MINE, WATER, GEOTECH & CONSTRUCTION CATALOGUE

IPI Packers

Made differently
Perform better

MAY 2025

Introduction

From establishment in 1999, IPI Packers have been privileged to have supplied our equipment to some of the world's most prestigious resources projects and have continued our association with many of these to this day.

If we are not suppling the resource owner (eg a mine) we will be supplying their service company (eg a drilling company) or their engineering consultants (eg hydrogeologists or geologists). Often all three are involved. Some specialist service companies have made a business of using our tools.

El Teniente, Chile
World's largest underground copper mine.

The Andean hard rock mining industry are advanced users of inflatable packer technology for wireline permeability testing, hydraulic fracturing for rock burst mitigation and block caving pre-conditioning as well as for In Situ Recovery.

Major Tunnel and Dam Projects, worldwide

Clients use a range of IPI Packers products from OEM or standard inflatable packers for their own tools to IPI Packers' own wireline permeability testing tools, including versions with balanced piston setting tools and optional impression packers, for a wide range of geotechnical tests.

Nuclear waste disposal sites, worldwide

Work is either undertaken by specialist consultancies or government sector agencies. For the sensitivity of data required, IPI Packers has provided specialist tools with advanced Data Acquisition Systems and high pressure specialist testing rods.

Oyo Tolgoi Copper Mine
Gobi Desert, Mongolia

One of the early users of SWiPS®, IPI Packers has gone on to develop market leading permeability testing tools that now dominate the hard rock mining and coal bed methane industries, as well as used for such as CO_2 sequestration and salt dome testing. All the world's major mining companies use IPI Packers equipment.

IPI Packers – our mission is to be the world's first choice inflatable packer company.

Our mission is to become the world's first-choice inflatable packer company. Everyone has a passion, ours is making the best inflatable packer elements in the world. We started in 1999 in Perth, Western Australia, with the objective of introducing our innovative packer element design to the international market. We are proud to have celebrated our 25th anniversary in 2024, grown from a company of one to one hundred plus with eight locations around the world serving multiple industries.

We are first and foremost a designer and manufacturer of inflatable packer elements and associated equipment. Our goal is to provide quality products with timely delivery at competitive prices. We offer a proven line of standard tools for the Oil & Gas, Mining, Ground Water, Geotechnical, Geothermal, and Construction industries. In addition, we excel at OEM, replacement, and custom-made products to suit our customer's precise needs.

MANAGEMENT SYSTEM CERTIFICATION
DNV
ISO 9001 · ISO 14001
ISO 45001

www.ipipackers.com

IPI Packers Around The World


Peruvian Andes
(Aqua Lithos LLC)

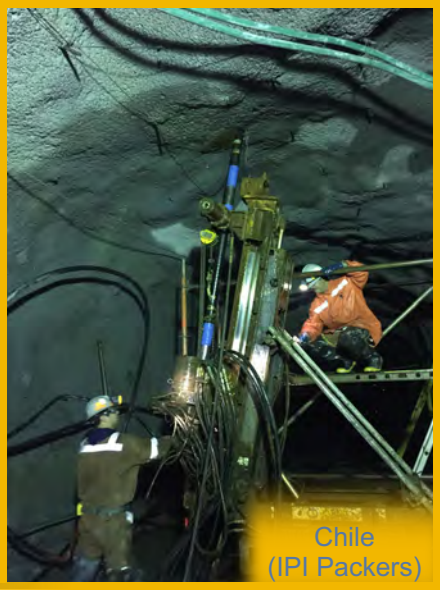

India
(IPI Packers)


Montana, USA
(IPI Packers)


Antarctica

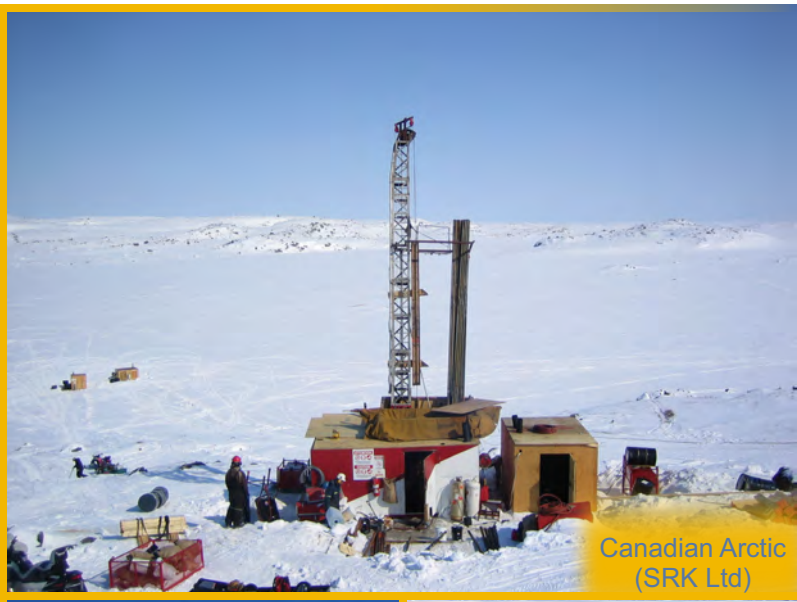

Mongolia
(IPI Packers)


Illinois, USA
(IPI Packers)


Chile
(IPI Packers)


Sahara Desert, Mauritania
(Aqua Lithos LLC)

Atacama Desert, Chile
(Geotech Drilling Services)



Canadian Arctic
(SRK Ltd)

Ghana
(IPI Packers)

New Zealand
(Blick)

Bowen Basin, Australia
(SRK Ltd)

British Columbia, Canada
(IPI Packers)

Yukon, Canada
(Eric Swanson)

IPI Packers are a world leader in inflatable packer technology. Outside of the oil and gas industry we are leaders in the supply of equipment in many other industry sectors, such as the in-situ characterization of permeability and rock stress (hydraulic fracturing and jacking), water well construction and service, pressure grouting for major construction projects and many other applications. A wide range of custom and standard packer-based products are available for sale or rent. Technical support and training is available from our qualified staff of engineers and technicians to assist our customers. IPI equipment has been used on all continents including Antarctica for both commercial and government backed projects and institutions.

Standard Wireline Packer System (SWiPS®)

SWiPS®:

The IPI SWiPS® is designed for permeabilitiy testing in NQ, HQ and PQ wireline core holes. The packers are hydraulically inflated through the drill string, eliminating the need for high-pressure gas bottles and inflation lines.

Applications:

- Permeability (lugeon) testing for major construction projects e.g. dams, tunnels:
  - Hydrogeologic characterization
  - In situ mining
  - Water sampling (e.g. lithium exploration)

Benefits:

- Completely hydraulic - needs no nitrogen gas or inflation lines
- Effective to depths over 1,000m in angle and vertical holes
- Pump-down versions for shallow angle, horizontal, and up-hole use
- Works with standard Boart Longyear™ or equivalent coring systems
- Compatible with industry standard orientation devices
- Configurable as single or straddle packer system
- Portability for heli-based operations and express shipment options
- Stainless steel option for brine and other aggressive borehole conditions
- No Inflation line or suspension wire in the rods allows running a small-diameter pump for aquifer testing and sampling
- Sizes to suit NQ, HQ and PQ coring programs, including Thin Kerf versions

Accessories:

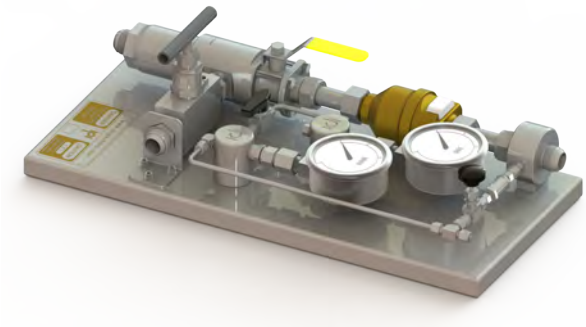
- Non-rotating C-Plate and hauling sub for tool assembly over rods
- Flow meter assembly with pressure gauge and optional data logger
- PQ 70 adaptation kit to enable HQ SWiPS® to be run in PQ size core barrel using 70mm packer elements
- Annular, interval, and bottom hle memory gauge housings available
- A suitable line on freight box options

