The FO™ (full-opening) multiple-stage cementer (or FO cementer) is used to place any number of stages of cement or other fluids outside a casing string at different selected points along the casing. This tool is operated manually and requires the use of a drill or tubing string and the sleeve positioner operating tools. These operating tools are available through Halliburton tool departments as rental items. In addition, they are also manufactured for customer purchase.

These cementers are made of heat-treated stock to a maximum hardness of RC 21. FO cementers are suitable for use with H-40, J-55, K-55, L-80, and N-80 grades of casing. They can even be used in sour service applications (sour gas – H₂S and sour oil) at any temperature.

The Halliburton series of FO (full-opening) cementing tools consists of the following equipment:

- FO multiple-stage cementers
- Opening and closing sleeve positioners
- Standard isolation packers
- Port valve isolation packers
- RTTS™ circulating valves
- FO inflatable packer collars

**Features**

The FO cementer has the following unique advantages:

- Any number of tools can be run in the same string.
- No plugs or seats must be drilled out at the cementer.
- Operators can open or close the tool whenever necessary.
- The tool can be used to test, treat, and evaluate a zone in the well before it is reclosed.
Applications

FO cementers have the following applications:

- In addition to being used with combination strings, these cementers can be used for selective water injection/production.
- If located across from a suitable uncemented zone, they can be used for mud disposal.
- They can be used to perform inner-string cementing when used with standard inner-string cementing equipment.
- The tool can be used to test, treat, and evaluate a zone in the well before it is re-closed.
- Can be used in sour gas applications

Surface Pack-Off Requirements

When using standard operating tools, a high pressure surface pack-off (QUICK-PAK™ or similar) is required, and when using operating packers, a low pressure pack-off can be used.

For more information about the FO Multiple-Stage Cementing System, contact us at cementing@halliburton.com.