

IMERYS Oilfield Solutions

Enhancing Well Production by Using Quality IOS Ceramic Proppants

Sand vs. Ceramic: When “does the good of the well” outweigh “the cost of the completion?”

Sand Disadvantages

- Poor porosity and permeability
- Uneven, angular shape
- Low Strength

Ceramic Advantages

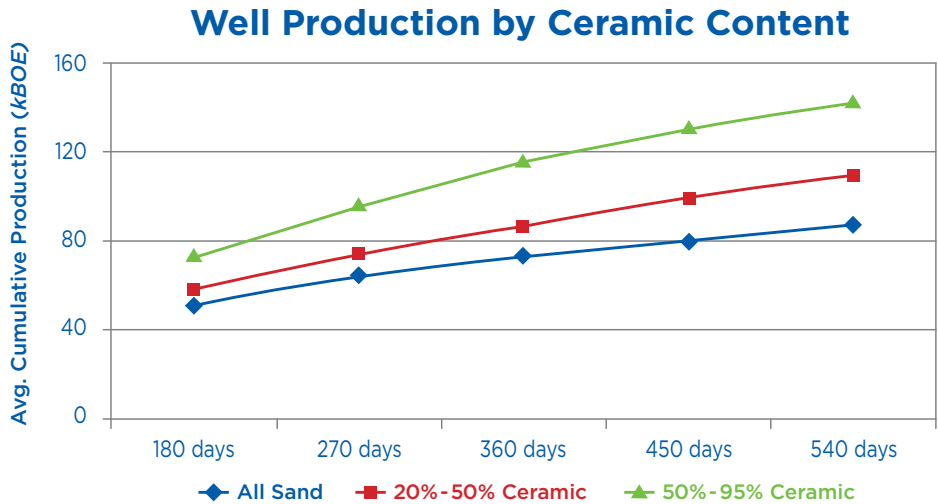
- Improved conductivity
- Superior roundness and sphericity
- High Strength
- Increased well productivity
- Extended well life and length of service
- Comparable bulk density and specific gravity as natural sand

Ceramic Results

- Superior recovery
- Increased ROI and EUR
- Enhanced long-term production

Studies have shown that there is a correlation between the proppant type used and the performance of a well. Third party testing under API conditions shows Lightweight Ceramic proppant is about 5 times more conductive than premium sand. While actual conductivity is much lower for all proppants under real conditions, a recent study in McKenzie county, ND shows that ceramic proppants outperformed sand wells even when used in varying percentage of total proppant volume.

All wells with ceramic proppants performed BETTER than sand only wells, with the gap widening over time; this is because ceramic proppants are much better at keeping the fractures open and the additional cost is more than offset by increased revenues from the more productive wells. The graph below shows the superior performance of wells with ceramic proppants in the study.



Source, NavPort, FracFocus

STUDY PARAMETERS

- 86 wells completed within a 20-mile radius in McKenzie county of Williston basin
- Year of completion: 2013 - 2015
- Average number of frac stages: 30 - 31
- Average horizontal length: 9300 ft - 9800 ft

RESULTS

- Wells with at least 50% ceramic proppants performed best while wells with 20% - 50% ceramic performed better than wells with sand proppants only
- Pumping at least 50% ceramic proppants yielded 67% increase in production
- On average an additional investment of \$500k per well with at least 50% ceramic yielded \$6M increase in revenue after 540 days of production on the average*

* Assumptions: Ceramic proppants @ \$0.5/lb., sand proppants @ \$0.15/lb. and crude oil @ \$100/barrel.

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Challenges

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