Thru-Tubing Intervention
Thru-tubing fishing

Baker Hughes has consistently set the technological standard for thru-tubing fishing tool design and implementation. Our field-proven portfolio includes tools and systems for a multitude of fishing, cutting, milling and impact service requirements.

Fishing

Thru-tubing fishing systems, most commonly deployed on coiled tubing, are used to retrieve many different types of fish. Fish include, but are not limited to, bottomhole assemblies, stuck flow-control devices, bridge plugs and packers, wireline and coiled tubing.

Baker Hughes thru-tubing fishing tools include hydraulic releasing spears and overshots that are specifically engineered to withstand the high tensile and compressive stresses encountered during jarring operations.

Impact services

In most fishing operations, some type of impact device is required to free the stuck fish. Baker Hughes employs two distinct methodologies to achieve the required impact: (1) a hydraulic jar/accelerator combination; and (2) a high-frequency/vibratory impact system. Our qualified thru-tubing intervention professionals engineer the optimum impact tool solution based on the well’s downhole parameters.

Cutting and milling

Our proprietary METAL MUNCHER™ and Opti-Cut™ technologies are used in systems powered by VIP™ and X-treme™ series workover motors. These systems set the standard for reliability and performance in operations ranging from removing composites, scales, nipple profiles and cement, to cutting exotic metals such as nickel-based alloys and chrome. The resulting solutions reduce intervention cost and risk.

Rotational services

The Navi-Drill™ X-treme™ motor is the new-generation reduced-length workover motor that lowers customer well intervention costs by applying new “equidistant” power section technology, which provides unmatched performance at lower operating pressures than any other workover motor.

X-treme XS:
Reduced-length motor for short riser deployment.

X-treme X:
A standard-length motor with significantly increased operational torque output, ranging from 50% for the 2.88-in. version to 130% for the 1.69-in. version.

X-treme AD:
A high-torque/low-speed motor with ultra-high operational torque output. Powered by nitrogen or fluid.

Thru-tubing fishing applications

- Internal hydraulic release tools
- External hydraulic release tools
- Clean-outs
- Underreaming
- Scale removal
- Bridge plug removal
- Nipple removal
- Cutting tubulars
- Shifting sliding sleeves
- Gravel pack extraction
- Pulling flow-control devices

Navi-Drill X-treme “equidistant” power section technology provides the workover motor with greatly increased torque and optimum rpm at lower operating pressures, and allows the motor to be run in more hostile and higher-temperature environments.
Thru-tubing intervention. Right the first time. Every time.

Thru-tubing intervention in live wells offers time savings, economic benefits and risk-reduction advantages over intervention methods that require killing the well and removing the completion equipment. Baker Hughes provides a unique combination of performance, portfolio, people and heritage that assures flawless thru-tubing intervention operations—the first time, and every time.

Unsurpassed performance
Baker Hughes engineers and field technicians gather data crucial to implement viable, customer-focused, fit-for-purpose intervention solutions. Then we carry out those solutions with flawless execution at the website. A problem-solving matrix consolidates collective knowledge and best practices to augment our field engineers’ personal knowledge and experience with that of fellow engineers who have addressed similar challenges. Project planning and execution is supported by our vast Thru-Tubing Intervention database, which captures years of global experience and lessons learned for our personnel to query and share with clients during the engineering phase of well intervention.

- Baker Hughes thru-tubing intervention solutions continually lead the industry.
- We developed the first thru-tubing inflatable tools and breakthrough, high-expansion, metal-to-metal sealing technology.
- Our tools are subjected to stringent testing in our Houston-based test facilities to ensure that all of our thru-tubing Intervention solutions meet or exceed client expectations. Rooted in our extensive testing and built from years of success, our portfolio is both comprehensive and proven, resulting in the creation of consistently successful applications. We also continue to exceed industry standards with ISO 9001-certified facilities.

