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Smart Drilling Services

COMPLETION TOOLS

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About Us

Smart Drilling Services (SDS), FZE is an Egyptian Free Zone company based in Egypt, specializing in innovative technologies and solutions for well drilling and completion operations.

SDS has established itself as a leading player in Egypt's oil and gas market, providing advanced drilling and completion technologies, equipment, and services to **oil and gas companies and major industry clients across Egypt.**

Our capabilities cover the **design, development, manufacturing, sales,** and **rental** of advanced drilling and completion equipment, enabling us to deliver innovative, reliable, and cost-effective solutions that meet the operational requirements of our clients throughout
Egypt.

Total group head count is **~1200** employees.
Total rental tool count as end of 2025 – **~750** tools.

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AVRORA 592
AVRORA 542

Basic information

- Annular Metal Packer has been designed and tested in accordance with the ISO 14310 V0 criteria validation class for packers design
- When activated, the packer expands in the space between the base pipe and the casing/formation and mimics the shape/ geometry of such casing/formation irrespective of the fluid in the well
- The design of the metal sealing sleeve enables metal-to-metal or metal-to-formation contact with highest possible force and reliable anchoring of the packer
- Annular Metal Packers are integral part of standard casing or liner assembly. Hydraulic communication of AMP with the internal area of base pipe is provided by internal sealing mechanism
- Once AMP is activated and set, casing integrity is restored by internal hydraulic isolation/sealing mechanism



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Applications & Features

- Cased hole pressure barrier rated as per ISO 14310 V0 (SCP - sustained casing pressure solution)
- Open hole pressure barrier rated as per ISO 14310 V3
- Solution for cementing quality assurance in open hole rated as per ISO 14310 V3
- Solution to address well fluids and gases cross flows / Casing integrity assurance
- Can be utilized as part of liner/casing hanger
- No premature expansion / Extremely high expansion feature when activated
- No degradation in differential pressure, constant and high values over full expansion range
- Most robust, reliable and ragged design in the industry / Well life barrier
- Can be set within cement or used in combination with 2nd Stage cement systems to support high pressure columns of cement, preventing SCP or production of unwanted gas or water
- Additional sealing length can be modelled and designed on request

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Comparison to Conventional Technology



Conventional packer



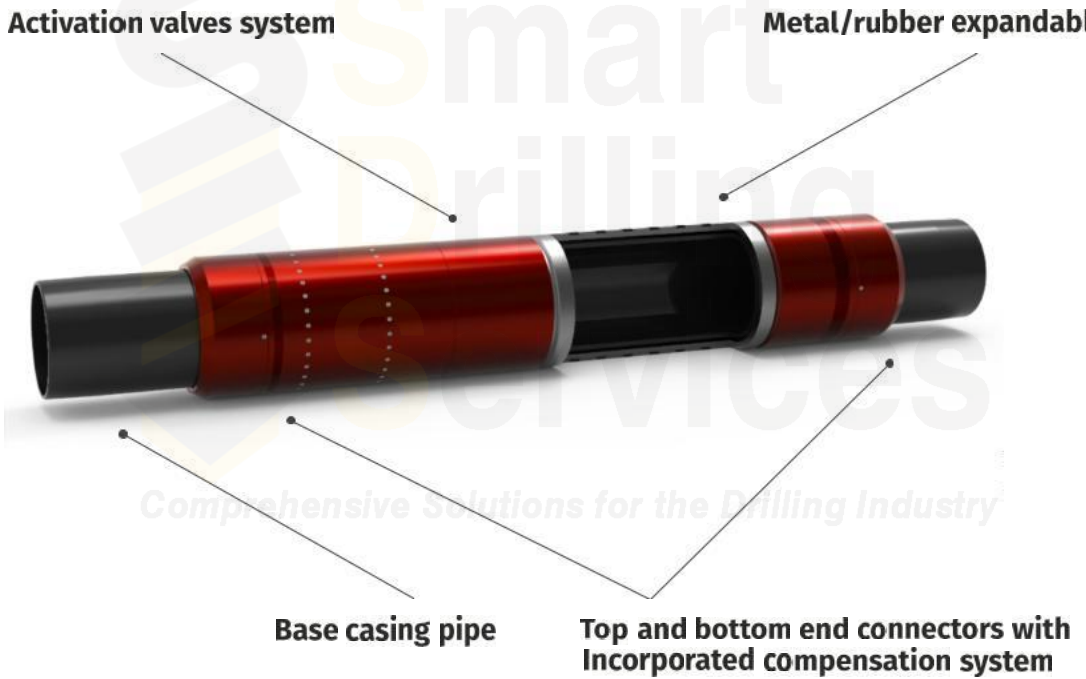
AVRORA 590 **and** AVRORA 540 **packer**

AVRORA 592 and AVRORA 542 Annular Metal Packers have number of significant advantages over conventional packers

- Specially designed seal formed by the hydraulically expandable metal sealing elements of the packer conforming to the actual wellbore or casing geometry
- When activated, the strengthened sleeve mimics the wellbore/ casing geometry, thus boosting the packer's resistance o pressure variations
- Rubber seals are optimally placed along the length of the steel sleeve and backed up by a series of metal fins that provide metal to metal or metal to rock contact, and also high strength anchoring assurance

AVRORA 592
AVRORA 542

AMP Basis of Design



AVRORA 592
AVRORA 542

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Specifications

Parameter	Parameter value							
	AVRORA 592	AVRORA 592	AVRORA 592	AVRORA 592Y	AVRORA 542	AVRORA 542	AVRORA 592	AVRORA 542
1. Base pipe OD, (in/mm)	13 3/8" (340mm)	10 3/4" (273mm)	9 5/8" (245mm)	9 5/8" (245mm)	7 5/8" (194mm)	7" (178mm)	7" (178mm)	4 1/2" (114mm)
2. Expansion Range (in/mm)	16.0 > 19.0" (406 > 483mm)	12.4 > 14.8" (315 > 376mm)	12.3 > 14.0" (311 > 356mm)	11.60 > 12.4" (295 > 315mm)	9.5 > 10.5" (241 > 267mm)	8.5 > 10.0" (216 > 254mm)	8.5 > 9.5" (216 > 241mm)	5.75 > 6.5" (146 > 165mm)
3. Max packer OD, (in/mm)	15.43" (392 mm)	12.20" (310 mm)	11.65" (296mm)	11.26" (286mm)	8.98" (228mm)	8.23" (209mm)	8.23" (209mm)	6.50" (144mm)
4. Packer ID, (in/mm)	Full Bore (as per base-pipe ID)							
5. Packer length ft, (m)	Up to 7.4ft (2.3m)							
6. Expansion coefficient	1.16	1.16	1.16	1.16	1.16	1.16	1.11	1.15
7. Temperature range °C (°F)	260°C (500°F) Maximum temperature is based on seals							
8. Constant element ΔP across expansion range psi (bar)	5000 psi (345 bar)	5000 psi (345 bar)	5000 psi (345 bar)	5000 psi (345 bar)	8000 psi (552 bar)	10000psi (689bar)	5000 psi (345 bar)	10000psi (689 bar)

