

# Welltec<sup>®</sup> Annular Barrier (WAB<sup>®</sup>)

For Well Construction  
& Integrity

Sustained Casing Pressure (SCP) is common in many wells globally (>30%) and present within multiple annuli. Since 2009, well integrity has cost operators over \$75 billion. This has provided the impetus for the industry to focus on and rework international standards on well integrity management. Through the incorporation of the WAB<sup>®</sup> to the well construction phase, Welltec<sup>®</sup> are facilitating enhanced well integrity via standalone cased hole barriers, open hole isolation and cement assurance.



Welltec<sup>®</sup>

# For well construction and integrity



## 01 Applications

ISO 14310 V0 cased hole SCP barrier

ISO 14310 V3 standalone open hole SCP isolation

ISO 14310 V3 open hole SCP cement assurance

Futureproof cap rock P&A

Platform for 2nd stage cement

Cross flow isolation

Open hole fault isolation plug

Liner/casing hanger

## 02 Features

Rugged, all welded, metallic construction

Casing integrity re-instated post setting

Burst protection fitted as standard

High expansion capability

Constant, high pressure  $\Delta p$  over full expansion range

No premature expansion

NACE compliant

## 03 Benefits

Removes the need for cement

Removes channels or leak paths at setting depth

Rotatable during deployment enabling casing to TD in challenging environments

Rotatable during primary cement operations enhancing cement placement

Deployable through milled windows

Slim OD allows for high rate circulation during deployment

Rapid set nature of WAB reduces time to next hole section

High rate circulation capability

Full bore – as per casing / tubing

At Welltec®, we design and test our WAB® range in accordance to ISO 14310, the industry standard which defines packer design validation grades. Our V0 WAB® range for cased hole SCP barrier has been tested to ISO14310 V0 criteria, the highest validation level within this industry standard, and provides, a verifiable, life of well barrier against SCP.

Our V3 WAB® range for open hole isolation, has been validated to ISO1410 V3, the highest fluid validation level within this industry standard. The WAB® provides life of well V3 isolation assurance within the open hole section. Additionally, it 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.

The steel packer expandable sleeve is expanded between the base pipe and the casing or the borehole by applying pressure in the casing. It conforms to the actual wellbore or casing geometry and primary sealing is achieved through a patented series of elastomer seals. The WAB® seals are optimised along the length of the steel sleeve, backed up by a series of metal fins that provide metal to metal or metal to rock contact, and high strength anchoring capability. Once the WAB® is set, casing integrity is re-instated via internal hydraulic isolation mechanism.

The WAB® can be mounted and welded onto any base casing in a simple and cost-effective way. Both ends are therefore fixed and provide life of well protection to the expanded WAB® Sleeve.

# WCS product specifications

Welltec® WAB® WC & I	General Information
Product Name	Welltec® Annular barrier (WAB®)
ISO Standard	Up to ISO 14310 V0
Product Structure	Single Piece, Machined Sleeve – Fully Welded to Base Pipe
Seal Length	Up to 2m*
Base Casing	Compatibility with all Standard Casing Material / Weight / Threads
Standard Material	Alloy 28 / Super Duplex SST
Standard Elastomers & Seals	HNBR / Aflas / FFKM
Non-Elastomer Seals	PTFE

\*Additional Sealing Length can be modelled on request.

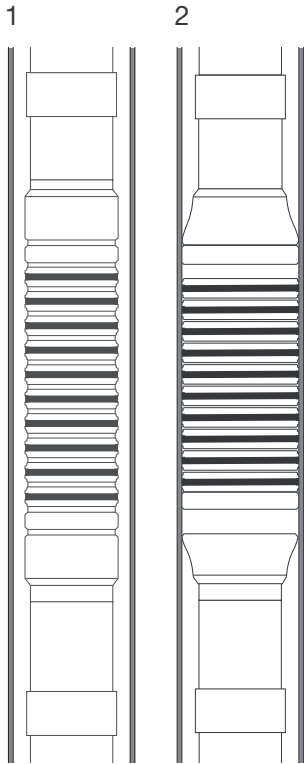
For well construction						
*Welltec® WAB®	812WAB	812WAB UHP	912WAB	1214WAB Slim	1214WAB	1214WAB HP
Expansion Range (mm)	8.50 > 10.00" (215.9 > 254mm)	8.40 > 9.00" (213.36 > 228.6mm)	9.50 > 10.50" (241.3 > 266.7mm)	10.8 > 12.75" (274.32 > 323.85mm)	12.25 > 14.00" (311.1 > 355.6mm)	11.60 > 12.45" (294.64 > 316.23mm)
Minimum Running OD (mm)	8.180" (207.8mm)	8.2" (208.28mm)	9.00" (228.6mm)	10.6" (269.24mm)	11.38" (289.1mm)	11.38" (289.1mm)
ISO14310 Standard **	Up to V0					
Maximum Working Pressure psi (bar)	10,000psi (689bar)	15,000psi (1034bar)	8,000psi (552bar)	4,500psi (310bar)	6,000psi (414bar)	10,000psi (689bar)
Constant element ΔP across expansion range psi (bar)	10,000psi (689bar)	15,000psi (1034bar)	8,000psi (552bar)	4,500psi (310bar)	6,000psi (414bar)	10,000psi (689bar)
Standard element lengths ft (m)	Up to 7.2ft (2.2m)					
Temperature range °C (°F) ****	260°C (500°F)					
Base-pipe range (up to)	7"	6 5/8"	7 5/8"	9 5/8"	9 7/8"	9 5/8"
ID in (mm)	Full Bore (as per base-pipe)					

