

Surface flowrate

Flowrate of a specific fluid component(s) or pseudo-component(s) measured at SPE Standard Conditions (STP).

Whenever is used the fluid component / pseudo-component for which the surface flowrates is measured should be explicitly specified to avoid confusion, for example:

Property	Symbol	Meaning
Oil production rate	$q_O^\uparrow$	Surface flowrate of total production of oil from all produced fluid phases measured at SPE Standard Conditions (STP).
Gas production rate	$q_G^\uparrow$	Surface flowrate of total production of gas from all produced fluid phases measured at SPE Standard Conditions (STP).
Water production rate	$q_W^\uparrow$	Surface flowrate of total production of water from all produced fluid phases measured at SPE Standard Conditions (STP).
Liquid production rate	$q_L^\uparrow$	Sum of oil surface flowrate $q_O^\uparrow$ and water surface flowrate $q_W^\uparrow$: $q_L^\uparrow = q_O^\uparrow + q_W^\uparrow$.
Water injection rate	$q_{WI}^\downarrow$	Surface flowrate of total injected water measured at SPE Standard Conditions (STP).
Gas injection rate	$q_{GI}^\downarrow$	Surface flowrate of total injected gas measured at SPE Standard Conditions (STP).

The surface flowrates are also used to calculate the total sandface flowrate at downhole conditions.

In case of Volatile Oil Reservoir the relation to sandface flowrates $\{q_O^\uparrow, q_G^\uparrow, q_W^\uparrow\}$ and mass flowrates $\{\dot{m}_O^\uparrow, \dot{m}_G^\uparrow, \dot{m}_W^\uparrow\}$ are detailed in Volatile Oil Fluid @model.

The key equations are given below:

(1) $q_O^\uparrow = \frac{q_o}{B_o} + \frac{R_v q_g}{B_g}$	(2) $q_O^\uparrow = \frac{\dot{m}_O^\uparrow}{\rho_O}$
(3) $q_G^\uparrow = \frac{q_g}{B_g} + \frac{R_s q_o}{B_o}$	(4) $q_G^\uparrow = \frac{\dot{m}_G^\uparrow}{\rho_G}$
(5) $q_W^\uparrow = \frac{q_w}{B_w}$	(6) $q_W^\uparrow = \frac{\dot{m}_W^\uparrow}{\rho_W}$

See Also

[[Well & Reservoir Surveillance](#)]

[[Surface flowrates](#)] [[Oil surface flowrate](#)] [[Gas surface flowrate](#)] [[Water surface flowrate](#)] [[Liquid production rate](#)]

[[Sandface flowrates](#)] [[Oil sandface flowrate](#)] [[Gas sandface flowrate](#)] [[Water sandface flowrate](#)] [[Total sandface flowrate](#)]

[[Volatile Oil Fluid @model](#)]