



Quickparts

LVIM Design For Manufacturing Analysis

Quickparts.Com, Inc.

PART NAME: Q-Sample

DATE: 10/11/11

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KEY:



Requires Modification













Minor or Cosmetic Issue –
Requires Customer Approval



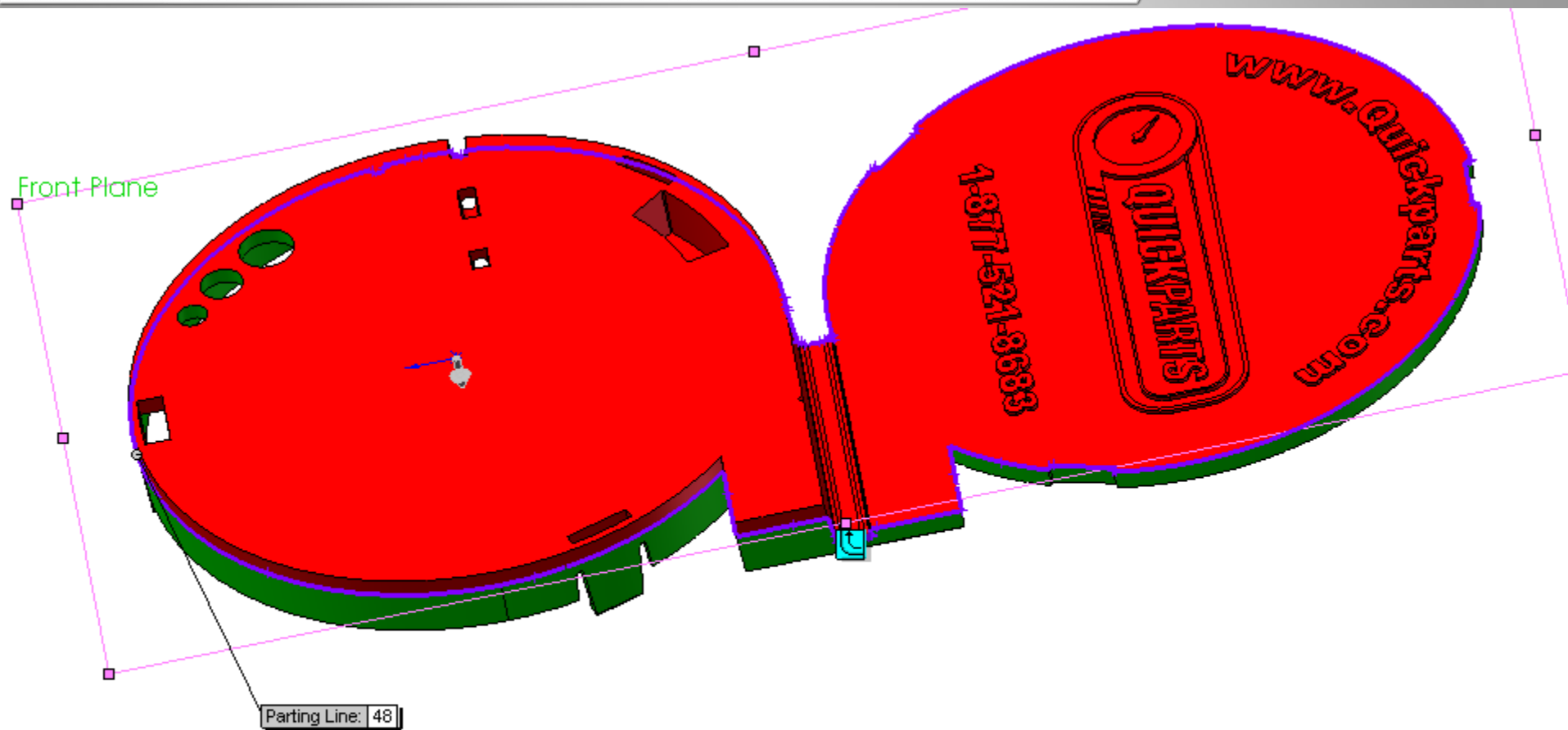
No issues – For Your Information

CRITERIA:

-  Part Orientation and Parting Line
-  Draft Analysis
-  Features Requiring Side Actions
-  Rib/Bosses & Wall Thickness Ratio
-  Thickness Analysis
-  Warp Analysis
-  Shut-off Conditions
-  Thin Tool Conditions
-  Features Requiring EDM
-  Weld line



PARTING LINE and ORIENTATION



- Parting lines may flash as a result of, but not limited to, part material, draft, wall thickness and mold usage. Part strength and surface appearance may not be as expected as a result of manufacturing orientation



DRAFT ANALYSIS

• Our analysis shows the part should not require any draft adjustments

Draft Analysis

✓ ✗ ?

Analysis Parameters

Front Plane

0.500deg

Calculate

Face classificat

Color Settings

Gradual transiti

Positive draft:

