

# WELLTEC® COMPLETIONS PRODUCTS

## - THE FLEX-WELL® CONCEPT

PRESENTED BY - JEREMY ALBRIGHT  
DATE March 16<sup>th</sup> 2016

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**Welltec**

# CONTENT

- 1. INTRODUCTION TO WELLTEC WELL COMPLETIONS**
- 2. FLEX-WELL® PRODUCT OVERVIEW**
  - Welltec® Annular Barrier (WAB® )
  - Welltec® Data Monitoring (WDM™)
  - Welltec® Flow Valve (WFV™)
- 3. WLIT FOR JUNCTION-LESS LATERAL INTERVENTIONS**

# Welltec Transformation Centre Esbjerg



- Build year: 2014
- 6000m2 Manufacturing
- 1250m2 Office
- Heliport: 5,4 km
- Port: 7,8 km
- Kastrup Airport: 294 km
- Billund Airport: 56,7 km
- Esbjerg Airport: 5,4 km

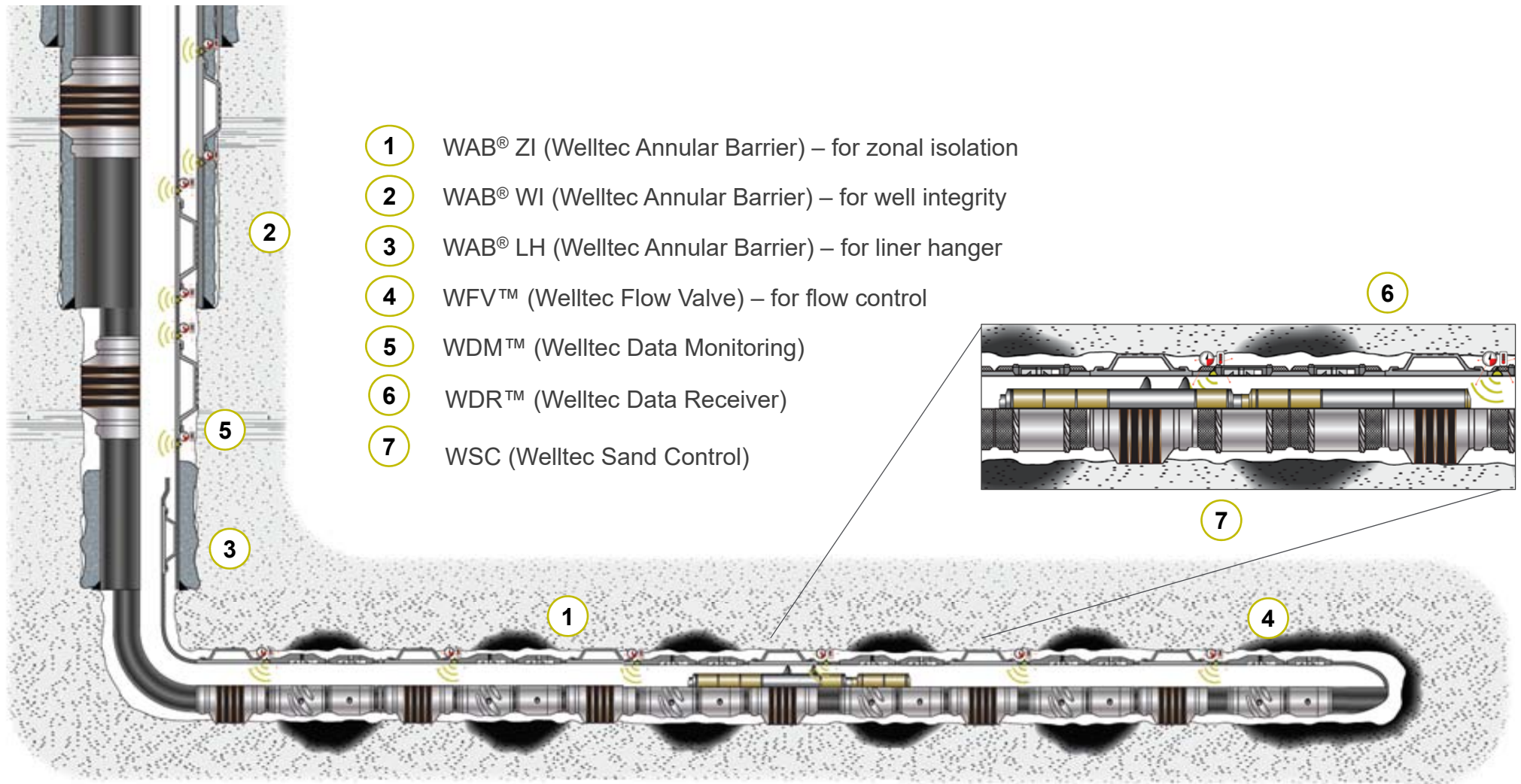


DNV BUSINESS ASSURANCE  
MANAGEMENT SYSTEM CERTIFICATE





## FLEX-WELL® COMPONENTS



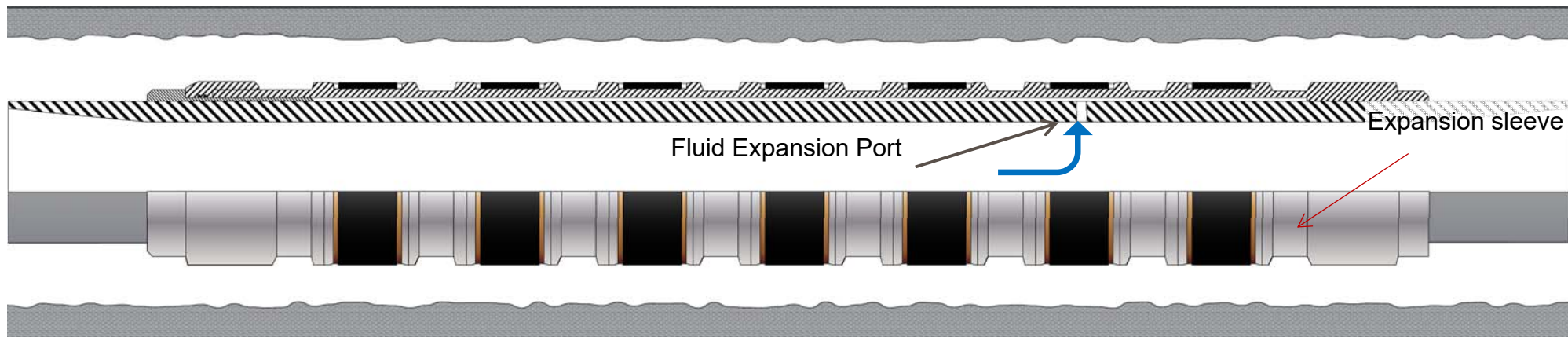
