TECHWEST LINERS

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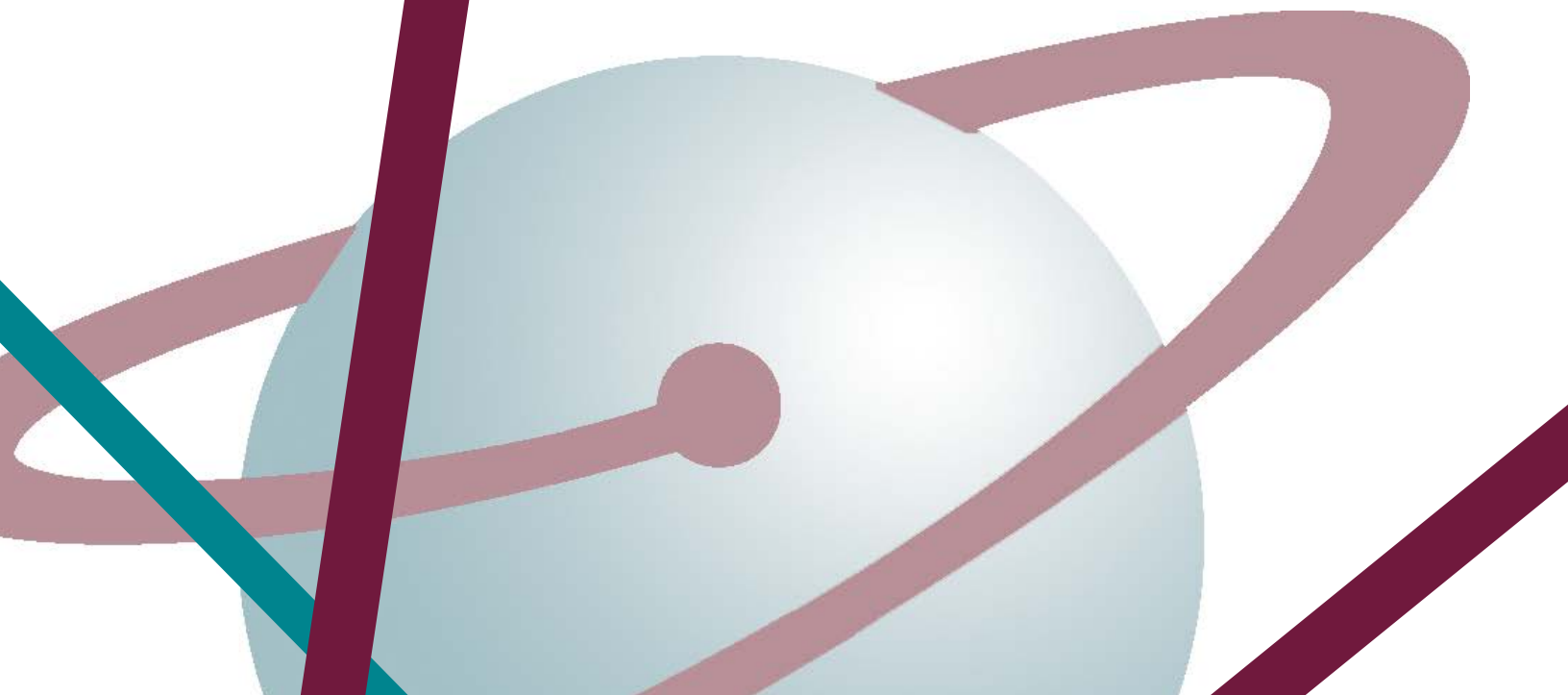
CEMENTED LINER HANGER SYSTEMS



Many of TechWest's new tool innovations come from customer requests. As a design and manufacturing company we are constantly in pursuit of new tools and innovations and we encourage anyone to contact us with such enquiries and requests.

Reg. No. 11D1-0124

Reg. No. 2995
ISO 9001:2015

Reg. No. Q1-2959

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The illustrations used in this catalogue are schematics only, so the actual product may not be exactly as illustrated.

The product information contained in this catalogue is of a general nature only and is subject to change without notice. For the most specific and detailed technical information please contact TechWest directly.

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LINER LAP PACKER, ROTATIONAL LLPR

UNIT 100

The ***TechWest Liner Lap Packer, Rotational (LLPR***) is a versatile 10K liner packer used in numerous applications. It is most often placed at the top of a liner which is to be cemented. Setting the LLPR after cementing allows the operator to reverse excess cement out of the hole without exerting pressure on formations below the top of the liner and prevents gas migration through the cement as it is setting up.

The LLPR employs castellation's on the top of the tool allowing the liner system to be rotated (to the right). This feature provides additional means of working the pipe to depth and allows for rotation during cementing to flow condition the cement during the cement job.

The LLPR is available with or without hold-down slips and comes with standard reinforced HNBR rubber pack-offs, TWL Premium Seal Pack-Off or other special high-temperature pack-offs upon request.

The LLPR is available with either internal Retrievable Pack-Off Bushing (RPOB) profile or Drillable Pack-Off-Bushing (DPOB) threading.

The Liner Packer provides the threaded connection for any standard length 122-Tieback Receptacle

Customizable for licensed premium threading or materials.

OPERATION

The LLPR is run with a type MR (Rotational) Setting Tool screwed into its barrel using a left-hand thread and floating nut. When setting the packer, the setting tool is released by right-hand rotation and picked up allowing the setting dogs to expand and catch the top sleeve of the LLPR packer. The setting tool is then lowered, forcing the sleeve down-ward and expanding the packoff to set the packer. A ratchet ring in the LLPR holds the packoff in the expanded position.

When used to set a screen, the type LLPR (without hold-down slips) may be retrieved by running a spear to catch the inner barrel.

A wide variety of optional configurations are available upon request.

LINER LAP PACKER, NON-ROTATIONAL (LLP)

UNIT 101

The ***TechWest LLP Liner Lap Packer, Non-Rotational (LLP)*** is a versatile 10K liner packer used in numerous applications. It is most often placed at the top of a liner which is to be cemented. Setting the type LLP after cementing allows the operator to reverse excess cement out of the hole without exerting pressure on formations below the top of the liner and prevents gas migration through the cement as it is setting up.

The LLP is available with or without hold-down slips and comes with standard reinforced HNBR rubber pack-offs, TWL Premium Seal Pack-Off or other special high-temperature pack-offs upon request.

The LLP is available with either internal Retrievable Pack-Off Bushing (RPOB) profile or Drillable Pack-Off-Bushing (DPOB) threading.

The Liner Packer provides the threaded connection for any standard length 122-Tieback Receptacle

Customizable for licensed premium threading or materials.

OPERATION

The LLP is run with a M Setting Tool screwed into its barrel using a left-hand thread and floating nut. When setting the packer, the setting tool is released by right-hand rotation and picked up allowing the setting dogs to expand and catch the top sleeve of the LLP packer. The setting tool is then lowered, forcing the sleeve down-ward and expanding the packoff to set the packer. A ratchet ring in the LLP holds the packoff in the expanded position.

When used to set a screen, the type LLP (without hold-down slips) may be retrieved by running a spear to catch the inner barrel.

A wide variety of optional configurations are available upon request.

DEEP SERVICE LINER TOP PACKER™

UNIT 681

The ***TechWest Deep Service Liner Top Packer*** is designed with a focus on Multi-Zone Fracturing applications, the Deep Service Liner Top Packer™ is a High Temperature / High Pressure thermal variation of the proven and reliable TechWest Liners Liner Lap Packer tool platform.

It is designed to be delivered downhole on the model HR Hydraulic Rotating Running Tool with the HydroAct™ (Hydraulic Actuator) for non-cemented applications. The HR running tool can push, pull and rotate to the right delivering the liner through challenging structure on the way to depth.

The Deep Service Top Seal packer may be set-up in numerous configurations to suit operational requirements. There are versions without slips, hold-up and -down slips.

For thermal applications it is usually dressed with SoftSet® sealing elements rated to 600 ^{o}F @ 3,000 psi. For non-thermal applications there is the opportunity to dress the packer with Nitrile, HNBR or HT/HP (High Pressure / High Temperature) Ecner Array® sealing elements.

While L80 metallurgy is the standard offering, other materials are readily available to meet operational needs. Economical setting sleeves or polished bore Tieback Receptacles maybe provided in a variety of lengths.

The Deep Service Top Seal packer also comes in a retrievable version with hold-up and -down slips.

OPERATION

At depth, a plug is pumped to seat allowing pressures to be built-up in the drill pipe. At a predetermined pressure, the packer is set, and annular tests can be conducted to verify element sealing integrity. A further increase in pressure releases the running tool. When the running tool is pulled from the Deep Service Top Seal packer, a set of ports are exposed allowing the drill pipe to be drained as it is pulled out of the hole.

HYDRAULIC DOVETAIL LINER HANGER (HDLH)

UNIT 124

HYDRAULIC DOVETAIL ROTATING LINER HANGER (HDRLH)

UNIT 125

The ***TechWest Hydraulic Dovetail Liner Hanger*** (HDLH) is a premium liner hanger with an integral body. The hanger mandrel is machined from heavy wall mechanical tubing and treated to the required grade. Integral construction eliminates all internal connections which provide maximum pressure ratings and liner hanging capacity. The cones have milled channels providing a superior bypass for circulation of fluids and cementing.

The hanger is shear pinned to prevent premature setting. The shear rate is variable and field adjustable according to operational parameters dictated by well conditions.

The ***TechWest Hydraulic Dovetail Rotating Liner Hanger*** (HDRLH) can be rotated into place, set and then rotated through the liner cementing operation.

