



Our technologies, used in all artificial lift systems, are focused on increasing pumping efficiency, equipment run life, increased production, reduction of operating costs of the different wells; and decreasing the carbon footprint, contributing enormously to the sustainability of the environment.

Our approach is to work as a team with the engineers in charge of the holes, to reduce failures and increase the run life of all artificial lift systems, conditioning the fluids before they enter the pump, and / or using complementary accessories that improve pump performance in the presence of solids or gases. We are committed to providing high-quality products and technical assistance to maximize hole pump productivity and profitability.

Brochure

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1.ABOUT US

1.1 WHO WE ARE

TUNDRA INGENIERÍA supplies products and services for the Colombian hydrocarbon sector. Our products look to optimize the lifetime of artificial lift and completion systems in oil and gas holes.

1.2 MISSION

TUNDRA INGENIERÍA Y SUMINISTROS is going to provide high performance equipment and tools for the hydrocarbon industry in the areas of completion and artificial lift. Our reason for being is going to be to present innovative solutions to our clients, supported by human talent, the environment and our available resources as key success factors.

1.3 VISION

In 2030 TUNDRA INGENIERÍA Y SUMINISTROS is going to be a sustainable company. The hydrocarbons sector is going to recognize our products and services for their performance, their ability to solve problems, responsibility with their stakeholders and the development of operations that achieve a human, social, environmental and economic balance.

1.4 INTEGRAL POLICY

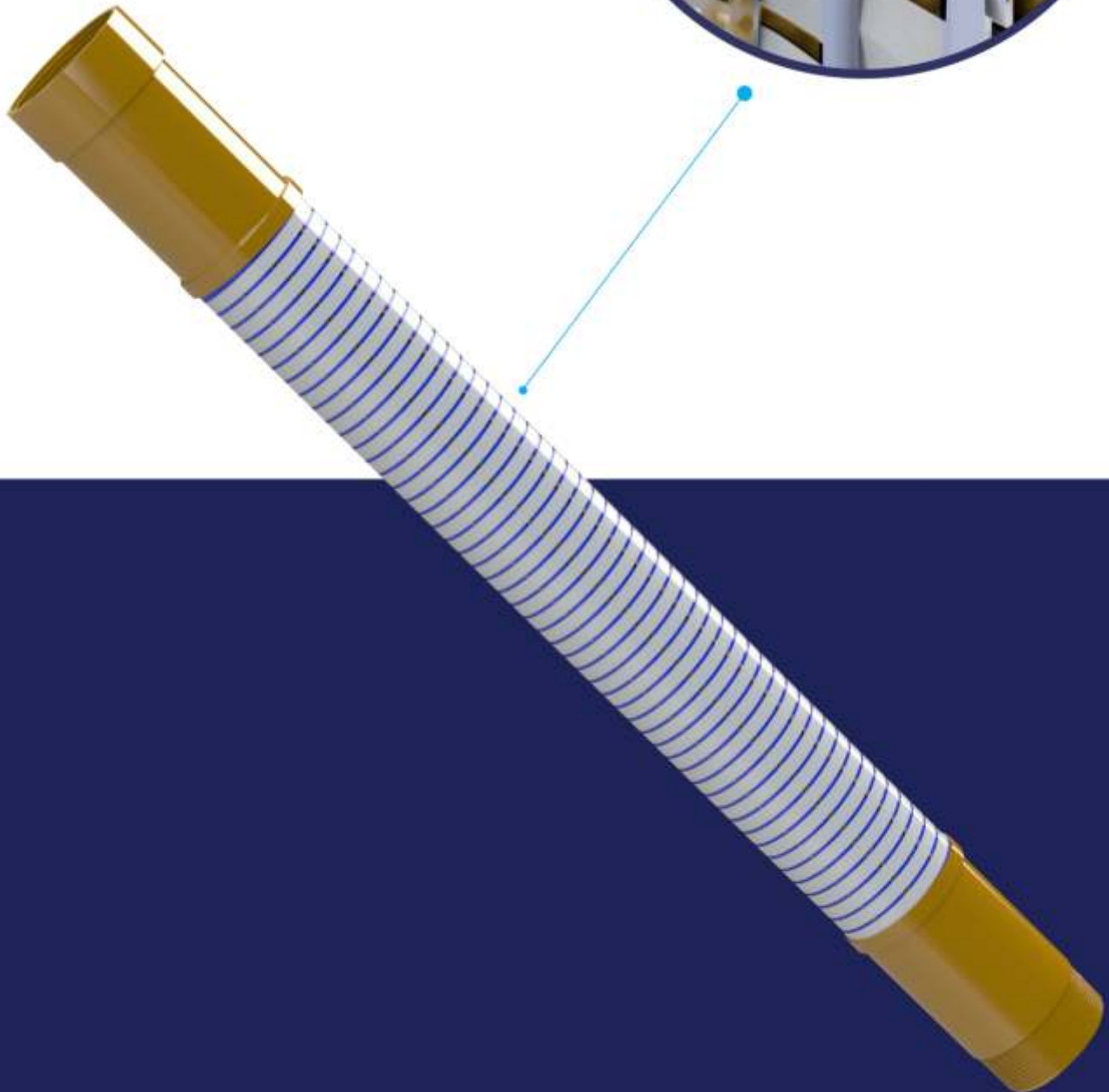
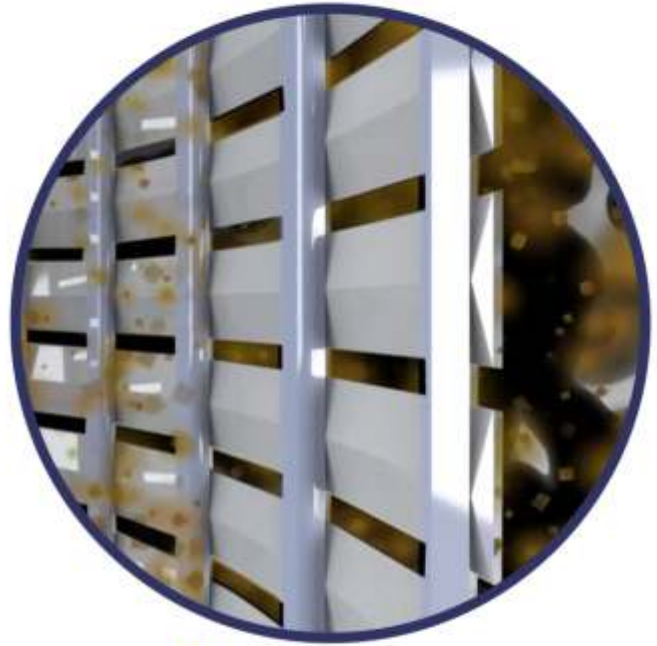
TUNDRA INGENIERÍA Y SUMINISTROS SAS in the development of its activities of provision of high performance equipment and tools for the hydrocarbon industry in artificial lift systems and hole completion designs, such as: solids filtration, gas separation and bottom hole chemical treatments, demonstrates its commitment to provide quality products to our clients and workers for the development of their work, through the review and continuous improvement of the integrated management system: which includes the identification of hazards, assessment of risks and determination of controls, the identification of environmental aspects and impacts and their respective mitigation measures of the standards in safety, health at work, environment, emergencies and contribute in the evolution of the working life of their workers and families, within the Colombian legal framework in force and others that the organization subscribes.