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# WAB® - How does it Operate

## Standard Configuration

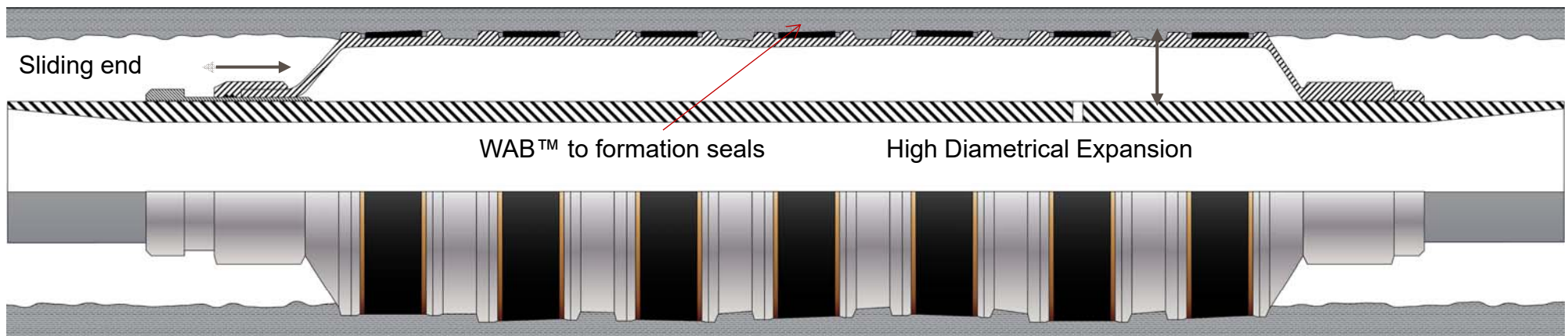
- Pressure is applied to the well bore, well fluid flows through the expansion port in the base pipe (casing or liner)
- The applied hydraulic pressure elastically expands, yields and then plastically expands the expansion sleeve to conform to the open hole
- This plastic expansion process and multiple seal elements accommodates for hole irregularity or ovality
- WAB to formation sealing is achieved via HNBR, Aflas or for extreme HT applications, all metal seals



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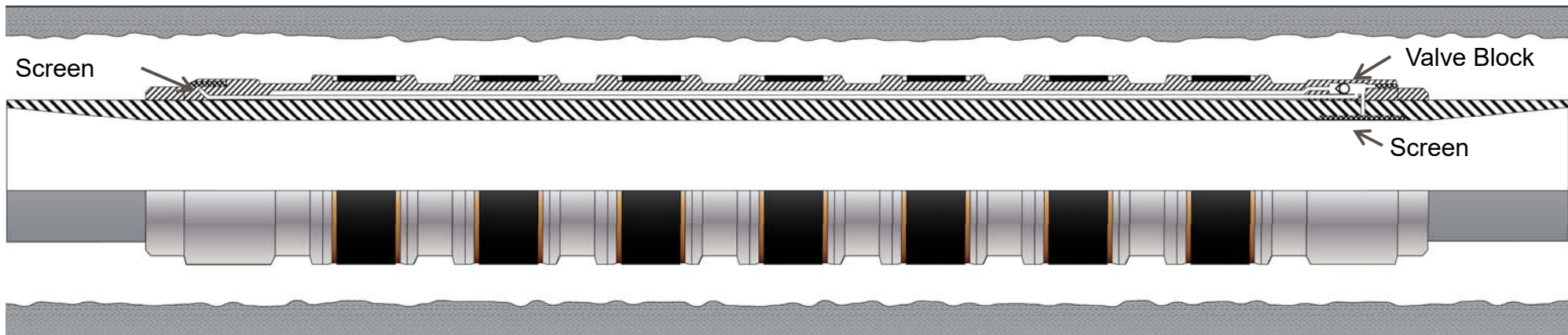
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# WAB® - How does it Operate

