

THE NAVIGATOR



Definitions of Rapid Tooling

by Vista Technologies, LLC

BLUSH – A cosmetic defect caused by shear through the gate.

BRIDGE TOOL – An injection mold tool used to supply parts while the production tool is being built.

CORE PINS/INSERTS – A pin or protrusion in the tool that are inserted to produce critical dimensions or features.

DRAFT – The angle or taper provided on molding sections to facilitate the removal of the molded piece part from the mold.

EJECTOR PINS – Steel pins strategically placed in the mold used to push or “eject” the finished piece part from the mold.

FAMILY TOOL – One mold that shares two or more different parts in the core and cavity for injection molding.

FLASH – A thin fin of material, which forms at the parting line of the mold.

FLOW LINES – Flaws or visual blemishes that indicate material flow direction in the mold.

GALLING – A mold defect when the metal mold material creates friction upon itself from rubbing.

GATE – An opening in the mold where the injection molded material enters the mold to create the intended plastic part.

HAND PICK OUT – This is a manual “slide”. A hand pick out is used to produce details such as undercuts and recesses on low volume runs to reduce overall tooling cost.

HOT GATE / HOT TIP – This gate is directly into the part with no runner. This gate does not need to be trimmed. This gate is usually used for multi-cavity tools with high volume runs. This gate utilizes a heater wrapped around the gate to keep

the material fluid so it can fill a cavity. In a hot tip, the material is shot through a gate opening between .040” - .120”.

LEADER PINS – Pins located in one half of the mold assembly, mated with bushings in the other half and used to align the two portions of the mold base.

LOW-VOLUME PRODUCTION TOOL – A tool that is built for volumes that do not require the additional costs or lead-times of production tooling.

M.U.D. SET – (Master Die Unit) Inserts which are quickly changed over by using a standard frame.

NIT LINES / WELD LINES – Flaws or visible blemishes where two material flow fronts meet.

RADII / RADIUS – Rounded edges or surfaces to allow plastic parts to be created in the injection mold.

RAPID TOOL – An injection mold that is built fast and cost effective for low quantities. These spec material parts are used for functional testing.

RUNNER – A groove or channel cut into either one or both halves of the mold, which carries the molding material to the vicinity of the cavities.

SHRINK – The action of the material fluctuating when it is heated up and cooled down into the mold.

PARTING LINE – A line or mark on the piece part indicating where the two halves of the mold meet.

SINK – A shallow depression defect caused by thick wall sections. The material retains heat and shrinks more than normal due to irregular wall thickness.

SLA • FDM
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Metal Castings
Bridge Tooling

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Rapid Prototyping • Rapid Tooling

Flexible &
Standard Resins
Rapid Tooling
RTV Molding

Definitions, cont.

SLIDES – A portion of the mold, which is made to travel at an angle to the normal movement of the molding machine, to produce recesses, undercuts, and holes.

SPLAY / SHEAR – A cosmetic defect caused by moisture in the resin or injection molding machine screw rotation or the movement of material through a curved area.

SPRUE – The round, tapered material, which connects the loading chamber or nozzle with the runner system or the piece part.

SPRUE GATE – This gate goes directly into the part with no runner.

TAB GATE – A gate that is directly off the runner into the part. A tab gate needs to be trimmed in a second operation after the plastic part is ejected.

TUNNEL GATE – A gate that allows the material to flow into the plastic part, but when the part is ejected, the opening mold shears of the gate. (No second operations).

UNDERCUT – A recess or depression in a molded article, located in such a position that it impedes or makes impossible the ejection of the part by the normal opening of the molding machine.

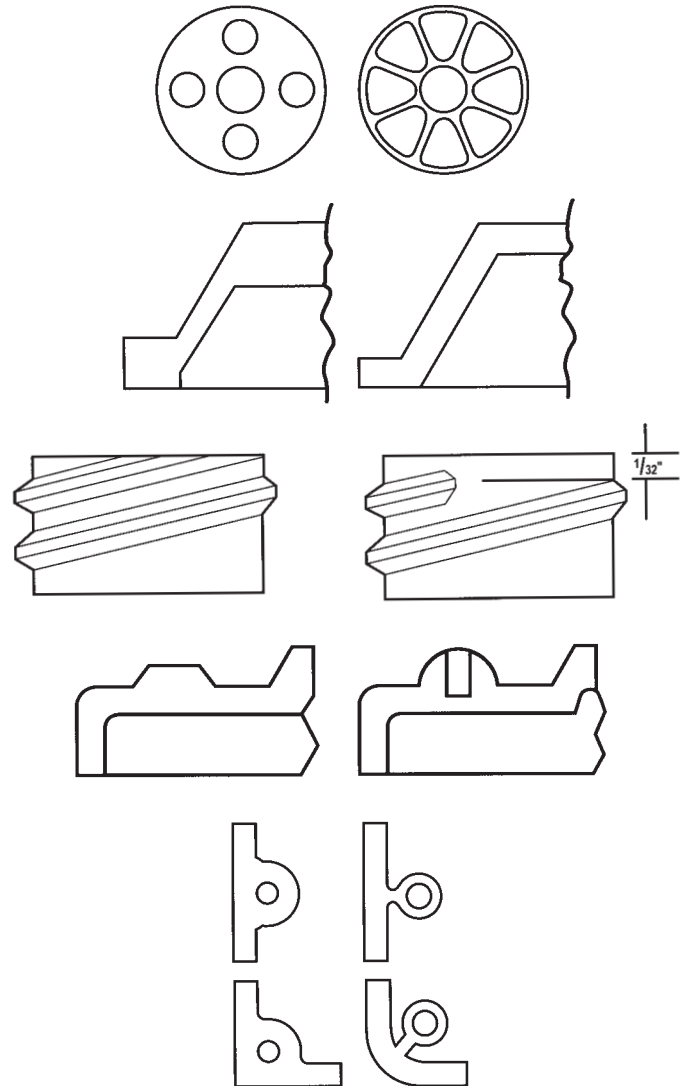
VENT – A shallow groove or slot machined into the parting line of the mold which allows air and gases to escape from the cavity as it is being filled with the molding material.

WARPING – Dimensional distortion in a molded part caused by material shrinking in different ways.

Plastic Part Design

Incorrect

Correct



Files Vista can accept for Tooling

These 3D CAD files below are used for quoting, mold splits and programming.

- Pro-E (prt)
- Solidworks (sld)
- Iges
- Step

These 2D CAD files below are used for budgetary quotes and for gathering dimensions and called out notes.

- dxf
- pdf

It is recommended to provide as much data upfront in the quotation process to ensure best cost, lead-times, and results.

Rules of Thumb

1. Nominal wall thickness .060" to .156".
2. Ribs and bosses 60% to 70% of wall thickness.
3. Radii all sharp corners 25%-75% of wall thickness.
4. Allow clearance on threads.
5. Draft angles are 1-degree standard practice and a minimum of .25 degrees. Textured parts require more degrees of draft.