

**Resin Coated Proppants**

High fracture flow capacity for HPHT conditions

**XRT™ Ceramax™ Resin Coated Ceramic**



As more high pressure, high temperature (HPHT) wells are drilled, the use of ceramic fracturing proppants has increased onshore and offshore.

Uncoated ceramics encounter serious performance issues when exposed to these harsh well conditions. These deficiencies include lower fracture flow capacity due to proppant fines generation and migration, abrasive proppant flowback, and a reduction in proppant pack strength from cyclic stress changes that occur during the life of the well.

Conventional resin coated ceramics are designed to address these issues; however they fail to perform under elevated pressure, temperature, and extended pump times. Hexion developed its patented XRT™ proppant product line to perform under the harshest high stress, high temperature well conditions.

**Typical Applications**

- At bottom-hole static temperatures from 175-450°F [79-232°C]
- At closure stress:
  - Up to 12,000 psi (XRT Ceramax™ E proppants)
  - Up to 14,000 psi (XRT Ceramax V proppants)
  - Over 14,000 psi (XRT Ceramax P proppants)
- When flowback control is necessary at high temperature, high pressure conditions

**Technical Advantages and Benefits**

- Higher fracture flow capacity than uncoated bauxite
- Proppant flowback control even under extreme HPHT conditions
- Superior cyclic stress resistance
- Temperature stability for both extended pumping and storage times
- Increases near wellbore conductivity over uncoated ceramics

**Proppant Flowback Control**

XRT Ceramax proppant's superior resin technology helps prevent proppant flowback, allowing you to flow the well back more aggressively than with other curable proppants in the industry.

**Cyclic Stress Resistance**

Wells undergo varying degrees of repetitive stress during their lifetimes. These cyclic stress changes have the most significant impact on fracture flow capacity. As the number of cycles increase, the proppant pack permeability and fracture width decrease over time. Cyclic stress can break a conventional pack, compromising the integrity of the structure and reducing conductivity. XRT Ceramax proppants remain flexible in HPHT environments. In addition, the XRT Ceramax proppant pack has the ability to re-heal, which helps prevent proppant flowback and fines generation.

**Temperature Stability**

Whether the proppant is exposed to downhole conditions or sitting in storage, temperature stability is an important factor. The resin coating of typical proppants begins to cure at elevated temperatures. A decrease in the amount of curability equals a decrease in bond strength. XRT Ceramax proppants were designed to retain their curability at elevated temperatures and will only bond when subjected to both high temperature and closure stress. XRT Ceramax proppants retain greater than 95% of their initial bond strength after sitting in storage conditions of 140°F for 28 days.

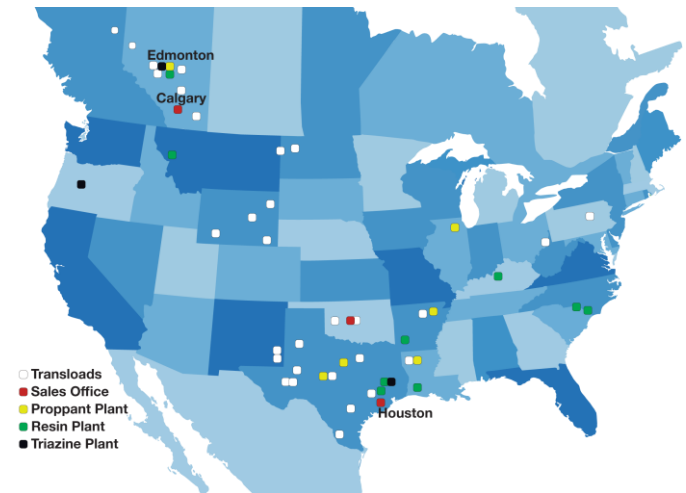
## Case History: Operator Eliminates Proppant Flowback

A South Texas operator experienced severe proppant flowback and disappointing production results after pumping both conventional resin coated proppants and “on-the-fly” liquid resin systems. This caused the operator to keep flowback equipment onsite to reduce damage to surface production equipment. It also led to costly wellbore clean-outs with coiled tubing. Switching to XRT Ceramax proppants has eliminated proppant flowback and provided increased production results from these HPHT wells.

## Case History: Faster Load Recovery/Quicker Sales

A North Louisiana operator decided to use XRT Ceramax E proppants for their well. After the stimulation job, the personnel responsible for flowback noticed that they could flow the well much faster and still not have any proppant flowback issues. This ultimately led to a 10% reduction in load recovery time, leading to quicker online gas sales. Since then, the operator has requested XRT Ceramax E proppants on all similar frac treatments in the field; now getting improved frac cleanup and quicker ROI from the frac treatments.

## North America Manufacturing and Distribution Network



Hexion continues to expand capacity and strategically locate transloads near the major shale plays in North America to meet the industry’s increasing need for resin coated proppants.



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