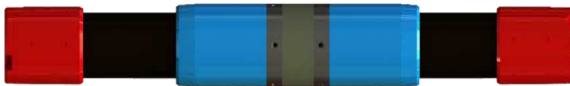


 **HP WELL SCREEN**



*Well
Completion
Products*

2022



INDEX

- Company introduction
- Product Overview H.P. Well Screen B.V.
- Well Screens
- Inflow Control Devices
- Swellable Packers
- Complementary products
- Developments

Company introduction

- Started in 1983 as Independent manufacturer
- Screen and Inflow Control specialist
- Production in
 - The Netherlands
 - Abu Dhabi
- Over 10.000.000 ft installed and producing successful
- > 10.000 ICD's reducing WC and GOR
- > 15.000 Dissolvable plugs
- Suppling to major and smaller operators and service companies
- Customized design
- In house engineering and design validation & testing
- ISO Certified (ISO-9001-2015)

Product Overview

H.P. Well Screen (HPWS) is Europe's largest private family-owned manufacturers and specialist of wedge wire screen filtration products. We are manufacturing and engineering customized screen solutions for applications in the **Oil & Gas, Geothermal, Water** and Petrochemical Industries.

We offer the following products;

- **Well Screens**
- **Inflow Control Devices**
- **Swellable Packers**
- **Dissolvable plugs**
- **Complementary products**

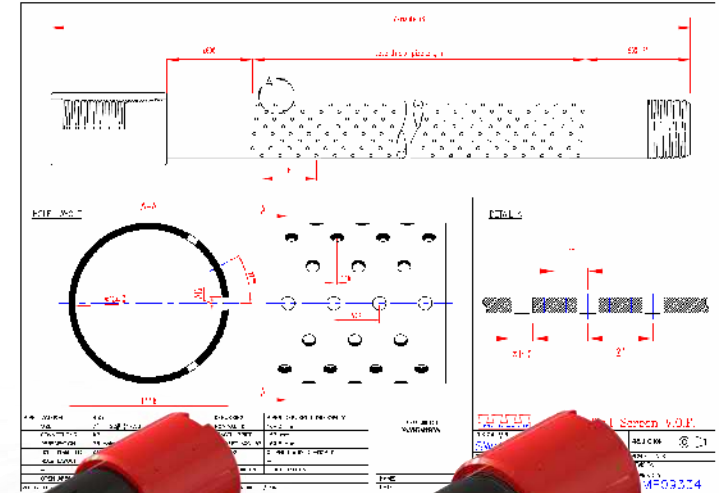
Well Screens

- **Slotted liner / Pre-drilled Liner**
- **FreeFlow**
- **SandFree / SolidWrap**
- **SlimPack**
- **Porobond**
- **Porolock / HD / Shield / ER TT**
- **Wash Pipe Free**
- **Annular Barrier**

Well Screens - Slotted liner / Pre-drilled Liner



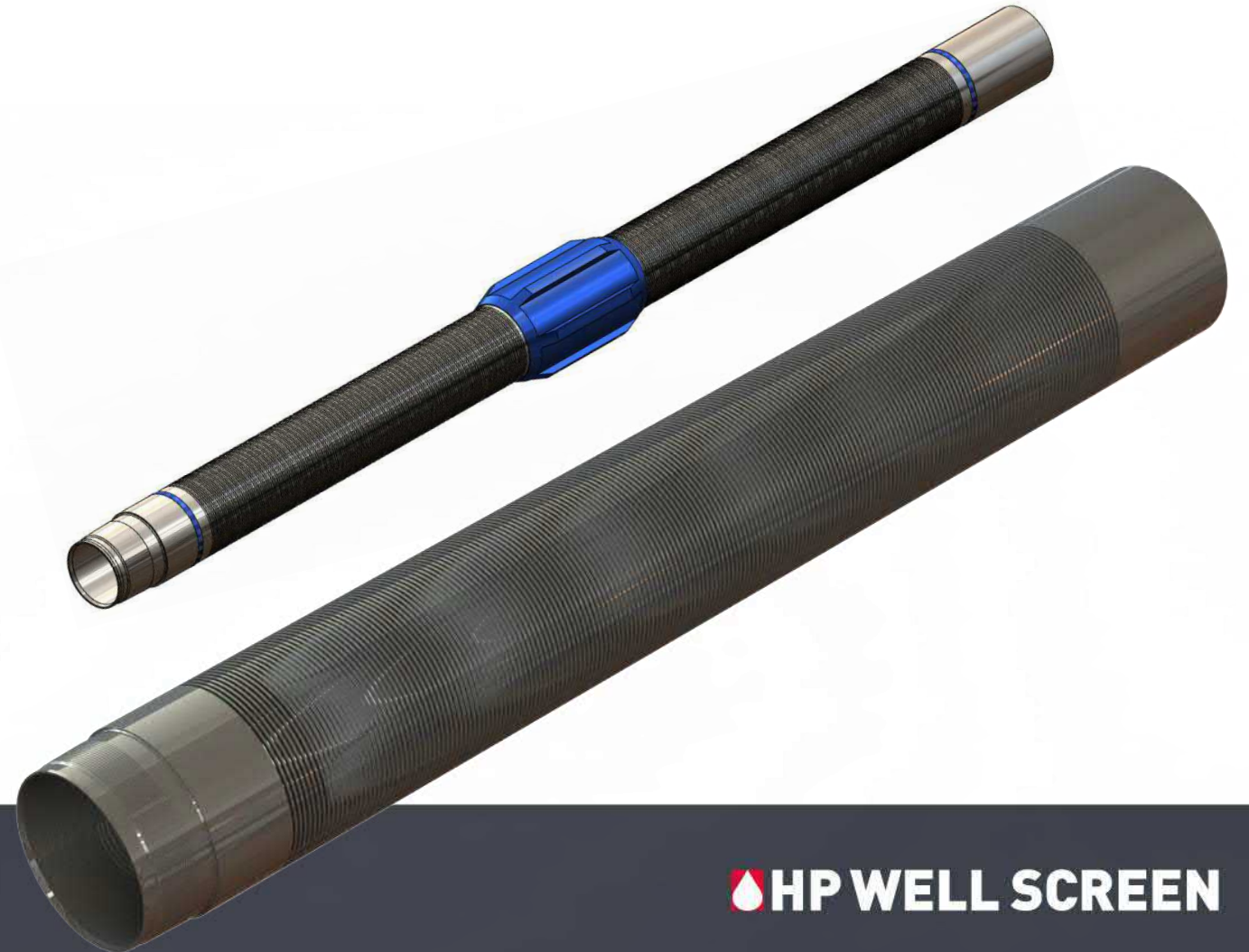
- Robust and cost-effective solution for
 - Sand control
 - Bore hole stability
 - Long horizontals
- Accurate multi spindle CNC machining
- Customized designs: Spiral / Staggered / Gang
- Every single slot / hole inspected
- Flush design for narrow sidetracks



Well Screens – Free Flow



- Rod base wire wrapped screen
- Direct formation contact
- Optimal cleaning ability
- Optimized OD/ID ratios
- High flow heavy duty V-wires
- Superior weld strength
- Internal external flush design



Well Screens – HD Bridge Slotted

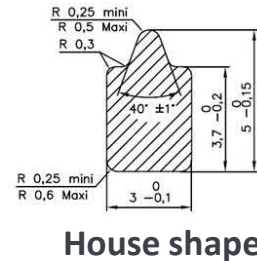
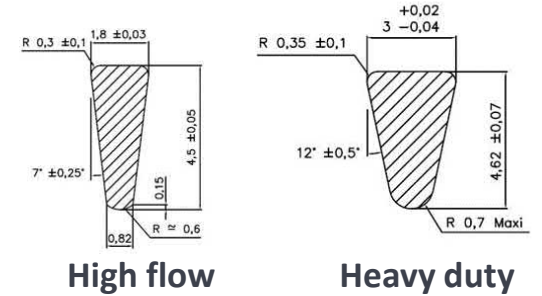
- High density punched screen jackets
- Higher open area and more accuracy
- Non clogging slots
- High damage tolerance
- Economical & robust sand control



Well Screens – SandFree / SolidWrap



- Pipe base screen + tight-fit jacket / direct wrapped
- Free flow continuous slot opening
- Best tolerances +25/-50 micron (99,7%)
- **High flow** V-wires for fine formation sands and heavy oil
- **Heavy duty** wires for erosion resistance and thermal applications
- Chrome and nickel alloys for sour service
- Protective **outer shrouds** for multi laterals
- **House shaped** wires for custom design
- Hardened WWS options for higher erosion resistance



