Schlumberger

ResPack

Swellable bonded-to-pipe packer

APPLICATIONS

- Openhole and cased hole wells
- Multistage fracturing
- Reservoir compartmentalization
- Flowing wells with inflow control devices
- Straddle assemblies
- Cement replacement
- Annular barrier for sand screens

BENEFITS

- Single-trip installation minimizes rig time, installation risks, and costs.
- Delayed swelling feature reduces risk of premature setting.
- Bonding and shorter element enhance well integrity.

FEATURES

- Elastomer bonded directly onto basepipe
- Increased pressure rating per foot
- No moving parts
- Durable, self-healing and self-sealing construction
- Time-delayed reactive filler for improved mechanical stiffening properties
- Tuned curing process for balanced swell kinetics
- Maximized swelling capability due to pipe bonding
- Shorter element lengths, which are better able to traverse tight openhole sections and lateral transitions
- Associated predictor software for product selection and job planning

The ResPack* swellable bonded-to-pipe packer is designed to swell on contact with fluid and expand to seal the annulus around the pipe. The elastomer is bonded directly onto the basepipe. The packer has no moving parts and is installed in a single trip; no special personnel or equipment is required. Applications range from well construction to completion in both openhole and cased hole wells.

Swelling mechanism

The packer element, which is shorter than typical packer elements, is engineered from a complex polymer that has properties similar to those of rubber before swelling. After swelling, the polymer and shorter element allow the packer to achieve the higher differential pressure and temperature ratings required in high-pressure applications such as multistage fracturing and sealing in flowing wells; the packer remains pliant enough to accommodate washouts and irregular wellbores.

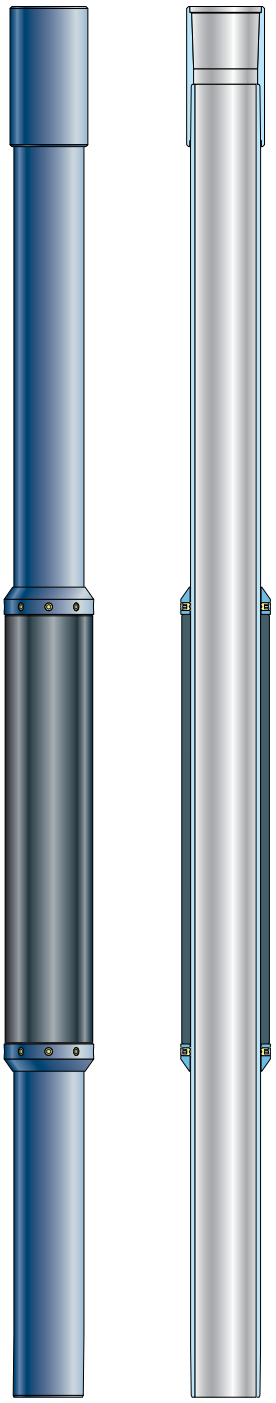
The packer is available with elements that swell in either oil or water.

Oil-swellable packer

An integral delay mechanism engineered into the polymer of the oil-swellable packer minimizes the risk of premature swelling and setting without the need for any additional exterior coating. Hydrocarbon molecules diffuse into the elastomer matrix to generate volumetric expansion.

Water-swellable packer

In the water swellable packer, reactive fillers integrated into the elastomer prevent the loss of strength and the deswelling effects seen in conventional water-swellable packers, which rely solely on osmosis for swelling. Osmosis can reverse over time, causing other packers to deswell and leak. The proprietary reactive technology, however, is based on an irreversible chemical reaction that mechanically reinforces the elastomer and enables higher differential pressures to be withstood by shorter lengths. This unique-to-Schlumberger technology enables higher pressure ratings per foot than for conventional water swellable packers.



ResPack swellable bonded-to-pipe packer.

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Sizes and ratings

ResPack packers are provided in sizes ranging from 2⅜ in to 13⅜ in. They have a wide temperature range, from 100 to 365 degF [37 to 185 degC] and a differential pressure rating of up to 15,000 psi [103 MPa], the highest psi/ft rating in the industry.

Swelling to first seal

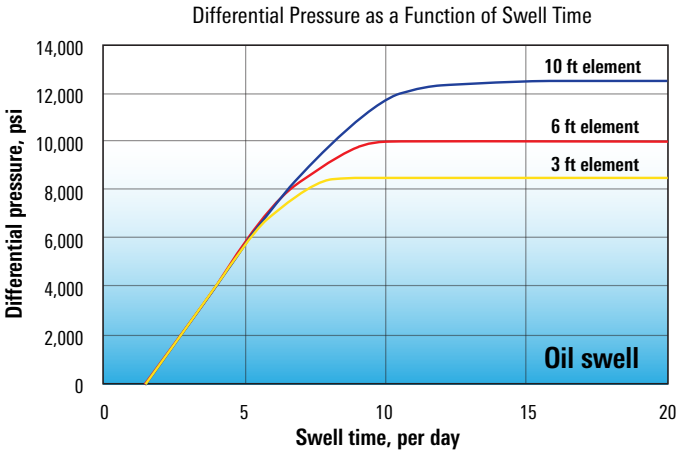
Swelling starts immediately after contact with the fluid (oil for the oil-swellable packer and water for the water-swellable packer) and progresses in small increments, enabling the packer to reach the target setting depth, where it continues to swell and seal.

Stringent qualifications

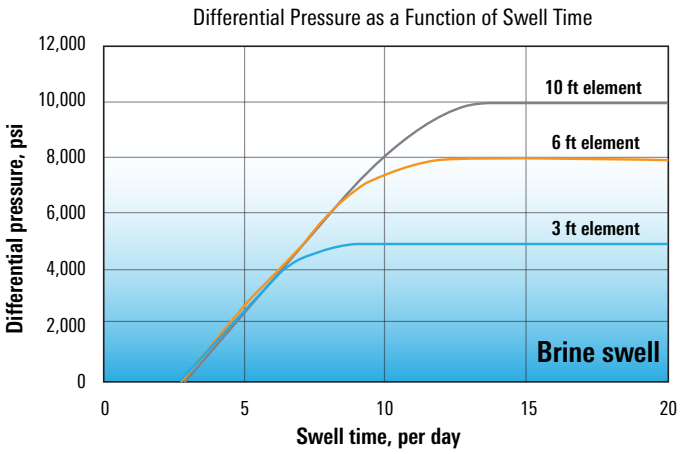
Our packers undergo full-scale highly accelerated life cycle testing and are qualified to rigorous standards. Elastomers are tested in high concentrations of hydrogen sulfide (H_2S), hydrochloric acid (HCl), and carbon dioxide (CO_2) at simulated downhole temperatures and pressures.

Swell-prediction software

Proprietary Schlumberger software is used to evaluate packer performance in various well environments. The software predicts the estimated swell time and pressure ratings for a certain hole ID. The results are used to select the appropriate packer and minimize risks during deployment.



The differential-pressure rating of oil-swellable packers is a function of the swell time and the element length.



The differential-pressure rating of water (brine)-swellable packers is a function of the swell time and the element length..

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