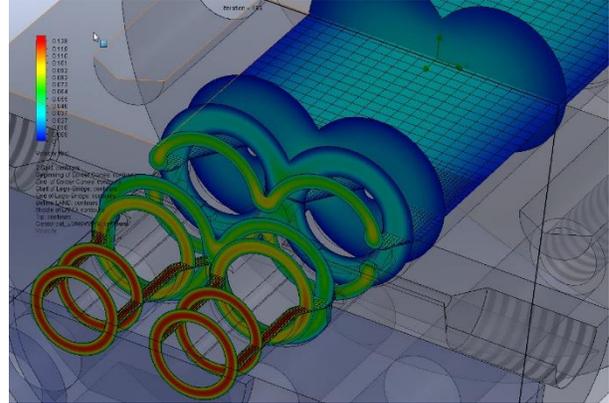


Flow Modeling for Reduced Development Lead Times

Teel's extrusion expert estimates flow modeling can cut development timelines by 50%-70%

Die Head Design

Designing a custom extrusion crosshead die for a complex medical product (such as a multi-lumen tube) is a complicated and time-consuming aspect of product development, potentially drawing out a product's overall time to market. An array of factors, from dimensional attributes and tolerances, to target output rate, to material properties and thermal expansion, to appropriate application of heat need to be accounted for concurrently in a process of fine-tuning and balance.



Teel paratube melt flow analysis model.

Many companies still develop die heads using a trial-and-error process, using part measurements and subsequent rework to bring a die into final dimensions. A powerful way to help reduce the trial and error of the design process is flow modeling, a software-based approach using polymer flow data to predict how a polymer will flow through a die prior to manufacturing it. Flow modeling software allows designers to see a simulation of how all the factors mentioned above will work together when elements of the design are adjusted.

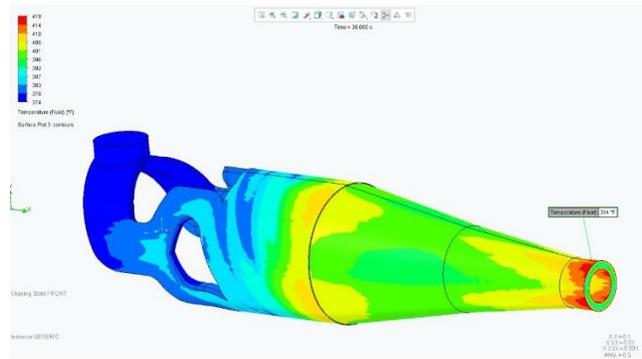
Flow Modeling Advantages

Teel's use of flow modeling software can reduce the time to bring a part to production by reducing die design time. Because the software helps produce a more precise and stable die design, Teel's extrusion experts find that the software can improve dimensional control during the extrusion process as well. Process control in extrusion is critical to achieving good CPK results and repeatable parts, especially for tight tolerance medical device components.

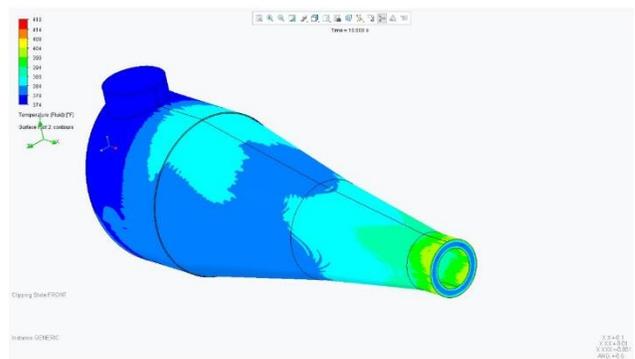
Further reducing development time is Teel's relationship with extrusion die tooling company [B&H Tool Company](#), specialists in die head design and manufacturing using flow analytics and simulation models. Partnering with B&H on specific projects allows Teel to devote its engineering resources to actual product development instead of tooling design.

Teel's work with B&H is a collaborative process where B&H gathers product information from Teel's development engineers and creates a simulation (such as those below), meeting with Teel as needed to determine if customer specifications are accounted for.

Temp 48pph



Temp 48pph



Models showing heat distribution maps of two potential die design variants.

Once the flow model is complete, B&H manufactures the die head and components, such as the deflector below.



B&H-manufactured deflector for a Teel medical project.

Conclusion

Teel's use of flow modeling and its close relationship with flow modeling specialists at B&H Tool Company helps Teel reduce extruded product development times, create quality tooling to help ensure quality product, and focus our engineering resources on other facets of product development aside from



tooling design. The efficiencies gained using flow modeling and flow modeling specialists assists Teel in more quickly bringing products to market for our customers.

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