

Introducing FUSION

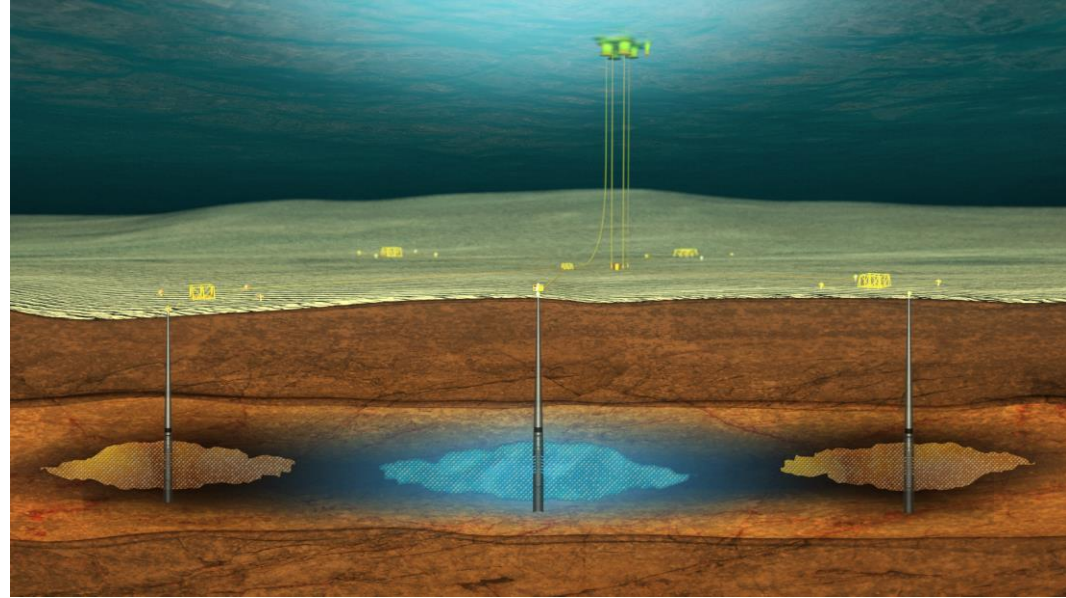
Unique Proppant Technology for Reducing Risk
in Deepwater Injection and Producing wells

Daryl Johnson
Director of Coated Proppants



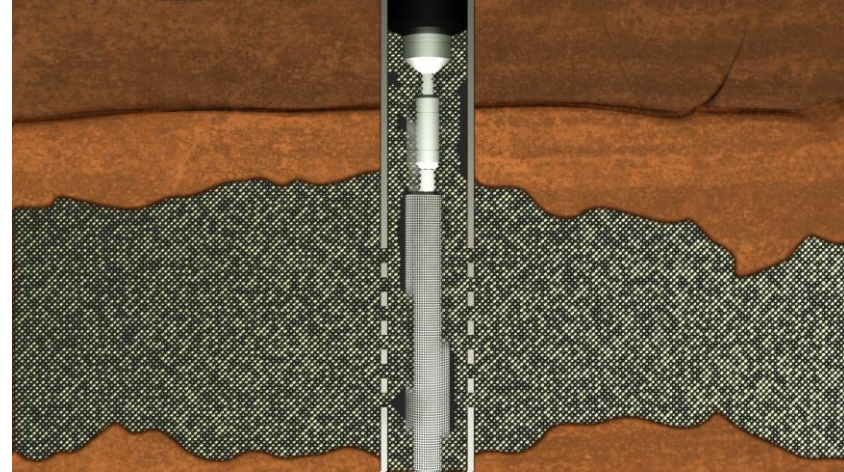
Meeting Today's Deepwater Production Demands

“Develop a proppant that will bond with no or very little stress and sustain ultra-high water injection or production rates and frequent cycling.”