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Specifications

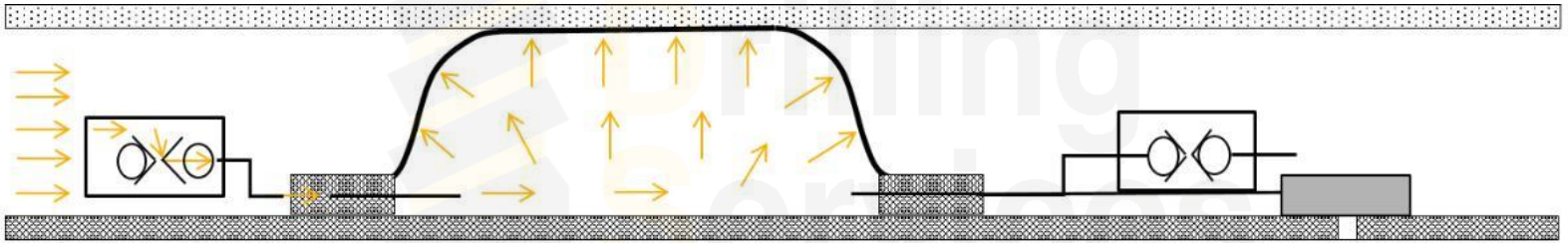
Parameter	Value
9. Density of cement slurries when cementing casing strings, g/cm3 (SG)	up to 2.4
10. Packer validation class according to the methodology in Annex 1 or ISO 14310-2014: - cased hole setting - open hole setting	- V0/V3 - V1 / V2 / V3
11. Packer housing steel material grade	GOST P 53366 / ISO 11960 / API 5CT / not lower than the grade of base casing pipe
12. Activation pressure of packer valve system (adjustable), MPa (PSI)	15-25 (2100-3600)
13. Packer valve system closure pressure (adjustable), MPa (PSI)	30-42 (4300-6100)
14. Thread connection	Connecting threads as agreed with the customer (conforming to the base casing threads as per GOST P 56349 /GOST 28487 /GOST 632 /TU 14-161-163 /API RP 5C5:2017 (ISO 13679:2019)
15. Salt resistance	yes

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Compensation System

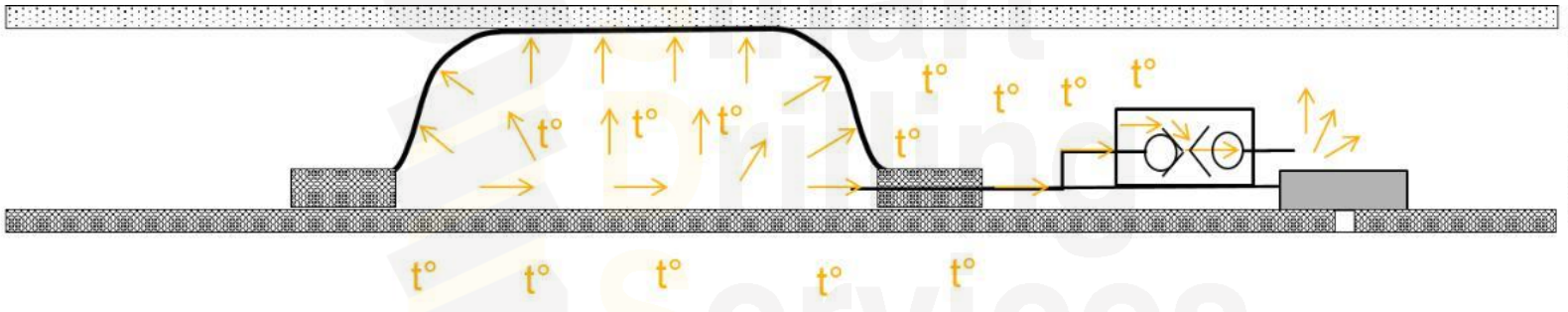
Metal annular packers have specifically designed compensation system. One part of the system consists of two booster valves that provide for maintaining high differential pressures above and below the packer.



These booster valves are equalizing the pressure in the annulus with the pressure inside the packer metal sleeve, thus protecting the sleeve from collapse and maintaining quality isolation between separated intervals. This compensation system can be installed on both sides of the packer.

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Compensation System

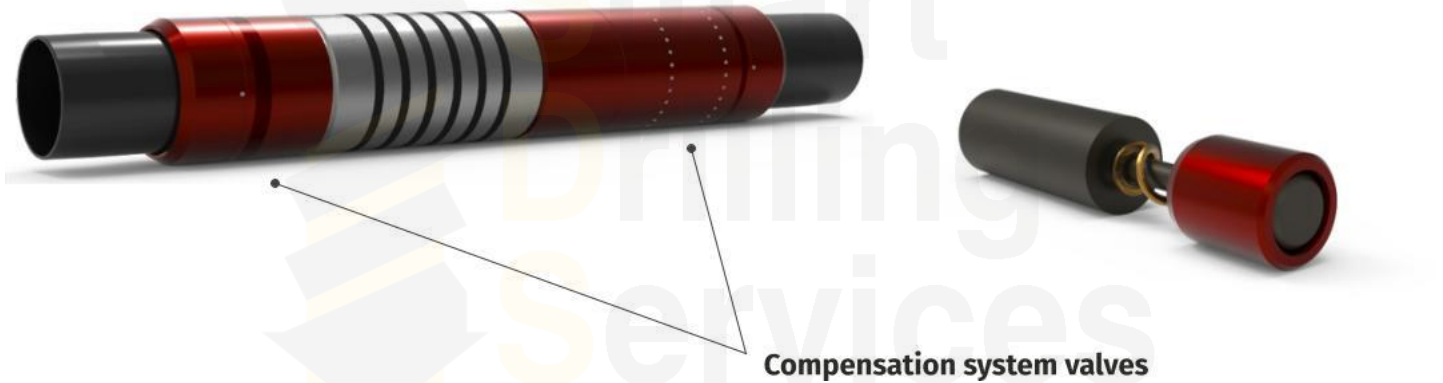


Second part of the compensation system is a relief valve. Its function is to relieve excess pressure in the packer's inner sleeve zone. It is required in case of changes or fluctuations in packer operating temperatures.