## Expansion via a Valve Block

- Pressure is applied to the well bore, fluid flows through a screen filter and expands the WAB
- The valve delivers a number of benefits
  1. Enables lower expansion pressures with high Delta P capabilities
  2. Isolates the expansion port on reaching the final expansion pressure to retain casing burst and collapse integrity
  3. Enable pressure balance from within the expanded WAB to either annulus above or below the WAB. This removes any collapse pressure on the expanded sleeve.

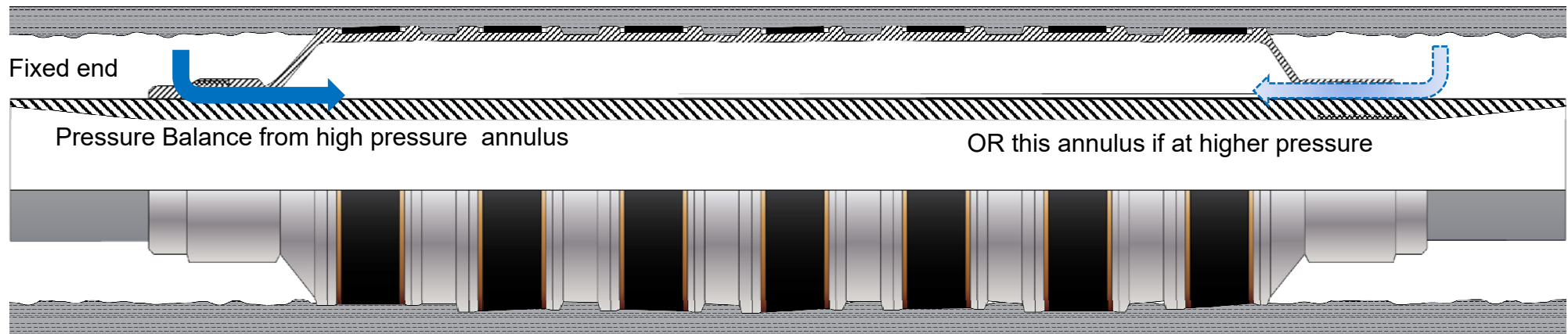




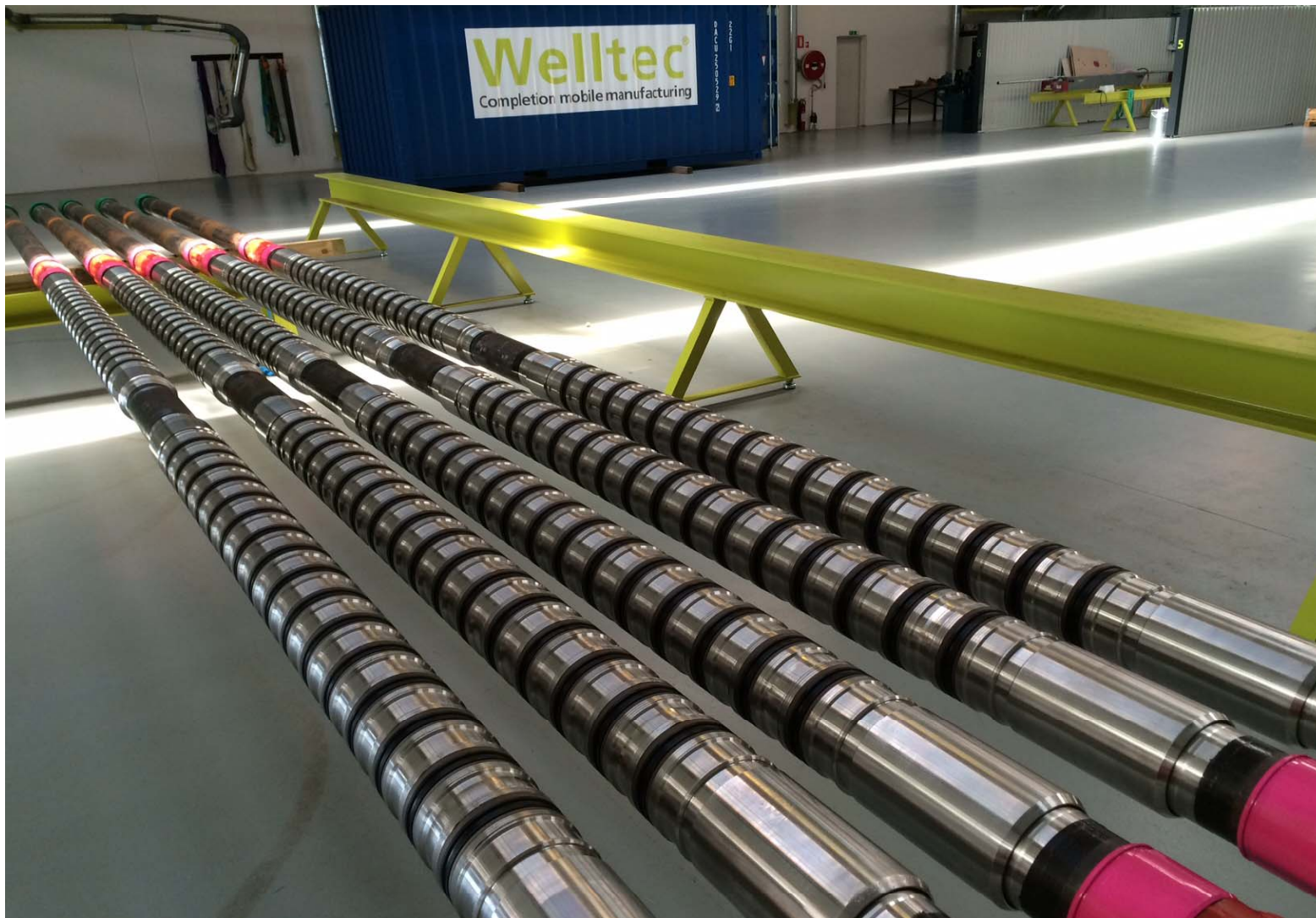
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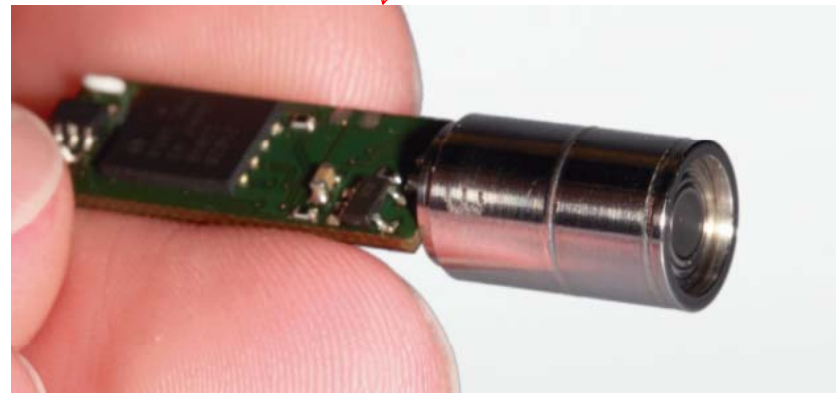
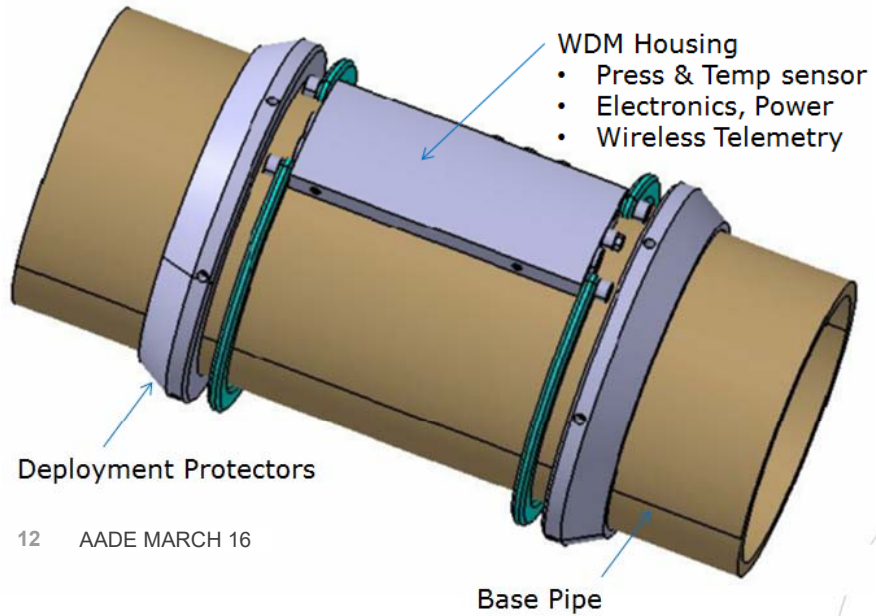
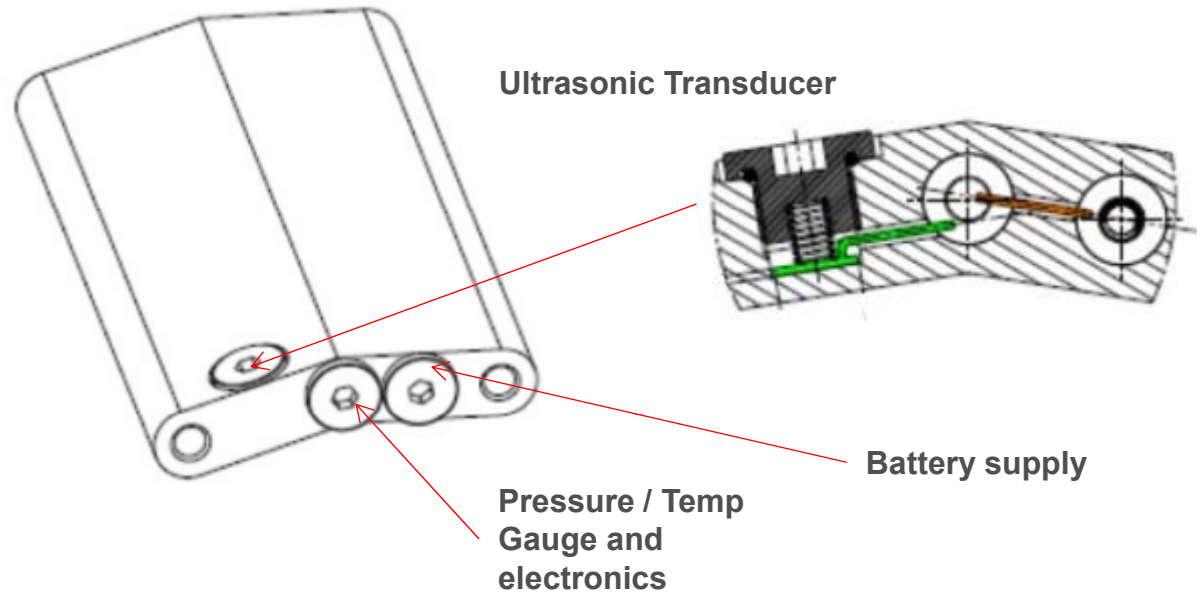
## 5" Slim OD WAB® with High Anchor Capabilities



