

Drill Stem Testing



The accurate data we provide from every Drill Stem Test allows our customers to plan the optimal exploitation of their reservoirs.



Drill Stem Testing



Expro offers the complete well test package, utilising some of the industry's most reliable technologies. We have invested in our infrastructure and people to enhance our global capabilities in all the key Exploration and Appraisal markets where we operate.

A major part of this is our Drill Stem Testing (DST) offering, where we provide multi-function and single-cycle cased hole DST tools for exploration well testing.

DST offers the fastest and safest method of evaluating the potential of a newly-discovered hydrocarbon-bearing formation. After the well has been drilled and cased, the first stage of a well test is to run a DST string in conjunction with a downhole data system and tubing conveyed sampling.



Our DST offering



Downhole data system

Expro's CaTS™ uses advanced wireless telemetry technology to transmit high quality bottomhole pressure and temperature data to surface in real-time using electromagnetic (EM) through-tubing/casing communication. Having access to surface readout data provides early confirmation that the quality and quantity of data collected is adequate to characterise the reservoir, leading to optimised timing of the well test operations.

Tubing conveyed sampling

Collection of representative downhole fluid samples is a key objective in most DSTs activity. Expro's tubing conveyed sampling system provides a high-quality alternative to traditional DST type full-flow samplers.

The DST bottomhole assembly is designed around your test objectives and well parameters using tools with an established track record to deliver reliable performance.

We provide multi-function and single-cycle cased hole DST tools for exploration well testing.

Our standard DST string includes:

- **Slip joint** – allows the string to contract and expand with temperature without affecting the internal pressure or volume
- **Single shot circulating valve** – single shot tool used to circulate tubing contents after over pressure of the annulus
- **Multi-function circulating valve** – used to reverse out tubing contents to remove hydrocarbons and debris, change fluid weights including spotting nitrogen and efficiently spot viscous pills
- **Self fill tubing tester valve** – used to pressure test the tubing while running in the well
- **Safety valve** – single shot tool used to shut in the well down hole with over pressure of the annulus
- **Tester valve** – used to shut-in downhole to obtain formation pressure, as a fluid-loss control tool and a safety shut in-valve
- **Gauge carriers** – houses high accuracy pressure and temperature gauges
- **Tubing conveyed sampler carrier** - houses bottom hole samplers that can be selectively fired from surface
- **Hydraulic jars** – allows adjusting the tension in the workstring to deliver a jarring action of the required intensity
- **Retrievable packer and safety joints** – Expro provides a range of retrievable casing packers for sizes from 4 ½” to 13 ¾” casings
- **Tubing conveyed perforating systems** – Industry standard perforating services

The data that we deliver



Expro has continuously developed its capability to acquire accurate and reliable high quality data, allowing the customer to make informed decisions quickly, effectively and efficiently.

Expro's data acquisition services provide monitoring solutions that apply at all locations from sand face to burner tip, including the EDGE data acquisition system for surface process monitoring, precision quartz memory gauges for reservoir pressure and temperature data and the CaTS wireless surface readout (SRO) system, providing real time bottom hole data on demand.

The EDGE system captures both surface and downhole well data and then collates the information into a single report format for our customers to review at, or remote from, the well site. EDGE features a complete visual/audible alarm system, which can be configured, with upper and lower limits, to alert the operator or perform shut-down operations when any abnormal conditions occur. It can monitor virtually any number of sensors, while simultaneously performing multiple operations on the data, both real-time and historic.

The CaTS system transmits data to surface in real time using electromagnetic (EM) signals. Having access to SRO data provides confidence in the data quality and quantity, leading to early decision making and optimisation of the testing program duration.

System benefits include:

- Uses the well-proven CaTS wireless communications technology
- High specification quartz crystal sensors
- Features dual redundancy throughout the system for enhanced reliability
- Dual purpose gauge features both SRO and memory functionality
- No need for wireline intervention to receive data at surface, reducing intervention risk
- Suitable for use in high H₂S/CO₂ harsh condition environments
- Compatible with onshore, jack-up and semi-submersible operations



Our DST track record

Expro is one of the most experienced international well testing companies in the world and an established provider of Drill Stem Testing (DST) services to the oil and gas industry.

We have vast operational experience with more than 400 DST jobs successfully completed in more than ten international countries, including Brazil, Bolivia, Nigeria, Malaysia and India. We have also provided DST solutions for some of the world's major oil and gas producers including Shell, BP, Total, Petrobras, Mobil, Texaco.

The data that we provide throughout every well test allows our customers to plan the optimal exploitation of their reservoirs.

Our DST tools

Our core DST tools have a track record that has been proven over the past 20 years. The addition of our new DST tools means that we provide integrated solutions across the Exploration and Appraisal phase of any well.

Our tools have been manufactured with a high content of Monel and CuBr, giving them reliable performance in H₂S, CO₂ and acid environments with no chromed seal surfaces exposed to well bore fluids in any of the tools.

