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.

Weatherford®

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Specifications

Ratings and Dimensions

	Standard	With Temperature Sub	HD
Maximum temperature	350°F (177°C)		
Maximum pressure	20,000 psi (138 MPa)		15,000 psi (103.4 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 attenuation	
Range	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	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