BOTTOM HOLE TOOLS FOR SOLID CONTROL

SAND SCREEN

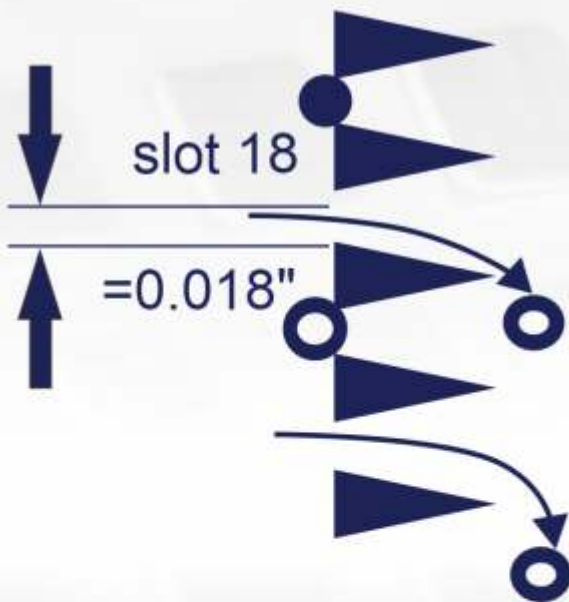
They are tubular screens of small diameters and lengths composed of a steel body covered by a stainless steel mesh of different slots, useful mainly to be connected directly to the pumps of the mechanical pump lifting system, among others.



WHAT IS THE SLOT?

The size of the slot is the opening or gap between "V" wires, which determines the filtration range.

