RADii® Cement-Bond Tool – Small to Medium Diameter

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

Applications

- Cement-bond quality
- Formation isolation
- Cement channeling

Features and Benefits

- Probe® high-speed digital (HD) platform version compatible with fast telemetry
- Full surface read out (SRO) and memory logging capabilities with HD version
- Master calibration stored in tool memory for retrieval when no free pipe is encountered in the well
- High-temperature version for hostile environments

Tool Description

The Weatherford small-to-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 that enables identification of cement channeling while the single receiver generates the traditional cement-bond log (CBL) and a variable-density log (VDL).

The small-to-medium diameter RADii segmented cement bond tool comes in three configurations: Probe telemetry (PTX), HD, and high temperature.

Weatherford®

RADii® Cement Bond Tool, Small-to-Medium Diameter

Specifications

Ratings and Dimensions

	PTX	HD	High Temperature
Maximum temperature	350°F (177°C)		475°F (246°C)
Maximum pressure	20,000 psi (138 MPa)	15,000 psi (103.4 MPa)	20,000 psi (138 MPa)
Outside diameter	1.69 in. (43 mm)		
Length	8.60 ft (2.62 m)		14.37 ft (4.38 m)
Weight	41 lb (18.60 kg)		51 lb (23.2 kg)
Tensile strength	Tension and compression: 15,000 lb Torque: 150 ft-lb		
Measure points	Amplitude, transit time: 4.3 ft (1.3 m) VDL, signature: 3.3 ft (1.0 m)		
Min/max casing/tubing OD	Min: 2.38 in. (60.45 mm) Max: 7.50 in. (190.50 mm)		

Borehole Conditions

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

Electrical

	PTX	HD	High Temperature
Current	38 mA at 130 V	50 mA at 50 V (SRO) 50 mA at 19.2 V (Memory)	38 mA at 130 V

Calibration

	PTX	HD	High Temperature
Primary	5.5 in. (13.97 cm) pressurized calibration tank		
Wellsite	Free pipe, stored calibration tank waveforms on demand		

RADii® Cement Bond Tool – Small-to-Medium Diameter

Specifications (continued)

Hardware Characteristics

	PTX	HD	High Temperature
Source type:	One piezoelectric crystal fired at 20 kHz, 50 ms intervals		
Sensor type	Omni Receiver: One 20-kHz piezoelectric Radial Receiver: One 8-segment 20-kHz piezoelectric		
Fire rate	20/s		
Waveform	**Analog**: 3 ft (0.9 m), 5 ft (1.5 m) **Digital**: Telemetry Data		
Record time	1,300 us for each receiver 250 us for each sector		
Connections	**Top**: 1 3/16 in. 12P type-A GO box **Bottom**: 1 3/16 in. 12-pin type-A GO box	**Top**: GOI box **Bottom**: GOI pin	**Top**: 1 3/16 in. 12P type-A GO box **Bottom**: 1 3/16 in. 12-pin type-A GO box
Combinability	GR, CCL, ProMac™, iQ™, temperature		GR, CCL, single or dual spaced neutron, temperature
Acquisition mode	SRO	SRO with telemetry control unit Memory with MLT	SRO

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)	
Secondary curves	PTX and heavy duty: head voltage, internal temperature, accelerometer, volume High temperature: head voltage, internal temperature	