

SALTGUARD

Proppant-delivered halite-inhibiting technology

Features

- Engineered porous ceramic proppant infused with halite inhibiting chemistry
- Durable encapsulation allows for a controlled release and significant reduction in chemical wash out
- Low minimum inhibitor concentration (MIC) required for effective treatment
- Effective in brines with presence of calcium and iron
- Replaces 3% or less of pumped proppant/sand volume

Benefits

- Eliminates production loss due to halite scaling in the fracture
- Lower MIC requirement compared to other treatments
- Eliminates fresh water consumption and associated disposal cost
- No impairment of fracture conductivity or durability
- Eliminates costly remediation treatments and equipment failures, while increasing production over the life of the well



Protect the entire production system from halite in a single, cost-efficient application

Halite scaling is an increasing prevalent production impairment. Cooling and pressure drop are the major influences on precipitation of halite scale. Most salt remediation treatments do not address halite scale deposits in the fracture.

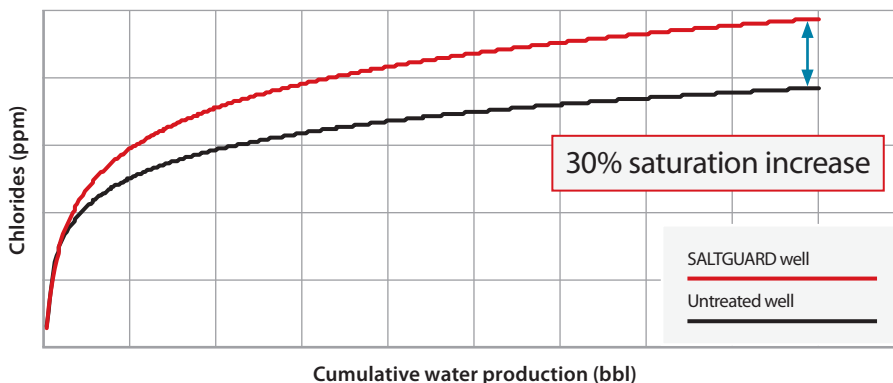
SALTGUARD™ proppant-delivered halite-inhibiting technology, prevents production impairment caused by halite scale deposits in the fracture through the wellbore and the surface production equipment.

Effective halite inhibition designed and built into every fracture

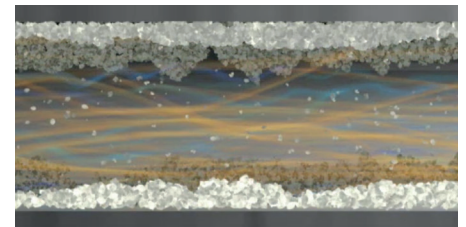
SALTGUARD technology is an encapsulated, porous ceramic proppant infused with halite inhibiting-chemistry that replaces a small percentage of the proppant throughout the entire fracture as part of the well completion.

The engineered, uniformly distributed, interconnected porosity in the proppant is infused with a polymeric halite inhibitor. The proppant is encapsulated to ensure a predictable and controlled release of halite inhibitor only on contact with produced water. The crystal modifier inhibitor raises the chloride saturation levels by 30% so that halite crystals do not adhere to surfaces within the production system.

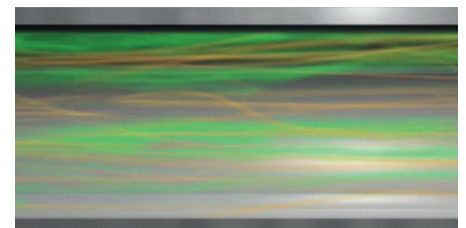
SALTGUARD improves saturation level by 30%



SALTGUARD treats the wellbore and the fracture maintaining space to flow



Prevents halite build-up in the fracture and wellbore



Maintain unobstructed flow with SALTGUARD

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Proppant-delivered halite-inhibiting technology

Long-term effective and environmentally-efficient

This efficient chemical delivery technique allows for a long-term, predictable release of chemical throughout the fracture, enabling each treatment to be engineered to assure production for multiple years.

Other halite treatments involve periodic water wash treatments or continuous water injection, leading to elevated freshwater consumption. This results in a poor environmental profile, and creates continuous operational and logistical requirements, such as water disposal.

