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MEETING
PAPER



ANAEROBIC THREAD COMPOUND USED ON LARGE DIAMETER CASING COMPLETED AS A RECOVERABLE GAS TIGHT TUBING STRING IN CAVERN WELLS.

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The Problem:

Cavern wells have their unique problems. Large OD casing functioning as production tubing is unusual in the domestic market. Several of the problems encountered in this application are:

1. Failures where the casing parts down hole and falls in the storage cavern. The exposed pin has polished full formed threads indicating that the connection unscrewed down hole.

2. As tubing strings, large OD casing has to be tripped several times. Frequently galling is encountered when backing out and expensive rework is required.

3. Seal integrity in the connection is critical as the connection is subjected to numerous flow cycles.

Anaerobic technology has been used in various industries over the past 30 years. (Automotive, medical, aircraft etc.) A special formulation has recently been developed to satisfy the unique needs of OCTG application.

ABSTRACT

In testing and actual field experience, anaerobic sealants offer a unique advantage over standard pipe dopes. The

anaerobic sealant is applied as a viscous paste which fills the entire inner space between the threads and cures into a tough, chemically resistant, polymer seal. This anaerobic technology provides gas-tight integrity in large API threaded connections. In Cavern well applications large O.D. casing functions as production "tubing".

The ability of these connections to be disassembled without thread damage is critical. An anaerobic sealant offers an obvious advantage over grease based pipe dopes. Typical API compounds have a tendency to be pressured out of connections because they remain in a semi-solid state. Further, under the combined influence of petroleum products and heat, the grease may be dissolved or "baked-out". Therefore, no lubrication is left for disassembly and galling occurs.

Test results from multiple make-up and break-outs performed on connection sizes 7", 26#, K-55, LT&C, and 10 3/4", 51#, K-55 ST&C indicates that thread damage is virtually non-existent when the anaerobic compound is used. Further, the product has been formulated to provide two distinct strengths to facilitate dissimilar break-out torques. One prevents mill end movements while the other allows a lower breakout torque on the field end of the connection. Combined, both products help to prevent downhole back-off.

An example of a typical cavern well application is described in the following: A large, Independent producer was in the process of drilling 10 new cavern wells. The company tested with internal gas pressure while running 7", 26.0#, P-110, LT&C casing. After the fourth well was run, the leak frequency (leaks while testing) had increased to 40%. Also, mill end turns were experienced on make-up on 80% of the connections. The company engineer elected to use Seallube HTM 1001 and LTF 4444 on a string to determine it's effectiveness.

Seallube Mill (HTM 1001) was applied to the pin and box. Couplings were then installed to hand tight position followed by power tight make up using a portable bucking unit. Make up position was verified. Seallube Field (LTF-4444) was applied to the box and pin while the joint was in the V-door. The pin was stabbed and made up to 80% of API optimum torque. The connections were internally tested to 5000 psi with Helium gas and held for 2 minutes. No leaks or mill end turns occurred while running the strings.

As a result, the remaining wells in this field will be run with Seallube HTM-1001 and LTF-4444 utilizing the above procedure.