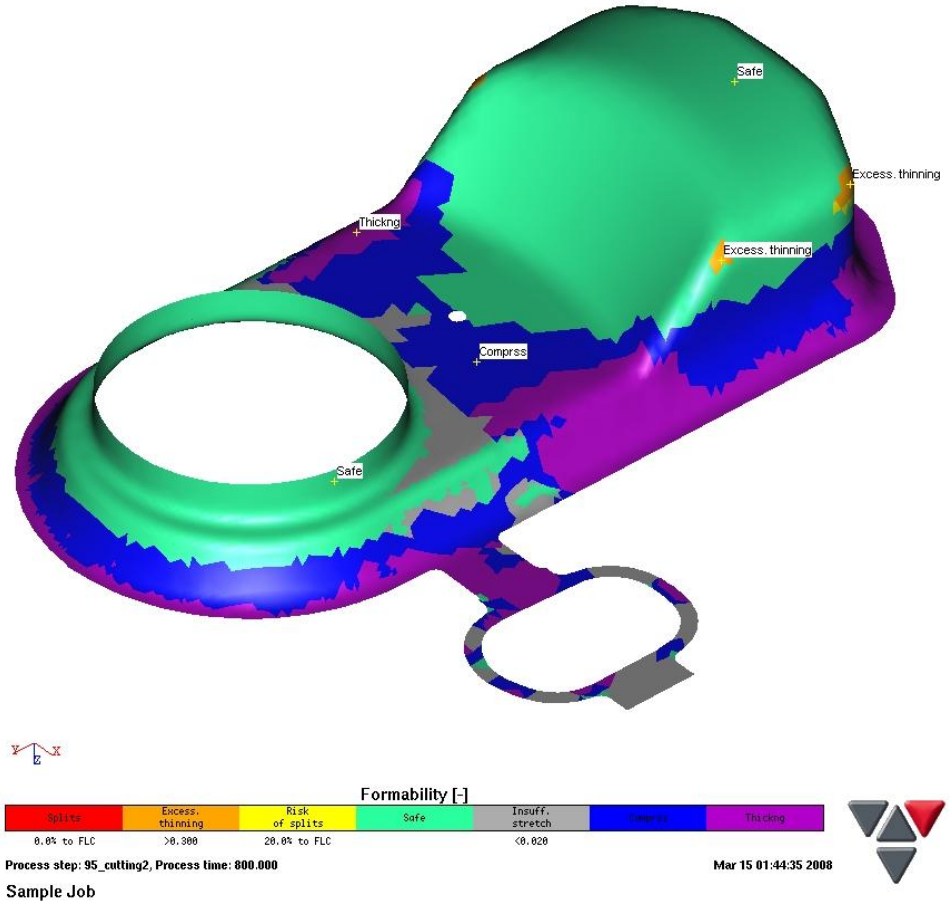
Basic Forming Analysis Process

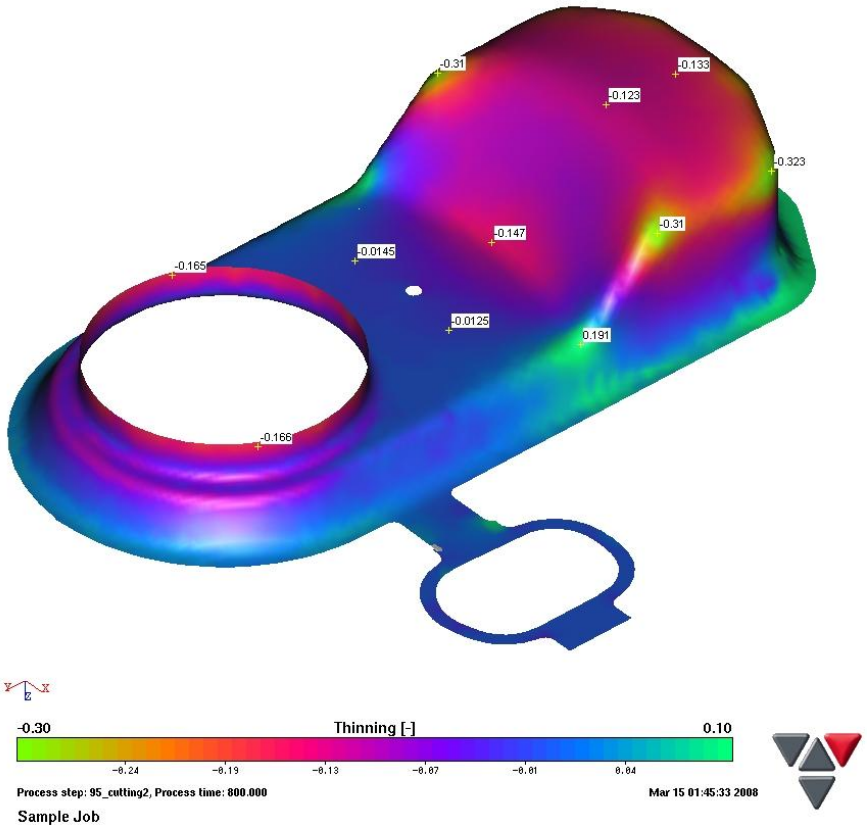
SUMMIT TOOL DESIGN
STAMPING DIE DESIGN

Check Formability

Run a formability analysis using the specified materials physical properties and 3D model geometry. A Formability Color Scale of the model shows where material is predicated to thicken, thin or remain within a safe zone.

A supporting report graphically highlights the changes to material thickness showing the predicted changes by percentages. With this information, changes to model geometry or the forming process can be designed.