House shape

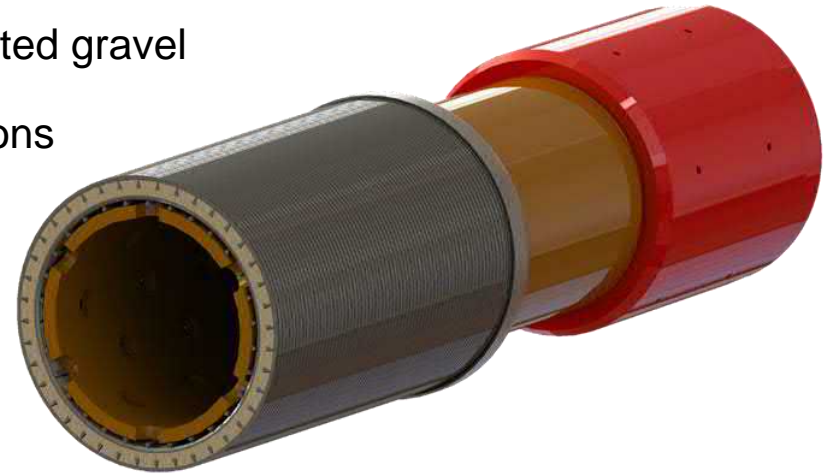
Shrouded



Well Screens – Slimpack



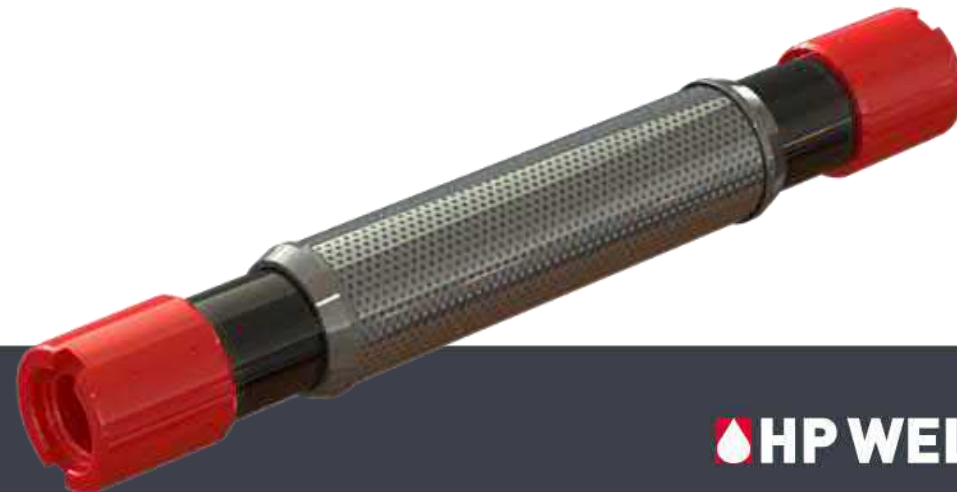
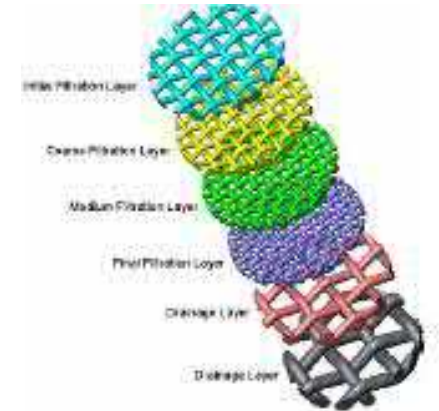
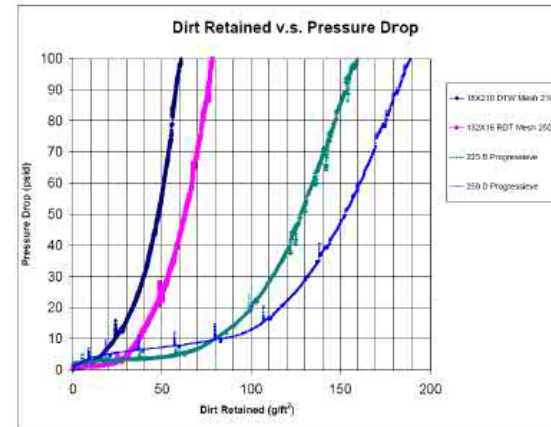
- Pre-packed with gravel between dual WWS
- Replacing conventional gravel packs
- High permeable glass beads, ceramic or resin coated gravel
- Thin pack for reduced OD/ID ratio running operations
- Compacted with unique vibrating system
- Controlled and monitored curing process



Well Screens – PoroBond



- Premium diffusion bonded laminate screen
- Multiple layer design
- 3D with high plugging resistance
- Sinter technique with diffusion of all layers
- Strong protective outer shroud
- Customized design



Well Screens – PoroLock



- Unique simultaneous forming of layers
 - Patented technology
- Weave locked by direct wrapping
- Multiple layer design
- No risk of weave damage by manufacturing process
- No welding on weave
- World best weave quality and validation system
- World highest collapse and burst rates
- Erosion resistant weave options



Well Screens – PoroLock HD



PoroLock HD - Chalk

- Optimized control layers for unstable chalk
- Rotation ability in squeezing chalk formation
- Ultimate collapse strength
- Bonded centralizers with 40% reduced friction (Maxwell)
- 2 successful wells in the north sea
- 25-34 kNm torque / 5-20mMT weight / 10 rpm



Well Screens – PoroLock Shield

Field Proven PoroLock Screen Superior Erosion Resistance

- **300%** increased erosion resistance by reducing flow velocities
- Shroud hole pattern offset from the base perforations
- Flexible shield sections to match base pipe perforation design
- Unique direct wrapping of all layers on inner shield
- PoroLock's superior sand control and mechanical strength

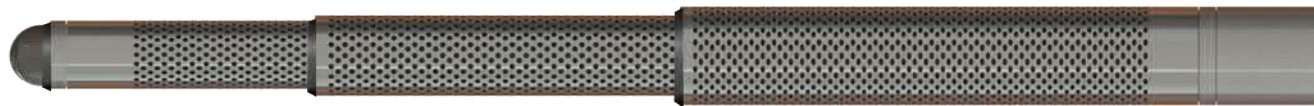


Well Screens – PoroLock ER TT



PoroLock Through tubing Superior erosion resistance

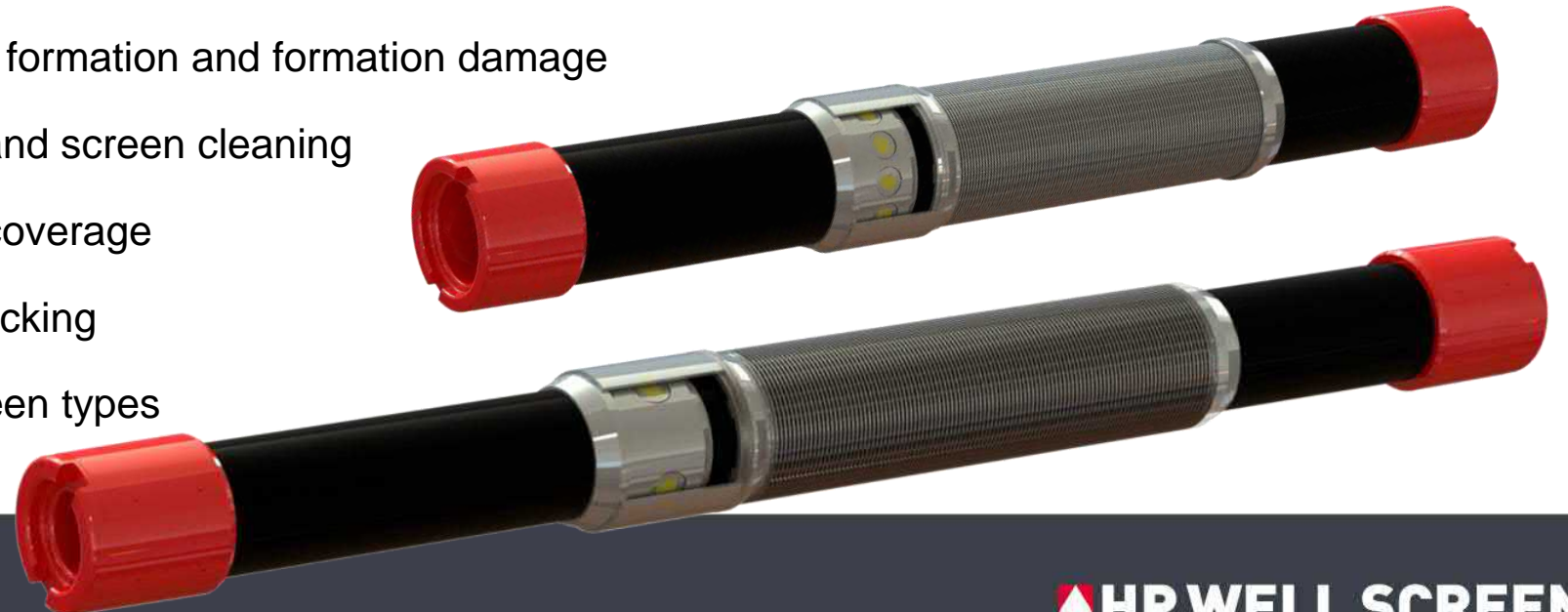
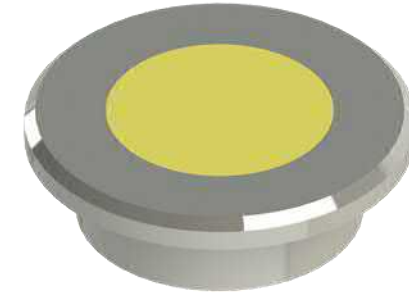
- **400%** increased erosion resistance by reducing flow velocities
- **500%** increased erosion resistance in combination with ER weave
- Basepipe-less design with heavy duty inner and outer shroud
- Flush inside and outside avoiding turbulence
- High open structure reducing velocity
- Flexible OD to fit through any nipple profile
- Tapered design for small annulus



Well Screens - Wash Pipe FREE Screen



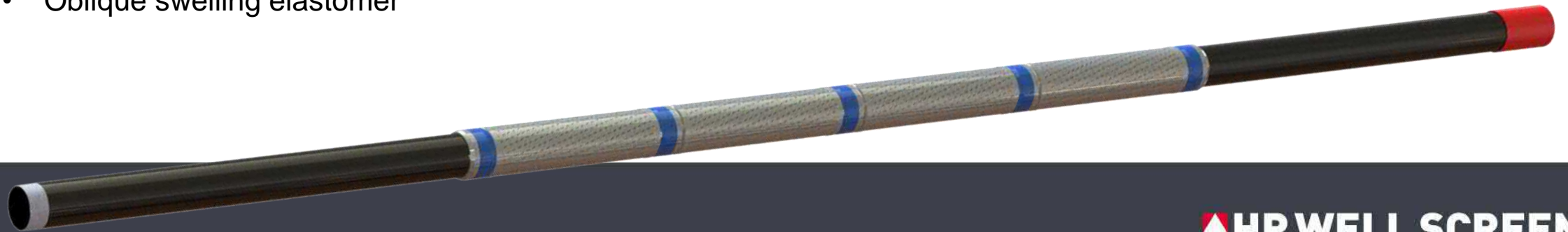
- Screen deployment without inner string
- Dissolvable plugged Perforation Assembly
- Time and cost savings
- Ability to wash to TD
- Less fluid losses to formation and formation damage
- Effective wellbore and screen cleaning
- Improved breaker coverage
- Improved gravel packing
- Comes with all screen types



Well Screens - Annular Barrier ABS

Reliable stand-alone screen in layered reservoirs

- Plugging starts in the annulus screen/ wellbore → lower permeability
- Avoid mixing along liner length → use swell packers / ICD's
- Alternative to ESS
- Stops mixing in the annulus
- PoroLock direct wrapped metal mesh
- Mesh sizes from 60 to 600 micron
- Oblique swelling elastomer



Inflow Control Devices

- **AICV Autonomous Inflow Control Valve**
- **QFlux ICD**
- **QFlux DPNA**
- **QFlux IBPV**
- **SelectFlux on/off ICD**
- **Qflux IBV**

Inflow Control – Increased Oil Recovery (IOR)

Water & Gas breakthrough problems

- Friction inside the well
- Heterogeneous reservoirs
- Fractures
- Fingering and mobility ratio

