

Zone Isolation Cylinder



Optimal distribution of steam can significantly improve the recovery factor of a heavy oil or bitumen reservoir. Thermal recovery utilizing steam, has been extensively and successfully used in many heavy oil wells.

Although steam injection has enhanced oil recovery, history has also shown us that steam injection has created challenges. Some of these challenges result in having steam break through on Steam Assisted Gravity Drainage (SAGD) wells, or unwanted water production through lower zones in horizontal wells, or thermal expansion causing failure to seals and hangers. These problems can result in costly work-overs associated with down hole equipment failures, reduced recovery, or loss of the well.

Specifically designed and engineered Zone Isolation Cylinders (ZIC) are placed within the production liner at specific depths or positions within the well. The production liner may be a sand control device that is hung within the well or a production liner that is cemented and perforated. In either case, the ZIC are installed within the production liner in areas that will separate sections of the well. These zone separations will assist in solving the challenges previously mentioned.

When zone isolation is required, the Flow Control Device (FCD) liners used for injection or production, would be installed within the production string containing the ZICs. These FCD liners will contain Zone Isolation Blocks (ZIB) that will coincide with the ZIC to create isolation. Refer to Zone Isolation Blocks (ZIB) for further information.

Each ZIC installed within the production liner will decrease in inside diameter (ID) as the depth of the liner increases. The coinciding ZIB will also decrease in outside diameter (OD) by the same amount as its mating ZIC. When the FCD liner's ZIB line up with the production liner's ZIC, the ZIB will slide inside their mating ZIC to complete a seal. The ZIC and ZIB work in conjunction with the FCD liner to inject, produce, or isolate specific sections of the well.

A specific gas nitrating process is applied to the ZIC during manufacturing, which creates a hardened and non-corrosion finish to the i.d. of the ZIC. Unlike coatings, this process is impregnated into the ZIC material and does not affect diameter tolerances or separate during thermal material movements.

APPLICATION

- Thermally enhanced oil recovery applications – steam injection wells.
- High temperature and pressure wells requiring debris / sealing capability during pipe movement.
- Vertical or horizontal well zone isolation to enhance steam distribution, shut off steam or water breakthrough.

FEATURES

- Hardened and non-corrosive finish for ZIB installation and longevity.
- Hardened and non-corrosive finish allows drill string runs through the ZICs without internal damage.
- Same threaded connection characteristics as the casing it is being run with.
- Provide thermal expansion protection to the FCD liner.

BENEFITS

- Easy installation. No special makeup requirements.
- Ability to isolate zones to decrease work over costs, or permanent loss of well.



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