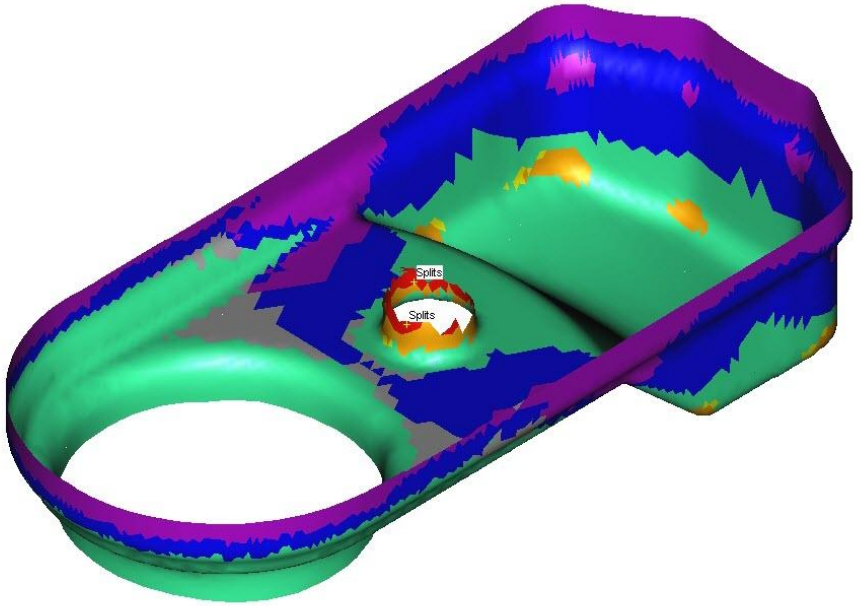


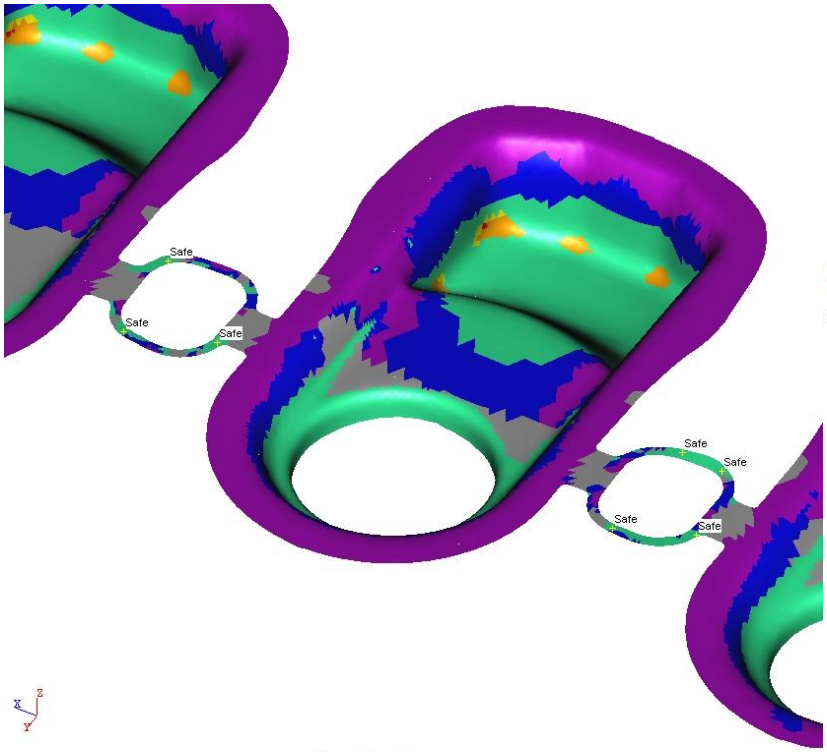


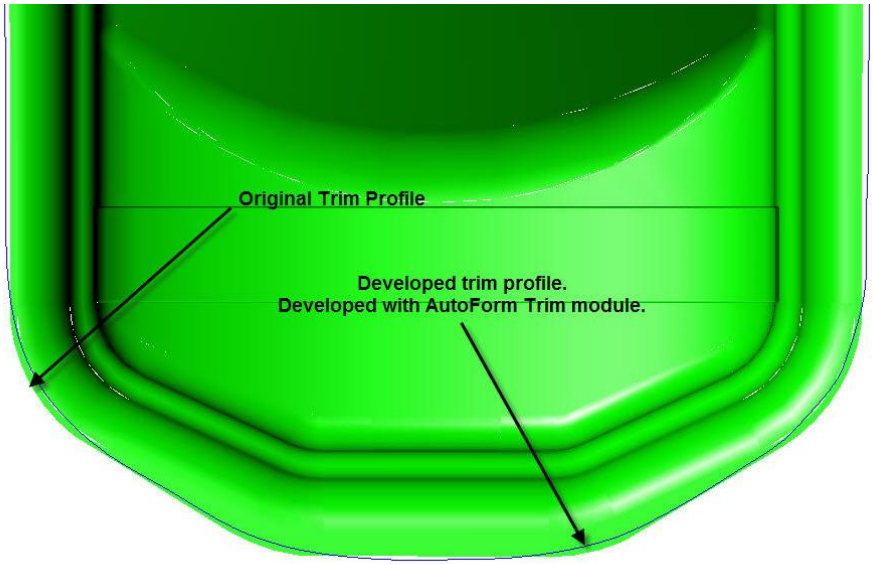
Basic Forming Analysis Process

The extrusion in the adjacent image is predicted to split. A solution can be designed before the tool is built.

Material Savings are an important benefit of simulation. With an accurate prediction of blank shape and confirmation of the carrier design, the stock width and progression can be safely optimized for minimum material usage.

