

Precision Metal Molding

The Goal

To meet demands for lightness, precision and cost, a Tier 1 needed to introduce a new production method: thixomolding. Metal is injection molded which eliminates the need for secondary machining operations.

The Problem

Everybody knows that new tooling launches involve some schedule risk. To minimize that, it's vital for teams to limit the number of iterations of tooling in the metal. When a launch also involves a new manufacturing process schedule risk increases. It's critical to get the process in control, and identify optimal corrections, fast.

The Solution

The first thixomolded part was a bracket, see Figure 1. Through PPAP, engineers from the Tier 1, the OEM, and the suppliers of both the precision tooling and the injected metal molding system closely collaborated from the earliest stage. Despite this there were repeated setbacks that dragged out the launch process for months.

To eliminate further tooling iterations the VP Engineering reached out to Origin for its unique CheckMate software. CheckMate provides SPC tools optimized for the small and noisy datasets of pre-production parts integrated with the industry's most versatile fitting technology. This enabled engineers to replace tool iterations in metal with simulations in software. The VP Engineering authorized Origin to shadow the efforts of the production engineering team for the next cycle of tool iteration.

Working from the same dimensional data as the production engineers, Origin worked through dozens of iterations of corrective action in the space of a few hours. CheckMate helped Origin discover all the dimensional issues, accurately identify the root cause in each case, and recommend the location, vector and amount of corrective action to apply to tool features.

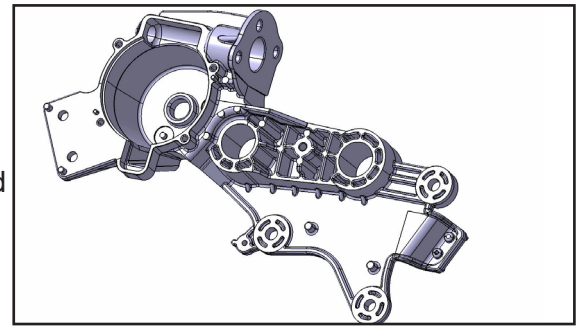


Figure 1: The bracket

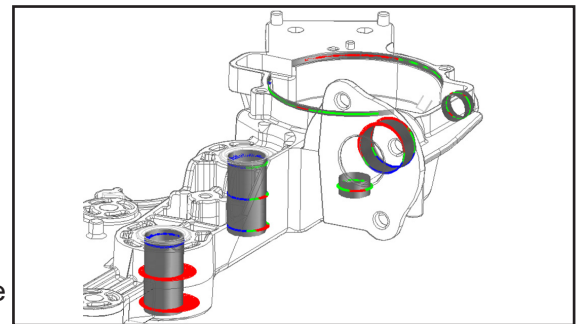


Figure 2: The analysis of 7 samples

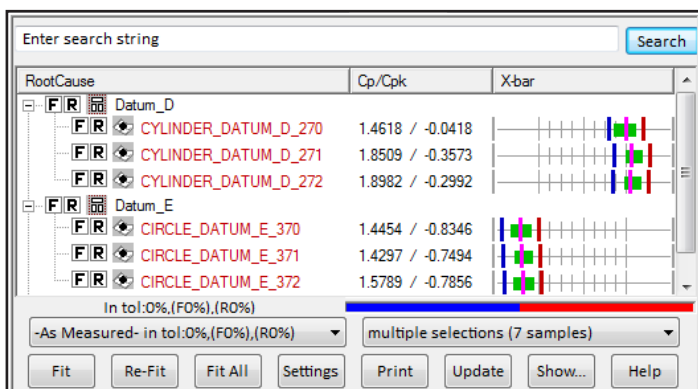


Figure 3: SPC views include Cp, X-bar

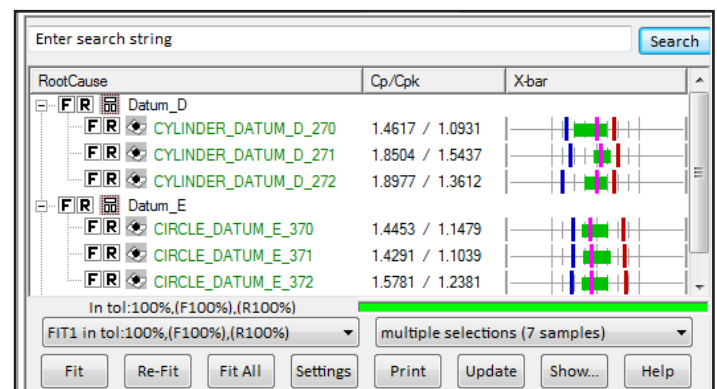


Figure 4: Effects of simulated corrective action

The Result

As a result Origin's customer was able to finalize the buyoff for the tool in a matter of days after months of delays. Plus, the tier 1's engineers completed the second tool in less than 25% of the time taken to launch the original. Besides significantly less tool iterations, the second tool was also much more robust than the original.