Standard Wireline Packer System (SWiPS®)

Freight Box Options:

Flow Meter Skid:

- 800psi Flow Meter Skid (manual version) for controlling packer inflation and monitoring downhole volume and pressure

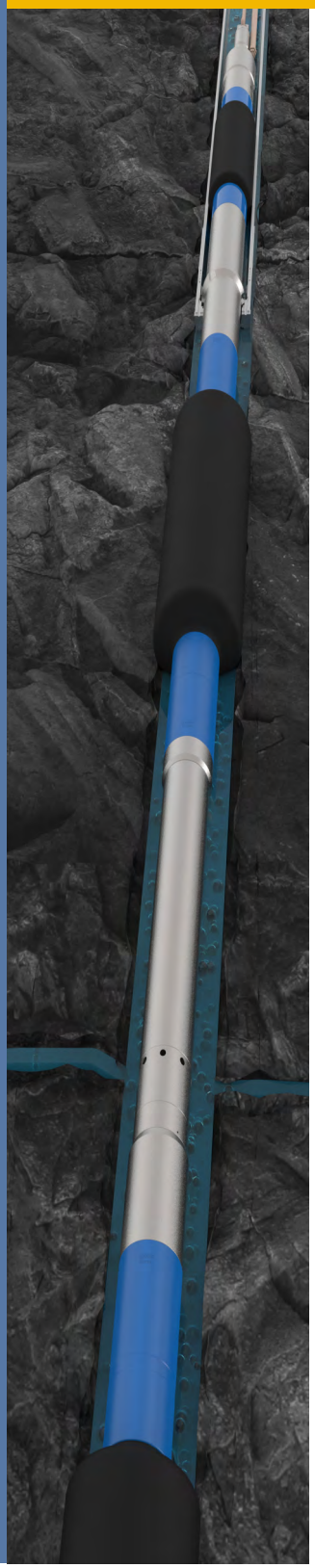


Technical Specifications:

Nominal Size*	NQ [75.7mm]	HQ [96.0mm]	PQ70 [122.6mm]
Center Tube ID	13.9 mm [0.55"]	18.9 mm [0.74"]	18.9 mm [0.74"]
Maximum Working Pressure	100 bar [1450 psi]	100 bar [1450 psi]	100 bar [1450 psi]
Packer Element Length	1000 mm [39.4"]	1000 mm [39.4"]	1000 mm [39.4"]
OD - deflated	42mm [1.65"]	60mm [2.36"]	70mm [2.76"]

* PQ specific sizing available upon request.
** Packaging for illustration purposes only. May differ based on the sending location. Lightweight transport box options available for express shipments and heliportable operations.

SWiPS® Surface Control



SWiPS® SC:

The IPI SWiPS® SC is designed for permeability testing in shallow HQ and PQ wireline core holes. The packers are either pneumatically or hydraulically inflated using inflation lines with both single and straddle options available.

Applications:

- Hydrogeological characterization and testing for major construction projects e.g., dams, tunnels, water well & mineral exploration:
  - Lugeon test
  - Falling Head test
  - Step rate test
  - Constant rate test
- In Situ mining:
  - Water sampling (e.g., lithium exploration)

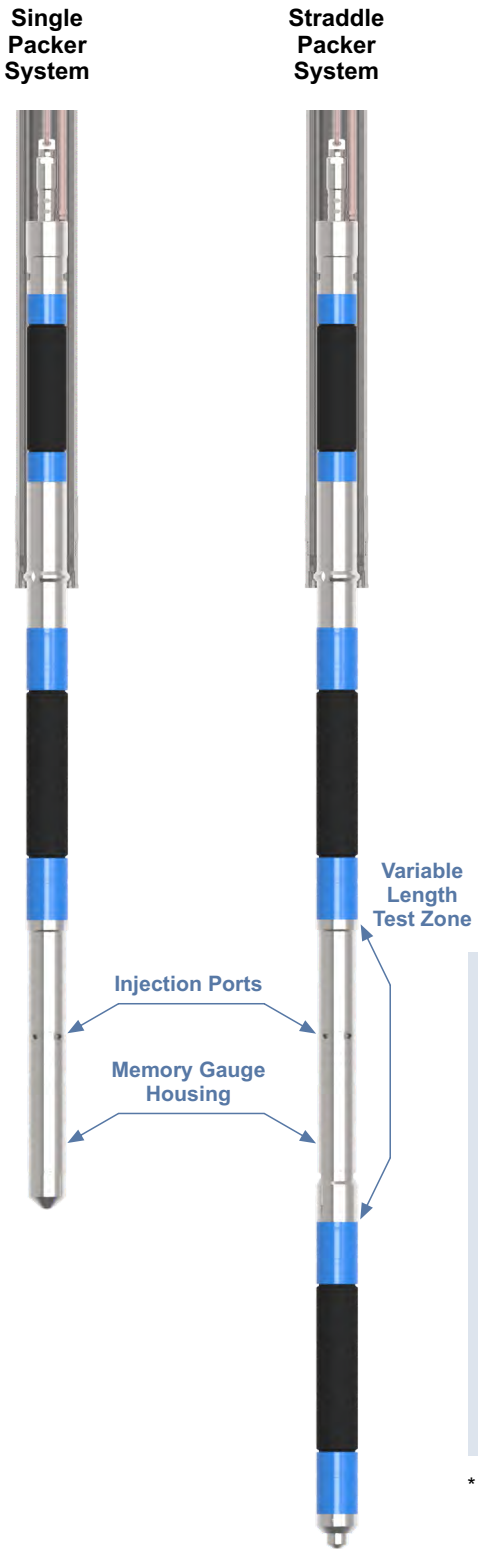
Benefits:

- Compatible with either Pneumatic & Hydraulic inflation
- Effective to depths over 350m in angle and vertical holes
- Works with all industry standard coring systems
- Compatible with industry standard orientation devices
- Configurable as single or straddle packer system
- Portability for heli-based operations and express shipment options
- Multiple material options available for brine and other aggressive borehole conditions
- Sizes to suit HQ and PQ coring programs, including Thin Kerf versions.
- Independent monitoring of inflation pressure + injection pressure

Accessories:

- Non-rotating C-Plate for tool assembly over rods.
- Flow meter assembly with pressure gauge and optional data logger
- PQ 70 adaptation kit to enable HQ SWiPS® SC to be run in PQ size core barrel using 70mm packer elements and bit sub
- Annular, interval, and bottom hole memory gauge housings available
- Base ancillaries: flowmeter, 1” injection hose, hose reel, ?” inflation tube, tight-head, sheave block, inflation set (gauge board), H/P whip hose, surge dampener and tool spares
- Ancillaries for Pneumatic option: nitrogen regulator
- Ancillaries for Pneumatic option: Auto dump valve (ADV) and emergency deflate
- Various methods of transportation boxes: galvanized steel boxes, aluminum and pelican cases

SWiPS® Surface Control

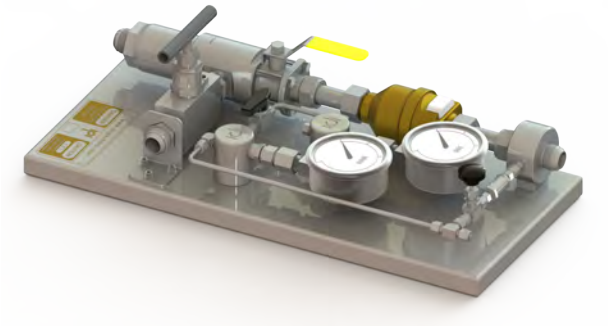


Technical Specifications:

