answer: Laser cutting, because it can cut the plate profile and varied hole positions directly from sheet without making a dedicated die.

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