Most Commonly Used Plastic Injection Molding Terms

Additives – These compounds are added to resins to improve the overall performance and appearance of finished products. A key trend in this area today is using additives that are made from organic materials such as eggshells, wood pulp, rice hulls or materials that improve the biodegradability of the plastic.

Alloy – A plastic alloy is a physical modification of an existing plastic to achieve higher performance and or functionality. These alloys are often used in the automobile industry and to replace metal parts.

Annealing - Annealing is the heating and slow cooling of a plastic part which allows the polymer chains to recoil and relieve internal stresses.

Assembly – A secondary manufacturing function of joining finished parts together.

Backing plate – A plate, which supports the mold, pins and bushings in the injection machine.

Blister – As the name says, this is a part defect which appears as a small bubble or blister on the surface of a part and it generally created by gas or air bubbles.

Blow molding – The process follows the basic steps found in glass blowing. A parison (heated plastic mass, generally a tube) is inflated by air. The air pushes the plastic against the mold cavity to form the desired shape. Once cooled, the plastic is ejected. This method is used to make plastic bottles.

Bridge tool – An injection mold that makes parts until the final tool is completed. These molds or tools are not meant to be production tools.

Bubbles – Similar to blisters, gas pockets, or voids that have formed inside the plastic.

Cavity - The machined shape within a mold which created the form of the plastic part.

Clamp – The mechanism that holds the mold in location during the molding process.

Cold slug – A defect characterized by a small non-uniform area on the part caused by an improperly heated piece of plastic becoming attached to the part.

Colorant – A pigment system, usually in pelletized form, powder or liquid, which is mixed with resin to produce the desired color.

Compression molding - The name of this molding method says everything. A heated plastic material is placed in a heated mold and is then compressed into shape. The plastic can be in bulk but often comes in sheets. The heating process, called curing, insures the final part will maintain its integrity. This molding method is often used to make large objects such as automobile components.

Copolymer - A polymer derived from more than one type of monomer.

Core - A protrusion or set of matching protrusions, which form the inner surface of a plastic part. They are often considered they "male" side of the part.

Crazing – A defect that causes small cracks often caused by over-stressing the plastic material.

Creep – The "set" that a molded part takes under stress, and does not return to its original shape. Also known as "memory".

Cure – The process of allowing a plastic to harden or stabilize.

Cycle – The overall time it takes for the plastic injection process to complete a finished part.

Degassing – Opening and closing of a mold to allow gas to escape. Trapped gas and/or air can cause parts defects such as blistering and bubbles.

Delamination - This defect appears as a flaky surface layer on the part and is often caused by contamination or moisture in the resin pellets.

Dimensional stability - Ability of a plastic part to retain the precise shape in which it was molded.

Draft – The angle or degree of taper in a side wall to help facilitate removal of the parts from the mold.

EDM or electric discharge machining - A manufacturing process used to create molds, where the shape of the mold cavity is obtained by removing metal material using electrical discharges.

Ejection pin – Metal rods in the mold which push the parts from the mold.

Ejector return pins – Pins that push the ejectors back into position once the parts have been released.

Ejector rod – A bar that engages the ejector assembly and pins when the mold opens.

Elasticity – The ability of a material to return to its original state when stretched.

Elastomer – A rubber-like material, which is highly elastic.

Extrusion – The process of forming tubes or continuous shapes by pushing melted material through a die aperture.

Fabricating – The process of manufacturing plastic products through various molding and forming methods.

Family mold – A mold which contains cavities for various parts.

Fan gate – A gate with a wider width that helps reduce warping through stress.

Fill – The packing of material into the mold

Filler – An inert additive that adds strength or hardness to a part.

Finish – The surface texture to a part.

Flash gate – An alternative to a fan gate, which conveys the melted resins into a thinner gate section creating a linear melt flow into the cavity.

Flash or burrs – A thin lip or protrusion beyond the body of the part that is generally caused by poor clamping force, improper mold design and/or mold damage.

