

Micro Electric Tool (MEL)



The Micro Electric Log (MEL) identifies permeable rock formations.

The MEL provides a high resolution qualitative indication of permeable rock formations. Identifying reservoir permeability, in combination with other logging measurements, enables the volume of movable hydrocarbons to be identified.

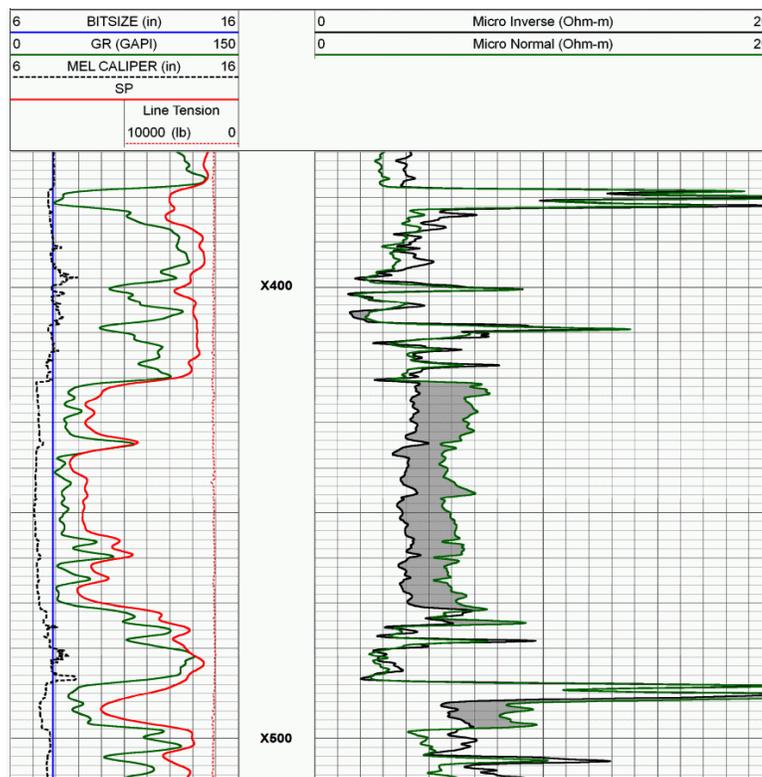
The column of drilling mud in an open hole creates hydrostatic pressure against the borehole wall. A permeable reservoir allows mud filtrate to enter the formation while solids in the mud form a mud cake along the borehole wall. Consequently, where there is mud cake build-up it can be deduced that the formation is permeable.

The MEL detects the presence of mud cake along the borehole wall by making resistivity measurements near to the borehole wall. The tool also has two independently sprung Calliper Arms, one on either side of the Arm Housing, and each calliper arm has a sensor to measure its position.

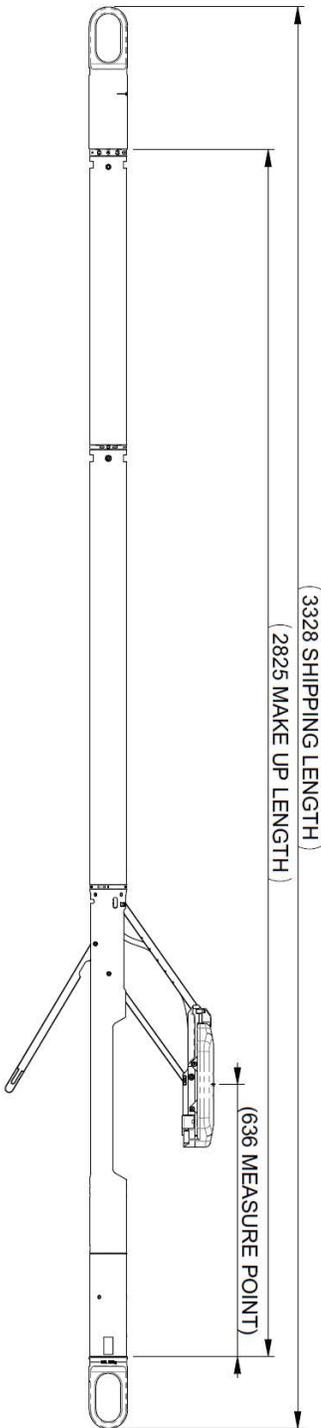
The MEL has three electrodes in an oil filled rubber pad. The rubber pad is mounted on the end of a Calliper Arm and maintains good wall contact as it conforms to borehole irregularities. The tool measures the resistivity of the mud cake (micro-inverse, MINV curve), and a shallow depth of the flushed zone resistivity (micro-normal, MNOR curve).

The mud cake has a lower resistivity than the flushed zone. The MINV measurement has a shallow depth of investigation and is influenced more by the low resistivity mud cake than the flushed zone. The MNOR measurement has a deeper depth of investigation, representative of the flushed zone. Consequently, when MNOR > MINV, this is considered positive separation and indicates permeability.

The MEL can also be used to estimate mud resistivity when run into the well with the calliper arms closed.



Micro Electric Tool (MEL)



Features

- Identifies permeable reservoir zones
- Two fully independent calliper arms
- Mud resistivity estimate while running in hole
- Tool can be placed anywhere in the string
- MEL & MSFL share a common sonde body allowing the pads to be interchanged

Specifications

Maximum OD	3 ³ / ₈ in. (85.7 mm)
Makeup length	9.825 ft (2.8 m)
Weight	219 lb (99 kg)
Maximum temperature	302°F (150°C)
Maximum pressure	20 kpsi (137.9 Mpa)
Minimum hole	6 in. (152 mm)
Maximum hole	16 in. (406 mm)
Tensile strength	50,000 lb (22,700 kg)

Sensor Offsets

MINV/MNOR/MCAL	2.09 ft (0.636 m)
----------------	-------------------

Borehole Conditions

Borehole fluids	Fresh, salt
Recommended logging speed	30 ft/min (9.1 m/min)
Tool position	Centralized/Decentralized

Measurement

Accuracy	MINV & MNOR: +/-5% Calliper: +/-3.8 mm Calliper: +/-0.15 in.
Vertical resolution	1.5 in (3.8 cm)
Radial Depth of Investigation (50%)	MINV: 1.5 in. (3.8 cm) MNOR: 4.0 in (10.2 cm)
Measurement range	0.2–200 ohm-m
Primary curves	MINV, MNOR
Secondary curves	MCAL

Hardware and Power Requirements

Tool bus	Ultrawire
Power	18 VDC 150 mA - 400 mA



imagination at work

Visit us online at:
www.ge-energy.com/wireline

*Trademark of General Electric Company.
Copyright ©19/11/2014 General Electric Company. All rights reserved.