Our core tools are:



Slip joint

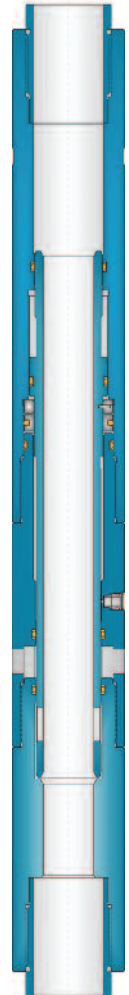
The Slip Joint is a telescopic joint run in the tool string, allowing five feet of free travel. It allows for tubing movement caused by temperature changes. The tool is internally pressure and volume balanced. It is also splined so that torque can be transferred below the tool.

Specifications:

Working Pressure	5,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	3.75" S.A. 6 TPI
Lower Thread Connection	3.75" S.A. 6 TPI
Tensile Strength	350,000 lbf / 155,600 daN
Tool Weight	1040 lbs / 472 kg
Service Condition	H ₂ S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)
Length Extended	330" / 8382 mm
Collapsed	270" / 6858 mm
Max Stroke	60" / 1524 mm

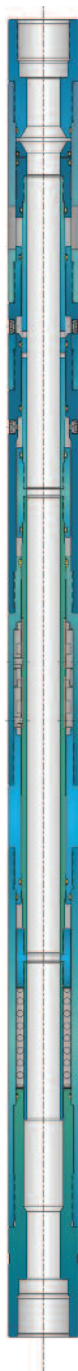
Annulus Operated Reversing Valve (AORV)

The AORV is a single shot circulating valve giving unrestricted flow between tubing and annulus. Once open, the tool is retained in this position by a lock ring and cannot be reclosed.



Specifications:

Working Pressure	15,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	3.75" S.A. 6 TPI
Lower Thread Connection	3.75" S.A. 6 TPI
Tensile Strength	350,000 lbf / 155,600 daN
Tool Length	41.4" / 1052 mm
Tool Weight	250 lbs / 133 kg
Service Condition	H ₂ S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)



Multi Reverse Spot Tool (MRST)

The MRST provides a means of establishing communication between the annulus and the drill string. It has three functional positions: closed, reverse, and circulate, and may be run in the well in either the closed or reverse positions.

Specifications:

Working Pressure	15,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	3.75" S.A. 6 TPI
Lower Thread Connection	3.75" S.A. 6 TPI
Tensile Strength	350,000 lbf / 155,600 daN
Tool Length	138.2" / 3510 mm
Tool Weight	575 lbs / 261 kg
Service Condition	H2S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)



Self Fill Tubing Tester Valve (SFTTV)

The SFTTV provides a means of pressure testing tubulars while running in the hole. The flapper valve in the tool will only support pressure from above thereby allowing completion fluid to enter the test string via the bypass.

Specifications:

Working Pressure	15,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	3.75" S.A. 6 TPI
Lower Thread Connection	3.75" S.A. 6 TPI
Tensile Strength	350,000 lbf / 155,600 daN
Tool Length	74" / 1879 mm
Tool Weight	572 lbs / 260 kg
Service Condition	H2S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)

Our DST tools



Pressure Operated Tester Valve (POTV)

The POTV is an annulus pressure-operated downhole ball valve. It is run with a nitrogen section which compensates for changes in annulus hydrostatic pressures. The POTV is designed to work in conjunction with either retrievable or permanent packers as no set-down weight is required when operating. An optional index lock-open system allows the ball to be retained open every second cycle. This lock open feature allows the POTV to act as a fluid by-pass when placing seals in a packer bore and aids in wireline and well kill procedures.

Specifications:

Working Pressure	15,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	3.75" S.A. 6 TPI
Lower Thread Connection	4" FH special
Tensile Strength	350,000 lbf / 155,600 daN
Tool Length	153" / 3886 mm
Tool Weight	640 lbs / 290 kg
Service Condition	H2S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)



Nitrogen Chamber

The Nitrogen Chamber is a nitrogen filled chamber which in conjunction with the Annulus Reference Trap System (ARTS), traps hydrostatic pressure at test depth which in turn is used as a reference for the POTV.

