RADii® Cement-Bond Tool – High Temperature

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

Applications

- Cement-bond quality
- Formation isolation
- Cement channeling

Features and Benefits

- Master calibration storage in tool memory, retrievable when no free pipe is encountered in the well
- High-temperature (HT) rated for hostile environments

Tool Description

The Weatherford large-diameter RADii segmented cement-bond tool uses a single ceramic transmitter, a sixteen-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 a traditional cement-bond log (CBL) and a variable-density log (VDL).

The high-temperature RADii segmented cement-bond tool comes in 2-3/4 in. and 3-1/2 in. sizes.

Weatherford®

RADii® Cement-Bond Tool – High Temperature

Specifications

Ratings and Dimensions

	2-3/4 in.	3-1/2 in.
Maximum temperature	475°F (246°C)	
Maximum pressure	20,000 psi (138 MPa)	
Outside diameter	2.75 in. (69.85 mm)	3.5 in. (88.9 mm)
Length	11.35 ft (3.46 m)	11.35 ft (3.46 m)
Weight	130 lb (59.1 kg)	185 lb (83.92 kg)
Tensile strength	Tension: 15,000 lb Compression: 35,000 lb	Tension: 40,000 lb Compression: 40,000 lb
Casing/tubing OD	Min: 4.5 in. (115 mm) Max: 10.75 in. (270 mm)	Min: 4.5 in. (115 mm) Max: 20 in. (508 mm)
Measure points	Amplitude, TT: 4.3 ft (1.3 m) VDL, signature: 3.3 ft (1.0 m	

Borehole Conditions

	2-3/4 in.	3-1/2 in.
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

	2-3/4 in.	3-1/2 in.
Current	38 mA at 130 V	82 mA at 130 V

Calibration

	2-3/4 in.	3-1/2 in.
Primary	5.5 in. (13.97 cm) pressurized calibration tank	9.625 in. (24.4 cm) pressurized calibration tank
Wellsite	Free pipe, stored calibration tank waveforms on demand	

RADii® Cement-Bond Tool – High Temperature

Specifications (continued)

Hardware Characteristics

	2-3/4 in.	3-1/2 in.
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/sec	
Waveform	Analog: 3 ft (.9 m), 5 ft (1.5 m) Digital: Telemetry data	
Record time	1,400 microns for each receiver 500 microns for each sector	
Combinability	GR, CCL, ProMac™, iQ™, temperature	
Connections	Top: GOI box Bottom: GOI pin	
Acquisition mode	SRO with TCU Memory with MLT	

Measurements (all configurations except where noted)

	E_1 Peak Amplitude	Sonic Waveform
Principle	Sonic Wavetrain Attenuation	
Range (2-3/4 in.)	0 to 100 µs	200 to 1500 µs
Range (3-1/2 in.)	200 to 1500 µs	
Accuracy	TT: +/- 2 µs Amplitude: +/- 5%	N/A
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	Probe® telemetry and temperature: head voltage, internal temperature High-speed digital: head voltage, internal temperature	