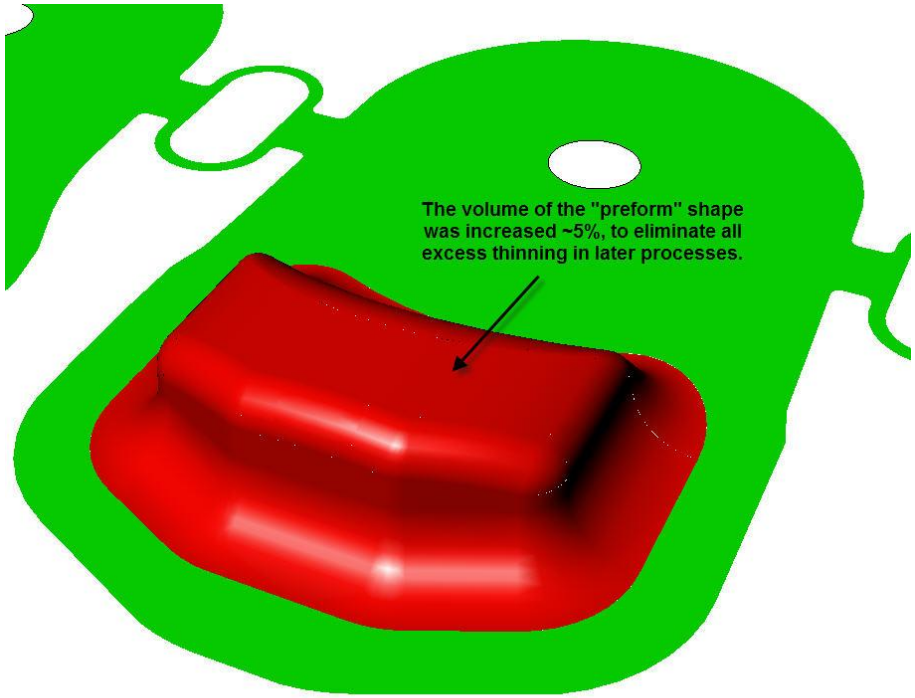


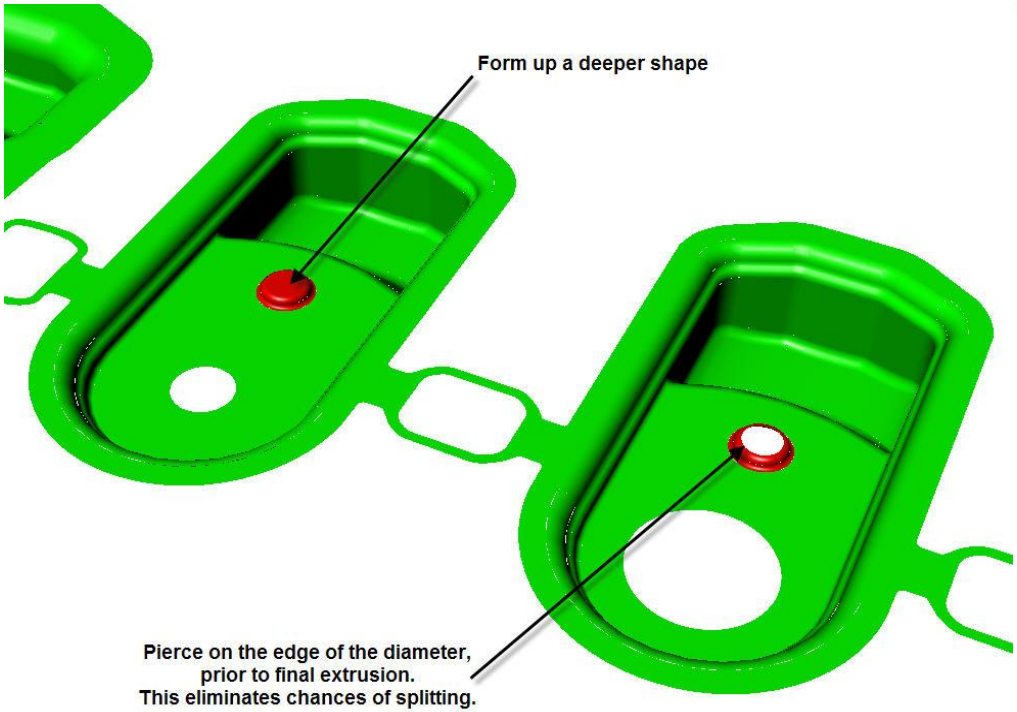




Basic Forming Analysis Process

