

Oil surface flowrate = qO

Volumetric flowrate of mostly degasified **oil** normally measured at **SPE Standard Conditions (STP)**.

Usually produced from **subsurface oil phase** and **gas phase**.

It usually requires additional processing before taking commercial form of the **Crude Oil**.

For **MBO fluid @model** the **oil surface flowrate** q_O is related to **oil sandface flowrate** q_o and **gas sandface flowrate** q_g as below (see **Derivation**):

$$(1) \quad q_O = \frac{q_o}{B_o} + R_v \frac{q_g}{B_g}$$

where

B_o, B_g	oil formation volume factor between separator and sandface pressure/temperature conditions
R_v	Vaporized Oil Ratio at sandface pressure/temperature conditions

The **oil surface flowrate** q_O relates to **Surface Liquid production rate** q_L as:

$$(2) \quad q_O = (1 - Y_W) \cdot q_L$$

The **oil surface flowrate** q_O relates to **Total sandface flowrate** q_t as:

$$(3) \quad q_O = \frac{1 - Y_W}{B_w Y_W + [(B_o - R_s B_g) + (B_g - R_v B_o) Y_G] \cdot (1 - Y_W)} \cdot q_t$$

It simplifies for the **Black Oil** model ($R_v = 0$) to:

$$(4) \quad q_O = \frac{q_o}{B_o} = (1 - Y_W) \cdot q_L = \frac{1 - Y_W}{B_w Y_W + [(B_o - R_s B_g) + B_g Y_G] \cdot (1 - Y_W)} \cdot q_t$$

See Also

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