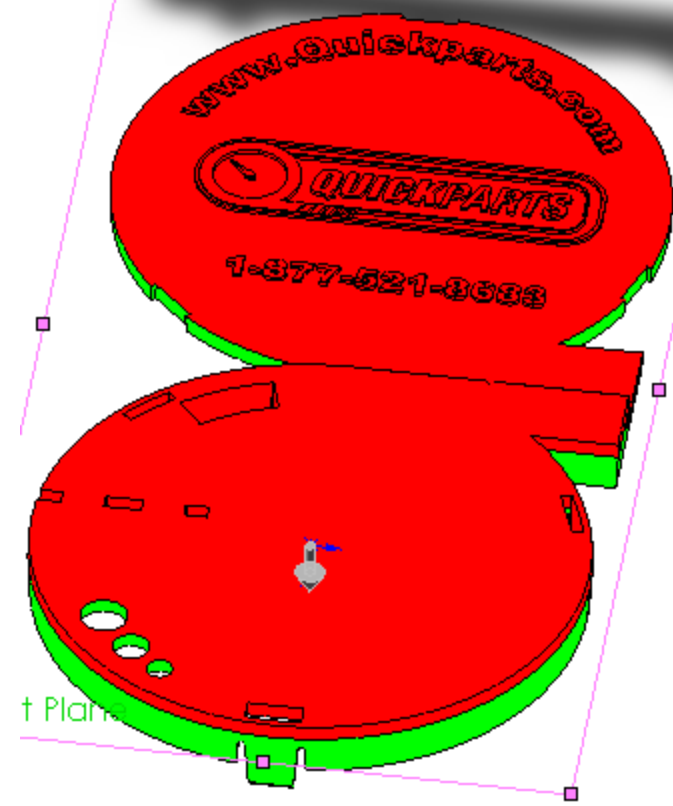
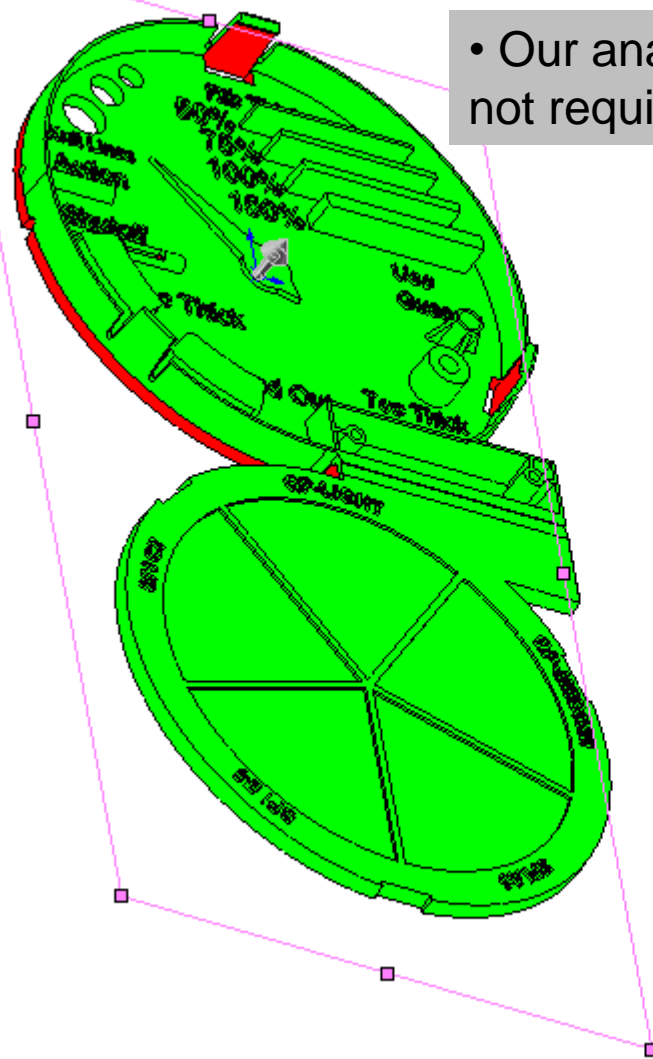
Edit Color

Requires draft:

Edit Color

Negative draft:

Edit Color

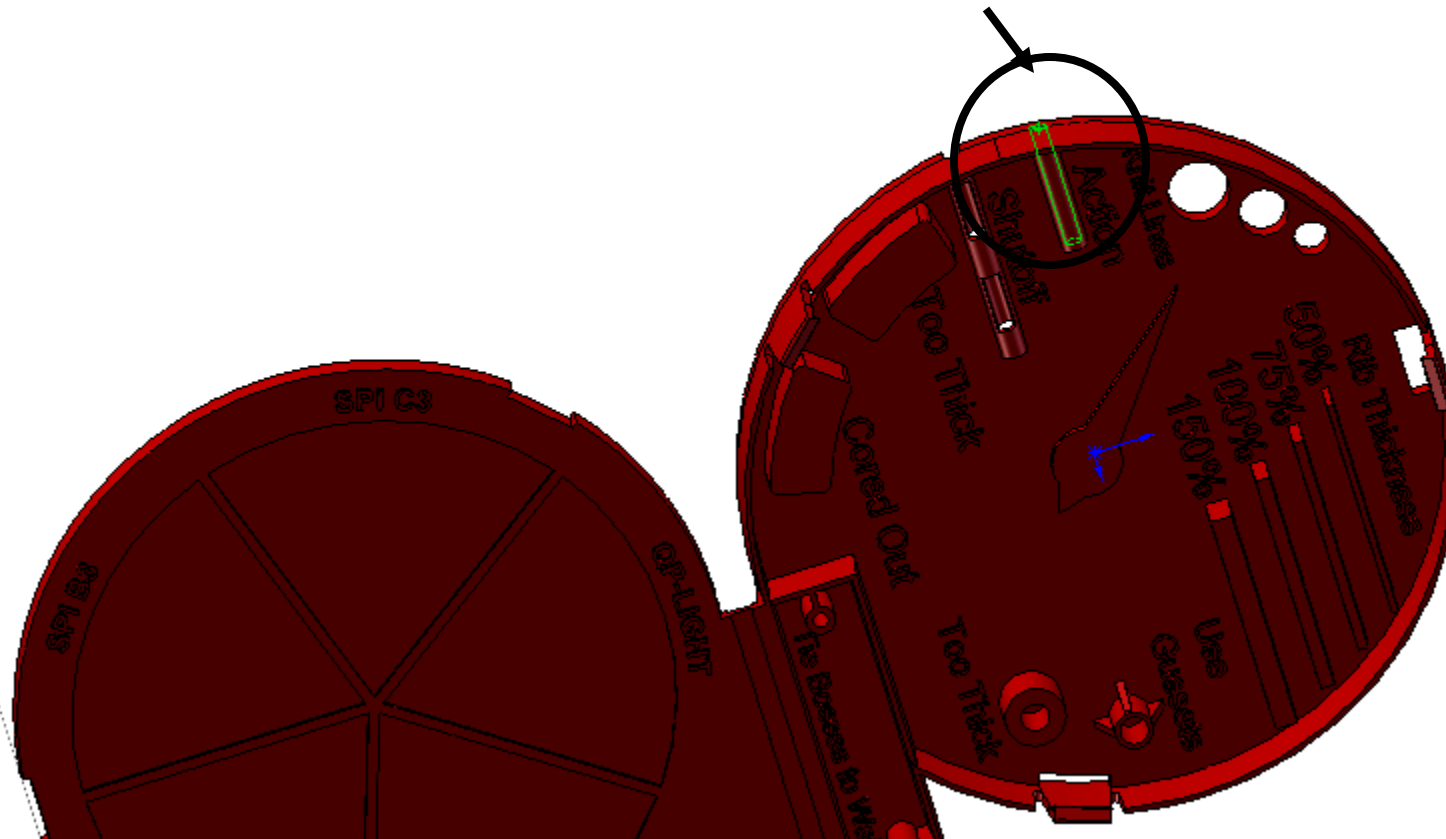


• Parts should have at minimum 1 deg. draft added to all surfaces with textured surface requiring more draft