Example: An 18 slot has an opening of 0.018 inches

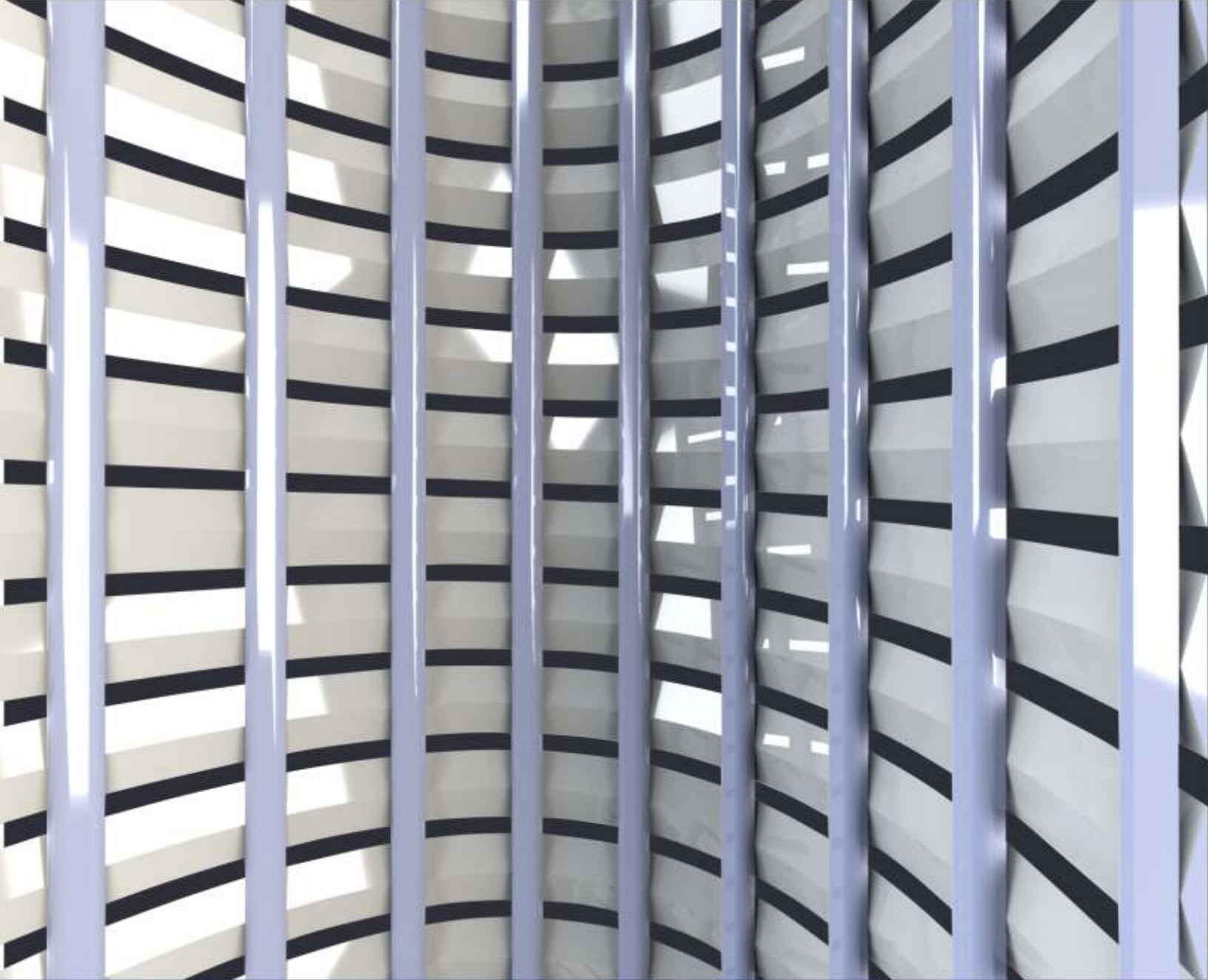


| CONNECTION DIAMETER | LENGTH | SLOT |
|---------------------|--------|------|
| 1" | 2 | 12 |
| | 2 | 15 |
| | 2 | 20 |
| | 2 | 30 |
| | 2 | 50 |
| | 2 | 75 |
| | 4 | 12 |
| | 4 | 15 |
| | 4 | 20 |
| | 4 | 30 |
| | 4 | 50 |
| | 4 | 75 |
| | 8 | 12 |
| | 8 | 15 |
| | 8 | 20 |
| | 8 | 30 |
| | 8 | 50 |
| | 8 | 75 |
| | 6 | 75 |
| | 8 | 12 |
| | 8 | 15 |
| | 8 | 20 |
| | 8 | 30 |
| | 8 | 50 |
| | 8 | 75 |
| 25 | 12 | |
| 25 | 15 | |
| 25 | 20 | |
| 25 | 30 | |
| 25 | 50 | |
| 25 | 75 | |

| CONNECTION DIAMETER | LENGTH | SLOT |
|---------------------|--------|------|
| 1 1/2" | 2 | 12 |
| | 2 | 15 |
| | 2 | 20 |
| | 2 | 30 |
| | 2 | 50 |
| | 2 | 75 |
| | 3 | 12 |
| | 3 | 15 |
| | 3 | 20 |
| | 3 | 30 |
| | 3 | 50 |
| | 3 | 75 |

| CONNECTION DIAMETER | LENGTH | SLOT |
|---------------------|--------|------|
| 1 1/4" | 2 | 12 |
| | 2 | 15 |
| | 2 | 20 |
| | 2 | 30 |
| | 2 | 50 |
| | 2 | 75 |
| | 4 | 12 |
| | 4 | 15 |
| | 4 | 20 |
| | 4 | 30 |
| | 4 | 50 |
| | 4 | 75 |
| | 6 | 12 |
| | 6 | 15 |
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| | 6 | 75 |
| | 8 | 12 |
| | 8 | 15 |
| | 8 | 20 |
| | 8 | 30 |
| | 8 | 50 |
| | 8 | 75 |
| | 25 | 12 |
| | 25 | 15 |
| | 25 | 20 |
| | 25 | 30 |
| | 25 | 50 |
| | 25 | 75 |





| CONNECTION DIAMETER | LENGTH | SLOT |
|---------------------|--------|------|
| 23/8" | 4 | 12 |
| | 4 | 15 |
| | 4 | 20 |
| | 4 | 30 |
| | 4 | 50 |
| | 4 | 75 |
| | 8 | 12 |
| | 8 | 15 |
| | 8 | 20 |
| | 8 | 30 |
| | 8 | 50 |
| | 8 | 75 |
| | 25 | 12 |
| | 25 | 15 |
| | 25 | 20 |
| | 25 | 30 |
| | 25 | 50 |
| | 25 | 75 |

| CONNECTION DIAMETER | LENGTH | SLOT |
|---------------------|--------|------|
| 27/8" | 4 | 12 |
| | 4 | 15 |
| | 4 | 20 |
| | 4 | 30 |
| | 4 | 50 |
| | 4 | 75 |
| | 8 | 12 |
| | 8 | 15 |
| | 8 | 20 |
| | 8 | 30 |
| | 8 | 50 |
| | 8 | 75 |
| | 25 | 12 |
| | 25 | 15 |
| | 25 | 20 |
| | 25 | 30 |
| | 25 | 50 |
| | 25 | 75 |