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Compensation System



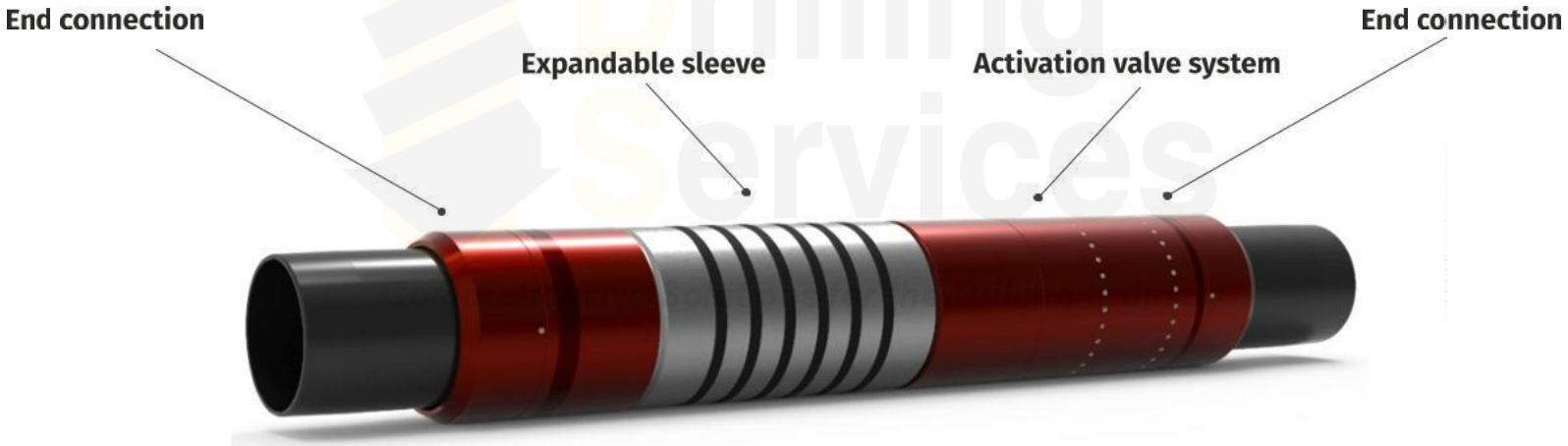
- The compensation system enables pressure equalization inside the expandable sleeve with the booster valves, as well as excess pressure relieve with relief valve, thus ensuring the integrity of the sleeve and preventing its destruction
- The system works equally at the both ends of the packer and protects against all potential and sharp pressure spikes/drops

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Packer Assembling

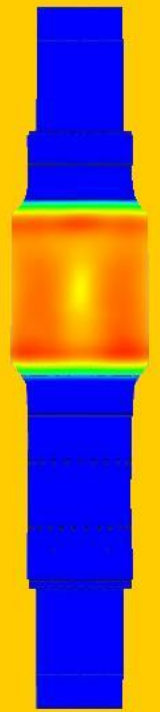
First, the right end connection is mounted on the casing pipe by welding. After that, the activation valve system assembled on the pipe, the right float valve, expandable sleeve and the left end connection with the left float valve are installed afterwards.



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Sealing Sleeve Expansion

The design of the metal sealing sleeve of the AMP packer enables fast and intensive expansion with a strong sealing element set against the walls of the open hole or cased hole, regardless of the type of liquid or gas in the well. Moreover, there is no degradation of the maximum delta P capability versus sleeve e xpansion diameter increase.



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Client Benefits

- Best solution for well integrity problems
- Eliminates channeling effect or leak paths at setting depth hence providing solution for sustained casing pressure and surface leaks
- Very fast setting operation saves operator time and reduces complexity
- Full bore drift as per base casing pipe
- Can be rotated with casing string while running in hole which increases probability casing to TD in challenging wells and reduces operators risks
- Can be run through milled casing windows with no risk
- Slim OD provides for higher circulation rates during operations
- Well life product

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SDT Stage Cementing Collar with Mechanical Packer

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Basic information

- SDT Stage Cementing Collar with Mechanical Packer designed to prevent well integrity issues, even after a multiple-stage cementing job is complete
- SDT Stage Cementing Collar with Mechanical Packer provides 5,000- psi rated pressure-holding capacity and increased reliability over inflatable packer options
- The Packer of Stage Cementing collar is mechanically set and not inflated using an internal latching mechanism to lock the compression element after its set resulting in zero weak points
- SDT Stage Cementing Collar with Mechanical Packer provides a high-quality cementing job in oil and gas wells with a high risk of lost circulation
- SDT Stage Cementing Collar with Mechanical Packer has the emergency Packer setting mechanism by applying 25 tons with the special tool
- SDT Stage Cementing Collar with Mechanical Packer is run as an integral part of the casing string and provides a mechanical annular isolation barrier between the run-in casing and the parent casing and further allows for one or two stage cement job



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Applications & Features

- SDT Stage Cementing Collar with Mechanical Packer is opened by dropping a plugging devise that lands in the tool. Applied pressure will set the packer mechanically. Additional pressure will open the cementing ports allowing for a cement job. The cement displacement wiper plug lands in the stage tool closing the ports
- Mechanically set tool that promotes well integrity by integrating a packer and stage cementing collar into a single assembly
- Field-proven packer element and internal ratchet mechanism
- Differential packer element ratings up to 5,000-psi
- No risk of premature packer setting while circulating and performing 1st stage cementing job
- Guaranteed closure of cementing ports provided by compensation valve
- Simple and reliable design that eliminates leak paths from the setting operation
- Can be utilized for 1 or 2 stages cementing job
- SDT Stage Cementing Collar utilizes a mechanical Packer which is set with applied pressure as opposite to inflation pressure



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Plugs for SDT Stage Cementing Collar with Packer



Free-Fall Opening Device (Optional/Emergency device)



Closing plug (To close cementing ports)



Intermediate plug (To open cementing ports)



