BARRACUDA OIL TOOLS, LLC
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EXTERNAL CASING PACKER (ECP)

Barracuda Oil Tools ECP assemblies are designed with packer elements with sealing sections in 4-Foot, 10-Foot, and 20-Foot (6.10m) lengths. Barracuda Oil Tools packer elements conform to irregular or washed-out hole diameters. Steel reinforcement slats are used within the elements to ensure that the ECP self-centers itself in vertical, deviated, or horizontal wellbores.

Tools are available in Standard and Special clearance models. Standard clearance tools are used where higher differential pressures are encountered across the packer element. Special clearance tools are used for applications where restricted hole diameters may occur.

Standard elastomer compounds may be used for temperatures up to 240° F (115° C). Advanced elastomer compounds are made available for applications in which temperatures reach up to 350° F (180°C).

APPLICATIONS

• Prevent Loss of Cement
• Prevent Gas Migration through Cement Columns
• Prevent Unwanted Water Production
• Minimize Damage to Sensitive Formations
• Centralize Casing in Deviated or Horizontal Wells
• Slotted Liners

FEATURES & BENEFITS

• Large full-opening bore provided through ECP assembly – Internal bore of the assembly is equivalent to the Inner Diameter and Drift Diameter of the casing string used in a well.

• Continuous Mandrel Design – Each assembly is provided with an integral mandrel with no internal threaded connections in the tool.

• Used for open-hole or cased-hole applications – Inflatable packers conform well to washed out or irregular wellbores.

• Used for vertical, deviated, or horizontal wells – ECP assemblies are hydraulic set, and no pipe manipulation is required to set packers.

• Easily adjustable valve system – Shear pins may be changed in the field when operating conditions change.

• Packer seal lengths available in 4, 10, or 20 foot lengths

• Special Clearance Models available – For additional clearance when tools are run into restricted wellbores or into horizontal wells.

• Cement Inflation - ECP packer elements may be cement inflated for permanent applications where casing string is not cemented in place.

• Retrievable - ECP assembly may be retrieved by incorporating an over-pressure valve into the tool.
**DIFFERENTIAL PRESSURE CHART**

**EXTERNAL CASING PACKER (E.C.P.) - DIFFERENTIAL PRESSURE**

**OPERATING PROCEDURE**

* Prior to installation, the ECP is to be callipered and the dimensions recorded.

1. Make up and thread-lock the float shoe to the first joint of casing.

2. Make up and thread-lock the float collar to the first joint of casing. Install any casing centralizer(s) as required.

3. Make up and run the required amount of casing to position the ECP external casing packer at the desired setting depth. Fill the casing with drilling mud regularly while running in the hole. Install centralizers as required.

   NOTE: It is recommended that casing centralizers be installed immediately above and below the ECP packer.

4. Make up and install the (ECP) external casing packer. The threads on the ECP should be torqued to the same specifications as the casing string. Thread locking of the connections is optional. Insure the ECP valve system shear pressures are properly pre-set.

   NOTE: The protective knock-off rods are NOT removed prior to installation.

5. Make up and run the balance of the casing string, installing casing centralizers as required and filling the casing string regularly with drilling mud.

6. Install the circulating head and circulate and condition the hole as required prior to cementing.
7. Rig in the cementing unit. Hold a pre-job operational meeting to define all operational and safety responsibilities.

8. Pump cementing pre-flush and pressure test surface treating lines prior to mixing the cement slurry. 

**NOTE: DO NOT USE A BOTTOM WIPER PLUG AT ANY TIME.**

9. Mix and pump the required volume of cement slurry(s). Pump rates will be dependent on actual hole conditions and it is strongly recommended that at no point during pumping operations that the optimum fluid velocity used to drill the open hole section be exceeded during cementing.

10. Release the top cementing plug from surface. (Pumping out the surface treating line is optional.

11. Displace the wiper plug with the required volume of displacement fluid. Displacement rates will dependant on the conditions outlined in step #9.

12. Slow the displacement through ECP to 0.5m3/min approximately 0.5m3 before ECP and 0.5m3 after. Follow proper cementing displacement for remainder of displacement.

13. Bump the plug at the float with approximately 2000 KPA over the final circulating pressure. Hold the applied pressure for 5.0 minutes to insure pressure competency of the casing string components.

14. Depending on the actual conditions at the time, the pressure may be bled to zero prior to beginning the inflation procedure to insure the floats are holding. In situations where the opening pressure of the ECP packer is close to the differential pressure seen when the plug bumps or if fluid losses have occurred during the job this step should be omitted.

15. Increase the applied pressure to 80% of the calculated opening pressure. Step pressure 1-2 MPA and hold 2-3 minutes per step until opening valve functions. Monitor for a pressure drop as the packer inflates.

16. When the pressure drop occurs, monitor the pressure insuring the pressure does not fall below 2 MPA above the calculated hydrostatic balance at the packer. Larger diameter packers may require pressure application from the surface to fully inflate.

17. Once the packer is inflated, increase the pressure to the actual shear pressure + or – 20% seen during the inflation process. Hold this pressure for 5 minutes as a pressure test of the casing string and the packer valve assembly.

18. Bleed the applied pressure to zero (0) to insure the opening valve is closed and the floats are holding.

If a pressure drop is not observed as outlined in step #14, increase the applied pressure in 1000 KPA increments for a full 2 minutes between the increases, monitoring for a pressure drop as the packer inflates. When the pressure drop occurs proceed with the steps 15-17.

**NOTE: Do not exceed an applied pressure in excess of 80% of the casing burst pressure when inflating the packer.**

If the packer inflation valve opens and the packer does not maintain pressure competency (bursts during inflation) the following procedures should be followed to lock the opening valve closed to regain pressure competency within the packer and casing string.

- Pump max volume of 200% of ECP element fill volume while filling ECP element
- Stop Pumping
- Bleed the internal casing pressure to zero to lock the opening valve closed
- Pressure up to a maximum of 80% of the casing string burst pressure to insure pressure competency of the ECP packer and the casing string