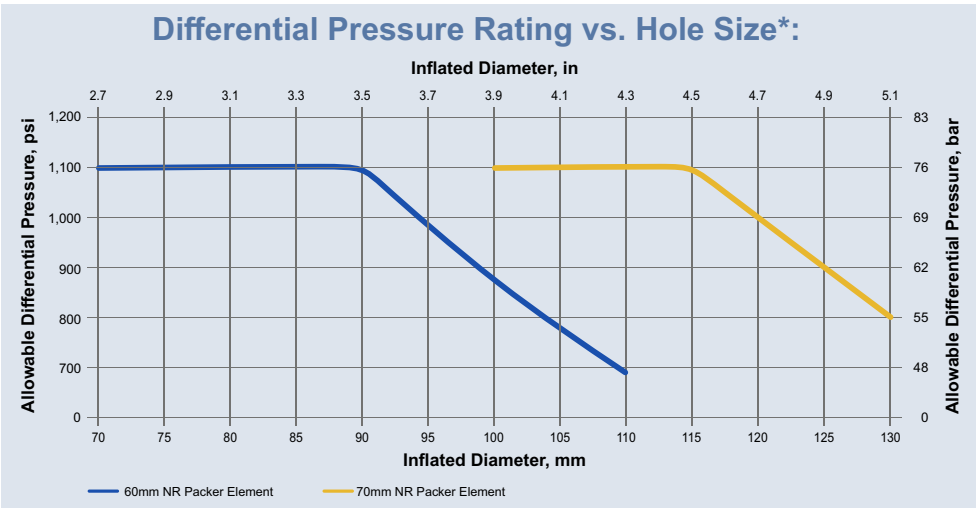
	Hole Size	Packer Diameter		Packer Effective		Max Working Pressure	
		in	mm	in	mm	PSI	bar
Core Barrel Packer Element	HQ/PQ	2.36	60	11.8	300	1100	76
Packer Element (open hole)	HQ	2.36	60	43.3	1100	1100	76
Packer Element (open hole)	PQ	2.75	70	43.3	1100	1100	76

Flow Meter Skid:

- 800psi Flow Meter Skid (manual version) for controlling packer inflation and monitoring downhole volume and pressure



Differential Pressure Rating vs. Hole Size*:



* please contact IPI Packers for the latest pressure chart and custom sizes

STX-60

STX-60:

The STX-60 is the smallest diameter version of IPI's ST range. It employs a multi-cycle, four stage valving mechanism that allows fluid communication to either the packers, annulus, test interval or provides complete shut in. What makes the STX unique is that it can be run:

- As a wireline tool in conjunction with a 3m or longer mineral wireline coring system;
- Or, on rods/tubing – including coiled tubing.

As with all other setting tools in IPI's range, shifting between different stages is accomplished by axial movement only – no rotation is required. The multi-stage functionality enables multiple tests in a single run without pulling out of hole.

Applications:

- Permeability testing
- Hydrojacking
- Hydraulic fracturing
- Rock stress testing
- Selective stimulation
- Casing integrity testing
- Caprock integrity testing

Benefits:

- Run in on either wireline or on rods/tubing
- Ease of use - no control lines, no rod rotation, no down hole pumps required
- Inflation bypass design -no 'squeeze' pressure while inflating the straddle packers
- Zero displacement valve design - maintains accurate shut-in pressures after the tool is shifted from injection/inflow to shut-in. Prevents spiking the formation when shifting from shut-in to test zone, which can cause jacking/hydraulic fracturing.
- Balanced valve piston - the tool is in equilibrium
- Ability to circulate while shut-in
- Ability to blow down the fluid in the drill pipe/tubing whilst in circulating stage by using compressed air/nitrogen, to facilitate DST or slug withdrawal testing
- All inlet/outlet ports are protected by filter screens to prevent ingress of solids
- Emergency deflation - can be activated by over-pull in the event that the packers will not deflate by normal means
- Cased and open hole application
- Suitable for H and P size core barrels
- Direct connect to rods, for N sized boreholes
- Can run impression packers

STX-60

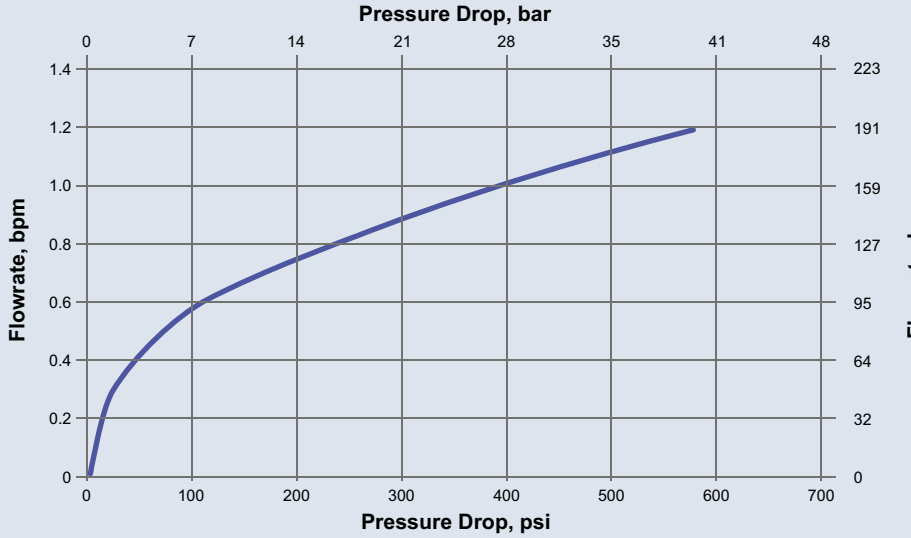
Compatible Packer Systems:

Packer Size		Wireline		Run on Pipe	
mm	in	Hole Size	Max. Pressure	Hole Size	Max. Pressure
57	2 ¼	HQ (Ø96 mm)	2500 psi	Ø76 mm	5000 psi
				Ø96 mm	2500 psi
60	2 ⅜	HQ (Ø96 mm)	1500 psi	Ø76 mm	2500 psi
				Ø96 mm	2000 psi
67	2 ⅝	PQ (Ø122 mm)	2500 psi	Ø96 mm	5000 psi
				Ø140 mm	1700 psi
70	2 ¾	PQ (Ø122 mm)	1500 psi	Ø96 mm	2000 psi
				Ø122 mm	1500 psi
86	3 ⅜	N/A	N/A	Ø96 mm	5000 psi
				Ø152 mm	2000 psi

Specifications:

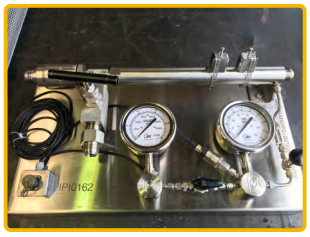
	STX-60
Minimum Tool Diameter	60 mm
Run in Mineral Wireline Coring System	HQ or PQ size
Run in on Tubing/Pipe	NQ, HQ & PQ
Max. Pressure Rating	5000 psi (34.5 Mpa)
Max. Temperature Rating*	70°C (158°F)
Max. Pull (Emergency deflate)	4.4 T (9,700 lbs)
Max. Axial Load (1.6 safety factor)	13.5 T (29,762 lbs)

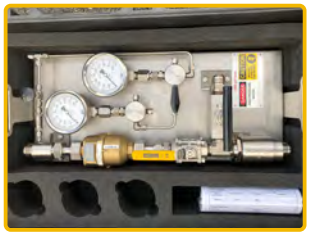
Pressure vs. Flow:



* Maximum temperature rating on a standard tool. Tools requiring higher temperatures can be supplied, as well as change over kits to existing tools to a maximum temperature of 130°C / 266°F.

Portable Flow Meter Skids





Portable Flow Meter Skids:

IPI manufactures a range of portable flow meter skids for use with high-pressure IPI downhole tools, eg. SWiPS®, SWiPS® Surface Control, STX 60, ST Range, etc.