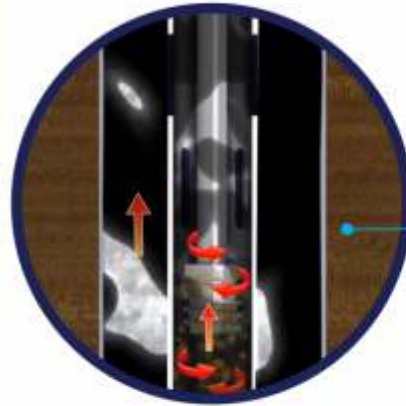
| CONNECTION DIAMETER | LENGTH | SLOT |
|---------------------|--------|------|
| 31/2" | 4 | 12 |
| | 4 | 15 |
| | 4 | 20 |
| | 4 | 30 |
| | 4 | 50 |
| | 4 | 75 |
| | 8 | 12 |
| | 8 | 15 |
| | 8 | 20 |
| | 8 | 30 |
| | 8 | 50 |
| | 8 | 75 |
| | 25 | 12 |
| | 25 | 15 |
| | 25 | 20 |
| | 25 | 30 |
| | 25 | 50 |
| | 25 | 75 |

| CONNECTION DIAMETER | LENGTH | SLOT |
|---------------------|--------|------|
| 41/2" | 4 | 12 |
| | 4 | 15 |
| | 4 | 20 |
| | 4 | 30 |
| | 4 | 50 |
| | 4 | 75 |
| | 8 | 12 |
| | 8 | 15 |
| | 8 | 20 |
| | 8 | 30 |
| | 8 | 50 |
| | 8 | 75 |
| | 25 | 12 |
| | 25 | 15 |
| | 25 | 20 |
| | 25 | 30 |
| | 25 | 50 |
| | 25 | 75 |
| 30 | 75 | |



HELIX SAND SEPARATOR

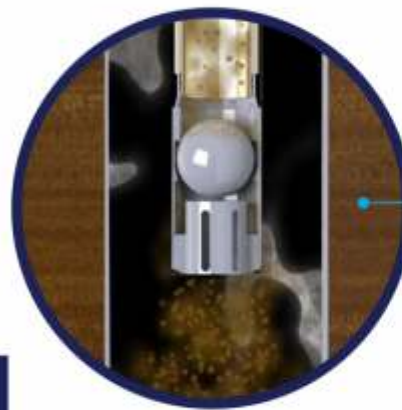
It is a device that, when the fluids produced from the well pass through the propeller, take a centrifugal force, sending the solids that are collected in a trap to the external part and allowing the liquid free of solids to enter the dip tube into the system lifting.



| CONNECTION DIAMETER | DIP TUBE LENGTH | HELIX |
|---------------------|-----------------|-----------------------|
| 2-7/8" | 0' | 2.1 ; 2.3 ; 2.4 ; 2.5 |
| | 9' | 2.1 ; 2.3 ; 2.4 ; 2.5 |
| | 41' | 2.1 ; 2.3 ; 2.4 ; 2.5 |
| | 74' | 2.1 ; 2.3 ; 2.4 ; 2.5 |
| | 108' | 2.1 ; 2.3 ; 2.4 ; 2.5 |
| 3-1/2" | 41' | 3.1 ; 3.3 ; 3.4 ; 3.5 |
| | 74' | 3.1 ; 3.3 ; 3.4 ; 3.6 |
| | 108' | 3.1 ; 3.3 ; 3.4 ; 3.7 |

DUMP VALVE

It is designed to be run at the bottom of the tubing. This valve allows the separated solids to be sent into the Rat hole without allowing flow to the desander. This is used only in mechanical pumping applications. The discharge valve allows solids to be initially stored in the tailpipe and when the tail pipe fills, to continue to be stored in the initially installed sand trap.



DUMP VALVE MODELS FOR STANDARD PIPE SIZES

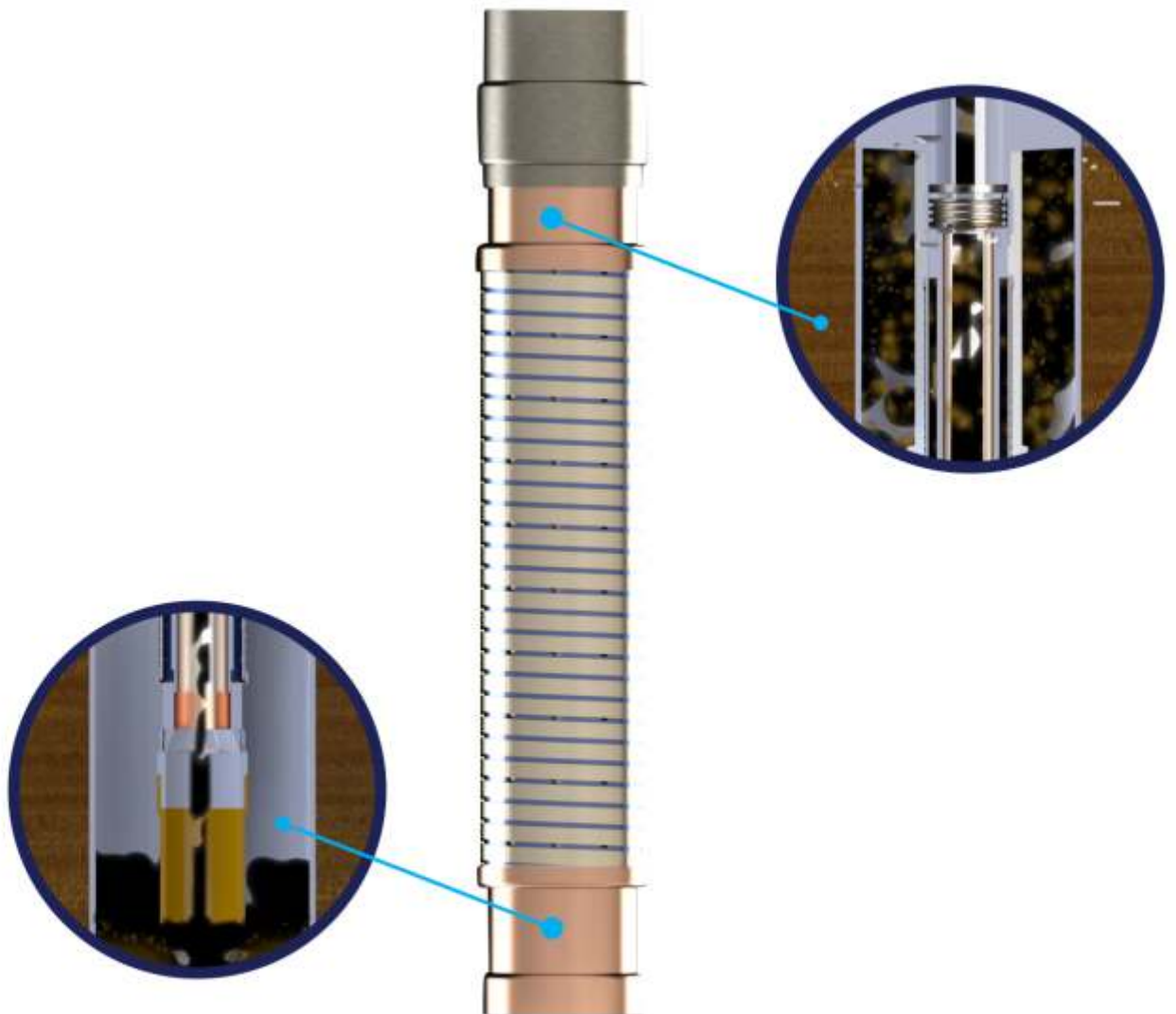
| MODEL | PIPE SIZE |
|--------|-----------|
| Dv2375 | 2-3/8"EUE |
| Dv2375 | 2-7/8"EUE |
| Dv2375 | 2-1/2"EUE |