FEATURES REQUIRING SIDE ACTIONS

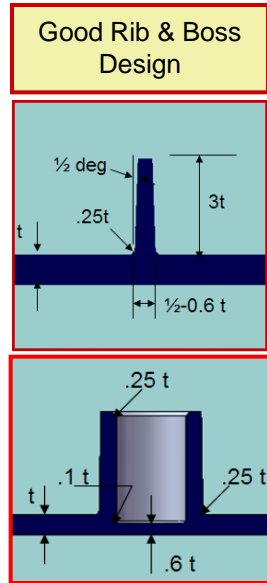
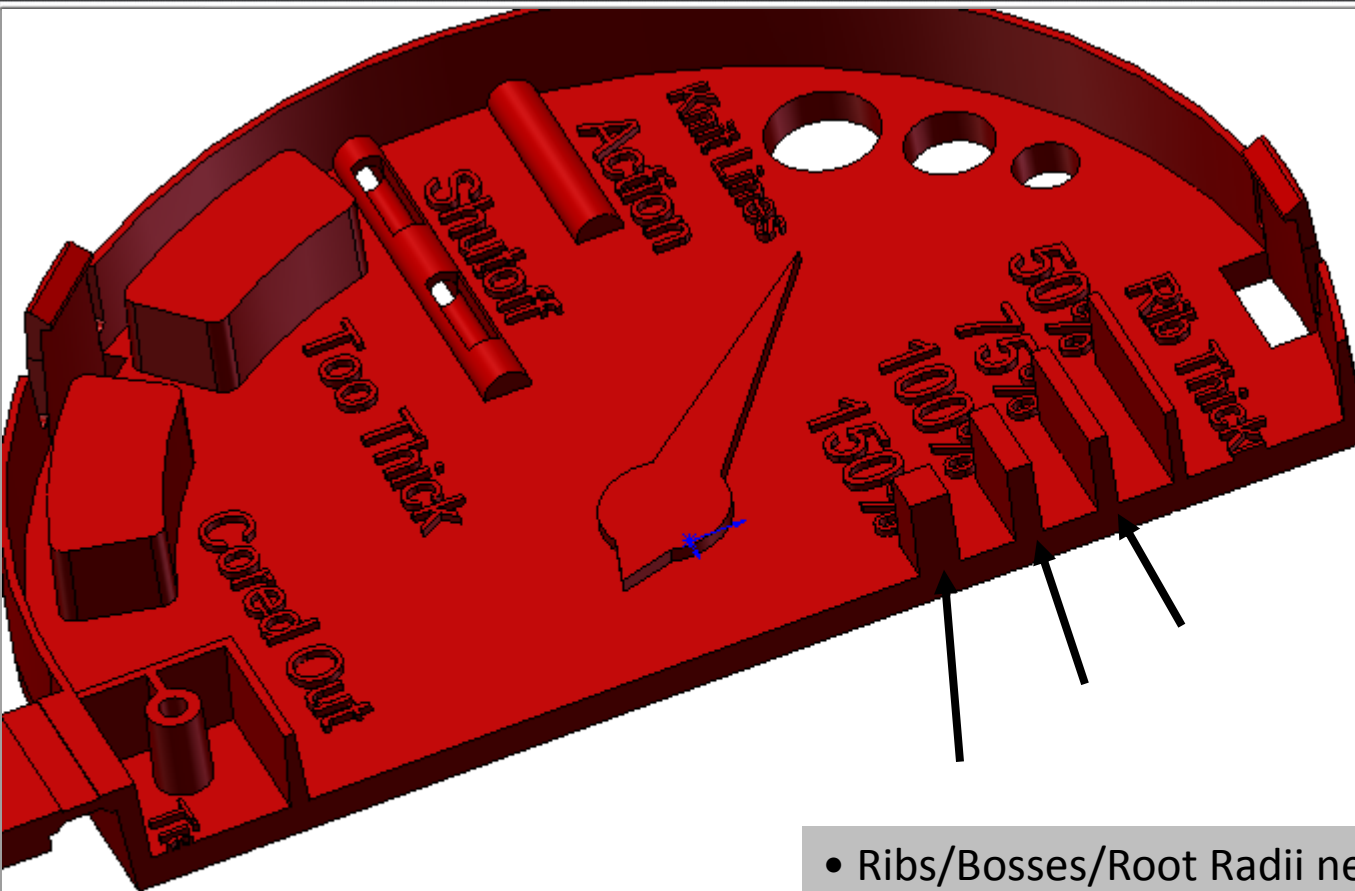
- This feature will require side action



- Parts with features not in the direction of part ejection will require mold mechanisms to facilitate part production



RIB/BOSSES TO WALL THICKNESS RATIO



- Ribs/Bosses/Root Radii need to be adjusted or sink may occur.

• Ribs/Bosses thickness should be 50%-60% of the nominal wall thickness. Height should be no more than 3x nominal wall thickness. Draft on these features of 0.5 deg. is acceptable. Radii at feature intersection should not exceed 1/4 wall thickness. These recommendations are general guidelines, even when followed, sink may still show.

THICKNESS ANALYSIS

Thickness Analysis

Analysis Parameters

T1: 0.025in

Show thin regions
 Show thick regions

Thick region limit: 0.600in

Treat corners as zero thickness

Calculate

Save Report

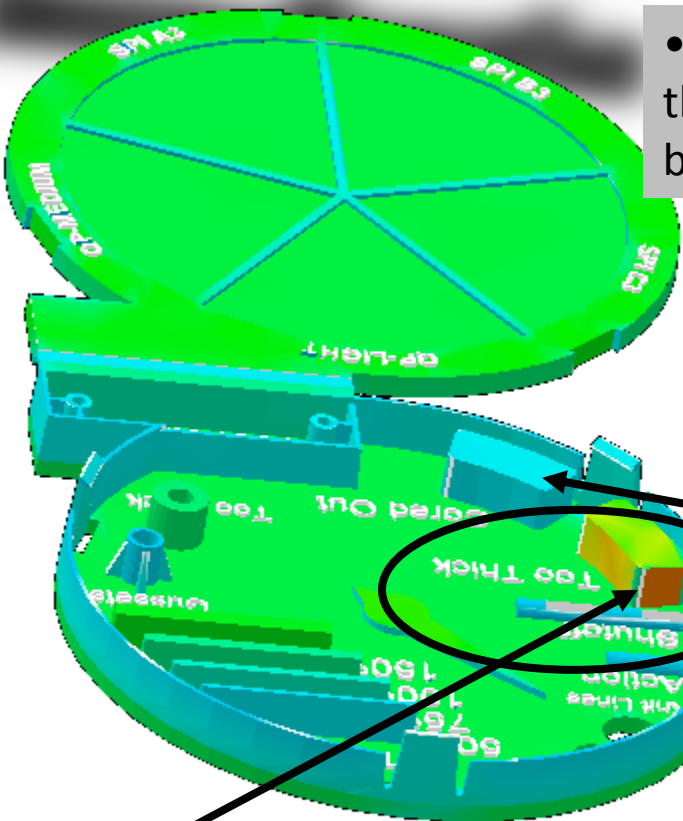
Color Settings

Full color range

Target thickness color: Edit Color...

