



Micro-Resistivity Tool (MRT)

Measure flushed-zone resistivity (R_{XO}) with the Micro-Resistivity Tool (MRT). An interchangeable pad allows this versatile tool to function either as a microlog (MEL) or a micro-spherically focused laterolog (MSFL).

The tool measures flushed-zone resistivity (R_{XO}) which can be used to calculate flushed-zone water saturation (S_{XO}). The difference between undisturbed water saturation and flushed-zone water saturation indicates the volume of hydrocarbons flushed during the invasion progress.

This pad-type micro-resistivity device uses a concentric arrangement of five electrodes which force the tool's measurement current into a hemispherical pattern. This arrangement eliminates errors generated by wellbore conditions like mudcake on the borehole wall.

The three-electrode array on the MEL pad provides micro-resistivity measurements at 1 1/2-in. (38-mm) (micro inverse) and 4-in. (102-mm) (micro normal) depths. As mudcake builds up adjacent to a permeable zone, positive separation occurs between the two resistivity curves.

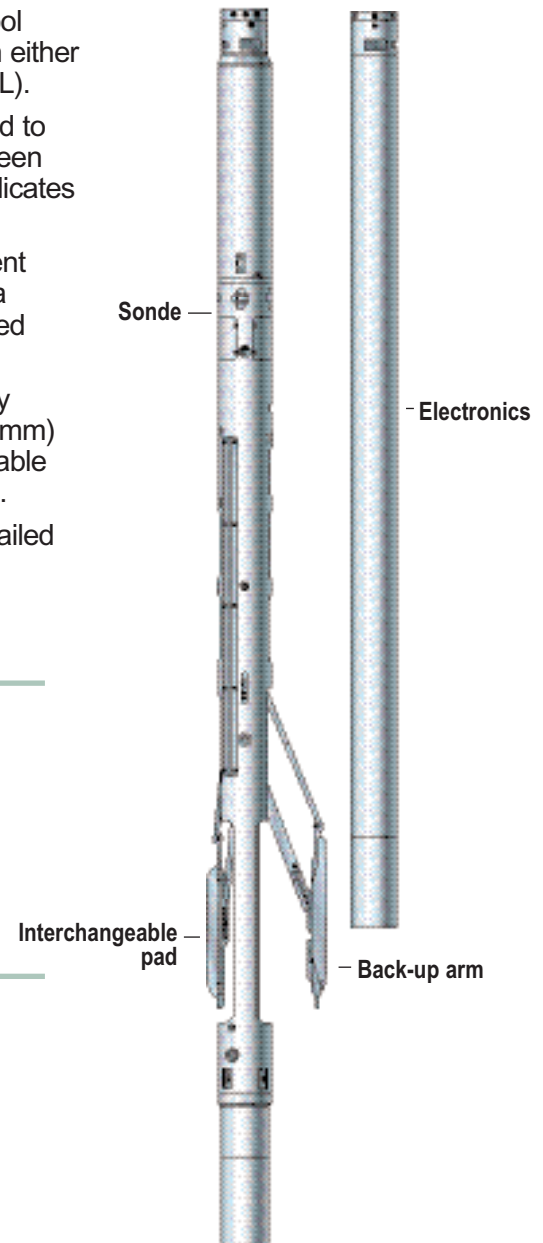
The fine 2-in. (51-mm) vertical resolution of this tool provides a detailed reservoir permeability profile.

Applications

- In MSFL mode, the MRT provides excellent high-vertical-resolution, flushed-zone resistivity (R_{XO}) measurements necessary for accurate movable hydrocarbon determination.
- With a pad change, the MRT also can provide a high-quality permeability indication with a MEL measurement.

