

2 5 Quality

Preparation

- Read pages 70 – 71

Resources

- Vernier calipers
- Micrometers
- Multiple components for sampling eg paper clips
- Newspapers or magazines

Key Points

Quality \Leftrightarrow Fitness for purpose \Leftrightarrow Compliance with Specification

Quality Assurance (QA)

- The management of quality control
- Including regulation of quality of raw materials and components bought in
- Factual evidence of quality management to inspire confidence in customers

Quality Control (QC)

- Inspection and testing to achieve a high quality product

Inspection

- Sampling and testing against a tolerance band
- 100% inspection
- Normal inspection
- Reduced inspection

Nominal	Tolerance	Lower limit	Upper limit
54	+/- 0.8	53.2	54.8
30	+/- 0.1	29.9	30.1
20	+0.2/0	20.0	20.2
70	+0/-1	69	70

Key Points continued

- Co-ordinate measurement
- Non-destructive testing
- Quality control in print runs: see assignment
- Total quality management

Class discussion: How can your school as a manufacturing organisation produce better students?

National Standards	BS	Image of BS Kite mark
European Standards	EN	Image of CE symbol
International Standards	ISO	Image of ISO

Wider study

- Table 2 18 Quality control checks used during a print run
- Table 2 19 Benefits of the BS EN ISO 9000 series of standards
- BSI Education <http://www.bsieducation.org/Education/default.php>
- BSI <http://www.bsi-global.com>

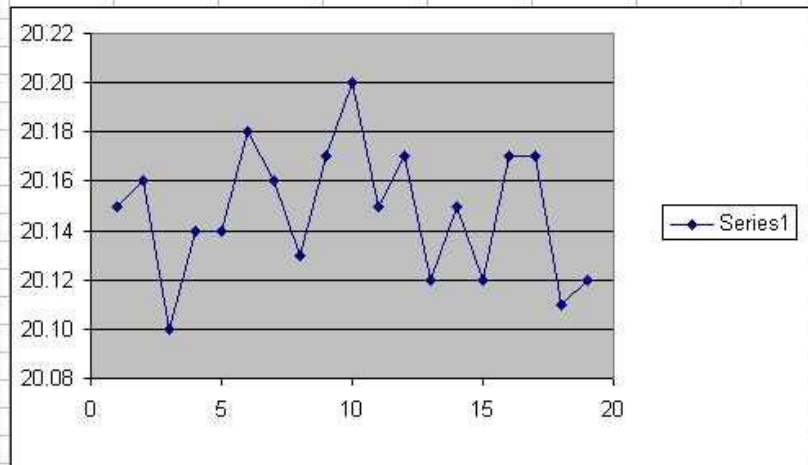
Assignments

- Sample the items supplied
- Ask your teacher for the nominal sizes and tolerances
- Compile a sampling chart using
 - 100% inspection
 - Normal inspection
 - Reduced inspection

Example:

Nominal	20.14
Tolerance	+/- 0.02
Lower limit	20.12
Upper limit	20.16

Sample no	Measurement
1	20.15
2	20.16
3	20.10
4	20.14
5	20.14
6	20.18
7	20.16
8	20.13
9	20.17
10	20.20
11	20.15
12	20.17
13	20.12
14	20.15
15	20.12
16	20.17
17	20.17
18	20.11
19	20.12



- Look for Set offs; Colour variations; Hickies; Bad registers in a sample of newspapers or magazines. Cut and paste into your file.
- Look for Colour bars and Registration marks in a sample of newspapers. Cut and paste into your file.
- Find and share some products with the CE mark

- Visit BSI Education Toy standards
<http://www.bsieducation.org/Education/14-19/topic-areas/toys/toys-experiment.shtml>
Apply some of the tests on a toy at home
Investigate the standards for other products as well.

Homework

- As above

Revision questions

1 Discuss the quality issues in the production of a novelty pencil sharpener

Specification and Learning Objectives

Concept, characteristics, application and advantages of the following when designing and manufacturing graphic products and commercial packaging:

- quality assurance (QA) systems for monitoring the quality of a product from its design and development stage, through its manufacture, to its end-use performance and degree of customer satisfaction
- quality control (QC) (as part of the achievement of QA concerning the monitoring and achieving of high standards and degree of tolerance by inspection and testing, including computer aided inspection)
- total quality management (TQM) when applying quality assurance procedures at every stage of the production process (ISO 9000 series)
- quality control during a final print run, user printer's marks
 - colour bars for colour consistency/density
 - registration marks for aligning printing plates
 - crop marks for cutting/trimming guides
 - greyscale for monochrome consistency.

Process of testing products, components and materials against external quality standards set by the following organisations:

- British (BSI and relevant kitemarks)
- European (CEN and CE)
- International (ISO).

Solutions to revision questions

Next page

1 Discuss the quality issues in the production of a novelty pencil sharpener

- Using Quality Assurance (QA) systems
- Using Quality Control (QC) systems involving inspection and testing. For example, quality control in a print run incorporating colour bars and registration marks
- Manufacturing to specified tolerances
- Using Total Quality Management (TQM) systems
- **Quality control – 5 examples – manufacturing a printed product**
- 5 marks
- Accept any of the following for 1 mark each:
 - Use of colour bars
 - Use of densitometer
 - Use of crop marks
 - Use of registration marks / check alignment / lined up
 - Use of greyscale
 - Reference to customer's / client's specification
 - Use of tolerances
 - Random sampling
 - Check levels / flow rate of ink
 - Final check with customer / client
 - Checks for bleeding / smudging