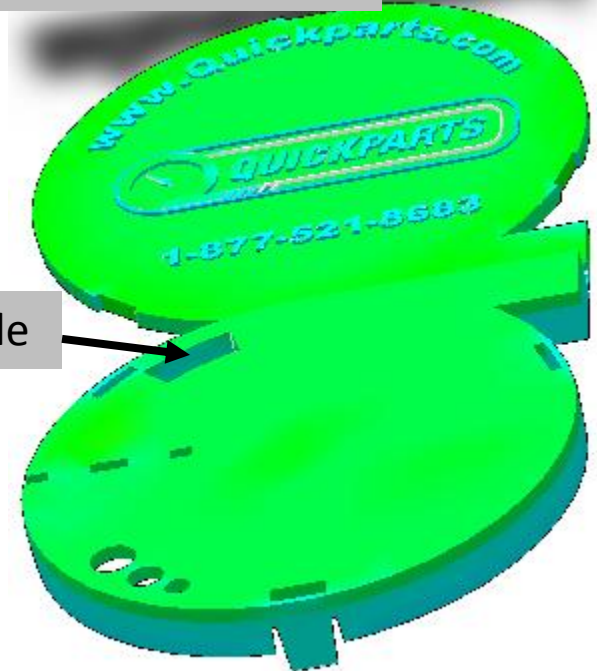
Thickness scale:

	> 0.0250in
	0.0995in
	0.1739in
	0.2484in
	0.3228in



• Our analysis shows the wall thickness in some areas should be adjusted or sink may occur.

For example



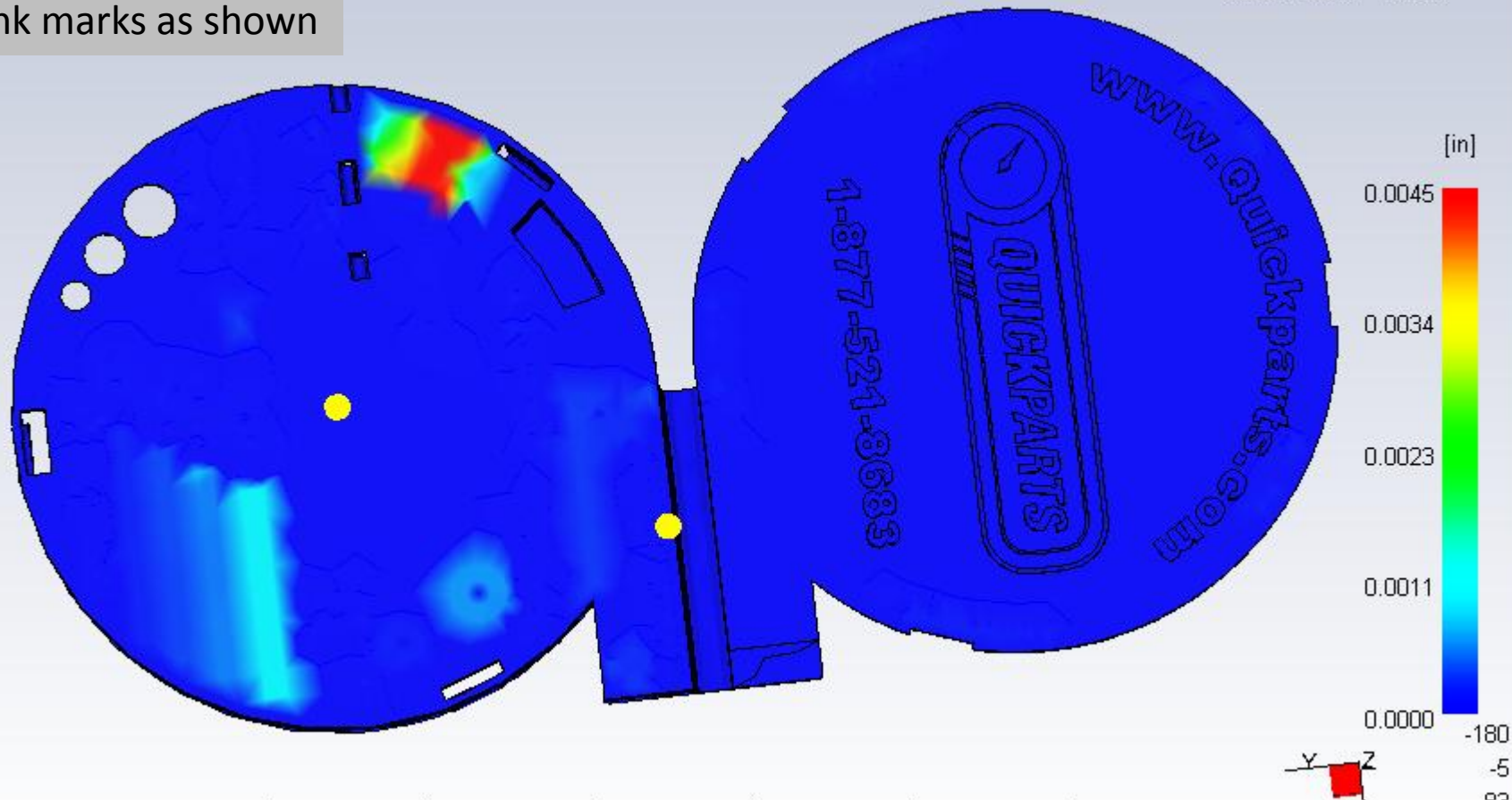
• Core out this red and yellow areas as shown

• Parts with open faces, long unsupported walls, or thick/thin wall thicknesses ratios may warp. Parts may also warp as a result of resin selection or uneven cooling.