Applications:

- Permeability tests
- Injection tests
- Withdrawal tests
- Hydrojacking
- Minifrac to 5000 psi*

Benefits:

- Built-in strainer to protect flowmeter
- 1" JIC male connections
- Easy-to-use stainless steel flow control needle valve
- All stainless steel construction
- Waterproof “Pelican“ storage & shipping case
- Robust high & low pressure analog gauges with optional electronic transducer on data logging models
- User friendly logging software (data logging models only)
- Twin meter boards and other customized skids available

Specifications:

Model	Max. Pressure Rating		Flow Meter Type	Pressure Measurement	Flow Rate Measurement Range		Data Logging Capability
	psi	bar			l/min	US GPM	
FM-800 Manual	800	55	Volumetric rotary piston	Dual direct drive gauges	0.5 - 83	No	No
FM-5000 Electronic	5000	345	Ultrasonic	Dual direct drive gauges + Strain bridge transducer	0.26 - 661.7	Yes	Yes

* Electronic version only

Mineral Drilling Annular Diverter

Threaded Version

Mineral Drilling Annular Diverter:

The IPI Packers Mineral Drilling Diverter system, is a compact inward inflating annular diverter specifically designed for mineral coring to suit N, H, P sizes. Different sizes are available on request for other applications. The compact and lightweight design enables use in surface operations as well as in underground situations, where space is a limiting factor. They can be mounted in any position to suit drill hole orientation. The design features quick change split wear guides that can be replaced with drill pipe in place. This system can also be used together with additional valving where borehole flow diversion while drilling is required.

Applications:

- Surface and underground exploration drilling
- Geothermal drilling
- Water well drilling

Benefits:

- Compact and lightweight size – suits manual handling in confined spaces
- Ability to change split guides with drill string in place
- May thread directly in N, H, P casing
- Low volume required to activate – suitable for hand pump or low volume accumulator
- Optional bushings for P size available to suit N & H sizes

Flanged Version

Sizes*:

	N	H	P
Connection Bottom	NWT or Flanged	HWT or Flanged	PWT or Flanged
Minimum ID (packer deflated)	79 mm	100 mm	125 mm
Split Guide ID (wear guide ID)	75 mm	95 mm	120 mm
Pressure Rating (inflated against drill string)	900 psi (N), 500 psi (B)	900 psi (H), 500 psi (N)	900 psi (P), 500 psi (H)
Weight	20 kg (NWT) 55 kg (Flanged)	29 kg (NWT) 63 kg (Flanged)	43 kg (NWT) 80 kg (Flanged)
Max. Temperature	150 °C	150 °C	150 °C

* For parameters outside of the specified above please contact your nearest IPI Packers representative

DuraFRAC® HP Straddle

DuraFRAC® HP Straddle:

Designed specifically to suit pre-conditioning for rock burst mitigation and for block caving via very high pressure hydraulic fracturing. IPI packers deflate faster and recover to their original diameter better than any packers on the market, enabling them to be run with lower annular clearances.

Applications:

- Hydraulic pre-conditioning for block caving
- Rock burst mitigation
- Other Hydraulic fracturing

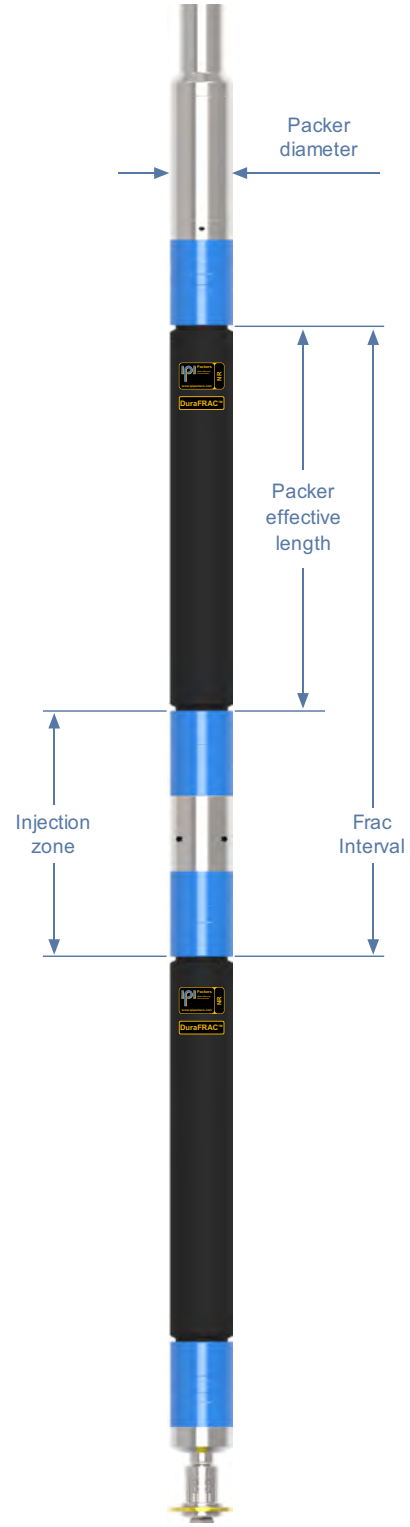
Benefits:

- Exceptional packer durability
- Use in any hole orientation (i.e up-hole or horizontally)
- Injection zones as short as 350mm
- Standard diameters for NQ (76mm) and HQ (96mm) size holes
- Pressure rating up to 12,000 psi (850 bar)
- Option of “XHP” packer elements with pressures >13,000psi
- Available in both carbon steel and stainless steel
- Lead-in wiper to minimize rock particle puncture when used up-hole
- Bypass feature to equalise pressure below and above the injection zone
- BQ rod connection and 1/4” tube inflation connection as standard

Auxiliary Equipment:

- Setting tools available to avoid use of external inflation lines
- Deflation dump valve
- Use in conjunction with impression packers to analyze formation fractures
- Downhole pressure sensors and housings
- Single or dual wall push rods

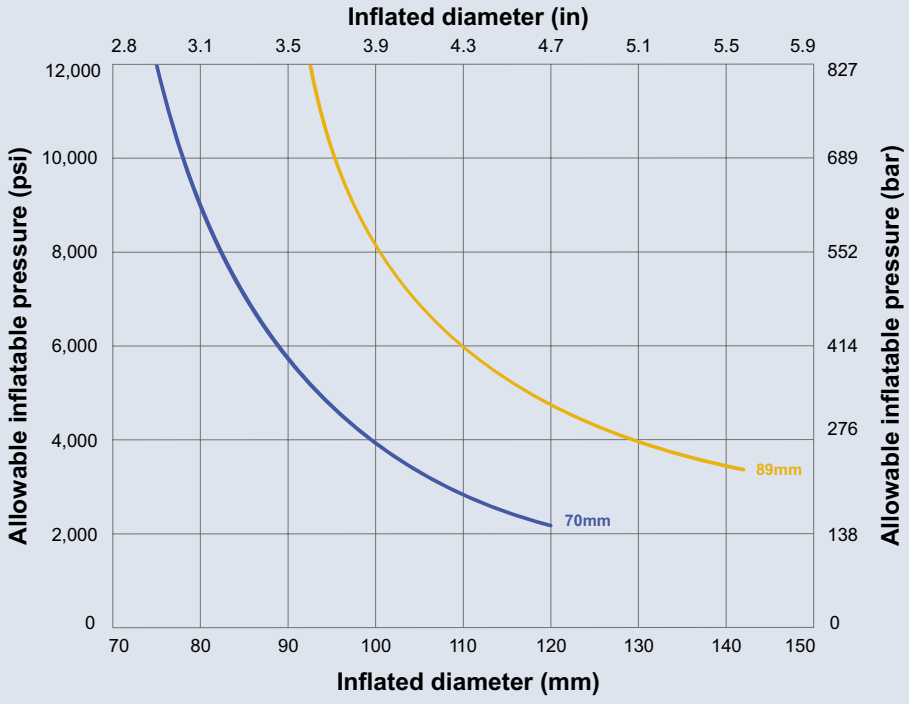
DuraFRAC® HP Straddle



Standard System Configurations:

Hole Size	Packer Diameter		Packer Effective Length		Frac Interval	
	in	mm	in	mm	in	mm
NQ	2.75	70	15.75	400	29.5	750
			15.75	400	39.4	1000
			35.43	900	59.0	1500
HQ	3.5	89	35.43	900	58.0	1475
			15.75	400	38.4	975

Packer Pressure vs. Inflated Diameter:



Grout-Free Expandable Standpipe*

Grout-Free Expandable Standpipe:

IPI Expandable Standpipes eliminate non-productive cure time associated with conventional grout and theexpense and inconvenience of resin grout. Installation is achieved by in-situ expansion of a rubber-coated steel standpipe using IPI's high-pressure setting tool. Once expanded and firmly anchored in rock, the standpipe can be pressure tested immediately and drilling can commence. Installation and testing take less than 30 minutes per standpipe. The setting tool utilizes IPI's high-pressure inflatable packer technology to provide a portable, robust and durable installation tool. The assembly includes an IPI re-usable inflatable packer assembly, variable length expandable standpipe, and cordless high-pressure pump.

