

Quality monitoring systems

Quality control:

- Checking for accuracy
- Checking for safety
- Checks carried out throughout manufacturing
- Check could be visual/automated/computerised
- Testing could be destructive/non-destructive
- Against the specification
- So that product meets expectations

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none">• Less faulty products being sold to customer• High quality product- better reputation for company	<ul style="list-style-type: none">• Quality control can be expensive• Can slow down rate of production• Does not prevent the waste of resources when products are faulty

Applications: Casting parts, products, car engines

Inspection:

Used to check that manufactured products have been produced with a specified tolerance ($\pm 5\text{mm}$)

- 100% inspection- everything is inspected
- Normal sampling- test every 100th product etc
- Reduced inspection- every 10000th product, used when the level of quality is 'sufficiently good'

Computer-aided inspection:

Uses a coordinate measuring machine (CMM) for dimensional measuring. Laser scanning machines are similar a CMM.

Testing/Checks:

Measures the products performance

- Check material quality (destructive/non-destructive tests)
- Check function (does it work)
- Check the parts fit together
- Surface finish (burrs/scratches)
- Testing for sharp corners/edges
- Check casting quality (flaws/cracks etc)
- Check for correct assembly (missing components)
- Check threads are fully cut
- Check qualities of decals/printing/position

Reducing cost of testing:

- Only test sampling method
- Use of gauges (reduces delays)
- Limit destructive testing (less labour needed)

Non-destructive testing:

Where the product is tested until it shows signs of failure (cracking etc)

Destructive testing:

Where the product is tested until it is destroyed

Quality Assurance:

Used by the manufacturer to monitor the quality of the product from its design and development stage to its manufacture

- Applied at every stage of design and manufacture
- To make products with no faults
- To ensure the product is fit for use
- External QA checks employed (ISO/BSI/CE)
- Quality of components monitored by quality control checks



<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • Ensures product is not faulty • Better customer satisfaction (high quality products) • Costs are reduced because there is less wastage and re-working of faulty products as the product is checked at every stage • It can help improve worker motivation as workers have more ownership and recognition for their work (see Herzberg) • It can help break down 'us and them' barriers between workers and managers as it eliminates the feeling of being checked up on • With all staff responsible for quality, this can help the firm gain marketing advantages arising from its consistent level of quality 	<ul style="list-style-type: none"> • Time consuming • Costs a lot of money to train staff • Time consuming to train staff • Arguments between employees and QA employees

Applications: High quality products, car parts, castings, engines

Total quality management (TQM):

- Used to help achieve customer satisfaction by applying quality assurance procedures at every stage
- TQM is based on all members of an organisation participating in the continual improvement of processes, products and services.
- Re-engineering processes and systems to improve products and services
- Reducing losses due to wasteful practices

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • Make products right the first time • Covers all aspects of the design and manufacturing (reduce waste) • Reduces cost of wastage from faulty good • Equipment is monitored to make sure it functions correctly • Improved quality product improves reputation of business • Staff receive more training • Shorter production times 	<ul style="list-style-type: none"> • Increases cost in development of flawless product • Employees can be resistant to changes • Time consuming/slow process to introduce • Testing/inspections can be expensive • Cost of introduction may outweigh the savings made

Applications: Goods and services

ISO 9000:

- Defined as a set of international standards on quality management and quality assurance
- Helps company's effective document the quality system elements needed to maintain an efficient quality system
- Not specific to one industry
- Helps to satisfy its customers

Seven points they look at:

- **Customer focus** (Existing needs/future customers)
- **Leadership** (Establish a vision and direction)
- **Engagement of people** (Use their skills properly/open discussions)
- **Process approach** (Deploy resources effectively/prioritise improvements)
- **Improvement** (improve organizational performance/capabilities)
- **Evidence-based decision making** (using data and analysis)
- **Relationship management** (share expertise/resources/information)