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Ceramic Screens, a promising approach for a sustainable oil and gas production

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Screen only systems (such as wire-wrapped screens) and gravel-pack completions are amongst the common options used in unconsolidated reservoirs. However, in the Danish offshore sector having low permeability and porosity reservoirs required that the pressure loss across the productive zone to be kept at a bare minimum. Therefore the Sliding Side Door(SSD) which allows for selective production was placed directly opposite the perforation. However the proppant backflow during clean-up as well as bean-up procedures not only gave rise to erosion on downhole and surface equipment but it has also led to HSE issues such as possible tubular leaks through erosion. In addition the selectivity of the production zones is lost right from the beginning.

Maersk Oil together with ESK Ceramics designed and developed a new sand screen with Sintered Silicon Carbide (SSiC) as the material instead of the common stainless steel to tackle the problem in hand. The ceramic sand screen has proved to be highly effective in the Danish offshore operations.

However the characteristics of ceramics screens in comparison to state of the art metal screens is not yet fully understood. RAG operators installed a ceramic screen and a state of the art metal screen in Gaiselberg-16. The latter caused immediate decline in production rate due to plugging while with the ceramic screens constant production rates was observed. This is believed to be due to erosion corrosion. An in depth investigation of plugging due to sand and scaling that occurs in stainless steel and ceramic screens were carried out in a laboratory environment. This gave a better understanding of the behaviour of the both screen materials.