TAM International, Inc., with corporate offices in Houston, Texas, has set standards in Inflatable and Swellable Packers for over 42 years, and offers efficient and economical options to conventional interventions.

In the Bakken Shale, over 500 wells have been completed with FREECAP® swellable packers for zonal isolation. FREECAP® has been used for over 5 million ft (1.5 million m) of multi-stage completions.

TAM maintains over fifty support locations worldwide, with their focus on defining and implementing SOLUTIONS for drilling & completions, well intervention, unconventional resources and reservoir optimization.

Inflatable and swellable packers offer highly flexible tool systems that are effective in a broad range of applications in a wide variety of well constructions, especially where conventional packers and operations are ineffective. These include:

- Cased Hole
- Open Hole
- Thru Tubing
- Vertical
- Horizontal
- Multi Lateral

Product flexibility also allows conveyance of tool strings into wells using a variety of methods – such as:

- Slickline
- Electric Line
- Coiled Tubing
- Drill Pipe
- Tubing
Well Integrity Testing and Repair

Whether integrity testing is standard operating procedure in the drilling program or required to satisfy a specific regulation, TAM provides the right equipment for the most flexibility and highest reliability in the industry. TAM can provide multiple set, inflatable packer systems for cased hole or open hole completions. Packers for operating inside diameters of 2 in. (50.8 mm) through 30 in. (762 mm) are capable of testing several locations (above and below the packer) in a single trip into the well.

TAM inflatable packers do not have stress inducing components, such as the anchoring “slips” on a conventional packer, and can be set inside unsupported pipe such as risers or surface casings without damaging the interior wall.

TAM provides high expansion ratio packers that lend flexibility and reliability to even the most difficult requirements. This enables operations to be conducted below restrictions or through smaller ID tubulars and into larger ID casing or open hole below.

Shoe integrity testing, especially in large diameter casings, can be achieved by using an inflatable packer set inside the casing. This reduces the potential shock load created from the large volume/stored energy associated with pressurizing the entire well in case of premature breakdown during tests.

Once testing has determined the exact location of any problem, the same packer can then be used for the required repair operations such as squeeze cementing, or sealant injection. The packer can be set as a bridge plug to allow an extra level of safety in the recovery and replacement process of tubulars and/or wellheads.

TAM’s proprietary TripSAVR® externally inflated tool is ideal for testing BOPs and flex joint connections prior to running the riser in deep water operations.

Temporary or Permanent Abandonment

Using an inflatable retrievable or permanent bridge plug versus a conventional, mechanical set plug offers greater flexibility and reduces costs associated with abandonment operations. As inflatable bridge plugs have much higher clearance between tool OD and casing ID combined with long seal lengths, a junk basket or gauge ring is not required. In addition, the bridge plug can be set in an unsupported section of the tubular without potential damage to the casing.

A North Sea operator analyzed the costs associated with running a TAM inflatable bridge plug versus conventional bridge plugs run on electric wireline and found cost savings in excess of $20,000 per plug. Excess costs are due to the incremental time required for three trips with the conventional plug – junk basket run, bridge plug run and a drill pipe run to place a cement plug. The inflatable bridge plug can be run in a single trip on drill pipe – inflated, released and cement plug placed.
Sidetracks

The inflatable bridge plug can be employed in open hole as a base for a cement plug or whipstock to allow sidetracking. By using an inflatable bridge plug in open hole, the quality of the cement plug is greatly enhanced as fluid migration is eliminated from below the bridge plug during the curing process. Potential fluid loss to lower pressure or high permeability reservoirs is also eliminated. Fluid migration is often considered the cause of poor quality and/or low strength of open hole cement plugs and can be controlled through the use of an inflatable bridge plug.

Open Hole Squeeze Cementing

Squeeze cementing can be achieved below the packer for improved long term isolation, especially in fractured and vugular carbonate reservoirs.

Lost circulation zones or potential water producing zones can be eliminated from future drilling or production operational problems by squeeze cementing the specific zones.

Stage Cementing

Running TAM’s Casing Annulus Packer (CAP) and Port Collar (PC) system provides a reliable means to achieve high-quality, second-stage cement operations. By inflating the CAP immediately after bumping the plug on the first stage, annular fluid migration is eliminated and a support for hydrostatic pressure is provided during the second cementing stage. This process reduces rig time as there is no need to wait for the first stage to cure.