Why thru-tubing?
- Live well intervention
- Faster trip times
- No need for expensive, formation-damaging, kill-weight fluids
- No need to remove completion equipment
- No workover rig required
- No fluid disposal concerns
- Less pipe handling
- Improved HS&E compliance
- Greater return on investment

Baker Hughes has been a leader in oilfield technology innovation and application for more than a century. The company’s Center for Technology Innovation in Houston will ensure continued leadership in the thru-tubing intervention arena.
Thru-tubing casing exits
Baker Hughes mills cleaner casing exit windows in less time than other providers. The results are:
- Savings in valuable rig time; and
- Less potential for completion equipment damage during subsequent re-entry operations.

Additional features and advantages of thru-tubing casing exits include the following:
- Window can be cut without pulling existing completion or production tubing
- One-trip orientation and setting on electric line, coiled tubing or threaded pipe
- Ability to set on either “high” or “low” side of casing ensures optimal exit point
- Retrievable whipstock
- Large bypass flow area allows for continued production from the main bore below
- Single or dual exit possible
- Multiple exit sizes available
- Integral anchor system reduces trips and wellbore restrictions

Thru-tubing inflatables
Baker Hughes is the recognized industry leader in engineering and manufacturing inflatable products and systems. From pioneering research and development of the first thru-tubing inflatable tools to our current comprehensive array of thru-tubing inflatable bridge plugs and packers, we continue to lead the way in the inflatable arena with:
- a full suite of coiled tubing- and electric wireline-conveyed running and retrieving tools;
- software that draws from our extensive experience to build a successful solution for each unique application; and
- the expertise that comes from having the longest inflatable track record in the industry.

Our thru-tubing Inflatable tools offer the highest available expansion characteristics (up to 350% of original run-in OD) with the greatest available differential pressure ratings compared to traditional service tools.

Why use a thru-tubing casing exit?
- Recover bypassed reserves
- Extend well life
- Sidetrack to bypass collapsed or damaged casing
- Drill multilateral wells
- Conserve platform slots
- Mill windows underbalanced using two-phase flow

Advanced anchoring systems allow for anti-vibratory management and stability axis control, even during casing exits in exotic materials.
INFLATEDESIGN™ is Baker Hughes's proprietary software design program package developed to assist in the information gathering, engineering, execution, and post-job reporting phases of a wellbore isolation with thru-tubing inflatable technology.

The versatility offered by Baker Hughes thru-tubing inflatable packing element allows for tools to be set in the most diverse range of wellbore environments including cased hole, slotted pipe, perforations, screens and open hole.

Thru-tubing inflatable applications
- Barriers for primary and secondary well control
- Permanent well isolation and abandonment
- Temporary zonal isolation, frac barrier and gauge hanger
- Upper tubing change-out
- Chemical stimulation
- Water or gas shut-off
- Selective well testing and monitoring
- Pressure testing
- Production packer setting
- Remedial squeeze operations
- Injectivity testing
- Straddle systems

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The advantages of using INFLATEDESIGN are:
- Client planning guidelines
- Pre-job information data sheet
- Inflatable element performance envelope
- Hydraulics checking spreadsheet
- Electric wireline deployment plan calculations
- Supervisor worksheets
- Element pressure differential calculator
- Post-job reporting guide
- Capturing each application on InDEx™—Baker Hughes’ worldwide database

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Z-Seal™ metal-to-metal sealing technology
Z-Seal offers an alternative sealing methodology to the more traditional elastomeric approach and addresses the challenges of elastomer-based seals during well suspensions and intervention operations. Using the Z-Seal in place of a traditional elastomer provides a high-integrity pressure seal on the tubular wall with an improved operating envelope. Elimination of elastomers makes the Z-Seal highly insensitive to temperature and chemical attack and immune to explosive decompression. The advantages of a metal sealing alternative in the live well intervention arena make this revolutionary technology ideally suited to a wide range of isolation applications, including those found predominantly in hostile, high-pressure and/or high-temperature environments.

Why use metal-to-metal sealing technology over conventional elastomer sealing systems?
- Enhanced chemical resistance
- Increased expansion ratio for restricted bore access
- Does not rely on memory for retrieval
- No extrusion gap shearing
- Not susceptible to dynamic fatigue under pressure cycling
- Not susceptible to gasification that leads to explosive decompression
- Mitigates many common elastomer failure modes

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Z-Seal—award winning technology