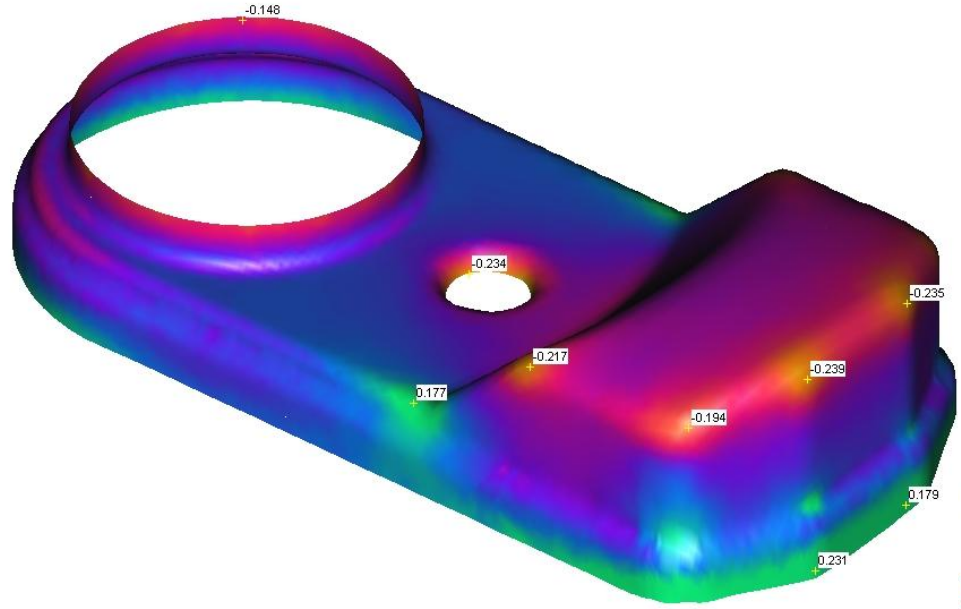
With the initial formability analysis complete, design or revise the processes.