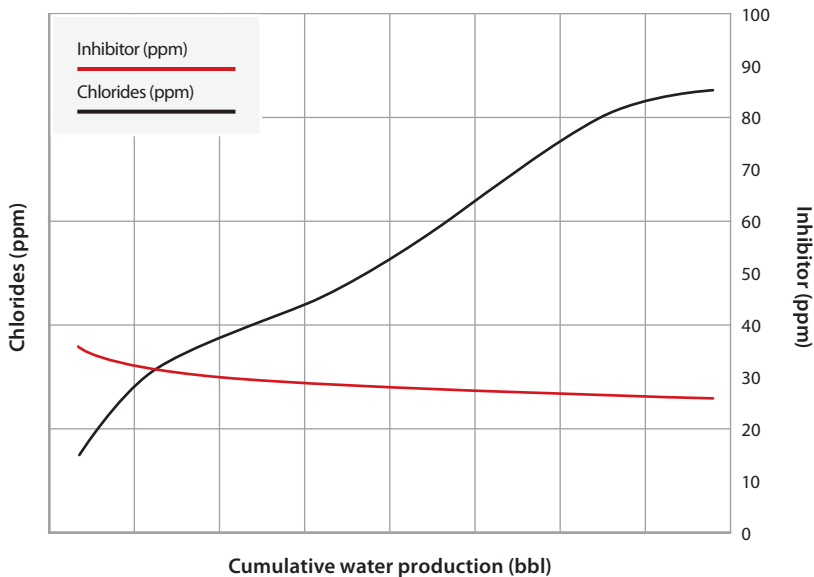
No loss of fracture conductivity or integrity

SALTGUARD technology serves as both a halite inhibitor and proppant, which means it has no impact on fracture conductivity or durability. The uniform distribution of the engineered porosity of the proppant ensures that the proppant provides maximum conductivity, while also avoiding excessive fines that restrict or block hydrocarbon flow spaces: a risk associated with lower strength particulate-based carriers.

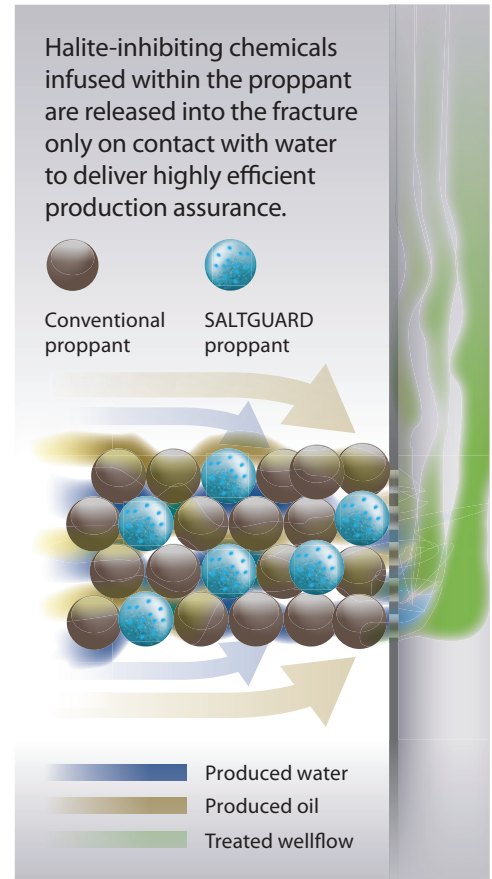
The most effective, simple and cost-efficient treatment available

Other chemistries have compatibility issues with some brines (e.g. iron), resulting in reduced inhibition performance, or even no inhibition in the presence of calcium and iron. SALTGUARD technology is designed to be unaffected by iron or calcium fluids. Field trials have also shown synergistic effect with calcium carbonate and barium sulfate scale inhibitors.

SALTGUARD technology enables super saturation



SALTGUARD technology only requires a MIC of less than 50 ppm to provide effective inhibition, which is significantly lower than the typical 200–1,000 ppm requirement for continuous injection of halite inhibitors in field application. SALTGUARD technology has a high thermal stability and is effective in a wide range of reservoir types.



SALTGUARD technology is superior to other methods of inhibiting halite

- Engineered ceramic proppant gives a high strength, controlled releasing inhibitor
- Encapsulation technologies significantly lengthen treatment life and reduce initial inhibitor washout
- Periodic wash or water injection does not remove halite in the fracture
- The technology removes the environmental, logistical and operational issues associated with water injection treatment
- Typically replaces less than 3% of the designed proppant

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