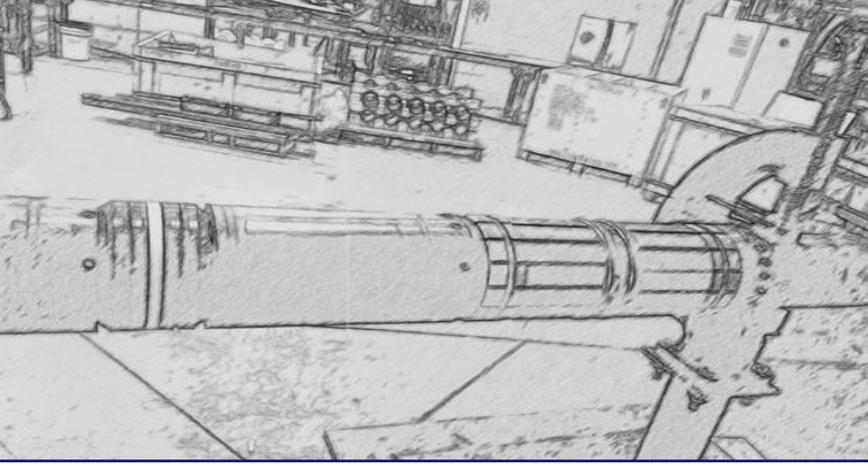


# **SYN WENCO**

*SERVICES & TOOLS*      *A GoldStar Group Company*

## ***PRODUCT CATALOG 2023***





## ABOUT US

SYSVENCOL is a subsidiary of GoldStar Group. We are highly dedicated to the needs of our clients, taking into account that they and our employees are the most precious treasure for us.

SYSVENCOL is a company focused on the energy sector providing services and products for oil well completion to customers with an immediate and efficient solution to their needs.

SYSVENCOL provides a wide range of products as Liner Hangers, Packers, Seals Assy, Sleeves, Down Hole Gauges, Fiber Optic, VIT, Steam Injection Tools and accessories

## OUR LOCATION

SYSVENCOL is located in Venezuela with partners in Miami/Usa, Calgary/Canada and Georgetown/Guyana

Our location provides us with a geographical competitive advantage in the Caribbean countries and Latinoamerica



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## LINER PACKER “SPARK”



The Sysvencol Liner Packer "Spark" or Thermal application "Spark HT" is a dynamic, durable, and field proven packer that is simply reliable. The Spark HT is used in applications where both the liner does not need to be anchored and where thermal expansion is expected. It is a robust seal designed to accommodate thermal expansion liner movement up to as much as 20 ft. The packer incorporates an extremely short setting sleeve that considerably shortens the tools profile improving its mobility, and provides the shortest available PBR which can be adapted with our Tie-back Nipple. The smallest OD and the elimination of a long and rigid tie-back results in significantly less friction when circulating to clean out the hole, and leads to more success when trying to convey to depth into tight radius horizontal wells. The Tie-Back Nipple can be released and re-engaged to simplify the spacing out of completions. All of our hangers are conveyed and retrieved via tubing or drill pipe with our Running/Setting Tools. The running/setting tools are designed for extreme high torque operations, including rotating and drilling the liner into position

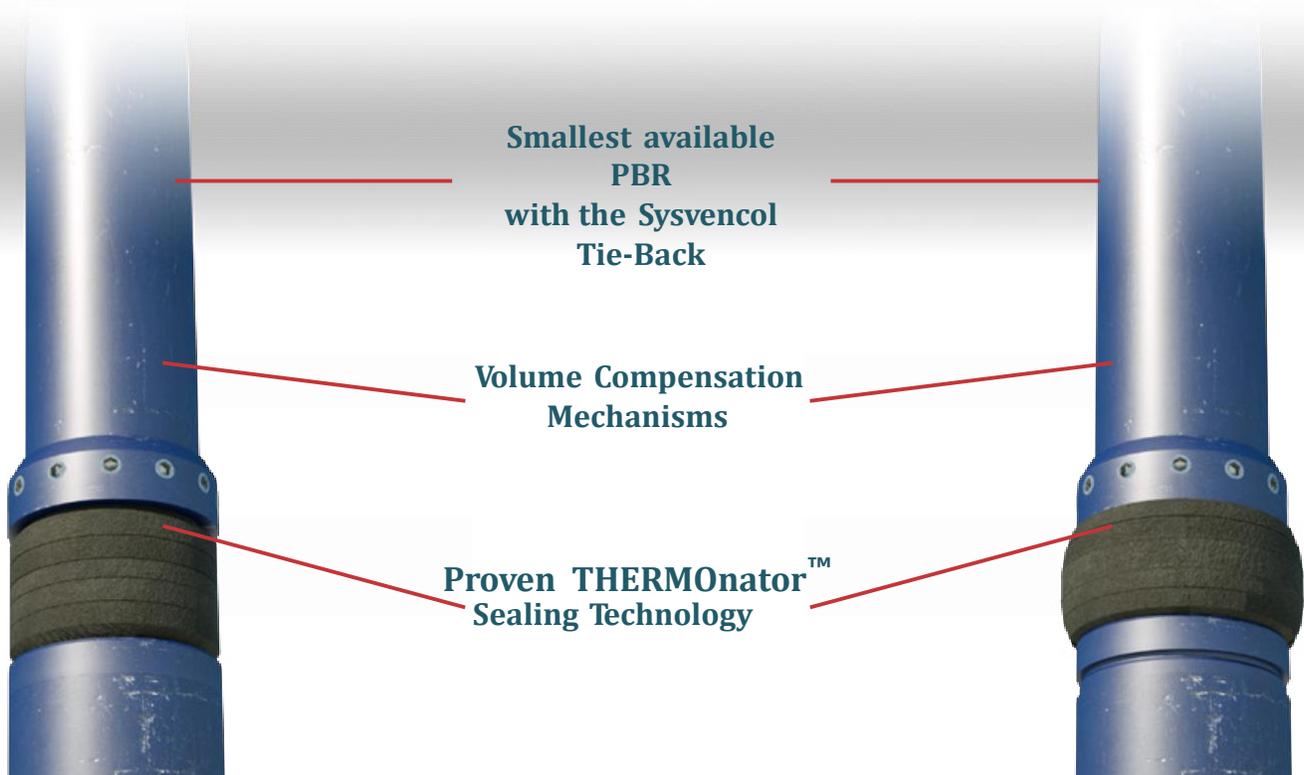
### DYNAMIC SKID RINGS:

The "Spark HT" Thermal Liner Top Seal utilizes top and bottom skid rings that allow the tool and liner to travel while relieving stress on the seal. The skid rings also act as scrapers that condition the casing upon travel by removing any irregularities, build-up, and any unwanted materials that may impregnate or damage the seal during travel. The seal is securely maintained in a set position by an integral ratchet, and volume compensation mechanisms that sustain the seals effectiveness throughout the life of the installation by maintaining element energy in all conditions. The seal integrity improves with solid impregnation which is typical given the dynamic nature of unsecured liner top movement in a thermal well.

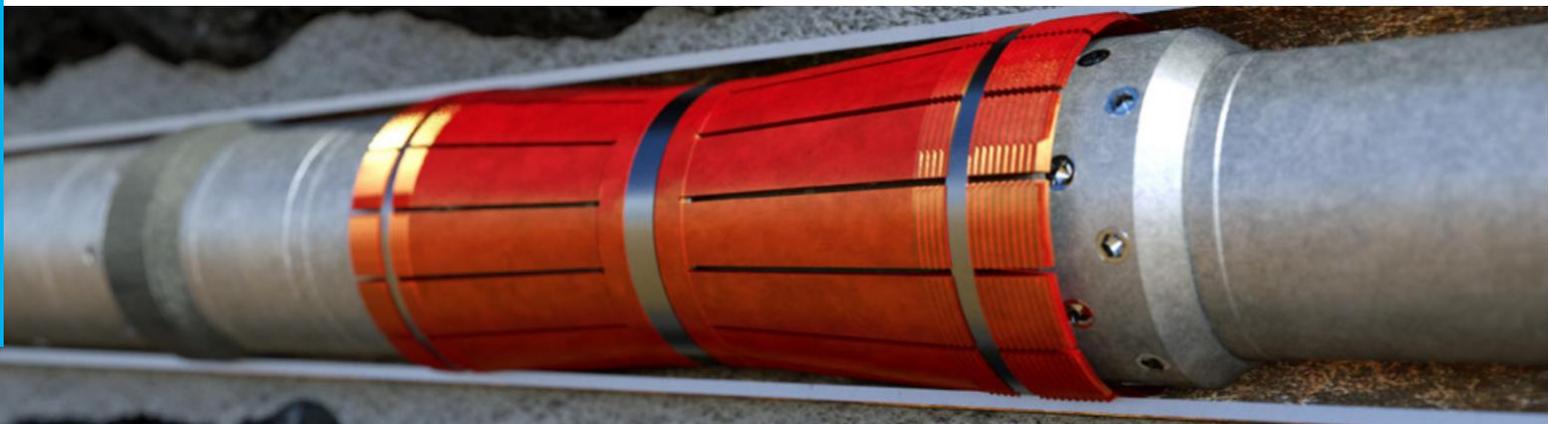
### FEATURES AND BENEFITS:

- Rated at 675°F and 3000psi
- Accommodates up to 20ft of liner travel
- Backup seal skid rings accommodate travel and reduce stress on seal
- THERMONator™ thermal element developed over 20 years of thermal experience and testing
- Tie-back nipple kit eliminates need for long tie-back receptacle

LINER HANGER SIZE	CASING		Liner	
Liner x Casing size (in)	Casing Size (In)	Weight (lb/ft)	Size (in)	Weight (lb/ft)
5" x 7"	7"	23# - 38#	5"	11,5# - 18#
5- 1/2 " x 7"	7"	17# - 26#	5 - 1/2"	13# - 23#
6-5/8" x 8-5/8"	8-5/8"	24# - 32#	6-5/8"	17# - 32#
7" x 9-5/8"	9-5/8"	29# - 53,5#	7"	17# - 35#
8 - 5/8" x 11-3/4"	11-3/4"	42# - 54#	8-5/8"	24# - 49#
9-5/8" x 13-3/8"	13-3/8"	48# - 85#	9-5/8"	29,30# - 53,5#
10-3/4" x 13-3/8"	13-3/8"	48# - 68#	10-3/4"	32# - 55,5#



# SYSVENCOL LINER TOP HANGER PACKER



The Sysvencol retrievable liner top hanger packer is suitable for a wide variety of through tubing applications. Designed for operation in conventional, extreme, high pressure and thermal environments up to 600<sup>o</sup> F, the packer has been engineered for the most extreme deviated and undulated vertical and horizontal well applications.

The proprietary design offers full 360<sup>o</sup> tubing contact with 'state of the art' durability, pressure maintenance and hanging/compression capacity. Our unique dual collet slip design offers bi-directional pressure and force maintenance while a one piece inner mandrel provides upper and inner bore sealing, eliminating the need for PBR or setting sleeve integral seals when used with our Sysvencol Tie Back Nipple.

Designed with simple operation in mind, zero set down weight is required for setting, while a single downward movement engages the soft release allowing slips and seal mechanisms to release for easy extraction out of the well.

An available conversion kit allows the Sysvencol Running/Setting tool shear stud to release from the setting tool and adapter kit, converting it to a conventional electric line setting tool.

## COIL TUBING & JOINTED PIPE

The hydraulic setting tool is used to set the Sysvencol Liner Top Hanger Packer. On retrieval, a soft release extension is supplied which is threaded to our running tool. Stabbing into the liner top hanger packer shears the soft release mechanism for easy pull and release with a secondary shear release.

## FEATURES AND BENEFITS

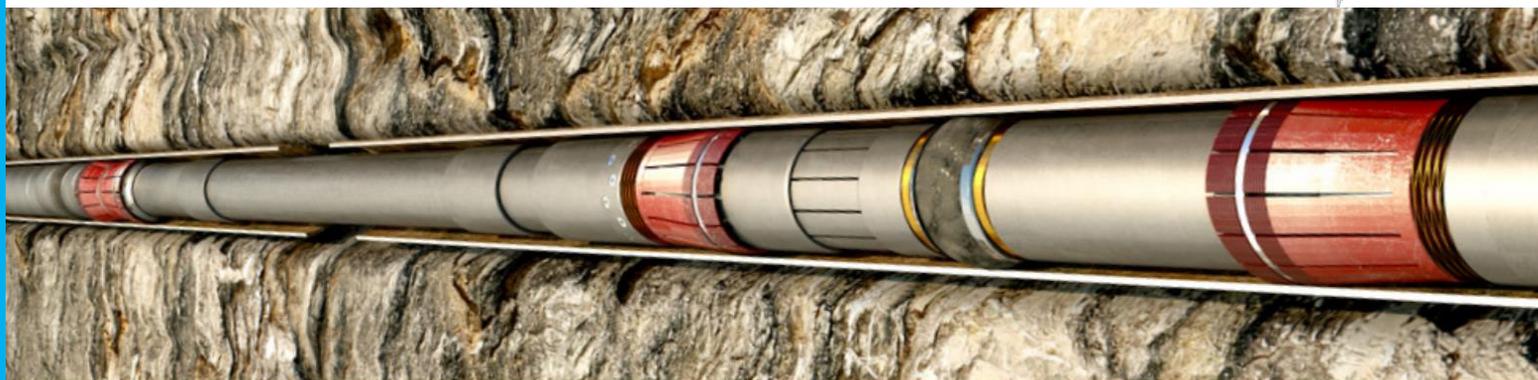
- Completely retrievable
- Adaptable to Primary or Thermal Seals
- Primary Seal rated to 10,000 Psi.
- Thermal Seal rated to 600 F at 2,500 Psi.
- Simple, short design makes hole deviation not a concern.
- Ratchet rings maintain seal stress as well as positive slip setting force
- Bi-Directional Slip set with 3600 coverage
- Full ID through bore eliminates flow restrictions
- Field adjustable shear setting
- Unique and very strong Collet type slips w/ retainers for secure run in
- Optional Internal PBR and One-Piece Mandrel
- Drill in ready, capable of rotating liners into place when required
- Can be installed below restriction (nipples)
  - Most special clearances and ID combinations available on request
- One piece mandrel increases strength and pressure integrity
- Engineered for conventional, hazardous or thermal applications
- Soft set option with secondary shear release
- Can be installed and retrieved by wireline, coiled tubing or jointed pipe

## APPLICATIONS

- Straddling or hanging sand control liners across productive intervals
- Tubing patch
- Pump seating nipple for slim hole completions
- Check valve
- Blanking plug
- Down hole choke for injection or production independent of nipples
- Gravel packing configured for:
  - one trip circulating gravel packs
  - one trip squeeze gravel packs (usually high dense)
- Multistage fracturing
- Cementing wellbore
- Sand Control liners
- SAGD and CSS Liners

LINER HANGER SIZE	CASING		Liner	
	Liner x Casing size (in)	Casing Size (In)	Weight (lb/ft)	Size (in)
5" x 7"	7"	23# - 38#	5"	11,5# - 18#
5- 1/2 " x 7"	7"	17# - 26#	5 - 1/2"	13# - 23#
6-5/8" x 8-5/8"	8-5/8"	24# - 32#	6-5/8"	17# - 32#
7" x 9-5/8"	9-5/8"	29# - 53,5#	7"	17# - 35#
8 - 5/8" x 11-3/4"	11-3/4"	42# - 54#	8-5/8"	24# - 49#
9-5/8" x 13-3/8"	13-3/8"	48# - 85#	9-5/8"	29,30# - 53,5#
10-3/4" x 13-3/8"	13-3/8"	48# - 68#	10-3/4"	32# - 55,5#

# SYSVENCOL PATCH TOOL



The Sysvencol Patch provides a durable and dependable high grade steel tube sealing across casing corrosion, perforations, splits or leaks. Deployed in a single trip, the Sysvencol Patch is engineered to be fully retrievable. It provides an economical solution for casing damage and erosion caused by connate water zones, thermal cycling, static annular fluid during production and shearing or collapse caused by formation degradation, swelling or movement. The system incorporates our field proven liner hangar packer and seal technology. Both tools offer unparalleled reliability with a proven track record of performing in the harshest of environments. Once installed across shear or collapsed mother bore sections, the Sysvencol Patch restores well bore integrity for thermal injection, production and well bore access to productive intervals.