FEATURES

- Enhanced fluid bypass with pocket slip design.
- Long pocket type dovetail slip for long heavy liners.
- Faster running speed with pocket slip design.
- Castellation clutch in setting collar allows for rotating of liner through tight hole spots.
- Manufactured from mechanical tubing of equivalent liner grade; 80,000 psi is standard, other yield strengths and materials available by special order
- Slips manufactured to 55-60 Rockwell “C” hardness for high-grade casing compatibility.

OPERATION

The HDLHP is set hydraulically while building up pressure against the Hydraulic Landing Collar.

A wide variety of optional configurations are available upon request.

MECHANICAL SET LINER HANGER (MSLH)

UNIT 116

The ***TechWest Mechanical Set Liner (MSLH)*** is economical liner hanger, used to suspend cemented and uncemented liners off bottom. Designed for heavy duty service, they are capable of successfully suspending long liners.

The MSLH is available with a one-piece integral barrel for maximum pressure integrity. Large bypass lessens pressure build-up during run-in and cementing operations.

The MSLH is set by picking up on the liner and rotating to disengage the J-Slot. When the MSLH is lowered the springs hold the cage stationary. This allows the barrel to move downward engaging the cone against the slips. This action moves the slips outward against the casing wall.

The MSLH are available in right hand set only.

FEATURES

- Economical slip design
- Manufactured from mechanical tubing of equivalent liner grade; 80,000 psi is standard, other yield strengths and materials available by special order
- Slips manufactured to 55-60 Rockwell “C” hardness for high-grade casing compatibility.

OPERATION

The MSLH is set mechanically by drill pipe manipulation. Disengage the latch housing and set down with right hand rotation.

A wide variety of optional configurations are available upon request.

MECHANICAL DOVETAIL SLIP HANGER (MDSH)

UNIT 144

MECHANICAL DOVETAIL ROTATING SLIP HANGER (MDRSH)

UNIT 145

The ***TechWest Mechanical Dovetail Slip Hanger (MDLH & MRDLH)*** is a premium hanger with an integral body. The hanger mandrel is machined from heavy wall mechanical tubing and treated to the required grade. Integral construction eliminates all internal connections which provide maximum pressure ratings and liner hanging capacity.

Once in position, the ***Mechanical Dovetail Rotating Slip Hanger (MDRSH)*** can be rotated through the liner cementing operation.

FEATURES

- Enhanced fluid bypass with dovetail design.
- Long recessed type dovetail slips for long heavy liners.
- Faster running speed with dovetail design.
- Manufactured from mechanical tubing of equivalent liner grade; 80,000 psi is standard, other yield strengths and materials available by special order.
- Slips manufactured to 55-60 Rockwell “C” hardness for high-grade casing compatibility.

OPERATION

The MDSH is set mechanically by drill pipe manipulation. Disengage the latch housing and set down with right hand rotation.

A wide variety of optional configurations are available upon request.

SETTING COLLAR, ROTATIONAL (SC-R)

UNIT 107

The ***TechWest Setting Collar, rotational*** (SC-R) is designed for use with either rotating and/or all right-hand set liner assemblies. The SC-R Setting Collar can also be used to carry bottom liners into place and then set on bottom.

FEATURES

- Top clutch allows for right hand set hangers to be set.
- Top clutch allows operator to work liner into place in a deviated well bore, as well as work the casing into place if hole fill is encountered.
- Suitable for applications where a liner top packer is not required
- Customizable for licensed premium threading or materials

SETTING COLLAR, NON-ROTATIONAL (SC-NR)

UNIT 108

The ***TechWest Setting Collar, non-rotational*** (SC-NR) is used to carry short drop off liners or screens to bottom where it is not necessary to use a liner hanger to suspend the liner weight.

FEATURES

- Drop off liner in open-hole to keep the hole open.
- Drop of liner screens where liner top packer or hangers are not needed.
- Suitable for applications where a liner top packer is not required
- Customizable for licensed premium threading or materials

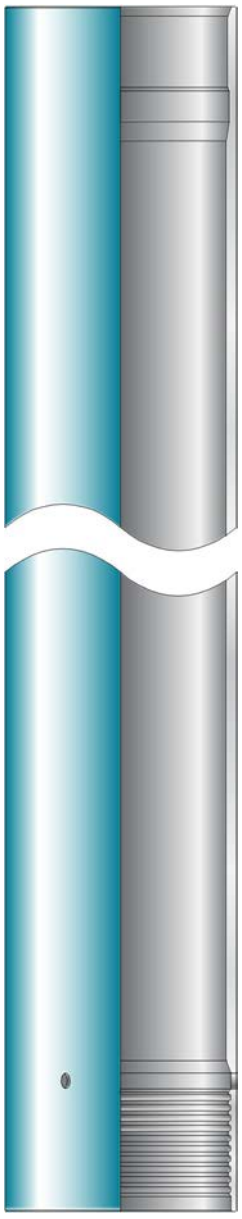
TIEBACK RECEPTACLE (TBR)

UNIT 122

The ***TechWest Tie-Back Receptacle*** (TBR) is run as an integral part of the liner or casing string. It is a honed and/or coated receptacle that allows the tubing string to contract and/or expand in response to pressure and temperature, while maintaining the high degree of sealing capability.

The TBR is normally installed above a Liner Lap Packer or Setting Collar.

The honed inside surface of the TBR can be coated to prevent cement or other material from adhering. This coating minimizes corrosion caused by metal-to-metal contact and well effluents.



FEATURES

- Comes is standard length ranging from 6 to 20 feet
- Allows tie-back to surface with a Tie-Back Seal Nipple.
- Can set Tie-back Packer into for remedial operations.
- Honed finish internal diameter.
- Top profile for plate or screen debris barriers to prevent abrasive internal damage
- Suitable for TechWest top dress and bore polishing mills

TIEBACK SEAL NIPPLE (TBSN)

UNIT 140

The ***TechWest Tieback Seal Nipple*** (TBSN) has proven to be a superior method of extending the liner to the surface of the well. Using the polished bore receptacle of the Setting Collar (SC) or the Liner Lap Packer (LLPH) packer, this assembly facilitates the entry and subsequent seal of the nipple into the bore.

The TBSN is run at the bottom of the liner extension. Depending on the application, it employs either a premium Aflas or Chevron-type unitized seal assembly, or a series of o-rings. Both designs deliver a solid seat and permanent seal.

The orifice collar normally included in the liner extension assembly is positioned one joint above the seal nipple. This prevents hydraulic blockage as the seal is engaged in the receptacle and allows the liner extension to fill at a predetermined rate as it is run. The orifice collar also serves as a stop for the cement plug and is constructed of drillable materials.

FEATURES

- Provides a high-pressure seal at the liner top
- Extends a liner to the surface
- Allows a PBR-type completion after the liner has been set and cemented by mounting a PBR above it.

TIE BACK LATCH SEAL ASSEMBLY

UNIT 321

The ***TechWest Tie Back Latch Seal Assembly*** (TBLSA) is used to connect the work string to a previously run liner down hole and provide a high-pressure seal to the system. It is disconnected from the liner with right hand rotation.

FEATURES

- High pressure latch seal assembly
- Premium seal stack configurations available for high pressure and high temperature applications
- Ease of entry into tie-back receptacle or setting collar combined with high tensile load capabilities.
- A wide variety of optional configurations are available upon request.

POSI-LATCH TIE-BACK FRAC SEAL

UNIT 699

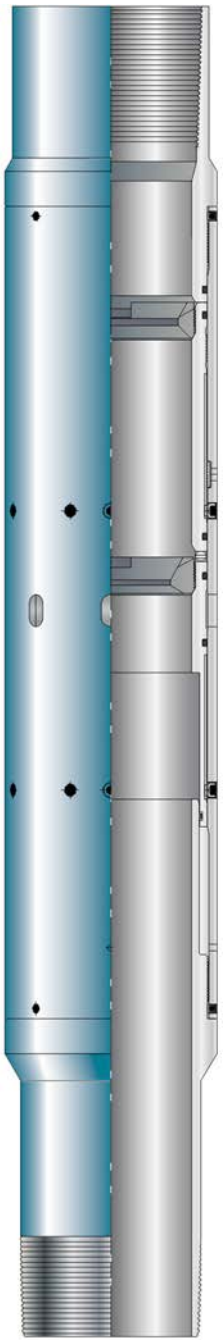
The ***TechWest Posi-Latch Tie-Back Frac Seal*** provides a high pressure seal while anchoring the frac string to the packer. It is used to lock the fracturing string to the liner top packer prior to pumping. The Posi-Latch will keep your tubing in tension until you release it.

The Positive Tie Back Latch Assembly is often used with the Deep Service Top Seal Packer™.

STAGE COLLAR (SC)

UNIT 260

The ***TechWest Stage Collar*** (SC) hydraulically opened stage cementing tool is used to stage cement into the annulus over specific intervals. Staging cement is done where weak formations will not support the hydrostatic column of annular cement. This can occur when large volumes of cement are needed, and pumping time may become an issue, or when specific placement of cement over an interval is required.



FEATURES

- Provides improved zonal isolation
- Available in multiple materials and connections.
- Hydraulically or Mechanical Set
- Easily adjustable setting pressure on location.
- Multiple bomb and pressure dart configurations available.

OPERATION

In the hydraulic configuration the SC is set by pressure build up in the liner string. In the mechanical configuration the SC is set by a gravity bomb dropped from surface.

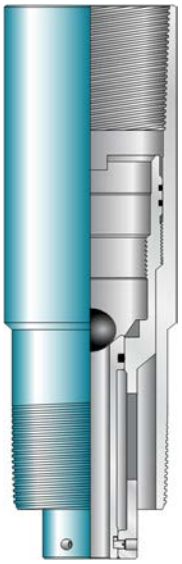
A predetermined amount of cement is then pumped through large cementing ports. The closing wiper dart then hydraulically closes the ports reestablishing liner pressure integrity.