INFLOW CONTROL

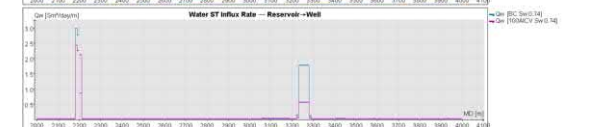
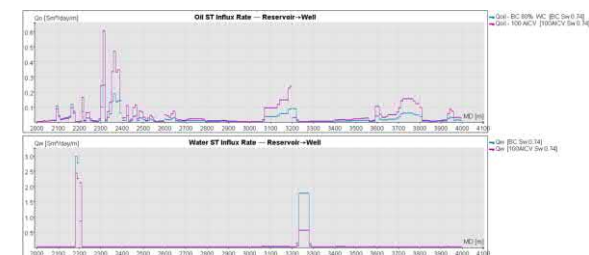
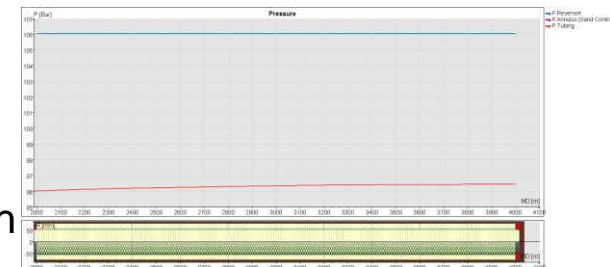
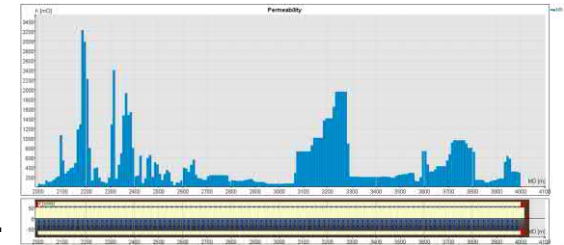
QFlux®	Passive ICD
Qflux DPNA	Plugged nozzle
SelectFlux®	Active Valve
AICV®	Automatic Valve

Inflow Control is required



Inflow Control – Modeling & Design - NETool

- Focus on reservoir objectives:
- Oil recovery or max flow io delaying water breakthrough
- Selection of isolation seal locations based on formation permeability or production profile.
- Computation of optimum choking level for each interval for best oil recovery
- Computations of oil, gas and water flow rates, average reservoir pressure and recovery factor with time
- Determination of well intervals likely to be the sources for early water or gas break-through
- Determination of the time of water or gas break-through.
- Scenario analysis
- Assessment of multiple design options and selecting one that best meets reservoir and production objectives.

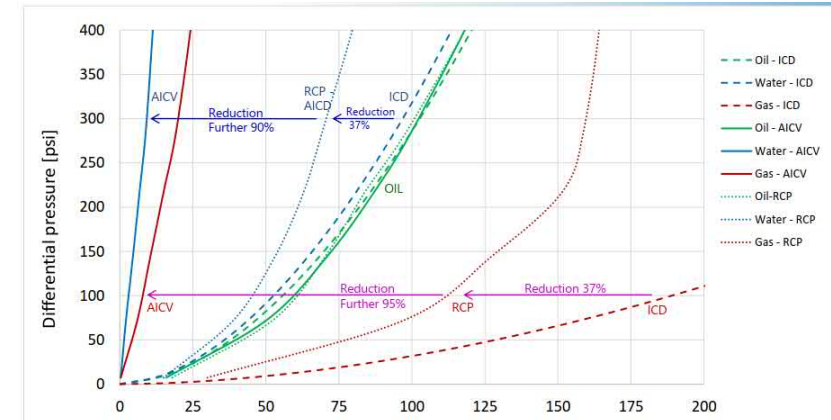


Inflow Control Devices - AICV

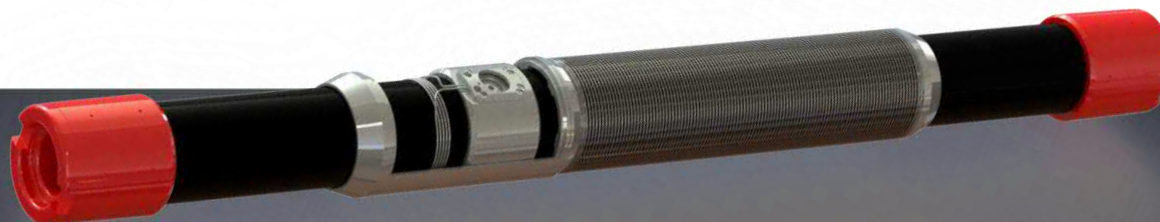


Stops water & gas completely at breakthrough

- Autonomous, requires no external power or control system
- Reversible, allows the oil to pass after an earlier stoppage.
- No limit in number of zones
- Retrofittable, can be installed in new and old wells
- Valve functions based on viscosity ratio
- ICD function chocking back oil production at start-up
- No separation, transport and handling of unwanted fluids



Water Reduction	Gas Reduction
<ul style="list-style-type: none"> • AICV* produces 95% less water vs. regular ICD • AICV* produces 93% less water vs. RCP-AICD 	<ul style="list-style-type: none"> • AICV* produces 98% less gas vs. regular ICD • AICV* produces 96% less gas vs. RCP-AICD

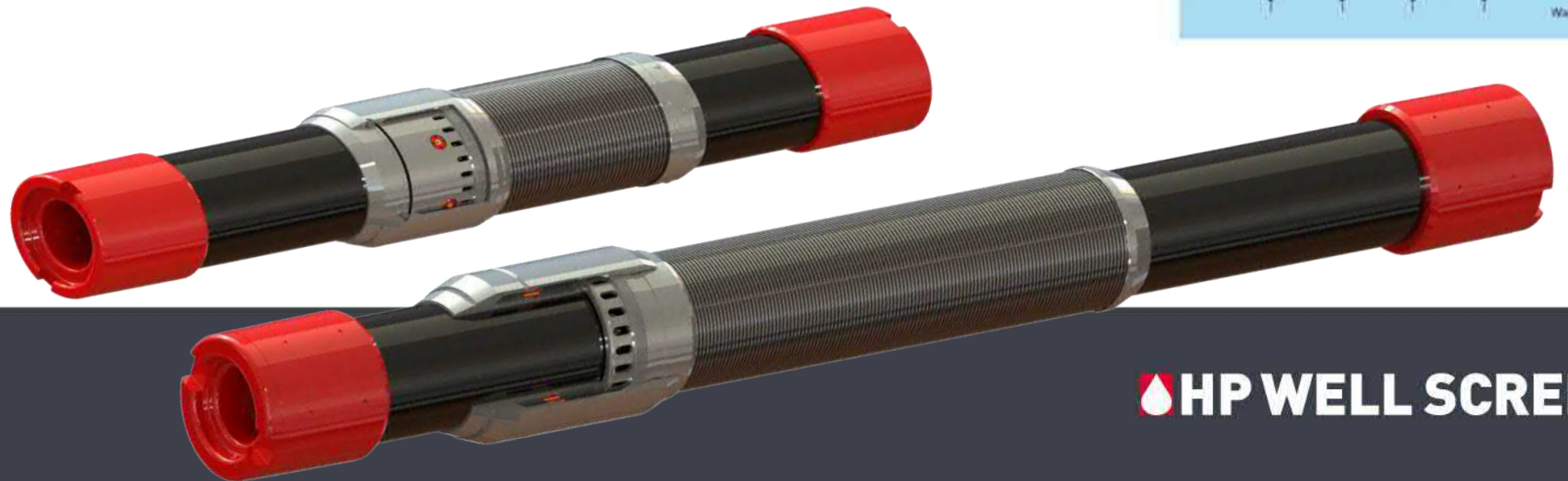
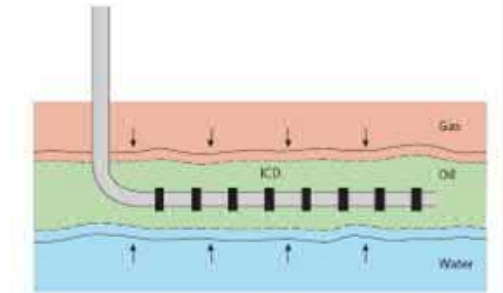
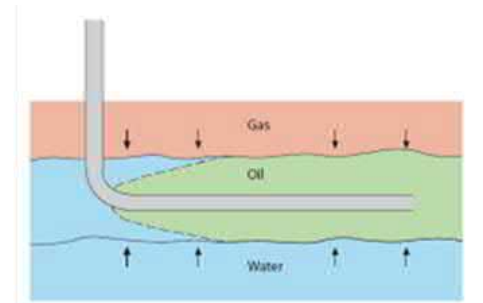