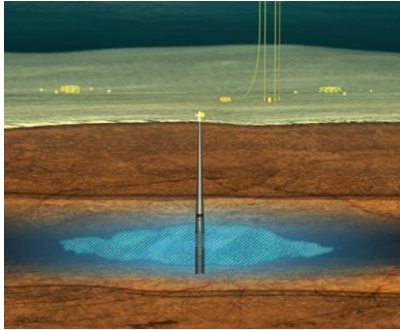


Field Development Challenges

- Ultra-high pump rates in water-injection wells
 - Can cause channels, voids or the complete loss of annular pack & ultimately connection to the fracture
 - Result: Loss of injectivity and a failed injector \$\$\$\$\$
- Eliminate workovers or recompletions
 - Deepwater & subsea intervention is very costly and usually not possible
 - Result: Potentially loss of well, injection or production \$\$\$\$
- Control prop and formation fines migration
 - Loss of secondary filter system, screen plugging or failure
 - Result: Lower injection rates and increased solids to control \$\$\$

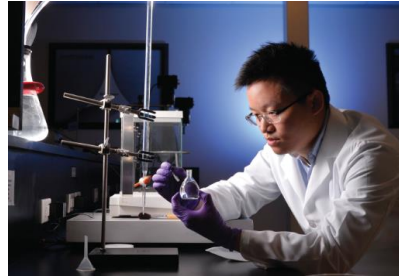


FUSION Technology Development



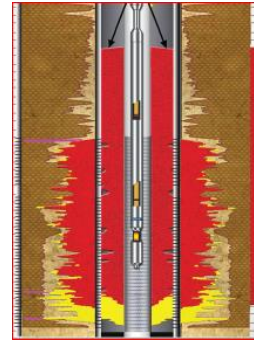
2010

Customer Requests



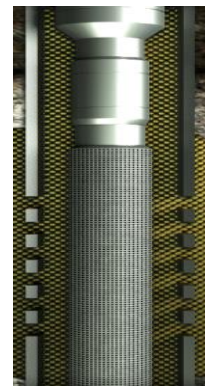
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Development of Unique Coating Technology



