

Mike Gunningham SPE Papers – Link: <https://www.onepetro.org/>

<p>24986-MS SPE Conference Paper</p>	<p>Through-Tubing Remedial Treatments Using a Novel Epoxy Resin System</p>	<p>1992</p>	<p>Gunningham, M.C., Koninklijke/Shell E and P Laboratorium van Paassen, A.S.W., Koninklijke/Shell E and P Laboratorium Samuel, A.J., Koninklijke/Shell E and P Laboratorium</p>	<p>A new formulation epoxy resin system has been developed, with a solvent system that is compatible with high-expansion elastomers. The versatile epoxy resin system can thus be used with through-tubing straddle packers to treat intervals selectively. The system can be used for sand consolidation, water shut-off and cement repairs. This paper describes the laboratory testing of the new system, various applications of the novel epoxy resin and a case history of the first field trial. Laboratory testing of the system has shown that for sand consolidation the system gives 80-90% return permeability while resulting in increases in unconfined compressive strength of typically 50-70 bar. The system can also be used for shut-off purposes, reducing permeability to water by 99%. Gas shut-off may be less effective. The new resin system produces consolidated sand packs with low moduli of elasticity, which may allow them to survive pressure fluctuations better than more rigid formations. The compatibility of the system with high-expansion straddle packers has been field-proven.</p> <p>The oil industry has traditionally completed oil and gas wells using production tubing (typically 3 1/2" diameter) run inside production casing (typically 7" diameter). Thus, when problems occur, such as excessive sand or water production, remedial treatment can become difficult because of the difficulties in obtaining full wellbore access below the production tubing. To repair these wells, a full workover is required to pull the tubing out of the well, before gaining access for remedial treatment. This approach to well intervention is both costly and time-consuming.</p> <p>When considering sand production, the usual remedy is to gravel-pack the interval concerned. Although this can be done through-tubing, the resulting gravel pack would have an extremely small diameter. Gravel packs in general tend to reduce productivity, but through-tubing gravel packs have the additional disadvantage of restricting access to the wellbore below. An alternative approach, widely used by Shell in Africa, is to carry out chemical sand consolidation. This technique leads to much higher productivities than seen with gravel packs, while allowing full wellbore access along and below the treated region. However, experience has shown that successful, reliable treatments are normally achieved over relatively short interval lengths, 3 m (10 ft) or less. To overcome this hurdle, work has been carried out to develop mechanical systems that will isolate these short intervals for treatment.</p>
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