First Stage Plug



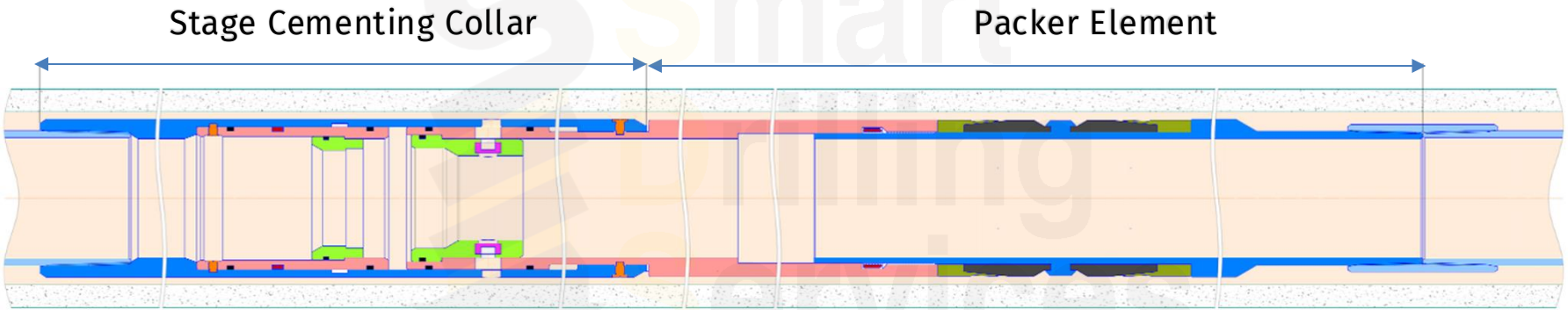
Landing Collar

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Design Features

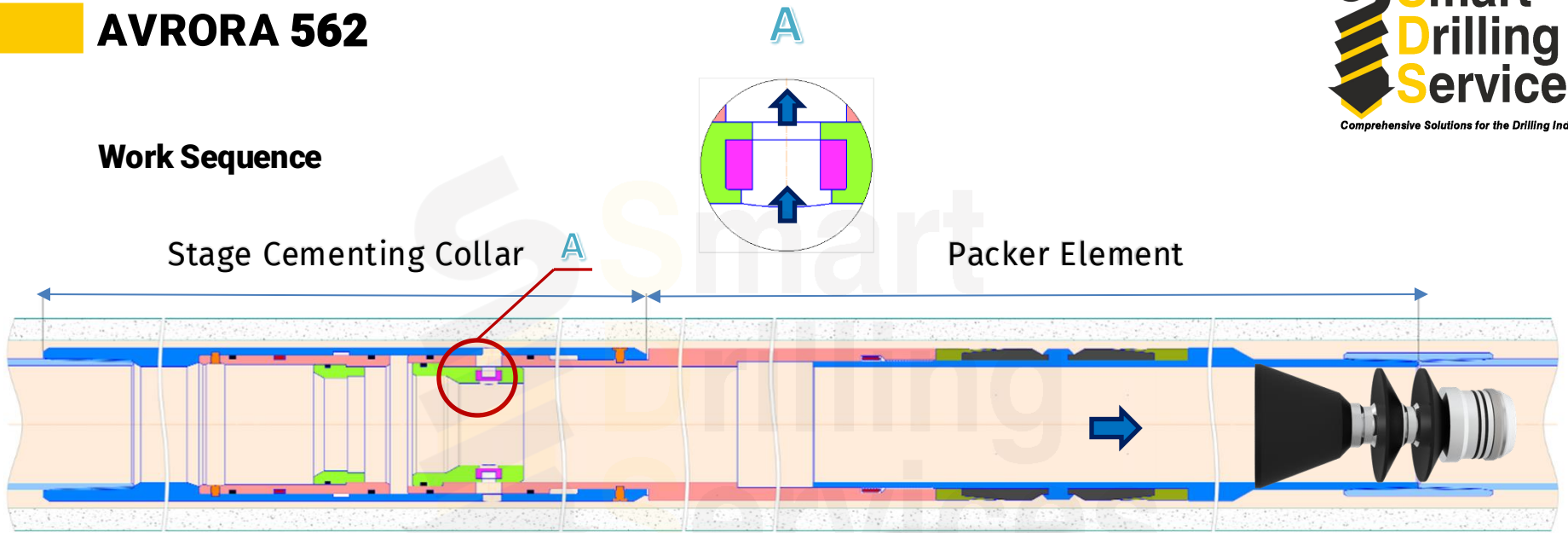


Packer Setting and opening of cementing ports occur sequentially. All components of Stage Cementing Collar with Packer activate at low pressure preventing the risks of emergency situations.

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Work Sequence



- First stage cement is mixed and pumped
- The first stage plug is launched and cement is displaced
- The plug lands and latches into landing collar



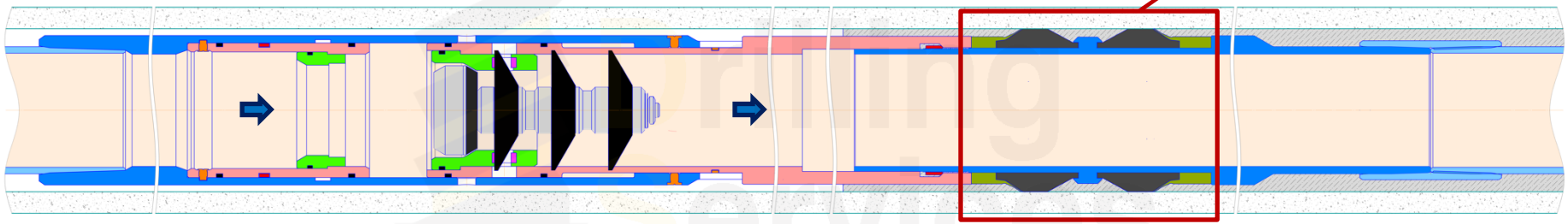
Plug latches into Landing Collar for further tool activation by applying pressure

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Work Sequence

Packer Setting and Opening Cementing Ports



- Pressure applied to open the internal ports to establish circulation allowing the Intermediate plug to get to the seat
- The Intermediate plug is launched and pumped down to the seat
- The plug lands and pressure applied to set the packer mechanically

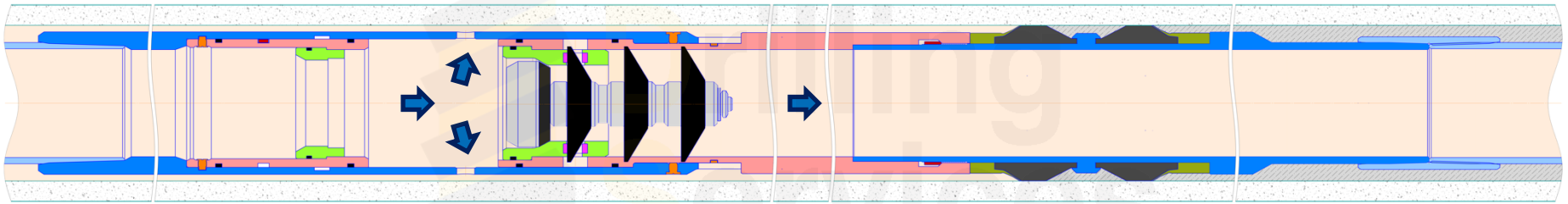


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Work Sequence

Packer Setting and Opening Cementing Ports



- Pressure increased to shear off the sleeve to open cementing ports for 2nd stage cementing job

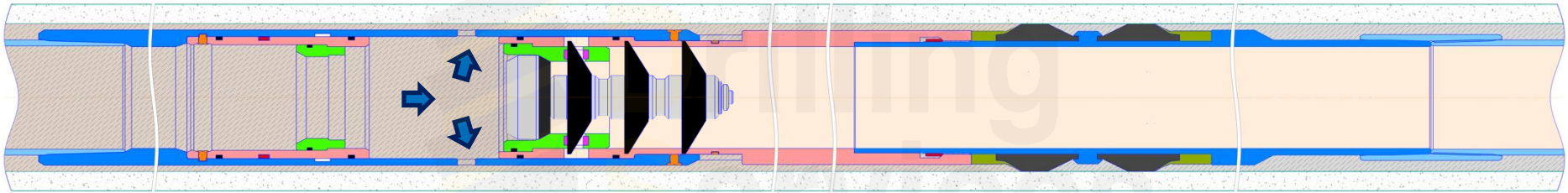


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Work Sequence

Second Stage Cementing Job



- Second stage cement is mixed and pumped
- The closing plug is launched to displace cement