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## WELLTEC® DATA MONITORING (WDM™)





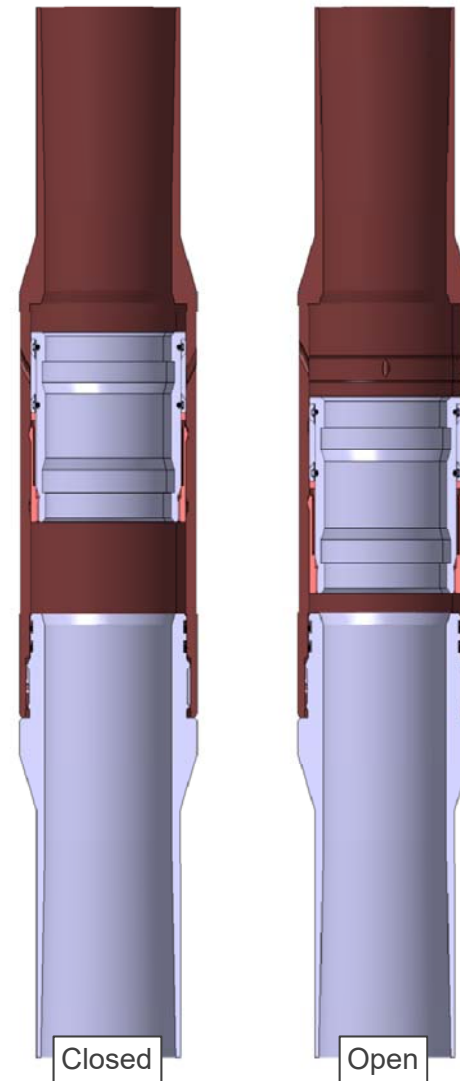
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## WELLTEC® FLOW VALVE (WFV™) 412WFV SINGLE SLEEVE FIXED CHOKE (FC)

### Single sleeve

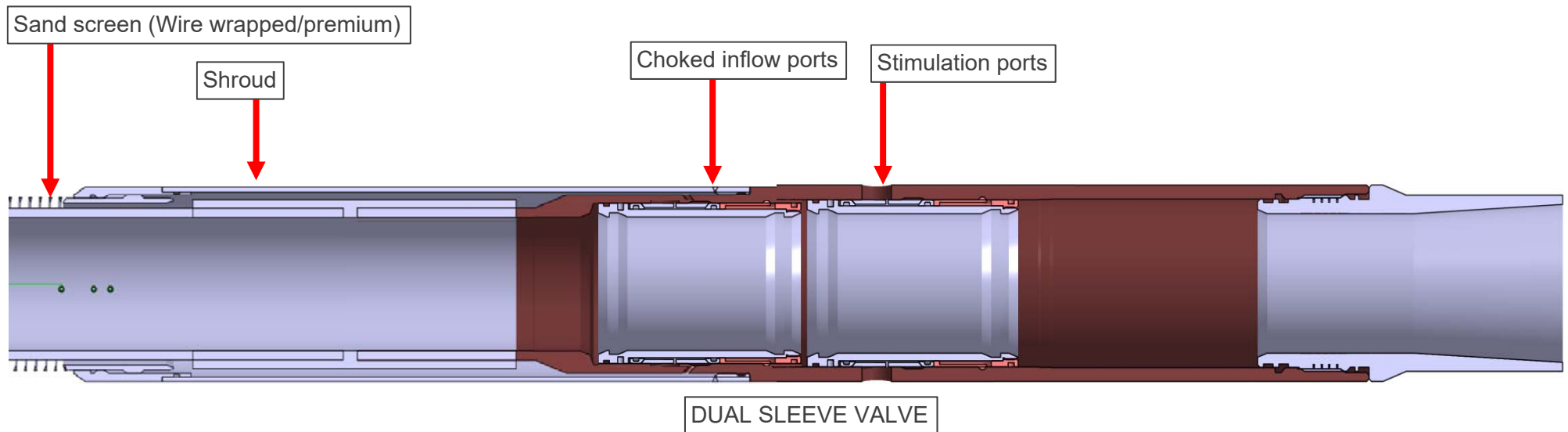
- Fully open or fully closed fixed choke valve
- Selectable choke inserts changeable at the well site
- Full bore ID as per 4 ½" liner, OD 5.57" for deployment in 8 ½" or 6" ID holes
- Burst 8,000 psi, collapse rating 4,000 psi
- Robust seal design for 1500psi unloading P at high flow rate
- Sleeve manipulated by Welltec Tractor/ Well Stroker/ Well Key.
- Multi-Lateral identification and entry using WLIT Tool
- Key slots for locking sleeve in open or closed position
- Flush profile on OD of valve



