WIRELINE TECH SPECS

RADii® Cement-Bond Tool - Medium Diameter

Identifies cement channeling and generates traditional cement bond log and variable-density log

Applications

- · Cement-bond quality
- Formation isolation
- · Cement channeling

Features and Benefits

- Fully Probe® high-speed digital (HD) platform compatible
- · Full SRO and memory capability
- Storable master calibration in tool memory for retrieval when no free pipe is encountered in the well
- High-temperature (HT) version for hostile environments

Tool Description

The Weatherford medium diameter RADii segmented cement-bond tool uses a single ceramic transmitter, an eight-segment receiver at 3 ft, and a single receiver at 5-ft spacing. The segmented receiver generates a cement map enabling cement-channeling identification while the single receiver generates the traditional cement-bond log (CBL) and a variable-density log (VDL).

The medium-diameter RADii segmented cement-bond tool comes in three configurations: standard, with temperature sub, and HD.



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TECH SPECS

RADii® Cement-Bond Tool - Medium Diameter

Specifications

Ratings and Dimensions

| | Standard | With Temperature Sub | HD |
|---------------------|--|--|---|
| Maximum temperature | 350°F (177°C) | | |
| Maximum pressure | 20,000 ps | 20,000 psi (138 MPa) | |
| Outside diameter | | 2.75 in. (69.85 mm) | |
| Length | 8.73 ft (2.66 m) | 9.39 ft (2.86 m) | 8.73 ft (2.66 m) |
| Weight | 93 lb (42.18 kg) | | |
| Tensile strength | Tension: 50,000 lb Compression: 15,000 lb | | |
| Casing/tubing OD | Min: 4.5 in. (115 mm) Max: 11.6 in. (295 mm) | | |
| Materials | Alloy steel (stainless also available) | Corrosion resistant materials used throughout | SST |
| Measure points | Amplitude, TT: 4.3 ft (1.3 m) VDL, signature: 3.3 in. (1.0 m) | Amplitude, TT: 4.3 in. (1.3 m) VDL, signature: 3.3 in. (1.0 m) Borehole temp: 6.8 in. (1.98 m) | Amplitude, TT: 4.3 in. (1.3 m) VDL, signature: 3.3 in. (1.0 m) |

Borehole Conditions

| | PTX | HD/Memory | HD |
|------------------|---|-----------|----|
| Borehole fluids | OBM, WBM | | |
| Tool positioning | Centralized with one each centralizer above and below | | |
| Logging speed | Recommended: 60 ft/min (18.2 m/min) Max: 100 ft (30.5 m)/min at 0.08 ft (.02 m) sample rate | | |

Electrical

| | Standard | With Temperature Sub | HD |
|---------|----------------|----------------------|---|
| Current | 45 mA at 130 V | 45 mA at 130 V | 65 mA at 50 V (SRO) 65 mA at 19.2 V (memory) |

Calibration

| | Standard | With Temperature Sub | HD |
|----------|--|----------------------|----|
| Primary | 5.5 in. (13.97 cm) pressurized calibration tank | | |
| Wellsite | Free pipe, stored calibration tank waveforms on demand | | |



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Specifications (continued)

Hardware Characteristics

| | Standard | With Temperature Sub | HD |
|------------------|--|---|---------------------------------------|
| Source type: | One piezoelectric crystal fired at 20 kHz, 50 msec intervals | | |
| Sensor type | Omni receiver: One 20 kHz piezoelectric Radial receiver: One 8-segment 20 kHz piezoelectric | | |
| Connections | Top: 1 3/16 in. 12-P GO box Bottom: 1 3/16 in. 12-P GO box | Top: 1 3/16 in. 12-P type-A GO box Bottom: 1 3/16 in. 12-P type-A GO box | Top: GOI box Bottom: GOI pin |
| Combinability | GR, CCL, ProMac™, iQ™, Temperature | GR, CCL, single- or dual- spaced neutron | GR, CCL, ProMac™, iQ™, Temperature |
| Acquisition mode | SRO | SRO | SRO with TCU Memory with MLT |
| Fire rate | 20/sec | | |
| Waveform | Analog: 3 ft (.9 m), 5 ft (1.5 m) Digital: telemetry data | | |
| Record time | 1,480 microseconds for each receiver, 500 microseconds for each sector | | |

Measurements (all configurations except where noted)

| | E ₁ Peak Amplitude | Sonic Waveform | | |
|------------------|--|--|--|--|
| Principle | Sonic wavetrain | Sonic wavetrain attenuation | | |
| Range | 200 to 1,5 | 200 to 1,500 us | | |
| Resolution | 3 ft/0.9 m | 5 ft/1.5 m | | |
| Precision (1 SD) | < 1 mV | N/A | | |
| Primary curves | Individual sector ampli TT: 3 ft (.9 VDL 5 ft (1 | Amplitude: 3ft (.9 m) Individual sector amplitudes: (3 ft) (.9 m) TT: 3 ft (.9m) VDL 5 ft (1.5 m) Borehole temperature*: 6.48 (1.98 m) | | |
| Secondary curves | | Probe telemetry and Temperature: Head Voltage, Internal Temperature HD: Head voltage, internal temperature, accelerometer, volume | | |

^{*}Temperature sub configuration only



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