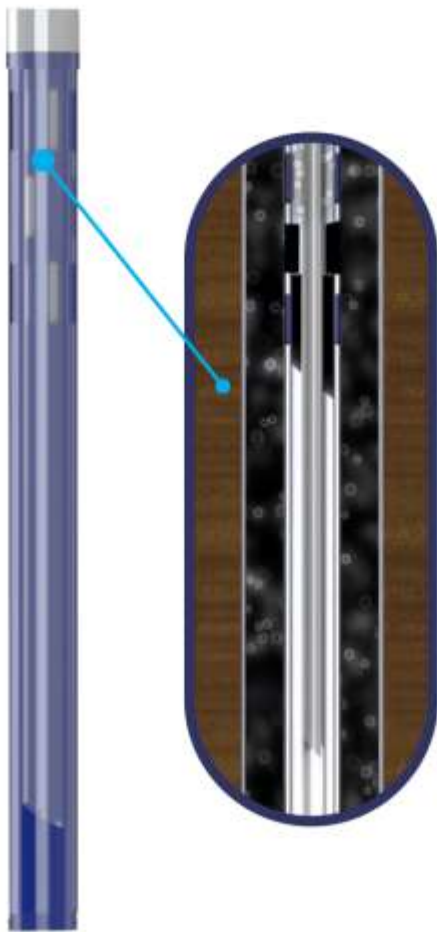


BYPASS VALVE

It is a safety device, used in the production string when there are screens to control solids, its function is to activate flow when the screens are plugged, by means of a 30 psi differential rupture disc, preventing the pump from running out fluid, although it already passes without filtering.

| CONNECTION DIAMETER | LENGTH | SLOT | PART NUMBER |
|---------------------|--------|--------|--------------|
| 2-7/8" | 5' | 0.075" | DWW-287-7501 |
| 3-1/2" | 5' | 0.020" | DWW-350-2001 |
| | 5' | 0.050" | DWW-350-5001 |
| | 5' | 0.075" | DWW-350-7501 |



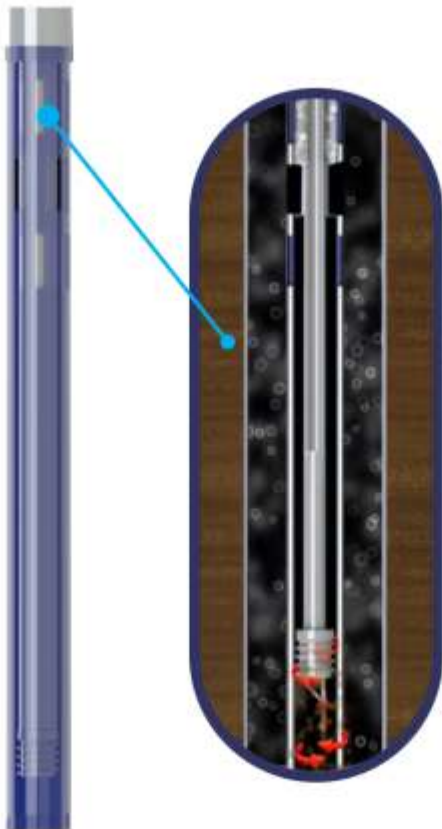


BOTTOM HOLE TOOLS FOR GAS SEPARATION

GAS LIBERATOR

This tool is designed to create an additional annular space to that of the well where the fluid changes direction allowing an initial separation of the free gas, and then generates a chamber where more free gas is released, which in contraviva returns to the annulus of the well.

| CONNECTION DIAMETER | LENGTH | LENGTH / DIP TUBE DIAMETER |
|---------------------|--------------|----------------------------|
| 2-7/8" | 30' | 30' / 1/4" |
| 3-1/2" | 30' | 21' / 1" |
| | | 21' / 1-1/4" |
| | 30' | 30' / 1-1/2" |
| | 50' | 50' / 1-1/2" |
| | | 50' / 1-1/2" |
| 60' | 60' / 1-1/2" | |
| 4-1/2" | 30' | 21' / 2-7/8" |



GAS/SAND COMBINATION

Gas separators can be combined with other tools to maximize performance or for additional work. The gas / sand combination allows the separation of sand by means of screens in an initial stage of the intake before carrying out the separation of gas with the "Gas Liberator".