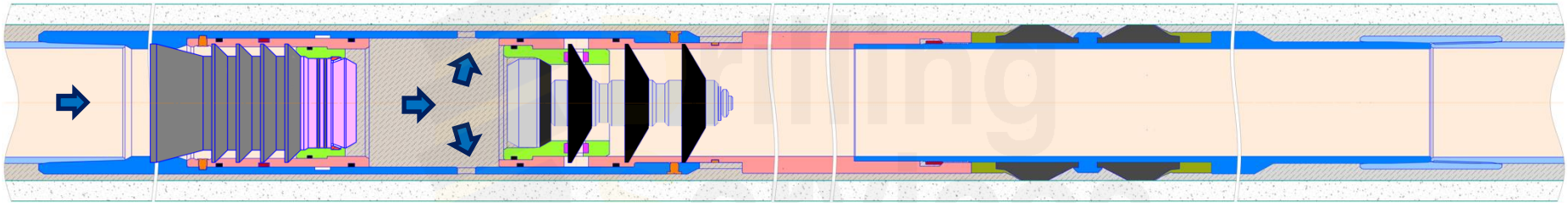


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Work Sequence

Second Stage Cementing Job



- SDT Stage Cementing Collar with Mechanical Packer is equipped with compensation valve to ensure the sleeve closure to isolate the cementing ports

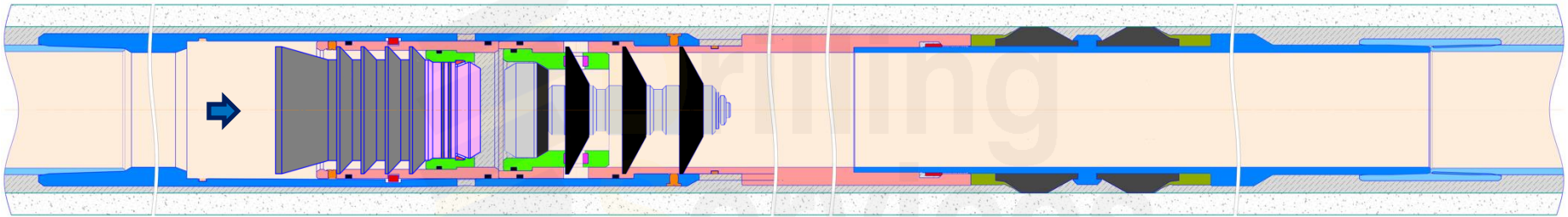


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Work Sequence

Second Stage Cementing Job



- The Sleeve shifts closed to isolate the cementing ports
- After WOC it is required to drill out the plugs and seats
- The internal parts of SDT Stage Cementing Collar are made of easily drillable material
- The tool is designed in a way of maintaining the minimal cement column between 2 plugs

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Client Benefits

- 2 stages cementing job without WOC
- 5,000- psi rated pressure-holding capacity
- Increased reliability over inflatable packer options
- Activation at low pressure
- Minimal cement column between 2 plugs
- Enhanced well integrity



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SDT Airlock & Debris Catcher

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AIRLOCK SYSTEM

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Basic information

- SDT AIRLOCK SYSTEM ® is a leak-proof collar with a ceramic valve designed to facilitate the deployment of the production casing string in extended reach laterals and highly deviated wells where high frictional forces always present. These friction forces can negatively affect casing running operations and can prevent casing from reaching the planned depth.
- The Airlock System is run as integral part of the production casing. The system allows air to be trapped and sealed inside production casing below the Airlock installation point. The trapped air increases the buoyancy of casing string and hence reducing the frictional forces acting along the wellbore while deployment. The fluid is placed above Airlock system and once casing reached target depth the ceramic valve gets shattered by pre-set pressure applied from surface allowing for full pass-through ID and next well operations to continue.



DEBRIS CATCHER

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Basic information

- The debris catcher is installed in the casing sleeve, located between the landing collar and the float collar to catch the ceramic elements of pressure activated Air Lock Sleeve.



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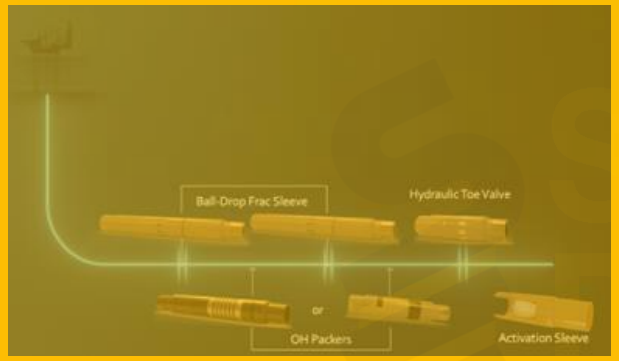
AIRLOCK SYSTEM

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Applications & Features

- Extended reach laterals and highly deviated wells
- Low TVD, highly curved and short radius wells where not enough push weight is available in vertical sections
- Casing intervals separation for staged pressure testing while run in hole (several systems are installed)
- Increased casing buoyancy by air trapped inside
- Installed as an integral part of casing string with full ID after activation
- Guaranteed activation at preset (adjustable) differential pressures
- No strict requirement for debris sub due to small size of ceramic barrier particles
- Customized settings subject to different depths and mud weights

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Multistage Fracturing Completion Equipment

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ISO 9001 : 2015

ISO 14001 : 2015

ISO 45001 : 2018

TOE ITITIATORS

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- **AVRORA 703 SHOT Frac Sleeve**
  - Hydraulically activated with pressure up
  - Activated with differential pressure between annulus and inner liner area
  - No need for dedicated cleanout (drilling-out)
  - Access to the entire reservoir area (360°) after activation
  - Secure fixing of the sliding sleeve in open position
  - Differential pressure up to 15,000 psi



- **AVRORA 704 BPS Frac Sleeve**
  - Hydraulically activated with pressure up
  - Activated with differential pressure between annulus and inner liner area
  - No need for dedicated cleanout (drilling-out)
  - Access to the entire reservoir area (360°) after activation
  - Can be used with selective packer technology
  - Differential pressure up to 15,000 psi



PACKERS (ZONAL ISOLATION)

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- **AVRORA 742 Mechanical-Hydraulic Frac Packer:**
  - Adjustable activation pressure
  - Differential pressures up to 15,000 psi
  - Up to 1 meter in length
  - OD available for any open hole sizes
  - Optional provision with mechanism preventing premature activation
  - Multistage fracturing wells and completions
  - Can be used with cemented designs
  - Can be used as a backup open hole packerAvailable sizes, inch