Applications:

- Groundwater control in tunneling and mining
- Pre-excavation grouting
- High pressure curtain grouting
- Underground exploration drilling
- TBM tunnel construction

Benefits:

- No grout required to install standpipes
- Portable for underground tunnel height restrictions
- Pressure-test ready in less than 10 minutes
- Threaded connection for BOP installation
- Compatible with Jumbo and TBM drills
- Re-useable inflatable packer setting tool
- Cordless high-pressure hydraulic pump
- After grouting, standpipe extension can be removed to eliminate pipe stick-out into excavation

* Patent Pending

Grout-Free Expandable Standpipe

Technical Specifications:

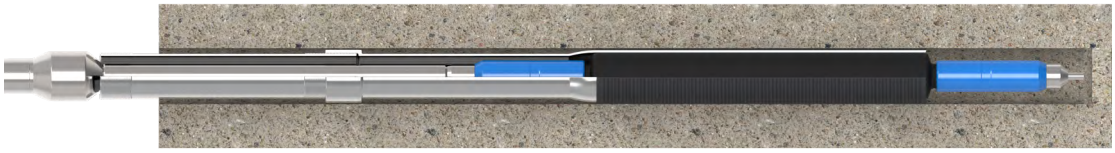
Standard Dimensions*:		
Expandable Anchor Length	4ft or 8ft	1220mm or 2440mm
Overall Standpipe Length	12ft	3650mm
Expandable Anchor ID (pre-expansion)	2.64in	67mm
Pilot Borehole Size	3.5in	89mm
Maximum Drill-through Size	2.5in	63.5mm

Steps for Installation:

Insert standpipe

Insert Inflatable packer setting tool

Expand standpipe anchor section



Retrieve setting tool and conduct standpipe pressure test

Drill through standpipe to target depth

Pump grout

OPTIONAL: Remove standpipe extension after grouting

* Custom sizes available upon request

Impression Packers

Impression Packers:

The IPI impression packer is an inflatable packer element that can be run in on tubing or drill pipe, that after being inflated into open hole or casing imprints the details of the sidewall with its unique memory retention rubber. Fine details of the sidewall are permanently imprinted on the packer element for examination at surface. Directional tools can be run in conjunction with the impression packer to determine the orientation of the imprint.

Applications:

- Formation fractures
- Rock characterization
- Casing damage or splits in casing
- Corrosion or erosion pitting

Benefits:

- Customizable packer diameter and impression lengths
- Redressable packer element
- Directional tools for impression orientation
- Impression rubber is reformable to remove previously imprinted impressions

Geopro Grout Packers

Single Packer System

Straddle Packer System

Standard Packers for Grouting and Monitoring:

IPI offers a wide range of Geopro packers for grouting and hydrogeological investigations. These packers have long been the standard in the foundations and construction industries for reliable use in lower pressure grouting and similar applications.

Benefits:

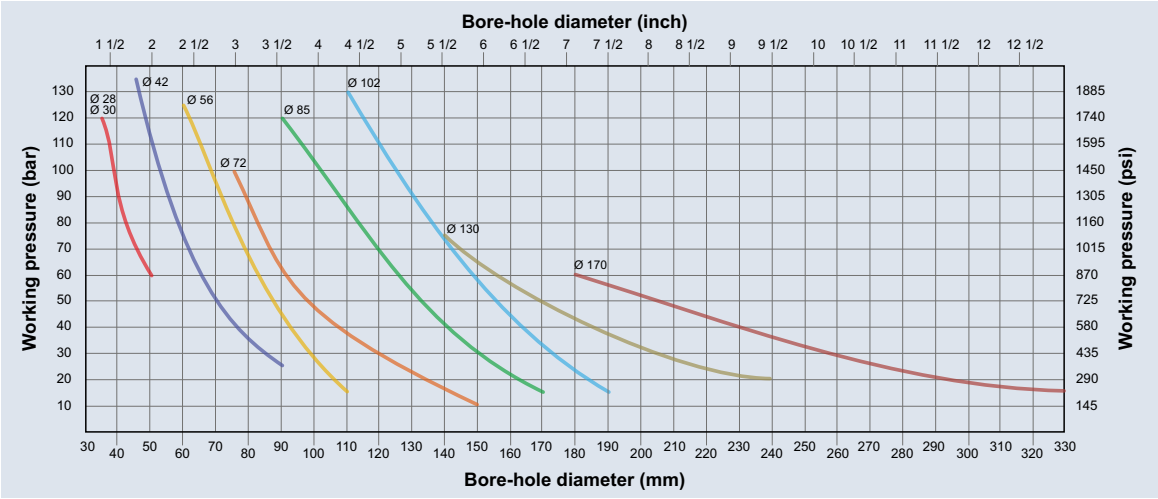
- Available as either single or straddle (double) packer assemblies
- Single packers are easily converted to double packers
- Suitable for Tube à Manchette grouting
- Double packer test zone lengths easily adjusted
- Field replaceable packer elements
- Inflated by small diameter control tube run to surface

Standard Sizes and Working Pressures*:

The length of the rubber sealing element depends on the application requirements with the standard lengths being:

- 300mm for Ø28, 30 and 42mm packers
- 500mm and 1000mm for Ø28, 30, 42, 56, 72, 85, 102, 130 & 170mm packers

Nominal diameter, mm	Connection Upper	Central tube ID, mm	Max. Expansion diameter, mm	Inflation Inlet(s)
28	⅜" BSP	8	55	1 x ⅛" BSP
30	⅜" BSP	8	55	1 x ⅛" BSP
42	½" BSP	17	98	2 x ⅛" BSP
56	¾" BSP	20	125	2 x ⅛" BSP
72	1 ¼" BSP	35	160	2 x ⅛" BSP
85	1 ¼" BSP	35	185	2 x ⅛" BSP
102	2" BSP	53	200	2 x ⅛" BSP
130	3" BSP	83	270	2 x ¼" BSP
170	3" BSP	83	350	2 x ¼" BSP



* Natural rubber as standard (max. temp 60°C). Other elastomers available on request

HydroFORM Liner

HydroFORM Liner:

The HydroFORM Liner offers an innovative solution for extending the service life of wells, improving water quality, and reducing maintenance costs and downtime. This method involves pressing or hydroforming a stainless-steel liner with a vulcanized seal against existing well casings, providing a robust and cost-effective repair option.

Unlike traditional relining methods, the HydroFORM Liner repairs and relines wells with minimal loss of internal diameter and without the need for grouting. This allows for the continued use of existing pumping equipment with little to no loss in capacity. Customisable for each application, this technique effectively seals breaches and holes, prevents contamination, and restores the integrity of the well.

The HydroFORM Liner system utilizes expandable steel tubing with a thin elastomer coating. This elastomer coating is vulcanized onto the liner or patch, creating a positive seal along the patch and casing interface, as well as forming a compressed anchor surface to securely hold the patch in place.