## WELLTEC® FLOW VALVE (WFV™) EXAMPLE OF A 412WFV VC DUAL SLEEVE, TWO CHOKE POSITIONS WITH SCREEN INTERFACE ONE END

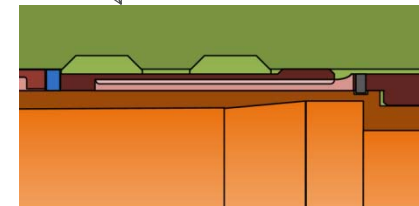
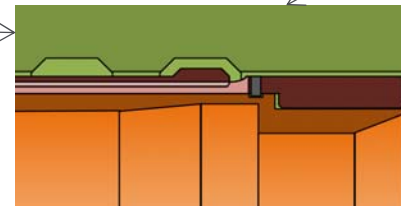
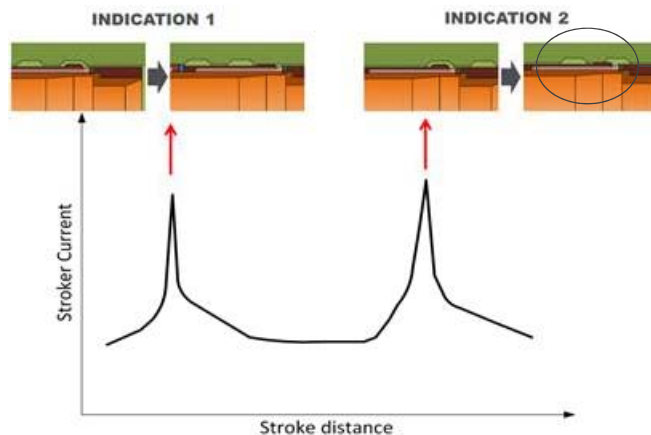
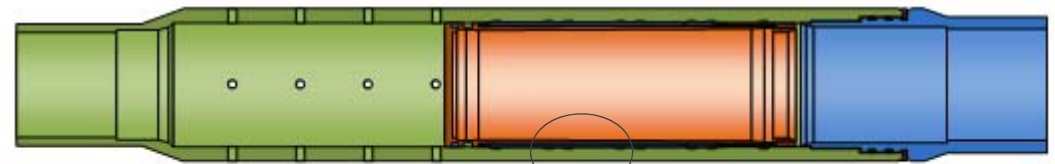
### Dual sleeve

- This solution delivering a fixed choke for production, a large flow port for stimulation and a fully closed position
- Tractor drive by or stroker operated sleeves
- Unique sleeve shifting sequence based on the shifting profiles
- Sand control has been integrated from on the production flow port only