Inflow Control Devices – Qflux ICD



Delays gas & water breakthrough

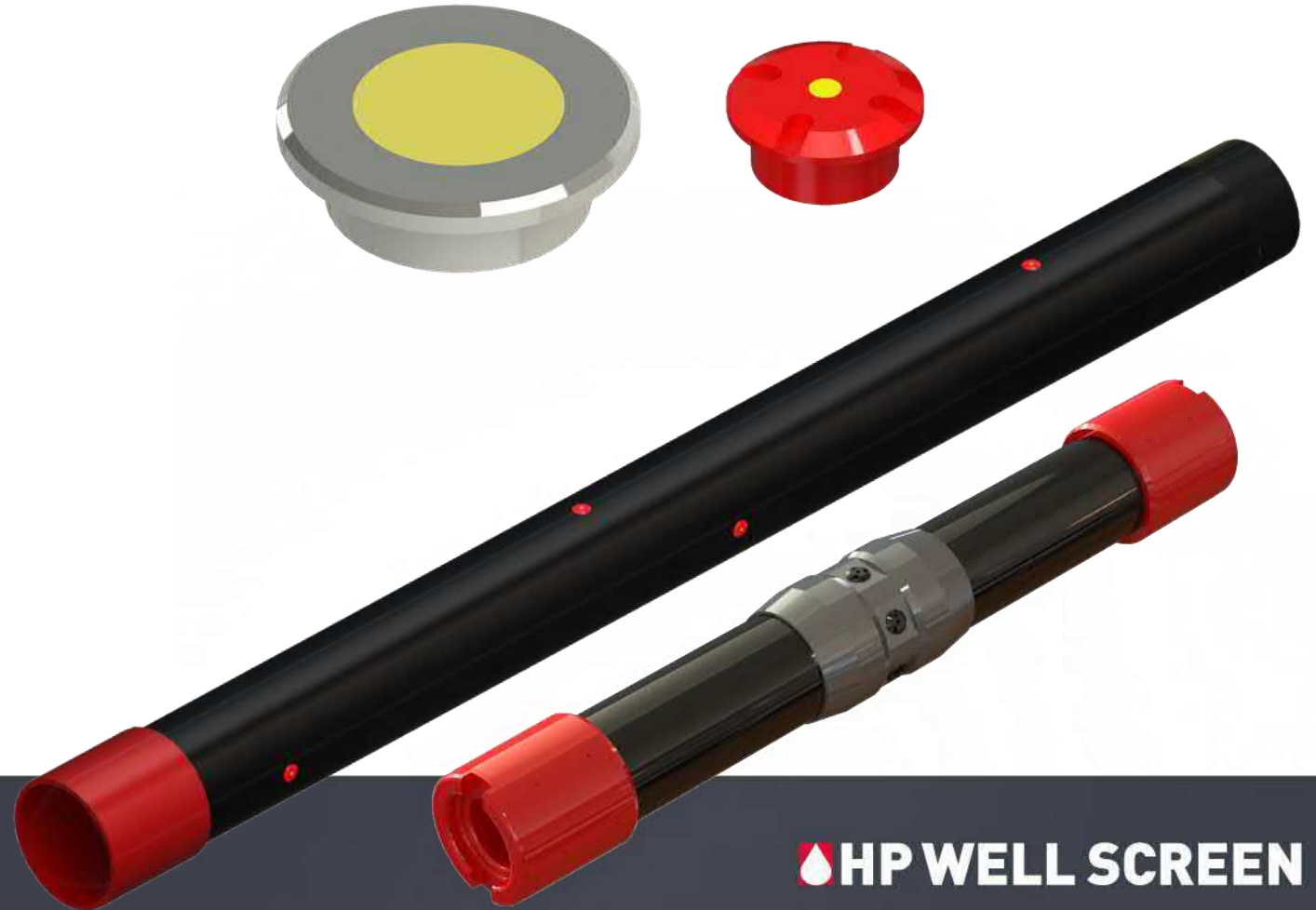
- Creating an even influx profile along the horizontal length
- Design on friction loss and reservoir permeability
- Specific flow rate/pressure drop by altering nozzle size and quantity
- Removable housing-coffer for installing orifices on site
- Large robust orifices with nozzles for easy installation in housing



Inflow Control Devices – Qflux DPN

Deployment without inner string

- Major time and cost savings
- Eliminating dedicated inner string
- Ability to circulate and wash down to TD
- Less fluid losses and formation damage
- Effective wellbore clean-up
- Improved breaker coverage
- Interventionless opening of nozzles
- Plugged liner or Qflux ICD functionality

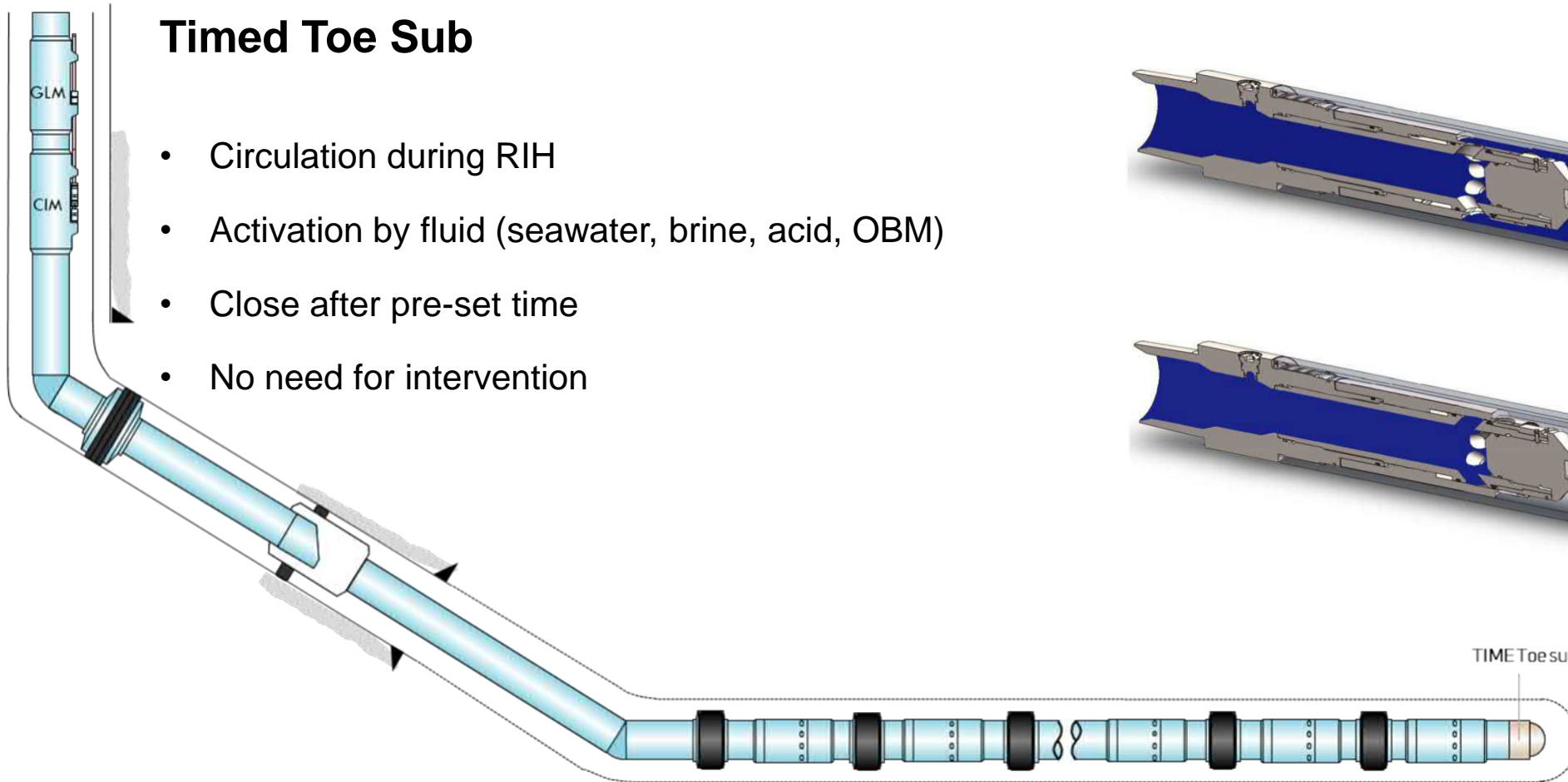
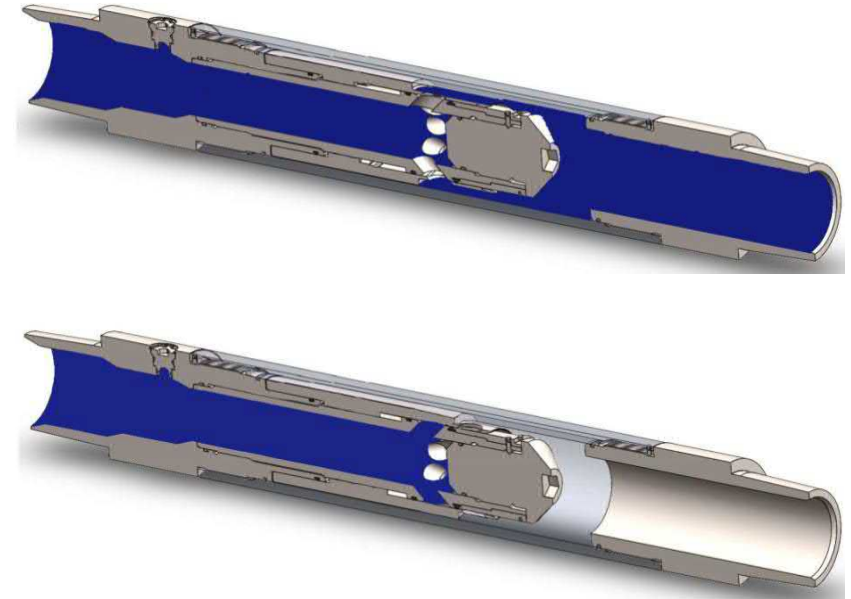


TIME Toe Valve

Dissolvable Technology

Timed Toe Sub

- Circulation during RIH
- Activation by fluid (seawater, brine, acid, OBM)
- Close after pre-set time
- No need for intervention



Inflow Control Devices – Qflux Injection Bypass Valve



Stimulation & Injection for AICV completions

- Open for high stimulation rates
- Well control by kill-pill
- Closed in production mode
- Robust proven check valve
- Outflow profile over horizontal well
- Multiple valves for high flow rates per unit
- Build inside AICV housing



Inflow Control Devices – SelectFlux



Selective production, stimulation and injection Stops water & gas completely selectively

- Sliding sleeve valve (SSD)
- Fitted with QFlux ICD nozzles (ON/OFF ICD)
- Multiple elements over horizontal length
- Opening and closing in same run
- Coil tubing or slick line + tractor shifting tool
- ISO 14310 V3 qualified HPHT seals



Screen & tracer section

ICD Housing

SSD section

Swellable Packers

Swellable Isolation Seals

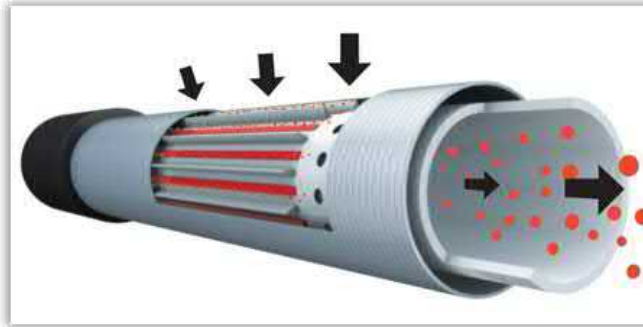
- Zonal isolation for inflow control
- Permeability based segmentation
- Improved recovery
- Prevents annular flow
- Enhanced screen life
- Water, Oil, Hybrid, Acid activation
- Colored elastomer
- Slip-on (Q-Stat Q-Stop) / Wrapped on pipe (Q-Seal)
- Designed by well data



