Expedite® Service

A Step-Change Improvement Over Conventional Proppant Flowback Control Systems. Provides Up to Three Times the Conductivity of RCPs.

In formations where controlling proppant flowback following fracture treatments is a primary consideration, Expedite® service can help improve production and the NPV of treatments in several ways:

- Enhances or maintains proppant pack conductivity.

Widely used RCPs (resin-coated proppants) and fibrous flowback control materials placed in the matrix of the proppant pack often reduce conductivity under high closure stresses.

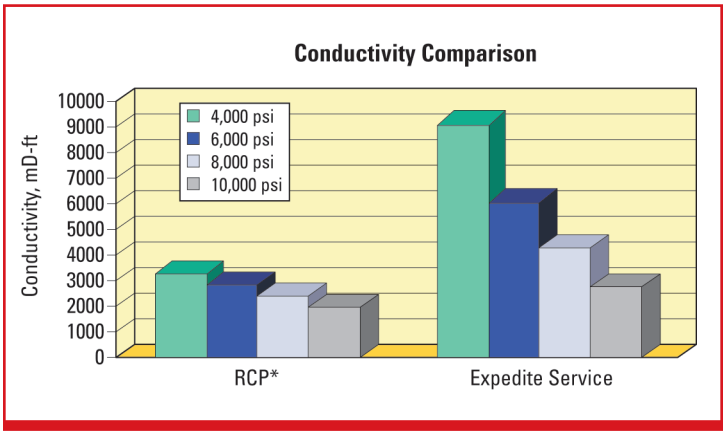
- Applied to the proppant on the fly so that no excess resin or coated proppant is left after the treatment.

Expedite service uses Halliburton's exclusive direct proppant coating process to apply a proprietary resin mixture to all the proppant used in a fracturing treatment.

- Enables earlier production of hydrocarbons after fracturing than is possible with conventional resin-coated or noncoated proppants.
- Promotes cleanup of fracturing fluid.
- Eliminates the problem of fibrous materials plugging surface equipment.
- Eliminates the problems of damage to coated proppants inherent in handling and storage.

An Expedite service formulation is available to help improve the results of fracture treatments in virtually any formation.

Formulated as Expedite Lite, Plus or Max based on the amount of coating required, it is applicable from 80 to 550° F (27 to 288° C).



In a comparison of widely used RCPs and Expedite service at various closure stresses, note that Expedite service provides about three times the conductivity of RCPs at 4,000 psi and 40% better conductivity at 10,000 psi. Testing conditions: 2 lb/ft 2,300°F, water as flow medium, at least 48-hr per stress load.
****RCP conductivity data is from supplier-published technical information.***

Expedite Service Provides Necessary Compressive Strength With No Closure Stress Required

Compressive strength of the consolidated proppant pack is critical to effectively controlling proppant flowback. Widely used resin-coated proppants often cannot provide the necessary compressive strength because high closure stress is required to provide good grain-to-grain contact prior to resin curing. This requirement can lead to proppant flowback since some formations may not completely close during the first 24 hours after treatments. In fact, many reservoir rocks do not close sufficiently to prevent proppant flowback and settling during the first 90 days after fracturing.

In contrast, even with no closure stress, proppant coated using Expedite service can provide more than sufficient strength to reduce or stop proppant flowback even under the most severe conditions. Plus, proppant packs treated using Expedite service provide and maintain exceptionally high conductivity.

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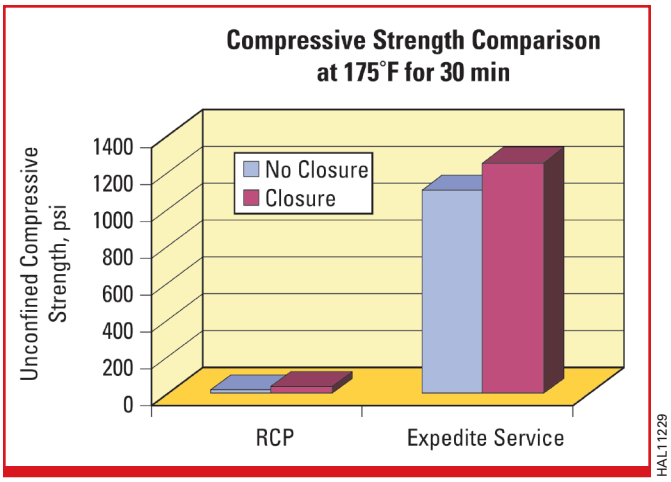
The direct resin coating process is key to the effectiveness of expedite service.

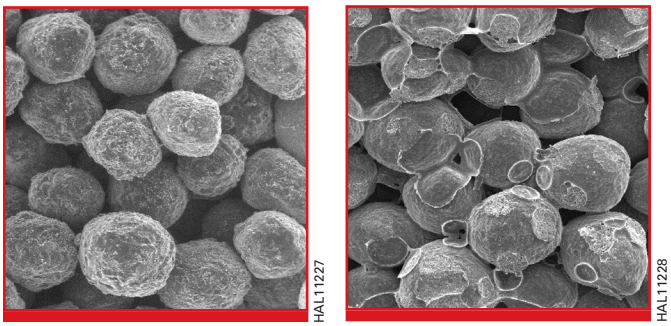
To virtually eliminate proppant flowback under the most severe conditions, it is critical that all the proppant pumped into the fracture be resin coated. Placing the resin on the proppant prior to addition to the blender tub helps assure that proppant surfaces are uniformly coated prior to contact by water-based fracturing fluids. This improves the resin coating efficiency and reduces the impact on resin and fracturing fluid chemistry.

Case History: Expedite® Service Helps Boost Production Rate by 30%, Cuts Time to Production by 68% and Reduces Proppant Flowback by 60%

A South Texas operator needed to stimulate a series of wells and achieve production more quickly than with the normal procedures using RCP. Typical well conditions included BHT >325°F with closure stresses up to ~12,000 psi. Typical treatments were pumped at 35 bbl/min to place 300,000 lb of bauxite at 2 to 8 lb/gal. **Results:** With Expedite service, temperature and pressure of these wells enabled cleanup to begin after only 2 hr with little or no proppant flowback. Production rate increased 30%. Time to achieve 40MMSCFD production was reduced from the usual 200 hr with RCP to 65 hr for a 68% improvement. Cumulative proppant flowed back was reduced by 60% compared to flowback with RCP material.



Unconfined, proppant packs formed with widely used resin coated proppants provide virtually no compressive strength. Proppant packs formed using Expedite service provide compressive strength almost instantaneously. Based on well conditions, after as short a time as 2 hr the coating is permanently affixed to the proppant and the well can be flowed back aggressively and put on production more quickly than with widely used RCPs.



With Expedite service, capillary action causes flow of the liquid resin, concentrating it between proppant grains and resulting in greater concentration of resin at contact points for increased durability. Above are photomicrographs of a widely used resin coated proppant (RCP) (left) and proppant coated using Expedite service (right). Both samples were handled identically and tested to failure. Resin contact footprints correlate closely to compressive strength. Note the lack of contact footprints on the RCP.

For more information about how Expedite® service can help control proppant flowback and improve the NPV of your fracturing treatments, contact your local Halliburton representative or email stimulation@Halliburton.com.

www.halliburton.com

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