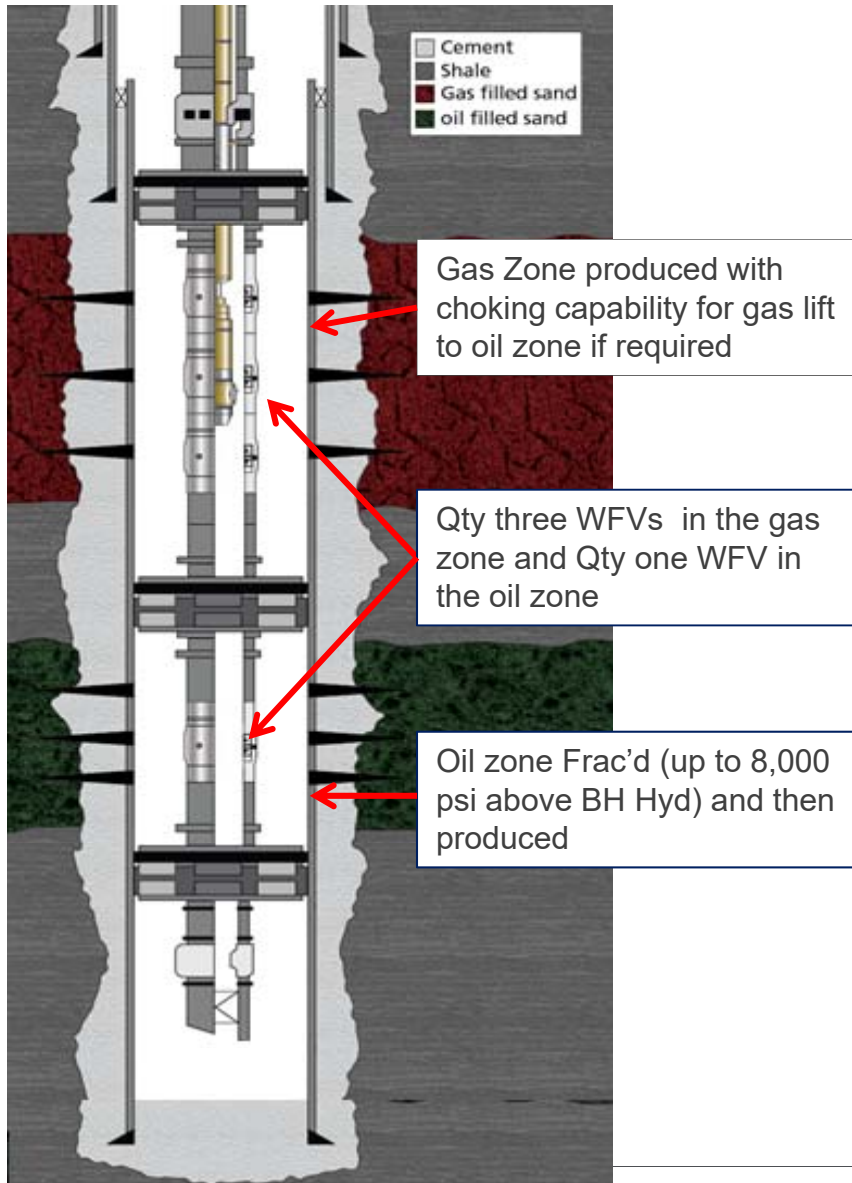
# WELLTEC® FLOW VALVE (WFFV™) EXAMPLE OF A 412WFFV™ VARIABLE CHOKE WITH CHOKE FOUR POSITIONS

- The example shown opposite has five flow positions (Off + four Chokes)
- The choke sizes can be configured to meet flow or Delta P needs
- To operate the Well Stroker is modified to deliver equal movements of four Inches
- Each shift delivers a four inch stroke and gives two clear indications in the current readout due to the locking collet requiring approximately 1,500lbs to shift





