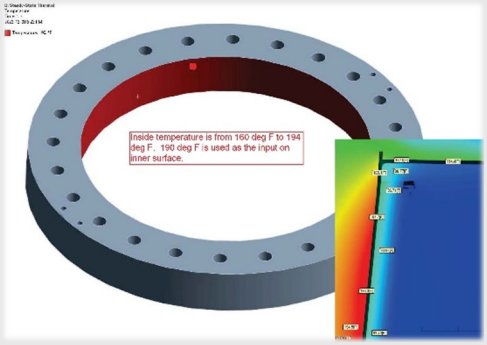
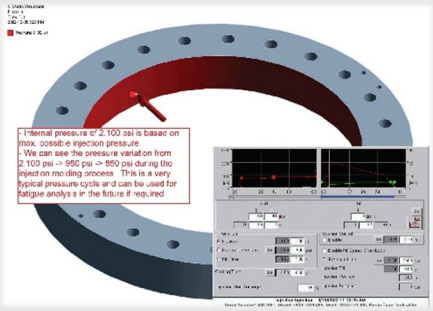
Using Analytical Engineering Tools for Product Optimization

With Sybridge Technologies

Sybridge approached SCS looking for engineering and design support to review and understand why their molds were cracking, leading to premature failure. Additionally, they needed to develop a better estimate of mold life to share with their clients ensuring they were getting the right life for every mold.

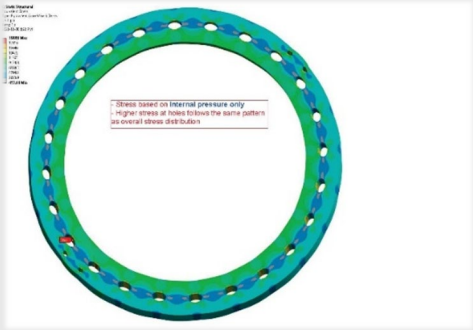
A short lead time was required to meet the end client's needs and secure a substantial tooling order for the following year. The initial steps involved reviewing data for the materials used and examining data from the actual molding process, including temperatures and pressures. A preliminary qualitative Finite Element Analysis (FEA) was performed to identify basic temperature and stress gradients and their locations within the analysis model in relation to the actual cracking. This procedure ensured that the models were correctly set up and that the results were practically sound.

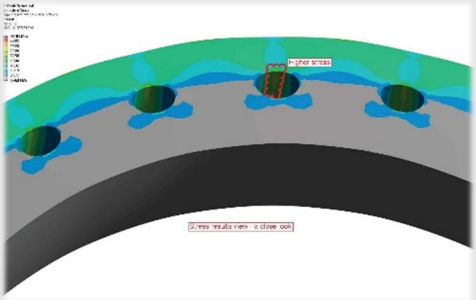




The first level analysis worked well and showed clearly the potential for fatigue cracking, over time, exactly where it was occurring based both on injection pressure and temperature gradients.

The next step involved conducting a more detailed analysis to assess actual stress and fatigue. This phase was carried out by Sybridge due to timing constraints. Results confirmed the first level analysis of high stress in these specific crack areas.





Finally, eliminating water lines to reduce the thermal gradient in the steel and cyclical stress has been effective. After over a year in operation, client feedback to Sybridge has been positive.

The analysis was successful in predicating real world issues in the field and allowed for the team at Sybridge to optimize their design, increasing mold life and reducing maintenance ensuring the end customer was satisfied. This demonstrates the effectiveness of analytical engineering models when completed with accurate input data and proper model preparation.

Thanks to the Sybridge team for the opportunity to support their team! #sybridgetechnologies