Sales of Halliburton products and services will be in accord solely with the terms and conditions contained in the contract between Halliburton and the customer that is applicable to the sale.

Halliburton coring technology is the subject of the following U.S. patents:

- 4,930,587
- 5,169,183
- 5,209,310
- 5,351,765
- 5,460,230
- 5,501,285
- 6,116,358
- 6,145,604
- 6,158,534
- 6,164,389
- 6,341,656
- 6,394,196
- 6,444,424
- 7,021,404
- 7,117,958
- 7,320,373

Trademarks of Halliburton:

- CAL™
- CD™
- CleanCore™
- CQL™
- Coriending™
- CT™
- FCS™
- Fibertube™
- Glider™
- HSB™
- Latch-Les™
- Low Invasion™
- MITP™
- PosiClose™
- Sponge Coring™
- TB™
- TBT™
- TD™
Latch-Les™
TripleTube
Wireline
System

Inner Barrel Drops from Surface
System in Coring Operation
Core Sample is Retrieved at Surface
System Can Drill Ahead with Drill Plug
The Inner Barrel is dropped and hydraulic pressure seats the assembly in the outer barrel.

Coring begins once the inner tube is seated. The corehead cuts the core sample.

When the Inner Barrel is full, an overshot is lowered on wireline from the surface which engages the spear head of the inner assembly and pulls it to the surface. A new inner barrel assembly is dropped to resume coring.

A Drill Plug transforms the core head into a drill bit, which enables the entire system to drill to a deeper target section for coring.

Wireline Meets the Needs of Both the Driller and Geologist

Wireline saves valuable rig time since the driller doesn’t have to trip the drill string to retrieve each core sample. He can also drill deeper with the system until he is ready for another core sample. This simple, rugged design means reliable, trouble free service.
Coalbed Methane and Shale Gas

In measuring gas content, it is important to get the core to the surface quickly to minimize gas escaping, allowing more accurate measurement of gas in place. Wireline can retrieve the sample as soon as it’s cored, rather than wait for the whole assembly to be tripped out of the hole.

Continuous Coring

Continuous coring without tripping allows long lithologies to be analyzed. Long intervals can be cored without the conventional tripping times.

Hydro-Seat Barrel (HSB™) coring system indicates jamming at the surface and is a standard feature. LEFT–The inner barrel is free floating, held on seat by hydraulic pressure. RIGHT–Jamming lifts the inner barrel and restricts mud flow, increasing the pressure reading at the surface.

Drill Plug

The Drill Plug can be dropped and retrieved from surface, allowing the system the flexibility to either drill or core. The corehead is converted to a drill bit, which allows drilling to another target formation. It eliminates tripping and saves valuable rig time.
Options Allow Coring in All Formations

The wireline system is flexible and allows many options to provide high quality cores in a full range of applications and rock types. It operates with standard drill strings and drilling services with no customization needed. The system passes through standard drill collars and connections. There is no breaking of connections at surface, since the inner barrel is hydraulically seated.

Glider™ System

The Glider™ system provides a layer of lubricating fluid between the core and inner tube to prevent jamming. It is ideal for broken formation as well as sticky clay which tends to swell and jam. The fluid also protects the core from the drilling mud.
Spring Core Catcher

The Spring Core Catcher allows the core to enter the inner barrel easily, but restricts exit. It’s also a redundant part of all the special systems on this page, making them suitable for a full range of formations.

Full Closure System (FCS™) Device

The Full Closure System (FCS™) device is ideal for soft, sandy, unconsolidated formations. It is hydraulically activated which minimizes mechanical parts and increases reliability. The collapsing sleeve provides total closure, preventing loss of sandy formations.
The Wireline System

The wireline system holds the inner barrel in place with hydraulic pressure rather than mechanical latches, improving reliability. This hydraulic actuation provides positive indication of inner tube landing. Without rigid mounting, the floating, flexible inner barrel dramatically reduces core stress upon entry.

Inner barrel permits recovery of full length, 30 foot sections. The length of the core barrel is easily modified to 60 or 90 foot sections.

