

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

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

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

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

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

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

See Also

Petroleum Industry / Upstream / Subsurface E&P Disciplines / Well Testing (WT) / Flowrate Testing / Flowrate

[Well & Reservoir Surveillance]

[Sandface flowrates] [Oil sandface flowrate] [Gas sandface flowrate] [Water sandface flowrate]

[Surface flowrates] [Oil surface flowrate] [Gas surface flowrate] [Water surface flowrate]

[Crude Oil]