## INTEGRATED EXPANSION

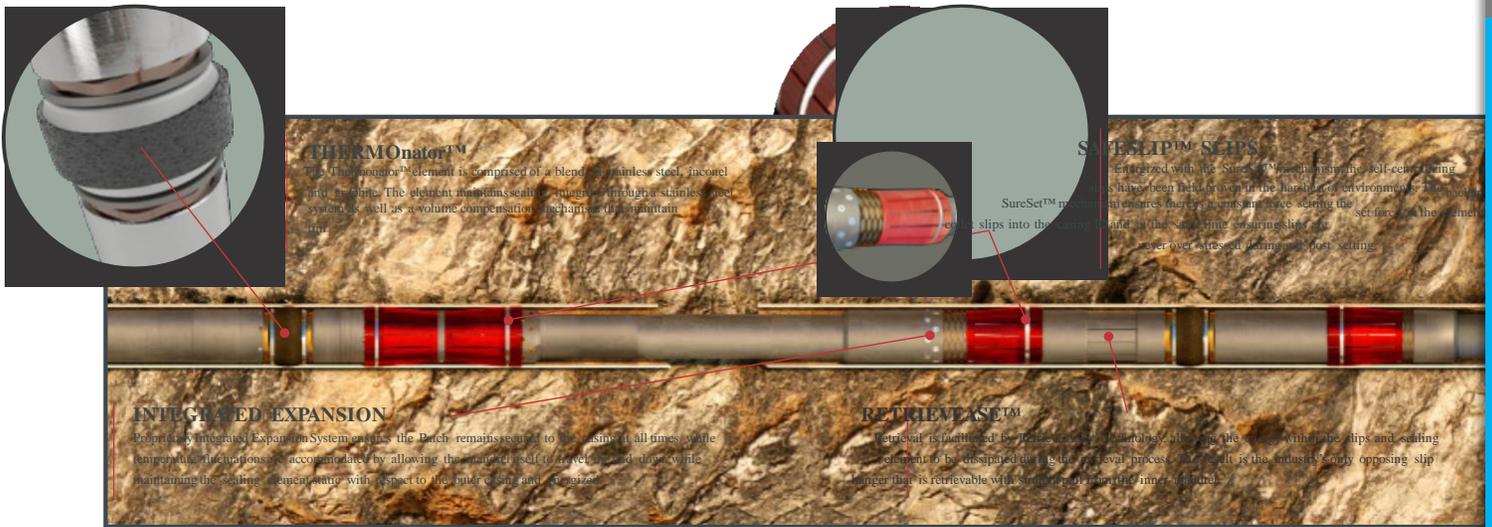
The integrated expansion system removes internal ID changes resulting in an exceptionally smooth internal bore, mitigating the risk of erosion which is a typical failure mode of traditional patches. The sealing elements remain static to the casing they are set in, allowing only the precision ground tungsten carbide coated mandrel to move in and out of the element, eliminating the risk of element deterioration and compromising the seal

## SINGLE TRIP SYSTEM

Deployed in a single trip, the Sysvencol Patch is as efficient as it is simple to install. The patch is set hydraulically by a ball drop. An exceptionally large bore ID allows passage of service and logging tools. The large ID allows increased flow rates ensuring maximum production efficiency of the well. Before disconnecting from the patch, the top and bottom sealing element can be fully tested simultaneously. This eliminates the need to run in hole with expensive and unreliable through patch tools to verify sealing integrity.

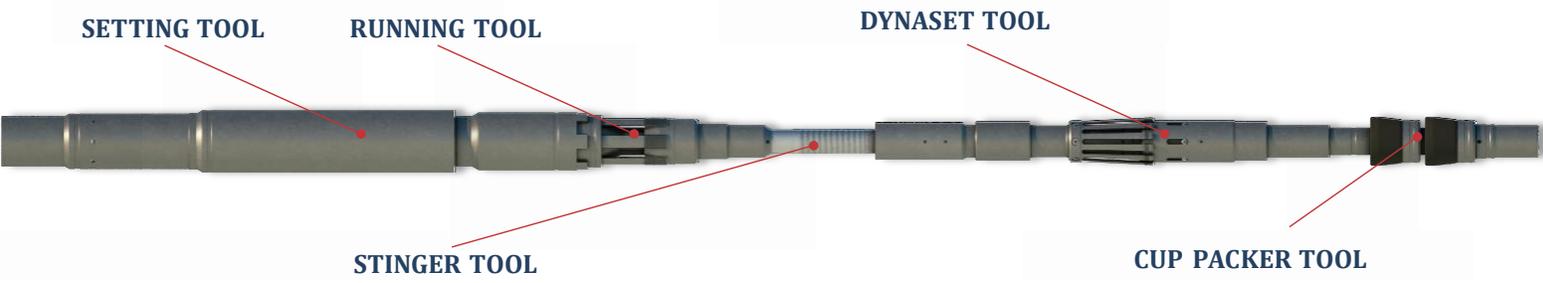
## FULLY RETRIEVABLE

The Sysvencol Patch is retrieved with straight pull of the inner patch tube with the same mechanisms as its components. Deploying the Running tool complete with the setting tool, the Sysvencol Patch features the industries only hydro-mechanical release system. By latching back into the top of the patch and applying both pressure and tension on the work string the patch can be retrieved with minimal hook load requirements.



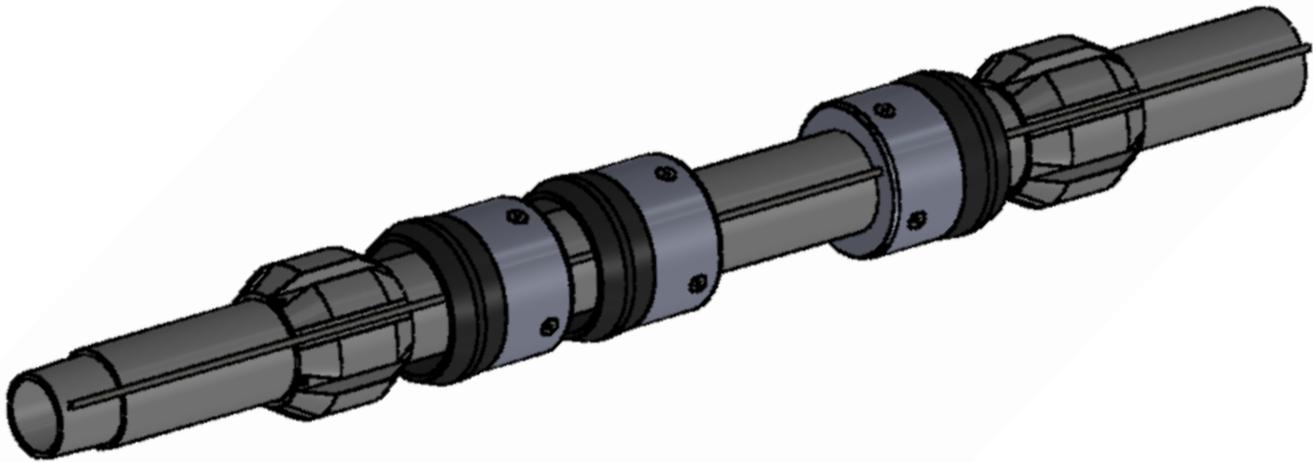
**SYSVENCOL PATCH LINER STRING**

This proprietary set of tools sets the Patch with a single ball. Once the Sysvencol Patch has been set, subsequent retrieval of the inner string allows full access to the well bore.



LINER HANGER SIZE	CASING		LINER	
	Liner x Casing size (in)	Casing Size (In)	Weight (lb/ft)	Size (in)
5" x 7"	7"	23# - 38#	5"	11# - 18#
5- 1/2 " x 7 -1/2"	7"	17# - 26#	5 - 1/2"	13# - 23#
6-5/8" x 8-5/8"	8-5/8"	24# - 32#	6-5/8"	17# - 32#
7" x 9-5/8"	9-5/8"	29# - 53,5#	7"	17# - 35#
8 - 5/8" x 11-3/4"	11-3/4"	42# - 54#	8-5/8"	24# - 49#
9-5/8" x 13-3/8"	13-3/8"	48# - 85#	9-5/8"	29,30# - 53,5#
10-3/4" x 13-3/8"	13-3/8"	48# - 68#	10-3/4"	32# - 55,5#

# FEED-THRU THERMAL CUP PACKER



The Feed-Thru Thermal Cup Packer is a premium packer designed to effectively seal off a particular area by providing insulation during stimulation and steam injection activities suitable for Enhance Oil Recovery (EOR) projects allowing permanent monitoring through its feed thru line. Its thermaite steam cup packers and metallurgy withstand up to 600 °F. The configuration of the Feed-Thru Thermal Cup Packer allows free positioning of the cup seals.

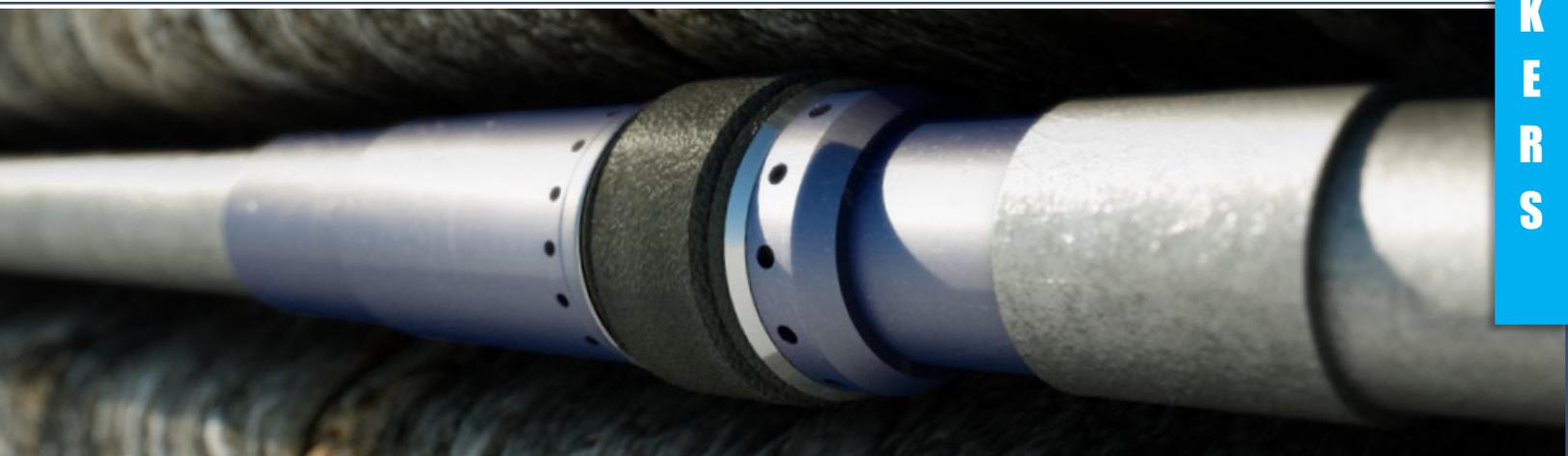
## FEATURES/BENEFITS

- No Setting tool required
- Easy installation
- Adjustable Cup packer positioning.
- Suitable for insulation and stimulation activities.
- Thermaite steam cup packers
- Permanent monitoring during EOR activities
- Available for standards and thermal applications up to 600 °F

## PERFORMANCE SPECIFICATIONS

PERFORMANCE SPECIFICATIONS	
Casing Size	7"
Pull Strength	122,500 lbs
Collapse Pressure	7,000 psi
Burst Pressure	7,000 psi
Temperature Rate	600 °F
Connections	3-1/2" Hydril CS Pin x Box
Seal Elements	Thermanite high performance

# SYSVENCOL OPEN HOLE PACKER



Sysvencol Open Hole Packer is a cost effective full bore open hole packer deployed as part of multi-stage stimulation. Positioned between two stages and creates isolation during stimulation. The number of intervals being stimulated in a well is equal to the number of open hole packers required.

## OPERATION

The packer is set when the on board piston is subject to a differential exceeding its pre-set activation pressure. The element creates a reliable seal inside the open hole, creating effective isolation between intervals. The design features an anti-preset function allowing the liner to be conveyed safely and also features anti-extrusion barriers on the element.

The Sysvencol packer is elegantly simple, yet robust, rugged and effective. The entire tool can be picked up and threaded on location with no requirement of pup joints or lifting subs. The torque rating of the tool allows for torque through rig operations when making up connections. Employing a simple, differentially activated piston, the element sets and maintains the set force with a fine tooth ratchet mechanism. The piston is long enough to ensure no risk of over-setting the element which traditionally has lead to leaky liner from piston over-extension. A metal split ring maintains the position of the bottom gauge ring ensuring any forces on the gauge ring running in hole are easily accommodated.

Engineered with two anti-swabbing mechanisms, it features Equalization Ports and Vulcanized Bonding. Equalization ports ensure there can never be differential from the OD to the ID of the element, which until now has been the main cause of element swabbing in longer elements. Vulcanized bonding bonds the rubber to the metallic gauge ring on each side providing the element with exceptional durability. The adhesion of the bonding exceeds the mechanical properties of the rubber itself, eliminating the risk of tearing the element from the gauge ring and subsequently swabbing the element off the packer.

**APPLICATIONS & BENEFITS:**

- Multi-stage stimulation
- Isolation for acid stimulation

**FEATURES:**

- Anti-Swab Design
- Anti-Extrusion barriers on element ensure efficient pack-off
- Unlimited number of packers can be set simultaneously



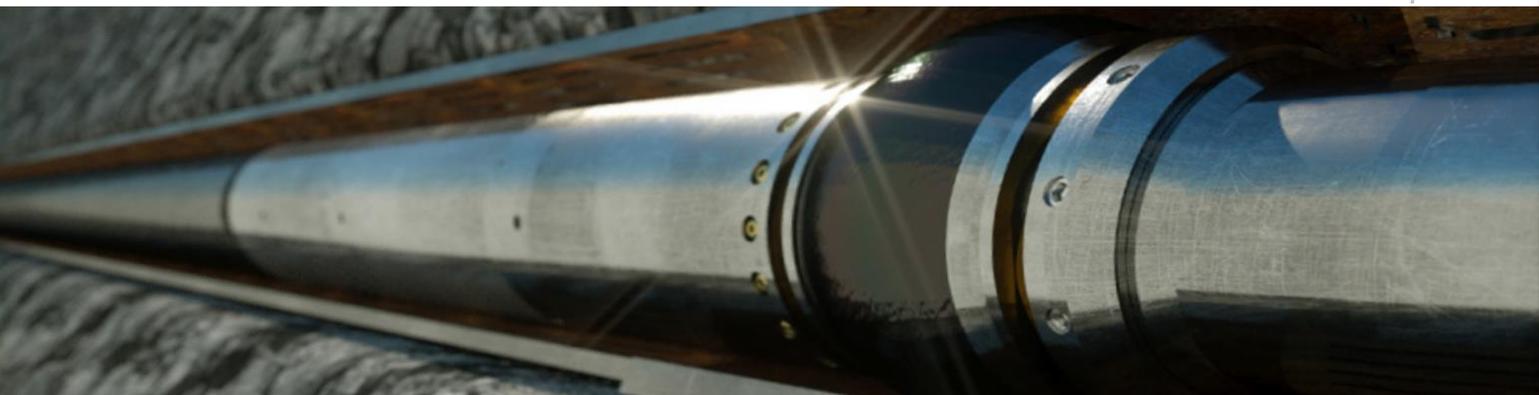
Long piston eliminates over-setting

Vulcanized bonding to gauge ring

Field dressable activation pressure

PERFORMANCE SPECIFICATIONS	
Max Burst Collapse	10,000 psi
Temperature rating	250 °F
Connections	As Requested
Open / cased Hole max	5,9" - 9"
Setting Pressure	2453 psi
Tensile	625,000 lbs
Torsional	10,000 ft-lbs

# HYDROSPARK



## RELIEABLE THERMAL INSULATION

The Hydro-Spark™ Thermal Seal is a fully retrievable, hydraulic set packer designed for use in cyclic steam systems, SAGD, geothermal and compartmentalization applications.

The Hydro-Spark can be successfully set in pipe that has become oblong due to steam cycling and is able to float with expanding and contracting liners due to temperature cycling. Any number of seals can be run in a well simultaneously and the seal is ideal for compartmentalization of tubing conveyed ICD and Steam Injection subs / tools.

## APPLICATIONS

- Compartmentalization
- CSS
- SAGD
- Geothermal

## FEATURES

- Slim OD and Short overall length, facilitates conveyance
- Easy to convey
- Rated to 650 °F and 3000 PSI
- Retrievable with slight over-pull with Little interference upon recovery.
- Control line feed through allows for multi string completions

## PERFORMANCE SPECIFICATIONS

PERFORMANCE SPECIFICATIONS				
Caing Size	7"	7"	8-5/8"	9-5/8"
Tubig Size	4,5"	5"	5,5"	7"
OD	5,95"	5,95"	7,75"	8,50"
ID	3,88"	4,151"	4,77"	6,19"
Element Rating	3,000 psi	3,000 psi	3,000 psi	3,000 psi
Req. Set Pressure	2,000 psi	2,000 psi	2,000 psi	2,000 psi
Tensile	237,000 psi	237,000 psi	350,000 psi	450,000 psi
Burst Strength	2,500 psi	2,500 psi	2,500 psi	2,500 psi
Temperature Rating	650 °F	650 °F	650 °F	650 °F

# HYDROSPARK WITH FEED-THRU



The Hydro-Spark can also be provided with control line feed through suitable for multi string completion and cyclic steam systems, SAGD, geothermal and compartmentalization applications. It is able to float with expanding and contracting liners when temperature cycling exists. Any number of HydroSpark™ assemblies with control line may be run in a well simultaneously.