*Welltec® WAB®	1214WAB LC	1312WAB	16WAB	1712WAB	22WAB
Expansion Range (mm)	12.00" > 13.00" (305 > 330mm)	12.40 > 14.80" (314.96 > 375.92mm)	16.00 > 19.00" (406.4 > 482.6mm)	17.50 > 20.50" (444.5 > 520.7mm)	22 > 23.50" (558.8 > 596.9 mm)
Minimum Running OD (mm)	11.75" (298.45mm)	12.20" (309.9mm)	15.50" (393.7mm)	17.00" (431.8mm)	21.75" (552.45 mm)
ISO14310 Standard **	Up to V0				
Maximum Working Pressure psi (bar)	5,000psi (345bar)	5,000psi (345bar)	5,000psi (345bar)	4,000psi (276bar)	4,000psi (276bar)
Constant element ΔP across expansion range psi (bar)	5,000psi (345bar)	5,000psi (345bar)	5,000psi (345bar)	4,000psi (276bar)	4,000psi (276bar)
Standard element lengths ft (m)	Up to 7.2ft (2.2m)				
Temperature range °C (°F) ***	260°C (500°F)				
Base-pipe range (up to)	10 1/8"	10 3/4"	13 3/8"	14"	18 5/8"
ID in (mm)	Full Bore (as per base-pipe)				

\* Custom specification and control line feedthrough options available on request \*\* V0 available on request for all WAB sizes \*\*\* Maximum temperature is based on FFKM seals & elements.

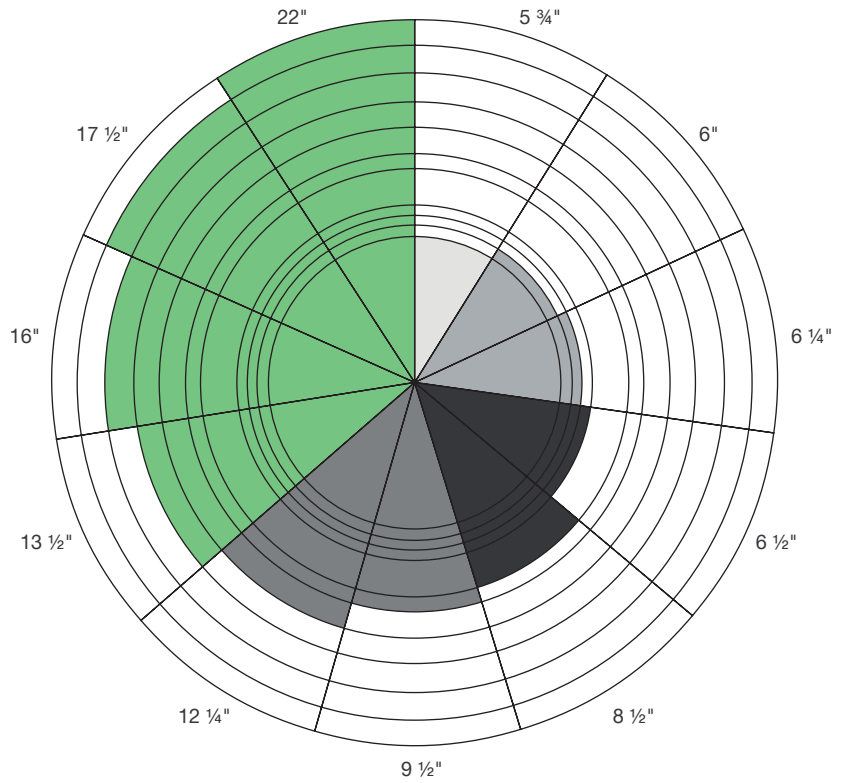
# 01. How it works

- 1: Mounted on base pipe
- 2: Hydraulic expansion controlled from surface



# 02. Our product range

Per open hole size.



# 03. The benefits

The WAB®'s metal construction provides a fast, high expansion, rugged seal against the open hole or casing irrespective of the fluid in the well. Furthermore, as shown in the chart below, there is no degradation of the maximum delta P capability versus expansion diameter.

- Conventional annular-barrier Delta P
- 812WAB® Delta P

Delta P