HYDRAULIC LANDING COLLAR (HLC)

UNIT 114

The ***TechWest Hydraulic Landing Collar (HLC)*** has an internal ball seat and is run with a Hydraulic Dovetail Liner Hanger (HDLH). The HLC is run two or three joints from the shoe and is used to land the Liner Wiper Plugs (LWP).

The LWP provides a pressure seal from above and below and are easily PDC drillable.



FEATURES

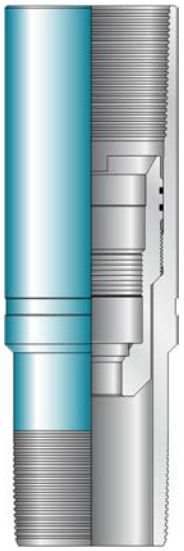
- Used to set a wide variety of hydraulic liner systems
- Aluminum internals for easy milling
- Locks the Liner Wiper Plug and Drill Pipe Wiper Plug.
- Extremely reliable primary setting technology.
- Available in standard and premium connections.

MECHANICAL PLUG LANDING COLLAR (MPLC)

UNIT 117

The ***TechWest Mechanical Plug Landing Collar*** (MPLC) is run two or three joints from bottom and is used to land the Liner Wiper Plug (LWP).

The LWP provides a pressure seal that holds pressure from above and below and are easily PDC drillable.



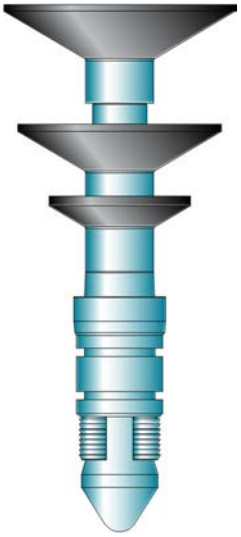
FEATURES

- Used to set a wide variety of mechanical liner systems
- Aluminum internals for easy milling
- Locks the Liner Wiper Plug and Drill Pipe Wiper Plug.
- Extremely reliable primary setting technology.
- Available in standard and premium connections.

DRILL PIPE WIPER PLUG (DPWP)

UNIT 111

The ***TechWest Drill Pipe Wiper Plug*** (DPWP) follows the cement, separating the cement from displacement fluid. The plug employs a series of rubber fins of varied sizes to wipe the inside of the cement head, setting string, tool joints, and liner setting tool. It is designed to latch and seal securely into the liner wiper plug. The two plugs then move as one through the liner to latch into the landing collar.



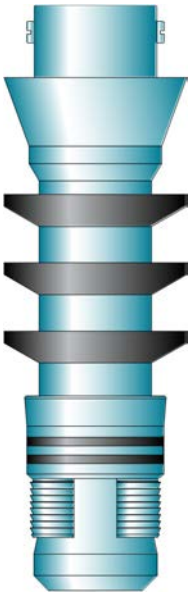
FEATURES

- Wipes the drill string clean after cementing operations.
- Lands and securely locks into the Liner Wiper Plug

LINER WIPER PLUG (LWP)

UNIT 112

The ***TechWest Liner Wiper Plug*** (LWP) is shear pinned to the shear out adaptor at the bottom of the 121-Cementing Seal Joint below the setting tool. It is designed to receive the 111-Drill Pipe Wiper Plug. The two plugs then move through the liner keeping the mud separated from the cement while it wipes the liner ID clean. When the liner wiper plug seats in the landing collar, it latches and forms a pressure seal that holds securely from either direction. The plug is also designed to clutch in the 114-Hydraulic Landing Collar to prevent rotation during drill out.



FEATURES

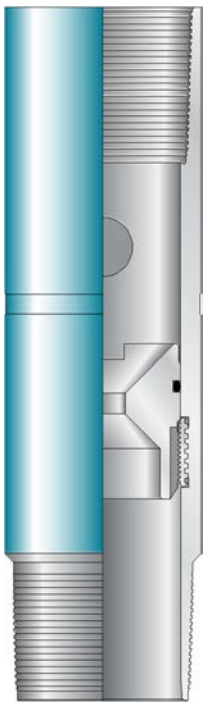
- Wipes the liner clean after cementing operations.
- Lands and securely locks into the landing collar

DRILLABLE BALL SEAT COLLAR (DBSC)

UNIT 133

The ***TechWest Drillable Ball Seat Collar (DBSC)*** can be used anywhere where it is desired to plug the bottom of the casing for any reason to ether set hydraulic equipment above or inflate packers that requires the plugging of the casing string.

The Drillable Ball Seat Collar is used to set Inflatable packers, open hydraulic stage tools and set most hydraulic equipment.



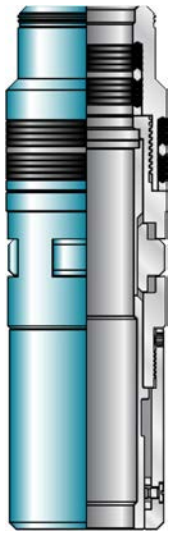
FEATURES

- Can be setup for high pressure setting capability
- Used in a wide variety of hydraulic or mechanical liner systems
- Locking aluminum internals for easy milling
- Extremely reliable primary setting technology.
- Available in standard and premium connections.

RETRIEVABLE PACK-OFF BUSHING (RPOB)

UNIT 120

The ***TechWest Retrievable Pack-Of Bushing (RPOB)*** is used to pack off and maintain a high-pressure seal inside the SSR receptacle for cementing and circulating operations. The RPOB is normally installed into the top of the Liner Lap Packer and is retrieved when setting equipment is pulled.



FEATURES

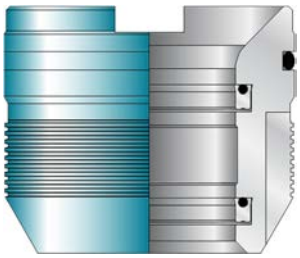
- Provides positive seal of liner setting tools
- No need to drill out pack-off bushing
- Redressable

DRILLABLE PACK OFF BUSHING (DPOB)

UNIT 110

The ***TechWest Drillable Pack-off Bushing (DPOB)*** is a high pressure, high-temperature pack-off used when working with high angle well bores.

The DPOB has chevron type packing that seal tightly around the polished Cementing Seal Joint (Unit 121). The DPOB hold pressure from above and below and is not damaged from rotation during setting and releasing of liners.



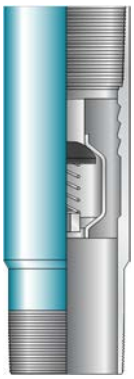
DRILLABLE PACK OFF BUSHING W/ FLAPPER VALVE (DPOB/F)

UNIT 126

The ***TechWest Drillable Pack-off Bushing with Flapper Valve (DPOB/F)*** is a high pressure, high-temperature pack-off used when working with high angle well bores. The component is like the DPOB except with a flapper acting an extra float that closes when the Cementing Seal Joint is removed,

FLOAT COLLAR (SVFC / DVFC)

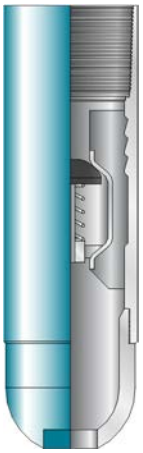
UNIT 250 / 255



The ***TechWest Single Valve Float Collar*** (SVFC) and ***Double Valve Float Collar*** (DVFC) act as extra back pressure valves, sealing against pressure from below when floating in a liner or casing. The spring-loaded ball and seat valve(s) ensure a secure seal. The SVFC and DVFC have no internal connections and is highly resistant to abrasive fluids, corrosion, and temperature.

VALVE FLOAT SHOE

UNIT 251 / 253



The ***TechWest Single Valve Float Shoe, Spaded Nose*** (SVFS-SN) and ***Double Valve Float Shoe, Spaded Nose*** (DVFS-SN) is a check-valve ran on the bottom of the casing. Spring-loaded ball and seat back-pressure valve(s) prevent annular fluid from entering the casing string and are highly resistant to abrasive fluids, corrosion, and temperature. The tool features a spaded nose that assists in getting the string to depth and down-jets used to facilitate wash down during running operations which are employed when liners are set on bottom, improving the cementing process.

The SVFS and DVFS-SN are designed to be easily PDC drillable.

FEATURES

- Used in a wide variety of hydraulic or mechanical liner systems
- Locking aluminum internals for easy milling
- Available in standard and premium connections.

INDEX SUB WITH ECCENTRIC NOSE (ISEN)

UNIT 333

The ***TechWest Index Sub with Eccentric Nose*** (ISEN) will rotate the shoe clockwise 180° degrees with each up and down movement of the work string at surface. This rotation will assist the liner through tight spots in the well bore and help get the liner to bottom.

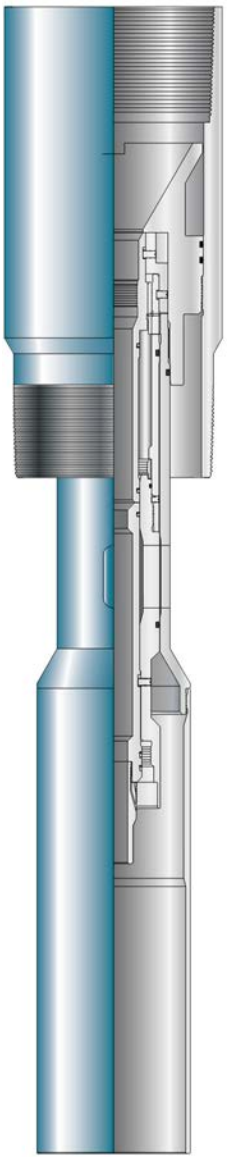
FEATURES

- Enhanced fluid bypass with dovetail design.
- Long recessed type dovetail slips for long heavy liners.
- Faster running speed with dovetail design.
- Manufactured from mechanical tubing of equivalent liner grade; 80,000 psi is standard, other yield strengths and materials available by special order.
- Slips manufactured to 55-60 Rockwell “C” hardness for high-grade casing compatibility.