| CONNECTION DIAMETER | TUBING SCREEN LENGTH | GAS BODY LENGTH | DIP TUBE LENGTH |
|---------------------|----------------------|-----------------|-----------------|
| 2-7/8" | 23.5' | 30' | 48' |
| | 47' | 30' | 68' |
| | | 60' | 110' |



TOOLS TO REDUCE GAS PRESSURE IN CASING

BEAM GAS COMPRESSOR (BGC)

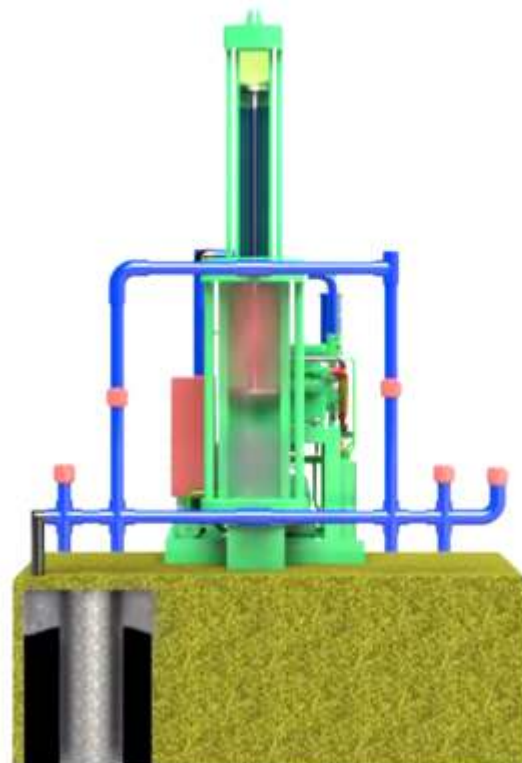
BGC is used to suck the gas from the annulus by compressing it to the production line or gas collectors through the action of the mechanical pumping beam as the main driving force with a double action system and continuously compresses the gas in both directions providing "Dynamic Compression".

The size of the BGC is configured according to the desired annular gas production within the normal operating time of the pumping unit.



HYDRAULIC BEAM GAS COMPRESSOR (HyBGC)

It works as a standalone piston system relieving back pressure and gas interference for PCP and ESP wells.



TOOLS WITH SOLID CHEMICAL TREATMENT FOR BOTTOM HOLE AND SURFACE

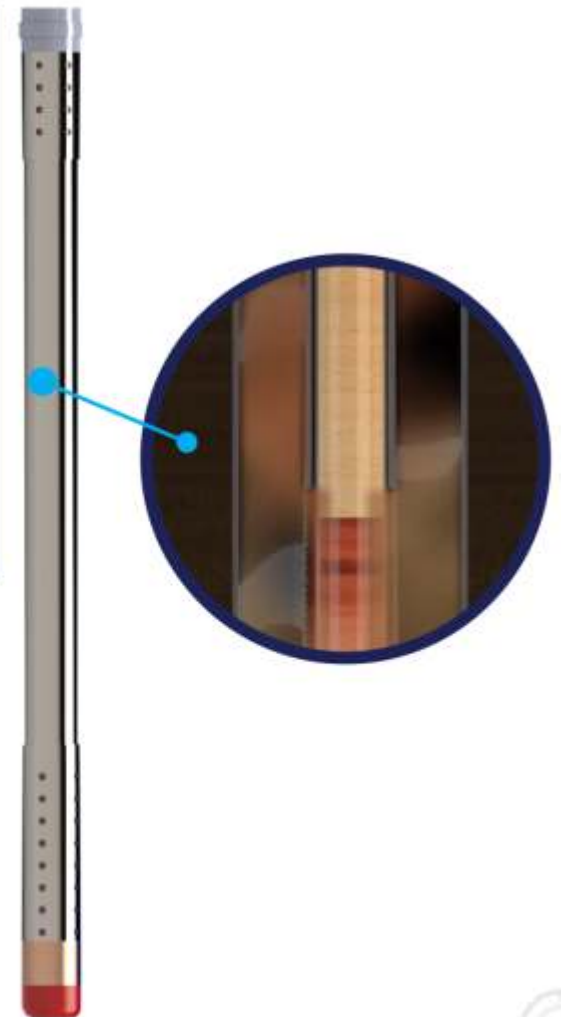
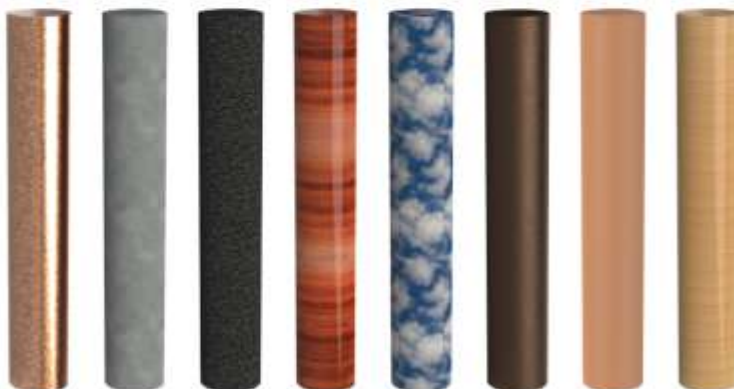
CHEMICAL TREATMENT FOR BOTTOM OF WELL RUNNING IN API PIPE OR SLIM HOLE

Solid chemical treatment in sticks that gradually dissolve with the well fluids providing protection to the complete lifting system. These sticks can be contained within different pipe sizes.

