



Ultra-High Expansion Additive Manufactured Metal Bubble Plug Deployed and Set on Coiled Tubing for Water Shut Off Application in Highly Deviated Well

dedicated to intervention



Cert Number: 10385

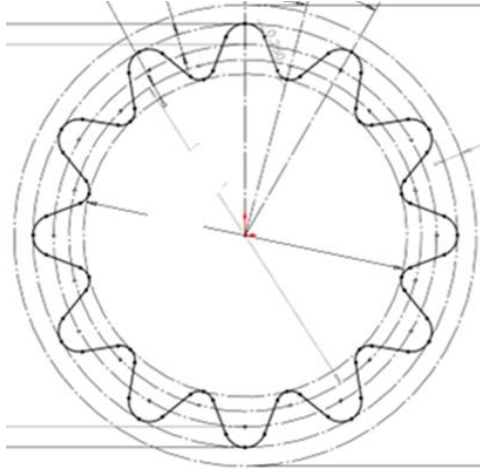


Ultra High Expansion Technology

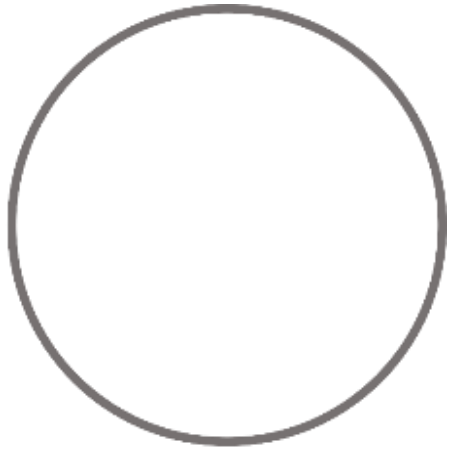
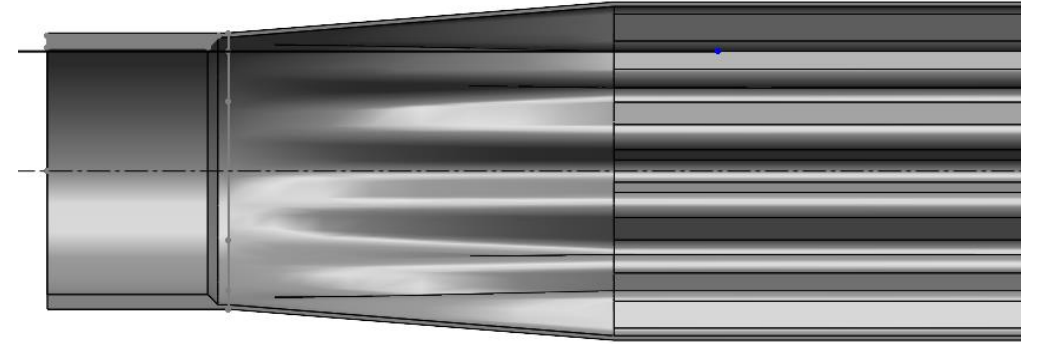
- Inconel alloy unfolding metal mandrel with elastomer outer seal
- Unfolded metal mandrel provides support for elastomer at close to sealing diameter
- Facilitates high pressure rating at high expansion ratios, at temperature.
- Elastomer can utilise high performance compounds not easily possible with other sealing technology



