

RADii® Segmented Bond Tool



The RADii® Segmented Cement Bond Tool accurately measures and maps the quality of cement behind casing in well bores with pressure up to 20,000 psi and temperatures up to 475°F.

The RADii® Segmented Cement Bond Tool uses a single ceramic transmitter, an eight or sixteen segment receiver at 3 ft. and a single receiver at 5 ft. spacing. The segmented receiver generates a cement map which enables identification of cement channelling, while the single receiver generates the traditional cement bond log (CBL) and a variable-density log (VDL).

The ruggedized design of the RADii® tool ensures consistently reliable and accurate operation in a wide range of environments. The oil-filled mandrels containing the transducers can be serviced individually, enabling significant time savings when the tool requires service. Ceramic transmitter and receivers enable the tool to withstand hostile high-temperature environments.

Data from the receivers are digitized and stored in the tool's internal memory before being sequentially transmitted to surface. An internal controller transmits 8 signals from the RADii® receiver, a composite signal representing the sum of the eight RADii® signals, the 5 ft. receiver signal and an internally generated calibration signal.

An optional temperature sensor can also be mounted close to the transmitter. The temperature log recorded while running in hole can be used to provide additional cement quality information.

Radii® tools can be run in combination with the entire Probe Well Integrity range, including all Multi-Arm Calipers and Electromagnetic Thickness tools, as well as Gamma Ray, Casing Collar Locator, Neutron and Compensated Neutron to provide a comprehensive behind-casing cement and formation evaluation analysis solution.



| | 1 11/16 in. RADii® | 2 3/4 in. RADii® | 3 1/2 in. RADii® |
|-----------------------------------|--|----------------------------------|-----------------------------------|
| Mechanical Specifications | | | |
| Outside diameter, in [cm] | 1.688 [4.29] | 2.750 [6.98] | 3.500 [8.89] |
| Length, ft [m] | 8.60 [2.62] | 8.73 [2.66] | 9.35 [2.82] |
| Weight, lb [kg] | 41 [18.60] | 93 [42.18] | 175 [79.40] |
| Temperature rating, °F [°C] | 350 / 475 [177 / 246] | 350 / 475 [177 / 246] | 350 [177] |
| Pressure rating, psi [MPa] | 20,000 [137.90] | 20,000 [137.90] | 20,000 [137.90] |
| Casing range, in. [cm] | 2.375 – 7.500 [6.03 – 19.05] | 4.500 – 10.750 [11.43 – 27.3] | 4.500 – 20.000 [11.43 – 50.80] |
| Measurement Specifications | | | |
| Output | Amplitude and TT: First arrival peak detection Variable density: Analog waveform from 5 ft receiver Cement map: 8 sector (1 11/16 in and 2 3/4 in), or 16 sector (3 1/2 in) options Secondary curves: Head voltage, internal temperature, external temperature (optional) | | |
| Transmitted waveforms | 1400 µsec for each receiver, 500 µsec for each sector | | |
| Logging speed, ft/min [m/min] | Recommended: 30.0 [9.14], Maximum: 60.0 [18.28] | | |
| Measurement range, µsec | 200 - 1500 | | |
| Vertical resolution | 3 ft E1 peak Amplitude, 5 ft Sonic Waveform | | |
| Radial resolution, deg | 8 sector (1 11/16 in and 2 3/4 in) : 45.0; 16 sector (3 1/2 in): 22.5 | | |
| Precision, mV | < 1 | | |
| Hardware Characteristics | | | |
| Sensor type | 18 kHz piezoelectric crystal (transmitter and receivers) | | |
| Sensors | 8-segment and 16-segment 3 ft receiver for amplitude and cement mapping 5 ft receiver for VDL | | |
| Voltage, VDC | 130 | 130 | 130 |
| Current, mA | 38 | 45 | 45 |