# Porosity Log @model

## Objectives

The main objective of RDL porosity interpretation is to predict air porosity from OH logs.

The interpretation model is calibrated to air porosity on dried out lab cores.

## Definition

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Different OH sensors have complex correlation to effective porosity, shaliness and pore-saturating fluids.

The density, neutron, sonic and resistivity tools show a monotonous correlation to porosity and shaliness.

The density, and neutron tools exhibit a linear correlation while sonic  and resistivity tools exhibit non-linear correlation to porosity and shaliness.

## Density Porosity

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# Neutron Porosity

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# Sonic Porosity

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# Cross-Porosity Analysis

## Neutron vs Density

| | | |
|---|---|---|
| (1) | $\phi_e = \dfrac{\phi_{ed} + \phi_{en}}{2}$ | for oil/water saturated formations |
| (2) | $\phi_e = \sqrt{\dfrac{\phi_{ed}^2 + \phi_{en}^2}{2}}$ | for gas saturated formations |

## Sonic vs Density

SPHI  is usually not sensitvie to second porosity development while DPHI  accounts for it proportionally.

This means formation units with secondary porosity development will show DPHI growing over SPHI.

## Reference