PERFORMANCE SPECIFICATIONS	
Casing Size	7"
Tubing Size	3,5"
OD	5,95"
ID	2,9"
Working Pressure	5,000 PSI
Element Rating	2.000 PSI
Req Set Pressure	3.500 PSI
Tensile Strength	200,000 LBS
Compression Strength	165.000 LBS
Temp Rating	600 °F

## FEATURES

- Slim OD and Short overall length, facilitates conveyance
- Easy to convey
- Rated to 600 °F and 2000 PSI
- Retrievable with slight over-pull with little interference upon recovery.
- Control line feed through allows for multi string completions

## APPLICATIONS

- Compartmentalization
- CSS
- SAGD
- Geothermal

# HYDROSOLACE WITH FEED-THRU



## DESIGNED FOR MODERN COMPLETION SYSTEMS

Reliable and economic the Hydro-Sole features a unique feed through line which provides the operator the option of static pressure sensing or fiber optic, thermo-couple or pressure sensors.

With field proven SureSet™ technology it is our most economic, low profile, full bore, and smallest OD hanger solution. Used as a production or isolation seal bore packer, it was built for a wide range of completion operations in vertical, deviated, and horizontal wells; for the purposes of gravel packing, fracturing, and hanging liners and sand control. A one piece mandrel provides maximum torque capabilities, and allows retrieval or fishing from the mandrel with maximum force.

The short stature features the smallest available OD including the PBR which can be adapted with our Shorty Thermal and Primary Tie-back Nipple. The elimination of a long and rigid tie-back results in significantly less friction when circulating to clean out the hole, and leads to more success when trying to convey hangers to depth into tight radius horizontals.

## FEATURES AND BENEFITS

- Feed Through line provides static pressure sensing or optional fiber optic, thermocouple or pressure sensors.
- Smallest OD and Length of any Retrievable Liner
- Hanger Rating of 675°F and 3,000 PSI thermal and up to 10,000 PSI and 400°F primary.
- THERMONator™ thermal sealing element developed over 20 years of thermal experience and testing
- Volume Compensation seal energizing mechanisms maintain full set force in the seal over life of the hanger
- Maximum torque rating for turning or drilling into place
- Proven reliable ExTrack/Beast Running, Setting and Retrieval Tools, compatible with all our hangers/packers
- 360 degree Collet slips, maximum contact and highest available hanging and compression load capacity
- Slip shear pins retain slips tightly in position, mitigating potential premature setting during conveyance
- SureSet™ mechanism ensures proper transfer of set force from top to bottom slip during life of the hanger.
- Shortest available PBR with our Shorty retrievable Tie-Back Nipple designed for thermal (675°F, 3000 Psi) and primary (up to 10,000 Psi)
- Soft and hard release options available for retrieval, a hard release is recommended for thermal environments.

# SYSVENCOL CASING PACKER



*Our Casing Packer offers maximum adhesion for complete isolation control*

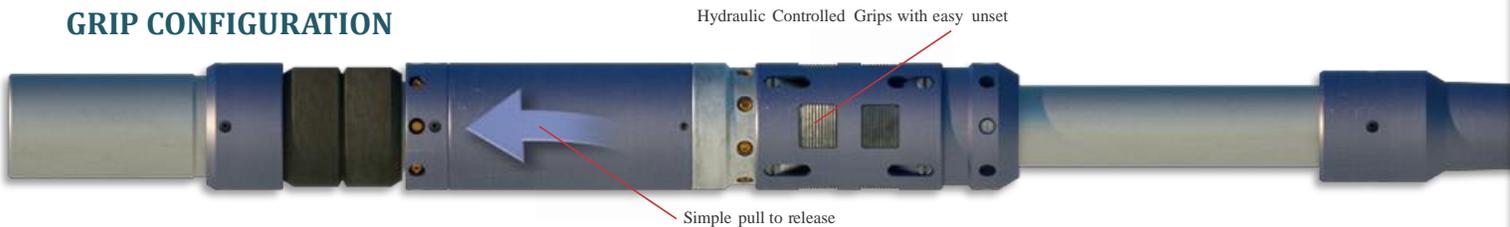
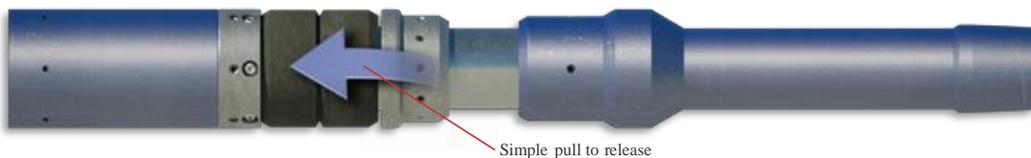
Sysvencol Packers are a cost effective retrievable family of casing packers deployed as part of multi-stage stimulation geared towards re-completions. Positioned between two stages in the re-completion, the Sysvencol Casing Packer creates isolation during stimulation. The number of intervals being stimulated in a well is equal to the number of packers required. It's ultra slim running profile means it is ideal to be ran in through milled out ball seats for re-completions.

## OPERATION

Sysvencol Casing Packers are set when the on board piston is subject to a differential exceeding its pre-set activation pressure. The element creates a reliable seal inside casing, creating effective isolation between intervals. The design features an anti-preset function allowing the liner to be conveyed safely.

It is elegantly simple, yet robust, rugged and effective. With an overall length of less than 3ft, the entire tool can be picked up and threaded on location with no requirement of pup joints or lifting subs. Employing a simple, differentially activated piston, the element sets and maintains the set force with a fine tooth ratchet mechanism. The piston is long enough to ensure no risk of over-setting the element which traditionally has lead to leaky liner from piston over-extension. A metal split ring maintains the position of the bottom gauge ring ensuring any forces on the gauge ring running in hole are easily accommodated.

Engineered with Equalization Ports for anti-swabbling during run-in, the ports ensure there can never be differentia from the OD to the ID of the element, which until now has been the main cause of element swabbing in longer elements. Each Sysvencol Casing Packer features an easy unset mechanism which allows the element to fully collapse and be pulled out of hole.

**GRIP CONFIGURATION****PULL CONFIGURATION****APPLICATIONS & BENEFITS:**

- Fully Retrievable
- Less than 3' long
- Ultra-slim running profile

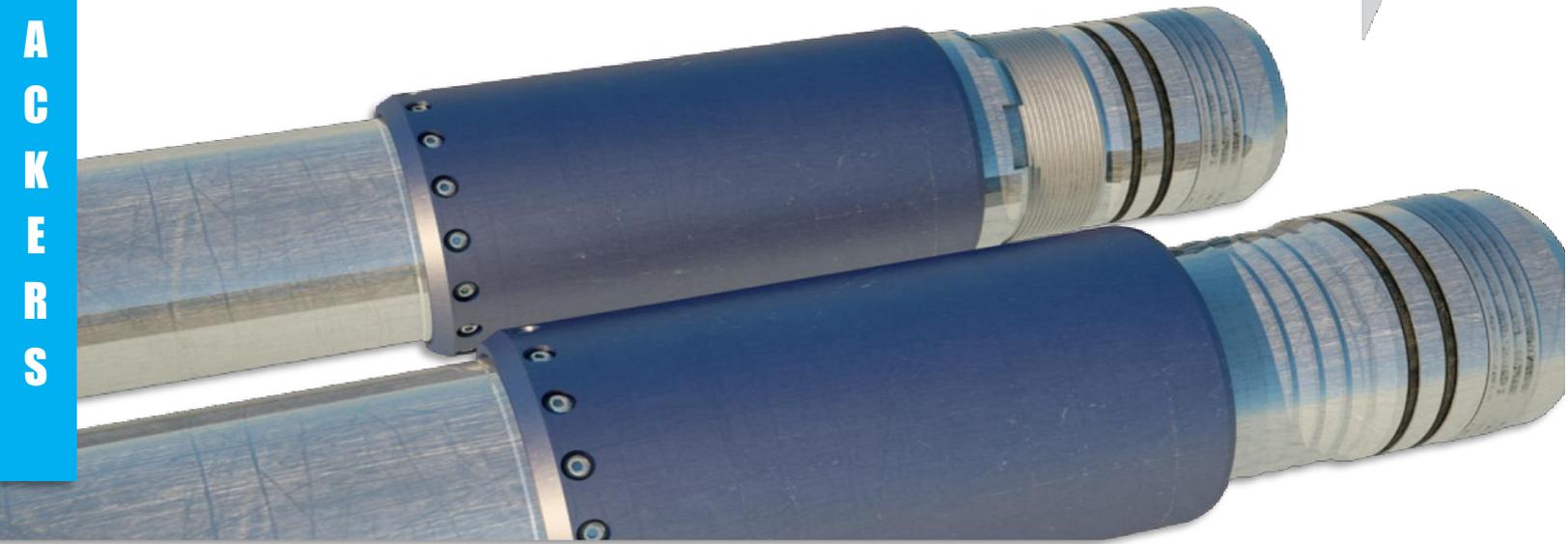
**FEATURES:**

- Anti-Swabbing Design
- Anti-Extrusion barriers on element ensure efficient packoff
- Packers can be set simultaneously

**GRIP****PULL****PERFORMANCE SPECIFICATIONS**

PERFORMANCE SPECIFICATIONS	
Casing Size	4,5" (11,6 - 15,1#)
Max Burst Collapse	10,000 psi
Temperature rating	285 °F
Connections	As Requested
Setting Pressure	4,000 psi
Tensile	90,000 lbs
Rotational Shear Max	1,600 ft-lbs

# SYSVENCOL TIE-BACK



Our Liner Top Packers and Liner Top Seals are engineered with one piece mandrels complete with integral PBR, allowing the operator to tie-back the liner by utilizing the Sysvencol Tieback Nipple Line. Eliminating the need to tie-back to a setting sleeve of a Liner Top mechanism dramatically decreases potential leak paths. The Sysvencol Tie-Back Nipples guarantee a high quality seal, are ultra short and snap, lock or locate directly into the mandrel of the Liner Top Packer and Liner Top Seal.

## There are three basic configurations of the Sysvencol Tie-Back Nipple:

- **Locator Type:** Set down to enter PBR with seal and over pull to exit seal from PBR. (No rotation required)
- **Snap Locator Type:** Set down to enter PBR with seal and over pull by predetermined amount to 'snap' seal from PBR. (No rotation required). *Note: release force has to be predetermined and pre ordered.*
- **Latch Locator Type:** Set down to enter and latch Seal into PBR and over pull with  $\frac{1}{4}$  turn of right hand rotation at the tool releases Latch Locator from PBR. *Note: only used when being run with jointed work string as rotation. Torque is required.*

## FEATURES

- Eliminates need for extra-long PBR's for sealing in and locating on setting sleeves
- Eliminates the need for setting sleeve seal
- Rated to 7,500 psi Primary
- Rated to 2,500 psi Thermal at 600 °F
- Rated to strength of Liner
- Does not restrict ID or integral strength of our Liner Top Packers and Liner Top Seals
- Threads are machined and compatible with most blank, perforated or sand control liners.

# GS HD RETRIEVABLE PACKER LEFT-HAND AUTO

The GS HD Retrieval Packer is a heavy duty service packer ideally suited for all types of squeeze cementing, formation fracturing, high pressure acidizing, etc. It is a large opening compression set packer with hydraulic button-type hold down. This packer withstands high pressure from above or below and uses a 3-element packing system, J-slot, and a drag block mechanism for easy setting. The packer has a built-in unloader which circulates across the hold down buttons to improve retrievability and run in performance.

## PERFORMANCE SPECIFICATIONS

Casing Size	Casing Weight	Recommended Hole Size	Thread Connections Box Up / Pin Down
7"	17-26 lbs-ft	6,276-6,538 "	2-7/8" EUE
	26,0-32,0 lbs-ft	6,094-6,276 "	2-7/8" EUE
9-5/8"	32,3-43,5 lbs-ft	8,755 - 9,001"	4-1/2" EUE
	43,5-53,5 lbs-ft	8,535 - 8,755"	4-1/2" EUE
10-3/4"	32,75 -45,5 lbs-ft	9,950-10,192"	4-1/2" EUE
	51,0-65,7 lbs-ft	9,560-9,850"	4-1/2" EUE
	65,7-91,2 lbs-ft	9,032-9,560"	4-1/2" EUE

Casing Size	Differential Pressure	Hanging Weight	Tensile Load Thru Tool
7"	10,000 psi	135,000 lbs	135,000 lbs
9-5/8"	8,000 psi	214,000 lbs	214,000 lbs
10-3/4"	8,000 psi	214,000 lbs	214,000 lbs

Rubber Type	Temperature Range
Nitrile	70 - 250 °F
HSN (HNBR)	70 - 300 °F
Viton	100 - 350 °F

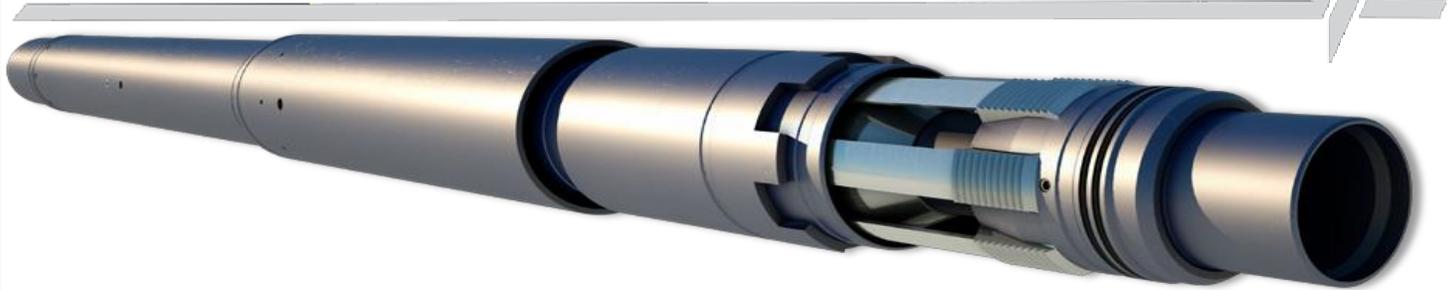
Other sizes available upon request.

Contact GoldStar Group Sales For 250 ° F + specifications



# SYSVENCOL SETTING TOOL BEAST

## RUNNING AND RETRIEVING TOOL



The Sysvencol Running / Setting tool is a Dual-Cylinder, hydraulically actuated. This Setting tool designed for vigorous push, pull, drill-down, and drill-in operations in tension or compression when working liners to bottom. The Running Tool will run and retrieve any of our Liner Hanger or Liner top Seals. With only the weight of the Running Tool, the snap latch collet thread engages into the running thread receptacle on the one piece mandrel of any of our liner top equipment. The high torque clutch, capable of up to 30,000 ft-lbs of torque (in some sizes), automatically engages the matching clutch of the one piece mandrel.

### PRIMARY HYDRAULIC RELEASE:

The tool is operated by two separate stages of hydraulic pressure differential. The first pressure stage activates the dual piston setting tool, which initiates and completes the hanger set. Once set, a second higher pressure stage shears the tools release sleeve providing circulation indicating positive release. Setting down collapses the unique collet running thread, disengaging from the liner top and held in the unset position eliminating the possibility of re-latching the hanger.

### SECONDARY LEFT HAND RELEASE:

A secondary safety release can be activated in the unlikely event that the tool string cannot be pressurized. The tool can be set to shear with left hand rotation at the tool, at a pre-specified value, and then weight can be set down to release the tool from the liner.

### TERTIARY THREAD OUT RELEASE:

In the unlikely event that the secondary left hand release has been completed but the running tool will still not release from the liner, it can be released from the liner with right-hand rotation.

