

3M™ Ceramic Sand Screens for HPHT Open Hole Applications

Simple and cost-effective alternative to gravel pack

Customer challenge

Operator Wintershall Dea anticipated sand control issues over the wells' lifetime during development of HPHT Dvalin field offshore Norway. Due to extremely high reservoir pressure, temperature and gas production rates, conventional sand control methods appeared challenging to apply.

Extremely high flow rates were expected from the short reservoir section leading to high impingement velocities and potential hot spotting.

Solution offered

Custom design of 3M™ Ceramic Sand Screens was developed and qualified to address reservoir challenges and target production rates.

Geomechanics calculations predicted wellbore collapse onto the screens, therefore improved robust screen shroud design was implemented and tested prior to deployment.

The customized screen has 7.88" max OD, configured on an R3 joint and slot sized by application to 400 µm. A thick robust shroud was configured to withstand up to 5000lbs of point loading.

Where

North Sea, Norway
Dvalin HPHT gas field

When

Screen development, qualification and manufacturing 2017 - 2019.

Deployment – Starting Q4 2019, 4 wells campaign.

Brief summary

Operator sanctioned first stage of Dvalin HPHT gas field development with 4 wells campaign. Having extremely harsh reservoir conditions and limitations in sand control method selection, operator and 3M developed customized 3M Ceramic Sand Screen design for Open Hole application to address existing challenges.

Key features

Drilling rig Transocean Artic
258 km offshore 381m water depth

HPHT application:

Pressure= 750bar, T= 160 °C

Production rates expected per well:
105 MMSCFD

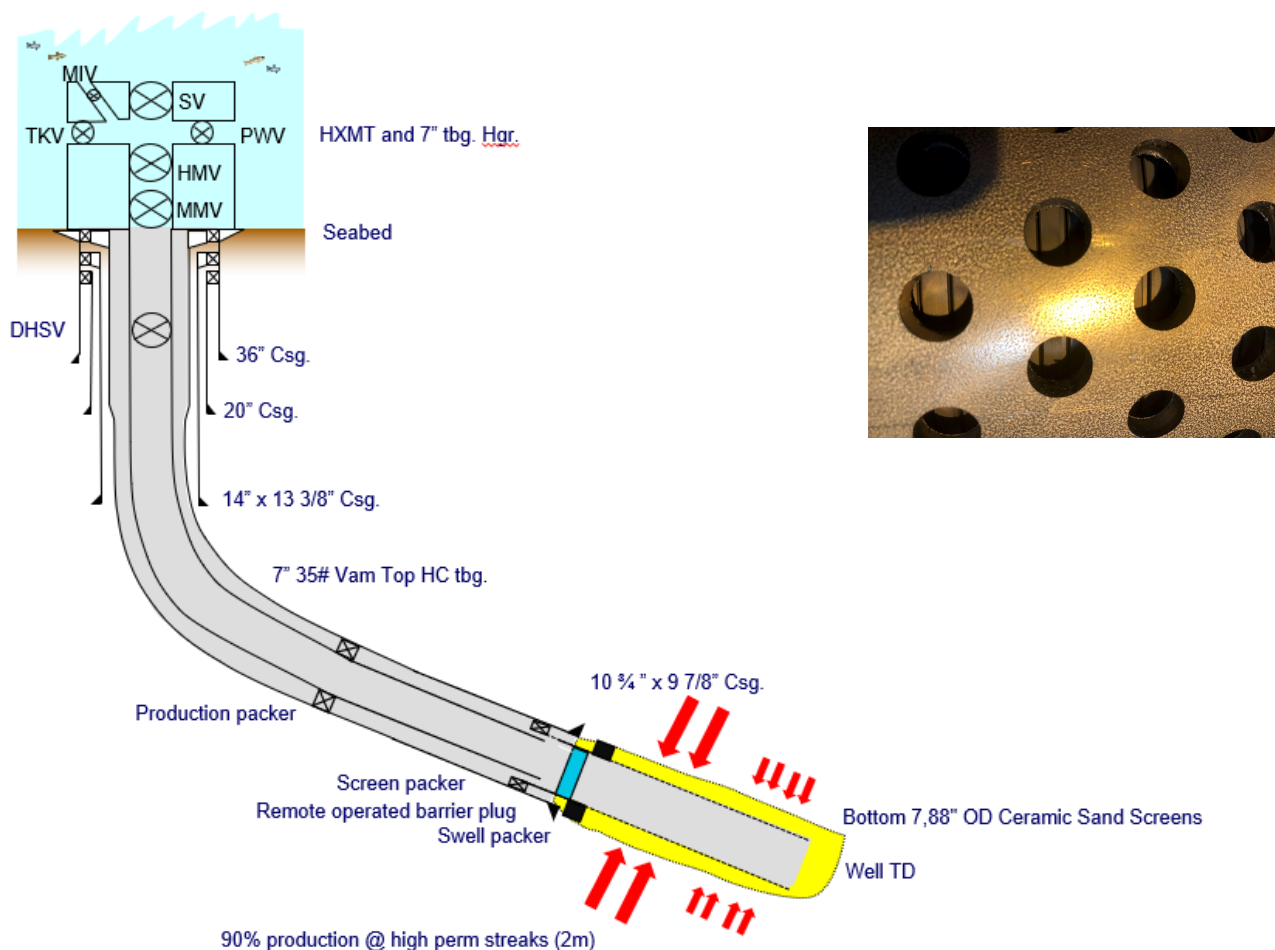
Why ceramics?

Metal sand screens tend to fail rapidly in highly erosive environments. Changing filter media material to ceramics (non-oxide silicon carbide) provides extreme resistance to erosion leading to increased production rates and period.

Customer Value

- ▶ Simplified Open Hole sand control completions design.
- ▶ Elimination of technical challenges and risks of gravel packing in HPHT conditions.
- ▶ Reduced operational risk and cost avoiding pumping services – less equipment footprint and personnel required offshore for deployment.
- ▶ Deployment of 3M screens in 1st well completed within one day.
- ▶ Erosion and corrosion resistant robust screen solution to meet field life.





Wellbore schematics disclaimer: the 1st well with 3M Ceramic Sand Screens deployed was an S-shaped well. The above schematics are given for reference purposes only to show the screens placement in open hole.

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3M Technical Ceramics

Zweigniederlassung der 3M Deutschland GmbH
Max-Schaidhauf-Str. 25, 87437 Kempten, Germany

Phone +49 (0)831 5618-0
Web 3M.com/ceramicsandscreens

3M Advanced Materials Division

3M Center
St. Paul, MN 55144 USA

Phone 1-800-367-8905
Web www.3M.com/advancedmaterials

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