Flow marks - A wavy pattern or discoloration caused by a slow injection speed which allows the material to cool too quickly.

Flow rate – The volume of material passing a fixed point per unit time.

Gate – The channel into which melted plastic flows into a mold.

Hardness – The resistance of a material to compression, indentation and scratching.

Hot-runner mold – Hot runner molds consist of 2 plates that are heated with a manifold system. The manifold sends the melted plastic to nozzles which fill the part cavities.

Injection Blow molding - A blow molding process in which the parison to be blown is formed by injection molding.

Injection molding – A manufacturing process in which melted plastic is injected into a mold to form a part.

Insert – An object, such as a magnet or screw, which is inserted into the molded part.

Jig – The apparatus which holds and guides the tool during the manufacturing process.

Machine shot capacity – The maximum volume of resin which can be injected in a single stroke.

Masterbatch – A solid or liquid additive for plastic used for coloring plastics or imparting other properties to plastics.

Memory – The action of plastic returning to its previous size and form.

Mold – A hollow form that plastic is injected or inserted into to manufacture a plastic part.

Mold release – A surface preparation used to aid in the ejection of the part from the mold.

Multi-shot molding – A process where two or more plastic substances are injected into the mold to form a part. Toothbrushes are often manufactured using this technique.

Nozzle - The hollow-cored metal nose screwed into the injection end of the barrel which forms a seal under pressure.

Orange peel – A patchy rough surface defect caused by moisture in the mold cavity, or by incomplete pack-out.

Over molding – A two-shot process, in which two plastic substances, are injected into a mold sequentially, usually a harder base material with a coating of softer material.

Parting line – A line on a part formed when the two sides of the mold come together.

Pinpoint gate – A very small gate, used in hot runner molds, to control the flow of material.

Plastic – A polymeric substance of large molecular weight.

Plasticity - The quality of being easily shaped or molded.

Platens – Steel plates in the molding machine onto which the mold is fastened.

Polymer - A substance that has a molecular structure consisting chiefly or entirely of a large number of similar units bonded together, e.g., many synthetic organic materials used as plastics and resins.

Prototype tool – Also called a soft tool, a preliminary mold built to produce prototype parts and used to make adjustments to the final production tool.

Purging – The process of cleaning the injection machine of remnant color or materials prior to running a new part.

Ram – A plunger-like part which pushes the melted material into the mold.

Release agent – A compound, which is sprayed on the mold, or as an additive, molded into the part to help facilitate the release of the part.

Retainer plate – A plate onto which the removable parts of the mold are mounted.

Runner system – The channel system that allows the flow of the melted material to fill the part cavities.

Short shot – A defect where the material does not fully fill the part cavity.

Shot – A complete cycle of the injection machine.

Shrinkage – The amount of volume reduction that takes place when a plastic material cools.

Sprue – The opening feed that conveys material from the nozzle to runner system in the mold.

Thermoplastic - A material that can be heated and cooled repeatedly without changing the material structure. Highly recyclable.

Thermoset – A material, which when heated, is pressed or molded into a shape. The heating process changes the structure of these materials, and for this reason they cannot by re-heated.

Tie bars - Bars which provide structural support to the mold in the press. The spacing between the tie bars dictates the size of the mold that can be placed into the injection machine. The mold opens and closes riding on the tie bars.

Toggle – A mechanism that is used to mechanically close the mold, as opposed to hydraulic clamping.

Tool – The mold used to form plastic parts in an injection machine.

Undercut – Can be a design flaw that results in an indentation or protrusion that inhibits the ejection of the part from the mold. Other times undercuts are designed into a mold to ensure a part holds onto the correct side of the mold.

Vent – A channel from the mold cavity that allows gas and air to escape as resin is being injected into the cavity to prevent many types of defects from occurring.

Weld line - Also called a knit line, the juncture where two flow fronts meet and are unable to join together during the molding process. These lines usually occur around holes or obstructions and cause localized weak areas in the molded part.


Have a question about
plastic injection molding?
Contact us at
info.rodongroup.com/contact-us