



customer profile

PHILLIPS PLASTICS DELIVERS WITH CONFIDENCE USING SIGMETRIX'S CETOL 6 SIGMA

Headquartered in Hudson, Wisconsin, Phillips Plastics is one of the largest privately-held, full-service designers and distributors of custom injection molded components and finished devices. They serve some of the largest OEM's in virtually every market including medical, automotive, consumer and defense.

Prior to implementing CETOL 6 Sigma from Sigmetrix, Phillips Plastics used customized Excel spreadsheets for doing their 1D tolerance stacks, for years. However, as their customers' designs became more and more complex, they were increasingly asked to perform a higher level of analysis than they could continue to offer with a spreadsheet-based approach. Inserting CETOL into their design process has helped Phillips Plastics to:

- Be more confident in their design tolerances
- Reduce the number of prototype iterations
- Maximize production yields
- Support their continuous improvement efforts

THE CHALLENGE

The design challenges at Phillips Plastics range from the simple one dimensional, linear stacks—such as assembly clearance between a mechanical switch and an elastomeric keypad—to complex multi-part, multi-dimensional mechanisms— like locating a feature that is positioned by multiple gears and cams such as a counter on a drug delivery device.

The device's assembly example is made up of approximately 15 components. It is extremely critical that the device dials out and delivers the correct dose to the user. At the same time, it must read the number of doses that have been delivered as well as the number that are left. The job of the mechanism on the device is to make sure that the numbers on the counter line up correctly.

Prior to using CETOL on this and similar designs, Phillips Plastics did not have the level of confidence in the results from their spreadsheet-based method of tolerance analysis, so optimization of the design required multiple prototype and rework steps which translates to time and money.

THE SOLUTION

After recommendations by their customer, Phillips Plastics evaluated several software packages and found CETOL to be the most comprehensive tool that could handle all of their tolerancing challenges. Acquiring CETOL 6 Sigma was the next logical step for Phillips Plastics to ensure they were offering the best design solutions possible for their customers.



“CETOL 6 Sigma has enabled us to be more thorough in the analysis phase to prevent accidental design issues that are very costly to fix after production molds are built.”

— Chris Belisle

Phillips Plastics' people process culture and state-of-the-art facilities set them apart in the manufacturing world and have helped them become one of the top ranked custom injection molders in North America. By researching and investing in new technologies and utilizing engineering skills, Phillips continues to meet customers demands for quality, service, costs, and time-to-market in multiple industries including Automotive, Consumer, Defense, and Medical.

“Our customers feel more confident that they are getting a design that will function as intended because they have the data in front of them,” said Chris Belisle, senior design engineer at Phillips Plastics. “Our customers understand that a little more time and effort spent up front can save a lot of time and money down the road in tool rework, product redesign, validation delays, and production downtime,” he added.

Their customers recognize that being thorough in the analysis phase can prevent accidental design issues that are very costly to fix after production molds are built.

It wasn't until they actually used the CETOL 6 Sigma product that they realized that there were many past examples that would have benefited from the CETOL software to complete some of the more difficult analyses that were very cumbersome to do in a spreadsheet.

In addition to new designs, Phillips Plastics uses CETOL as a tool for existing products to identify where to focus their energy and resources to solve production problems and to enhance existing products through continuous improvement efforts.

Phillips Plastics has found the contribution and sensitivity reports to be very valuable in helping identify areas for consideration. The CETOL software will report the results in the order of highest to lowest contributor.

“The contribution and sensitivity data CETOL provides is extremely valuable information,” commented Chris. “It provides information that is just not available using a spreadsheet. For Phillips Plastics, this has been a huge time saver. Many times it is not obvious where to focus on very complex designs.”

The advanced reports generated from CETOL are ideal for properly documenting their tolerance stacks and are very useful to fulfill regulatory requirements in the medical industry. At Phillips Plastics, proper documentation is a key item for a completed design package. Their customers can easily step through the CETOL report to verify changes that may have been made and understand the reasons behind the change.

Since Phillips Plastics is a multi-CAD environment, it was very important that the solution that they chose worked with multiple CAD systems—in their case, Pro/Engineer and SolidWorks. This enables them to provide advanced tolerance analysis for both sets of customers without significant investment in multiple solutions.

THE RESULT

Now, Phillips Plastics is able to verify the results in CETOL much easier and faster with readable results. They found that using CETOL in the design stage ensures their designs are more robust and they are able to eliminate costly rework and maximize production yields. They are doing a better job of properly tolerancing parts than they have in the past. They now have the confidence going into the prototype pass that parts will fit together and function as intended the first time.

CETOL has given them the ability to zero in on a particular quality level with much more accuracy than past tolerancing approaches. In many cases, they have been able to use CETOL to justify opening up tolerances to ease the burden on their production facilities.

CETOL has helped to limit the amount of rework and 2nd round prototype tooling. Reducing a prototype step in a snap fit, for example, can save as much as \$10,000 and up to 2 weeks time on a single design.



Chris added, “With multiple programs being tooled each year, we are confident the investment in CETOL has paid for itself and has established its value at Phillips Plastics.”