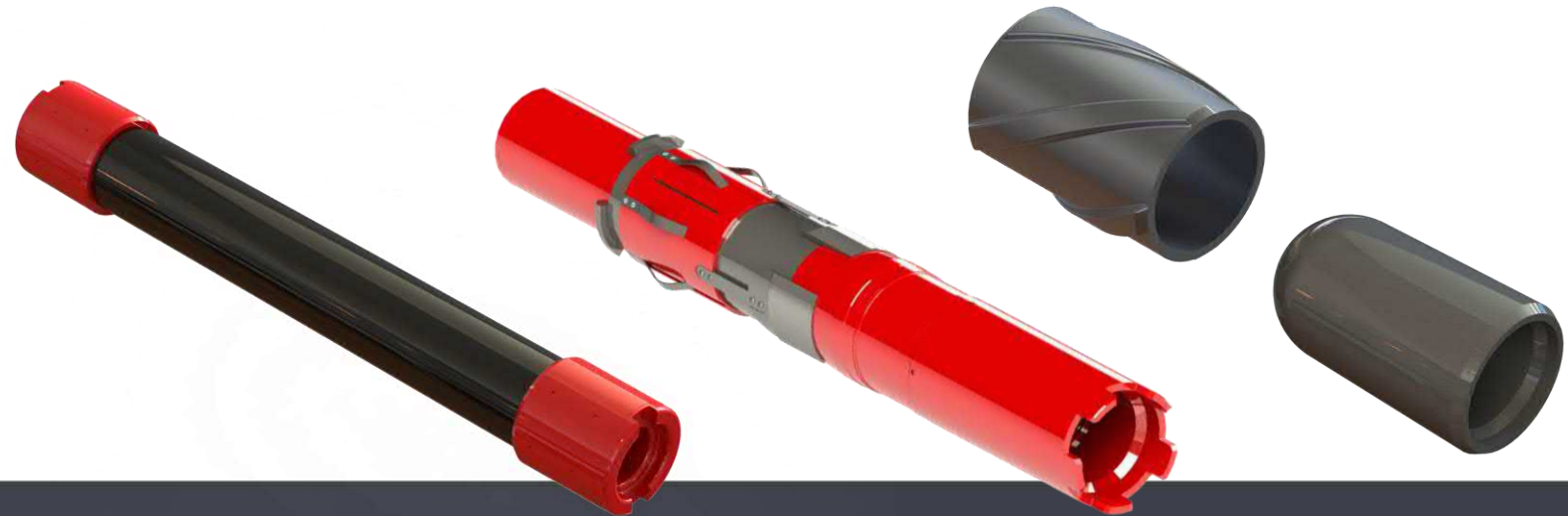
Complementary Products

- **Tracer Carriers**

- Integrated system
- Directed flow
- 100% effected
- Pre installed tracer material

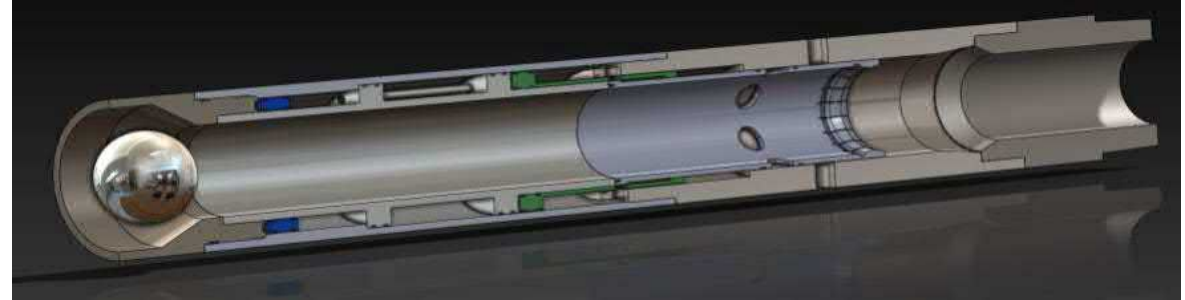


- **Centralizers**
- **Bottom Shoes**
- **Custom made products**
- **OCTG and accessories**



1-Drop multistage frac sleeves

- Unlimited number of stages
- 1 ball size opens all sleeves
- Each sleeve closes after stimulation (30min)
- All sleeves opens after a few days
- 6in OD / 3,5in ID / ball size 3,375in / ball seat 3,25in
- Planned release end of 2021

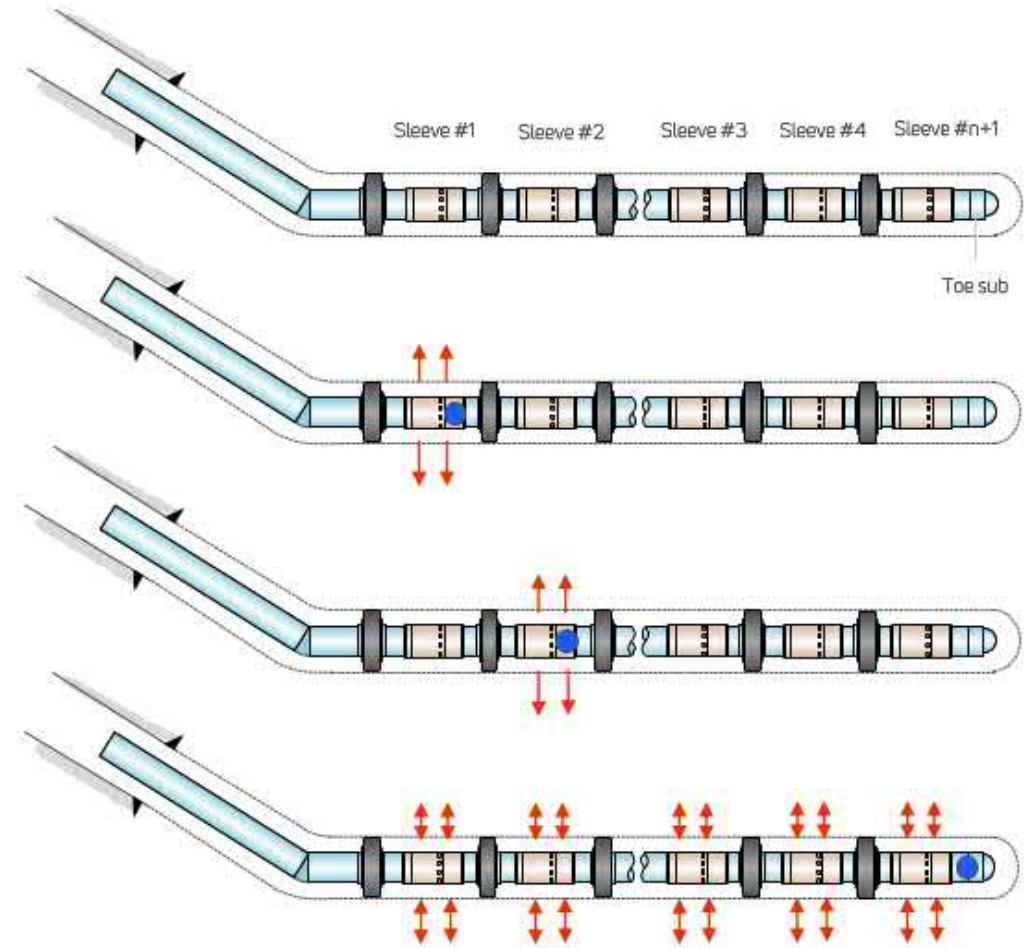


Development

Dissolvable Technology

1-Drop multistage frac sleeves

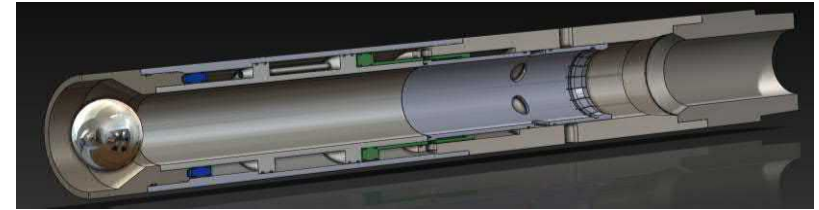
- Run in hole
- Open Sleeve #1 with ball
- Pump acid for about 30 min (time can be customized)
- Closes sleeve #1 with ball
- Open Sleeve #2 with ball
- Pump acid for about 30 min (time can be customized)
- Closes sleeve #2 with ball
- After 2-3 days all sleeve opens for injection or production



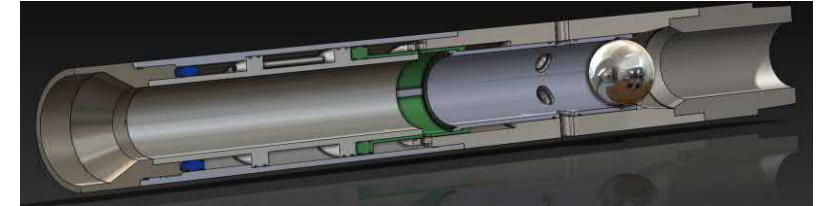
Development

Dissolvable Technology

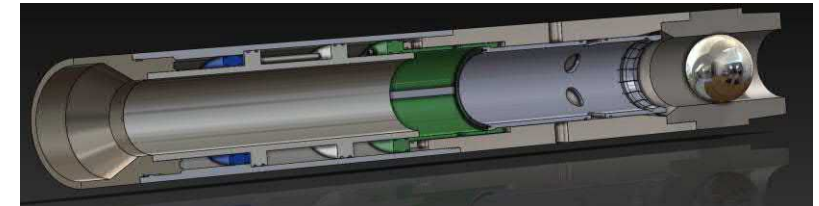
1. Sleeve in closed position. Ball pumped from surface.



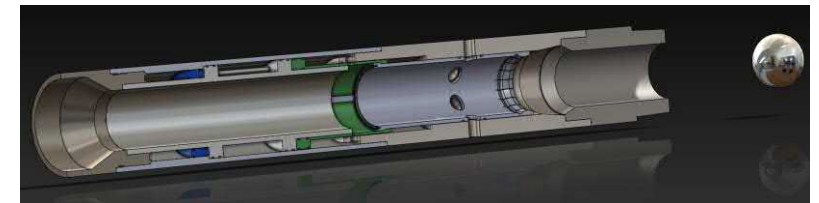
2. Ball lands on the seat and open sleeve (light blue). Ball cannot move due to sleeve (light blue) being hydraulic locked. Stimulation starts through open ports.



3. After a predetermined time (hours), the hydraulic lock is removed. Ball shifts sleeve (light blue) in closed position and continue to the next sleeve below.