Applications:

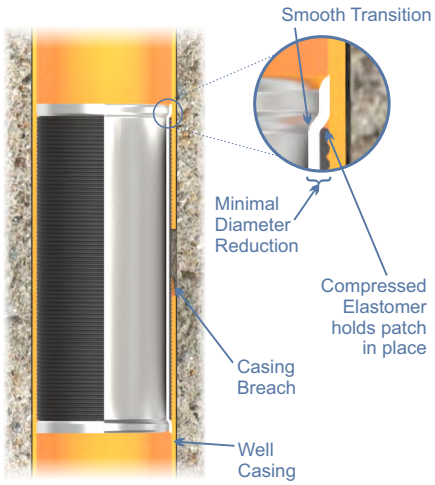
- **Well Casing Repairs:** Seals breaches and restores integrity in corroded, twisted, or damaged well casings.
- **Extend the service life of wells:** Installing a HydroFROM Liner where there are severe casing metal losses will increase the well's overall service life.
- **Contamination Prevention:** Seals holes and leaks that allow undesirable water intrusion or well contamination.
- **Partial Liners:** Ability to install targeted patches to cover specific sections, such as transitions between casing and screen.

Benefits:

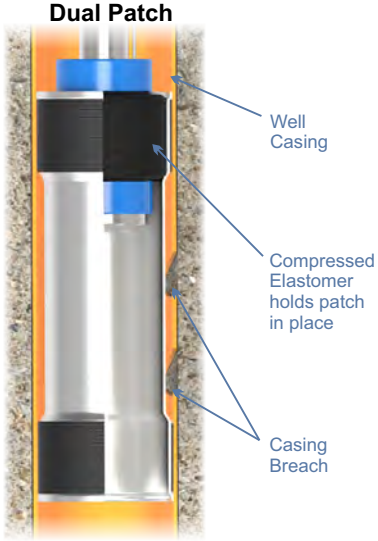
- **Versatile Depths and Diameters:** Applicable across various well sizes and damage depths, ensuring broad usability.
- **Minimal Downtime:** Quick installation process, often completed within a day, reduces service interruptions.
- **Cost-Effective:** Avoids the high costs of drilling new wells or relining with smaller casings.
- **Maintains the Production Capacity:** Unlike the traditional methods of the well rehabiliations HydroFORM Liners have minimal ID reduction.

HydroFORM Liner

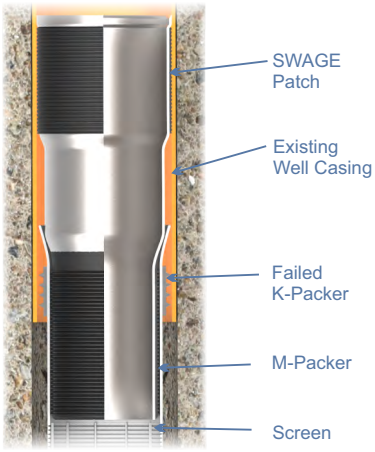
Single Patch



Dual Patch



Screen Seal



Patch Setting Procedure:

The installation tool for the HydroFORM Liner is a high-pressure inflatable packer that can deploy and expand the liner using either an external control line or the drill pipe. A typical installation process involves:

1. Mount the liner or patch onto the inflatable packer of the installation tool
2. Inflate the packer in the patch to securely hold the patch for deploying in the well
3. Run the assembly to the desired depth
4. Set the patch by increasing packer pressure until the liner material expands and anchors in place
5. Deflate packer and remove
6. For longer patches, the packer is progressively deflated, moved to the un-expanded portion of the liner, and re-inflated to continue expansion until the full length is expanded

Run-in

Swage Casing Patch in Three Stages

Complete, Ready for Production

One Shot Cementing System

One Shot Cementing System:

This system offers a one shot screen & casing running and cementing operation. Typically, the well is drilled to TD and casing is run with an inflatable casing packer and cementing valve and either with or without inline screen. A mechanical setting tool is run inside the casing on a cementing string to seat inside the packer. Initially pressuring up this tool inflates the packer to a pre-set shear pin pressure. After shear, the tool shifts to access the annulus above the inflated packer via the cementing valve and cement is pumped as required. Packer inflation pressure is maintained by check valves.

Applications:

- Off bottom cementing – casing installation, casing/screen installation, cemented liner application
- Casing re-lining operations
- Cementing casing in boreholes drilled into underground workings (breakthrough well bore)

Benefits:

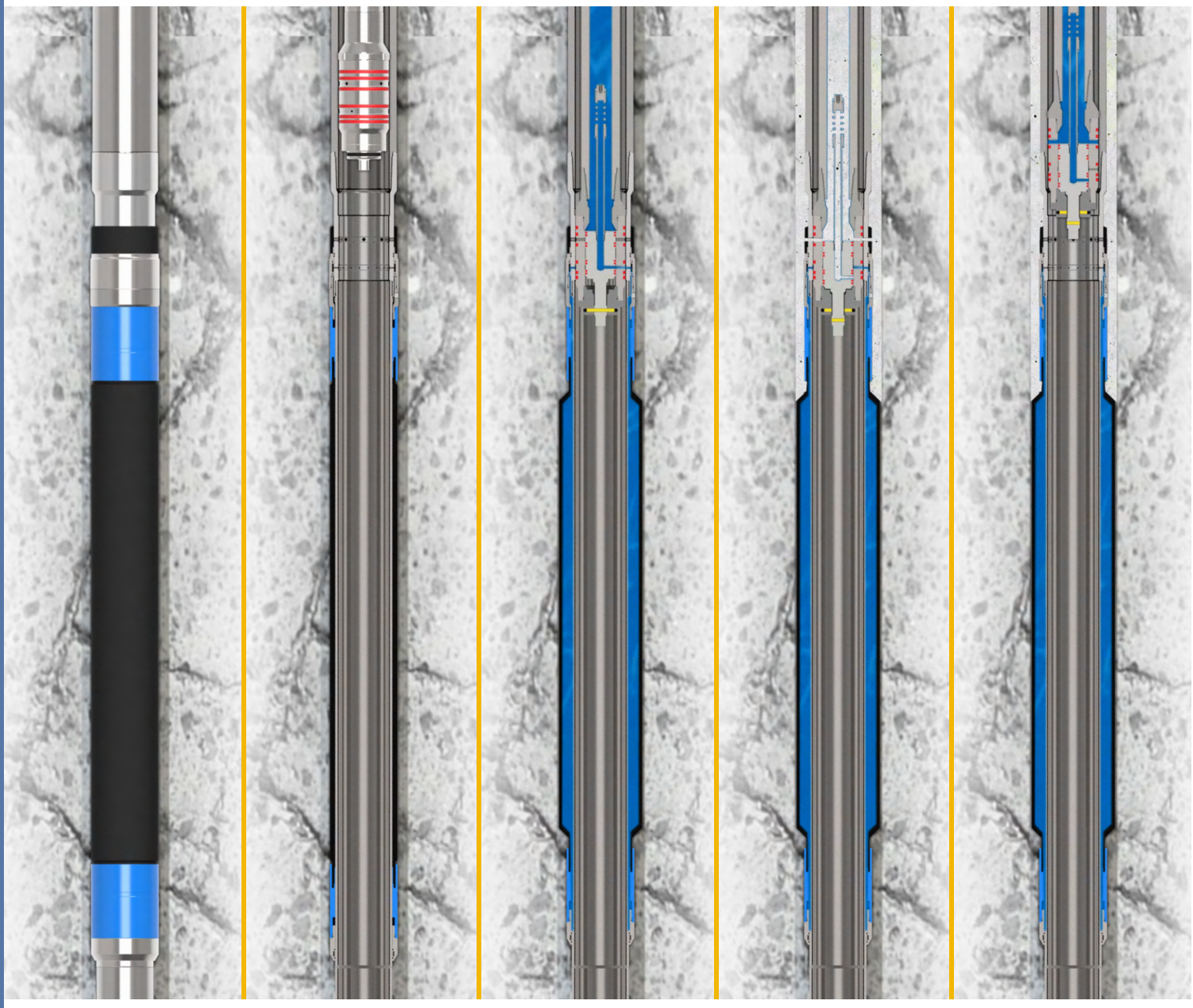
- The bore may be drilled to TD in a single run at a single size
- Casing toe location can be decided based on actual aquifer depth
- Casing and screen are run in-line in a single operation
- The casing is cemented in one operation
- Fewer pipe trips into and out of the well compared to standard float shoe cementing operations
- Can easily be adapted to casing re-lining operations
- The aquifer is fully sealed against cement contamination by an inflatable packer
- No drill out required