SURGE PROTECTION TOOL (SPT)

UNIT 272

The ***TechWest Surge Protection Tool*** (SPT) allows the reduction of the effect of fluid surging the formation on close tolerance annulus or weak formations that may break down on hydraulic ball shear out used to set liner hangers.



FEATURES

- Drastically reduces the risk of formation damage.
- Available to suit TechWest HPHT Liner Systems
- Keeps sudden pressure changes away from high risk areas.
- Evenly distributes burst pressure through high flow ports
- Ball drop configuration

OPERATION

The SPT is hydraulically operated with a setting ball.

LINER SWIVEL (LS)

UNIT 135

The ***TechWest Liner Swivel (LS)*** is used when long mechanical liners are run into deviated wells or through tight sections in the well bore. The liner swivel is ran further down the liner system and allows for the right hand rotation needed to disengage the “J” from its slot to allow for the hanger setting process.

FEATURES

- Used when liner rotation is required for deep or horizontal liner systems
- Available in multiple materials and connections.
- Heavy duty compression and tension ball bearings
- Rotational capabilities under extreme load

RECIRCULATING COLLAR (RCC)

UNIT 113

The ***TechWest Recirculating Collar*** (RCC) is used with inner string circulating strings to circulate screens and slotted casing into place. The pack-off is easily drilled out with PDC bits, if necessary.

The RCC provides a positive seal to the end of the liner string allowing fluids to be pumped to the liner toe.

FEATURES

- Provides the ability to float in liner assemblies.
- Compact high-pressure pack-off design.
- Suitable for any liner length
- Compact high-pressure pack-off design.
- Ideal for long horizontal liner systems
- Available in standard and premium connections.

CEMENTED LINERS RUNNING EQUIPMENT

Many of TechWest's new tool innovations come from customer requests. As a design and manufacturing company we are constantly in pursuit of new tools and innovations and we encourage anyone to contact us with such enquiries and requests.

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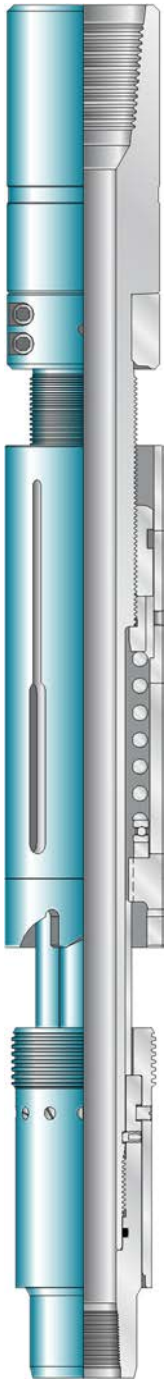
MECHANICAL ROTATING LINER RUNNING TOOL (MRLRT)

UNIT 200

The ***TechWest Mechanical Rotating Liner Running Too*** (MRLRT) has been designed to be run with LLP (Unit 100), or the Liner Setting Sleeve that are used with hydraulic or mechanical rotatable liner hangers for all vertical or horizontal liner applications. Right hand rotation releases the tool from the liner and is retrieved with the drill pipe at the end of the cementing or dropping off the liner.



FEATURES

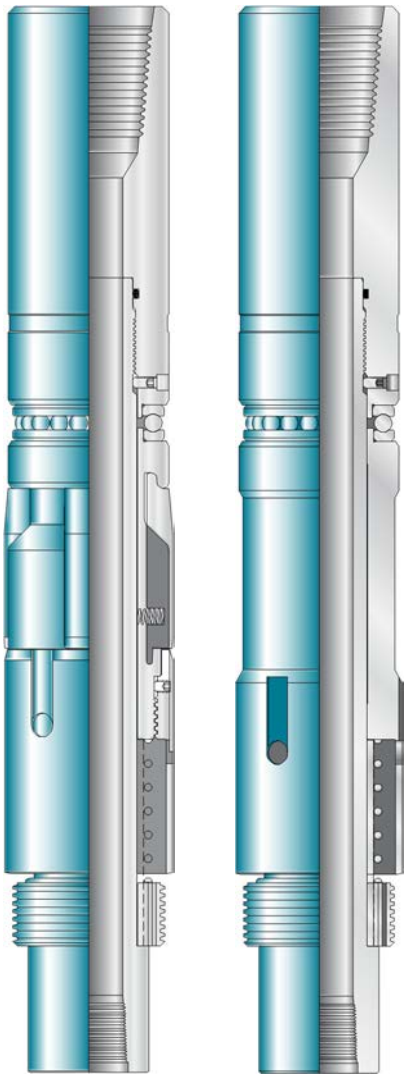
- Can be pushed, pulled and rotated to get the liner into position.
- Heavy duty construction for long term service use.
- Inner circulating string can be used when screen deployment is needed.
- Can be used in long ERD systems.
- Can be used when drilling down of liner systems

MECHANICAL LINER RUNNING TOOL (MLRT)

UNIT 210

The ***TechWest Mechanical Liner Running Tool*** (MLRT) is used to run and set liner into the well bore. It is used to set left hand mechanical liner hangers and hydraulic liner systems. Right hand rotation releases the tool from the liner and is retrieved with the drill pipe at the end of the cementing or dropping off the liner.

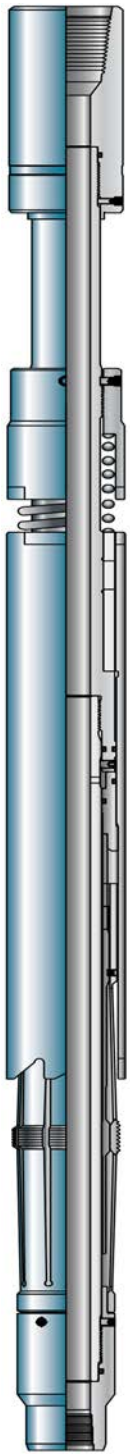
The ***TechWest Mechanical Liner Running Tool with Dogs*** (MLRWD) will set all compression-set Liner Packers. It combines the features of the type MLRT Running Tool with a spring-loaded, rotatable setting-dog section that allows the setting force to be transmitted to the packer. When activated, the spring-loaded setting-dog section permits setting force to be transmitted to the packer, while the bearing allows the work string to be rotated at the surface, thus transmitting additional weight to the packer. Both features can be beneficial in high angle, or horizontal well bores when attempting to weight-set a liner-top packer.



HYDRAULIC RELEASE RUNNING TOOL

UNIT 220

The ***TechWest Hydraulic Release Running Tool*** (HR) is used to run in vertical and long reach horizontal well bores. It is hydraulically set and released and can push, pull and rotate the liner without the need of major work string manipulation. The HR setting tool has an internal pack off and full open ID that allows for the circulation of well bore fluids.



FEATURES

- Can be pushed, pulled and rotated to get the liner into position.
- The hydraulic release eliminates string weight free point requirements.
- Inner circulating string can be used when screen deployment is needed.
- Can be used in long ERD systems.
- Can be used when drilling down of liner systems

ROTATING SETTING DOG (RSD)

UNIT 127

The ***TechWest Rotating Setting Dog*** (RSD) is used whenever compressions set liner packers are run. The dogs are spring loaded in the collapsed position while the liner is being run and cemented. When released from the setting sleeve, set down weight is applied to compress the liner packer. Bearing race in the RSD is used to transfer additional weight in high angle well bores.

FEATURES

- Can be pushed, pulled and rotated to get the liner into position.
- Heavy duty swivel for reliable service use
- High tensile springs for reliable setting with compression on setting dogs

HANDLING JOINT (HJ)

UNIT 128

The ***TechWest Handling Joint*** (HJ) is used with the setting tool and the setting dogs. It is made up to the setting tools and consists of either 3-1/2” or 4-1/2” drill pipe, with IF connections. The handling joint transitions the liner over to the drill pipe that is used to run the liner into position.

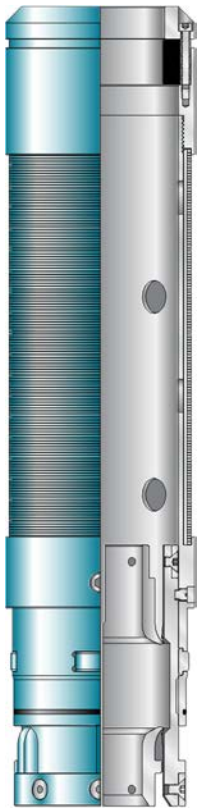
FEATURES

- Available with a wide variety of drill stem connections
- Suitable for 6FT, 10Ft, 15FT, or 20FT Tie-Back Receptacles
- Connects directly to the liner running tools

SCREENED AND PLATE DEBRIS BARRIER (SDB / PDB)

UNIT 130 / 132

The ***TechWest Screened Debris Barrier*** (SDB) and ***TechWest Plate Debris Barrier*** (PDB) sit on the top of a Tieback Receptacle (TBR) to prevent debris from entering the polished bore. The debris barrier is connected to a setting tool and is moveable on the setting tool permiting the setting tool to be stroked inside the liner hanger assembly. During normal operations, such as cementing, the debris screen remains at the top of the tieback receptacle except during the final stages of retrieval.