### FEATURES:

- Most simple and robust Running/Setting Tool available, stab-in and hydraulic release
- One tool sets and retrieves all Sysvencol Liner top Equipment
- Simple operation, redress and field adjustable shear setting
- High Torque through capacity
- Circulation Tell-Tale indicates release from liner
- Once unset, circulation is to the bottom of the running tool
- Compression capabilities during run in hole without release

# GS AS RETRIEVABLE PLUG

The GS AS Retrievable Bridge Plug is a high pressure plug for multiple zone and selective single zone operations such as acidizing, fracturing, cementing and testing. It features a large internal by-pass to reduce swabbing when running and retrieving. The by-pass closes during the setting of the plug and opens prior to releasing the upper slips to equalize pressure when unsetting. The by-pass is located directly below the upper slips to help wash debris when the by-pass is open. This tool can be set in tension or compression. It can be set shallow in unsupported casing to contain pressure while working on wellhead equipment. It can be set in tension making it ideal for setting shallow to test wellhead equipment and also deep, high-pressure wells.



## PERFORMANCE SPECIFICATIONS

Casing Size	Casing Weight	Recommended Hole Size	Thread Connections Box Up / Pin Down
7"	17-26 lbs-ft	6,276-6,538 "	2-7/8" EUE
	26,0-32,0 lbs-ft	6,094-6,276 "	2-7/8" EUE
9-5/8"	32,3-43,5 lbs-ft	8,755 - 9,001"	3-1/2" EUE
	43,5-53,5 lbs-ft	8,535 - 8,755"	3-1/2" EUE

Casing Size	Differential Pressure	Hanging Weight	Tensile Load Thru Tool
7"	10,000 psi	80,000 lbs	80,000 lbs
9-5/8"	8,000 psi	106,200 lbs	106,200 lbs

Rubber Type	Temperature Range
Nitrile	70 - 250 °F
HSN (HNBR)	70 - 300 °F
Viton	100 - 350 °F

Other sizes available upon request.

Contact GoldStar Group Sales For 250 ° F + specifications

## GS SPRING LOADED RETRIEVING TOOL



The GS Spring Loaded Retrieving Tool is used to set and retrieve the GS AS Retrievable Bridge Plug

Casing size (in)	Tool OD (in)	Tool ID (in)	Thread connection box up
7	5.875	2.50	2-7/8 EUE

## GS-WLAK WIRELINE ADAPTER KIT FOR ASW RETRIEVABLE BRIDGE PLUG



The GS Wireline Adapter Kit (WLAK) for ASW Retrievable Bridge Plugs is used to set ASW Retrievable Bridge Plugs on electric wireline or with a hydraulic setting assembly on tubing. The WLAK automatically disconnects from the bridge plug during packer setting to be easily retrieved and prepared to run again.

Casing size (in)	Tool OD (in)
8-5/8" – 14"	6.000

# DOWNHOLE MONITORING SYSTEMS

## COMPLETE PRODUCT LINE

SYSVENCOL has products and solutions that cover most of the market segments for downhole instrumentation and monitoring products.

**Accountability** means being responsible.

**Responsibility** is being in charge of delivering a satisfactory outcome.

For a company to be truly responsible for successful downhole instrumentation installations, it must offer a complete solution. This is where SYSVENCOL from any other downhole instrumentation company.

## DEPLOYMENT OPTIONS

Tubing Conveyed Systems	Cemented In Systems
Suspended Systems	Artificial Lift Systems
Multi Gauge Systems	Permanent P&T Systems
Deep Horizontal Systems	Systems (500°C) High Pressure Systems
Intrinsically Safe Deployments (Mining)	Environmental

## OTHER ACCESORIES

Quartz Memory Tools	Cable Protectors
Wireless EM Tools	Installation Tools & Spoolers
Wireless Inclination Tool	Centralizers

## SENSOR TECHNOLOGIES

Piezo-Resistive Sensors	Analog 4-20 mA Sensors
Quartz Sensors	Downhole Thermocouples
High Temp Piezometers	Bubble Tube
High Temp Strain	

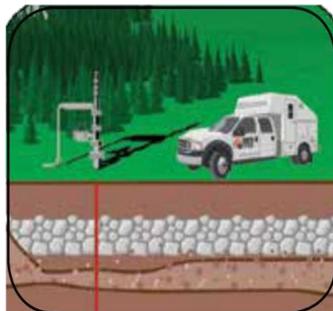
## SURFACE SOLUTIONS

Solar Panel Operated Systems	SCADA / DCS
Wireless Data Transmission	Connectivity
Flow Meters	VFD Integration
	Surface Pressure Gauges

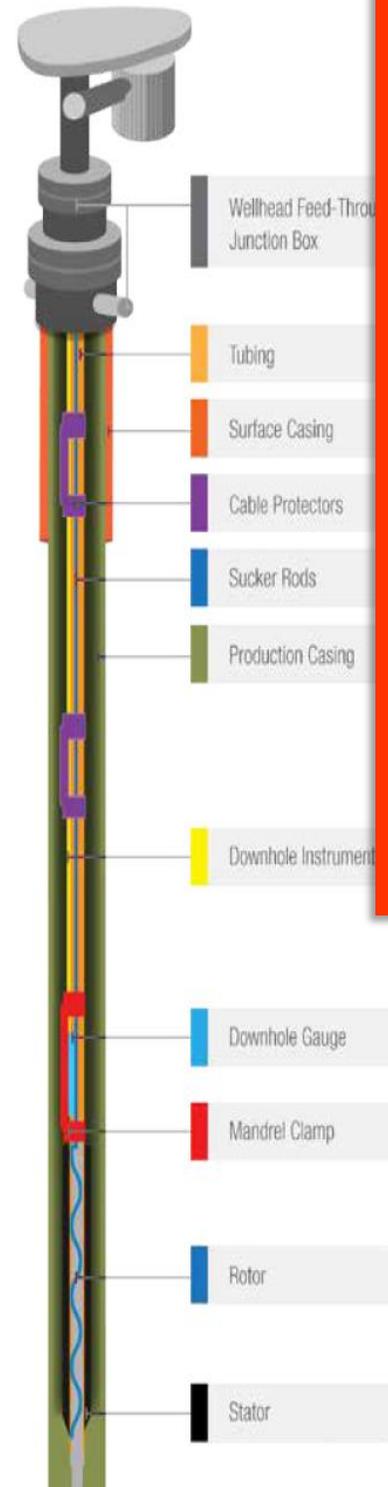
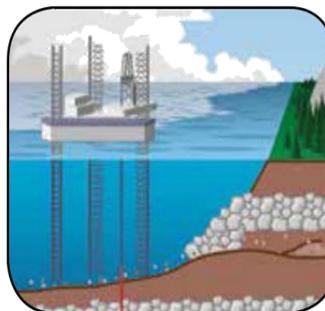
### PUMP CONTROL



### LAND BASE SYSTEM



### OFFSHORE



Progressive Cavity Pump (PCP)  
Completion Illustration

# DOWNHOLE-GAUGE APPLICATIONS



	P105	PT105	PT150	S150	VW250	Q125	Q177	PTV150	AL150	PCP12	IM10	PT300	Bubble Tube
<b>Artificial Lift Optimization</b>													
Rod Pump	•	•	•	•	•				•			•	•
Progressive Cavity	•	•	•	•	•			•	•	•		•	•
Electrical Submersible	•	•	•	•	•			•	•			•	•
<b>Artificial Lift Measurements</b>													
Pump Intake Pressure	•	•	•	•	•			•	•	•	•	•	•
Pump Intake Temperature		•	•	•	•			•	•	•	•	•	•
Discharge Pressure & Temp.									•	•	•		
Vibration								•	•	•			
Downhole Rotor Speed										•			
Downhole Pump Slip & Stick										•			
Downhole Rotor Positioning										•			
Distributed Temperature										•			•
<b>Observation Wells</b>													
Multi Zone Observation			•	•		•	•				•		•
Tubing Conveyed	•	•	•	•	•	•	•	•	•	•	•	•	•
Horizontal Completion	•	•	•	•	•	•	•	•	•	•	•	•	•
Cemented Behind Casing	•	•	•	•	•	•	•	•	•	•	•	•	•
Injection Disposal Wells	•	•	•	•	•	•	•	•	•	•	•	•	•
Suspended Wellbore	•	•	•	•	•	•	•	•	•	•	•	•	•
Monitoring (Wireline SRO)													
Cap Rock Monitoring	•	•	•	•	•			•			•		
Water Well Level Monitoring	•	•	•	•	•				•	•			
Surface Water Monitoring	•	•	•	•	•								
SAGD Geothermal Observation												•	•
High End Reservoir Analysis and Interference Testing						•	•						



# PERMANENT MONITORING – PT150 SRO

## DIGITAL DOWNHOLE PRESSURE AND TEMPERATURE

### HIGH QUALITY DATA WITH RELIABLE PERFORMANCE

Patented integrated *Easy Connect* pressure testable cablehead design allows direct connection to downhole instrumentation cable using metal-to-metal sealing technology.

Gauge body constructed out of 316L stainless steel or Inconel 825 with Hastelloy diaphragm for corrosive applications.

Fully welded construction ensures maximum protection against gas and fluid invasion.

**Multi-gauge.** Up to 10 gauges, any combination of Piezoresistive or Quartz, can be connected to a single downhole tubing encapsulated cable (TEC).

**Smart Technology.** In addition to just recording and transmitting downhole pressure and temperature data, SYSVENCOL gauges communicate other important data that is critical for diagnosis and prompt troubleshooting including: device configuration, device health, downhole head voltage, current, calibration files and downhole serial number identity.

**Field Programmable.** SYSVENCOL gauges can be configured for single or multi gauge applications and work on long lengths of TEC, up to 15,000 meters (50,000 feet).

### PRODUCT SUMMARY

Provides a reliable means of collecting high-quality, real-time downhole pressure and temperature data.

Direct and simple hookup to pump controllers, loggers, supervisory control and data acquisition (SCADA) systems, programmable logic controllers (PLCs) and variable speed drives (VSDs).

Includes RTU Modbus and 4-20 mA communication outputs.

### QUALITY ASSURANCE

Each gauge and G6 gauge controller is IEC 61326 certified by LabTest Certification Inc.. Important protective benefits that make SYSVENCOL systems more reliable include Electrical fast transients / burst surge immunity tested to 4kV, Immunity testing, Electrostatic discharge protection to 15,000 Volts, RF Radiated Immunity, Magnetic field immunity, Voltage dips & Interruptions protection on supply line, and Conducted RF immunity. This process prevents system failure due to incorrect field wiring, poor quality source power, improper grounding, and lightning strikes.

ISO certified manufacturing.



# PERMANENT MONITORING – PT150 SRO

## DIGITAL DOWNHOLE PRESSURE AND TEMPERATURE



### TECHNICAL SPECIFICATIONS

Sensor type	Piezoresistive			
Input voltage	9–24 VDC			
Downhole telemetry	Digital Phase Shift-Key			
Pressure accuracy	± 0.05% full scale			
Pressure accuracy measured in psi for 1,000 psi sensor	± 0.5 psi			
Pressure resolution	0.0003% full scale			
Pressure drift	< 3 psi per year			
Temperature rating	150°C (302°F)			
Temperature accuracy	± 0.5°C			
Temperature resolution	0.01°C at 1 Second			
Outside diameter	0.875" / 2.222 cm			
Overall length	8.10" / 20.57 cm (including cablehead)			
Process Connection	¼" Autoclave HF4			
Construction material	SS 316L, Inconel 718, or Inconel 825			
Real-time sample rate	10 times per second			
Long term vibration resiliency	8g at 120 Hz (equivalent to 150 horse power PCP)			
Available pressure ranges	300	1,500	5,000	10,000
	1,000	3,000	6,000	15,000 psiA
Meets or exceeds the following standards	IEC 61326 Certified			

### DOWNHOLE APPLICATIONS

- Reservoir analysis (Transient-pressure analysis)
- Observation wells
- VSD control
- Multi-zone: Production , Injection wells
- Monitoring frac / Acid jobs



# DOWNHOLE ARTIFICIAL LIFT OPTIMIZATION

## PCP12 SRO



The *PCP12 SRO* exemplifies SYSVENCOL's relentless commitment to downhole reliability and development of downhole instrumentation features that help our customers increase production and reduce workovers.

SYSVENCOL gauges have a mechanical engineering advantage that improves long-term performance and data quality while simplifying the installation process.

### GAUGE SYSTEM MEASUREMENTS

### DATA APPLICATION

### 12-IN-1 MEASUREMENTS

#### Pump intake pressure and temperature

Monitoring and controlling wellbore fluid level to prevent pumping off, reduce sanding off and increase production. Also useful for preventing gas production through the stator.

#### Pump discharge pressure

Real-time pump performance. Measure pump efficiencies. Useful for emergency shut off measurement.

#### Pump discharge temperature

Monitoring elastomer wear.

#### X and Z vibration

Early observation of abnormal pump performance caused by mechanical failure, gas, phase changes or solids produced through the stator.

#### Downhole Rod Speed Surface Speed Downhole Twist

Measure Downhole and surface speeds. Twist is calculated value that expresses sticking and slippage of rotor.

#### Rotor Positioning

perfectly engagement. option thereby

Measuring rotor position enables operators to space out sucker rod string and initial rotor. Continued measurement provides operators the of utilizing a rod rig and repositioning the rotor prolonging pump life.

#### Accumulated surface and downhole pump rotation count

The accumulated pump rotation count lets the operator benchmark lifetime operational statistics.

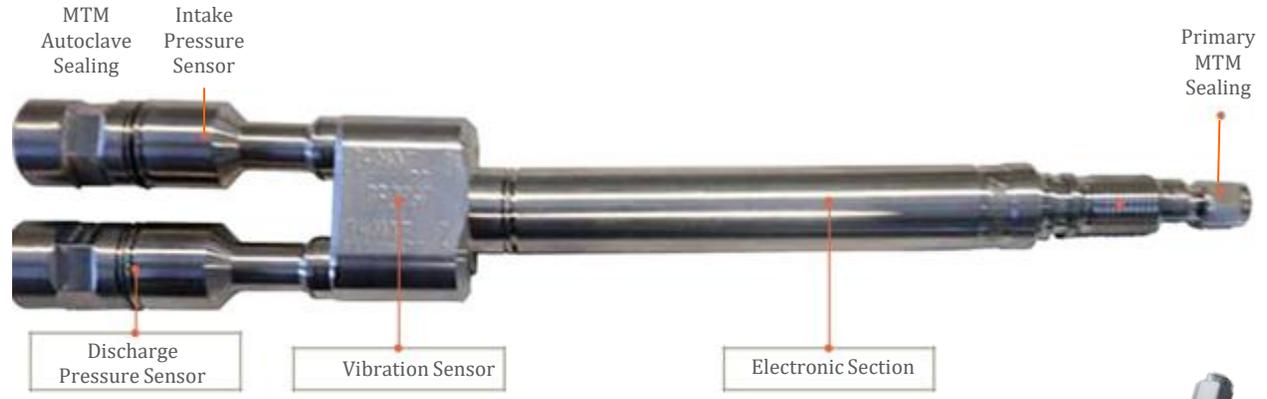
#### Optional Surface Casing Pressure Gauge

The addition of a surface pressure gauge enables GEO PSI to fine tune it's wellbore fluid level calculation.