Options:

- To clear cement from the string the options of over-displacing or pumping a wiper can be employed
- Alternatively a wiper style extension on the stab-in tool can be used. This allows the tool to be raised clear of the grout valve for flushing of the string and casing while the wiper section continues to seal the lower portion of the casing against contamination
- Setting tool can incorporate a drag spring actuated latch to match a profile in the casing packer for accurate landing of the tool when slight casing ID reduction is impermissible (typically 1/8" to 1/4")

One Shot Cementing System

Installation: Open Hole Completion:



Run In Casing with BHA

Run In Setting Tool on pipe to seat in packer

Pump water to inflate Packer and shear Setting Tool to cementing position

Perform cement job

Pull back Setting tool, circulate excess cement and pull out

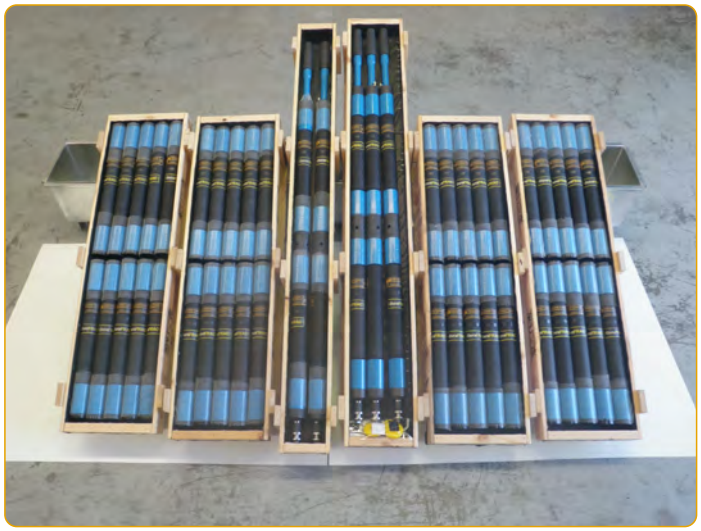
Custom Made Packers

IPI Packers' technology is probably the most versatile of inflatable packer technologies and has many potential non-standard formats and applications. IPI Packers' business started from custom design and manufacture to order and IPI Packers still develops specific products for clients, completely customized or a customization of the growing list of our standard inflatable packer products. This may be as simple as stainless steel versions, higher temp versions (requiring different seals and elastomers) and chemically resistant versions, to IPI Packers rising to the challenge of something totally new. This covers the application of our core packer technology as well as the developing tools the elements are run on. If needed to put together a complete system, IPI Packers will also buy in equipment from third parties – delivery of which often defines the critical path on the delivery schedule. A high level of inventory, SolidWorks CAD software, years of experience and a strong client service ethic result in a high level of client service and satisfaction. We cannot always reveal details of our custom designs, or certain details, owing to confidentiality restraints, but the following are some examples of customized and custom designed products and detail that we can feature.

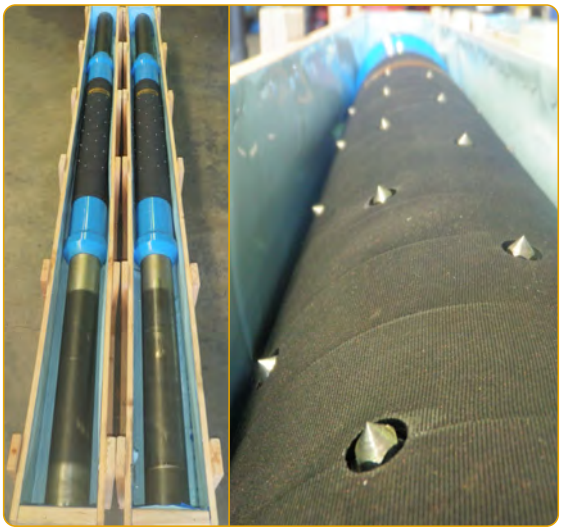
For an underground mining project in an Andean mountain location in 2015, comprising of both standard products and custom made equipment, including customized water flow diverter systems, plug and abandonment packers and monitoring packers, together with stainless steel versions of SWiPS®.

130mm stainless steel packers for solution mining (In Situ Leaching/ In Situ Recovery) in South Western USA. ISR is expected to be a significant mining technique in the future.

Custom Made Packers



A shipment of customised 70mm Hydraulic Fracture Straddles with special 400mm long elements for a major South American mine in 2013. Now a standard product.

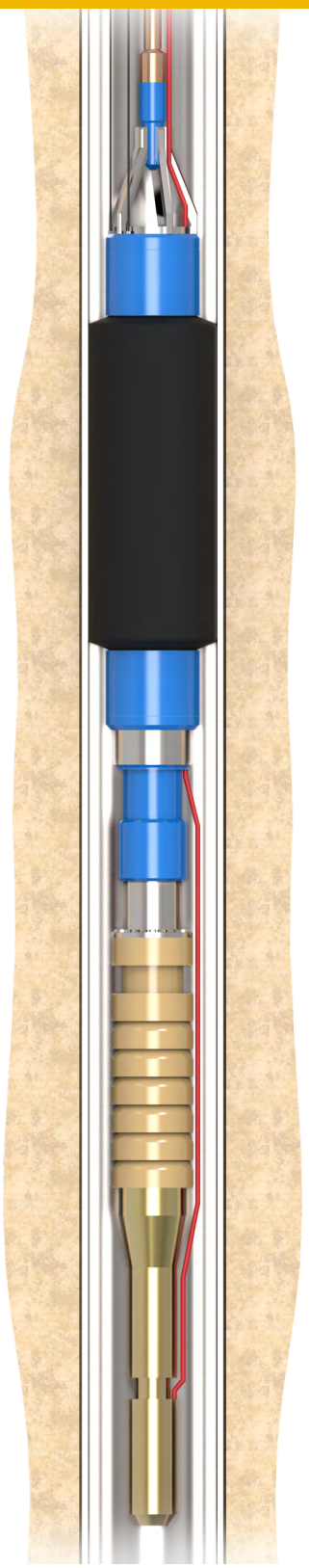


Special purpose inflatable packers deployed as part of a subglacial geological drilling operation performed for an Antarctic research project. This is another IPI Packers supplied project funded by the United States Government. IPI Packers has clients on every continent, including those operating in Antarctica's extreme conditions.

A series of PVC tube mounted pipe packers for a copper mine's tailing dam.

A 355mm dilatometer sleeve – an example of IPI Packers providing an OEM component solution for a European client who has made the rest of this advanced tool for rock elasticity measurement. Now a regular order from this client, covering various sizes.

Submersible Pump Packer



Submersible Pump Packer:

The Submersible Pump Packer is developed to allow the casing to be used as the pump column or riser for the electric submersible pump. Inflatable Packer provides a hydraulic seal and a means of suspending the pump in the casing. The Submersible Pump Packer has multiple feed-throughs to accommodate pump control and vent lines. Inflation and deflation are achieved through separate control lines from the surface.

