

Working With 3D Data Bases

Toolmaker to take a set of files (iges wire frame, iges surfaces, and original solids file) from beginning to completion without changes.

In order to accomplish this, a customer should have created prototypes from the 3-D files, done market survey/research with these models/prototypes, and made adjustments prior to starting the tools.

When quoting with 3-D files, the following are assumed:

1. The file is complete and fully consistent with no discontinuities.
 - a. All draft is in the file.
 - b. All corners are blended and uniform, all corners that require a radius have a radius.
 - c. There are no holes in the files down to a .0005" level of fineness.
2. A Q.C. print is provided (isometric or 2-D) which shows anticipated critical dimensions and features.
3. A prototype (SLA, machined, etc.) is available for the toolmakers during design and construction of the mold.
4. A set of notes/default tolerances which include – appearance and texture notes; default tolerances – in case of questions these default tolerances are guides. They do not overrule the 3-D model.
5. Any inconsistencies and additional manipulation of the files required to make the files useable will require add costs and time in the construction. Just because an S.L.S. (S.L.S.) has been made, does not mean that the files are enough to machine a useable mold. Machining requires much finer integrity.
6. The advantage of 3-D files is that you can program in total. When you make changes, it can require the toolmaker to totally reprogram all of the cutting paths, for the particular core or cavity. Hence, even relatively minor change cause almost total reprogramming, and commensurate time delays. Time delays often equate to dollar increase

Changes done after tool construction has started. (if unavoidable)- along with the upgraded files, there will be:

1. An isometric or 2-D of the original details.
2. The revised details.
3. A dated detailed ECN (engineering change notice). All files to contain some updated form of label that we can insure that only the latest files will be used.
4. Some CAD systems, (PRO-E ET. AL), allow you to compare the old and new files and to show all additions. (do old file minus new file, and then do new file minus "difference" file, you will simplify keeping track of the changes, and will minimize programming changes for the toolmaker. 3-D files give great help, and money/time saver, if handled properly. If not handled properly, they can turn every job into the job from Hell.

Some suggestions to prevent problems:

1. Run and print a "script" file, or "part check" file and review and correct any warnings. This will help insure file integrity.
2. Run a "show draft" file, and print an isometric of all surfaces that are under 50 draft, or just manually check all the side walls. Specifically, review each of these surfaces with toolmaker and molder and designer. Then upgrade 3-D File.
3. Print an isometric that shows all inside corners. Review every inside corner for radii, and upgrade 3-D files appropriately.
4. Have molder and toolmaker specifically acknowledge and initial each dimension on the QC print. Print out views that show all shut-offs, and features, so they can be reviewed. Particular emphasis should be on "Views" or "sections" that show wall thicknesses.
5. It is the moldmakers responsibility to review and note all:
 - Drafts less than 3 deg.
 - Shut offs less than 5 deg.
 - Ejector pins less than .078" diameter.
 - Anticipated areas for sink.
 - Any other potential problem

Upon review with the customer, the customer can elect to modify designs to eliminate the anticipated problems, or just live with them.

6. Although the designer/customer is responsible for the design and its ramifications, the molder and toolmaker must point out to them, any found flaws. The goal is a strong long lasting mold and top quality molded parts.

CUSTOMER :
PART :

MATERIAL :

MOLD TEMP
AREAS TO STAY STEEL SAFE
MOLD TEMP
SURFACE FINISH
TOLERANCES + QC
LINEAR + OR - .001 "/"
HOLE DIAMETER
FLATNESS
MOLD SPRAY ALLOWED
PERPENDICULARITY
SIDE WALL - WARP/BOW
CRITICAL FITS
UNIFORMITY OF LINEAR DIMENSIONS AFTER APPROVAL
APPEARANCE TOLERANCES
SINKS
VOIDS (CLEAR PARTS)
PARTING LINE MATCH
SCRATCHES
SHORTS
BURNS
FLASH
EJ. MARKS
BLACK SPECS
SPLAY

PACKAGING:
MOLDER/TOOLMAKER:
IN MOLD WITH:
SHRINKAGE:
WGHT.

CHECK LIST
(PARTS ARE ON 3-D FILES - THE FOLLOWING ARE
CONSIDERED AS DEFAULT TOLERANCES + NOTES
NOT ABLE TO BE PUT ON FILES.)

UNIFORM WALL?
RADI ON CORNERS (INSIDE).
DRAFT?
GATE LOCATION
GATE SIZE
GATE TRIM
PARTING LINE LOCATION
ANTICIPATED WELD LINES
EJECTION TYPE + LOCATIONS
SIDE ACTIONS OR LIFTERS
THICKNESS
ARE RADI ON 3-D FILE?
IS DRAFT ON 3-D FILE?
GATE TYPE
RUNNER TYPE
TRIM FIXTURE?
PIGMENT
LOCATION ORIENTATION
PARTING LINE OR WITNESS MARKS FROM LIFTERS
DIMENSIONAL STABILITY?
ANNEALING?
FIXTURES?
AREAS TO STAY STEEL SAFE

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