1. Pump intake pressure
2. Pump intake temperature
3. Pump discharge pressure
4. Pump discharge temperature
5. X vibration
6. Z vibration
7. Downhole rod speed
8. Surface rod speed
9. Rotor Stick and Slip
10. Rotor positioning
11. Optional surface casing pressure
12. Accumulated pump rotation



# DOWNHOLE ARTIFICIAL LIFT OPTIMIZATION PCP12 SRO



TECHNICAL SPECIFICATIONS	
<b>Output</b>	Phase Shift-Key (PSK) telemetry with embedded frequency encoding
<b>Input voltage range</b>	9-24 Volts DC
<b>Available pressure ranges</b>	300                      1,000                      1,500 3,000                      5,000                      6,000 10,000 psiA*
<b>Temperature rating</b>	150°C/302°F
<b>Pressure accuracy</b>	± 0.05% Full Scale
<b>Pressure resolution</b>	0.01 PSI
<b>Temperature accuracy</b>	±1°C
<b>Vibration sensors and resolution data</b>	36 g range 0.034 g resolution
<b>Dimensions</b>	Length 14 7/8" (200.02 mm) x Width 2 1/8" (53.975 mm) x Depth 7/8" (22.225 mm)
<b>Transducer type</b>	Piezoresistive
<b>Magnometer</b>	24-bit resolution
<b>Mechanical body</b>	Stainless steel 316
<b>Process connections</b>	Female autoclave
<b>Sample speed</b>	Two samples per second for pressure and Temperature Up to 1,200 rpm for downhole and surface rod rotation speed



# PERMANENT MONITORING – PT300 SRO

## DIGITAL DOWNHOLE EXTREME PRESSURE AND TEMPERATURE

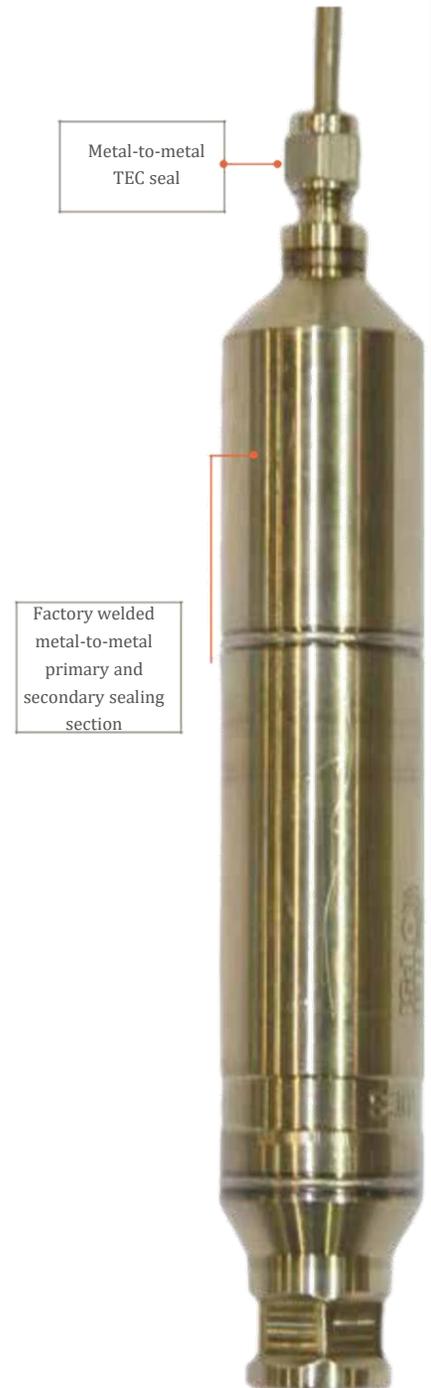


### FEATURES

- Patented integrated Easy Connect cablehead system. Dual metal to metal sealing design, factory pressure tested before deployment.
- Stainless Steel 316L construction ensures that gauge can be deployed in hostile environments.
- Leak proof engineering. Gauge body and sensor body area e-beam welded shut.
- Designed to endure vibration and shock associated with various artificial lift systems including metal to metal PCP's

### SAGD REAL TIME DATA APPLICATIONS

- Pump Intake Pressure and Temperature
- Steam Chamber Evaluation
- Progressive Cavity Pump Optimization
- Electric Submersible Pump Optimization



# PERMANENT MONITORING – PT300 SRO

## DIGITAL DOWNHOLE EXTREME PRESSURE AND TEMPERATURE



TECHNICAL SPECIFICATIONS	
FEATURE	
Output	Modbus RTU
Input Voltage:	12 to 24 Volts DC at 50 mA
Available Pressure Ranges:	1,000 1,500 2,000 5,000 10,000 15,000 20,000 psiA
Operating Range:	-40°C to +300°C
Vibration and Shock	Excellent
Resiliency:	
Pressure Accuracy:	±1% Full Scale
Pressure Resolution:	±0.1 psi
Pressure Drift:	1% per year
Temperature Accuracy:	±1°C
Compatible TEC Cable	GEO PSI 4mm (0.160") Four Conductor 300°C Stainless Steel or Inconel 825
Outside Diameter	1.25 inches or 3.175 cm
Overall Length	9.20 inches or 23.368 cm including pressure testable cablehead
Process Connection:	HF4 (0.25" Female Autoclave)



*SYSEVNCOL 300° C Four Conductor downhole instrumentation cable*

# RETRIEVABLE MONITORING – BUBBLE TUBE SYSTEM

## DOWNHOLE EXTREME PRESSURE AND TEMPERATURE

### BUBBLE TUBE PRESSURE COLLECTION

The primary advantages of bubble tube pressure collection systems are system reliability and cost-effectiveness

The concept is very simple. An automated system controls pressurized inert gas such as nitrogen or helium, which is injected down a capillary tube that into a pressure chamber or fluid into the wellbore causing a purge. The capillary is to clamp to the exterior of the producing tubing string from the desired depth to surface. The Bubble Tube will package a  $\varnothing 1/8"$ , MgO mineral insulated, 316SS sheathed, type-K thermocouple cable inside  $\varnothing 1/2" \times 0.049"$ wt Duplex Alloy 2205 capillary tubing. The MI thermocouple cable will provide points of temperature monitoring at the desired depths, while the capillary tubing annulus will act as a bubble tube conduit for single point pressure monitoring at bottom hole. An automated solenoid valve is then closed. The reservoir pressure fights back, compressing the inert gas column in the capillary tube. A high-end piezoresistive transducer measures the compressed pressure at surface and the SYSVENCOL logger makes an accurate downhole calculation of the reservoir pressure.

Bubble tube systems are very low maintenance. SYSVENCOL engineers each solution so that the inert gas supply only needs recharging every 1 to 3 months.

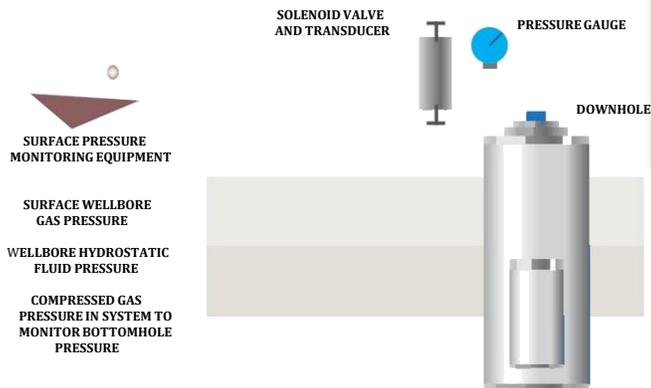
In some cases, supplied natural gas can be substituted for nitrogen or helium.

Although bubble tube technology has been used for bottomhole pressure calculations for over 75 years, its overall reliability and cost-effectiveness has kept it relevant to this day. Currently, bubble tube technology is commonly deployed in SAGD, high-temperature offshore fields, geo-thermal energy completions and enhanced oil recovery systems using steam floods across the world.

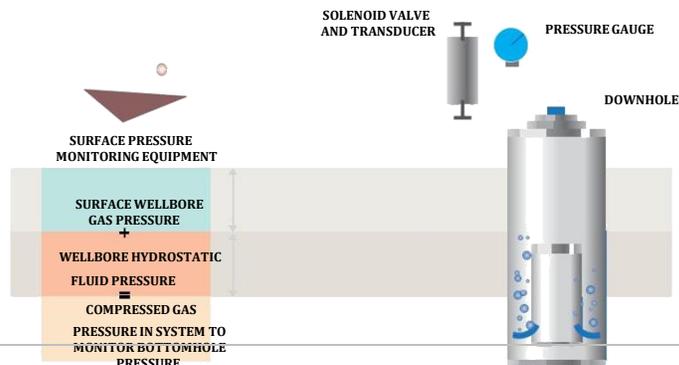
### PRESSURE PERFORMANCE STATISTICS

- Accuracy  $\pm 0.50\%$  full scale (standard)
- Resolution 16-bit Analog to Digital (A-D) processing
- Temperature Rating  $300^{\circ}\text{C}$

#### Chamber condition prior to purge



#### After the gas has equalized with the BHP, gas injection is stopped



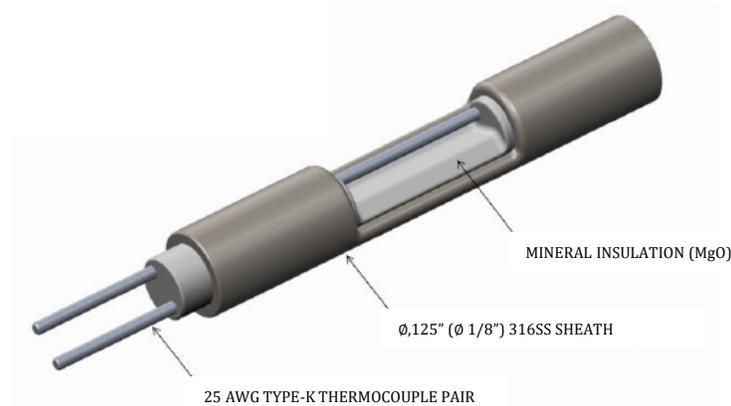
# RETRIEVABLE MONITORING – BUBLE TUBE SYTEM

## DOWNHOLE EXTREME PRESSURE AND TEMPERATURE



### TYPE-K MINERAL INSULATION (MI) THERMOCOUPLE CABLE FOR TEMPERATURE MONITORING

SYSVENCOL's choice of thermocouple cable for these high temperature applications is a magnesium oxide (MgO) mineral insulation (MI) cable, as it is proven to be the most robust and long lasting cable designed for these thermal applications. MI cable is selected over PFA Insulated Thermocouple wires due to its proven reliability at high temperatures. Type-K MI thermocouple cables are rated to 600°C. SYSVENCOL's experience with MI cables over the past eight years has been virtually 100% successful with several thousands of MI cable installations. SYSVENCOL's MI thermocouple cables have excellent mechanical strength, and are resistant to stresses such as bending, twisting, or flattening, as well as superior corrosion and scaling resistance. Type-K thermocouples are accurate to  $\pm 2.2^{\circ}\text{C}$ .



Description	Specification
OD	0,125"
Thermocouple per Cable	As Requested
Sheath Material	316SS
Mineral insulation	Magnesium Oxide (MgO)
Thermocuple Type	Type - K Chromel/alumel rated to 600 °C (1112 °F)
Accuracy	+/- 2,2 °C / Special limits cable available, accurate to +/- 1,1 °C

# DOWNHOLE DTS FIBER OPTIC

## DOWNHOLE EXTREME TEMPERATURE



### SYSVENCOL DTS

SYSVENCOL's fiber optic distributed-temperature-sensing (DTS) provides spatial temperature profile data across a horizontal or vertical wellbore. SYSVENCOL DTS systems can be deployed as a permanent downhole monitoring system or a short term wellbore logging intervention with SYSVENCOL's Fiber eSlickline or Coiled Tubing deployment services. Both single and dual loop DTS fiber systems are available. Additionally, SYSVENCOL DTS systems can be deployed in conjunction with various types of downhole pressure sensors. Surface equipment can be installed permanently or mobilized when needed.

### APPLICATIONS

- Characterization of production zones and cross flow identification
- Injection and stimulation performance monitoring
- Detection of water or gas breakthrough
- Determination of wellbore fluid rates
- Early identification of well problems including:
  - Gas migration behind casing
  - Gas migration behind casing
  - Leaks and thief zones.
  - Waxes and Asphaltenes



### FEATURES AND BENEFITS

- SYSVENCOL 4mm Incoloy and Stainless Steel manufactured armoured fiber in metal tube (TUBES) have the best crush protection in the market. Critical for permanent downhole applications, DTS Fiber eSlickline, and Coiled Tubing deployment services.
- Long lasting downhole fiber is provided by industry leading partners. Products available for downhole temperature ratings from 85°C to 300°C
- Surface interrogators with high measurements repeatability, lower power laser for safe use and long
- Smart Calibration feature automatically corrects measurement of fibers with varying refractive indexes and strain.
- Surface electronic operating temperature range of -40°C to +65°C
- Integrated switch and autonomous scheduling functionality for cost effective monitoring of multiple wells.
- State of the art viewing and modeling software is available.

# DOWNHOLE DTS FIBER OPTIC

## DOWNHOLE EXTREME TEMPERATURE



### DEPLOYMENT METHODS

- Permanent cemented in casing conveyed systems.
- Tubing conveyed systems.
- SYSVENCOL DTS eSlickline
- Coiled Tubing Deployed



SYSVENCOL DTS eSLICKLINE UNIT

### SYSVENCOL ARMORED FIMT TUBES

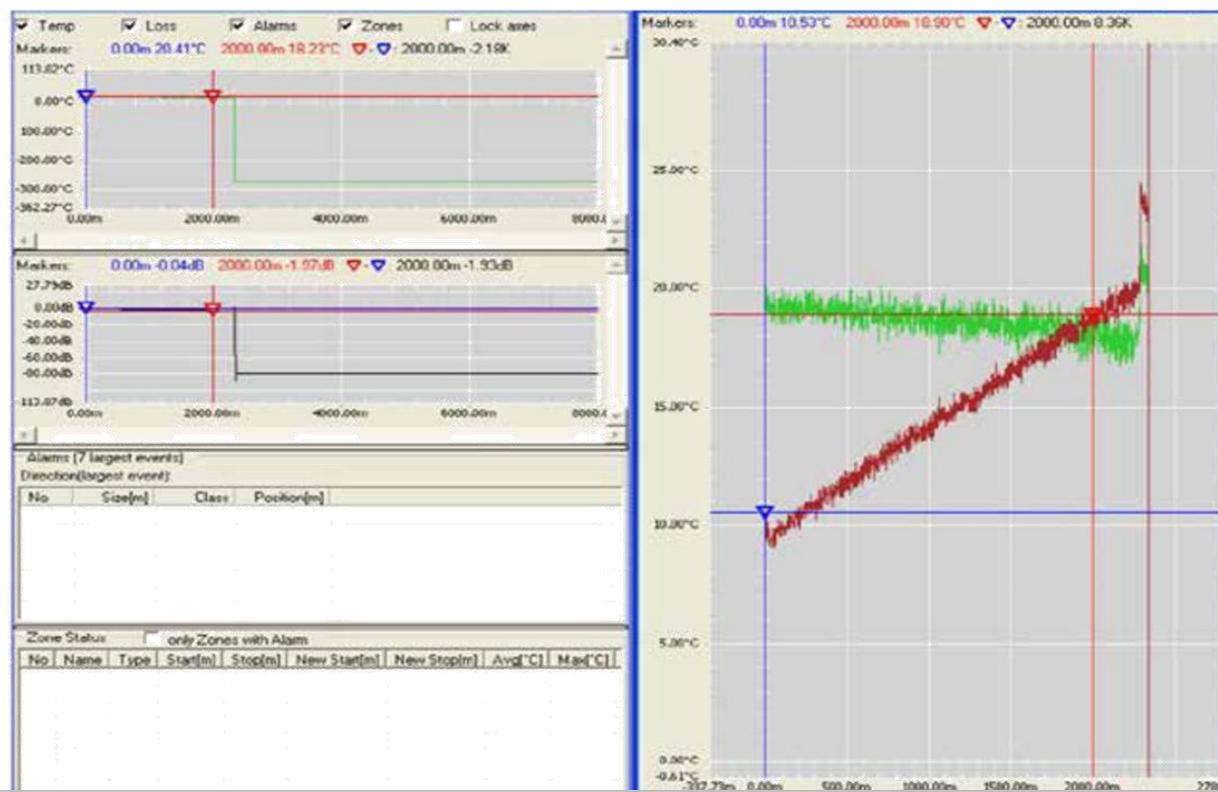
- Best available crush protection.
- Versatile.
- Perfect for DTS eSlickline.
- Perfect for coiled tubing deployment.



SYSVENCOL DTS Fiber Interrogator



### DISTRIBUTED TEMPERATURE SOFTWARE



# DOWNHOLE DTS FIBER OPTIC

## DOWNHOLE EXTREME TEMPERATURE



TECHNICAL SPECIFICATIONS	
<b>Housing Option</b>	<b>-H02 (Outdoor)</b>
Operating Temperature Range	-10 °C to +65 °C (-40 °C to +50 °C with option -T01 Outdoor Extreme: -25 °C to 65 °C with option -T02 Outdoor Extended)
Storage Temperature Range	-40 °C to 80 °C
Operating Humidity Range	0 % to 95 % r.h. Non condensing
Dimensions (H x W x D)	500 x 400 x 150 mm
Weight	17 kg
SENSING FIBER	
Fiber types	MM 50/125 µm graded index MM 62.5/125 µm graded index
Dynamic Range (two-way)	For option -002: 10 dB For option -004: 14 dB For option -008: 22 dB For option -012: 30 dB
Sensing Temperature range	-273°C to +1200°C depending on sensor coating
INTERFACES	
Optical connector	E2000 APC 8° angled
Number of channels	1 - 24
Computer interface	USB, Ethernet (LAN)
Communication protocol	SCPI; Modbus TCP/IP (option -060), OPC
Power Supply	10 V to 30 V DC
Power Consumption	17 W typically, at 20°C ambient temperature; <40 W (entire operating conditions); <50 W with -T01 Outdoor Extreme / -T02 Outdoor Extended
OTHER	
Measurement Time	10 s to 24 h (adjustable) for sensor length ≤ 8 km 30 s to 24 h (adjustable)
Available Spatial Resolution settings	0.5 m, 1 m, 2 m, 4 m, 6 m, 8 m
Available measurement modes	Single-ended; Dual-ended (incl. fiber break recovery)
Internal data storage capability	120 traces total
Power supply (option) operating conditions	0 °C to +50 °C; non condensing, indoor use only
Laser class (IEC 60825-1:2007)	1M (eye-safe)

# GS BRUSH

## WELLBORE CLEANING BRUSH, HEAVY DUTY NON-ROTATING



The GS Wellbore Cleaning Brush is run as an integral part of the string to brush the casing wall as the pipe is run in hole. It can be run as part of most cleaning/polishing assemblies, as a stand-alone device or with other down-hole tools as part of the clean-up system.