MOLD FLOW ANALYSIS – SINK-MARK ESTIMATE

- As mold flow analysis suggests the thick areas causes sink marks as shown

Sink marks estimate
Scale Factor = 1.000

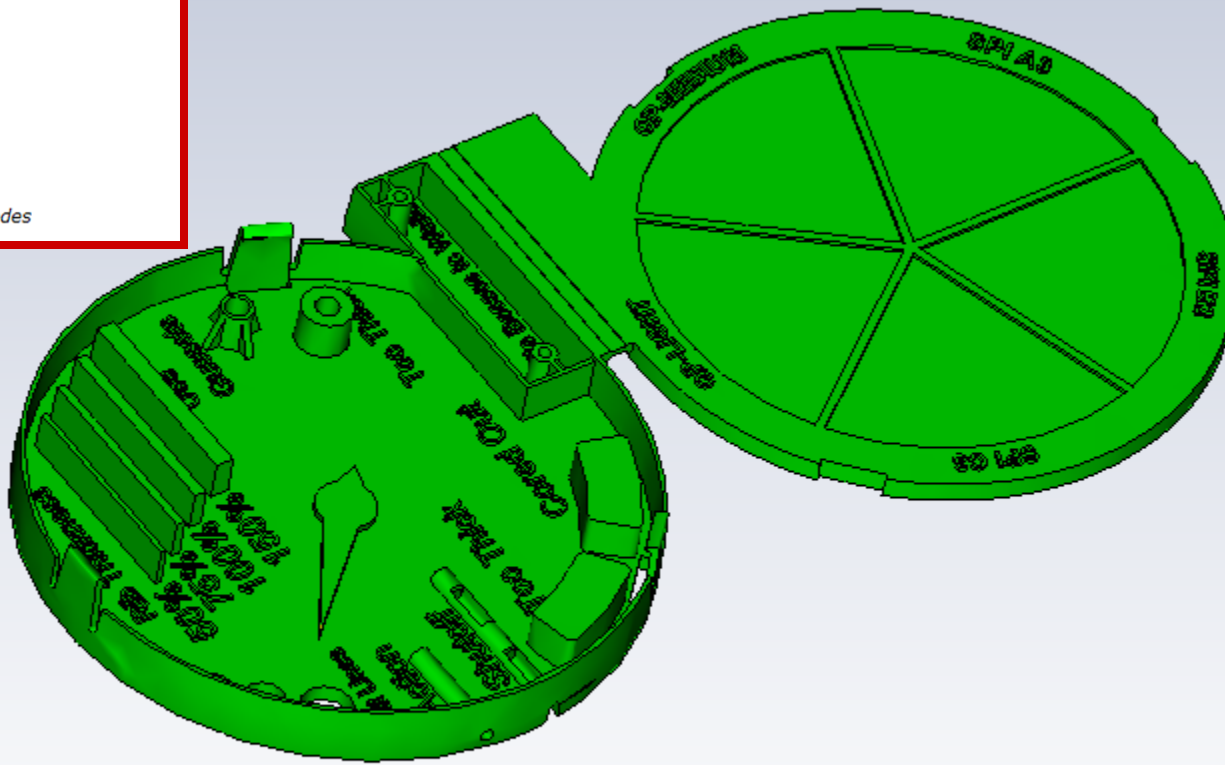
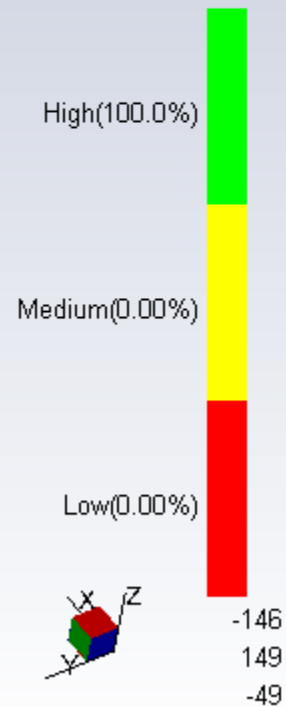


The sink mark estimate results displays the calculated depths of sink marks in the part, and shows a legend to detail the depth differences.



MOLD FLOW ANALYSIS – CONFIDENCE OF FILL

Confidence of fill



1. Will definitely fill.
2. May be difficult to fill or may have quality problems.
3. Will be difficult to fill or will have quality problems.
4. Will not fill (short shot).

