

# POWELSAND

## Sand Control by polymers

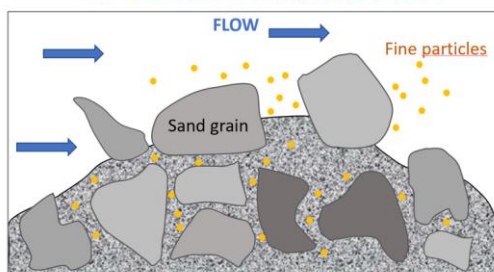
**POWELTEC**

In sandstone reservoirs, operators often face sand production problems due to the degradation of reservoir rock around the wellbore under high-velocity fluid flow. In many cases, **the sand consists of fines** which are not retained by stand-alone screens or gravel packs. The production of sand induces several problems such as **the degradation of surface facilities** (valves, pipe, pumping unit,...) and **the accumulation of sand in the wellbore**. The operators often choke the well and limit its production rate, which, in addition to frequent sand cleaning jobs, affects operational costs.

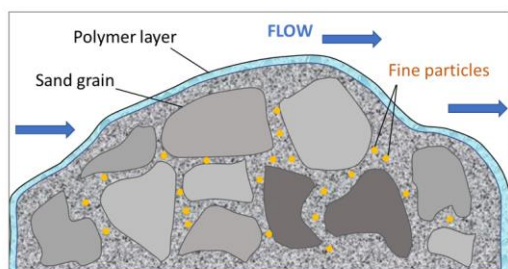
The degradation process starts with the erosion of the cement of the rock, with a production of fines. When the erosion of the rock is advanced, a production of large quantities of sand occurs together with sand accumulation in the wellbore. The principle of **the polymer sand control technology consists of the formation of a polymeric film on pore walls**, which stabilizes the rock around the wellbore and thus stops the erosion process. Such a film has to be strong enough to resist wash out by production fluids under high- velocity flow.

### Principle of Powelsand

#### Without Powelsand



#### With Powelsand



The technology is based on the adsorption of an «environmentally friendly» water-based polymeric film onto the pore walls, which can efficiently prevent the erosion of the cement of the rock under high flow rates.

POWELSAND™: polymeric products are specifically designed to stick onto the pore walls and prevent the erosion of the rock with almost no impact on oil or gas flow.

During the past 10 years, remarkable results have been obtained in the treatment of Underground Gas Storage wells. Treatment efficiency lasts at least 4 years, saving the cost of regular well interventions such as coil tubing sand cleaning jobs. Re-treatments have also been performed successfully.

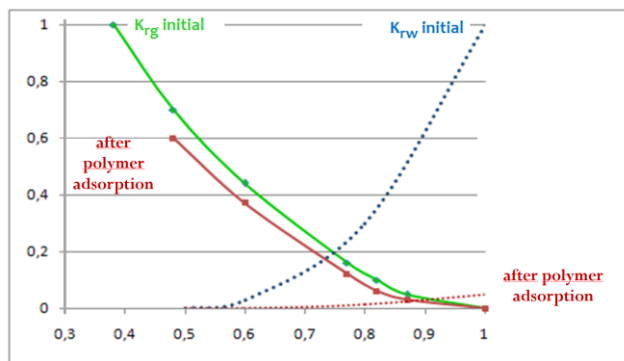
Combined Water Shut-Off & Sand Control treatments can be designed on request.

### Treatment mechanism

On the contrary of resin-based sand control treatments which consist of the formation of rigid material in the rock over 1-2 feet, POWELTEC technology is based on the formation of a soft polymeric film deeper in the formation (about 3 to 6 meters).

POWELSAND™ products can be bullheaded into the whole open interval of the well, without specific tools for placement. The risk of well impairment is minimized by the use of Relative Permeability Modifiers.

*The risk of well impairment is minimized through the a relative permeability modifiers effect*



Kh core = 210mD

## POWELSAND Applications

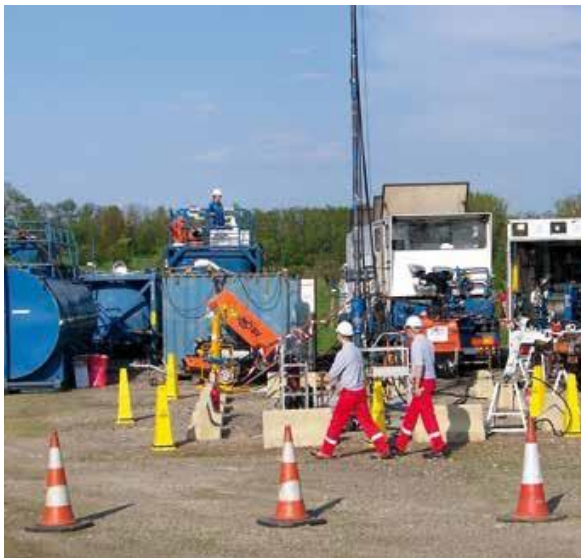
- Gas wells
- Oil wells
- Underground Gas storage wells
- Water injection wells

### *Powelsand specifications*

Temperature (°C)	Up to 120
Salinity (g/l)	Up to 300
Permeability range (mD)	10 - 10 000
Shut in time (hours)	6
Regained permeability %	>80

## Treatment design

Treatment design consists of laboratory flocculation tests to screen the polymer having the highest adsorption on produced sand. A full range of product is already available that have been evaluated through flocculation tests and coreflood experiments. Injectivity, dynamic adsorption, mobility reduction and oil/gas return permeability are the main parameters



## Product delivery and field assistance

POWELTEC delivers the products and sends a technical team to support the operation manager, supervise the chemicals preparation and check the quality of the solutions prepared on site.

POWELTEC can also assist the operator in post-treatment monitoring.

## References

Treatment of underground gas storage wells

- SPE 121291

Treatment of offshore gas wells

- SPE 179825

Treatment of oil well

- SPE IPTC 21171, SPE 210731

### CONTACT

- Tel = +33(0)141962195
- Fax = +33(0)141962196

Poweltec

3 rue Paul Heroult

92500 Rueil Malmaison

France

<https://www.poweltec.com/contact>

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