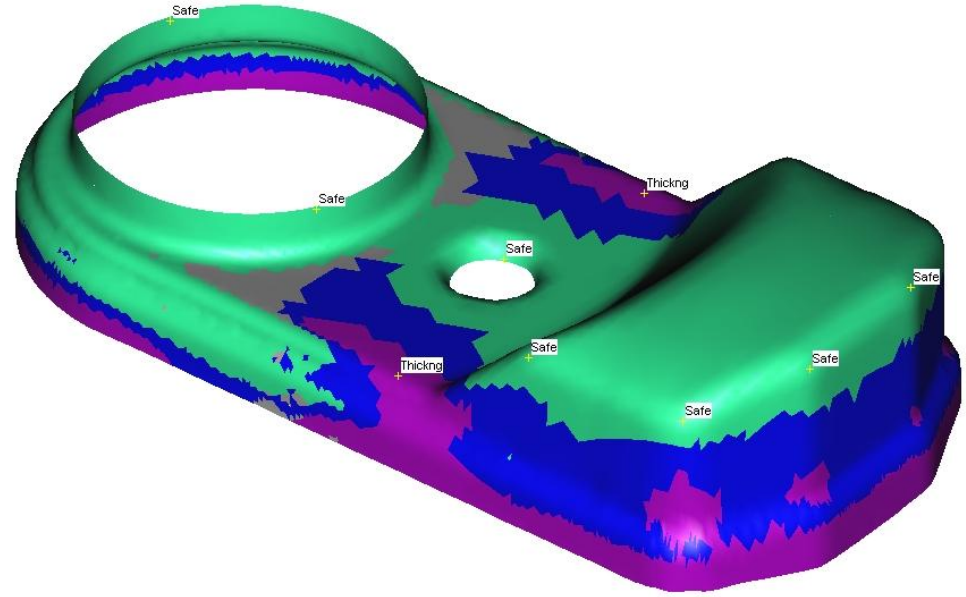


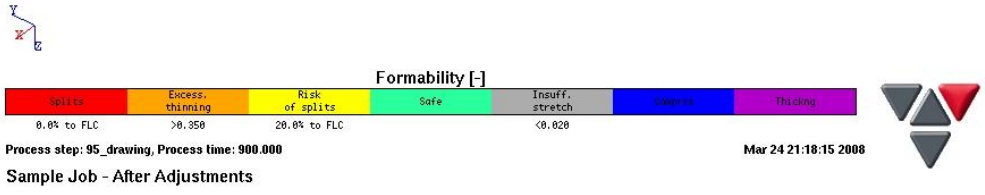


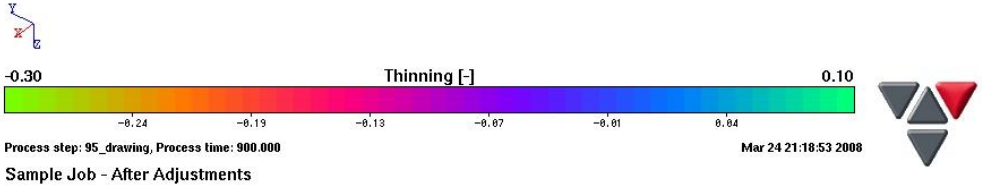
Basic Forming Analysis Process

Re-checking formability confirms that the designed process is capable of producing a quality part. The areas predicated to have excess thinning are now within the safe zone of the physical properties of the material.