FEATURES

- Economical PDB design for all standard applications
- Reduces risk in cemented liner installations
- High filtration capability SDB design for small particulate wellbores
- Keeps abrasive materials out of the polished tieback receptacle

CEMENTING SEAL JOINT (CSJ)

UNIT 121

The ***TechWest Cementing Seal Joint*** *(CSJ) is* made up with the liner setting tool using a CSJ polished nipple to extend down through its ID. A profile to receive and hold the bushing in place is machined into the ID of the setting collar, or the packer.

After cementing, the CSJ and bushing is retrieved with the setting tool.

FEATURES

- Available for drillable for retrievable pack-off bushings
- 12FT, 15FT, or 20FT Seal Joints can be provided
- Field adjustable shear ring for launching liner wiper plugs

CEMENTED LINERS REMEDIAL EQUIPMENT

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Reg. No. 11D1-0124

Reg. No. 2995
ISO 9001:2015

Reg. No. Q1-2959

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LINER TIE-BACK PACKER, ROTATIONAL (LTBPR)

UNIT 105

The ***TechWest Liner Tie-Back Packer*** (LTBPR) is a high-pressure seal at the top of a cemented or un-cemented liner. It is run on drill pipe and/or casing and landed in a receptacle at the top of the liner. In most applications the Tie-back Receptacle is run with the packer providing future tie-back capability.

The LTBPR Packer is run after the liner is set, so that maximum annular flow is achieved at the liner top during cementing.

The packer and accompanying hold-down slips are set by applying weight. The setting tool is retrieved with the drill pipe. Once set, the packer will seal in the liner receptacle and pack-off in the casing to isolate the liner top, holding securely pressures from above or below. The Premium Seal Pack-Off provides a seal against high pressures and temperatures.

FEATURES

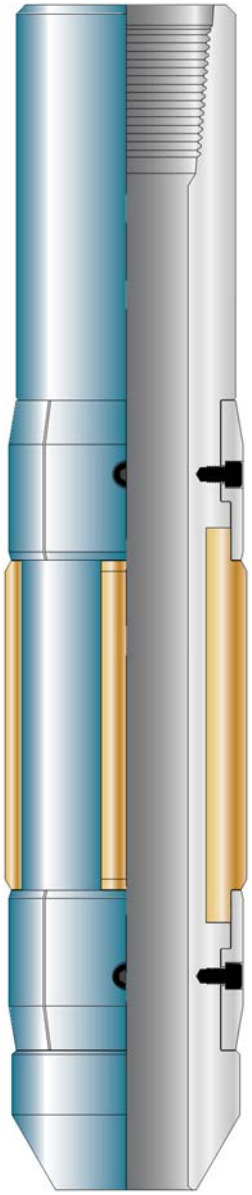
- Provides a high-pressure seal at the liner top
- Safely seals micro-annular leaks at the liner top caused by high-pressure gas
- Extends a liner to the surface when it is not desirable to cement the tie-back
- Allows a PBR-type completion after the liner has been set and cemented by mounting a PBR above it.

TIEBACK RECEPTACLE POLISHING MILL (TBRP)

UNIT 322

The ***TechWest Tieback Receptacle Polishing Mill*** (TBRP) is used to dress the inside of PBR before the running of seal assemblies or tie- back packers with seal assemblies.

The polished mill may be used immediately after cementing or prior to running any type of tie-back seal.



FEATURES

- Thoroughly cleans and polishes the tieback receptacle
- Top dress mill available upon request
- Connects to all standard drill stem connections
- Tieback receptacle locator option to ensure polish area is clean during the entire stroke length


CEMENTED LINERS
SURFACE
EQUIPMENT

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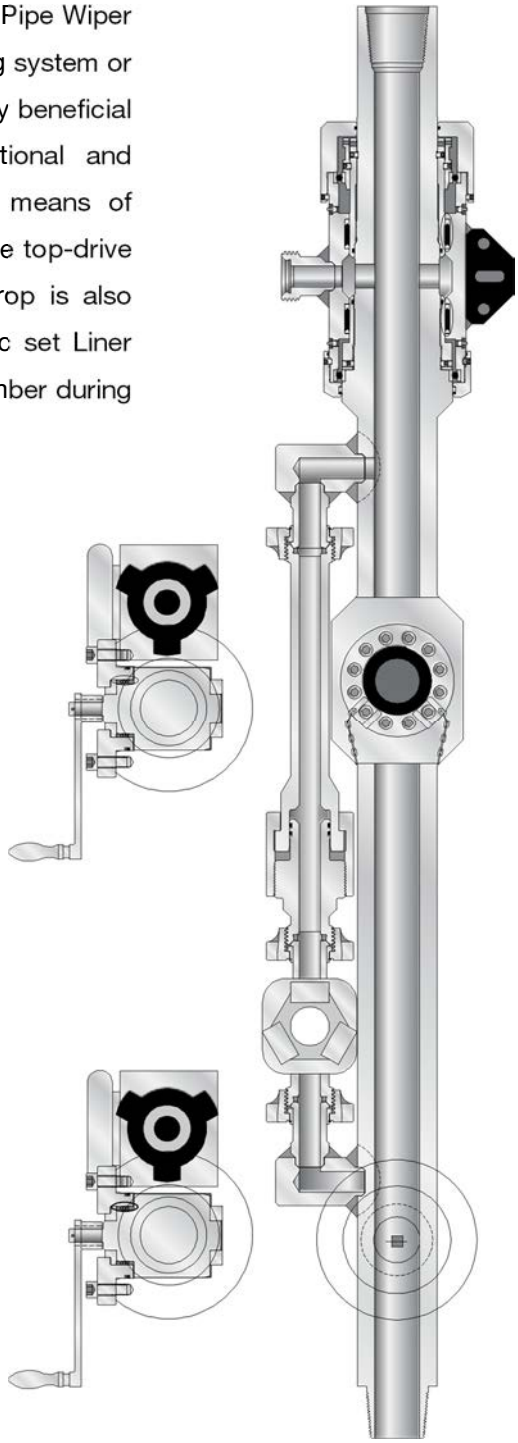
TOP DRIVE CEMENT HEAD (TDCH)

UNIT 300

The ***TechWest Top Drive Cement Head*** (TDCH) with Ball Drop, Drill Pipe Wiper Plug Valve and Bypass is used on rigs that employ a top-drive drilling system or a power swivel as the drill string power source. The unit is particularly beneficial in cementing operations when used in conjunction with rotational and reciprocating liner assemblies. The cementing head provides a means of introducing cement, and/or other fluids into the work string below the top-drive unit without interrupting rotational or vertical movement. A ball drop is also incorporated into the manifold to hold the setting ball for Hydraulic set Liner Hangers. The manifold stores the pump down plug in its upper chamber during the circulating, conditioning and cement mixing operations.

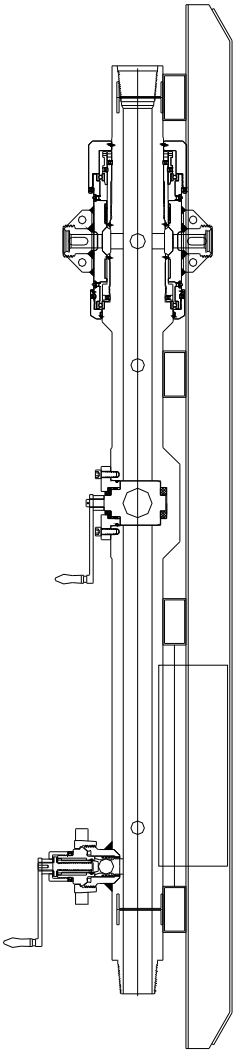
The TDCH is designed to support tensile loads from drill pipe setting string and liner.



TOP DRIVE CEMENT HEAD SKID

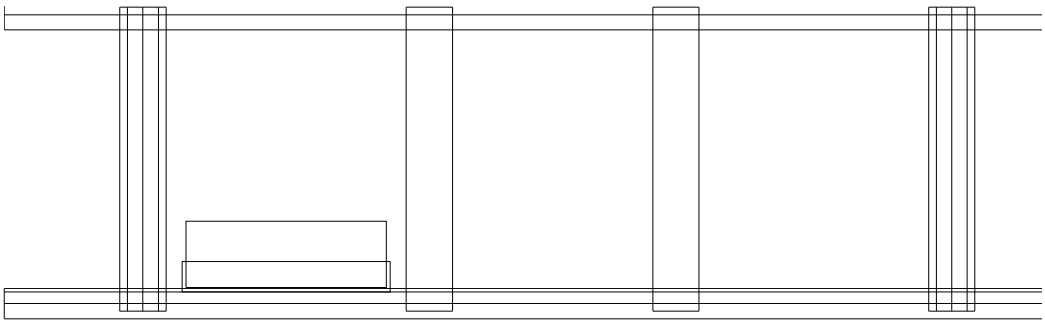
PRODUCT 301

The ***TechWest Top Drive Cement Head Skid*** is a heavy-duty cradle providing easy handling, storage and operation of the Top Drive Cement Head.



