Downhole X-Ray Diagnostic Service
Illuminate the Invisible®

Well intervention decisions are not easy to make. The Visuray® VR90® tool offers a new commercial wireline diagnostic service that uses ground-breaking X-ray technology to give you downhole images in any well production fluid – allowing you to see with certainty and act with confidence.

**ACCURATE • MEASURABLE • RECOGNIZABLE**

<table>
<thead>
<tr>
<th>WHAT’S IN YOUR WELL</th>
<th>WHAT WE SEE IN 2D</th>
<th>WHAT WE SEE IN 3D</th>
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</thead>
<tbody>
<tr>
<td><strong>FISH</strong></td>
<td><img src="image" alt="27 mm" /></td>
<td><img src="image" alt="Image" /></td>
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<tr>
<td><strong>WIRE BALL</strong></td>
<td><img src="image" alt="6 mm" /></td>
<td><img src="image" alt="Image" /></td>
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<tr>
<td><strong>WRENCH</strong></td>
<td><img src="image" alt="39 mm" /></td>
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*Above* These three examples show typical downhole objects encountered during well intervention operations. In all three cases, VR90 images allow you to select the correct fishing tool for successful recovery.

*Left* With its unique downward focused X-ray source, the VR90 tool is shown imaging the fishing neck of a wireline tool stuck in a well.
HOW DOES IT WORK?
A unique compact X-ray source emits X-rays that survey the volume immediately below the tool. Measurements of the backscattered radiation are then converted into 2D and 3D images using an innovative fluid-based surface reconstruction technique. By using X-rays rather than other conventional methods, the VR90 tool works in any downhole production fluid.

APPLICATIONS
- Inspection of downhole equipment such as valves and mandrels
- Classification and quantification of wellbore restrictions
- Determination of shapes and dimensions of dropped objects
- Identification and characterization of collapsed or split casing
- Providing input for design of customized fishing tools

BENEFITS
- Saves time, reduces cost, and minimizes environmental risk
- Provides immediate information during well interventions
- Works in all production fluids
- Runs on all types of electric wireline, and compatible with downhole tractors and coiled tubing systems
- Can be run centered or eccentered
- Uses electronic X-ray sources, simplifying logistics and increasing safety

MEASUREMENT SPECIFICATIONS
- Depth of investigation: 100 mm
- Depth resolution: < 5 mm
- Lateral resolution: < 1 mm
- Depth accuracy: 5 mm
- Lateral accuracy: 1 mm

EQUIPMENT SPECIFICATIONS
- Pressure: 20,000 psi (1380 bar)
- Temperature: 212 °F (100 °C)*
- OD: 3 5/8 in (92 mm)
- Length: 27.5 ft (8.4 m)
- Weight: 520 lbs (236 kg)

* 300 °F (150 °C) tool available in 2016