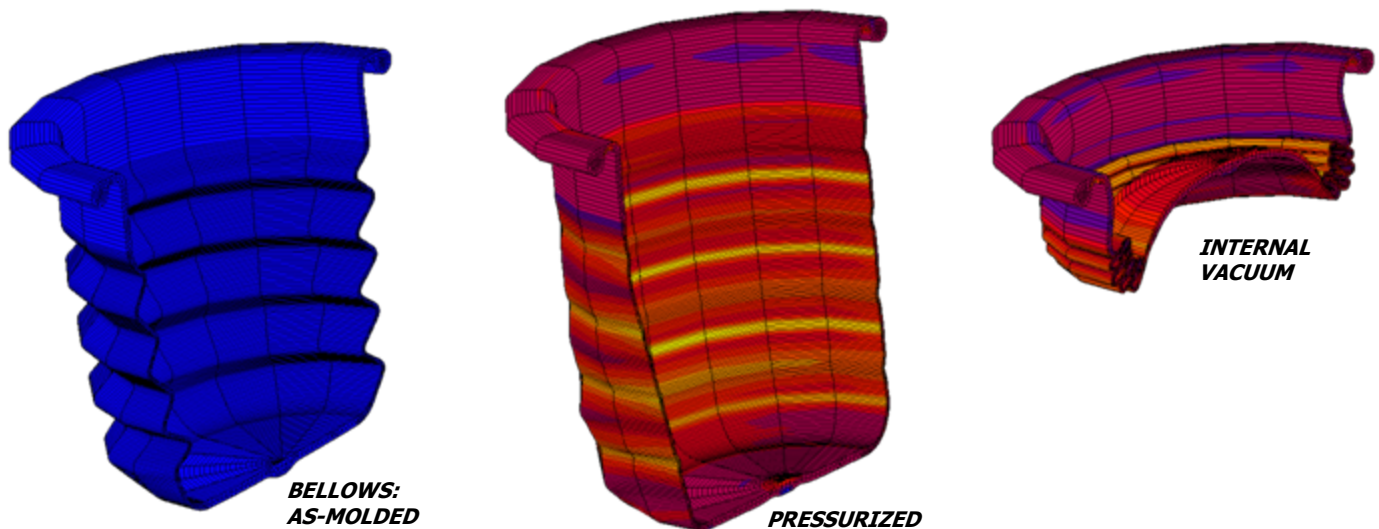


Application:

Product development activities where elastomeric components are used.

Problem:

Traditional product development involves prototyping multiple designs to find an adequate solution. In simple cases or where nearly identical solutions have been developed in the past, only one or two prototype iterations may be needed. However, when developing new or substantially enhanced products, time-to-market and development costs can be drastically increased by the need for many prototype cycles and experimentation. By the time a solution is found, an opportunity may have expired. Alternatively, a sub-standard design may be rushed into production, resulting in ongoing costs and poor performance.



Solution:

Parker Engineered Seals Division makes extensive use of Computer Aided Engineering (CAE) tools such as Computer Aided Drafting (CAD) and non-linear Finite Element Analysis (FEA) to minimize the number of physical prototype iterations needed to launch a successful product. CAD can be used to reduce design creation time, but also to check interfaces and evaluate the effect of tolerances on components. FEA simulations in both 2D and 3D allow the engineer to create and evaluate virtual prototypes in days or even hours, compared with weeks to build and evaluate prototypes.

Non-linear FEA is commonly used to predict the behavior of elastomeric components and accurately identify stresses and strains that can lead to premature failure. Other advantages realized by using FEA include:

- Optimized seal loads to avoid undesirable distortion or failure of mating components
- Optimized elastomer usage to reduce waste and part cost
- Visualization of deformed shapes to confirm component stability and intended deflections
- Evaluation of Maximum and Least Material Conditions (MMC & LMC) to confirm function at all tolerance extremes
- Effects of pressures, loads, deflections and other boundary conditions can be predicted and accommodated
- Failure analysis – identifying weaknesses in an existing design greatly improves a new design's success rate
- Virtual prototype evaluation reduces the number of physical prototype iterations needed, often to just one.
- FEA animations can be used as powerful communication and marketing tools

CAE is an integral part of all product designs developed by Parker Engineered Seals Division. Well equipped with non-linear FEA and CAD, Parker ESD can quickly develop and optimize your new product designs and assist with product improvements. Call (574) 528-9400 and ask to speak with a Product Engineer to see how we can improve your first time hit rate and reduce your time-to-market!