

Glossary

Abrasion the process of wearing something away.

Accuracy depends on the way in which measurements are taken and how they are recorded.

Alloys mixtures of two or more metals that have improved properties and characteristics.

Ancillary equipment covers any items of equipment required by the main equipment system to be a complete system.

Annotations labels used by engineers to give information about designs.

Annual turnover the amount of money relative to the value of the products and services a company sells over a year.

Assembly drawings used to show how components are put together.

Assembly line a process where engineers and machines assemble a product in a specified sequence.

Axis the name of either the horizontal or the vertical line that is used to show the scale of the graph or chart.

Blind hole a hole that does not break through to the other side of the workpiece.

Blow moulding a manufacturing process by which hollow plastic parts are formed.

Brainstorming an open group discussion of ideas to find solutions.

Branding of a product or company name is a way of distinguishing it so that it is easily recognisable.

Capacitors electronic devices that store electrical charge.

Chamfers features that remove sharp corners to make something safer and easier to assemble.

Chargehand a worker put in charge of others.

Chartered engineer registered with the Engineering Council as a person who has academic qualifications, technical training and knowledge, and practical experience. They are permitted to use the abbreviation CEng after their name.

Charts usually used when data are being presented in groups.

Chuck a specialised kind of clamp.

CNC stands for 'computer numerical control'. A CNC lathe is one that runs automatically.

Cold working when a material is reshaped while at a low temperature.

Commissioning the final testing and verification of the equipment's functionality.

Complex brackets brackets that have been designed for a specific purpose and often have complicated shapes that allow them to fit around other components but still remain strong.

Composite materials formed when two or more materials are bonded to produce a material with different properties from the original materials.

Compressible when the volume of a fluid can change when pressure is applied to it.

Compressive strength the ability of a material to resist a pushing force without being crushed.

Conductivity the ability of a material to conduct electricity.

Conductors materials that transmit heat or electricity.

Conform and **conformance** both mean meeting specified standards, regulations or laws.

Control valves automatic devices used to control fluids in a pipe.

Conventions the rules used to present information such as drawings; for example, BS8888 is the standard set of rules for working drawings. They cover line types, symbols and layouts of drawings.

Customised parts engineering products made or modified to meet the customer's specified requirements.

Deadline the latest date that the solution of a problem, e.g. an engineered product, needs to be completed by.

Degree of accuracy half a unit on either side of the unit of measure; if the unit is 1, then any measurement between $9\frac{1}{2}$ and $10\frac{1}{2}$ will be measured as 10.

Die a tool used to create a specific shape as part of the manufacturing process. A die is custom made for each specific job so that an exact shape can be made.

Diodes electronic devices that can be used to allow electrical charge to flow in only one direction.

Ductility the ability of a material to be deformed by bending, twisting or stretching. This ability increases in metals at higher temperatures.

Electroplating a process in which an electrical current is run through a solution between a zinc anode and a steel conductor.

Engineered products items produced using suitable engineering production processes.

Engineer's blue a quick-drying ink used to help the marking-out process on metals.

Ergonomics the science associated with the design and arrangement of equipment so that it is more comfortable and safer for people to use.

Ethical something that is morally good or right to do.

Fabrication the process of manufacturing something.

Feedback when you receive information, good and/or bad, from someone else about what you have done.

Ferrous metals contain iron. Typical types of ferrous metals include mild steel, wrought iron and stainless steel.

Fettling trimming or cleaning the edges of a metal casting.

Fillets similar to radii, but feature on internal corners and are used to reduce stresses in a joint.

Fit-for-purpose term used to describe whether a product can perform the job it was designed to do.

Fluid a gas or liquid.

Fuselage the main body of an aircraft, where passengers sit or freight is carried.

Galvanising the process of providing a protective zinc coating to steel. Products tend to be hot-dipped to provide the coating.

Graphs used to plot individual data values.

Gyroscopes wheels or discs that spin freely on their axes to find their orientation by themselves.

Handover possession of the equipment is passed to the customer.

Hazards things that could be dangerous to someone's health and safety.

Hot working when a material is reshaped while at a high temperature.

In-house activities are carried out by employees of the company.

Indentation the process of making a notch or scrape in a material.

Integrity the quality of having moral principles.

Interconnection the close connection between, or the joining of, two or more things.

Interpretation an opinion of what something means; when you interpret something, you are deciding what you believe to be the meaning.

Iteration repeating a process until the best solution is identified.

Justification the reason or evidence to support an idea or design.

Labelling used to identify groups of data clearly.

Lathes tools that rotate a workpiece to perform functions such as shaping, cutting and sanding.

LED stands for 'light emitting diode' and produces light when a voltage is applied to it.

Lifespan a product refers to how long it will last once a consumer begins using it for its primary purpose.

Logistics the organisation and implementation of an operation, usually involving a lot of detail.

Longevity a long life.

Machine shop where engineers use machine tools and cutting tools to make parts.

Malleability the ability of a material to be permanently deformed in all directions without breaking apart.

