



# Warpage Analysis



Flow

Pack

Cool

Warpage

2-Shot

Gas

Inj/Compression

Co-Injection

MuCell

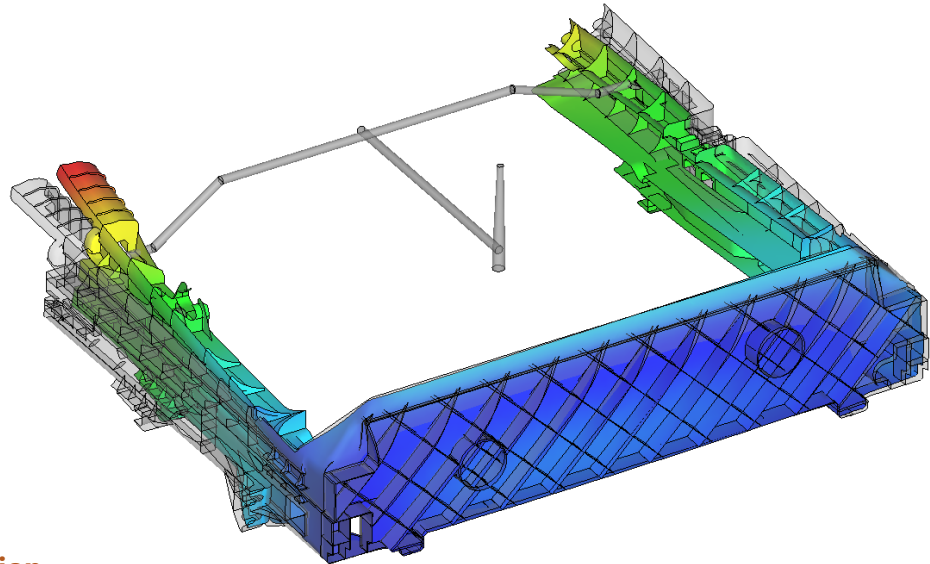
## Isolating causes of warpage

- Primary cause
- Part warpage @ ejection
- Warpage impact of flow, pack, or cool
- Warpage in X, Y, & Z directions

### Why Warpage Analysis?

#### Simple . . . Save Money!

Every molder experiences issues with part warpage. The time & costs associated with identifying the root cause can and will reduce your profitability!



**"Get it Right the First Time!"**



**Certified Staff**



**25 years Experience**

### Solution

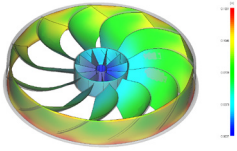
Our Warpage analysis capabilities determine the cause of shrinkage & warpage as related to part design, material type, cooling design and processing variables.

### End Result

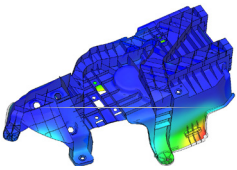
Improved part quality and appearance, identify root cause of warpage and reduce costly trial & error methods **before** cutting steel!

Warpage is due to lack of stiffness between the two hubs.

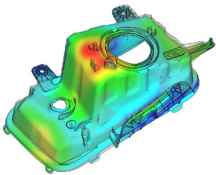
Total Deflection



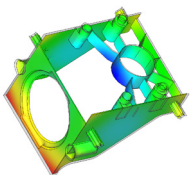
Cooling Deflection



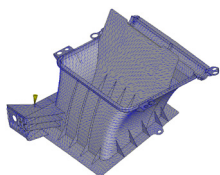
Orientation Deflection



Shrinkage Deflection



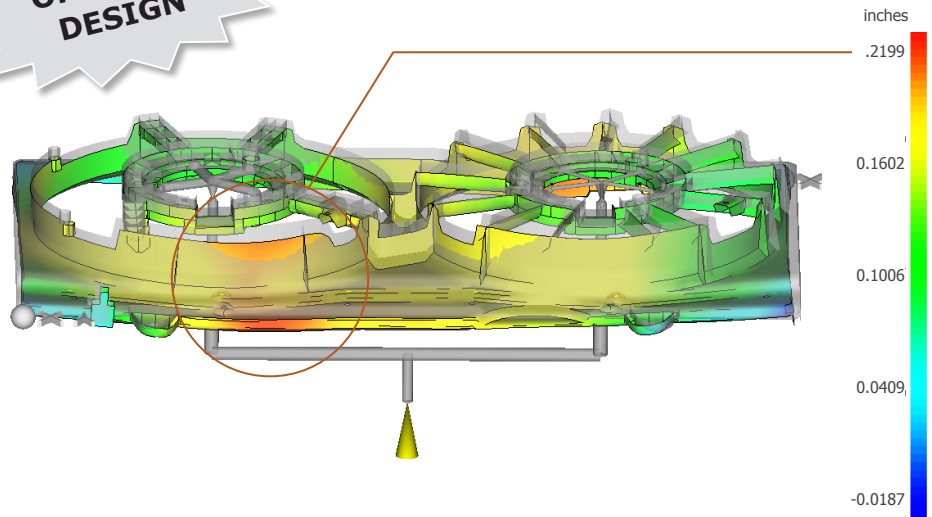
Material Orientation



**ORIGINAL DESIGN**

Deflection, all effects: Z Component

Scale Factor = 3

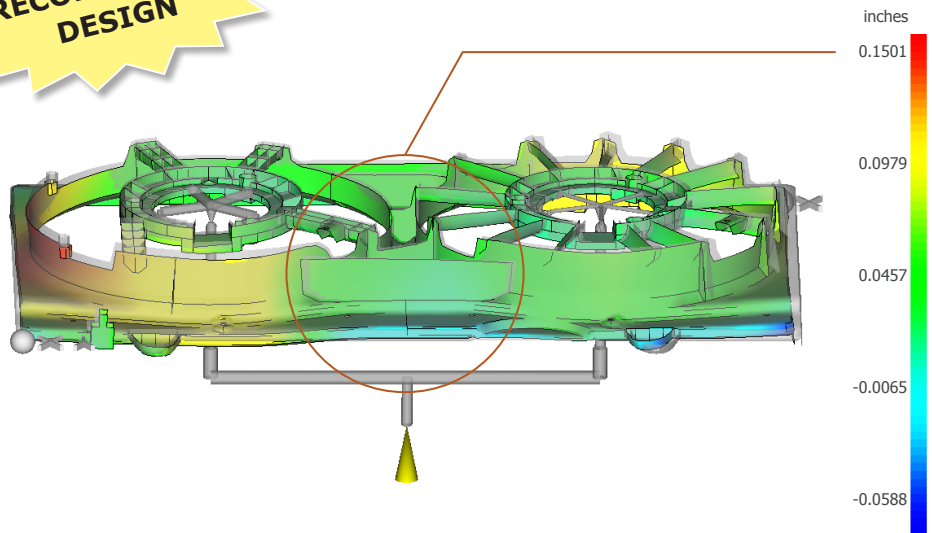


The Warpage was reduced by adding stiffening ribs.

**RECOMMENDED DESIGN**

Deflection, all effects: Z Component

Scale Factor = 3



Have an application?

Call us at **630.761.9898** and let's discuss how we can help you save money by "Getting it Right the First Time".

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