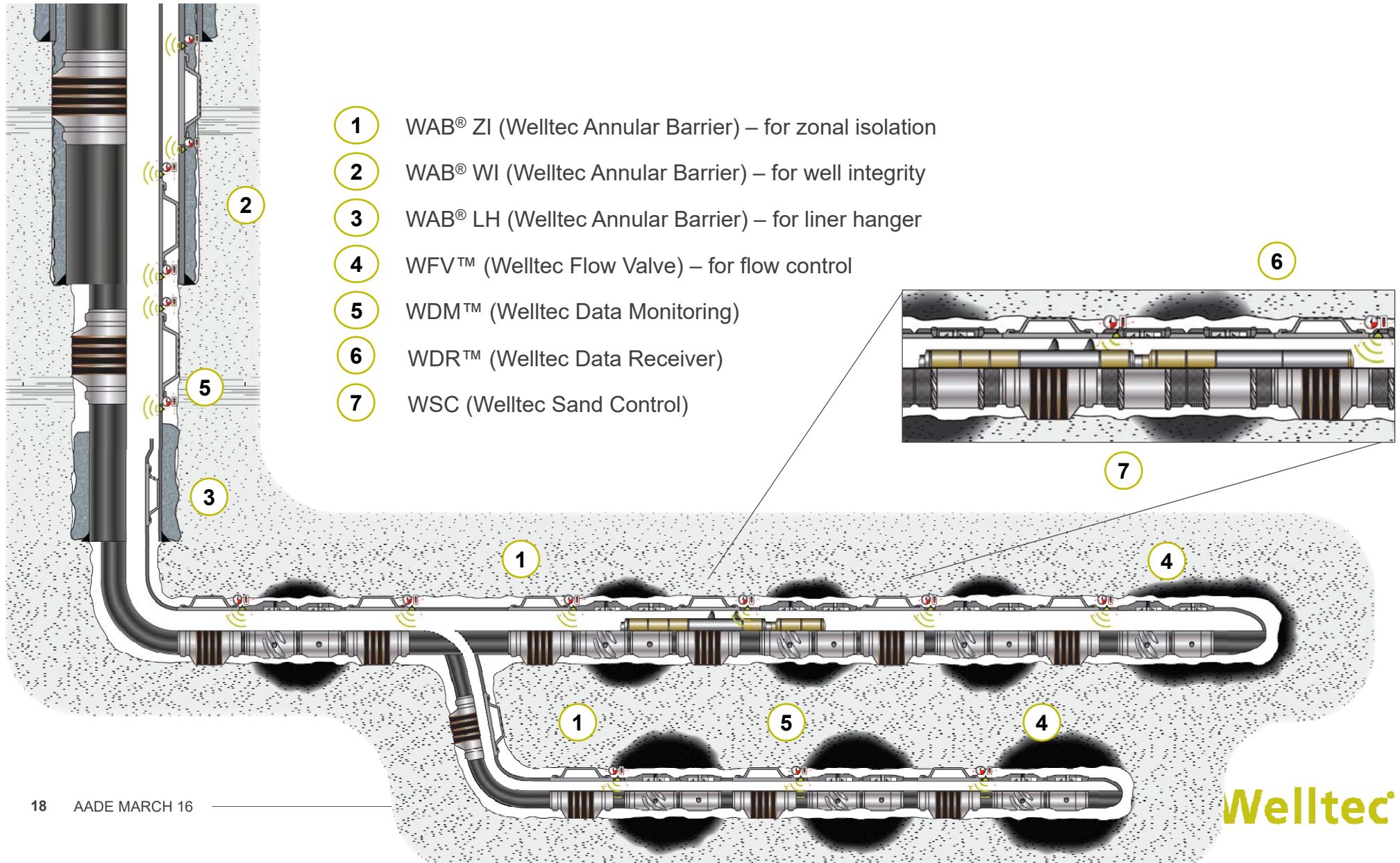
# WELLTEC® FLOW VALVE (WFV™) 412WFV8:4



- Three back to Back WFV's within the gas zone configured for SI (no flow), choke flow 0.049 sqins, 0.7 sqins, full flow equal to 7.2 sqins (cross section of the 4 ½" production tubing) or a combination. This option enabling the gas zone to be choked back to provide gas lift to the oil zone as needed.
- One WFV within the oil zone flow area equal to 7.2 sq ins ensuring no Delta P loss across the WFV.
- A high rate propanant frac was completed through this valve:
  - 300bbl, Xlinked fluid @ 20bpm @ 4000psi followed by propanant @ 1ppg and 2ppg stages.
  - When 3ppg propanant stages reached perforations, screen out occurred reaching the maximum allowable surface pressure of 7100psi
  - Total slurry pumped 723bbbls
  - Total propanant pumped 37.5klbs.
  - Total propanant reached the formation 19.1klbs.
- Once deployed, the WFV's are manipulated using the Well Tractor, high lift Key and Stroker to adjust the valve positions.
  - Large cost savings v's CT operated systems.
- Valve position confirmed via the Hardware Scanner (WHS)

# FLEX-WELL® COMPONENTS

ILLUSTRATING A CASED HOLE SIDE TRACK, TAML LEVEL 4 JUNCTION



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# WELLTEC® LATERAL INTERVENTION TOOL – WeIILIT™ DEPLOYMENT OF TOOLS ON E-LINE INTO LATERALS

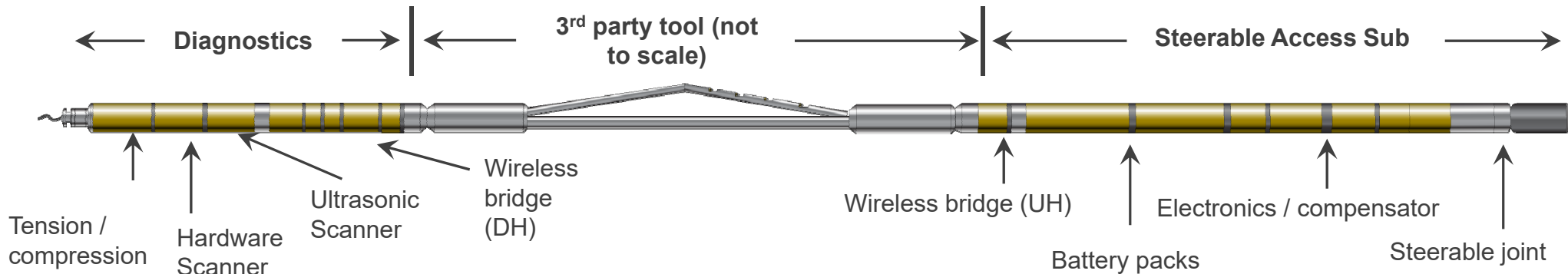
## Components and Specifications

OD	2 1/8"
Length (w/o 3 <sup>rd</sup> pty or WT)	32 feet
Weight in air	220 lbs
Maximum Pressure	20,000 psi *
Maximum Temperature	257 deg F
Tensile Strength	36,000 lbs
Compressive Strength	30,000 lbs
Well Fluid	oil/water/gas *
Min. deviation at junction	30°
Max. ID at junction	8.5" CH or OH
3rd party tool requirements	Mono conductor

\*WUS has lower P rating and ineffective in gas environment



*Steerable joint deployed w crew in Saudi*





QUESTIONS?  
..AND THANK YOU FOR YOUR TIME

**Welltec**