Features, Advantages and Benefits

- Measures flushed-zone or invaded-zone resistivity
- Provides input required to calculate movable hydrocarbons
- Contributes to invasion profile characterization when combined with other resistivity tools
- Indicates permeability
- Defines bed boundaries
- Measures borehole size with caliper measurement





Micro-Resistivity Tool (MRT)

Specifications

MEL

Dimensions

Tool length13.1 ft (4.0 m)
 Tool weight267 lb (121 kg)
 Maximum diameter4.7 in. (119 mm)

Vertical resolution

Micro inverse2.0 in. (5.1 cm)
 Micro normal2.0 in. (5.1 cm)

Depth of investigation

Micro inverse1.5 in. (3.8 cm)
 Micro normal4.0 in. (10.2 cm)

Measurement range @ 30-ft/min (10-m/min) logging speed

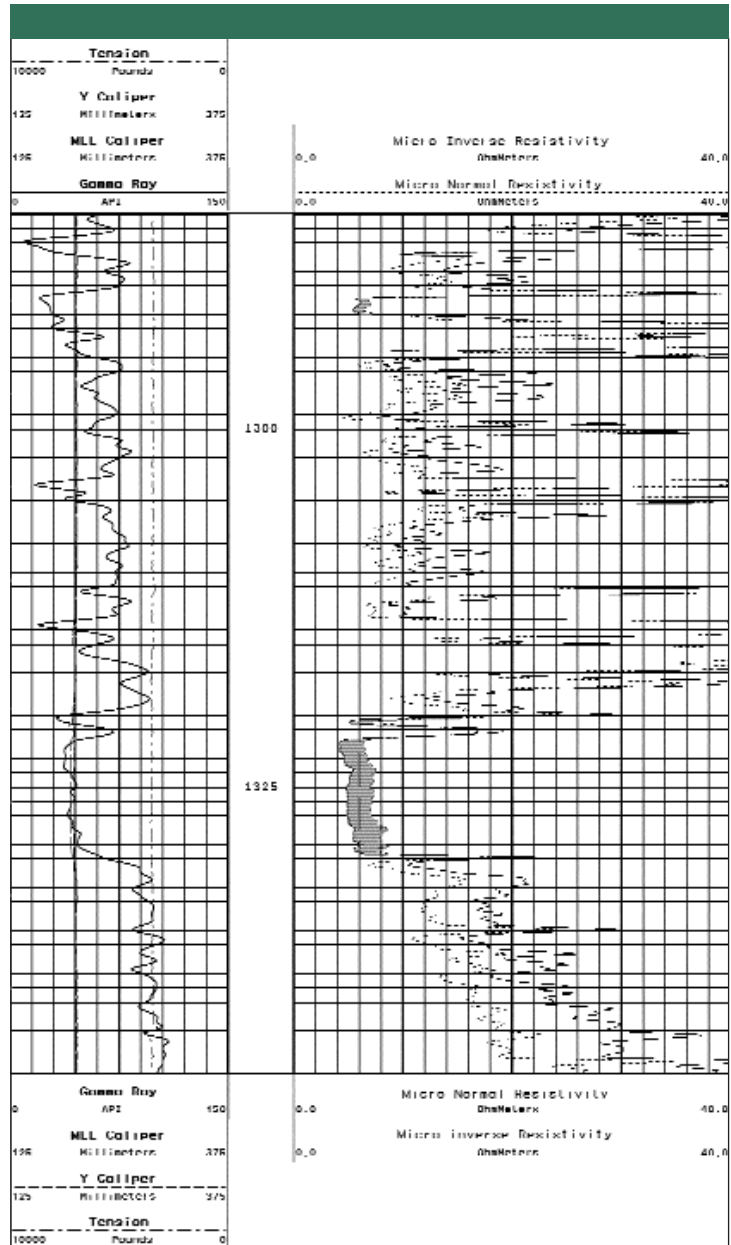
Micro inverse0.2–500 ohm-m
 Micro normal0.2–500 ohm-m

Measurement accuracy @ 30 ft/min (10-m/min) logging speed

Micro inverse0.05 ohm-m
 Micro normal0.05 ohm-m

Maximum ratings

Pressure20,000 psi (138 MPa)
 Temperature350°F (177°C)
 Minimum hole size6.0 in. (152.4 mm)
 Maximum hole size19.5 in. (495.3 mm)