Ultra-High Expansion Sealing Technology



When RIH the element geometry is folded



When internal pressure is applied to the element it unfolds to fill the casing





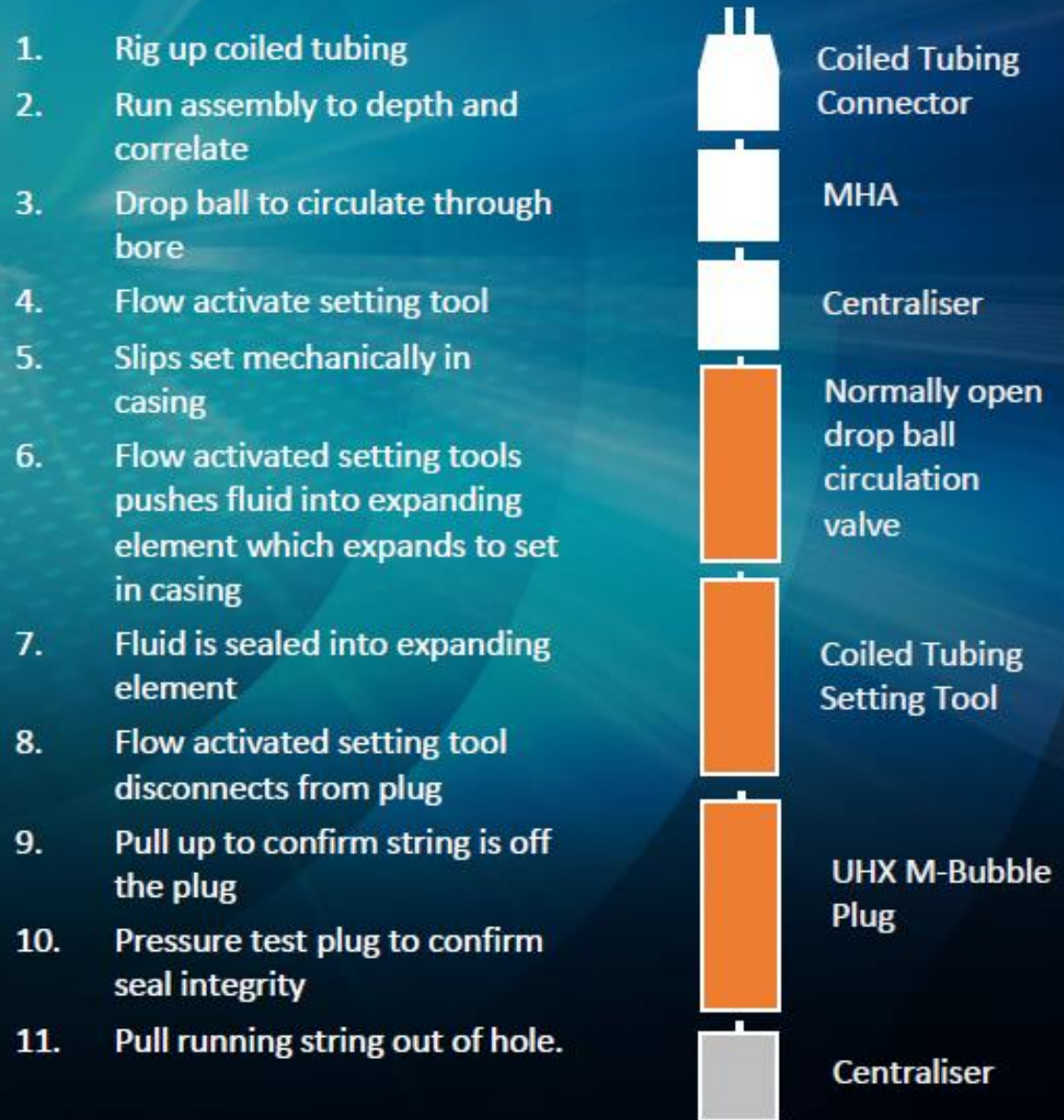
Application

- Water shut off application.
- Set in 5 ½" 17 lb/ft Liner
- Setting ID 4.95" (5 ½" 17 lb/ft).
- 2 1/8" OD Tool
- 245% Expansion sealing to 3,500 psi.
- Highly deviated well.

Considerations

- Safe Deployment
 - Protect UHM M-Bubble Plug from unexpected pressure surges.
 - Or accidental pump rate increase.
 - Use Normally Open Drop Ball Circulation Valve
- Centralization
 - Deviated wells
 - Ensure M-bubble expands evenly.
 - Install Centraliser or second set of slips below element.

Coiled Tubing Deployment



Coiled Tubing Setting Tool



- 5 stage tool : 15,000 lbs of force @ ~1500 psi.
- Staged so that initial pressure partially sets slips, continuation further sets slips and inflates element.
- Pressure relief valve prevents over-pressuring of element
- Continuation of applied pressure and load would apply full force of setting load to slips and shear the shear stub, subsequently releasing the setting tool from plug.

Thank You



Ultra-High Expansion (UHX) Sealing Solutions

- **UNRIVALLED 300% EXPANSION**
- **IN-FLOW, THRU-TUBING, HIGH-PRESSURE DEPLOYMENT**
- **PERMANENT PLUGGING, ZONAL ISOLATION, CEMENT RETAINER, HANGER, WELL WORKOVER, ABANDONMENT**
- **OIL AND GAS, CCUS AND GAS STORAGE.**

With industry-leading expansion and high-pressure, in-flow deployment capability, our UHX solutions help to solve a range of complex plugging, sealing and isolation challenges in a variety of wells.

For wells with narrow restrictions or with small diameter completion tubing, this technology provides the ideal expansion ratio and strength to deliver a reliable seal in lower sections of the well, that may be up to three times wider in diameter.

These outstanding solutions are suited to completion, production optimisation and abandonment applications in oil and gas wells and enable the repurposing of wells for carbon capture and gas storage by enabling the plugging of the lower completion.