Available sizes, inch	4”	5”	4-1/2”	5-1/2”	5-3/4”
Outer diameter, inch	4.65”	5-3/4”	5.35”/5.67”/5.75"	7.87”	7.87”
Inner diameter, inch	3.46”	4.41”	3.82”/3.90”	4.78”/4.89”	4.78”/4.89”
Activation pressure, psi	2320	2320	2320	2320	2320

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FRAC SLEEVS

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- **AVRORA 702 Mechanically Activated Frac Sleeve (Shifting tool activated)**
  - Mechanical activation with a tool conveyed by downhole tractor, tubing or coiled tubing
  - No need for dedicated cleanout (drilling-out)
  - Multiple closings/openings of the frac sleeve
  - Differential pressures up to 15,000 psi

- **AVRORA 708 Ball-Drop Frac Sleeve**
  - Activated with special balls (increasing in size)
  - Optional design of dissolvable ball seats
  - Multiple closings/openings of the frac sleeve
  - Differential pressure up to 15,000 psi



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FRAC SLEEVS (CLUSTER)

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- **AVRORA 760 CLUSTER Ball-Drop Frac Sleeve (multiple per zone)**
  - Designed for cluster multistage hydraulic fracturing completions
  - The design of the CLUSTER frac sleeves provides for many more fracturing stages (clusters) without need to increase the number of activation balls
  - The design of the CLUSTER frac sleeves allows for simultaneous stimulation of several stages with a single frac treatment operation
  - The CLUSTER frac sleeve is intended to increase the density of multistage fracturing clusters for stimulation operations to be evenly distributed along the entire wellbore and provide better stimulation control while offering a more complex fractures network





SELECTIVE PACKER

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Selective Packer Technology

- The selective packer technology is designed as a universal tool to be used in new wells and in old wells which require secondary recompletions. The packer design features the proven “pen” mechanism to get the packer in the working/transport position with the axial load applied to the sealing elements, ensuring the isolation of the target stimulation zone.

Features & Benefits:

- Capability of selective formation intervals treatments
- Used for hydraulic fracturing and acid stimulations
- The top packer is of cup type, the bottom packer is mechanical
- The interval to be treated is isolated from above and below enabling its selective stimulation
- Over 10 hydraulic fracturing stages with 1 single trip
- Robust and proven design
- Can be used for selective intervals pressure testing
- Conveyed by tubing, coiled tubing or downhole tractor
- The packer features a casing collar locator for accurate positioning in front of the dedicated frac sleeve
- Multiple repositioning of the packer
- Selective packer installation done within 30 minutes



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FLOAT EQUIPMENT

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GUIDE SHOE

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- **Guide shoe with aluminium nose**
  - The design of the shoe ensures its sufficient mechanical strength when running down the casing string and easy drilling out with PDC bits.
  - It has one central hole and several side holes



- **Guide shoe with smooth free rotating eccentric nose**
  - Equipped with a free rotating eccentric aluminium nose with a bevel angle of 25-60°, which allows to pass through ledges when running the casing string
  - Rotation angle of the eccentric aluminium nose – 360°
  - The aluminium nose is easily and quickly drillable by PDC drill bits without damaging the cutting structure and BHA elements.



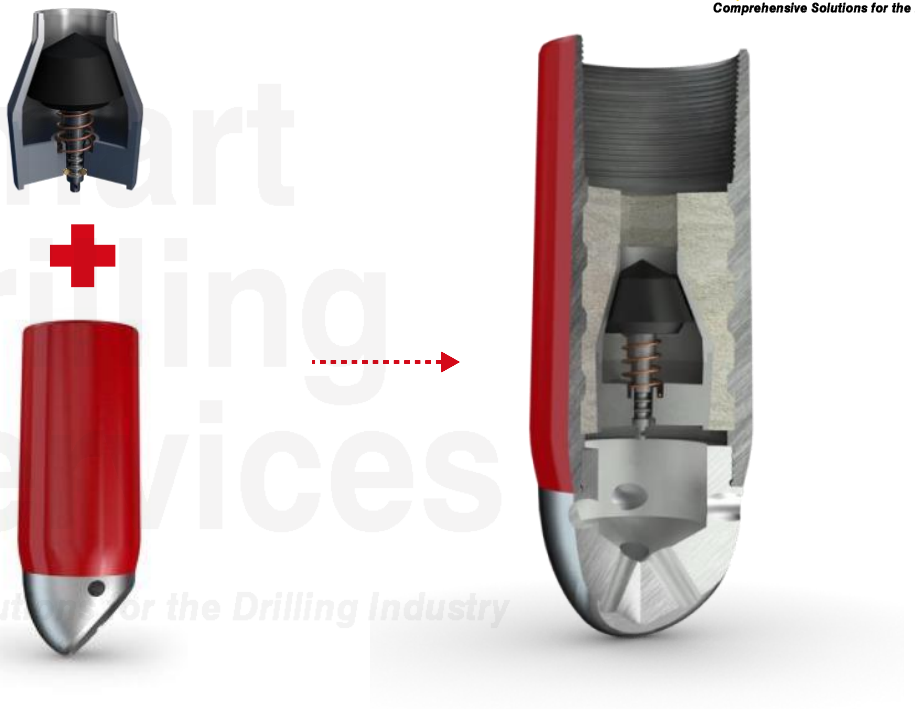
FLOAT SHOE

- **Float shoe with aluminium nose**
  - Complies with the requirements of API RP 10F category IIIC for fatigue strength, pressure and temperature for casing cementing equipment with float valve
  - The SFF (SFF PLUS) valve unit is subject to test with back pressure up to 34,70,100 MPa and flushing fluid with high sand content for 24 (48) hours
  - Easily drillable with PDC drill bits



FLOAT SHOE

- **Float shoe with eccentric aluminium nose**
  - Complies with the requirements of API RP 10F category IIIC for fatigue strength, pressure and temperature for casing cementing equipment with float valve
  - The SFF (SFF PLUS) valve unit is subject to test with back pressure up to 34,70,100 MPa and flushing fluid with high sand content for 24 (48) hours
  - Easily drillable with PDC drill bits



FLOAT COLLAR

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Float collar with SFF valve

- High performance in challenging conditions: long laterals, high temperature, high pressure, acidic environment, abrasion
- The SFF valve unit was tested with back pressure up to 35 MPa (350 atm.) and flushing fluid with high sand content for 24 hours
- Easily drillable with PDC or tricone drill bits
- Automatic fill-up function
- Withstands high temperatures and loads created by pressure differentials during running, landing and cementing of casing strings

Float collar with SG valve

- High performance in challenging conditions: long laterals, high temperature, high pressure, acidic environment, abrasion
- The SG valve unit was tested with back pressure up to 70 MPa (700 atm.) and flushing fluid with high sand content for 48 hours
- Easily drillable with PDC drill bits
- Automatic fill-up function
- Withstands high temperatures and loads created by pressure differentials during running, landing and cementing of casing strings