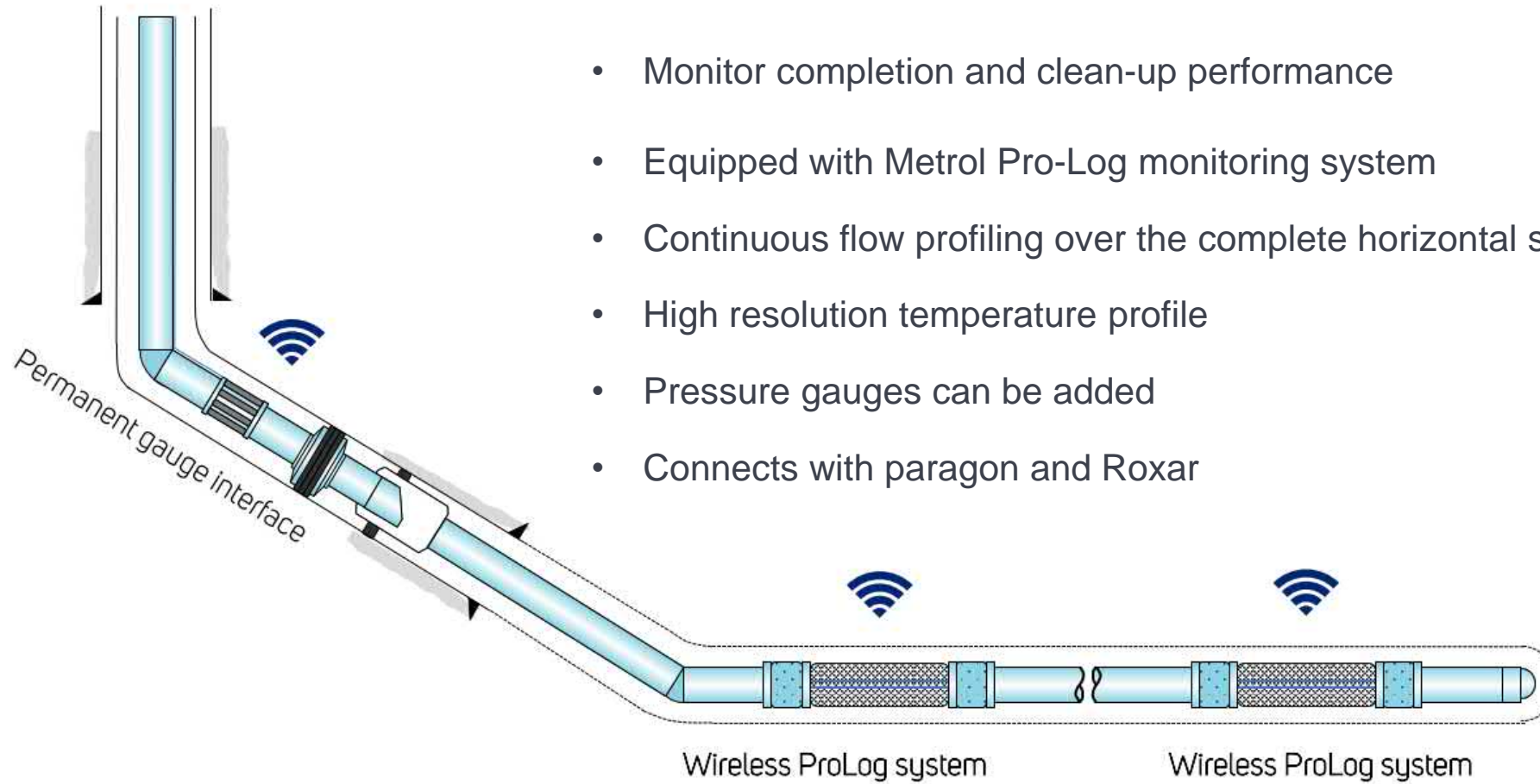


4. After a predetermined time (days), the sleeve (light blue) hydraulically move back and open the ports for injection or production again.



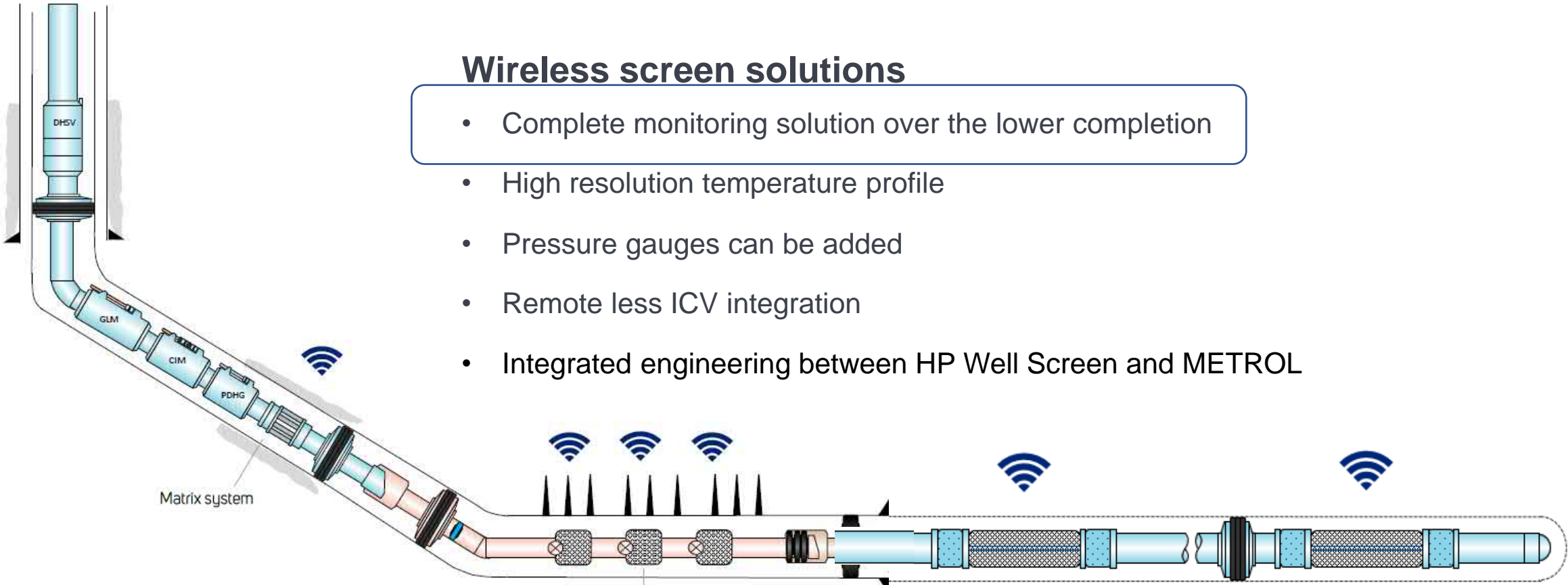
Wireless monitoring

- Monitor completion and clean-up performance
- Equipped with Metrol Pro-Log monitoring system
- Continuous flow profiling over the complete horizontal section
- High resolution temperature profile
- Pressure gauges can be added
- Connects with paragon and Roxar



Wireless screen solutions

- Complete monitoring solution over the lower completion
- High resolution temperature profile
- Pressure gauges can be added
- Remote less ICV integration
- Integrated engineering between HP Well Screen and METROL



5 1/2" Smartscreens with 5 1/2" Metrol wireless ICVs on each screen section. Each ICV contains 2 x wireless P/T gauges. PROLOG sensors can be deployed across the ICV Smart Screens

Wireless ProLog system

Wireless ProLog system



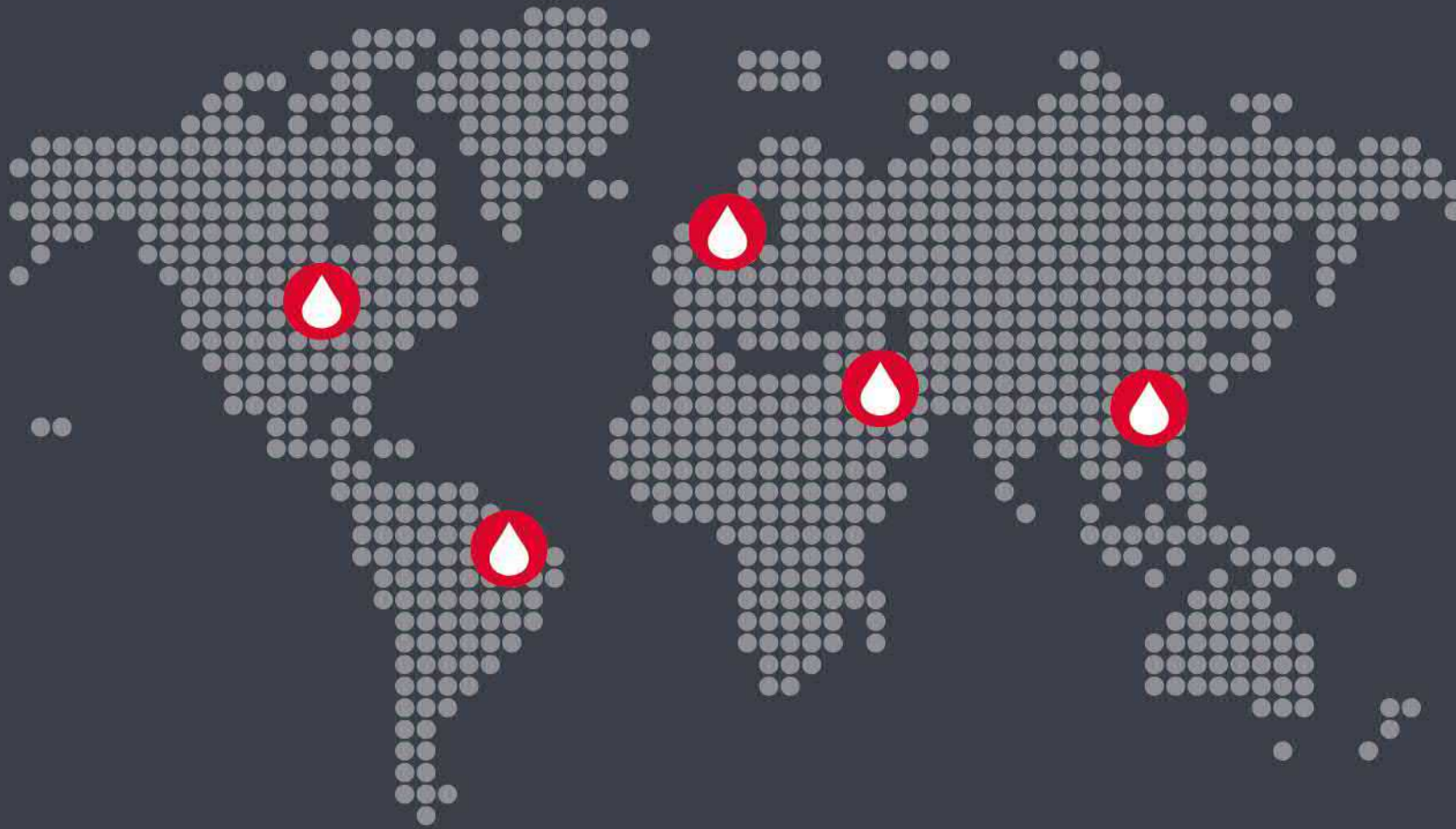
Discover our new “wash pipe free screen”

The wash pipe free screen is a next generation screen to minimize installation cost.