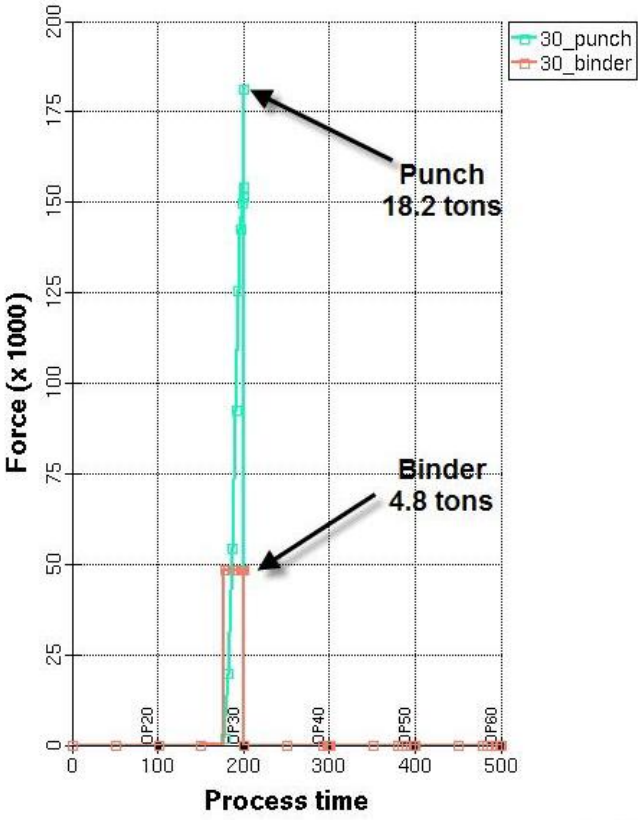


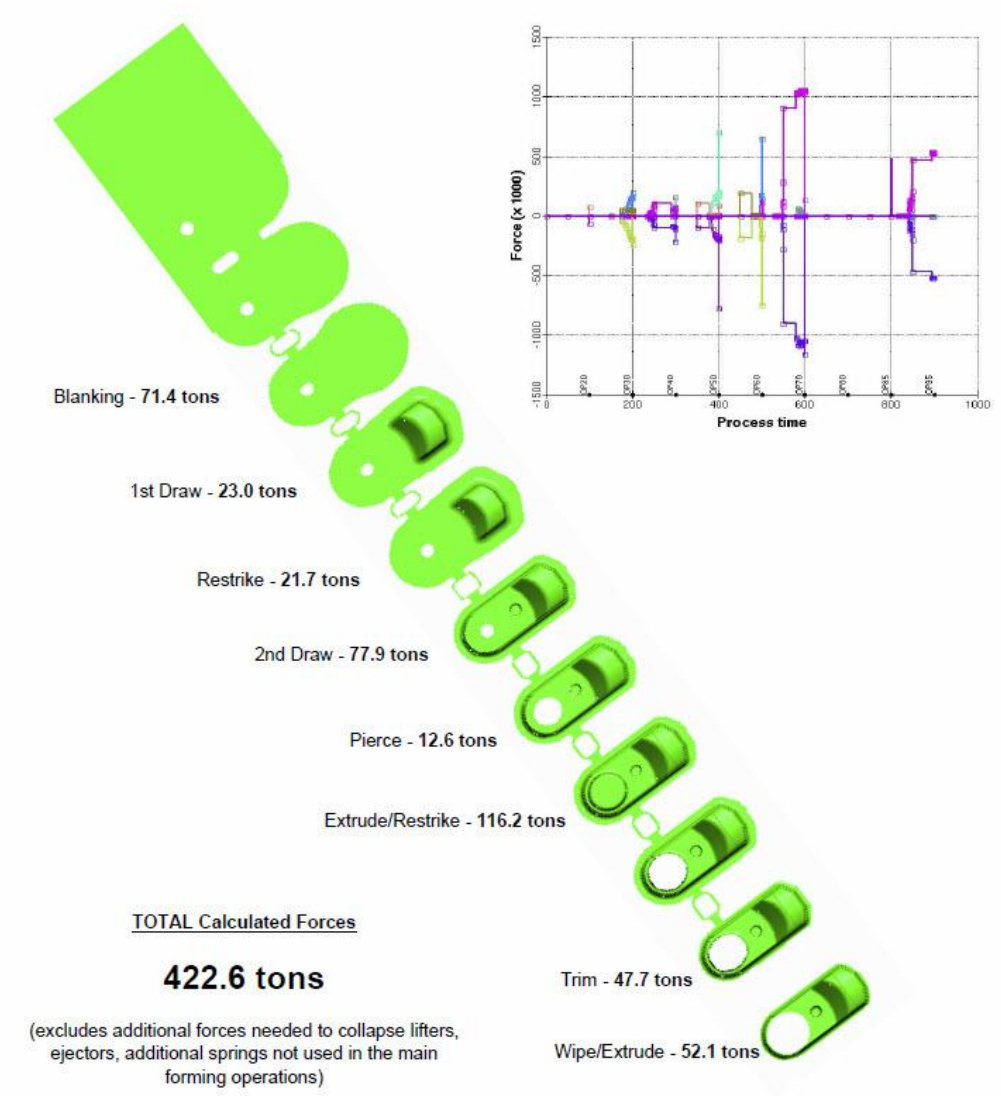




Basic Forming Analysis Process

Simulation and Analysis also produce a savings in design time, while improving quality. Regardless of the complexity of the part shape, the simulation software is able to accurately calculate the forces required much easier and faster than the designer can run the calculations manually. With the calculated force information, the proper press can be selected and force systems properly designed. Failure to have enough pressure available to produce a quality part can be difficult to overcome in the latter stages of a tool build project and are often costly to correct. An overbuilt system does not have the same risk of process failure, as to little force, but ***the cost to overbuild is lost profit***.

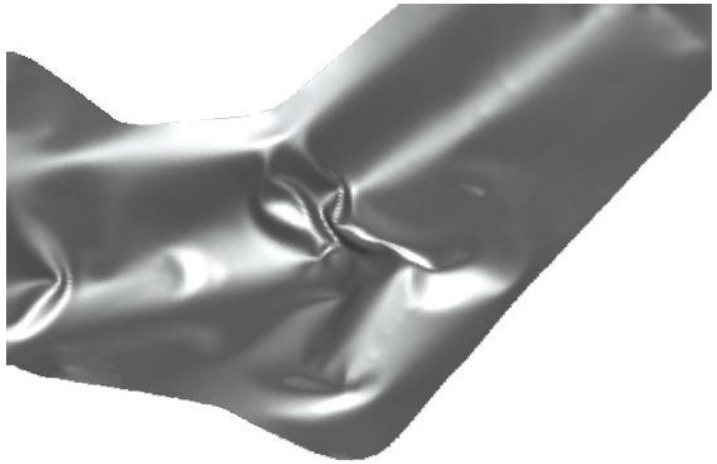




Basic Forming Analysis Process

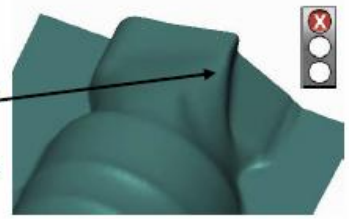
