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Design & Technology
AQA GCSE

How materials are cut shaped and formed to a tolerance

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don’t spend too much time on one question

Good luck!

Q1. What is a tolerance in manufacturing?

A The colour of a finished product

B The acceptable range between minimum and maximum measurements

C The type of material used

Q2. Why are tolerances important in mass production?

A They make every product unique

B They ensure parts fit together correctly and maintain quality standards

C They reduce the need for measurements

Q3. If a dimension is given as 50mm ± 0.5mm, what is the maximum acceptable size?

A 49mm

B 51mm

C 50.5mm

Q4. Which tool is most suitable for checking tolerances precisely?

A A ruler

B A saw

C A vernier caliper

Q5. Explain how tolerances are used to control quality when making a prototype. Give two examples of how incorrect tolerances could cause problems. **(4 marks)**

Answers

Q1. B
Q2. B
Q3. C
Q4. C

Q5.

Example Answer (4 marks):

1. **Purpose of tolerances (1 mark):** Tolerances define the allowable variation in measurements to ensure parts fit and function correctly.
2. **Quality control (1 mark):** During prototyping, tolerances help identify errors early, reducing waste and ensuring consistency.
3. **Problem 1 (1 mark):** If a drilled hole is **too small** (below minimum tolerance), a bolt won't fit, making assembly impossible.
4. **Problem 2 (1 mark):** If a component is **too large** (above maximum tolerance), it might not fit into other parts, causing structural weakness.