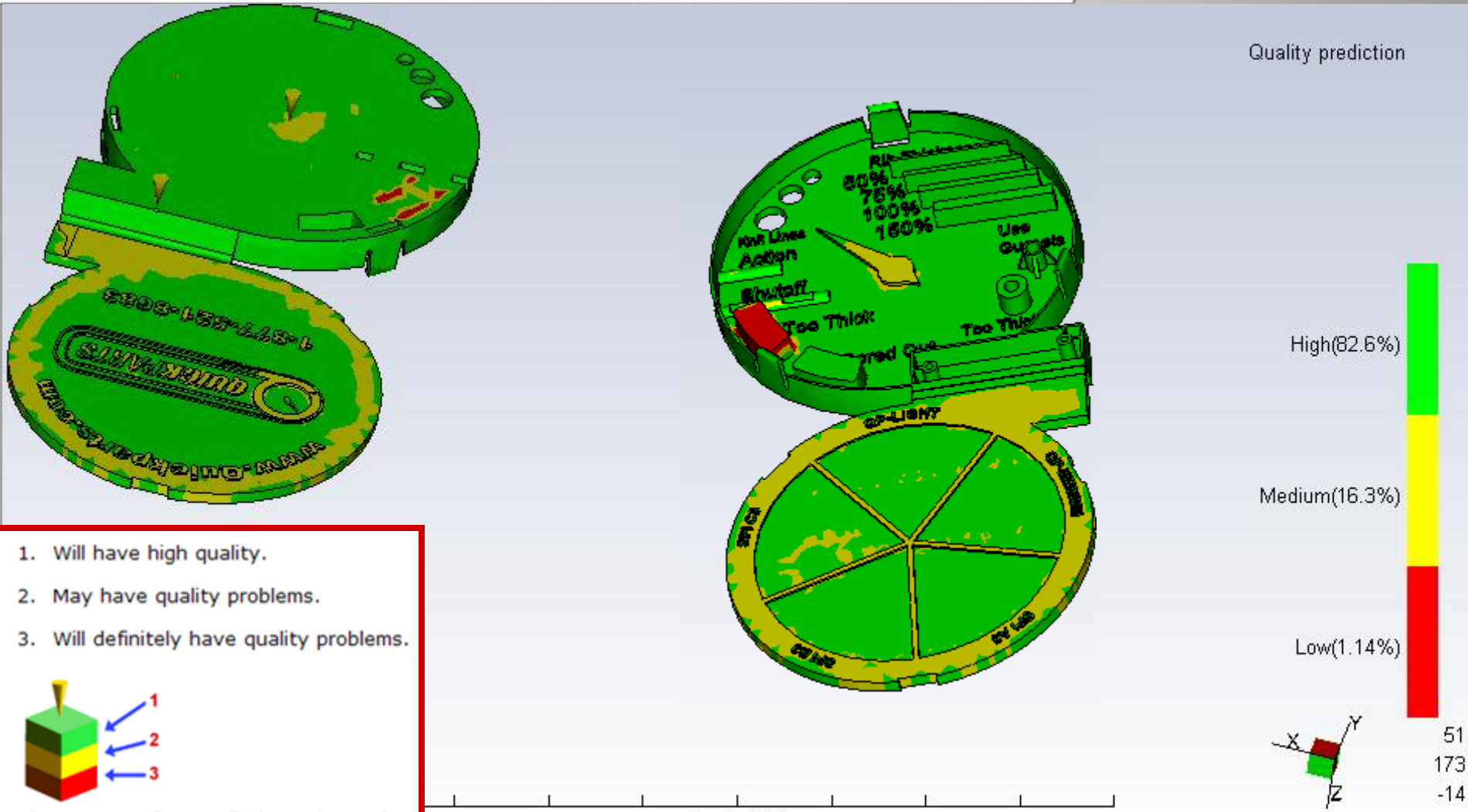


Figure 1. Confidence of Fill color codes

Autodesk:

To appreciate whether or not a good quality part can be molded , consider which colors are visible and how much of each color appears. You should also look at quality prediction results.

MOLD FLOW ANALYSIS – QUALITY PREDICTION



1. Will have high quality.
2. May have quality problems.
3. Will definitely have quality problems.

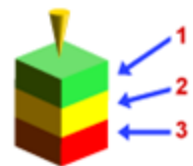


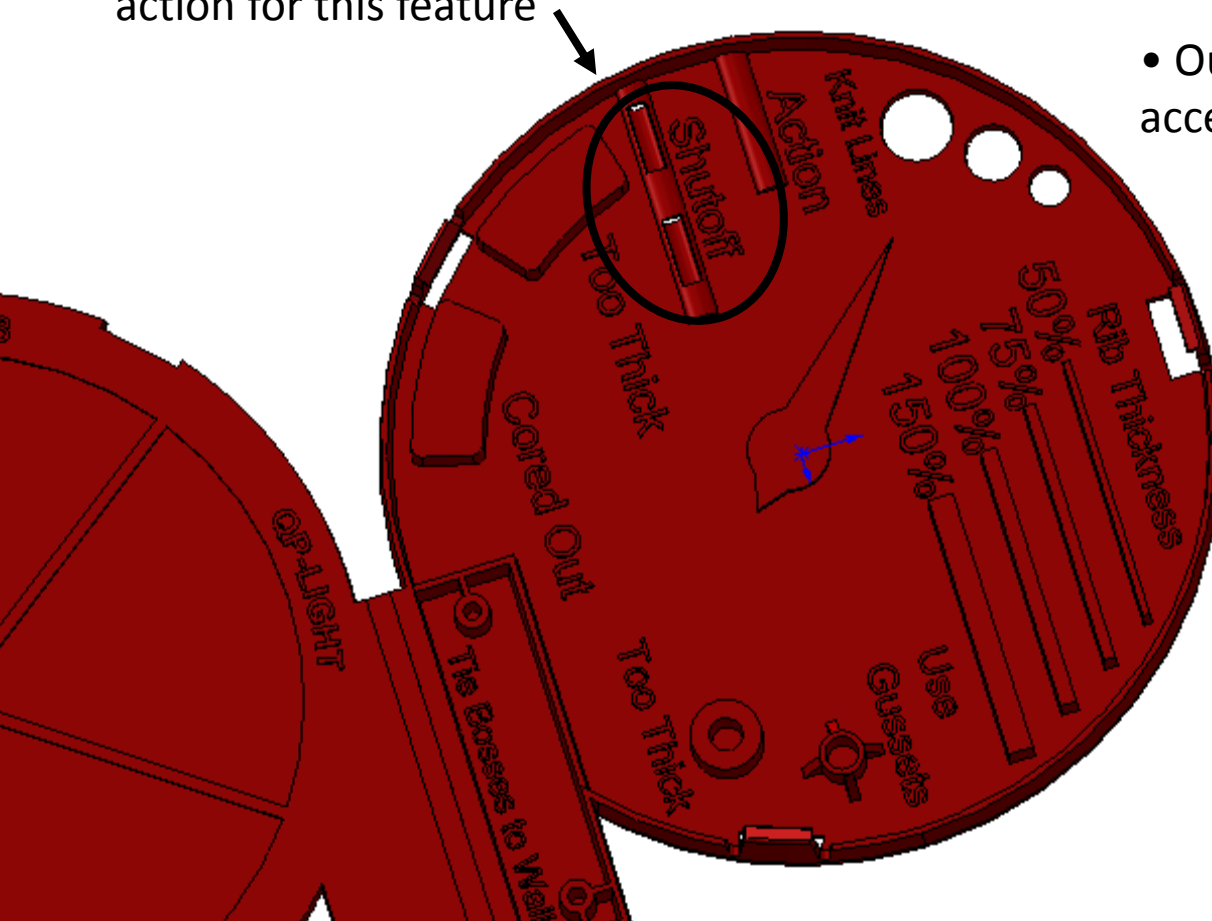
Figure 1. Quality prediction color code

Quality prediction result is not available when there is a short shot



SHUT-OFF CONDITIONS

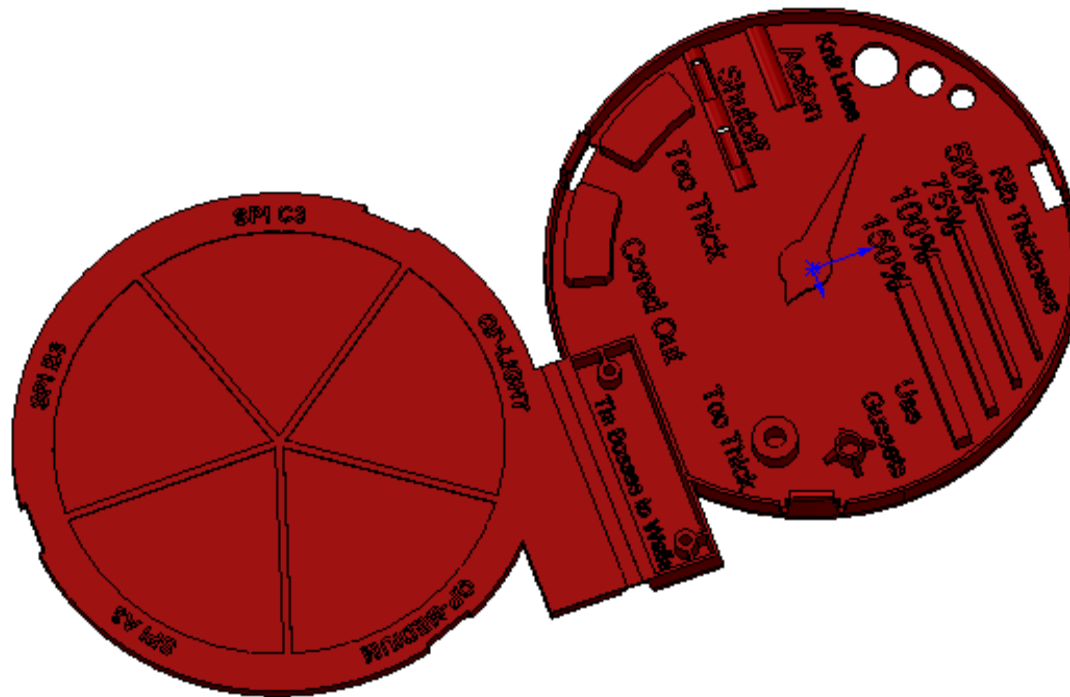
- These shut-offs help eliminate hand load/ side action for this feature