The previous pages discuss just the basics of what ***Stamping Simulation*** can offer. Additional capabilities will also:

- Identify fold and wrinkling problems.
- Check for springback.
- Properly orient (Tip) the part to avoid undercuts.
- Determine correct number of form operations.
- Identify holes that can be developed and formed or need to be pierced after forming.
- Provide corrected die face geometry and aide in the design of the correct process parameters.

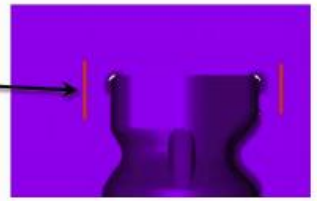


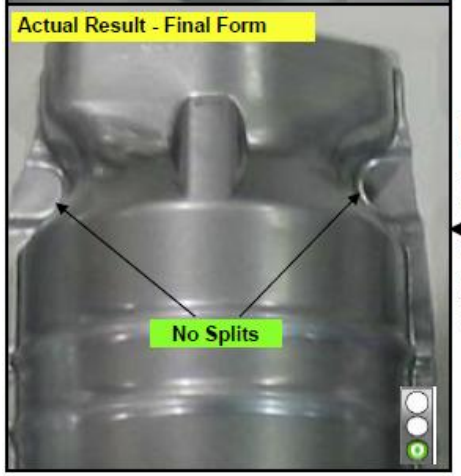
Result
The problem was avoided successfully.

Problem 1
The draw shows loose material and a large fold developing at the open ends.



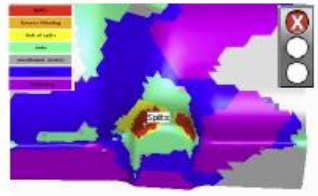
Solution
Add draw beads adjacent to the open ends, to pull the material tight.



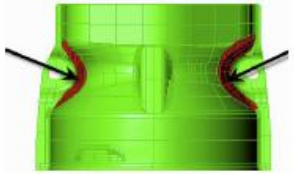


Result
The problem was avoided successfully, after minor adjustments to draw beads.

Problem 2
Severe splits are predicted, starting in the draw and becoming worse in the final form.