This design can be custom build to your specifications for maximum reliability and durability and has the advantage of not requiring any washpipe during installation.

Not requiring any washpipe means less service cost, less rig time and therefore lower operational and total well cost. Next to Oil and Gas also for Geothermal wells this can be a great advantage where cost is an issue and especially for deeper wells this could have a significant advantage over standard installation.

In case of interest we will be pleased to discuss the possibilities.





Contact

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P.O. Box 4015 / Abu Dhabi / UAE

T +971-2-6344441 / E sales@wellslot.ae

CUSTOMIZED SOLUTIONS

MANUFACTURED IN THE NETHERLANDS

 **HP WELL SCREEN**

POROLOCK SHIELD

- Superior Erosion resistance
- Unique Shielded Direct wrap Metal mesh
- Increased diverted flow area
- Tailored shield sections to match perforation design

**EROSION
IMPROVEMENT
300%**

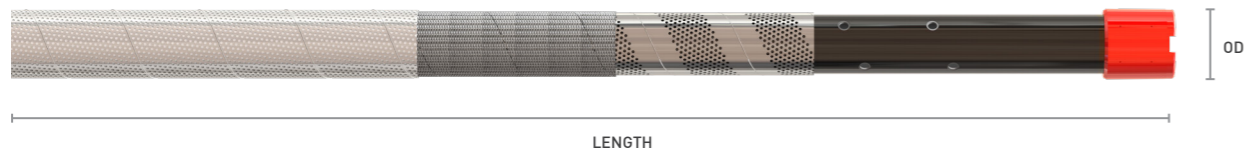
 **HP WELL SCREEN**

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7641 AB Wierden
The Netherlands

T +31 546 577 908
E sales@hpwellscreen.com

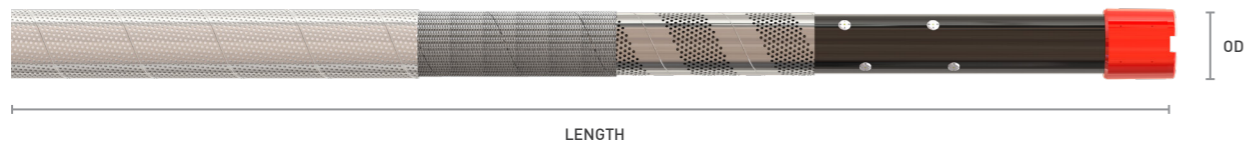
www.hpwellscreen.com

PoroLock Shield



- 300% increased erosion resistance by reducing flow velocities
- Tailored shield sections to match base pipe perforation design
- Unique direct wrapping of all layers with integrated inner shield
- PoroLock's superior sand control and mechanical strength

PoroLock Shield ICD

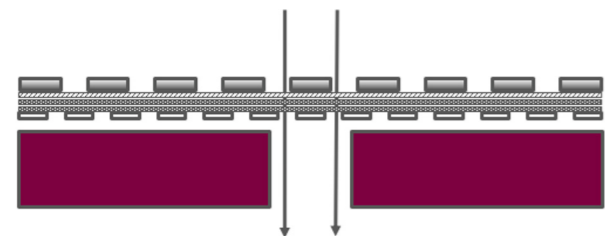
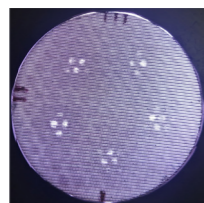


- 300% increased erosion resistance by reducing flow velocities
- Engineered shield sections protecting screen from high flow rates through ICD's
- ICD's distributing flow over the horizontal section reducing hotspotting
- Unique direct wrapping of all layers with integrated inner shield
- PoroLock's superior sand control and mechanical strength

Avoiding direct line-of sight flow

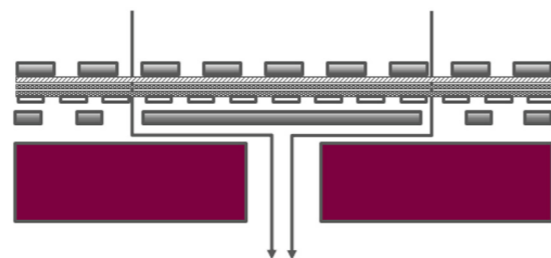
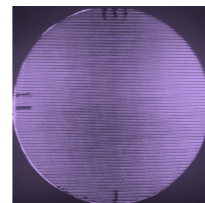
Regular screen

Erosion after 24 hr



PoroLock Shield

No erosion after 96 hr



When to use the PoroLock Shield?

- High rate horizontal gas wells
- Horizontal Wells with consolidated or partial consolidated reservoirs
- Horizontal Wells with shallow or depleted reservoirs where GP is not possible

ER Weave ^{OPTION}

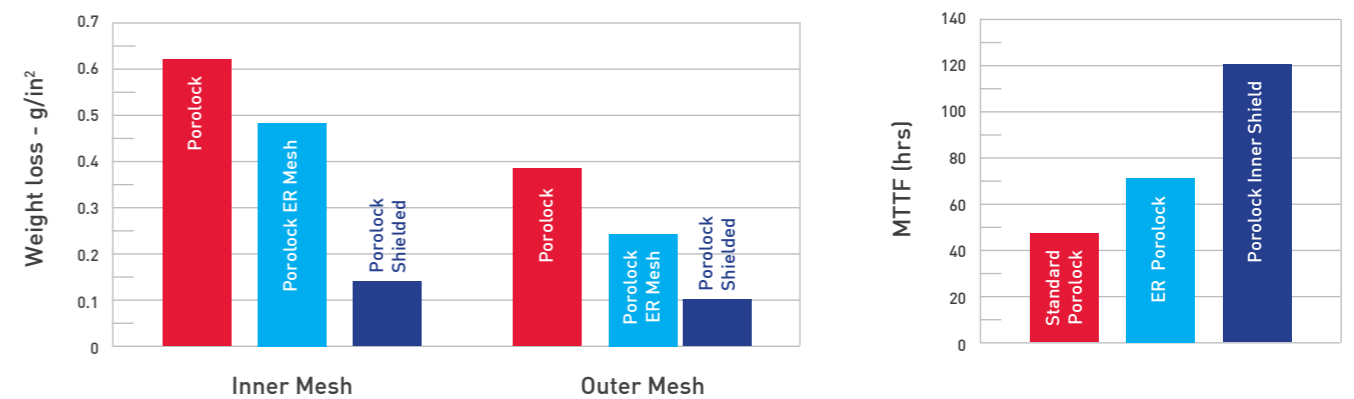
Erosion resistant weave

- Dutch weave
- Surface hardness >1200 HV
- Wire core hardness < 250 HV
- No pore size change
- No effect on ductility
- No peeling/delamination



