Gamma Ray – Casing Collar Locator Tool

Provides accurate correlation of log depth to formation gamma ray and casing record.

Applications

- Real-time depth control of cased-hole log data
- High-temperature wells up to 475°F (246°C)

Features and Benefits

- Versatile tool for simultaneous acquisition of background gamma ray and casing/tubing collars
- Compatible with all HD-platform tools

Tool Description

The Weatherford gamma ray and casing collar locator (CCL) tool is a combined gamma ray and CCL tool which provides a passive measurement of gamma radiation by means of a sodium iodine scintillation detector and identifies changes of metal thickness by means of a collar locator.

The telemetry gamma ray and CCL is a combined gamma ray and CCL tool with a telemetry control unit which provides a passive measurement of gamma radiation by means of a sodium iodine scintillation detector and identifies changes of metal thickness by means of a collar locator. The telemetry control unit is the communications control center for the logging system. The tool controls the collection of data from the tools below and packages it for the transmission to the surface system.

Gamma Ray – Casing Collar Locator Tool

Specifications

Ratings and dimensions

	1-11/16 in.	2-3/4 in.	1-11/16 in. Corrosion	2-3/4 in. 6-Pin	1-11/16 in. High Temp	2-3/4 in. High Temp
Maximum temperature	350°F (177°C) for 4 hours	350°F (177°C) for 4 hours	350°F (177°C) for 4 hours	350°F (177°C) for 4 hours	475°F (246°C) for 4 hours	475°F (246°C) for 4 hours
Maximum pressure	20,000 psi (138 MPa)	20,000 psi (138 MPa)	20,000 psi (138 MPa)	20,000 psi (138 MPa)	20,000 psi (138 MPa)	20,000 psi (138 MPa)
Outer diameter	1.69 in. (42.93 mm)	2.75 in. (69.9 mm)	1.69 in. (42.9 mm)	2.75 in. (69.9 mm)	1.69 in. (42.9 mm)	2.75 in. (69.9 mm)
Length	62.4 in. (1584.96 mm)	54.48 in. (1383.79 mm)	62.4 in. (1585.0 mm)	57.6 in. (1463.04 mm)	94.2 in. (2392.7 mm)	77.04 in. (1956.82 mm)
Weight	35.0 lb (15.9 kg)	55.0 lb (25.0 kg)	35.0 lb (15.9 kg)	55.0 lb (25.0 kg)	42.0 lb (19.1 kg)	65.0 lb (29.5 kg)
Minimum casing/tubing OD	2.38 in. (60.45 mm)	4.5 in. (115.0 mm)	2.38 in. (60.5 mm)	4.5 in. (115.0 mm)	2.38 in. (60.5 mm)	4.5 in. (115.0 mm)
Maximum casing/tubing OD	7.0 in. (178.0 mm)	7.0 in. (178.0 mm)	7.0 in. (178.0 mm)	7.0 in. (178.0 mm)	7.0 in. (178.0 mm)	7.0 in. (178.0 mm)
Tensile strength*	Tension: 65,000 lb Compression: 130,000 lb Torque:150 ft-lb	Tension: 65,000 lb Compression: 130,000 lb Torque:150 ft-lb	Tension: 65,000 lb Compression: 130,000 lb Torque:150 ft-lb	Tension: 65,000 lb Compression: 130,000 lb Torque:150 ft-lb	Tension: 65,000 lb Compression: 60,000 lb Torque:150 ft-lb	Tension: 65,000 lb Compression: 130,000 lb Torque:150 ft-lb
Measure Points	Gamma Ray: 6.84 in. (173.74 mm) Casing Collar Locator: 48.96 in. (1243.58 mm)	Gamma Ray: 10.68 in. (271.27 mm) Casing Collar Locator: 43.56 in. (1106.42 mm)	Gamma Ray: 6.84 in. (173.74 mm) Casing Collar Locator: 48.96 in. (1243.58 mm)	Gamma Ray: 30.96 in. (786.38 mm) Casing Collar Locator: 46.92 in. (1191.77 mm)	Gamma Ray: 14.76 in. (374.90 mm) Casing Collar Locator: 80.88 in. (2054.35 mm)	Gamma Ray: 17.04 in. (432.82 mm) Casing Collar Locator: 65.28 in. (1658.11 mm)

*Strengths apply to new tools at 70°F (21°C) and 0 psi.

Borehole conditions

	1-11/16 in.	2-3/4 in.	1-11/16 in. Corrosion	2-3/4 in. 6-Pin	1-11/16 in. High Temp	2-3/4 in. High Temp
Logging speed	Recommended: 60 ft/min. (18.2 m/min) Maximum: 100 ft/min. (30.5 m/min) at 0.08 ft (.02 m) sample rate					
Tool positioning	Centralized | Eccentralized					

Gamma Ray – Casing Collar Locator Tool

Specifications, continued

Hardware characteristics (all configurations)

	Gamma Ray	Casing Collar Locator
Sensor type	Thallium activated sodium iodide crystal	Dual magnet, center coil
Transmission type	Analog pulse or telemetry	Line wobble or telemetry
Data rate	20 frames / sec @ 20 kHz	
Combinability	Corrosion platform	
Connections	GO Top / GO Pin Bottom	

Measurements (all configurations)

Principle	Natural gamma radiation	Magnetic flux lines
Range	0-10,000 cps	4.5 to 7.0 in. (115.0 to 178.0 mm)
Resolution	6.0 in. (152.5 mm)	NA
Accuracy (1SD)	± 5%	NA
Sensitivity	≈ 1.5 cps per API Unit	NA
Primary curves	GR (API)	CCL (mV)
Secondary curves	Head Voltage, Internal Temperature (Telemetry Only)	

Calibrations (all configurations)

Primary	Houston API Pits
Wellsite Verifier	Thorium Blanket

Gamma Ray – Casing Collar Locator Tool

Specifications, continued

Ratings and dimensions (Telemetry)

	Telemetry gamma ray and CCL 2-3/4 in.	1-11/16 in. HD	2-3/4 in. HD
Maximum temperature	347°F (175°C)		
Maximum pressure	15,000 psi (103.4 MPa)		
Outer diameter	2.75 in. (70.0 mm)	1.69 in. (43.0 mm)	2.75 in. (70.0 mm)
Length	47.69 in. (1,211.0 mm)	31.25 in. (794.0 mm)	36.7 in. (933.0 mm)
Weight	44.6 lb (20.2 kng)	13.8 lb (6.3 kg)	34.0 lb (15.6 kg)
Measure points	Gamma Ray: 8.43 in. (214.0 mm) Casing Collar Locator: 39.92 in. (1,014. 0 mm)	Gamma Ray: 6.0 in. (152.0 mm) Casing Collar Locator: 23.6 in. (600.0 mm)	Gamma Ray: 8.48 in. (215.0 mm) Casing Collar Locator: 28.9 in. (735.0 mm)
Materials	Corrosion resistant materials used throughout		

Hardware characteristics (Telemetry)

	Telemetry gamma ray and CCL 2-3/4 in.	1-11/16 in. HD	2-3/4 in. HD
Range	1-65,000 cps		
Resolution	1 cps		
Accuracy	10%		
Sensitivity	(nominal) 1 count / API		

Measurements (Telemetry)

	Telemetry gamma ray and CCL 2-3/4 in.	1-11/16 in. HD	2-3/4 in. HD
Voltage	300 V DC	50 V DC 19 V DC	
Current	Load dependent	10 mA 24 mA	
Tool bus rate	500 kbps	—	—
Uplink rate	150 kbps	—	—
Downlink rate	16 kbps	—	—