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VALVES

- **SFF valve**
  - Automatic fill-up option in three working positions
  - Switching the valve from automatic fill-up mode to check valve mode is performed by increasing the circulation flow rate above 23 l/s
  - Withstands back pressure up to 35 MPa (5,000 psi)

- **SG valve**
  - Company's leading-edge development that provides reliable in-line sealing for oil and gas well construction and is designed for pumping of fluid with additives at high flow rates during continuous operation
  - Fully polymer design (except the bronze alloy spring)
  - The SG valve unit was tested with back pressure up to 70 MPa (700 atm.) and flushing fluid with high sand content for 48 hours
  - Easily drillable with PDC drill bits
  - Automatic fill-up function
  - Withstands high temperatures and loads created by pressure differentials during running, landing and cementing of casing strings



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CASING CENTRALIZERS

Aramco Approved





CASING CENTRALIZERS

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Semi-rigid centralizer



Spring centralizer



Semi-forced centralizer



Double spring centralizer



Cementing basket



Stop Collars

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CASING CENTRALIZERS



Rigid turbulator



Straight-bladed and rigid centralizer



Rigid polymer centralizer

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AICD /AICV TECHNOLOGY

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AICD





ARP Select



ARP Select PRO



ARP Select FLOW

Optionally, all types of devices feature an Endurance (E) version with increased erosion (wear/tear) resistance

ARP SELECT

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Solution for:

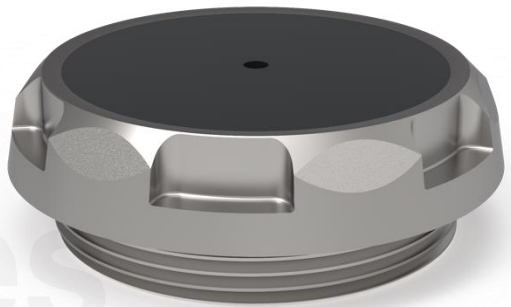
- ✓ oil production

Restricted inflow of:

- ✓ water
- ✓ gas

Benefits

- ✓ Water and gas inflow restriction in oil wells
- ✓ Prevention of coning
- ✓ Inflow profile equalizing
- ✓ Reduced water cut of the oil produced
- ✓ Selection of inflow control design for each specific well / field
- ✓ Capability to work in low-viscosity oil
- ✓ Increase in oil production rate and final oil recovery factor
- ✓ Extened well life
- ✓ Successful applications in many different oil field assets



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ARP SELECT PRO

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Solution for:

- ✓ oil production

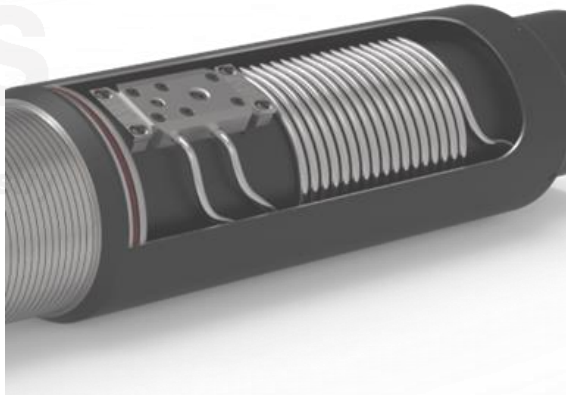
Restricted inflow of:

- ✓ water
- ✓ gas

Benefits

- ✓ Efficient restriction of adverse fluids/gases inflow
- ✓ Customized design selection for specific well and field conditions
- ✓ Resistant to salt deposition and debris accumulation
- ✓ Erosional resistance
- ✓ Many various tests conducted to prove operational efficiency and value to Customer, including proprietary design 3-phase test bench





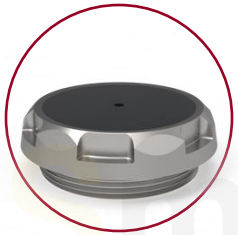
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ARP SHIFT

ARP Shift Select
Well screen with **ARP Select** autonomous inflow control device and sliding sleeve.

=

ARP Select



+

ARP Shift Select PRO
Well screen with **ARP Select PRO** autonomous inflow control device and sliding sleeve.

=

ARP Select PRO



+

ARP Shift Select FLOW
Well screen with **ARP Select FLOW** autonomous inflow control device and sliding sleeve.

=

ARP Select FLOW



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Casing Shoe Reamers Technology

Aramco Approved



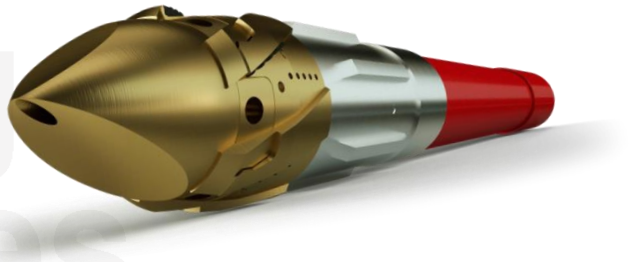
Casing Shoe Reamers Technology

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Overview and Challenges

- Conventional casing running methods have not given full confidence of landing at TD every time a casing job is run, especially with difficult and challenging wells.

- Conventional Casing Shoe Run:
  - No agitation
  - No cutters to clear out ledges and no reaming possibility
  - No rotation to avoid obstructions
  - Additional wiper trips (more costs)
  - Casing pull outs for clean out BHA runs (much more costs)
  - Lost holes/wells (HUGE costs)



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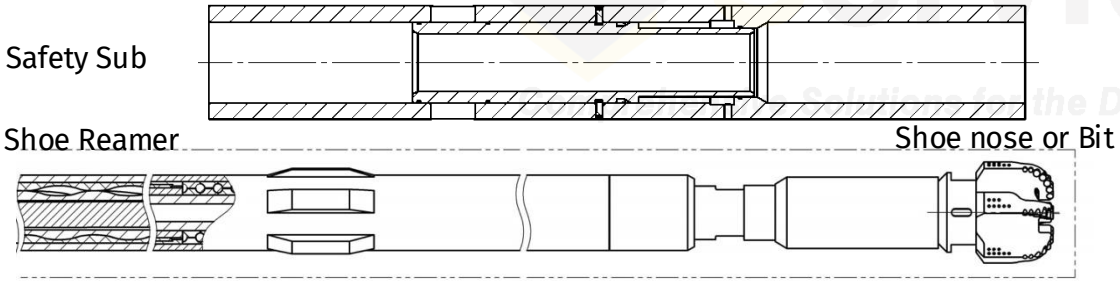
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COCEPT & TAILOR-MADE APPOACH

- Casing Reamer Shoe is available in different options
- Housing, stabilizer and reamer nose (bit) may have various sizes and be pre-agreed with the client on request
- Operating parameters (flow rate, pressure drop) and performance (speed, torque, power) characteristics can be different from the standard values and pre-agreed with the client on request
- The reamer nose cutting structure can be blank or PDC / Standard drill bit can be used as well in non-drillable applications
- Designed to be installed in the bottom of the casing pipe or liner assembly to ream unstable, obstructed sections of the borehole including situations when rotating of the casing/liner casing string is not possible





