Technology
Chapter 16: Manufacturing Products—Terms and Definitions

**Adhesive bonding:** a bonding technique that uses substances with high adhesive forces to hold parts together.

**Annealing:** a process used to soften and remove internal stress in a part.

**Artificial intelligence (AI):** intelligence exhibited by a manufactured device or system.

**Assembling process:** a process that connects parts together to make assemblies and products.

**Bonding:** an assembling process that uses cohesive or adhesive forces to hold parts together.

**Bonding agent:** a material used to achieve bonding.

**Casting and molding processes:** processes in which a liquid material is poured into a cavity in a mold, where it solidifies into the proper shape and size.

**Chemical action:** a change (for example, changing a material from a liquid to a solid) caused by adding chemicals.

**Chemical conditioning:** a type of conditioning process that uses chemical actions to change the properties of a material.

**Chemical machining:** a nontraditional machining process using chemical reactions to remove material from a workpiece.

**Chip removal:** a separating process using a tool to cut away excess material in the form of small pieces, or chips.

**Cold bonding:** a joining technique that uses extreme pressure to squeeze two parts to create a bond.

**Compounding:** the act of mixing the parts of a fluid for casting.

**Computer-controlled machining:** a process that adds automatic control, provided by a computer program, to basic machines.

**Conditioning process:** a process in which heat, chemicals, or mechanical forces are used to change the internal structure of a material.

**Converted surface finish:** a finish on the surface of a metal that has been chemically changed to protect the metal.

**Cutting motion:** an action that causes material to be removed from a workpiece.

**Die:** a forming tool made of hardened steel.

**Dipping:** a technique in which stock is run through a vat of molten metal.

**Drawing machine:** a machine that pulls materials through die openings to form them.

**Drilling machine:** a separating machine that produces or enlarges holes using a rotating cutter for the cutting motion.

**Drying:** a common thermal conditioning process that removes excess moisture from materials.
**Elastic range:** the range between a material at rest and the material’s yield point.

**Electrical discharge machining (EDM):** a nontraditional process that uses electrical sparks to make a cavity in a piece of metal.

**Enamel:** a varnish that has color pigment added.

**Expendable mold:** a mold that is destroyed to remove the cast item.

**Extrusion:** a process in which material is pushed through a hole in a die.

**Fastener:** a device used to hold parts together.

**Feed motion:** an action that brings new material in contact with a cutting tool and allows the cutting action to be continuous.

**Finishing process:** a secondary process that protects products and enhances their appearance.

**Firing:** a thermal conditioning process used for ceramic products.

**Flame cutting:** cutting material to size and shape using burning gases.

**Flow bonding:** a method of joining materials that uses a metal alloy as a bonding agent.

**Flow coating:** a process that passes a product under a flowing stream of finishing material.

**Forming process:** a process in which force applied by a die or roll is used to reshape materials.

**Fracture point:** the point at which a material cannot withstand any more force.

**Fusion bonding:** a bonding technique that uses heat or solvents to melt the edges of a joint.

**Hammer:** a device that delivers force to complete a forming action. Hammers drop or drive a ram down with a quick action.

**Hardening:** a process used to increase the hardness of a material.

**Heat treating:** the thermal conditioning processes used on metals.

**Joint:** a place where parts meet.

**Lacquer:** a solvent-based, synthetic coating that dries through solvent evaporation.

**Laser machining:** a nontraditional process that uses the intense light generated by a laser to cut material.

**Machining:** a separating process based on the motion of a tool against a workpiece.

**Mated dies:** dies that have the desired shape machined into one or both halves of the die set.

**Mechanical conditioning:** a type of conditioning process that uses mechanical forces to change the internal structure of a material.

**Mechanical fastening:** an assembling process that uses mechanical forces to hold parts together.

**Milling machine:** a separating machine that uses a rotating cutter for the cutting motion.
**Nontraditional machining:** processes that use electrical, sound, chemical, and light energy to size and shape materials.

**Open die:** a simple die consisting of two flat die halves.

**Paint:** a coating that dries through polymerization.

**Permanent mold:** a mold that withstands repeated use.

**Pickling:** dipping a material in a solvent to remove unwanted materials. Also called *chemical cleaning*.

**Planing machine:** a machine tool that produces flat surfaces. Planing machines move the workpiece back and forth under the tool to generate the cutting motion.

**Plastic range:** the range in which a material can be stretched, compressed, or bent.

**Plating:** an electrolytic process.

**Press:** a device in which force is delivered to complete a forming action. Presses slowly close die halves by lowering a ram to produce a squeezing action.

**Press fit:** a fit in which friction between parts will cause them to remain together.

**Pressure bonding:** a bonding technique that applies heat and pressure to a bond area.

**Programmable logic controller (PLC):** a device that uses a microprocessor to control machines or processes.

**Robot:** a mechanical device that can perform tasks automatically or with varying degrees of direct human control.

**Rolling machine:** a machine that uses two rolls rotating in opposing directions to form a material.

**Secondary manufacturing process:** the action used to change industrial materials into products.

**Separating process:** a process in which tools or machines are used to remove excess material to make an object of the correct size and shape.

**Shaped die:** a die used to form plastic objects.

**Shaping machine:** a metalworking machine tool that produces flat surfaces. Shaping machines move a single-point tool back and forth over the workpiece to produce the cutting motion.

**Shearing:** a separating process that uses opposing edges of blades, knives, or dies to fracture unwanted material away from a workpiece.

**Spraying:** a process that uses air to carry fine particles of finishing materials to the surface of a product.

**Tempering:** a process used to relieve internal stress in a part.

**Thermal conditioning:** conditioning processes using heat.

**Turning machine:** a separating machine that rotates a workpiece against a single-point tool to produce a cutting motion.
**Varnish:** a clear finish made from a mixture of oil, resin, solvent, and a drying agent.

**Yield point:** the point at which a material will not return to its original shape after being stretched.