

**Overview of
Logging Tools:
Measurements, Units and Acronyms**



Table of Contents

Measurements Made By Wireline Tool Strings	3
Acronyms And Units Used For Wireline Logging Tools	4
Measurements Made By Logging-While-Drilling And Measurement-While-Drilling Tools	6
Acronyms And Units Used For Logging-While-Drilling And Measurement-While-Drilling Tools	7

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Measurements Made By Wireline Tool Strings

Tool string	Tool	Measurement	Sampling interval (cm)	Approximate vertical resolution (cm)
Triple Combination	HNGS	Spectral gamma ray	15	51
	APS	Porosity	5 and 15	43
	HLDS/HLDT	Bulk density	2.5 and 15	38/46
	DIT/DLL	Resistivity	15	76, 150, 200/61
	TAP*	Temperature Tool acceleration Pressure	1 per s 4 per s 1 per s	NA NA NA
	MGT*	Gamma ray	15	15
	QSST*	Inline checkshot	NA	NA
Formation MicroScanner	FMS	Microresistivity	0.25	0.5
FMS - Sonic Combination	GPIT	Tool orientation	0.25 and 15	NA
	NGT/SGT	Spectral gamma ray/ Total gamma ray	15	46/NA
	DSI/SDT/LSS/BHC	Acoustic velocity	15	107/120/61/61
GHMT	NGT	Spectral gamma ray	15	46
	SUMS	Susceptibility	5 and 15	35
	NMRS	Total field	5 and 15	45
Borehole televiewer	BHTV	Sonic imaging	Variable	1.5 - 8
Ultrasonic Borehole Imager	UBI	Ultrasonic imaging	Variable	0.5 - 2
	GPIT	Tool orientation	0.25 and 15	NA
	SGT	Total gamma ray	15	
VSI (stationary measurement)	VSI	Sonic traveltime	Variable	NA
WST (stationary measurement)	WST/WST-3	Sonic traveltime	Variable	NA

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* Not included on every run.

NA - not applicable.

Acronyms And Units Used For Wireline Logging Tools

Tool	Output	Tool name / Explanation of output	Unit
APS		Accelerator Porosity Sonde	
	APLC SIGF STOF	Near array porosity (limestone calibrated) Formation capture cross section ($\sum f$) Tool standoff (computed distance from borehole wall)	% Capture units in
BHC		Borehole Compensated Sonic tool	
	DT	Compressional wave delay time (Δt)	ms/ft
DIT		Dual Induction Tool	
	IDPH IMPH SFLU	Deep induction resistivity Medium induction resistivity Spherically focused resistivity	Ωm Ωm Ωm
DLL		Dual Laterolog	
	LLD LLS	Deep resistivity Shallow resistivity	Ωm Ωm
DSI		Dipole Sonic Imager	
	DTCO DTSM DTST	Compressional wave delay time (Δt) Shear wave delay time (Δt) Stoneley wave delay time (Δt)	ms/ft ms/ft ms/ft
FMS		Formation MicroScanner	
	CI, C2 PIAZ	Orthogonal hole diameters Pad I azimuth Spatially oriented resistivity images of borehole wall	in Degrees
GHMT		Geologic High-Resolution Magnetic Tool	
	MAGS RMGS MAGC MAGB	Magnetic susceptibility (limited range) Low-resolution magnetic susceptibility (wider range) Earth's conductivity Earth's total magnetic field	ppm ppm ppm nT
GPIT		General Purpose Inclinator Tool	
	DEVI HAZI F_x, F_y, F_z A_x, A_y, A_z	Hole deviation Hole azimuth Earth's magnetic field (three orthogonal components) Acceleration (three orthogonal components)	Degrees Degrees Oersted m/s^2
HLDS		Hostile Environment Litho-Density Sonde	
	RHOM PEFL LCAL DRH	Bulk density Photoelectric effect Caliper (measure of borehole diameter) Bulk density correction	g/cm^3 b/e^- in g/cm^3
HLDT		Hostile Environment Litho-Density Tool	
	RHOB PEF CALI DRHO	Bulk density (corrected) Photoelectric effect Caliper (measure of borehole diameter) Bulk density correction	g/cm^3 b/e^- in g/cm^3