REAMER SHOE OPTIONS

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Hydraulic Type – SDT-S

- Standard casing shoe with nose arming equipped for cementing operations
- Works with effect of hydro jetting from the shoe nose nozzles while circulating
- Can be rotated downhole with complete string rotation form surface
- SDT-S is drilled out within several minutes with next section drill bit



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REAMER SHOE OPTIONS

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Hydro-Mechanical Type - SDT-RS

- Works with effect of hydro jetting from the shoe nose nozzles while circulating
- Can be rotated downhole with string reciprocating movements (up – down)
- No need for complete string rotation from surface
- The shoe is easily and quickly drillable with standard PDC type bits



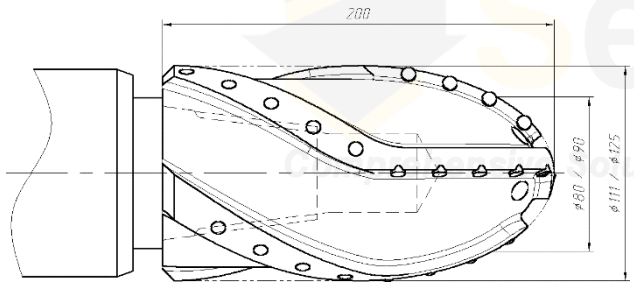
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REAMER SHOE OPTIONS

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Turbine Powered Type – SDT-TRS

- Hydraulic powered type from mud pumps circulation
- Power section design is turbine type with high RPM (up to 1500) and moderate torque outputs
- Hydro jetting from the shoe nose nozzles while circulating
- No need for complete string rotation from surface as shoe nose/bit is driven by power section
- SDT-TRS is drilled out within several minutes with next section drill bit





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REAMER SHOE OPTIONS

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Motor Powered Type – SDT-MSR

- Hydraulic powered type from mud pumps circulation
- Power section design is drilling motor type with moderate RPM (100-200 depending on lobe config) and highest passible torque outputs (can be adjusted by power section configuration)
- Hydro jetting from the shoe nose nozzles while circulating
- No need for complete string rotation from surface as shoe nose/bit is driven by power section
- Available in drillable and non-drillable options
- SDT-MSR can be drilled out within few hours with next section drill bit (drill out time depends on power section configuration)



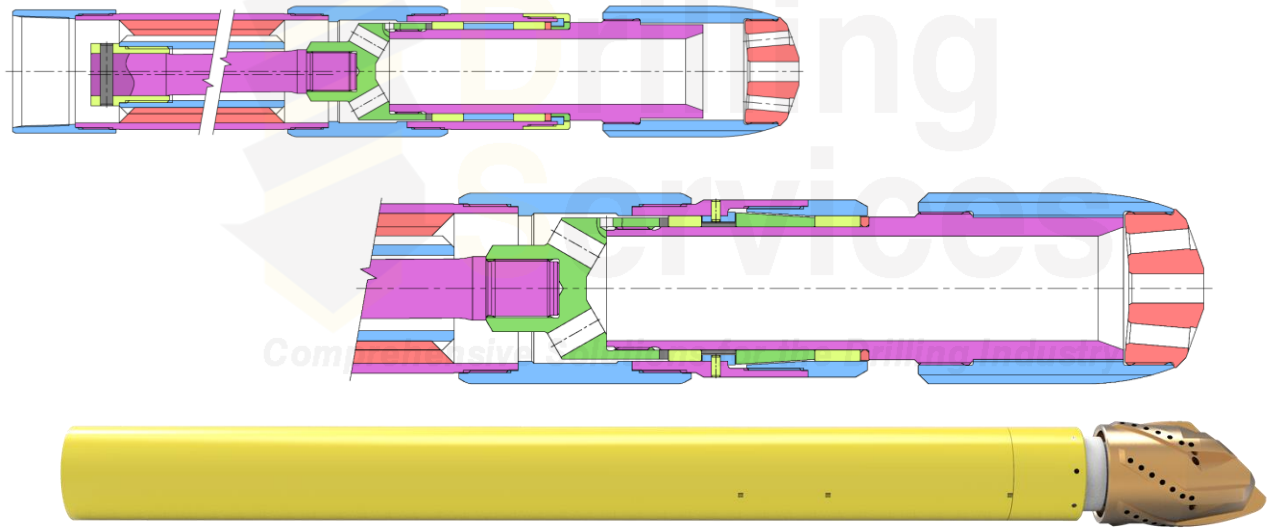


Motor Powered Type – SDT-MSR

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SDT-MSR ROTOR LOCKING MECHANISM

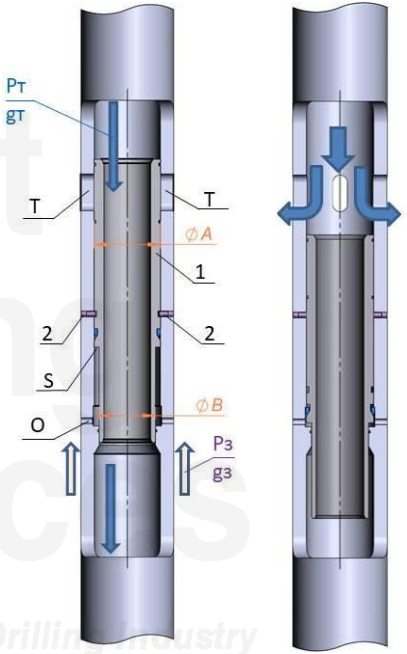
- Rotor rotation can create difficulties during drill out operations after cement job is completed
- Rotor locking mechanism is designed to stop rotor rotation in case no cement placed inside power section
- Locking mechanism is activated by applying WOB with drill out BHA (WOB setting can be pre-adjusted)



Motor Powered Type – SDT-MSR

SDT-MSR CEMENTING SAFETY SUB

- Designed to enable completion of the cementing operation through bypass ports if the reamer system got plugged off during RIH
- Activation differential pressure is adjusted by amount of shear pins installed (range of 150-250 bar / 15000-25000 kPa). Each pin provides for 25 bar differential pressure increase
- Safety sub is proven design and widely supplied now by SDT as first stage of multistage fracturing jobs and cementing stage collar





Casing Shoe Reamers Technology

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Client Benefits

- All sizes and options available upon request
- Gets your casing or screens to TD when hole problems would stop normal deployment
- Eliminates the need for a wiper trip prior to running casing or liners after long logging jobs
- Provides low-cost improvement in operational efficiency
- Rotates end of string when full string rotation is not possible
- Drill/ream casing or liners back to TD by pumping alone
- Better preparation of the well bore and mud before cementing operations



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Our Business Partners

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THANK YOU

FOR YOUR TIME & ATTENTION

We appreciate your interest and look forward to working together.

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