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.

Applications

UHX technology provides a reliable sealing solution for a range of applications.

Flexibility in the design of the packers, packoffs and plugs makes the range suitable for a variety of well configurations and tubing/casing/liner sizes.

They can be run on either slickline or electric line and set using powered setting tools, or run on coiled tubing and set using flow activated running tools.

Zonal Isolation

- UHX Packoff, Straddle Isolation Sleeves and Patches are suitable to isolate hydraulic fractured or perforated zones e.g. to prevent water cut.
- Can be used in high-pressure flowing wells.
- Isolated sections can vary to suit the application by stinging multiple sections of tubing into the packoff or by using sections of coiled tubing.
- DTI's UHX Packer can provide a means of installing isolation tubing or sand screens below the existing tail pipe.

Permanent Hanger

- The UHX Packoff allows you to create a permanent nipple profile or tag point below the upper completion for deployment of conventional plugs, injection valves or chokes.
- The UHX Packoff can be used as a hanger for the deployment of jointed tubing or coiled tubing inside and below the existing production string. This extends the life of the well by enabling the installation of velocity strings or injection strings.

Plug and Abandonment

- The UHX M-Bubble Plug provides a reliable pressure-tight barrier so that the zone below the plug can be isolated. This solution is ideal for applications where it is not possible to deposit cement, especially in cases due to the architecture of the well.
- The UHX M-Bubble Plug can be run in flowing wells and set as a platform for cement to be deposited once pressure and flow have abated. Traditional high expansion solutions do not always provide a suitable platform for cement.

Carbon Capture, Utilisation and Storage (CCUS)

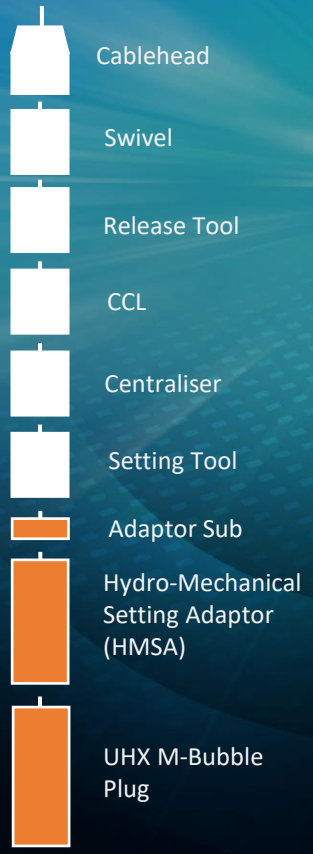
- UHX technology enables an existing oil and gas well to be recompleted for gas or CO2 storage. It provides a pressure tight platform in the liner below the upper completion and provides a profile for a temporary plug to be set prior to a well workover. Removing the plug enables access through the Packoff to the bore below.

Operation

The DTI UHX Plug, Packer and Packoff can be run on slickline, e-line or coiled tubing. To set the UHX tool a setting force of approximately 30,000 lbs is required.To run on e-line or slickline a powered setting tool with a stroke in excess of 5.5" is required, with around 10" preferred. The powered setting tool acts on the DTI hydro-mechanical setting adaptor to pump fluid into the M-Bubble element to a pressure of between 1650 psi and 1700 psi. An adaptor is required to connect the powered setting tool to the HMSA.

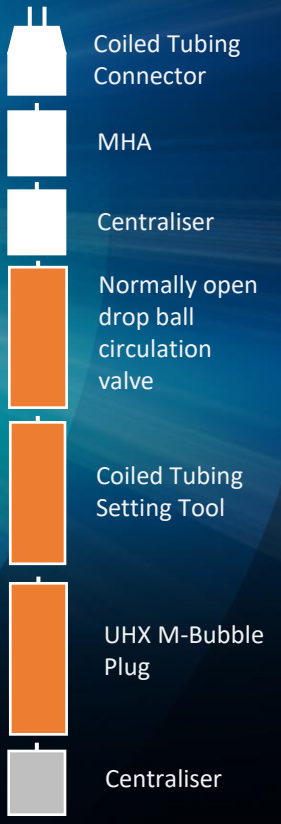
Typical E-Line Deployment

1. Rig up wireline string inside lubricator
2. Run assembly down to depth using CCL for depth correlation
3. Signal to setting tool to set plug
4. Slips engage and then element expands
5. Setting tool and HMSA disconnect from Plug
6. Pull up to confirm string is off of the Plug
7. Pressure test on top of plug to confirm seal integrity
8. Pull wireline string out of hole.



Typical Coiled Tubing Deployment

1. Rig up coiled tubing
2. Run assembly to depth and correlate
3. Drop ball to circulate through bore
4. Flow activate setting tool
5. Slips set mechanically in casing
6. Flow activated setting tools pushes fluid into expanding element which expands to set in casing
7. Fluid is sealed into expanding element
8. Flow activated setting tool disconnects from plug
9. Pull up to confirm string is off the plug
10. Pressure test plug to confirm seal integrity
11. Pull running string out of hole.