In order for the chemical to dissolve gradually, the system has several dispersion zones installed, consisting of short slotted tubes with their respective screens.

| CONNECTION DIAMETER | CHEMICAL LENGTH | DISPERSION ZONES | PRESENTATION |
|---------------------|-----------------|------------------|--------------|
| 2-3/8" | 34' | 2 zones | Tubing |
| | 65' | 2 zones | Tubing |
| | 96' | 2 zones | Tubing |
| | 98' | 3 zones | Tubing |
| | 129' | 3 zones | Tubing |
| | 160' | 3 zones | Tubing |
| 2-7/8" | 34' | 2 zones | Tubing |
| | 65' | 2 zones | Tubing |
| | 96' | 2 zones | Tubing |
| | 98' | 3 zones | Tubing |
| | 129' | 3 zones | Tubing |
| | 160' | 3 zones | Tubing |
| 3-1/2" | 34' | 2 zones | Tubing |
| | 65' | 2 zones | Tubing |
| | 96' | 2 zones | Tubing |
| | 98' | 3 zones | Tubing |
| | 127' | 2 zones | Tubing |
| | 129' | 3 zones | Tubing |
| | 158' | 2 zones | Tubing |
| | 160' | 3 zones | Tubing |

| TUBING | WIRELINE WELL DEFENDER | DISPERSION ZONES | LENGTH |
|--------|------------------------|------------------|--------|
| 27/8" | 1-1/4" | 1 | 55 |
| | 1-1/4" | 2 | 84 |
| | 1-1/4" | 3 | 109 |
| 31/2" | 1-1/2" | 1 | 55 |
| | 1-1/2" | 2 | 84 |
| | 1-1/2" | 3 | 109 |



WELL PROTECTOR WITH SOLID SURFACE CHEMICAL TREATMENT

Fully autonomous surface treating vessel where the “well” treats itself.

FEATURES:

- No power source required
- Reduces potential for spills and accidents
- All chemicals in one vessel reducing surface footprint
- No treater trucks reducing carbon footprint
- Reduced chemical costs
- Chemical is not diluted (100% active)
- Alter formulations and interchange on the fly as conditions dictate
- Rechargeable
- No chemical pump required
- Patented time release chemical stick technology and vessel



STICKS FOR CHEMICAL TREATMENT (FOAMING OR ANTIFOAMING)

Chemical sticks are manufactured for the following types of treatment:

- **Scale liberator:** A formulated blend of phosphonates, high weight molecular polymers, phosphoric acid, phosphonic acid, phosphonates and orthophosphates to inhibit the formation of Scale in environments with a wide spectrum of temperatures and pressures. Components have also been added to insulate the metal and protect with a film for corrosion inhibition.



- **Corrosion Advantage:** A formulated blend of high molecular weight amines, amides, imidazoline, and surfactants to passivate corrosion problems. It provides a constant film that protects in agitated environments and in the presence of acid gases. Its formulation has also been modified with the addition of components that protect from highly acid gases such as CO₂ and H₂S.



- **Paraffin Rich:** A formulated blend of pour point depressants, surfactants, sulfonic acid-based solvents, dispersants, and demulsifiers to inhibit and disperse paraffin in its nucleating stage prior to depositing and sticking in the pipe. This formula is used thoroughly to remove and disperse paraffin particles which cause plugging of pumps and pipes. This product also helps minimize paraffin deposition on conveyor lines and tank bottoms.



- **Freedom Fighter:** A formulated blend of pour point depressants, surfactants, demulsifiers, amines, high molecular weight imidazoline, and polymers that provide protection against corrosion, scale precipitation, and paraffin deposition.



STICKS FOR CHEMICAL TREATMENT (FOAMING OR ANTIFOAMING)

Chemical sticks are manufactured for the following types of treatment:

- **Defoamer:** Silicone defoamer can have a wide variety of applications. They can be used to reduce surface foam by releasing the air produced. It is also suitable in non-aqueous environments such as crude oil, refined crude oil and in gas lift operations where foam and high levels of condensate present in high gravity hydrocarbons are generated.



- **Foamer:** Freedom Foamer rods provide surface tension release and foam generation that aids in the release of the fluid column in the wellbore. The strong foaming agent function has been developed to show excellent tolerance to background hydrocarbon influx with high tolerance to calcium.



- **Asphaltene Compound:** Asphaltene solvent that helps in reducing the deposit of solids at the hole bottom and that with residual concentrations also helps to reduce the deposit on the surface in transfer lines and tanks.



- **Acid Surfactant Compound:** Solubilizing surfactant phosphoric acid of Scale components that reveals the integrity of the metal by removing the residual layer on it.



ADDITIONAL TOOLS AND ACCESSORIES FOR THE INSTALLATION, ADEQUACY AND OPERATION OF FREEDOM CHEMICAL TECHNOLOGIES

DUAL CUP PACKER

Tool with standard EUE connection to separate or create two casing sections using two tapered elastomer gaskets that adhere to the casing walls without the need to apply pressure, tension or rotation of the tubing. Its removal as well as the installation is done by running the pipe. Does not create a high pressure gap. Used to force fluid into gas and sand separation tools.



| TUBING | CASING |
|--------|--------|
| 2-3/8" | 5" |
| 2-7/8" | 5-1/2" |
| 3-1/2" | 7" |
| 3-1/2" | 9" |

NO FLOW COLLAR

Collars or coupling with standard 2-3 / 8 ", 2-7 / 8" and 3-1 / 2 "connection that don't allow internal flow. They are used for the connection of chemical treatments to the intake or gas or sand separators in the different lifting systems.