Applications:

- Producing from the Casing instead of the pump column or riser
- Offers retrofitting solutions for cost and operational savings
- Isolating a deeper production zone from the rest of the borehole

Benefits:

- **Lower well completion cost** – The Submersible Pump Packer eliminates the need for a pump column or riser, eliminating the need for a larger casing to accommodate the pump column. The smaller casing size and the lack of a production column or riser reduce the overall cost.
- **Low frictional head loss** – Pumping through the casing instead of a smaller ID column will reduce the frictional head loss, reducing the pump power consumption.
- **Protects pump assembly** - The inflatable packer rigidly couples and centralizes the pump/motor assembly, preventing movement that could damage the equipment or casing, especially in delicate fibreglass or plastic casing.
- **Less corrosion** – The Submersible Pump Packer keeps the casing water-filled, eliminating the corrosive "splash zone" caused by fluctuating water levels due to drawdown and seasonal variations.
- **Excludes polluted water** – The casing leaks above the pump may cause water loss but maintain clean water production (pressurised casing), unlike pump and column or riser systems, where leaks can introduce contamination into the produced water.
- **Reduced biofouling** – The Submersible Pump Packer keeps the casing water-filled, preventing oxygen entrainment that can promote biological growth and mineral deposition, which reduce well production and require intervention.
- **Suitable for wells with severe dog legs** - The Submersible Pump Packer with its lightweight and flexible hanger pipe, is ideal for wells with severe dog legs where rigid riser pipes cannot be used.

CASE STUDY

Custom 5.75” Packer System Enables CBM Operator to Clean Out the well Sump prior to running PCP completion.

The Problem:

The main challenge with these specific CBM wells is the ability to flush out the residual coal fines from the sump bottom up to surface post Drilling operation, and prior to running PCP Production Equipment into the well. Attempting with the conventional methods by high flow rate circulation at the bottom of the well wasn’t successful, as the drop in up-hole circulation velocity when the flushing fluid passes the 16” underreamed section, causing the heavier fines/cuttings to divert and gravitate downwards, eventually accumulated back at the sump bottom due this large 16” cavity on the way upward.

The use of air to flush the sump to overcome the velocity issue has resulted in a sudden unloading of the well which has caused an inrush of fines and damage to the formation in the lateral section, increasing the fines fragments, rather than evacuating to surface, In addition, the customer has tried sand pumps and bails in the past with no significant outcome.

Region: Africa
Customer: CBM Operator
Well Type: Development

Our Solution:

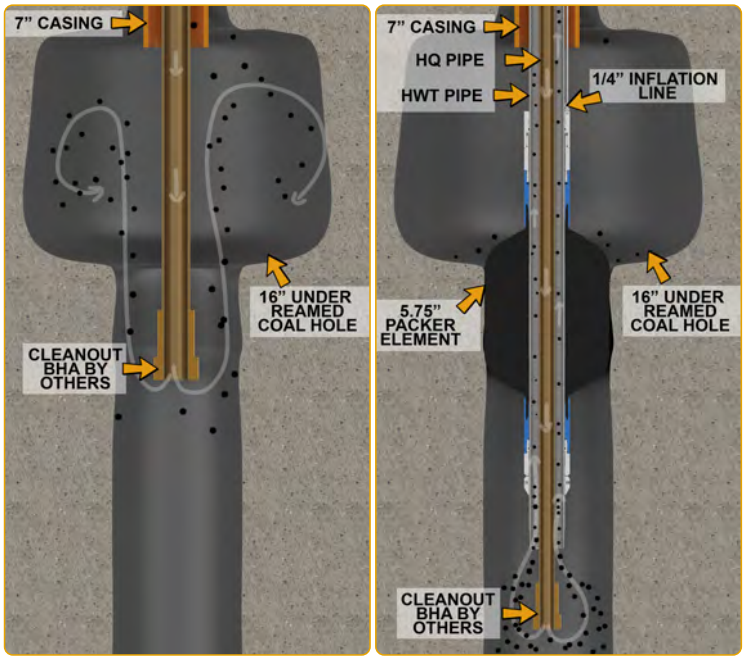
To overcome the associated issues during the flushing process, the Idea of using two annular conduits where the packer is installed on a string of HWT casing, inflate below the 16” under reamed section to effectively isolated the under-reamed section, then deployed a Clean Out BHA on HQ Drill Pipe into the HWT casing and the packer ID, then reamed from below the packer to the bottom of the well while evacuating all cuttings and fines back to surface via the reduced annular section between the HWT casing and HQ Drill pipe, this confined annular volume has enabled for enough circulation velocity for the fines to circulate up to surface.

A Slim and Slick 5.75” Packer System with an external inflation system has been designed to operate within such a tight well clearances and limitation (running the packer system through 7” 23ppf casing, whilst having a bore ID wide enough to enable Clean Out BHA on HQ pipes to be run into HWT and the packer bore ID).

The Result:

IPI’s solution generated the operator substantial savings by allowing the customer to effectively clean out the well bottom sump from the accumulated coal fragments, its now the operator tool solution of choice for coal clean out. The Progressive Cavity Pump installed successfully at the target depth after well clean out run.

“This method has been used twice now with 100% success to clean all the cuttings/fines from the sump, the Packer came out of the well without any damage and will be redressed and run on our next CBM well” The Project Manager has quoted.



Before After

Using HydroFORM Liner to repair a damaged screen

CASE STUDY

The Problem:

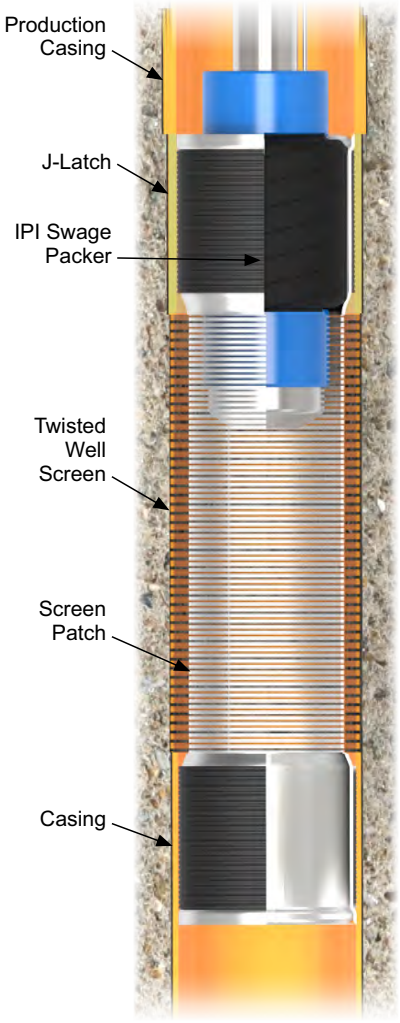
A high-capacity well's pressure-relief screen was damaged during initial installation when a drilling contractor used the rig's Kelly drive to install a cone reducer. This caused the J-Latch to disengage, resulting in over-torquing of the riser and twisting of the pressure-relief screen. Though still operational, the screen's structural integrity was compromised, making it unsuitable for long-term use. The damage occurred at a depth of 620 feet, with a static water level approximately 240 feet below ground.

Region: North America
Customer: Schnieder Well Services
Well Type: Development

Our Solutions:

To resolve the issue, a 20-foot custom bridge liner was installed to replace the damaged section. Key aspects of the solution included:

- **HydroFORM Liner Design:** Constructed using food-grade neoprene vulcanized to Sch10 12" stainless steel pipe and welded to the relief screen. The patch was positioned just below the compromised J-Latch to ensure proper coverage of the twisted screen.
- **Packer Implementation:** An IPI 9.75-inch Swage Packer, equipped with a 30mm Auto Dump Valve (ADV), was used to accommodate the well's static water level.
- **In-House Preparation:**
  - A 12.75-inch calibration blank was prepared to obtain expected values for installation, requiring ~30 liters per inflation at a setting pressure of 2,300 psi for a full expansion diameter of 15.25 inches.
  - The HydroFORM Liner was shortened from 72 inches to 70.5 inches after swaging.



The Results:

The job was completed successfully, with the packer in near-perfect condition after seven total inflations. Key outcomes included:

- **Efficiency:** Inflation times ranged from 30-40 minutes, with deflation times efficiently reduced to 7-10 minutes with the help of the ADV.
- **Precision:** The Televiewer log indicated the patch's setting depth was within ½ inch of the target, ensuring accurate placement.
- **Avoiding Risks:** The packer was never set in the compromised J-Latch, preventing additional complications.

The repair restored the well's structural integrity and functionality, providing a reliable, long-term solution with minimal downtime.

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Packers

Made differently
Perform better

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