MEL Log Example



Micro-Resistivity Tool (MRT)

MSFL

Dimensions

Tool length 13.1 ft (4.0 m)
 Tool weight 267 lb (121 kg)
 Maximum diameter 4.7 in. (119 mm)

Vertical resolution

MSFL resistivity 3.0 in. (7.6 cm)

Depth of investigation

MSFL resistivity 1.0–4.0 in.
 (2.5–10.2 cm)

Measurement range @ 30-ft/min (10-m/min) logging speed

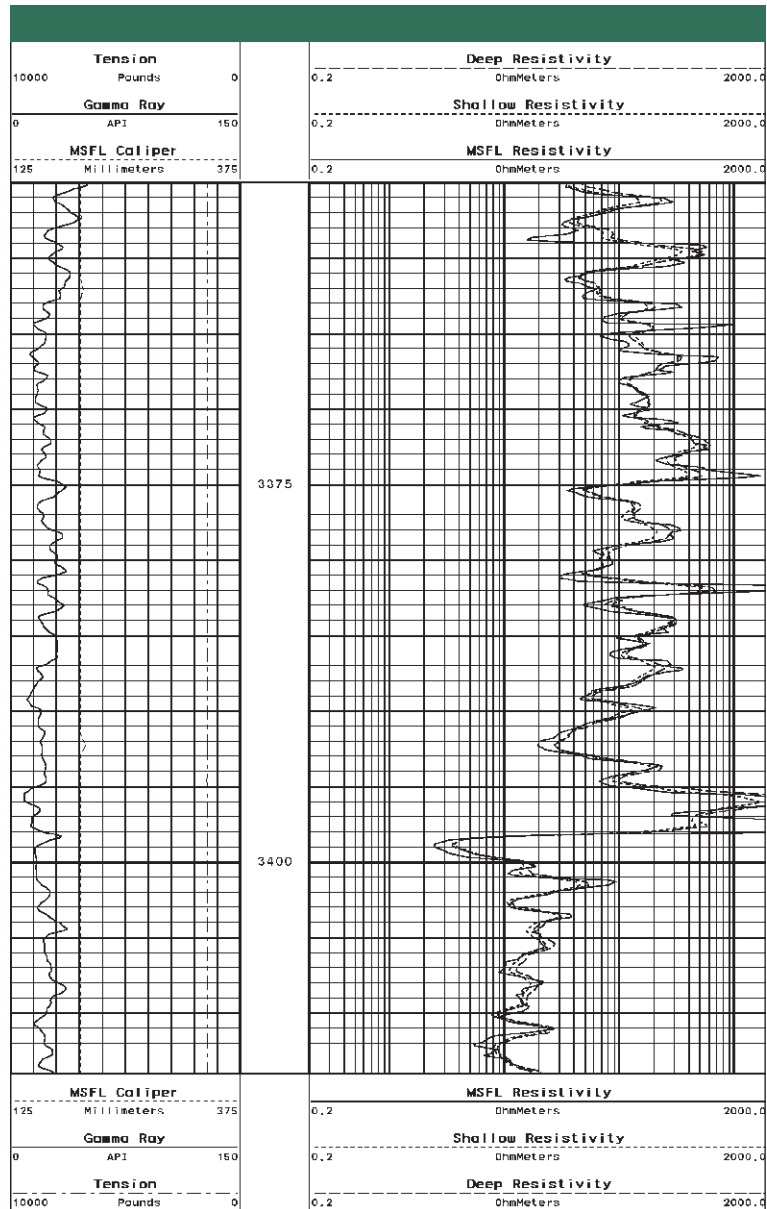
MSFL resistivity 0.5–5000 ms/m

Measurement accuracy @ 30-ft/min (10-m/min) logging speed

MSFL resistivity5% or 0.5 ms/m

Maximum ratings

Pressure 20,000 psi (138 MPa)
 Temperature 350°F (177°C)
 Minimum hole size 6.0 in. (152.4 mm)
 Maximum hole size 19.5 in. (495.3 mm)



MSFL Log Example