It can be brought to the surface by conventional oilfield wireline, slickline, or sandline.
## Wireline Technical Specifications

### GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>IMPERIAL</th>
<th>METRIC</th>
<th>IMPERIAL</th>
<th>METRIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hole Size Compatibility</strong></td>
<td>5-7/8 to 7 in.</td>
<td>149 to 178 mm</td>
<td>8 to 9 in.</td>
<td>203 to 229 mm</td>
</tr>
<tr>
<td><strong>Maximum Flow Rate</strong></td>
<td>350 gpm</td>
<td>1,325 lpm</td>
<td>450 gpm</td>
<td>1,700 lpm</td>
</tr>
<tr>
<td><strong>Core Size</strong></td>
<td>1.713 in.</td>
<td>43.5 mm</td>
<td>2.02 in.</td>
<td>51.3 mm</td>
</tr>
<tr>
<td><strong>Core Capacity</strong></td>
<td>30 ft.</td>
<td>9.15 m</td>
<td>30 ft.</td>
<td>9.15 mm</td>
</tr>
<tr>
<td><strong>Core Barrel Type</strong></td>
<td>Heavy Duty</td>
<td>Heavy Duty</td>
<td>Heavy Duty</td>
<td>Heavy Duty</td>
</tr>
<tr>
<td><strong>Drill String Drift Diameter</strong></td>
<td>2-1/4 in.</td>
<td>57.15 mm</td>
<td>2-13/16(^{\text{th}}) in.</td>
<td>71.43(^{\text{th}}) mm</td>
</tr>
</tbody>
</table>

### OUTER ASSEMBLY

<table>
<thead>
<tr>
<th></th>
<th>IMPERIAL</th>
<th>METRIC</th>
<th>IMPERIAL</th>
<th>METRIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top Connection (Box-API)</strong></td>
<td>3-1/2 IF</td>
<td>33-1/2 IF</td>
<td>4-1/2 IF</td>
<td>4-1/2</td>
</tr>
<tr>
<td><strong>Overall Length</strong></td>
<td>35.83 ft.</td>
<td>10.9 m</td>
<td>36.6 ft.</td>
<td>11.2 m</td>
</tr>
<tr>
<td><strong>Outer Barrel (OD x ID)</strong></td>
<td>4-3/4 x 3-3/4 in.</td>
<td>121x95 mm</td>
<td>6-3/4 x 5-3/8</td>
<td>171 x 137 mm</td>
</tr>
<tr>
<td><strong>Hanger Sub ID</strong></td>
<td>2-13/16 in.</td>
<td>71.4 mm</td>
<td>2.91 in.</td>
<td>74 mm</td>
</tr>
<tr>
<td><strong>Inner Stab. Positions</strong></td>
<td>2-17-32 ft.</td>
<td>0.6-5.2-9.7 m</td>
<td>2-17-32 ft.</td>
<td>0.6-5.2-9.7 m</td>
</tr>
<tr>
<td><strong>Pulling Capacity</strong></td>
<td>246,000 lbs.</td>
<td>228 T</td>
<td>506,000 lbs.</td>
<td>228 T</td>
</tr>
<tr>
<td><strong>Maximum Torque</strong></td>
<td>14,800 FtLbs.</td>
<td>2,000 daNm</td>
<td>39,000 FtLbs.</td>
<td>5,300 daNm</td>
</tr>
<tr>
<td><strong>Make-Up Torque</strong></td>
<td>9,600 FtLbs.</td>
<td>1,300 daNm</td>
<td>25,800 FtLbs.</td>
<td>3,500 daNm</td>
</tr>
</tbody>
</table>

### INNER TUBE ASSEMBLY

<table>
<thead>
<tr>
<th></th>
<th>IMPERIAL</th>
<th>METRIC</th>
<th>IMPERIAL</th>
<th>METRIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Length</strong></td>
<td>34.8 ft.</td>
<td>10.6 m</td>
<td>34.7 ft.</td>
<td>9.77 m</td>
</tr>
<tr>
<td><strong>Maximum OD</strong></td>
<td>2-6/32 in.</td>
<td>55.7 mm</td>
<td>2.75 in.</td>
<td>69.8 mm</td>
</tr>
<tr>
<td><strong>Inner Tube</strong></td>
<td>2.126x1.811 in.</td>
<td>54x46 mm</td>
<td>2.68 x 2.25 in.</td>
<td>68x57.25 mm</td>
</tr>
</tbody>
</table>

(*) P.C. calculated with tensile stress = 80% of the yield strength
(**) Maximum Torque is about 80% of the yield torque
(***) M.U.T. is based on torque test performed in Halliburton lab facilities
(1) Depends on LL version
These systems are fully compatible with the Halliburton 4-3/4” and 6-3/4” Heavy Duty Threadform equipment.