Marketplace a term used to describe the activities associated with the sale and purchase of a product.

Milling machines used to shape materials, but the material is fixed and the cutting tool rotates.

Nanotechnology the branch of engineering technology that deals with extremely small things, including the manipulation of atoms and molecules.

Non-compressible a fluid that cannot be compressed.

Non-ferrous metals do not contain iron. Typical non-ferrous metals include aluminium, titanium, copper, silver and zinc.

NVQ stands for National Vocational Qualification: a practical qualification gained through employment.

Orientation of an object is its direction or relative position.

Outsourced functions are carried out by someone outside the company.

Parts integration the ability to combine different parts.

Patent the sole right of a person or company to make or sell a product.

PDF stands for portable document format and is used for creating electronic documents.

Permanent something intended to last unchanged forever.

Pilot hole a small hole drilled ahead of a full-sized hole as a guide.

Plating a thin coating of gold, silver or other metal.

Precision the depth of information that is included in the data: how far the information is broken down.

Products things produced for sale, usually by a manufacturing process.

Qualitative comparisons a type of analysis used when the data collected are circumstantial (very detailed).

Quality control the set of procedures that are followed to ensure that the quality of a product is maintained and manufacturing errors reduced or eliminated.

Radius (or **radii**) refers to a smooth, rounded corner, like a chamfer, typically used on external corners.

Recesses internal grooves, also known as pocket cuts.

Recycling the process of converting waste material into other usable products.

Re-forming changing something from one shape to another.

Reliability depends on there being only small variations in data and that measurements are within tolerance.

Resistance to wear means that something is not easily damaged over time.

Resistors electronic devices that restrict the flow of an electric current.

Resolution a term used to describe how clear an image is.

Right first time often quoted in terms of quality control and refers to when something is done without errors so that no time and money are wasted.

Risers occur where excess metal from the moulding escapes from the casting box. They will also solidify, and so need to be removed at the end of the process.

Risk the probability of a hazard causing harm to someone's health.

Risk assessment a process used to document that all hazards have been considered and appropriate measures put in place to deal with them.

Runners used to allow metal to flow from one moulding to another so that multiple parts can be cast at the same time.

Rusting when a metal becomes covered in a reddish-brown, flaking coating of iron oxide. Rusting affects iron and steel.

Scale the ratio of the model compared to its actual physical size. For example, if a model is ten times smaller than in real life, the scale of the model is 1:10.

Sector a term used for a particular type of industry within the nation's overall economy.

Semi-permanent something will not last forever, but will last for a long time.

Services the actions of providing something for a customer, usually performing work or a process.

Setpoints target values for a process value, e.g. maximum temperature, minimum flow rate.

Shank the shaft of a tool.

Shear force arises from forces that act in opposite directions.

Skill set the range of skills and abilities that a person has.

Specialised equipment can be used for more than one product or component, but can only be used to carry out a limited range of processes.

Speeds and feeds refer, respectively, to the 'spindle speed' (the speed at which a machine spindle rotates) and the 'feed rate' (the rate at which a machine tool moves across a 'workpiece', i.e. the material being machined).

Sprue the hole that molten metal is poured into when casting. When the casting solidifies, the sprue needs to be removed.

Surface roughness a measure of the deviations of a real surface from its ideal form. If these deviations are large, the surface is rough; if they are small, the surface is smooth.

Sustainability the ability of something to be maintained at a specific level.

Swarf the small chips or pieces of metal removed by machining processes such as grinding, turning or milling.

Team building a method of getting employees to work together as an effective team.

Teeth the grooves on engineering tools.

Tensile something is capable of being stretched out.

Tension the pulling force or forces on an object.

Thermosetting polymers materials that cannot be reshaped with the application of heat. Typical thermosetting polymers include phenol-formaldehyde, polyimides and polyurethane.

Thermoforming polymers materials that can be reshaped with the application of heat. Typical thermoforming polymers include polyethylene, polypropylene and acrylic.

Thinking outside the box to think in an original or creative way.

Thread a raised structure on a screw or bolt that follows a helical path and allows parts to be joined together.

Tolerances the allowable variation of a specified dimension, normally associated with machining operations but can also apply, for example, to equipment that needs to be set up exactly level for it to operate correctly.

Transparent polymer allows light to pass through it in such a way that objects behind it can be easily seen.

Trends patterns in data, e.g. values might increase for one variable as the values decrease for another.

Troubleshooting the identification and correction of faults and problems.

Unit cost the cost of one item, e.g. if 10 m of pipe costs £20, the unit cost is £2 per metre.

Unit costs the costs associated with the manufacture of an individual product.

Vanishing points points on an imaginary horizon where all projection lines in a perspective drawing are drawn from.

Velocity the object's direction and speed of movement.

Virtual reality computer technology that uses special equipment such as headsets to create images, sounds and other sensations that simulate a user's physical presence in a virtual or imaginary environment.

Welding heating the surfaces of two objects to the point of melting and then joining them together.

Workpiece a piece of metal or other material that is in the process of being worked (cut or shaped) by a hand tool or machine.