Six/Eight brush pads are mounted within the mandrel altogether offering 360° of casing wall coverage. Installed in each brush pad are rows of bristles. The spring-activated pads are forced outwards against the casing wall. The pad pressure can be customized to well geometry according with customer requirement.

Casing		Inside diameter (in)	Tool OD (in)	Thread connection pin down
Size (IN)	Weight (LBS/FT)			
7	17.0 - 38.0	2 1/8	5.969	3 1/2 IF
7-5/8	39.0 - 44.0	2 1/8	6.062	3 1/2 IF
9 5/8	40.0 - 58.0	3.00	7.500	4 1/2 IF

Size (IN)	Diff pressure (MAX)	Working temperature (max)	Tensile load (max)	Torque (max)
7	10,000 psi	600 °F	200,000 lbs	20,000 ft-lbs
7 5/8	10,000 psi	600 °F	200,000 lbs	20,000 ft-lbs
9 5/8	10,000 psi	600 °F	200,000 lbs	20,000 ft-lbs

# GS SCRAPER

## WELLBORE CLEANING SCRAPER, HEAVY DUTY NON-ROTATING



The GS Casing Scraper is designed for different casing sizes and is considered as a fundamental tool in wellbore cleaning services usually placed as the first tool for the assembly. Its maintenance is easy as it is an assembly tool, so each part can be removed and replaced in case of damage.

Casing		Inside diameter (in)	Tool OD (in)	Thread connection pin down
Size (in)	Weight (lbs/ft)			
7	17.0 - 38.0	2 1/8	5.969	3 1/2 IF
7-5/8	39.0 - 44.0	2 1/8	6.062	3 1/2 IF
9 5/8	40.0 - 58.0	3.00	7.500	4 1/2 IF

Size (IN)	Diff pressure (MAX)	Working temperature (max)	Tensile load (max)	Torque (max)
7	10,000 psi	600 °F	200,000 lbs	20,000 ft-lbs
7 5/8	10,000 psi	600 °F	200,000 lbs	20,000 ft-lbs
9 5/8	10,000 psi	600 °F	200,000 lbs	20,000 ft-lbs

# GS MAGNET

## WELLBORE CLEANING MAGNET, HEAVY DUTY NON-ROTATING



The GS Casing Magnet can be run above cleaning tools such as the GS Casing Scraper and the GS Storm Brush. Suitable for collecting the ferrous flow debris using a fin profile made by the efficient distribution of its magnets.

Casing		Inside diameter (in)	Tool OD (in)	Thread connection pin down
Size (in)	Weight (lbs/ft)			
7	17.0 - 38.0	2 1/8	5.969	3 1/2 IF
7-5/8	39.0 - 44.0	2 1/8	6.062	3 1/2 IF
9 5/8	40.0 - 58.0	3.00	7.500	4 1/2 IF

Size (IN)	Diff pressure (MAX)	Working temperature (max)	Tensile load (max)	Torque (max)
7	10,000 psi	400 °F	200,000 lbs	20,000 ft-lbs
7 5/8	10,000 psi	400 °F	200,000 lbs	20,000 ft-lbs
9 5/8	10,000 psi	400 °F	200,000 lbs	20,000 ft-lbs

# GSG BASKET

## WELLBORE JUNK BASKET, HEAVY DUTY NON-ROTATING

The GSG Junk Basket is run as an integral part of the string to collect debris from the wellbore. It can be run as part of most cleaning/milling assemblies, usually placed above milling or cleaning such as scrapers and brushes.

The GSG Junk Basket is designed to capture debris in its large capacity basket by a sudden change in flow area, creating a vortex effect that promotes debris to enter the basket, which contains drain holes that allows for flow recirculation.

Casing		Inside Diameter (in)	Fishing neck diameter (in)	Thread connection pin down
Size (in)	Weight (lbs/ft)			
7	17.0 - 35.0	2 1/8	5.50	3 1/2 IF
9 5/8	43.0 - 53.5	2.11/16	6.50	4 1/2 IF

Size (in)	Collapse pressure (max)	Burst pressure (max)	Tensile load (max)	Yield torque (max)	Working temperature (max)
7	8,000 psi	13,000 psi	150,000 lbs	9,000 ft-lbs	600 °F
9 5/8	10,000 psi	15,000 psi	200,000 lbs	20,000 ft-lbs	600 °F



# 10K CAST IRON BRIDGE PLUG



The 10K Cast Iron Bridge Plug is an economical bridge plug designed for rapid drill-out while maintaining sufficient strength during the set to sustain high pressure and temperature. The plug can be set on different types of wireline pressure setting tools and can also be run on pipe with a hydraulic mechanical (HM) setting tool

## FEATURES/BENEFITS

- Electric wireline set
- Drillable
- Cast iron construction
- One piece slips-hardened to depth of wicker only
- Set in any grade of casing including P-110
- Form Fitting metal back-ups prevent rubber extrusion
- For temporary or permanent service
- Ratcheting lock ring holds setting force
- Can be run on pipe

PERFORMANCE SPECIFICATIONS	
Casing Size (in)	Casing Weight (lbs/ft)
4-1/2"	9,5 - 13,5
5	11,5 - 18
5-1/2	13 - 25
6	10,5-12
6-5/8	17 - 34
7	17 - 38

# CIRCULATION SHOES



Our circulation shoes provide a versatile circulating, drill-down or drill in assembly to accommodate any type of fill or obstruction. Traditional float shoes, when subjected to excessive set-down can bind up and leave operators in unfortunate situations. Our Circulation Shoes were developed over 1000's of liner installations and has a track record of excellent performance in floating, rotating, and liners into place.

## BENEFITS AND FEATURES

- Opens at predetermined, field set differential
- Will not open upon surging preventing any potential plugging or internal contamination
- Made from 4140 corrosion resistant alloys, meeting MR0175
- Abrasive Drill-down bullnoses condition the open-hole during liner operations
- Proven valve design that has never failed over 1000's of installations
- Adjustable opening Pressure
- Thermal ready
- Dual or Single Valve Configuration

## SPECIFICATIONS

Nominal Size (in)	OD (in)	Length (in)
4-1/2"	5"	10"
5"	5,563"	11"
5-1/2"	6,05"	11,5"
6-5/8"	7,39"	12,5"
7"	7,66"	14"
9-5/8"	10,63"	15"

# SYSVENCOL TOE PORT



The Sysvencol hydraulically actuated frac valve is designed as integral part of a multistage stimulation system, providing a means to initiate communication with the reservoir. Run with liner, the Toe Port is used for selective stage stimulation. Closing the flow-through circulation valve allows communication to be established with the first fracture zone at the toe of the well.

Positioned above the flow-through circulating valve, the frac valve is activated by applying pressure after circulation valve has been closed. Once activation pressure is reached, the sleeve shifts hydraulically, exposing the ports to the formation and establishing communication with the zone.

## APPLICATIONS & BENEFITS:

- Multistage fracturing zonal isolation
- Stimulation for casing integrity issues
- Horizontal, deviated, and vertical wells

## FEATURES:

- Valve ratings to 8,000 psi and 285 degF
- Opening pressure of 5,000 psi [34.47 MPa]
- Large ports increase flow area allows for high flow rates
- Minimal fracturing pump pressure required
- Simple increase of internal pressure initiates fracturing operations
- No need for mechanical intervention
- Only one valve per system required, placed above flow-through circulating valve

## PERFORMANCE SPECIFICATIONS

<b>Size</b>	4,5"
<b>OD</b>	5,5"
<b>ID</b>	2"
<b>Flow area</b>	10,7 square in
<b>Burst Rating</b>	8,000 psi
<b>Temperature</b>	285 °F
<b>Opening pressure</b>	5,000 psi
<b>Body Tensile</b>	215,000 lbs

\* Additional sizes available upon request

# SYSVENCOL BALL DROP SLEEVE



The Sysvencol Ball Drop Sleeve is a vital part of your completion. Cost effective and durable, the valve allows the operator to sequentially fracture a wellbore. After isolation, each valve is actuated with progressively larger balls. When all zones have been stimulated, ball seats can be easily milled out allowing service access to each valve.

## FEATURES & APPLICATIONS

- Un-cemented horizontal, deviated or vertical wells for:
  - ◇ Zonal Isolation during multistage hydraulic fracturing
  - ◇ Zonal Isolations during acidizing treatments
  - ◇ Stimulation in formations where water shut-off may be required
- Rated to 10,000 PSI and 250 degF
- One valve per stage
- Large exit ports maximize potential stimulation rates
- Progressively larger ball sizes
- Seats and balls made from proprietary material facilitating mill out operations



## PERFORMANCE SPECIFICATIONS

PERFORMANCE SPECIFICATIONS	
Size	4,5"
OD	5,5"
ID	3,8"
Burst Rating	10,000 psi
Temperature	285 °F
Connection	To Match Liner
Opening pressure	1,800 - 2,200 psi
Body Tensile	300,000 lbs
Body Torsional	10,000 ft-lbs

*\* Additional sizes available upon request*

# GS THERMAL EXPANTION JOINT

The GS Thermal Expansion Joint allows the tubing string to expand and contract during high temperature injection and cyclical steam operations. High alloy steel with a double chromed traveling mandrel ensures the tool is tough enough to get the job done in the most extreme conditions.

Using exclusive technology, the sealing element is designed for absolute seal integrity during high temperatures and during travel in both directions, along its polished extension. The Thermal Expansion Joint allows safe installation and retrieval of the tubing string and completion components while maintaining reliable expansion and contraction during production and injection.

## FEATURES & BENEFITS

- Reliable operation over temperature extremes
- Safe installation and retrieval
- Manufactured to customer requirements



## PERFORMANCE SPECIFICATIONS

PERFORMANCE SPECIFICATIONS	
Max. OD	
Min. ID	
Length (Extended)	20 ft
Length (Retracted)	12 ft
Thread Configuration	7" Buttres 23# Pin x Box
Tensile Strength	
Compression Strength	
Burst Pressure	
Temperature	600 °F

# PUMP INTAKE FILTER SHOE



Pump Intake control with proven and patented sand control technology providing maximum pump protection and life expectancy.

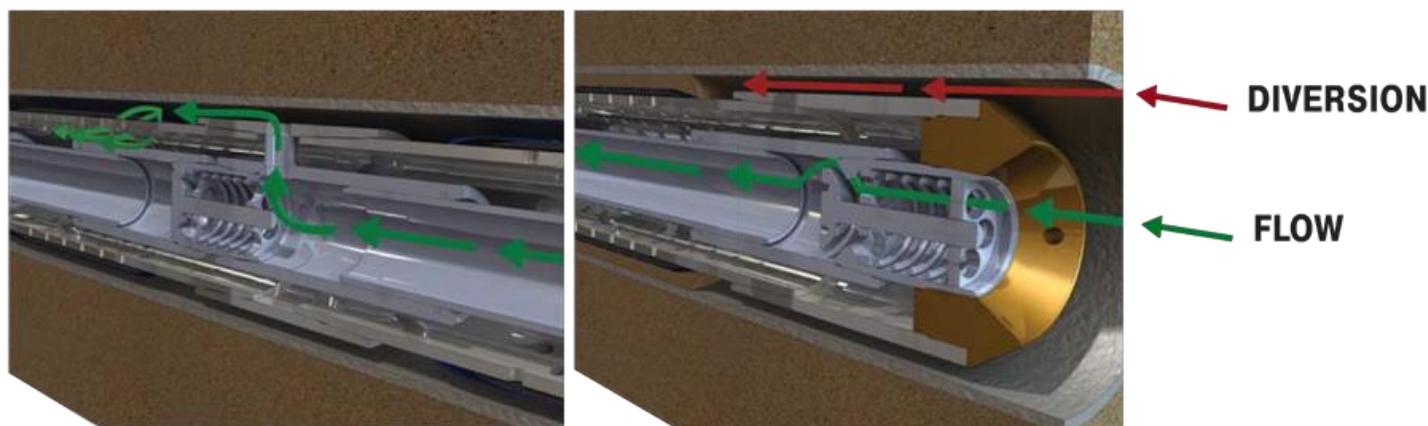
The Pump Intake Controller has been designed to be an integral component to our premium sand control media providing maximum sand and fine retention when producing pumping oil and gas wells.

In a continuous pumping environment liquid and gas flows along the OD and through the Sand control into the pump or production tubing intake. Any sands are effectively filtered and sorted by the Sand control, a continuous build-up of these sands can eventually lead to a sand bridge that can start in the annulus between the Sand control and Casing ID. The deposition of sand would normally continue from the bridging point towards the bottom of each Sand control joint, decreasing productivity and the Sand control's ability to extend pump life.

Run in conjunction with one joint, or within multiple joints of Sand control providing many levels of redundancy, the Pump Intake Controller is designed to divert flow around sand bridging to different sections of the Sand control media to maximize production, pump life, and sand control.

Once a sand bridge has formed in the annulus, a flowing differential will slowly build opening the adjacent Extreme Circulation Valve diverting the majority of the well flow through the ID of the slick joint section through the next Cross over by-pass coupling to the annular area between the OD of the Sand control and ID of production casing.

The resulting diversion of flow will extend the pump life by the time it takes to fill the annulus between Sand control section and production casing with formation sand and/or fines. The entire length of the inner slick joint is produced only once the entire length of Sand control has been covered with formation sand and/or fines.

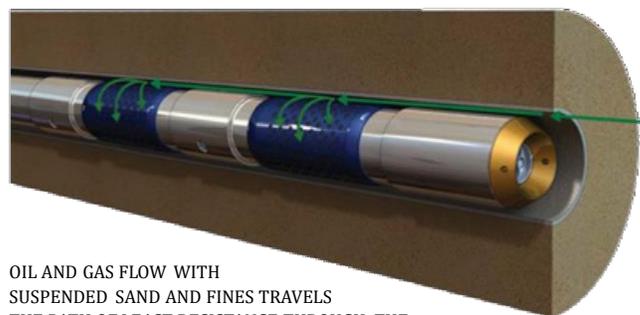


**FEATURES & BENEFITS:**

- Economic
- Ran on one or many joints of sand control media providing multiple levels of pump protection to extend pump life considerably
- Pump life is extended by time it takes to fill the entire annulus between sand control media and production casing
- Reduction of inventory (one gauge fits all sands)
- High flow capacity and plugging resistance
- Reduced completion costs
- Fewer work overs and longer well life
- Large open area (40%) and permeability (400D)
- Unique 3-D filtration to create negative skin
- High mechanical strength
- Rugged and flexible design
- High erosion and corrosion resistance

**APPLICATIONS:**

- All oil and gas producers requiring sand control
- All water producers/injectors requiring sand control
- Alternative to gravel packing
- Stand alone screen (SAS) in open-hole or cased-hole
- Re-completions inside failed completions
- High rate oil/water/gas wells or high viscosity oil wells
- Thermal and steam-assisted gravity drainage (SAGD) wells
- Support screen for gravel packing or frac packing
- Pump protection, including high-rate ESP wells
- Reservoirs with poorly defined grain size distributions (GSD)
- Reservoirs with poorly sorted or widely varying grain sizes

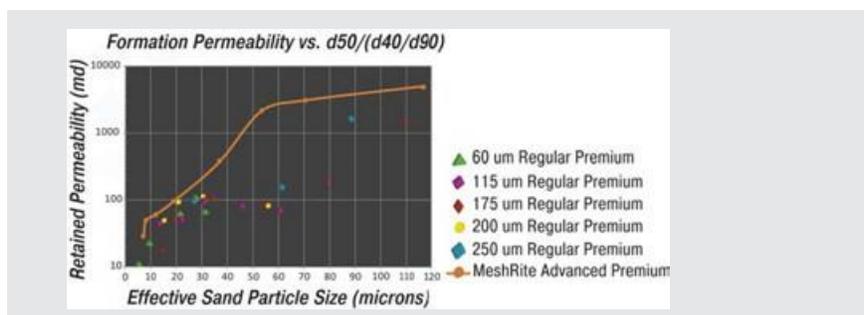


OIL AND GAS FLOW WITH SUSPENDED SAND AND FINES TRAVELS THE PATH OF LEAST RESISTANCE THROUGH THE SAND CONTROL MEDIA WITH THE SAND BEING DEPOSITED IN THE ANNULUS.



