

Gas surface flowrate = qG

Volumetric flowrate of dry gas measured at SPE Standard Conditions (STP).

Usually produced from subsurface gas phase and oil phase.

It usually requires additional processing before taking commercial form of the Natural Gas.

For MBO fluid @model the gas surface flowrate q_G is related to gas sandface flowrate q_g and oil sandface flowrate q_o as (see derivation):

$$(1) \quad q_G = \frac{q_g}{B_g} + R_s \frac{q_o}{B_o}$$

where

B_o, B_g	oil formation volume factor between separator and sandface pressure/temperature conditions
R_s	Solution GOR at sandface pressure/temperature conditions

The gas surface flowrate q_G relates to Surface Liquid production rate q_L as:

$$(2) \quad q_G = Y_G \cdot (1 - Y_w) q_L$$

The gas surface flowrate q_G relates to Total sandface flowrate q_t as:

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

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

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

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]

[Natural Gas]