PUP JOINT

Short tubes used to join pipe joints. In addition, they can be manufactured with perforations or grooves that are used together for the entry of fluid to the different systems or tools for separating gas or solids.

| DIAMETER | LENGTH | TYPE |
|----------|--------|-------------------------|
| 2-3/8" | 2 | PERFORATED/UNPERFORATED |
| 2-3/8" | 4 | PERFORATED/UNPERFORATED |
| 2-3/8" | 6 | PERFORATED/UNPERFORATED |
| 2-3/8" | 8 | PERFORATED/UNPERFORATED |
| 2-3/8" | 10 | PERFORATED/UNPERFORATED |
| 2-3/8" | 12 | PERFORATED/UNPERFORATED |
| 2-7/8" | 2 | PERFORATED/UNPERFORATED |
| 2-7/8" | 4 | PERFORATED/UNPERFORATED |
| 2-7/8" | 8 | PERFORATED/UNPERFORATED |
| 2-7/8" | 10 | PERFORATED/UNPERFORATED |
| 2-7/8" | 12 | PERFORATED/UNPERFORATED |
| 3-1/2" | 2 | PERFORATED/UNPERFORATED |
| 3-1/2" | 4 | PERFORATED/UNPERFORATED |
| 3-1/2" | 6 | PERFORATED/UNPERFORATED |
| 3-1/2" | 8 | PERFORATED/UNPERFORATED |
| 3-1/2" | 10 | PERFORATED/UNPERFORATED |
| 3-1/2" | 12 | PERFORATED/UNPERFORATED |



BULL PLUG

Blind plug used as a termination for separators or chemical treatments.

| DIAMETER | CONNECTION |
|----------|------------|
| 1-1/4" | NPT |
| 1-1/2" | NPT |
| 2-7/8" | NU/EUE |
| 3-1/2" | NU/EUE |



X-OVERS

Accessories for connecting pipes and other tools of different threads and diameters

CrossOver,,2-3/8" NU Boxx 2-3/8" NU Pin.
CrossOver,,2-3/8" NU Boxx 3-1/2" NU Pin.
CrossOver,,2-7/8" NU Boxx 2-3/8" NU Pin.
CrossOver,,2-7/8" NU Boxx 2-7/8" NU Pin.
CrossOver,,2-7/8" NU Boxx 3-1/8" NU Pin.
CrossOver,,3-1/2" NU Boxx 2-3/8" NU Pin.
CrossOver,,3-1/2" NU Boxx 2-7/8" NU Pin.
CrossOver,,3-1/2" NU Boxx 2-7/8" NU Pin.
CrossOver,,2-3/8" EU Boxx 2-7/8" EU Pin.
CrossOver,,2-3/8" EU Boxx 2-7/8" EU Pin.
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CrossOver,,2-3/8" EUBoxx 2-7/8" NU Pin.
CrossOver,,2-3/8" EUBoxx 3-1/2" NU Pin.





GROUND PUMP TOOLS FOR GAS AND SAND HANDLING

CLEANSWEEP BRUSH

It is a device that is installed on top of a PCP pump or mechanical pump, in order to retain the sand on top of them (without falling to the piston-barrel or rotor-stator), during maintenance stops, electrical cuts or other reasons, allowing a restart of pump operation without clogging problems. It is lowered according to the size of the pipe, and is available for 2-3/8", 2-7/8" and 3-1/2".



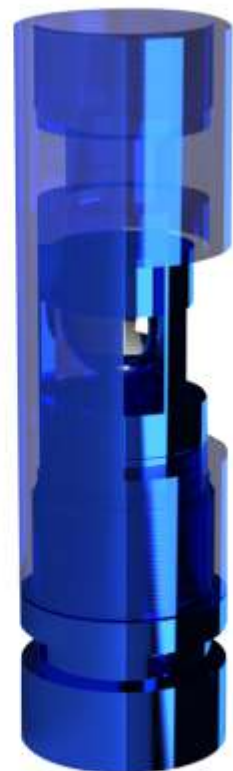
CYCLONE PLUNGER ADAPTER INSERT & TUBING PUMP

It is a device that can be installed on mechanical action pumps, located on the upper part of the piston, in order to improve solids handling, avoiding damage or premature sticking to the piston or barrel. Can be used with insert or pipe pumps. Likewise, it can be manufactured in special materials for corrosion management, if well conditions require it. Fits piston size or barrel bore so they come in 1-1 / 2", 1-3 / 4", 2", 2-1 / 4", 2-1 / 2 pump sizes", 2-3 / 4" and 3-1 / 4". To select the appropriate equipment, we must consider the external diameter of the insert pump rod valve (5/16", 7/8" and 1-1 / 16") and its thread (5/8", 3/4", 7/8" and 1").



HIGH FLOW VALVE

They are improved cages, non-API classification, which are installed in the traveling valve or fixed valve, in order to improve the handling of gas or solids, since the internal handling area is 40% higher than API cages. It comes for box or pin connections, of different metallurgies, and for all sizes of pumps. Fits piston size or barrel bore so they come in 1-1 / 2", 1-3 / 4", 2", 2-1 / 4", 2-1 / 2 pump sizes", 2-3 / 4", 3-1 / 4" and 3-3 / 4".



SUREFLOWVALVE

It is a valve specifically designed for gas handling, increasing the compressibility factor, eliminating gas interference or gas blow, in mechanical action pumps. Fits piston size or barrel bore so they come in 1-1/2", 1-3/4", 2", 2-1/4", 2-1/2 pump sizes", 2-3/4" and 3-1/4".



SANDCHECKVALVEROD GUIDE

It is a device, used in the pump, to prevent the entry of sand when the well is stopped for some reason, or to reduce the impact of the fluid or gas shock, since it supports the entire hydrostatic column of the well. Adapts to piston size or barrel ID, so they fit only some 1-1/2", 2" and 2-1/2" insert pump sizes. To select the appropriate equipment, we must consider the external diameter of the insert pump rod valve and its thread.





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