TAM provides metal-to-metal seal Port Collars and a patented Hatch Packer combination (CAP and PC) which includes a unique metal-to-metal seal in the closing valve. The Hatch Packer is the only Casing Annulus Packer in the industry with metal-to-metal seal isolation of the valve mechanism.

Multiple Port Collars can be run in a single casing string for selective zonal isolation. The TAM Port Collar is operated with a simple up/down or rotational movement and can be selectively manipulated with the same (Combo) tool run on the work string.

Port Collars are available for casing sizes from 2-3/8 in. (60.45 mm) through 30 in. (762 mm). Casing Annulus Packers are available in sizes from 2-3/8 in. through 22 in. (558.8 mm).
Annular Gas Migration Control

TAM’s Casing Annulus Packer (CAP) provides the highest reliability compared to any chemical solution when used to eliminate sustained casing pressure (SCP). Without a secondary barrier, cement integrity and zonal isolation problems are common when fluids travel upwards through the prior cement stage. With over 99% success in elimination of gas migration worldwide, the CAP has established a reputation as a means to stop gas migration problems and eliminate sustained casing pressure.

Off Bottom Cementing

Increased production can be achieved through non-cemented, open-hole completions. Well integrity is maintained through cementing the liner above the pay zone. TAM provides port collars and casing annulus packers to achieve off bottom cementing without compromising rig time with multiple trips.

Liner Top Packer

TAM’s inflatable CAP and swellable FREECAP® packers are used at the top of a liner to assure a seal between the liner annulus and the production casing. Swellable packers can be constructed with less than ½ in. (19.05 mm) OD increase over liner diameters thus providing clearance for the cement flow around the liner.

Zonal Isolation

TAM packers can establish a simple, stand alone means of achieving zonal isolation in wells without the need to cement.

The swellable FREECAP® system can isolate segments of the well to allow multi-stage fracturing and production optimization. With over 14,000 swellable packers installed in extended reach wells, the reliability of controlling differential pressure is well proven.

Selective cementing of specific zones can be achieved through the use of the Casing Annulus Packers (CAP) and Port Collar (PC) system leaving select zones un-cemented. This method greatly decreases formation damage from cement and cement filtrate invasion, especially in low permeability and fractured carbonate reservoirs. Inflatable packers can be inflated with gas, water, mud or cement to provide reliable, long term zonal isolation.

With the addition of a Polished Bore for sealing the test string, the Port Collar in conjunction with standard DST tools can be manipulated for selective production testing while maintaining complete well integrity. This proven test procedure can eliminate perforating, bridge plugs, and often stimulation.
Multi-Lateral Selective Production

TAM’s inflatable and swellable packers can be used in the open hole or cased hole sections in multi-laterals. This flexibility enables many completion scenarios and provides unlimited selectivity to produce or shut-in zones. TAM can provide multiple options to optimize your completion in any complex well configuration.

Circulating Casing

TAM’s patented inflatable Casing Circulator is a proven method to reduce casing running problems even in the most difficult well conditions. The tool connects directly to the top drive and is inserted into each joint of casing as the casing is made up to the prior casing string.

The packer can be used as a simple “fill-up tool” saving rig time and assuring that each joint is filled as it is lowered into the well. If conditions indicate that casing is becoming stuck, the packer can be inflated and mud circulation initiated in less than a minute. The Casing Circulator has been used to run thousands of strings of casing.

It has also been proven effective in well designs where there is minimal annular clearance between the running casing string and existing casing. In these cases, fluid can flow up the casing string being run, diverting flow from passing through the annulus. This method improves the running speed and greatly reduces the “swab” effect and shock loads created when all mud displacement must flow through the annulus.

Other Applications

Inflatable and swellable packers and accessories offer great flexibility in a wide variety of other applications in drilling operations whether for standard requirements or special/emergency cases.

- Liner top seal using inflatable or swellable packers
- Enhanced annular isolation, especially in low clearance liner – open hole conditions
- Temporary abandonment in non-API casings using retrievable bridge plug(s)
- Straddle testing tools for LWD systems
- Selective treating and testing in open hole, including proppant fracturing
- Running thru tubing or restrictions to achieve conventional operations

For well intervention, reservoir optimization and unconventional resource completions, ask your TAM representative for additional information.