2014

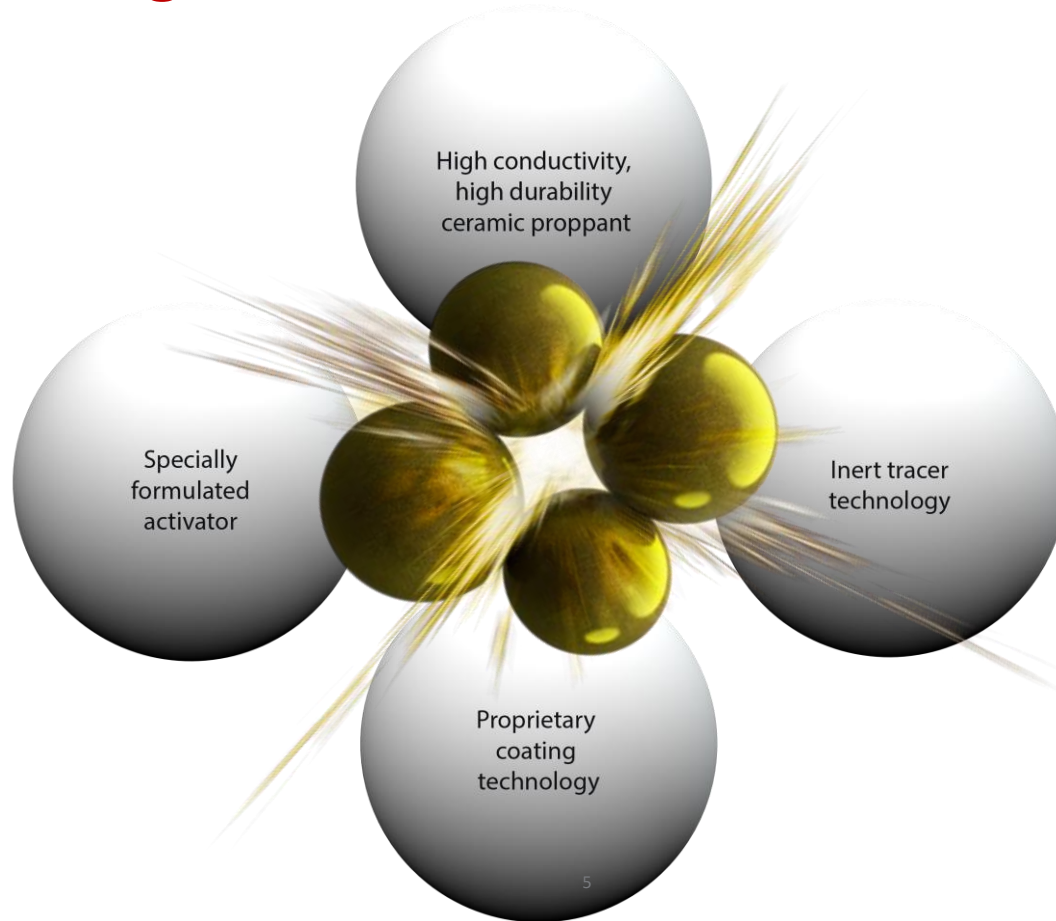
CARBONRT Inert Tracer Incorporated



2015

Field Testing & Commercialization

FUSION—Integrates Advanced CARBO Technologies



The Result: FUSION Technology

- The unique solution for prop pack consolidation in deepwater injectors and producers
- Creates a highly conductive and permanent proppant pack in non-compressive environments
- Allows proppant pack quality verification of both the frac and annulus for the life of the well
- Delivers enhanced reservoir recovery in depleted fields and unconsolidated formations

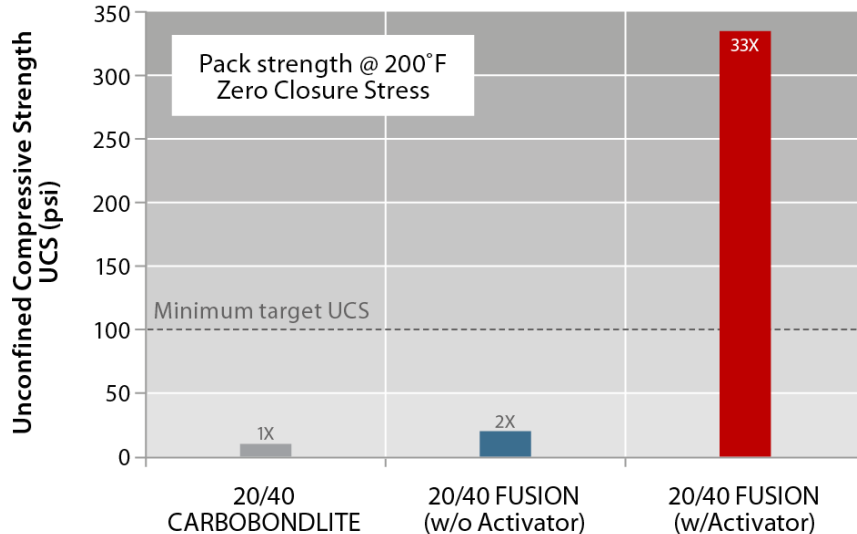


**Proppant pack formed
with zero closure stress**

FUSION Features

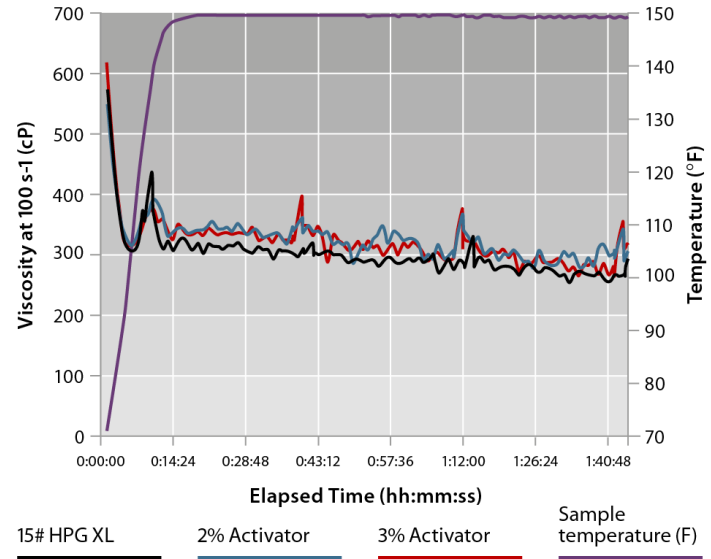
- Chemical-activated in non-compressive environments
- Controllable bonding (curing) process
- Fluid compatibility with linear and borate x-linked frac fluids

