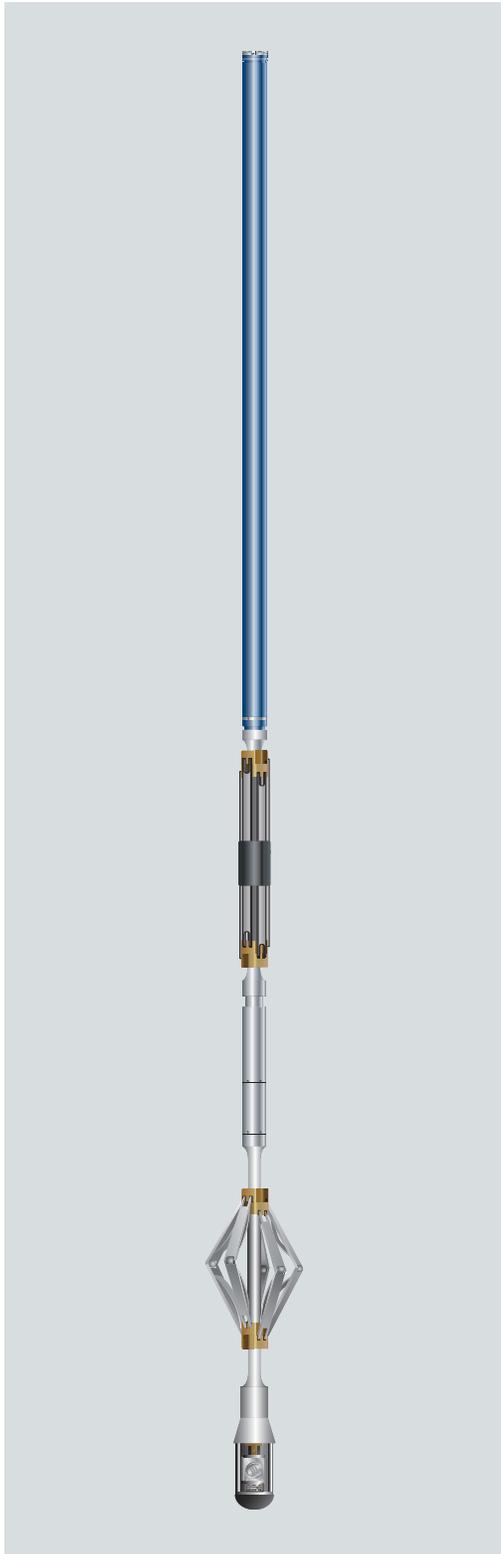


# USI UltraSonic Imager Tool

**Schlumberger**



The USI\* UltraSonic Imager tool (USIT) uses a single transducer mounted on an Ultrasonic Rotating Sub (USRS) on the bottom of the tool. The transmitter emits ultrasonic pulses between 200 and 700 kHz and measures the received ultrasonic waveforms reflected from the internal and external casing interfaces. The rate of decay of the waveforms received indicates the quality of the cement bond at the cement/casing interface, and the resonant frequency of the casing provides the casing wall thickness required for pipe inspection. Because the transducer is mounted on the rotating sub, the entire circumference of the casing is scanned. This 360° data coverage enables the evaluation of the quality of the cement bond as well as the determination of the internal and external casing condition. The very high angular and vertical resolutions can detect channels as narrow as 1.2 in. [3.05 cm]. Cement bond, thickness, internal and external radii, and self-explanatory maps are generated in real time at the wellsite.

## Applications

- Cement evaluation
- Casing inspection
  - Corrosion detection and monitoring
  - Detection of internal and external damage or deformation
  - Casing thickness analysis for collapse and burst pressure calculations

## Measurement Specifications

	USIT
Output	Acoustic impedance, cement bonding to casing, internal radius, casing thickness
Logging speed	1,800 ft/hr [549 m/h]
Range of measurement	Acoustic impedance: 0 to 10 MRayl [0 to 10 MPa.s/m]
Vertical resolution	Standard: 6 in. [15.24 cm]
Accuracy	Less than 3.3 MRayl: ±0.5 MRayl
Depth of investigation	Casing-to-cement interface
Mud type or weight limitations <sup>†</sup>	Water-base mud: Up to 15.9 lbm/gal Oil-base mud: Up to 11.2 lbm/gal
Combinability	Bottom-only tool, combinable with most tools
Special applications	Identification and orientation of narrow channels

<sup>†</sup>Exact value depends on the type of mud system and casing size.

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**Mechanical Specifications**

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	<b>USIT</b>
Temperature rating	350°F [177°C]
Pressure rating	20,000 psi [138 MPa]
Casing size—min.	4½ in. [11.43 cm]
Casing size—max.	13¾ in. [33.97 cm]
Outer diameter <sup>†</sup>	3.375 in. [8.57 cm]
Length <sup>†</sup>	19.75 ft [6.02 m]
Weight <sup>†</sup>	333 lbm [151 kg]
Tension	40,000 lbf [177,930 N]
Compression	4,000 lbf [17,790 N]

<sup>†</sup>Excluding the rotating sub

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**USIT Rotating Sub Mechanical Specifications**

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	<b>USRS-AB</b>	<b>USRS-A</b>	<b>USRS-B</b>	<b>USRS-C</b>	<b>USRS-D</b>
Outer diameter	3.41 in. [8.66 cm]	3.58 in. [9.09 cm]	4.625 in. [11.75 cm]	6.625 in. [16.83 cm]	8.625 in. [21.91 cm]
Length	9.8 in. [24.89 cm]	9.92 in. [25.20 cm]	9.8 in. [24.89 cm]	8.3 in. [21.08 cm]	8.3 in. [21.08 cm]
Weight	7.7 lbm [3.5 kg]	7.7 lbm [3.5 kg]	10.6 lbm [4.8 Kg]	15.0 lbm [6.8 kg]	18.3 lbm [8.3 kg]

[www.slb.com/oilfield](http://www.slb.com/oilfield)

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