

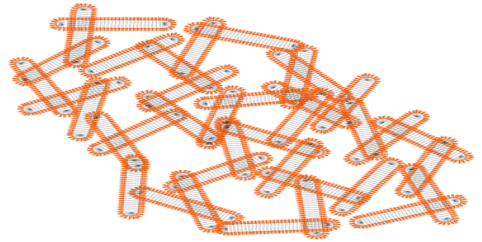
PREMIUM ACIDIZING

SDA-550: Acid Diverter

Employing diverting agents to prevent acids from leaking into the most permeable sub-layer of the target zone is common practice. These additives function by creating a temporary blocking effect which causes fluid diversion facilitating homogeneous and successful acidizing.

Product Properties

SDA-550 is a surfactant-based product with a tendency of forming rodlike micelles in acidic solutions. Here, a chaotic worm-like arrangement of dissolved molecules leads to a viscosity increase. The use of a special breaker system effectively reduces said diverter viscosity and helps preventing formation damage.



Lab Testing

Lab experiments conducted prior to the field application included rheology measurements at bottomhole temperature, corrosion testing with representative steel coupons, core flooding with sandstone samples, and breaker fluid optimization.



Equipment on Site



Fluid Recipes

Fluid	Function	Composition	Volume
1	Pre-Flush	Water + 100 L/m ³ SMS-300 + 30 kg/m ³ SCC-220	2 m ³
2	Acid	15.0% HCl + 5.0 L/m ³ SIC-123	12 m ³
3	Diverter	7.5% HCl + 2.5 L/m ³ SIC-123 + 50 L/m ³ SDA-550	3 m ³
4	Breaker	Water + 500 L/m ³ SBR-300	5 m ³
5	Over-Flush	Formation water	40 m ³

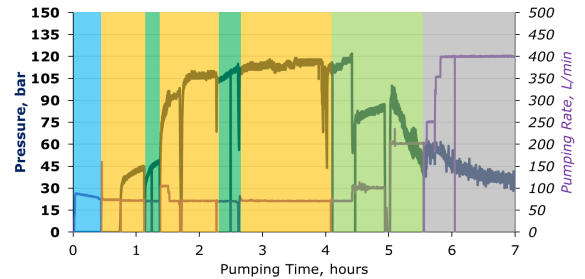
Product	WGK	Function
SMS-300	1	Mutual solvent for cleaning purposes in oil wells
SCC-220	1	Additive to prevent clay swelling in sandstone formations
SIC-123	2	Corrosion inhibitor in HCl-based systems
SDA-550	3	Acid diverting agent for HCl-based treatment fluids
SBR-300	1	Breaker for acid diverting agent

Pumping Schedule

For the actual treatment of the injector well in a Dogger formation, we alternated between acid and diverter steps in a volume-wise increasing approach. In total, 12 m³ of 15% HCl containing an adequate corrosion inhibitor dosage were pumped through tubing to a measured depth of approx. 1,400 m. Descaling of the two perforation zones with a length of 14 and 8 meters, respectively, was the goal of this application.

1 m³ / 2 m³ of the surfactant-based system followed each acid step for effective fluid diversion. Finally, 5 m³ of a special breaker concluded the acidizing job reducing diverter viscosity and hence counteracting formation damage.

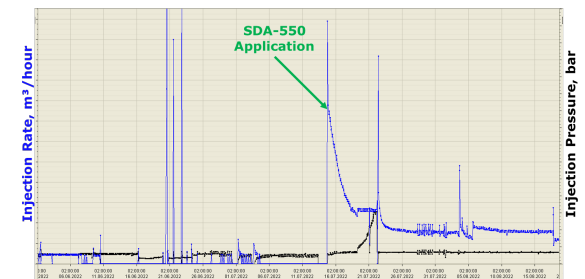
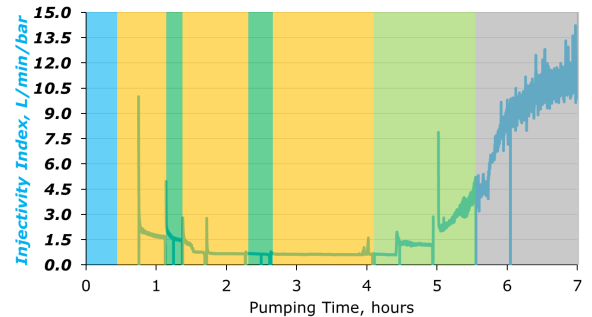
Step	Fluid	Function	Volume
1	1	Pre-Flush	2 m ³
2	2	Acid	3 m ³
3	3	Diverter	1 m ³
4	2	Acid	4 m ³
5	3	Diverter	2 m ³
6	2	Acid	5 m ³
7	4	Breaker	5 m ³
8	5	Over-Flush	40 m ³



Job Evaluation

For evaluating treatment efficiency, we injected 40 m³ of formation water at ever increasing pumping rates and recorded the resulting pressure. Based upon these values, we determined a significant improvement of injectivity index directly after the job.

Long-term surveillance of well performance confirmed a two-fold increase in injection rate at constant pressure. Thus, lab and field results impressively proved the premium effectiveness of this surfactant-based diverting agent for acidizing.



Your Benefits

- ✓ Surfactant-based Diverting Agent
- ✓ Effective Viscosifier for HCl
- ✓ Lab- and Field-approved
- ✓ Non-damaging

READY FOR SERVICE

Dr. Nils Recalde Lummer

Senior Chemist

+49 4471 980 08 25

+49 151 41 42 58 82

nlummer@fangmanngroup.com

fangmannenergyservices.com

