

CAD/CAM FACTSHEET

Virtual modelling and testing

Properties

- A virtual model is a computer (or digital) model of a physical object.
- Virtual modelling is used mainly for visualisation purposes.

Advantages

- Products can be coloured, and textures added to show what they will look like in real life
- Designs can be changed easily without redrawing the whole image
- Files can be sent electronically via email to clients and manufacturers, which saves time and money

Disadvantages

- Software can be expensive to purchase
- Learning to use the software can take a long time

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Laser cutting

Properties

- Laser cutting is a developing technology that uses a high powered laser controlled by a computer to cut various materials.
- The finished edge requires little or no surface finishing.

Advantages

- Highly accurate and capable of achieving fine detail
- Can work 24 hours a day, 7 days a week since it's fully automated.
- Easy to cut identical components.

Disadvantages

- Initial capital outlay for machine is high
- Lasers can damage the eyes
- Not effective on highly polished mirrored surfaces.

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Computer numerically controlled (CNC) milling and turning

Properties

- CNC machinery can be used to cut and turn products and components automatically with great accuracy and speed.

Advantages

- Can work 24 hours a day, 7 days a week
- Extremely accurate, identical copies are produced each time
- Fewer manual workers required as labour costs are lower
- Complex shapes and forms can be achieved

Disadvantages

- Initial capital outlay for machines is high
- CNC milling and turning requires highly specialised staff.

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Rapid prototyping

Properties

- Rapid prototyping is a process of automatically creating physical objects by adding materials in layers to build up a 3D object.
- It takes a virtual design from a CAD package and converts it into the horizontal layers that sit on top of each other until the model is complete.

Advantages

- Prototypes can be produced very quickly from a design idea
- Full 3D complex shaped products or components can be formed
- A 3D model is easier to handle than a 2D image, and communicate a design idea more quickly
- Products can be developed. Tested and brought to market more quickly
- Fewer manual workers are required so labour costs are lower.

Disadvantages

- Initial capital outlay is expensive for the machines
- Models are sometimes very fragile and can break easily