Tool	Output	Tool name / Explanation of output	Unit
HNCS		Hostile Environment Gamma Ray Sonde	
	HSGR HCGR HFK HTHO HURA	Standard (total) gamma ray Computed gamma ray (HSGR minus uranium contribution) Potassium Thorium Uranium	gAPI gAPI wt% ppm ppm
LSS		Long Spacing Sonic tool	
	DT DTL	Short-spacing delay time (Δt) Long-spacing delay time (Δt)	ms/ft ms/ft
MGT		Multi-Sensor Spectral Gamma Ray Tool	
	GR POTA THOR URAN	Total gamma ray Potassium Thorium Uranium	gAPI wt% ppm ppm
NGT		Natural Gamma Ray Spectrometry Tool	
	SGR CGR POTA THOR URAN	Standard total gamma ray Computed gamma ray (SGR minus uranium contribution) Potassium Thorium Uranium	gAPI gAPI wt% ppm ppm
QSST		Inline Checkshot Tool	
SDT		Digital Sonic Tool	
	DTCO	Compressional wave delay time (Δt)	ms/ft
SGT		Scintillation Gamma Ray Tool	
	ECGR	Environmentally corrected gamma ray	gAPI
TAP		Temperature/Acceleration/Pressure tool	
UBI		Ultrasonic Borehole Imager	
		Spatially oriented acoustic images of borehole wall Acoustic arrival times and amplitude Borehole diameter Borehole azimuth	ms in Degrees
VSI		Vertical Seismic Imager	
		Acoustic arrival times	ms
WST		Well Seismic Tool	
		Acoustic arrival times	ms
WST-3		Three-component Well Seismic Tool	
		Acoustic arrival times	ms

All tool and tool string names (except the TAP and MGT) are trademarks of Schlumberger.

Measurements Made By Logging-While-Drilling And Measurement-While-Drilling Tools

Tool	Measurement	Approximate vertical resolution (cm)
ADN	Bulk density Porosity	15 30
CDN	Bulk density Porosity	61 34
CDR	Resistivity Gamma ray	66 - 330 (deep), 30 - 254 (shallow) 46
ISONIC	Velocity	61
NMR	Nuclear magnetic resonance	15
RAB	Resistivity-at-bit Gamma ray	5 - 8 46
MWD	Drilling parameters-at-bit	NA

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Acronyms And Units Used For Logging-While-Drilling And Measurement-While-Drilling Tools

Tool	Output	Tool name / Explanation of output	Unit
ADN/CDN		Azimuthal Density Neutron tool/Compensated Density Neutron tool	
	TNPH	Thermal neutron porosity	%
	RHOB	Bulk density	g/cm ³
	ROMT	Maximum density total from rotational processing	g/cm ³
	DROR	Correction for rotational density	g/cm ³
	DCAL	Differential caliper	in
CDR		Compensated Dual Resistivity tool	
	ATR	Attenuation resistivity (deep)	Ω m
	PSR	Phase shift resistivity (shallow)	Ω m
	GR	Natural gamma ray	gAPI
	SGR	Total gamma ray	gAPI
	CGR	Computed gamma ray (SGR minus uranium contribution)	gAPI
	THOR	Thorium	ppm
	URAN	Uranium	ppm
	POTA	Potassium	wt%
ISONIC		IDEAL Sonic-While-Drilling tool	
	DTCO	Compressional delay time (Δt)	μ s/ft
NMR		Nuclear Magnetic Resonance	
	MRP	Magnetic resonance porosity	%
	FFV	Free fluid volume	%
	BFV	Bound fluid volume	%
	T2	T2 distribution	%
	T2LM	T2 logarithmic mean	ms
RAB		Resistivity-at-Bit tool	
	BDAV	Deep resistivity average	Ω m
	BMAV	Medium resistivity average	Ω m
	BSAV	Shallow resistivity average	Ω m
	RING	Ring resistivity	Ω m
	RBIT	Bit resistivity	Ω m
		Spatially oriented resistivity images of borehole wall	Ω m
MWD		Measurement-While-Drilling tool	
	DWOB	Downhole weight-on-bit	klbf
	DTOR	Downhole torque-at-bit	kft-lbf
	*	Bit bounce	klbf
	*	Tool stick slip	

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