Specifications:

Working Pressure	15,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	4"FH special
Lower Thread Connection	4.375 " S.A. 6 TPI
Tensile Strength	350,000 lbf / 155,600 daN
Tool Length	189" / 4800 mm
Tool Weight	575 lbs / 261 kg
Service Condition	H2S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)

Annulus Reference Trap System (ARTS)

The ARTS is used to trap a pressure in the reference section of the Pressure Operated Tester Valve (POTV). Once this reference pressure has been trapped, the POTV can then be operated through the application and removal of applied annulus pressure

Specifications:

Working Pressure	15,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	4.375" S.A. 6 TPI
Lower Thread Connection	3.75" S.A. 6 TPI
Tensile Strength	350,000 lbf / 155,600 daN
Tool Length	55.4" / 1407 mm
Tool Weight	250 lbs / 133 kg
Service Condition	H2S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)

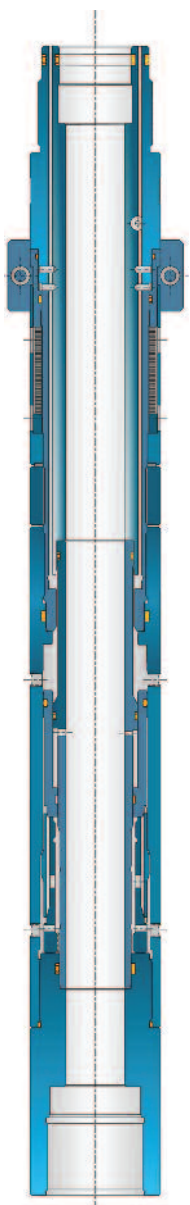
Hydraulic Jar

The Hydraulic Jar is used for the purpose of freeing stuck pipe and tools in the wellbore.

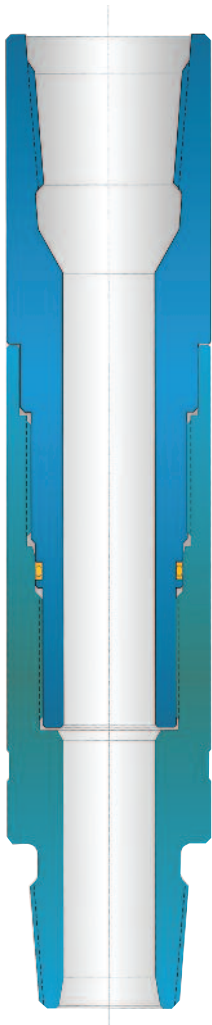
This device delivers heavy impact blows to the test string by storing energy within the tool. In well test applications the tool is run directly above the Safety Joint. The Hydraulic Jar is designed to transmit torque and withstand severe tensile and compressive loads.

Specifications:

Working Pressure	15,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	3.75" S.A. 6 TPI
Lower Thread Connection	3.75" S.A. 6 TPI
Tensile Strength	350,000 lbf / 155,600 daN
Tool Length	113.8" / 2890 mm
Tool Weight	525 lbs / 133 kg
Service Condition	H2S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)
Maximum overpull	80,000lbs / 36 tons



Our DST tools



Safety Joint and Overshot

The Safety Joint provides for an emergency release between the work string and the packer. In the event that the Safety Joint is released, the Overshot can be run to reconnect the work string with the packer assembly.

Specifications:

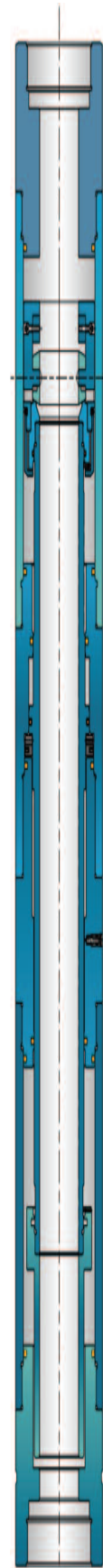
Working Pressure	15,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	3.75" S.A. 6 TPI
Lower Thread Connection	3.75" S.A. 6 TPI
Tensile Strength	350,000 lbf / 155,600 daN
Tool Length	27.2" / 690 mm
Tool Weight	140 lbs / 63 kg
Service Condition	H2S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)

Downhole Safety Valve (DHSV)

The DHSV is a single-shot ball valve run in the open position. If required the ball can be closed by applying annulus pressure to burst a high-accuracy rupture disc. Once closed the ball will isolate well pressure but will still allow fluid to be pumped through from above – pump through pressures depend on hydrostatic and differential pressure.

Specifications:

Working Pressure	15,000 psi / 103.42 Mpa
Working Temperature	350°F / 175°C
O.D.	5" / 127mm
I.D.	2.25" / 57.2mm
Upper Thread Connection	3.75" S.A. 6 TPI
Lower Thread Connection	3.75" S.A. 6 TPI
Tensile Strength	350,000 lbf / 155,600 daN
Tool Length	93.6" / 2377 mm
Tool Weight	300lbs / 136 kg
Service Condition	H2S per NACE MR-01-75
Torque Strength	10,000 ft-lb (13,558 Nm)
Make-up Torque	4,000 ft-lb (5,423 Nm)



Expro's business is well flow technologies and specialised services, and our mission is to:

- **measure**
- **improve**
- **control** and
- **process**

flow from high-value oil and gas wells.

From reservoir to disposal, Expro provides safe, efficient and accurate well testing services to meet the needs of our customers in any well, anywhere in the world.





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