- Our analysis shows the part has acceptable shut-off conditions

- Areas on a part that are created by mold halves coming together require at least 3 degrees of draft.

- Our analysis shows the tool does not have thin metal conditions

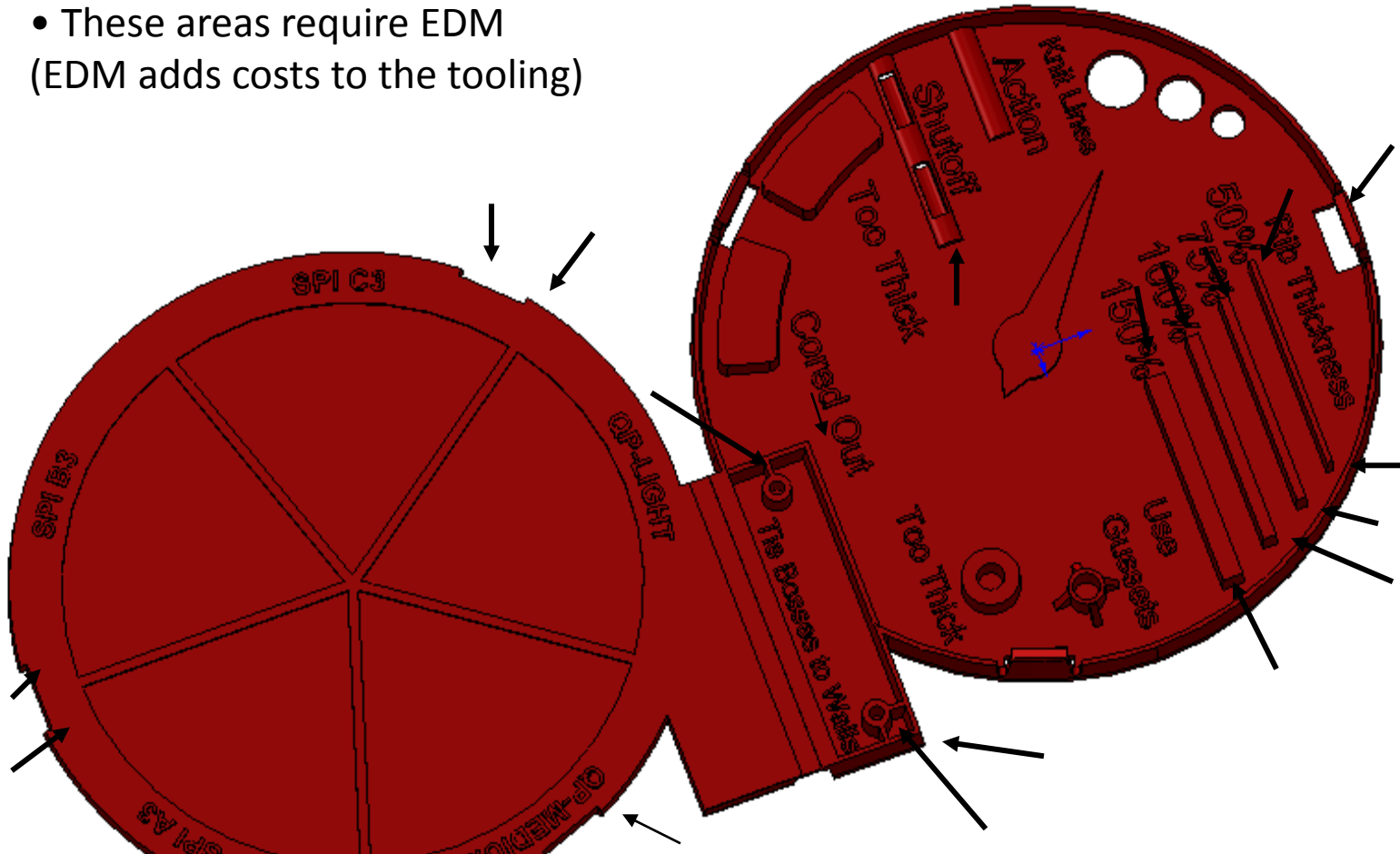


- Areas on the part where tool metal will be less than 0.050" can result in tool failure.