THE FLOW CONTINUES WITHIN THE ID OF THE SAND CONTROL TO THE PUMP INTAKE. EACH SECTION OF SAND CONTROL USED IN THE PUMPING APPLICATION IS SEPARATED BY A FLOW DIVERTER AND A PUMP INTAKE CONTROLLER.

A SINGLE JOINT OF SAND CONTROL REQUIRES ONLY THE END CONE VALVE ASSEMBLY (HIGHLIGHTED ABOVE) WITH NO CROSSOVERS OR INNER STRING.



# SELF ALIGNING GUIDE SHOE



The Self-Aligning Guide Shoe allows a seamless entry into Seal Bores when used with a Tie-Back Assembly. With unlimited re-entry into the seal bore, the Self-Aligning Guide Shoe prevents any hang ups and avoids harming crucial elements of the seal stack assembly. A double mule shoe design centralizes the BHA when entering a shouldered entry point. The Self-Aligning Guide Shoe is short and simple that retains a full bore when installed with a Tie-Back.

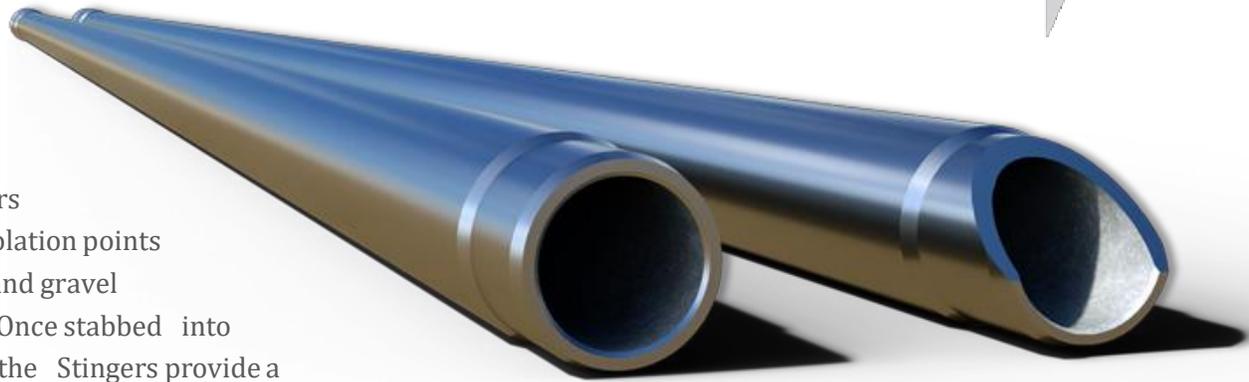
## FEATURES AND BENEFITS

- Minimalistic design that utilizes very few parts
- Fully enclosed design that is not affected by corrosion or solids deposition
- A single moving component
- Easy to assemble, redress, and reuse
- Double mule shoe for entry in any orientation
- Compatible in vertical, deviated, and horizontal well configurations
- All materials comply with NACE MR0175 for sulfide stress cracking resistance
- Unlimited re-entry through restrictions and seal bores
- Axially activated, requiring no turn to function.

PERFORMANCE SPECIFICATIONS	
Seal Bore Size	3"
OD Max	2,98"
ID Min	2,38"
Length	14"
Thready type	Stub Acme Box
Force to retract	2,500 – 7,500 lbs
Tensile strength	50,000 lbs

\* Additional sizes available upon request

# STINGER AND STINGER RECEPTACLES ORING SEAL SUB



Our polished Stingers provide selective isolation points during completion and gravel packing operation. Once stabbed into their receptacle, the Stingers provide a temporary pressure and fluid seal at the bottom of the liner string that isolates a pressure actuated bullnose, or at the top of a bottom tell tale-circulating screen to ensure fluid reaches the bottom of the sand control screens to enable complete gravel coverage.

## FEATURES/BENEFITS

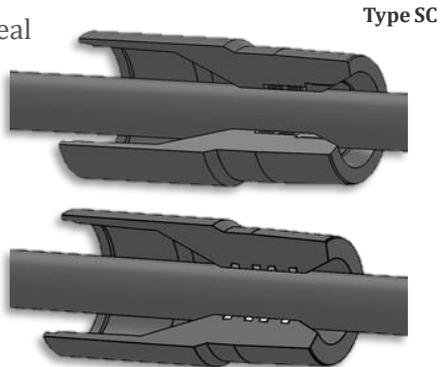
- Ground and Polished stingers ensure a large positive sealing area
- Available in variety of lengths and receptacle IDs to accommodate most completion requirements
- Premium Metallurgy comply with NACE standards MR0175

## ECO-X CIRCULATION STINGER RECEPTACLES

Polished Stinger Receptacles provide selective isolation points during completion and gravel packing operations. Once stabbed into their receptacle, the Stingers provide a temporary pressure and fluid seal at the bottom of the liner string that isolates a pressure actuated bullnose, or at the top of a bottom tell tale-circulating screen to ensure fluid reaches the bottom of the sand control screens to enable complete gravel coverage.

## TYPE SC

- Complete with Chevron type, durable seal configuration that eliminates the risk of seal erosion and performs both in high temperature and highly corrosive environments



Type SC

Type SP

PERFORMANCE SPECIFICATIONS		
Liner Size	Thread Type	Inner String Nominal Size
4-1/2"	4-1/2" LTC	2-3/8"
5"	5 LTC	2-3/8"
5-1/2"	5-1/2" LTC	2-7/8"
6-5/8"	6-5/8" LTC	2-7/8"
7"	7" LTC	2-7/8"
7-5/8"	7-5/8" LTC	3-1/2"
8-5/8"	8-5/8" LTC	3-1/2"

## TYPE SP

- Complete with Loaded O-ring Scraper Seals that remove debris as the stinger is stabbed in, ensuring a secure seal with no debris.

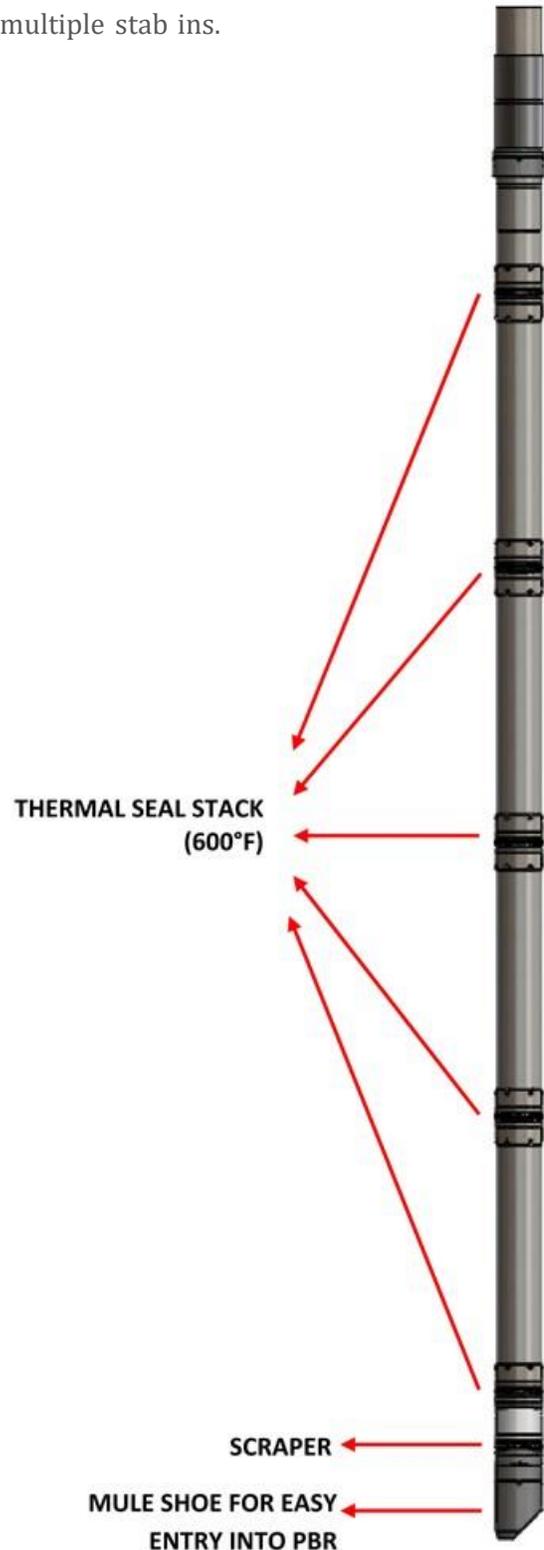
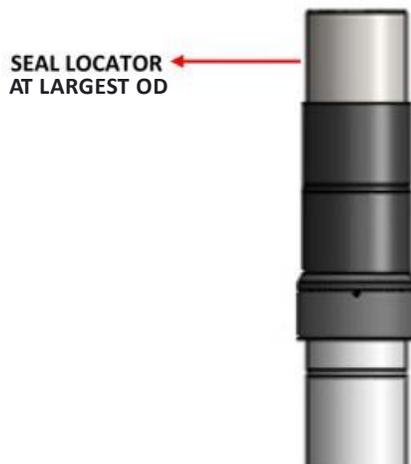
# THERMAL SEAL ASSEMBLY

The Thermal Seal Assembly is used to Tie-Back to Thermal Liner Hangers and Packers. Used for re-entry in SAGD and CSS. Seal stem incorporates Seal Stacks made with High Temperature Thermal Seal to create a very robust seal capable of withstanding high temperatures, pressures and multiple stab ins.

## FEATURES AND BENEFITS

- Premium Metallurgy
- Thermal Seal material rated for 600 OF and 3,000 psi
- Thermal Seal stacks
- For use in SAGD and CSS
- PBR Scraper to improve sealing surface

PERFORMANCE SPECIFICATIONS	
ID Min	4,657"
OD Max	6,50"
Sealing length	12 ft 0 in
Total Length	16 ft 6 in
Thread	3-1/2" Tenaris Hydril-CS Box
Working pressure	3,000psi
Tensile strength	200,000 lbs
Temperature	600 °F / 315 °C



# TUFF TORQUE SHEAR SUB



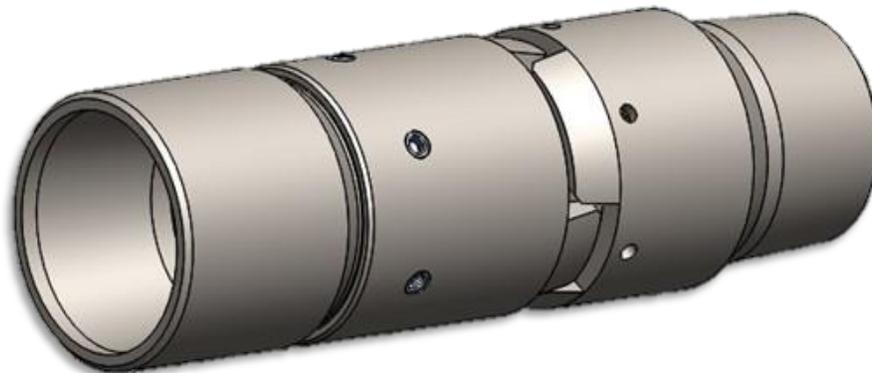
The TuffTorque Shear Sub is designed to allow the transfer of up to 10,000 ft-lbs of torque through the sub, while shearing at a specified value up to 120,000 lbs. It can be used in thermal environments and maintains seal integrity up to 600°F.

## FEATURES AND BENEFITS

- Supports up to 10,000 ft-lbs torque.
- May be set to shear at a tensile force from 0 to 120,000 lbs (in 5000 lbs increments).
- Easy to adjust shear value by changing shear pins.
- Operates at temperatures up to 600°F.

PERFORMANCE SPECIFICATIONS	
Casing Size	4,5"
Casing Weight	12#
OD Max	5,5"
ID Min	3,92"
Thread Size and Type	4,5" 12,6# JFE Bear Box x Pin
Tensile Strength	Up to 120,000 lbs
Compression Strength	250,000 lbs
Burst Pressure	3,000 psi
Temperature	675 °F
Torque	10,000 ft-lbs

# TUFF TORQUE SWIVEL JOINT



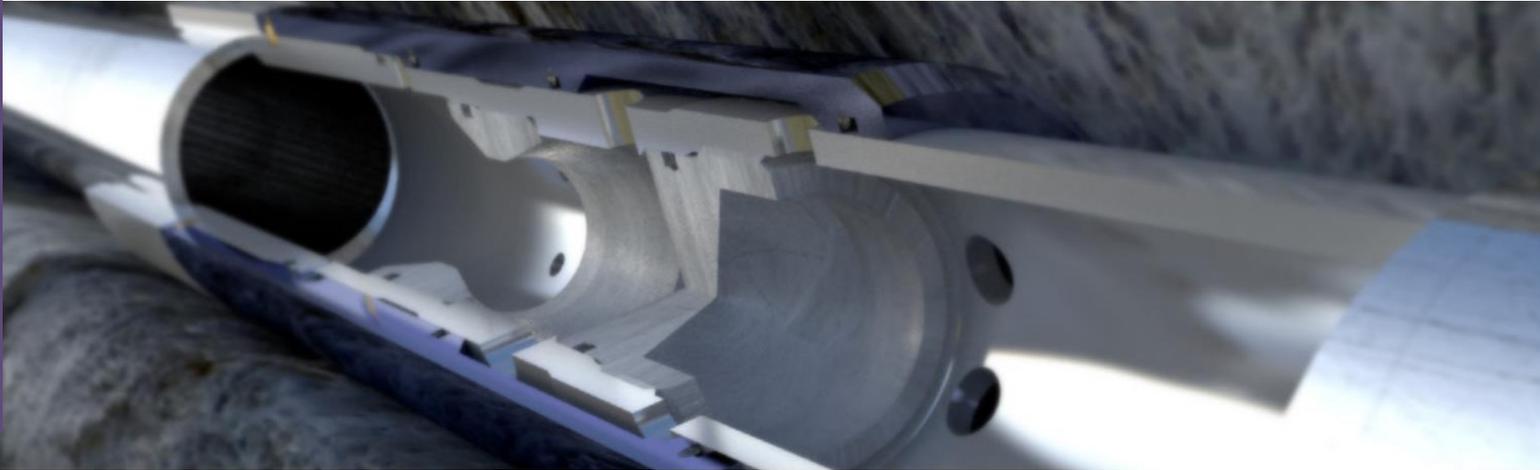
Tuff Torque Swivel Joint is a torquing swivel joint that connects casing joints used in short radius completion applications.

## FEATURES AND BENEFITS

- Full bore and no ID restrictions
- Available in all API casing sizes
- Can be manufactured with API or premium threads
- Allows for 7 degrees of swivel while maintaining full torque capabilities
- Exceeds strength of conventional API tubular in tension

PERFORMANCE SPECIFICATIONS	
Casing Size	3,878"
Casing Weight	11,6#
OD Max	5,5"
ID Min	3,88"
Thread Size and Type	4,5" EUE Box x Pin
Tensile Strength	226,000 lbs
Max Pressure	8,000 psi
Temperature	350 °F / 177 °C

# SYSVENCOL FLOW LOCK ACTIVATION SUB



The Sysvencol Flow Lock Activation Sub is used for selectively shutting off circulation and allowing pressurization of the work string. A from surface to the ball seat. Pressure is applied, allowing the sleeve to slide, permanently closing the csingle ball is dropped circulation valve. Hydraulically set packers can then be pressurized for setting.

## BENEFITS

- Open-hole vertical, horizontal and deviated wells for:
- Carbonite, sandstone and shale play stimulation
- Matrix acidizing treatment isolation
- Multistage fracturing zone isolation

## FEATURES

- Closing pressure of ~1,500 PSI once system reached TD initiated by ball drop
- Protection of internal components while run in-hole
- Valves rated to 10,000 PSI and 350°F
- Positive sleeve closure -eliminates need for positive ball seat after closure.
- Positive seal on closure allows for hydraulic tool set and/or manipulation

## PERFORMANCE SPECIFICATIONS

PERFORMANCE SPECIFICATIONS			
Size (in)	2,875	3,5	4,5
Max OD (in)	3,5	4,13	5,05
Flow area in <sup>2</sup>	3	2,25	1,75
Max Burst Pressure rating, (psi)	10,000	10,000	10,000
Temperature Rating, (°F)	325 - 350	350	350
Closing Pressure, (psi)	1,200 - 1,500	3,000	2,000
Body Tensile Strength, (lbf)	100,000	200,000	300,000

# SYSVENCOL TUBULARS

## ISOTHERMAL® VIT



### DESCRIPTION

The Sysvencol Isothermal® pipe consists of a set of concentric pipes which have a high vacuum atmosphere in the annular space to suppress conduction / convection heat losses and to keep the heat losses of any fluid injected or produced in the well to a minimum . The high vacuum of the Isothermal® is produced mechanically by vacuum pumps that reach a limit close to the absolute vacuum (Absolute Zero Pressure: 0 lpca) reinforced by a chemical compound (located on the external surface of the internal pipe) called "collector" or getter that ensures the vacuum in the useful life of the product and metallic treatment of the pipeline to mitigate the migration of hydrogen.