30% improvement in erosion resistance

Erosion Resistance Comparison



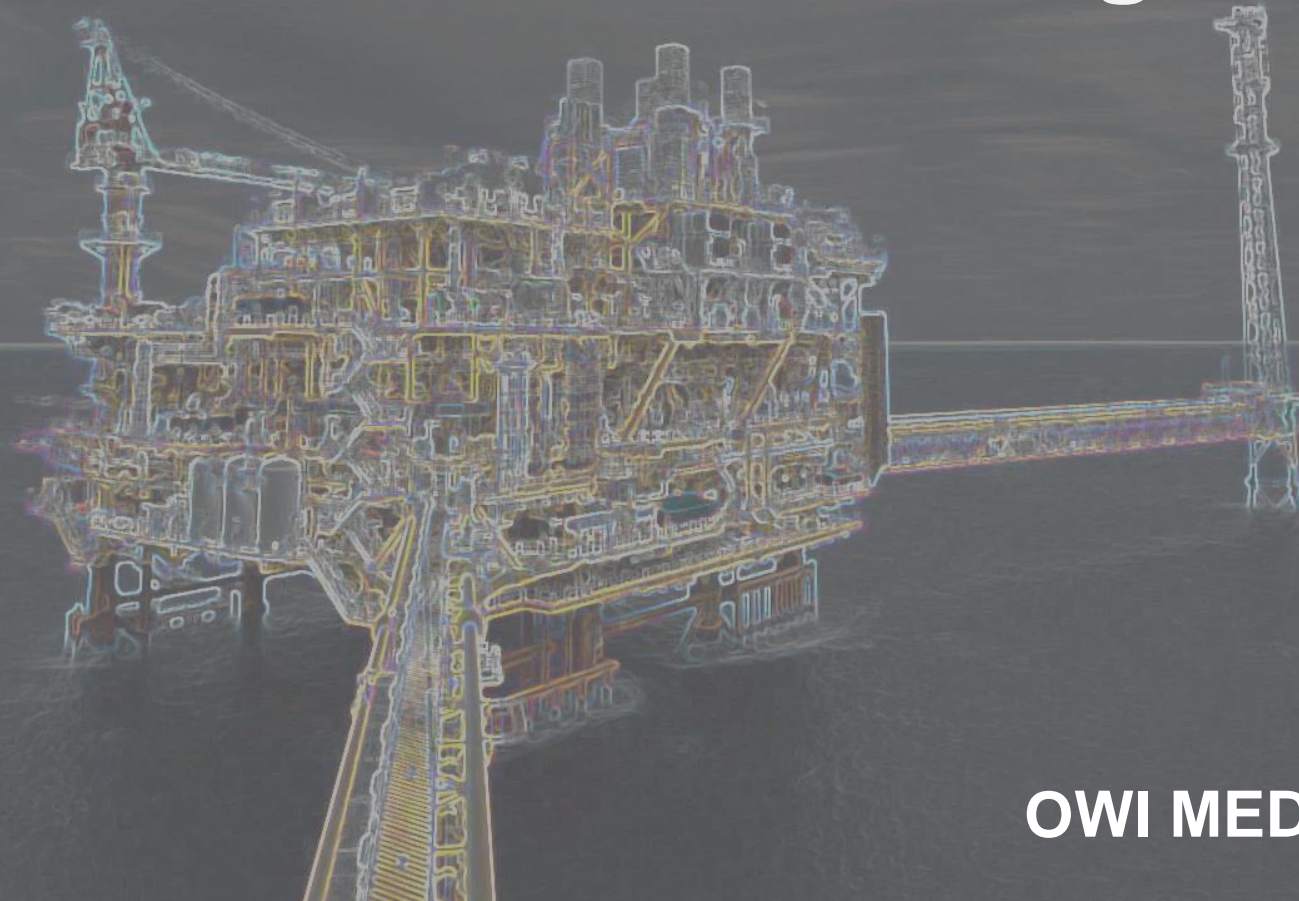
Conclusion →

**EROSION
IMPROVEMENT
300%**

HP WELL SCREEN

Portfolio

PoroLock Thru Tubing



OWI MED September, 2022

PoroLock Through tubing

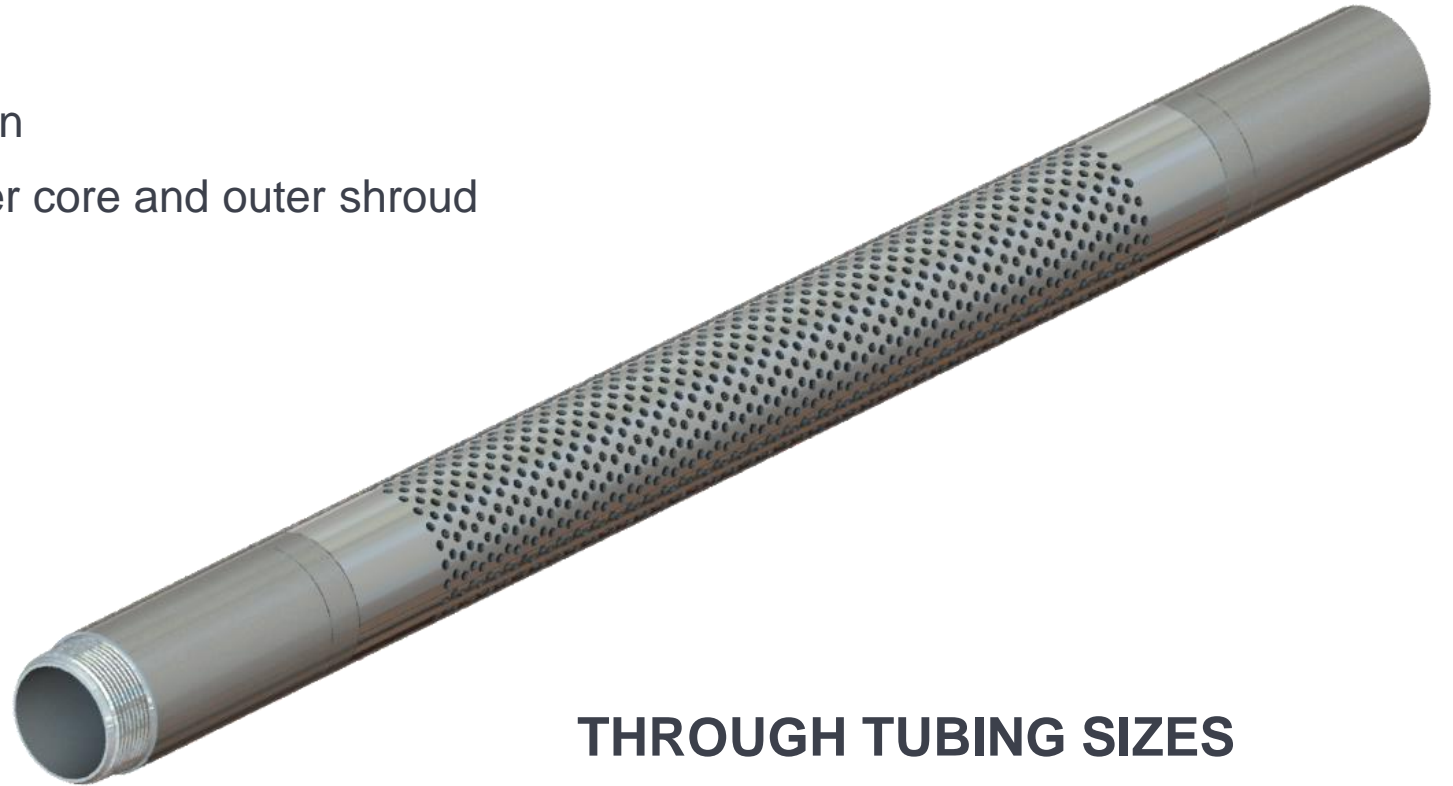
Application: Through tubing

- Direct wrapped metal mesh screen
- **Base pipe less** - Heavy duty inner core and outer shroud
- Flush inside and outside
- High open structure
- Erosion resistant weave

Benefits

- Reduced inflow velocity
- Avoiding localized flow
- Avoiding turbulence

Erosion improvement 400 – 500 %



THROUGH TUBING SIZES

- * Any size to fit through nipple profile
- * Flexibility in design

PoroLock Tapered

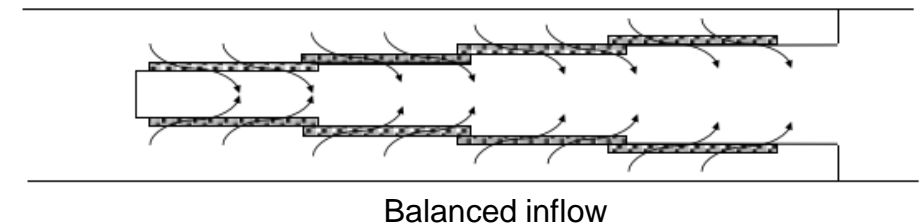
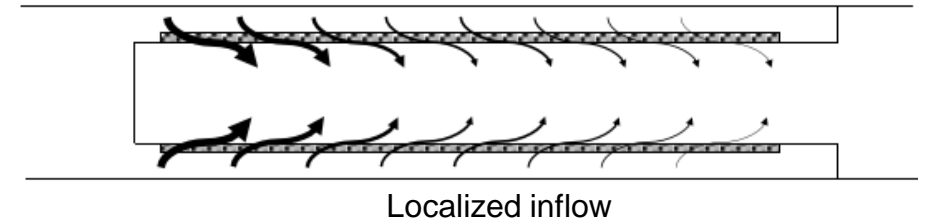
TAPPERED DESIGN

Application: Through tubing – small annulus

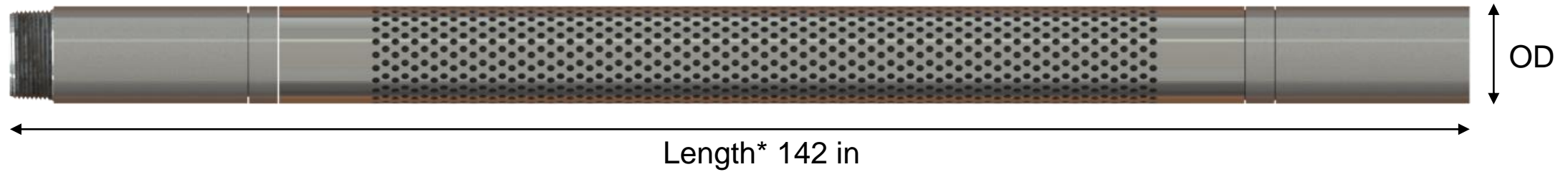
- Tapered design
- Defined diameters with rugged construction
- Optimized inflow velocity

Benefits

- Balanced inflow along screen length
- Minimized flow acceleration at screen tip



PoroLock Through Tubing



Mesh Selection (microns)	Weave Pattern	Material
300	Plain Dutch Weave	316L*
250	Plain Dutch Weave	316L*
200	Twill Dutch Weave	316L*
175	Plain Dutch Weave	316L*
150	Plain Dutch Weave	316L*

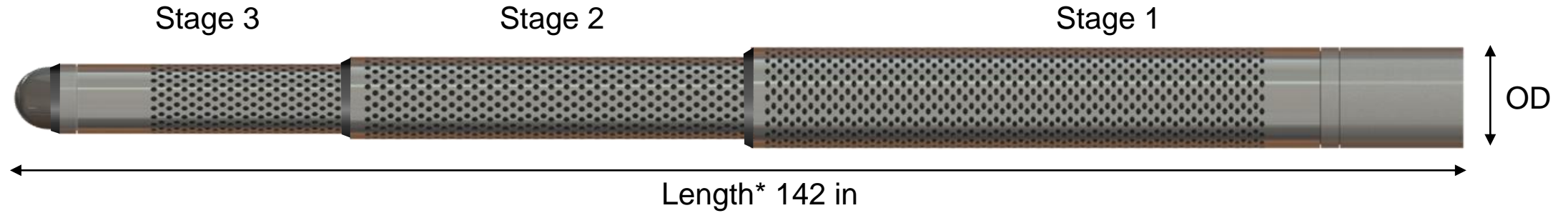
* Mesh treated for erosion resistance

Nominal Size (OD)*	Thread	ID	OD	Screen ID
1.31	1" FLUSH	0.764	1.315	0.764
1.66	1 ¼" FLUSH	1.109	1.660	1.109
1.90	1 ½" FLUSH	1.3149	1.900	1.349
2.06	1 ¾" FLUSH	1.509	2.060	1.509
2.375	2 3/8 FLUSH	1.824	2.375	1,824

Note: Shroud Open Flow Area = 33%

* Note: design flexibility for OD and length to fit to nipple profile and tubing length

PoroLock Tapered



Mesh Selection (microns)	Weave Pattern	Material
300	Plain Dutch Weave	316L*
250	Plain Dutch Weave	316L*
200	Twill Dutch Weave	316L*
175	Plain Dutch Weave	316L*
150	Plain Dutch Weave	316L*

* Mesh treated for erosion resistance

Nominal Size (OD)	Thread	Number of Stages	Section Length	OD
1.31	1" NPT	2	65/65	1.315
1.66	1 ¼" NPT	2	65/65	1.660
1.90	1 ½" NPT	2	65/65	1.900
2.06	1 ¾" NPT	3	24/36/70	2.060
2.375	2 3/8 NUE	3	24/36/70	2.375

Note: Shroud Open Flow Area = 33%

* Note: design flexibility for OD and length to fit to nipple profile and tubing length

For more products please visit

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