AREAS REQUIRING EDM

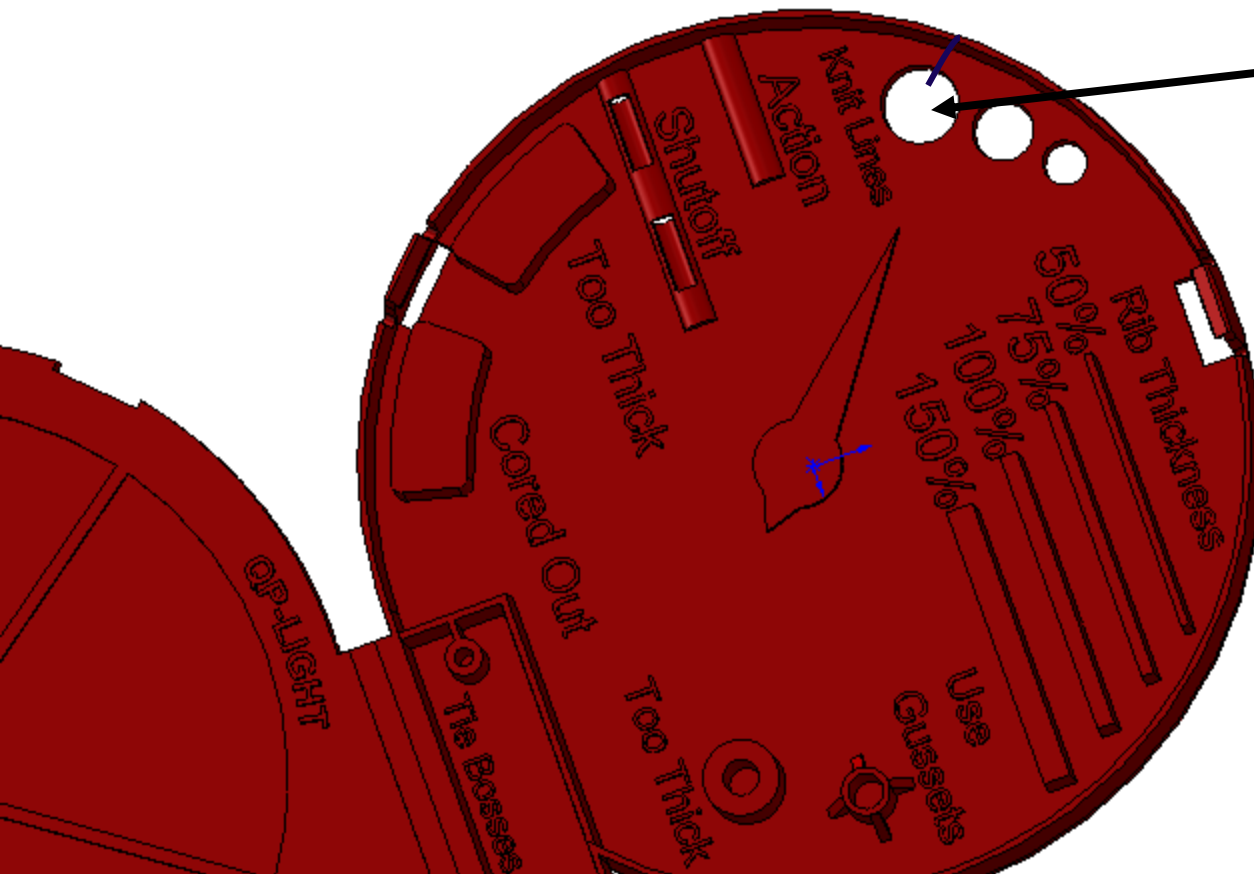
- These areas require EDM (EDM adds costs to the tooling)



- Features with sharp corners or height-to-thickness ratio more than 8/1 will require EDM rather than CNC machining.

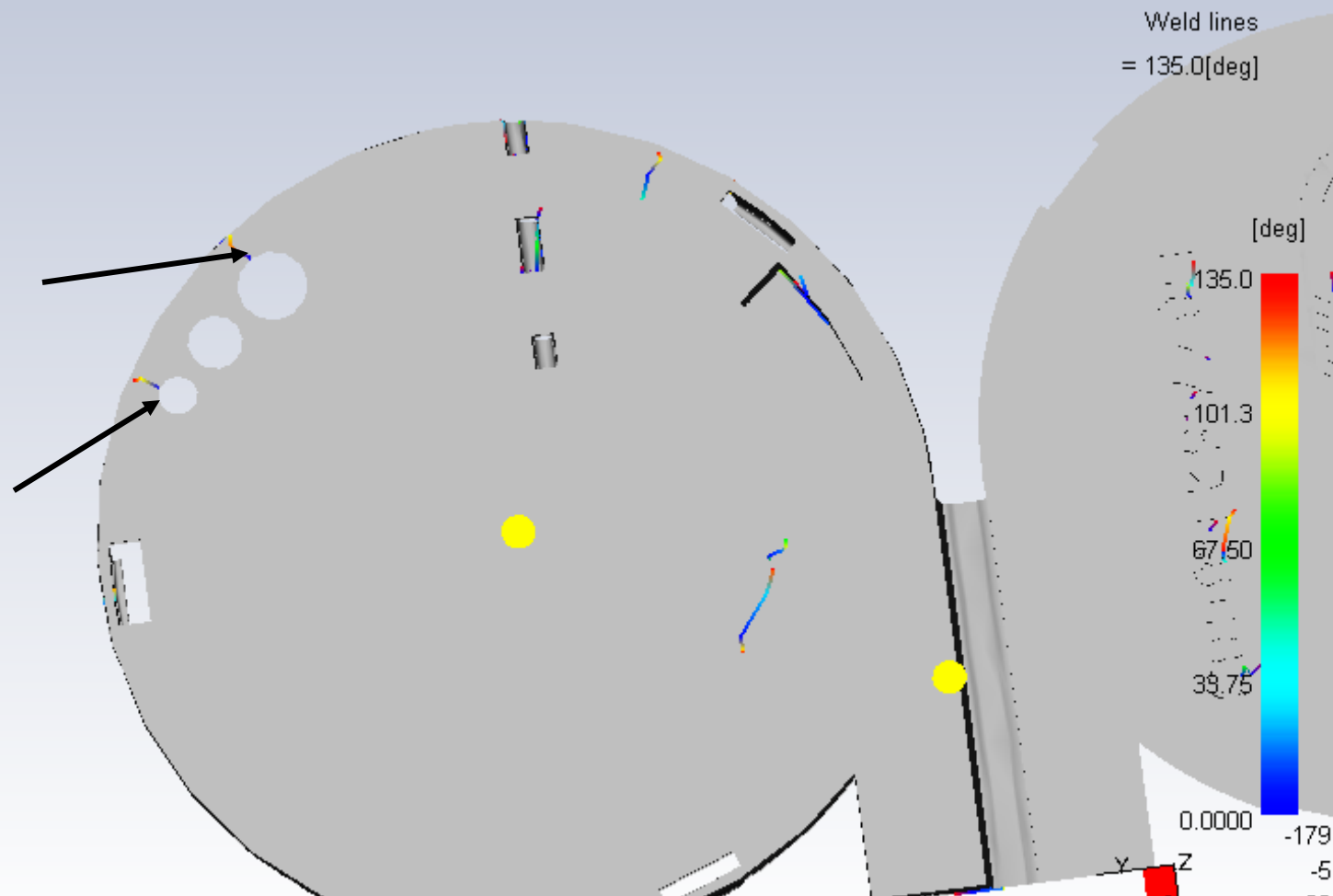


MOLD FLOW ANALYSIS – WELD LINE



- Weld lines may appear as a result of the following obstructions, for example

- Where ever plastic must flow around an obstruction, a weld line is formed. Usually a visible line, which might be mistaken as a crack is formed where the plastic joins together.



The weld lines results displays the angle of convergence as two flow fronts meet.

The presence of weld lines may indicate a structural weakness and/or a surface blemish.