FEATURES

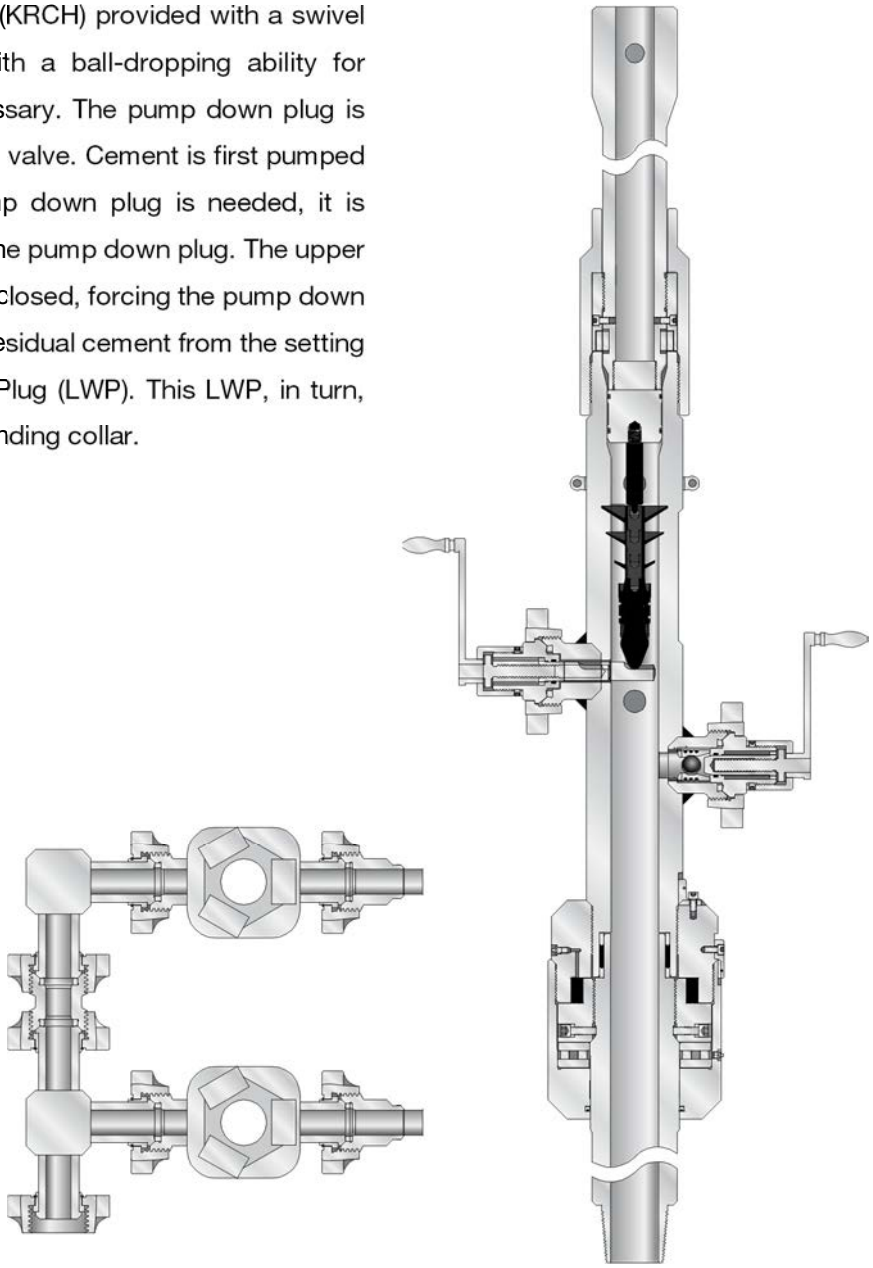
- Provides a strong solid base to protect and safely store the cementing head.
- Mounted toolbox installed for operator hand tool storage
- Custom company logo laser engraving available
- Highly beneficial for repeated cemented liner hanger operations



KELLY RIG CEMENT HEAD (KRCH)

UNIT 310

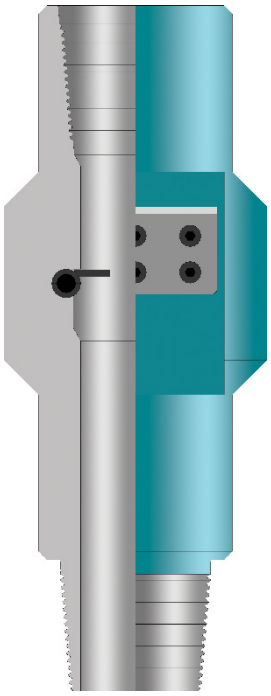
The ***TechWest Kelly Rig Cement Head*** (KRCH) provided with a swivel for rotate-and-reciprocate operations with a ball-dropping ability for setting the Hydraulic Hanger when necessary. The pump down plug is held in the body above the lower manifold valve. Cement is first pumped through the lower valve. When the pump down plug is needed, it is released by opening the valve to release the pump down plug. The upper valve is then opened, and the lower valve closed, forcing the pump down plug out of the cementing head. It wipes residual cement from the setting string and then seats in the Liner Wiper Plug (LWP). This LWP, in turn, wipes the liner clean until it seats in the landing collar.



FLAG SUB (FS)

PRODUCT 320

The ***TechWest Flag Sub (FS)*** is a surface installation that is used to indicated when the Drill Pipe Wiper Plug (Product 111) has passed through the cementing head.



FEATURES

- Indicates when the drill pipe wipe plug has been successfully launched.
- Spring loaded flag mechanism for multiple service usage
- Can be installed on Kelly or Top-Drive cementing heads
- Available in Standard or Premium thread connections

CEMENTED LINERS ACCESORIES

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Reg. No. 2995
ISO 9001:2015

Reg. No. Q1-2959

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NON-WELDED BOWSPRING CENTRALIZERS

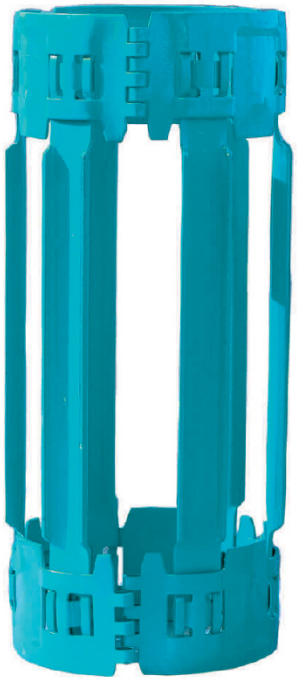
UNIT 373

The ***TechWest Type S850 and S350 Non-Weld Bow Centralizer*** uses the same style of spring design found in Type S300 centralizers. Type S350/S850 Centralizer are available in a wide range of casing and hole sizes and are designed to be installed over stop collars or casing collars.

NON-WELDED POSITIVE CENTRALIZERS

UNIT 374

The ***TechWest Type S880 and S380 Positive Centralizers*** are designed to provide positive stand-off of casing inside of cased holes. The shape of the positive bows allows for optimum fluid flow past the centralizer. The outer diameter of the bows is supplied ¼ inch (6 mm) smaller than the casing bore. These centralizers are designed to be installed between Stop Collars or free floated on the casing.



NON-WELDED TURBOLIZER CENTRALIZER

UNIT 375

The ***TechWest Type S880 and S870 Non-Welded Turbolizer Centralizers*** incorporate turbolating fins and integral set screws in the lower collar to provide a secured centralizer capable of turbolating the flow of fluid in the area directly above the turbolating fins.

The turbolizer collar end with the set screws should be the lower collar when the centralizer is installed on the casing.

LINER CENTRALIZER

UNIT 376

The ***TechWest Type S310 Liner Centralizer*** uses a solid end band that is installed by sliding the centralizer onto the casing. It provides minimal annular obstruction in close tolerance holes. Used primarily in liner completions, Type S310 liner centralizer can be supplied with integral set screws in the lower collar or installed over Model S415 liner stop collars. Liner Turbolizers (Model S311) are also available where additional turbulence is desired during circulation and cementing.

CEMENTING PLUGS

UNIT 371

The ***TechWest Type S252 Top Cementing Plug and Type S253 Bottom Cementing Plug*** are designed to replace conventional cementing plug systems. By replacing the aluminum and rubber core material in conventional plugs with a large crushable plastic core, most of the rubber is eliminated, allowing the drill bit to fracture the plastic rather than tear the rubber and aluminum thus significantly reducing drill out times. These plugs are completely PDC drillable.

ALUMINIUM CORE CEMENTING PLUGS

UNIT 372

Type S255 Top Plug Aluminum Core and type S256 Bottom Plug Aluminum Core are manufactured with an aluminum insert and are rubber coated. The plugs are available in 4 ½ inches (114 mm) to 20 inches (208 mm). The top plug is manufactured in black natural rubber and the bottom plug in orange with rupture diaphragm at 300 psi differential. Operating range is up to 200°F (93°C). Plugs can be ordered in Viton® allowing for higher operating temperatures and are operational in either synthetic or mud fluids.

DEPTH ORIENTATION COLLAR

TechWest Liners' Type S240 Depth Orientation Collar is an economical means of providing a correlation point that can be referenced during well logging operations. The collar may be located at any point in the casing string and provides a clean smooth bore that is compatible with the corresponding casing bore.

BELL NIPPLE

TechWest Liners' Type S213 Bell Nipple is designed to be slipped over and welded onto the production casing stub so that a threaded wellhead can be installed onto the bell nipple. Manufactured from seamless K-55 material with API 8 round short threads in sizes 4 ½ inches (114.3 mm) through 7 inches (177.8 mm).

PRODUCTION CASING CAP

TechWest Liners' slip-on cap is designed to be easily installed over the exposed top of the production casing to prevent foreign objects from being dropped into the well after the drilling rig has moved off location and prior to production equipment being installed. The casing cap is manufactured from steel and is installed and locked into place with an integral set screw. Manufactured in sizes 4 ½ inches (114 mm) through 7 inches (177 mm).

BAFFLE COLLAR

TechWest Liners' Type S245 Baffle Collar is an effective method for landing cementing plugs at specific points in the casing string. Useful in situations such as liner cementing and where no float collar or float shoe is being run. Cement filled collar that is easily drillable.

BAFFLE PLATE

TechWest Liners' Type S201 Baffle Plate is used for landing cementing plugs and is designed to be installed in the center of a casing coupling. These units are available in both aluminum and plastic materials, and come in threaded and lush outside diameter configurations. Baffle Plates are available in sizes 4 ½ inches (114.3 mm) through 13 inches (339.7 mm).

