

## LWT Logging Tools Specifications

LWT™ tool	Dual Induction (DUIN)	Propagation Resistivity (PRT)	Laterolog Resistivity (GRT)	Triple Detector Density (DEN)	Compensated Neutron & Gamma Ray (CN-GR)	Spectral Gamma Ray (SGR)	Memory Logger (MEMBAT)
Weight (lbs/kg)	18/8.1	129/58.5	75.8/34.4	33/15	44/20	17.6/8	13.2/6
Length (ft/m)	6.19/1.89	7.8/2.37	11.54/3.52	5.43/1.65	10.06/3.07	3.95/1.20	4.0/1.22
Outside Diameter (in) With wear bands	1 11/16 / 43	2.05/52.07	6.75/171.45 7 /7.5 / 190.5	2.05/52.07	2.05/52.07	2.05/52.07	1 11/16 / 43
Max Temp (°F/°C)	300/150	300/150	320/160	300/150	300/150	300/150	300/150
Max Pressure (PSI/MPa)	14,000/100	20,000/138	20,000/138	14,000/100	14,000/100	14,000/100	14,000/100

## LWT Logging Parameters

LWT Tool	Dual Induction (DUIN)	Propagation Resistivity (PRT)	Triple Detector Density (DEN)	Compensated Neutron & Gamma Ray (CN & GR)	Spectral Gamma Ray (SGR)
Max. Logging Speed (ft/min / m/min)	36 / 11	21/6.5	36 / 11	36 / 11	23 / 7 (> 30 GAPI) 10 / 3 (< 30 GAPI)
Sample Rate	2 sample/sec	3.5 sec/sample	1 sample/sec	1 sample/sec	1 sample/sec
Depth of Investigation Rt/Rm=10 (in / mm)	Deep: 51 / 1,300 Medium: 25.6 / 650	2 MHz Phase Shift 28 /711 400 kHz Phase Shift 37/940  2 MHz Attenuation 48/1219 400 kHz Attenuation 76/1930	3.9 / 100	CN: 10 / 260 at 20 PU	11.8 / 300
Vertical Resolution Rt/Rm=10 (in / mm)	Deep: 51 / 1,300 Medium: 25.6 / 650	2 MHz Phase Shift 21 /533 400 kHz Phase Shift 28/711  2 MHz Attenuation 40/1016 400 kHz Attenuation 58/1473	17.6 / 448	22.4 / 570	5.9 / 150
Min Hole Size (in / mm)	4.9 / 125	4.9 / 125	4.9 / 125	4.9 / 125	4.9 / 125
Max Hole Size (in / mm)	9.8 / 250	9.8 / 250	9.8 / 250	9.8 / 250	9.8 / 250
Measurement Range	Resistivity 0.5-2,000 ohm-m	Resistivity 0.1-1,000 ohm-m	Bulk Density: 1-3 g/cm3	Porosity: 0-60% GR: 0-400 API	GR: 0-3000 API K: 0-100% U: 0-1,000 ppm Th: 0-1,000 ppm
Accuracy	Max Error: 5% (at 0.5 ohm-m)	2 MHz Phase Shift 0.5 to 50 ohm-m ± 5% 50 to 1000 ohm-m ± 7mS/m 400 kHz Phase Shift 0.1 to 10 ohm-m ± 5% 10 to 500 ohm-m ± 5mS/m  2 MHz Attenuation 0.5 to 25 ohm-m ± 5% 25 to 500 ohm-m ± 3mS/m 400 kHz Attenuation 0.1 to 5 ohm-m ± 5% 5 to 500 ohm-m ± 3mS/m	Bulk Density:  Hole size< 311mm/12" <0.023 g/cm3  Hole size> 311mm/12" <0.32 g/cm3	Porosity: 0-10 PU: ± 0.5 PU 10-30 PU: ± 8% 30-60 PU: ± 10% GR: ± 2% measured values	GR, K: ± 2% measured values U, Th: ± 3% measured values