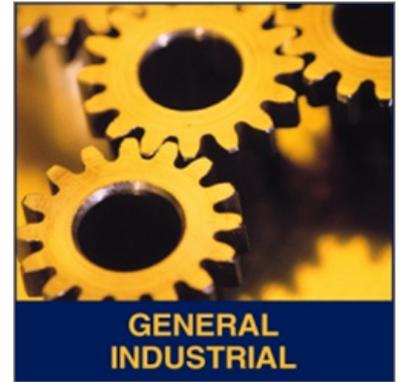


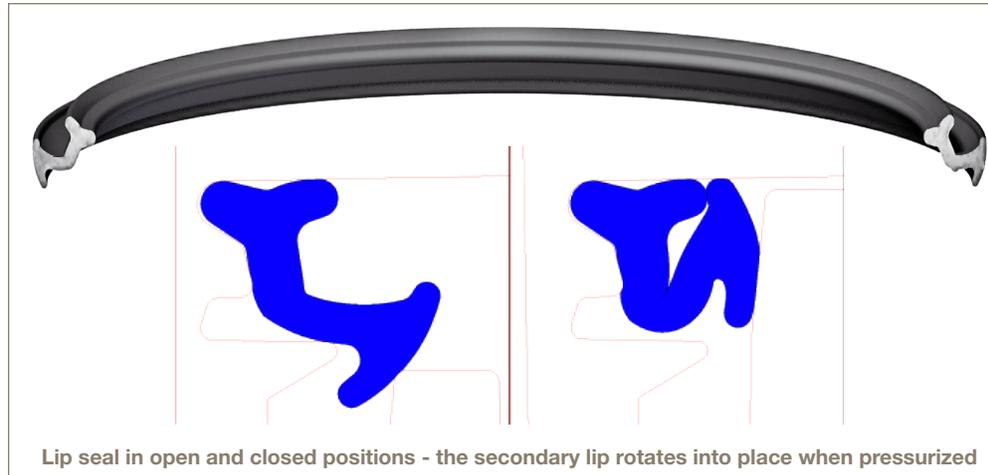
Low-Torque Articulating Seal

Engineered Solutions
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Problem:

A dominant competitor in the personal hydration pack market was experiencing market share erosion as competitors offered packs with easier to use fill caps. High installation and removal torque was driven by the need for absolute sealing in other market segments, a need which could not be compromised. As such, potential customers found the fill cap too difficult to use and were migrating to competitive products. The challenge was to develop a fill cap seal as reliable as the existing design, but with fill cap closure and removal torque low enough, anyone of average strength could operate it with ease.



Solution:

Parker Engineered Seals Division knew that to achieve low torque, the force exerted by the seal against the cap and hydration pack must be as small as possible. Yet, since this force also creates the seal, a balance between the two requirements had to be achieved. It was decided a lip seal, deflected by fill cap installation, would provide the lowest torque. However, the orientation of the installed lip would allow water in the pack to squeeze past the seal with any pressure applied to the pack. Water pressure may develop in the pack by heating or by mechanical squeezing as might occur during normal in sporting activities. To enhance the lip seal and provide sealing function equal to a high-torque seal, a second lip was added to the outer edge of the first lip. This patent-pending sealing concept uses water pressure developed in the pack to increase sealing force as needed. Multiple design iterations were evaluated by Parker engineers using nonlinear Finite Element Analysis (FEA) until a suitable shape providing the optimum balance of properties was found. Prototypes of the selected shape were molded and extensive testing confirmed the reliability of the new seal. Torque testing showed a dramatic improvement in the installation and removal of the cap using the new seal. A side-by-side comparison of the old and new seal left no doubt the Parker ESD low-torque seal had exceeded the customers' expectations.

Applications: Assemblies sensitive to low-closure force requirements, whether to meet ergonomic constraints or delight customers can benefit from the low-force sealing technology of Parker ESD.

Contact Parker Engineered Seals Division and ask for a product engineer to review your application and see what opportunities are waiting to be discovered!

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