OPENHOLE LINER SYSTEMS

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LINER ANCHOR PACKER (LAP)

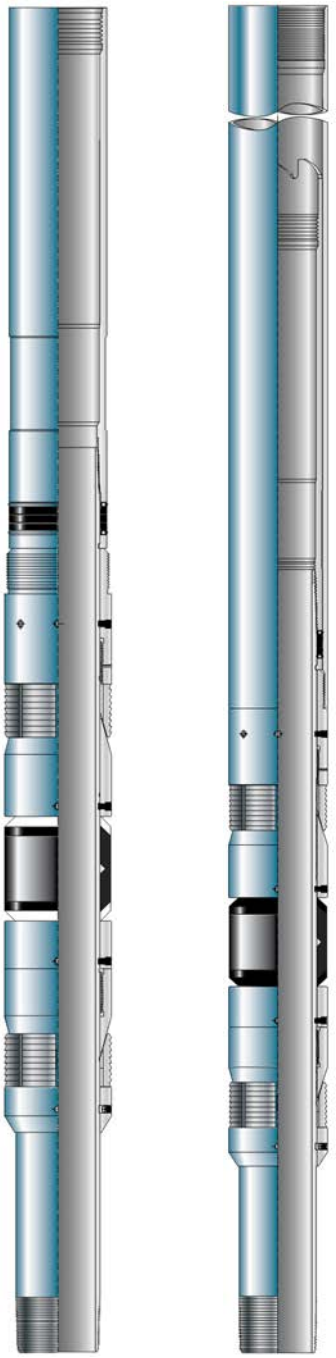
UNIT 103

The ***TechWest Liner Anchor Packer*** (LAP) is used at the top of the liner system where both hold-up and hold-down abilities are required. This packer comes with the ability to rotate into the well bore if tight restrictions are likely to be encountered.

The Liner Anchor Packer is hydraulically set by the HRN or HMN running tools while running open hole completions or multi-zone frac systems. It's high pressure reliable design allow for a wide variety of downhole completion or frac well designs.

High capacity slips provide by-directional tension and compression reliability for high hanging loads or high-pressure performance requirements.

Anchoring and pressure integrity system for TechWest high performance frac system.



FEATURES

- Reliable economical high-pressure performance
- The hydraulic release eliminates string weight free point requirements.
- Inner circulating string can be used when screen deployment is needed.
- Can be used in long ERD systems.
- A wide variety of optional configurations are available upon request.

HYDRAULIC ROTATING LINER RUNNING TOOL

UNIT 230

The ***TechWest Hydraulic Rotating Liner Running Tool*** (HRN), ***non-cementing***, is used to run and set thermal or multi zone un-cemented frac liner systems. The robust design and rotational capabilities ensure the liner will reach TD. The tool has double internal hydraulic pistons set the packer then disengage simply by slowly increasing hydraulic pressure. It can also be rotated into the well bore to get through tight sections.

FEATURES

- Can be pushed, pulled and rotated to get the liner into position.
- The hydraulic release eliminates string weight free point requirements.
- Inner circulating string can be used when screen deployment is needed.
- Can be used in long ERD systems.
- Primary setting dart, and secondary fail safe dart comes standard
- Ability to pressure test the packer prior to tool disengagement
- Drainage ports provide the ability to drain fluid once you have disengaged from the packer during tripping out.

HYDRAULIC MECHANICAL LINER RUNNING TOOL

UNIT 231

The ***TechWest Hydraulic Mechanical Liner Running Tool*** (HMN), ***non-cementing***, is used to run and set multi zone un-cemented frac liner systems hydraulically and mechanically release from the liner. Swivels as you run in hole for increased performance.

FEATURES

- Can be pushed and pulled to get the liner into position.
- Hydraulic setting and mechanical release allow for an economical design.
- Inner circulating string can be used when screen deployment is needed.
- Can be used in long ERD systems.re
- Primary setting dart, and secondary fail safe dart comes standard
- Ability to pressure test the packer prior to tool disengagement
- Drainage ports provide the ability to drain fluid once you have disengaged from the packer during tripping out.

SETTING PLUG

PRODUCT 111

The ***TechWest Setting Plug (SP)*** is designed to provide positive displacement down a horizontally positioned running string and land in a seat for applying pressure to the Running Tool. If the running string is vertically orientated at the liner top, then a ball could be used with a compatible seat.

OPEN HOLE HYDRAULIC INTERVAL PACKER

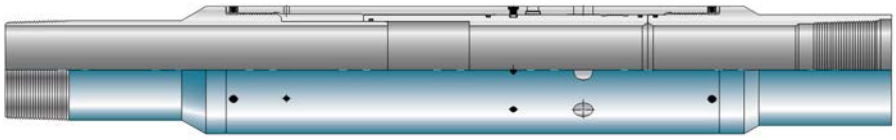
UNIT 142

The ***TechWest Open-Hole Hydraulic Interval Packer*** (OHHIP) is used for zone isolation in multi-zone fracturing operations. When ran with ball opening frac sleeves they work to divert frac fluids to a pre-determined area of the well bore. High density elastomer for high pressure frac performance securely locks the elastomer with continuous pack-off for long term sustainable performance.

HYDRAULIC FRAC SLEEVE

UNIT 260

The ***TechWest Hydraulic Frac Sleeve*** (HFS) is used between Openhole Hydraulic Isolation Packer (OHHIP) isolation zones and is opened hydraulically for frac operations. It is activated by circulating varying ball sizes to the drillable ball seat.



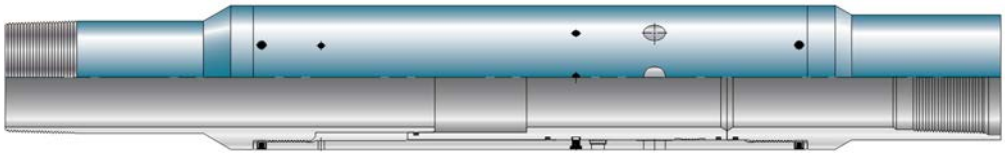
FEATURES

- System securely locks the entire mechanism
- Field adjustable setting pressures for ease of operation
- High pressure frac performance
- Provides focused frac pressure for increased production
- Economical reliable multi-zone frac system for increased savings and downhole performance.

LOWER HYDRAULIC FRAC SLEEVE

UNIT 270

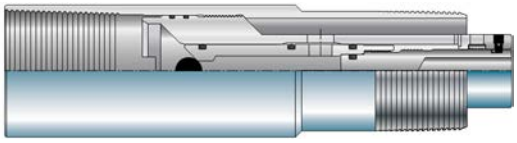
The ***TechWest Lower Hydraulic Frac Sleeve*** (LHFS) is the lower most frac sleeve ran in the toe section of the well bore and is opened hydraulically for fracturing of the first zone in the well bore.



HCBS HYDRAULIC CLOSING BALL SEAT

UNIT 136

The ***TechWest Hydraulic Closing Ball Seat*** (HCBS) is used at the toe of multi zone frac string and is used to catch the first ball dropped and close off the inside of casing for setting open-hole hydraulic packers.



FEATURES

- Provides full bore ID
- Reliable setting and hydraulic frac system for increased performance
- High pressure frac performance for increased production

DEEP SERVICE TOP SEAL™

UNIT 680

The ***TechWest Deep Service Top Seal*** is designed with a focus on High Temperature applications including SAGD (Steam Assisted Gravity Drainage), and Multi-Stage fracturing operations. The Deep Service Top Seal™ packer is a thermal variation of the proven and reliable TechWest Liners' Liner Lap Packer tool platform.

It is designed to be delivered downhole on the model HRN Hydraulic Rotating Running Tool with the HydroAct™ (Hydraulic Actuator) for non-cemented applications. The HR running tool can push, pull and rotate to the right delivering the liner through challenging structure on the way to depth. At depth, a plug is pumped to seat allowing pressures to be built-up in the drill pipe. At a predetermined pressure, the packer is set, and annular tests can be conducted to verify element sealing integrity. A further increase in pressure releases the running tool. When the running tool is pulled from the Deep Service Top Seal packer, a set of ports are exposed allowing the drill pipe to be drained as it is pulled out of the hole. The Deep Service Top Seal packer may be set-up in numerous configurations to suit operational requirements.

There are versions without slips, hold-up and -down slips. For thermal applications it is usually dressed in thermal sealing elements rated for high temperature performance.

For non-thermal applications there is the opportunity to dress the packer with Nitrile, HNBR or HT/HP (High Pressure / High Temperature) Ecner Array® sealing elements.

While L80 metallurgy is the standard offering, other materials are readily available to meet operational needs. Economical setting sleeves or polished bore Tieback Receptacles maybe provided in a variety of lengths.

The Deep Service Top Seal packer also comes in a retrievable version with hold-up and -down slips.

DEEP SEAL ANCHOR PACKER™

UNIT 681

The ***TechWest Deep Seal Anchor Packer*** is designed with a focus on Multi-Zone Fracturing applications and along with the Deep Service Top Seal™ packer is our High Temperature / High Pressure, hydraulically set Anchor Packer.

The elements are of proven High Temperature / High Pressure elastomers with the maximum available expansion to seal in oversized holes.

The Deep Seal Anchor Packer is designed with low friction stand-off centralizer to protect and aid in deployment of liner into the well bore, this low drag coefficient centralizer is highly beneficial in getting the liner through any tight spots that may be encountered in the well bore.