FUSION proppant and activator



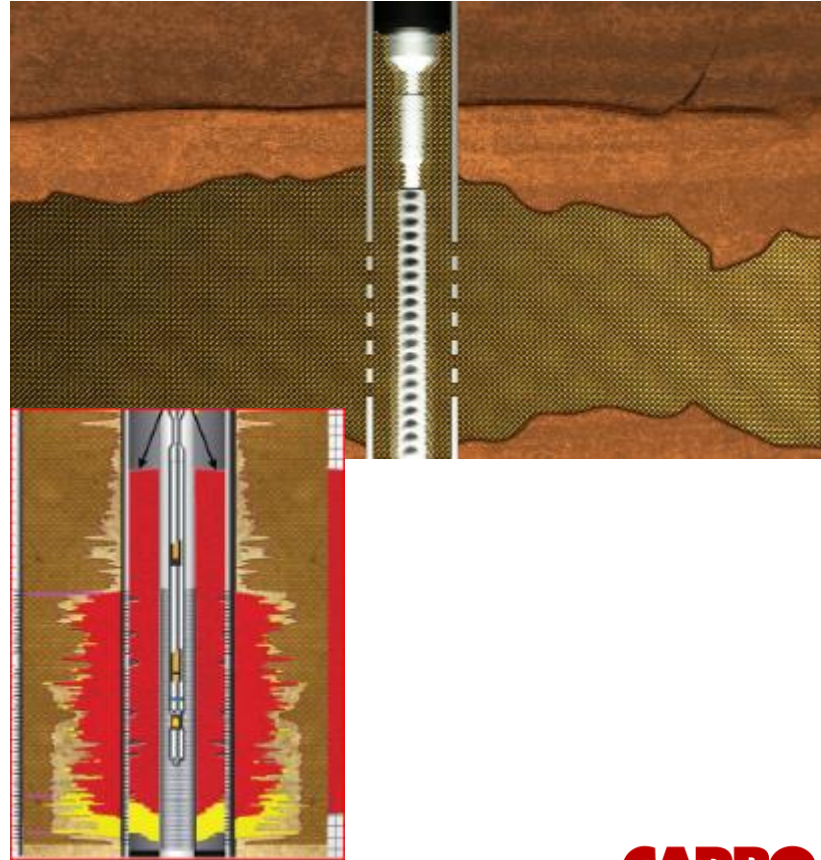
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Frac fluid compatibility



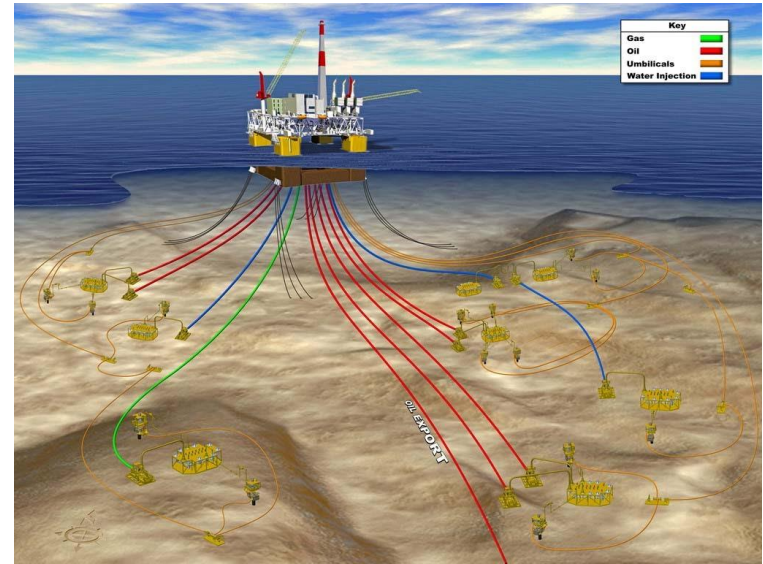
FUSION Performance Benefits

- Frac and pack in continuous operation with a single proppant
- Bonds the annular pack in non-compressive environments and low temperatures
- Locks in a high quality pack without voids or channels, and prevent washouts
- CARBONRT allows the evaluation of pack integrity, near wellbore connectivity and propped pack height during the life of the well



FUSION Applications

- Water injectors and producers in unconsolidated formations and soft sands
- Frac-pack in unconsolidated or low temperature formation
- Gravel pack consolidation
- Formation stabilization
- Screenless frac-packs
- Oil, natural gas and CO₂ storage facility wells
- Steam flood injectors and producers



FUSION—Higher Production, Increased Recovery

- Creates a highly conductive and permanent proppant pack in non-compressive environments
- Allows proppant pack quality verification of both the frac and annulus for the life of the well
- Delivers enhanced reservoir recovery in depleted fields and unconsolidated formations
- Extend the productive life of the field and increases ROI

Thank You!



Questions?