UHX M-Bubble Plug Assembly

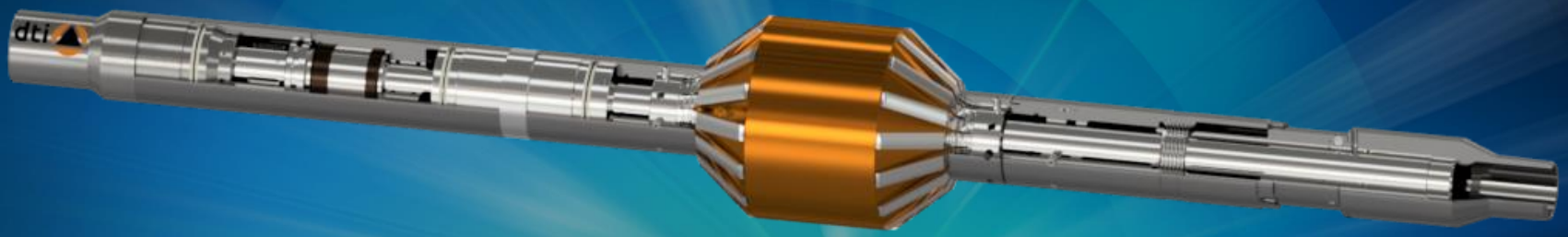
Part Number	Running OD	Setting ID	Pressure Rating	Temp. Rating
Slickline and E-Line Deployed				
MB-WL175AD4513V	1.750”	3.826” (4 ½” 13.5 lb/ft)	1,000 psi/ 2,600 psi	175°C
MB-WL213BB2592H	2.125”	2.992” (3 ½” 9.2 lb/ft)	5,000 psi	125°C
MB-WL213BB4011H	2.125”	3.476” (4” 11 lb/ft)	4,500 psi	125°C
MB-WL213BB4512H	2.125”	3.958” (4 ½” 12.6 lb/ft)	4,500 psi	125°C
MB-WL213BB5015H	2.125”	4.408” (5” 15 lb/ft)	3,500 psi	125°C
MB-WL213BB5517H	2.125”	4.892” (5 ½” 17 lb/ft)	3,500 psi	125°C
MB-WL213BB6624H	2.125”	5.920” (6 5/8” 24 lb/ft)	500 psi	125°C
MB-WL263BB7023H	2.625”	6.366” (7” 23 lb/ft)	2,000 psi	125°C
MB-WL263BB7026H	2.625”	6.276” (7” 26 lb/ft)	2,000 psi	125°C
MB-WL263BB7026V	2.625”	6.276” (7” 26 lb/ft)	2,000 psi	150°C
MB-WL263BB7029H	2.625”	6.184” (7” 29 lb/ft)	2,000 psi	125°C
Coiled Tubing Deployed				
MB-CT213BB5517H	2.125”	4.892” (5 ½” 17 lb/ft)	3,500 psi	125°C
MB-CT250BB6624H	2.500”	5.920” (6 5/8” 24 lb/ft)	2,000 psi	125°C
MB-CT250BB7029H	2.500”	6.276” (7” 26 lb/ft)	2,000 psi	150°C
MB-CT263BB7023H	2.625”	6.366” (7” 23 lb/ft)	2,000 psi	125°C

Features and Benefits

- Ultra high expansion ratios.
- Industry leading pressure rating + expansion ratio
- Expandable inconel metal mandrel/element with NBR/HNBR, Viton or FFKM packing element.
- Flexible deployment options with standard setting tools
- M-Bubble element is highly resilient to pressure cycling.

Product Customisation
DTI offer alternative sizes, materials and thread connections. Please contact us for more information.

UHX Packoff Assembly



Part Number	Running OD	ID	Setting ID	Pressure Rating	Temp. Rating
UHX-CT275AC7029H	2.75”	1.20”	6.184” (7” 29 lb/ft)	2,000 psi	125°C
UHX-CT300AA7032H	3.00”	1.50”	6.094” (7” 32 lb/ft)	2,000 psi	125°C
UHX-WL320BB5018H	3.20”	1.50”	(5” 18 lb/ft)	6,500 psi	125°C
UHX-CT350AC5517H	3.50”	2.00”	4.892” (5 ½” 17 lb/ft)	5,000 psi	125°C

Features and Benefits

- Ultra high Expansion Ratios.
- Industry leading pressure rating + expansion ratio + ID combinations
- Expandable metal mandrel/element with NBR/HNBR, Viton or FFKM packing element.
- Flexible deployment options with standard setting tools.
- M-Bubble element is highly resilient to pressure cycling.

Product Customisation
DTI offer alternative sizes, materials and thread connections. Please contact us for more information.

How are these solutions different?

DTI has pioneered the use of addititive manufacturing to develop our range of M-Bubble UHX products. Additive manufacturing can produce intricate designs with greater intrisic strength than traditional machining methods. This is the ideal choice for a novel design based on an expanding metal bubble. Using our advanced design and manufacturing processes, the technology is capable of delivering an industry leading combination of strength, durability, expansion ratio and pressure rating.

DTI is a specialist in innovative downhole technology for the global energy industry. We design and manufacture tools to solve current and emerging challenges for the oil and gas and energy transition sectors, including gas storage, CCUS, H2 storage and geothermal production.

For the oil and gas sector, DTI's technology solutions span the complete lifecycle of the well, from completion and intervention to production optimisation and P&A. With a field-proven track record, and expertise in the latest manufacturing materials and techniques, we are transferring our technology and knowledge to solve cross-sector challenges. These include extreme temperature or highly corrosive environments, high-expansion sealing, zonal isolation and flow control. We are committed to leveraging advantage for our customers through new technology solutions which are highly differentiated, low risk and significantly enhance the performance of wells.

With headquarters in the UK, and representation around the world, the company has a global operational footprint.

www.dti.uk.com
+44 1202 690001

UK- enquire@dti.uk.com **Europe** - eur@dti.uk.com **North America** – nam@dti.uk.com **Latin America** – lam@dti.uk.com
North Africa – afn@dti.uk.com **Sub-Sahara Africa** – ssa@dti.uk.com **Middle East** – me@dti.uk.com **Asia Pacific** – apac@dti.uk.com