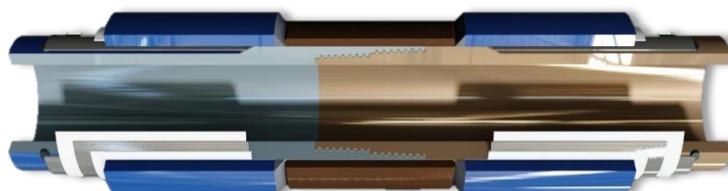
The "collector" upon receiving heat (from the fluid that is injected or produced) and reaching the temperature of 200° C is activated and initiates a process of absorption of the gases present in the annular of the pipe, thereby guaranteeing the permanent "vacuum" . In the "vacuum" there is no heat transfer by conduction or convection, there is only heat transfer by radiation; which is minimized by the combination of the insulating material "aluminum foil-glass wool" that covers the external surface of the internal pipe. The heat loss by radiation is minimized due to the refractory property of the aluminum foil and low thermal conductivity of the glass wool.

### FEATURES

- It allows the injection or production of hot fluids, minimizing the heat loss of them.
- Maintains the quality of the steam in a range of loss of up to 10% against a loss of quality of 44% compared to the standard pipe
- It prevents the cooling of the produced oil and therefore maintains its mobility.
- Low Thermal Conductivity (k) nominal @ 650° F: 0.0025 - 0.003 BTU / hr x ft x °F.
- By preventing heat transfer, it protects the casing/liner against premature failure due to thermal fatigue.

### APPLICATIONS

- Production of extra heavy oil
- Steam injection applications
- Production of hot oil at deep wells.



# SYSVENCOL TUBULARS

## ISOTHERMAL® VIT (CONTINUED)



### COMPOUNDS

**Getter-Collector of free gases:** The collector is a reactive material made of zirconium / titanium and traces of other alloys that is placed inside the annular space created between internal and external pipes, which upon reaching 200° C is activated and starts to absorb the residual air molecules from the annular space being eliminated in the vacuum chamber. Providing a longer life to the pipeline

**Isolation Layers:** Due to the vacuum insulation present in the pipeline, it prevents the exchange of heat by conduction and convection, alternating layers of aluminum and glass wool are used to provide the pipe with a barrier capable of minimizing heat losses by radiation. Inner tube, secured in place and remaining in the vacuum chamber when the inner tube is inserted into the outer tube.

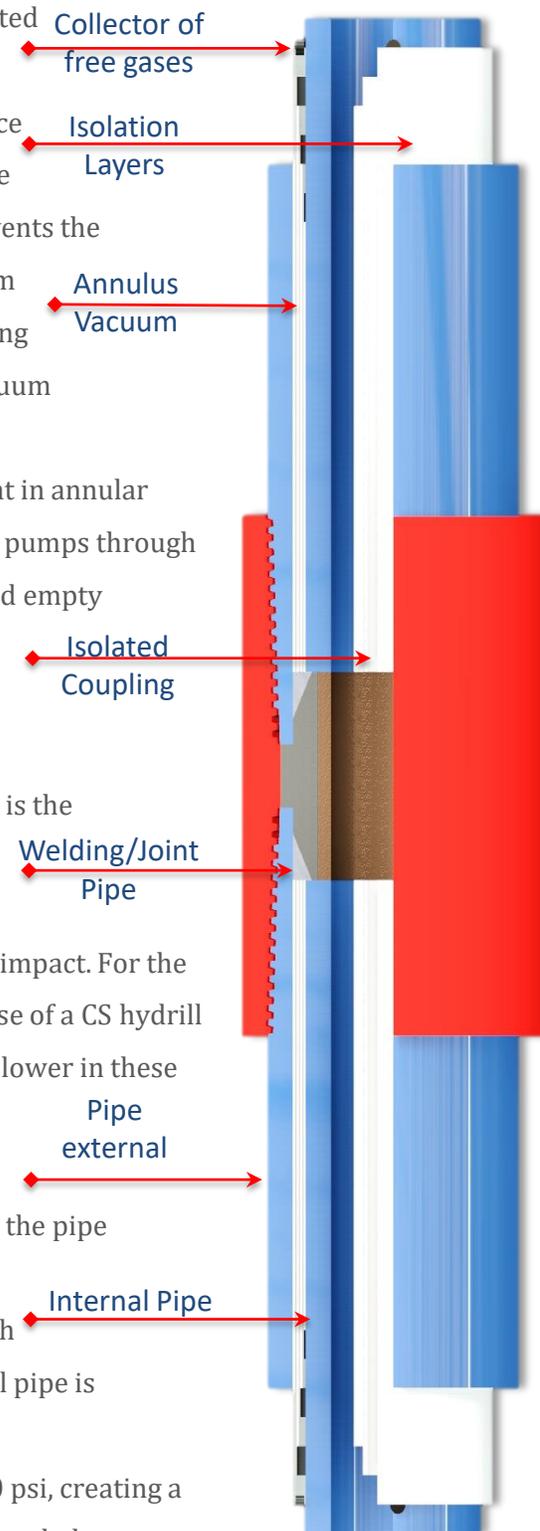
**High Vacuum Annulus:** After the two pipes are unit by welding, the air present in annular space generated between the internal and external pipes is sucked by vacuum pumps through a hole that is drilled in the outer tube, which extract the air, creating a inert and empty chamber, which is secured by a welded "rivet" in the previously drilled hole, leaving the interior at an approximate pressure of 10<sup>-5</sup> -10<sup>-6</sup> Torr.

(1 Torr = 1/760 mmhg),

**Isolated Coupling:** The vulnerable part of heat transfer in the isothermal pipe is the connections, since these are not isolated to the vacuum so to avoid the Migration of energy through this point, an insulating coupling is placed which depending on the Application of the pipe can be Teflon or grafoil molded high impact. For the case of the connection buttress the coupling is placed internally and for the case of a CS hydrill thread the coupling is placed externally. This achieves that the heat losses are lower in these points.

**Joint Welding:** A fillet weld is used to join both pipes. Which is tested and certified through non-destructive tests and through the baking that is given to the pipe to later corroborate the heat transfer value of each of the joints.

**Internal and External Pipe:** The internal and external pipes are API pipes with the same mechanical characteristics as any conventional tubular. The external pipe is coated with an alumina paint to prevent the migration of free gases. Since the internal pipe will be under heavy thermal stress, it is pre-stressed with 30,000 psi, creating a compressive effort of 23,000 psi to the external pipe. This configuration of forces helps to compensate thermal stresses due to the high temperatures to which it will be subjected.



# SYSENCOL TUBULARS

## ISOTHERMAL® VIT (CONTINUED)



### SIZES AND SPECIFICATIONS

	SIZE					
	2-7/8" x 1,9"	3-1/2" x 2-3/8"	4-1/2" x 3-1/2"	4-1/2" x 2-7/8"	5 x 3-1/2"	5-1/2" x 4-1/2"
<b>Weight (lbs/ft)</b>	10	14	21	21	24	29
<b>Length (ft)</b>	28-32	28-32	28-32	28-32	28-32	28-32
<b>Total weight per pipe (lbs)</b>	300	420	630	555	720	870
<b>Outer Tubing</b>						
<b>OD (in)</b>	2,875	3,5	4,5	4,5	5	5,5
<b>Thickness (in)</b>	0,217	0,254	0,25	0,25	0,296	0,304
<b>ID (in)</b>	2,441	2,992	4	4	4,408	4,892
<b>Weight (lbs/ft)</b>	6,5	9,3	11,6	11,6	15	17
<b>Inner Tubing</b>						
<b>OD (in)</b>	1,9	2,375	3,5	2,875	3,5	4,5
<b>Thickness (in)</b>	0,145	0,19	0,254	0,217	0,254	0,25
<b>ID (in)</b>	1,61	1,995	2,992	2,441	2,992	4
<b>Weight (lbs/ft)</b>	2,72	4,43	8,81	6,16	8,81	11,3



# SYSVENCOL DRILLING TOOLS

## TRICONE DRILL BITS



### SYSVENCOL TRICONE DRILL BITS

The TriCone Bit is the most versatile drill bit on the market. It is the go to drill bit in most styles of drilling. Whether you are drilling a water well or an oil well, SYSVENCOL Drilling Tools has the Tri Cone Drill Bit for you.

### THE ADVANTAGES OF USING A TRI CONE OVER OTHER DRILL BITS

- There is a Tri Cone suitable for any rock formation
- Tricone bit is versatile and can handle changing formations
- Tri Cones are reasonably priced, long lasting and have an efficient drilling rate



Depending on your application, SYSVENCOL Drilling can provide you with new, re-run or premium oil field quality Tricone bits. The difference between a premium oil field Tricone bit and non-premium oil well quality Tricone is that the roller cones have high end sealed bearings; extremely high quality tungsten carbide and diamond gauge protection throughout the drill bit as well as skirt tail hard facing and optimized hydraulics. These roller cone drill bits are designed to go to extreme depths in extreme conditions and in situations where they cannot fail.

When ordering a bit the IADC bit classification system is a very useful tool and allows SYSVENCOL Drilling to specify a bit that out performs your expectations.

The TCI Tricone Bit ranges in size from 3.875" (88.9mm) to 28" (711.2mm)

The Mill Tooth TriCone Bit ranges in size from 5" (127mm) to 32" (812.8mm)



### IADC TRICONE ROLLERCONE CLASSIFICATION SYSTEM

- 4 character code, first 3 characters are numbers, the last is a letter
- 1st number is the series. 1 to 3 represent a milled tooth tri cones, 4 – 8 represent TCI tri cones. The higher the series number the harder more abrasive the rock formation is.
- 2nd number is the relative degree of hardness within a series. The number ranges from 1 – 4, the higher the number the harder the formation
- 3rd number represents bearing design and gauge protection
  - Open bearing
  - Roller bearing air cooled
  - Open bearing gauge protected
  - Sealed roller bearing
  - Sealed roller bearing gauge protected
  - Sealed friction bearing
  - Sealed friction bearing gauge protected
- 4th character is a letter and describes optional features. There are 16 alphabetic character's, each representing the Tricones most significant feature.



# SYSVENCOL DRILLING TOOLS

## PDC DRILL BITS

### SYSVENCOL PDC DRILL BITS

PDC stands for Polycrystalline Diamond Compact which refers to the cutters on these drill bits. PDC bits have exceptional rates of penetration when drilling and can outperform other bits in the right conditions. The diamond cutters are 10 times stronger than steel but they are brittle and can get damaged in discontinuous formations.

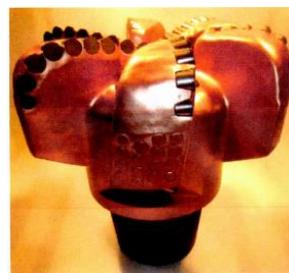
PDC bits love to drill through shale's, salty clay stone, concrete and sands. Avoid gravel and sand stone.

PDC Bits can be constructed from steel bodies or matrix bodies. You will get deeper hole out of a Matrix Body but they cannot be repaired or re-tipped they may crack if the driller dynamically impacts the bit. A steel body PDC bit is much tougher than a matrix body and will not crack. It will not drill quite as deep but it can be repaired and retipped.

When drilling with PDC bits it is important to know and follow instructions for the recommended weight on the drill bit and to control the rotational speed.

Western drilling tools can supply PDC bits in sizes from 3.5" (88.9mm) to 12-1/4" (311.2 mm). Our PDC bits have 3 to 6 wings, Jet Nozzles and gauge protection.

Western Drilling tools also Builds PDC bits for RC drilling (reverse circulation drilling) applications.



# SYSVENCOL STAINLESS STEEL TUBING



Our tubings can be manufactured *seamless or welded*, they are tested and inspected to meet maximum strength and performance. All parts are designed in accordance with the industry standards, based in ASME guidelines for low and High Pressure Piping.

Commonly our tubings are used in a wide variety of industries, including oil and gas, petrochemical, power generation, semiconductor, food and beverage, marine and automotive due to its excellent general corrosion resistance, high strength-to-weight ratio, and remarkable ductility, stainless steel has become the predominant material choice in hydraulic and instrumentation applications within countless industries as the primary component of high-pressure fluid systems.

## FEATURES :

- Welded or seamless manufacturing
- Maximum performance for low and high pressure
- Versatility
- Variety of applications
- Corrosion resistance
- Alloys and sizes available upon request



# SYSVENCOL CHEMICAL INJECTION SERVICES



We offer the encapsulation of control lines to provide increased durability along with chemical and corrosion resistance.

## REFERENCE:

- 5 = Excellent
- 1 = Poor

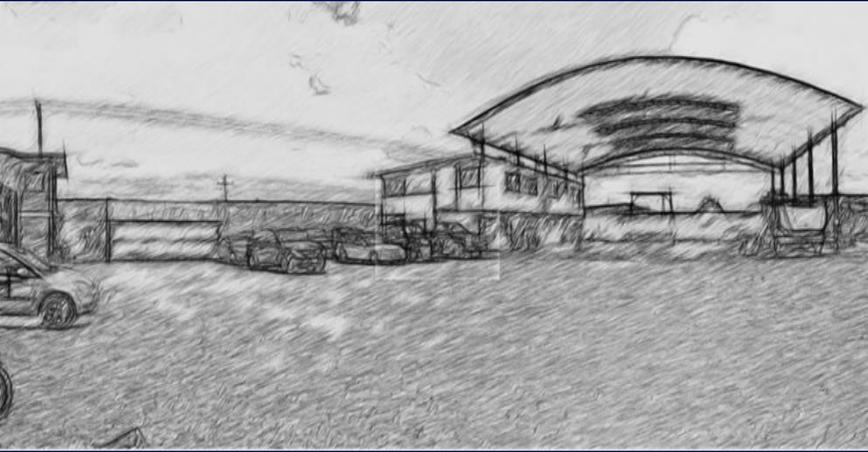
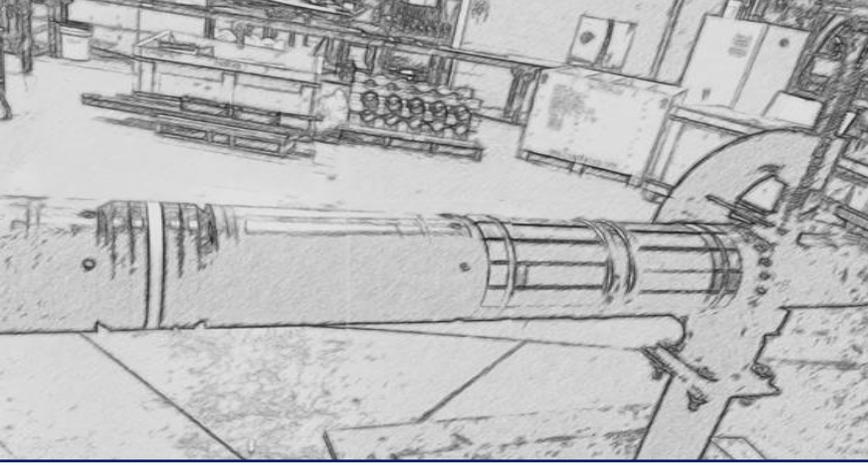
MSCL Name	Common Industry Name	Temperature Range	Abrasion Resistance	Resistance to Brines	Resistance to Hydrocarbons
Nylon 11	Rilsan 11, Nylon 11, Polyamide	-60C to 135C	5	3	5
Polypropylene	Poly, Polyolefin	-25C to 150C	3	5	3
TPE,TPR,TPV	Santoprene, EZPrene, NexPrene	-30C to 150C	3	5	3
PVDF - Copolymer	Solef, Kynar	-30C to 150C	4	4	5
ECTFE	Halar	-75C to 150C	5	5	5
ETFE	Tefzel	-100C to 150C	5	5	5
FEP	Teflon	-110C to 200C	3	5	5
MFA/PFA	Teflon	-110C to 250C	3	5	5

*NOTE: Other Polymers and grades available upon request*

## CABLE PROTECTOR



The Cable Protector provides a safe, quick and efficient way of conveying and securing downhole cables into well-bores. Ideal for the protection of any size ESP cables, control lines, umbilicals and encapsulated bundles in well-bores. Eliminating compression-induced damage to downhole cables, its slip and rotation resistant design is streamlined to help prevent hang-ups downhole.



## CONTACTS



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