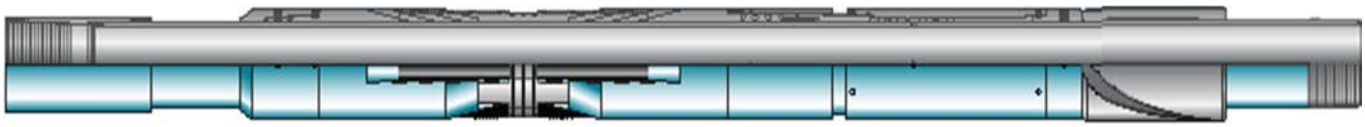
DEEP SEAL ANCHOR™

UNIT 682

The ***TechWest Deep Seal Anchor*** is designed with a focus on Multi-Zone Fracturing applications including with the Deep Service Top Seal™ Open Hole Tandem Seal or the Swell-Tech II™ the Deep Seal Anchor for open hole.

The Deep Seal Anchor allows the liner to be pulled into tension prior to setting of the Deep Service Top Seal this process aids in removes any compression bends in the liner string from being push into the well bore in long ERD liners.

This tool is also highly beneficial during fracturing operations as both end of the liner is locked into its elongated position and aid against movement that may occur during fracturing operations.



TANDEM SEAL OPEN HOLE PACKER

UNIT 683

The ***TechWest Tandem Seal Open Hole Packer*** is designed with a focus on Multi-Zone Fracturing applications and when included with the Deep Service Top Seal™ packer this High Temperature / High Pressure packer is used for open-hole zone isolation.

It comes with dual element. The elements are of proven High Temperature / High Pressure elastomers with the maximum available expansion to seal in oversized holes.

This packer is designed and comes with special low drag coefficient stand-off centralizers on both ends to protect the elements and aid in deployment of liner into the well bore.

FEATURES

- Tandem premium pack-off ensures zone isolation integrity under HT/HP applications
- Suitable for ERD and demanding well conditions
- High pressure frac performance for increased production


THERMAL
LINER
SYSTEMS

Many of TechWest's new tool innovations come from customer requests. As a design and manufacturing company we are constantly in pursuit of new tools and innovations and we encourage anyone to contact us with such enquiries and requests.

Reg. No. 11D1-0124

Reg. No. 2995
ISO 9001:2015

Reg. No. Q1-2959

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LINER THERMAL PACKER – RETRIEVABLE AND ROTATIONAL

PRODUCT 276

The ***TechWest Liner Thermal Packer*** (LTPRR) is a hydraulic-set, retrievable and rotational liner hanger packer suitable for non-cemented high-temperature operations.

The LTPRR features rotating castillations on the top of the mandrel which permits the transmission of torque to the liner string below. The packer mandrel also contains the running thread which provides the connection to the running tool. A latch setting bore is mounted on the top which mates with the setting sleeve on the running tool for hydraulic actuation. A short sealing surface is provided either within the upper part of the mandrel or via a sub on the bottom. The Thermal Element and Seals are compatible with temperatures and pressures experienced in Thermal Heavy Oil Applications. The Packer is supplied with a latched bore at the top for remedial purposes.

The Liner is set using a Setting Plug (Product 111), or a ball if set in the vertical and the Hydraulic Rotating Running Tool (Product 230).

FEATURES

- Retrievable thermal liner system
- Built in redundancies to aid in reducing risk of operator error

OPERATION

The LTPRR is set using type HRN (Rotational) Hydraulic Setting Tool screwed into its barrel using a left-hand thread and floating nut. When setting the packer, the setting tool is pressured up to set and then release the thermal liner assembly.

When used to set a screen, the type PTPRR may be retrieved by running the tie-back latch assembly with drill stem connections

A wide variety of optional configurations are available upon request.

LINER SAGD PACKER, ROTATIONAL (LSPR)

UNIT 102

The ***TechWest SAGD Packer, Rotational (LSPR)*** is a versatile liner high-temperature packer that can be used in Thermal operations. Setting the LSPR Packer provides a reliable seal between the openhole and the cased hole.

The LSPR features rotating cantillations on the top of the mandrel which permits the transmission of torque to the liner string below. The packer mandrel also contains the running thread which provides the connection to the running tool. A latch setting bore is mounted on the top which mates with the setting sleeve on the running tool for hydraulic actuation. A short sealing surface is provided either within the upper part of the mandrel or via a sub on the bottom. The Thermal Element and Seals are compatible with temperatures and pressures experienced in Thermal Heavy Oil Applications. The Packer is supplied with a latched bore at the top for remedial purposes.

The Liner is set using a Setting Plug (Product 111), or a ball if set in the vertical and the Hydraulic Rotating Running Tool (Product 230).

FEATURES

- Customizable with or without hold down slips
- Economical reliable design

OPERATION

The LSPR is set using type HRN (Rotational) Hydraulic Setting Tool screwed into its barrel using a left-hand thread and floating nut. When setting the packer, the setting tool is pressured up to set and then release the thermal liner assembly.

When used to set a screen, the type PTPRR may be retrieved by running the tie-back latch assembly with drill stem connections

When used to set a screen, the type LLP (without hold-down slips) may be retrieved by running a spear to catch the inner barrel.

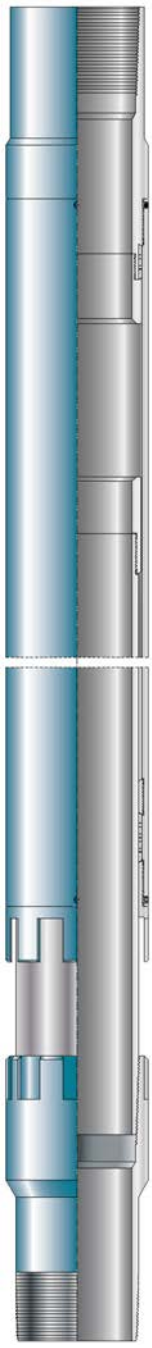
A wide variety of optional configurations are available upon request.

LINER THERMAL EXPANSION JOINT (LEJ)

UNIT 331

The ***TechWest Liner Thermal Expansion Joint*** (LEJ) is used when thermal expansion down hole occurs from steaming operations in SAGD/CSS operations and the need to counter that effect down hole to keep packers set and elements in good condition.

The Thermal Expansion Joint is mounted below a Rotational Liner Thermal Hanger and torque may be transmitted through the tool when it is closed and in compression.



FEATURES

- Torque is transmitted from full compression or extension
- Standard 10 foot stroke, and available in different lenghts.
- 600F thermal presure integrity
- Avaiallble in a variety of materials, and preimum threads.

OPERATION

Run to depth and space out the thermal liner string according to the anticipated expansion/contraction required to always keep the packer in the neutral position. Set the LTPRR or LSPR hydraulically and disconnect the running tools from the liner assembly.

MECHANICAL OPENHOLE THERMAL PACKER (MOHT)

UNIT 147

The ***TechWest Mechanical Open Hole Thermal Packer* (*MOHT*)** is designed to grip and seal against open hole to isolate producing zones in high temperature applications.

The MOHT Packer is a one trip double grip mechanical set permanent packer. Premium surface treatment, the Pre-Squeeze mechanism, and precise manufacturing makes the MOHT Packer to one of the most reliable permanent packers for this specific application. MOHT Packer features the Pre-Squeeze mechanism to eliminate any relative movement of the Soft Set Thermal Element against open hole when packing off the element occurs.

Two MOHT Packers can be run in simultaneously with one trip. By adjusting the quantity of shear screws on each stage of each packer, the desired sequence of setting is achieved.

The MOHT Packer is made of materials for standard service and can be supplied for virtually any existing well environment.

TIE BACK LATCH ASSEMBLY

UNIT 321

The ***TechWest Tie-back Latch Assembly*** (TLA) is used to latch and seal the work string into a Tie-Back receptacle on a previously run liner. It is disconnected from the liner with right hand rotation.

FEATURES

- Retrieving configuration with drill steam connections for retrieving LTPRR packers
- Tie-back configuration to set additional liner thermal packers while mainting full liner internal diameter
- No seals required to maintain thermal capabilities
- Simple snap in running procedure

THERMAL CUP STRADDLE / PACKER

UNIT 335

The ***TechWest Thermal Cup Straddle/Packer*** (TCS/P) can be used in any number of ways and will cover any area needed with the addition of pipe between the thermal high-temperature cups.

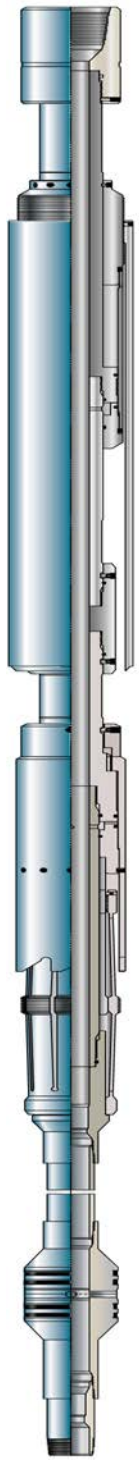
FEATURES

- Ability to cover a large straddle gap by simply adding additional spacing joints
- Two thermal cups ensure thermal pressure isolation.
- Economical design
- Ran with existing inner strings for increased thermal production

HYDRAULIC ROTATING LINER RUNNING TOOL

UNIT 230

The ***TechWest Hydraulic Rotating Liner Running Tool*** (HRN), ***non-cementing***, is used to run and set thermal or multi zone un-cemented frac liner systems. The robust design and rotational capabilities ensure the liner will reach TD. The tool has double internal hydraulic pistons set the packer then disengage simply by slowly increasing hydraulic pressure. It can also be rotated into the well bore to get through tight sections.



FEATURES

- Can be pushed, pulled and rotated to get the liner into position.
- The hydraulic release eliminates string weight free point requirements.
- Inner circulating string can be used when screen deployment is needed.
- Can be used in long ERD systems.
- Primary setting dart, and secondary fail safe dart comes standard
- Ability to pressure test the packer prior to tool disengagement
- Drainage ports provide the ability to drain fluid once you have disengaged from the packer during tripping out.