Solution
Develop a preform shape in the draw, and modifiy final form shape.

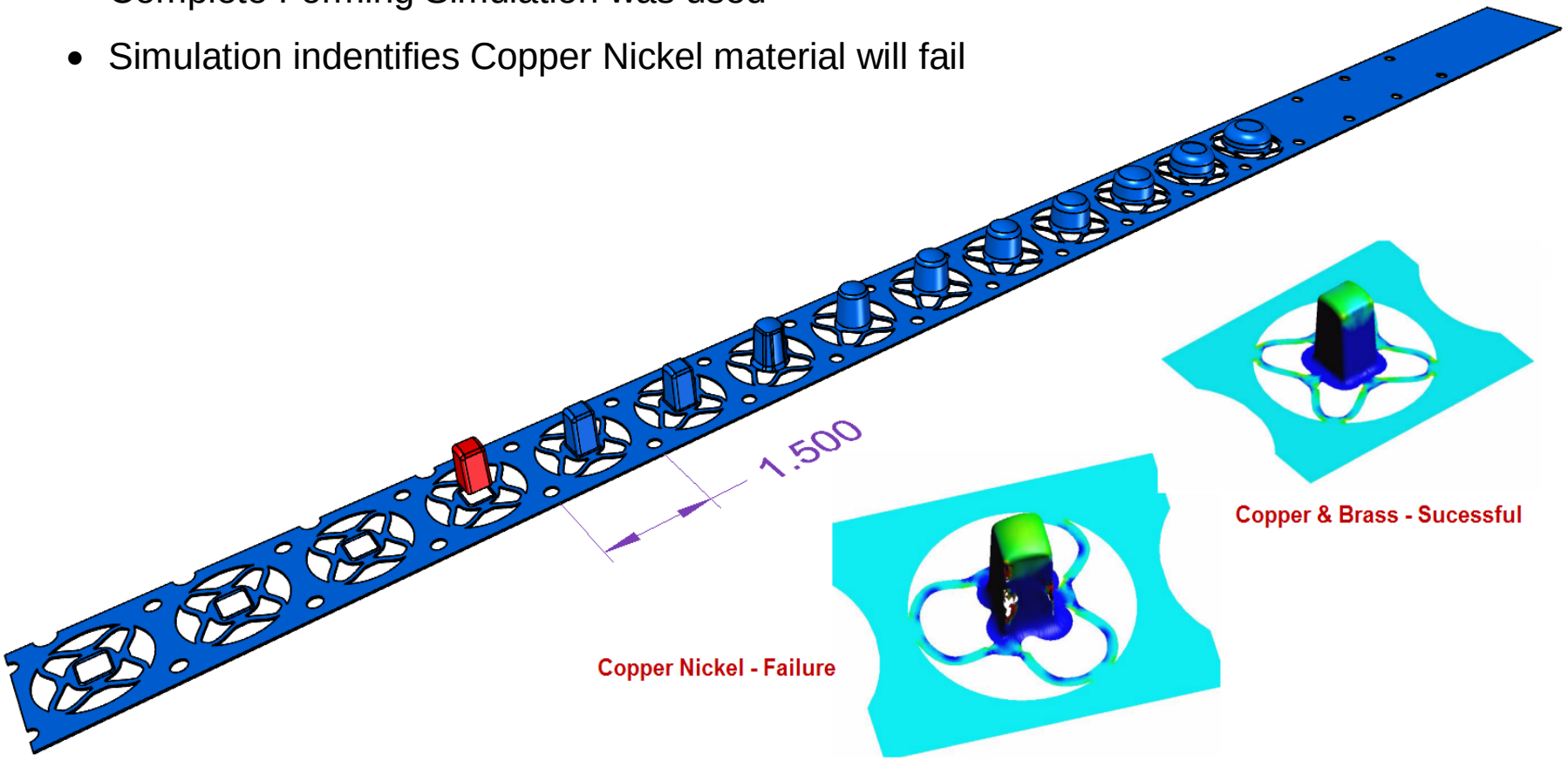


Avoid Splits, Tears and Wrinkles
Use Simulation!

Basic Forming Analysis Process

1-Out Progressive Draw Die

- Die was planned to run 3 Materials
- Copper, Copper Nickel, Brass
- Complete Forming Simulation was used
- Simulation indentifies Copper Nickel material will fail



Simulation prevents an expensive mistake from reaching the shop floor!

.