Gas formation volume factor = Bg

Formation Volume Factor (FVF) for gas:

(1) $$B_g(p,T) = \frac{\mathring{\rho}_g}{\rho_g} = \frac{V_g}{\mathring{V}_{Gg}} = \frac{q_g}{q_{Gg}}$$

where

ρ_g°	fluid density at reference conditions	V_m°	molar volume at reference conditions
ρ_g	fluid density at reservoir conditions	V_m	molar volume at reservoir conditions

The reference conditions may vary from case to case but most popular choice are: Separator, Stock Tank and SPE STP.

It can be expressed through the Z-factor as:

(2) $$B_g(p,T) = \frac{Z(p,T)}{Z^\circ} \cdot \frac{T/T^\circ}{p/p^\circ}$$

where

p	reservoir pressure	p°	reference pressure
T	reservoir temperature	T°	reference temperature
		$Z^\circ = Z(T^\circ, p^\circ)$	Z-factor at reference conditions

If reference conditions are set at SPE STP then reference Z-factor $Z^\circ = 1$ is close to 1 for all natural gases and equation (2) takes explicit form as:

(3) $$B_g(p,T) = 0.3470 \cdot Z(p,T) \cdot \frac{T}{p}$$

where

B_g	Gas formation volume factor in frac = m^3/m^3
p	reservoir pressure in [kPa]
T	reservoir temperature in [K]

See Also

Petroleum Industry / Upstream / Subsurface E&P Disciplines / Fluid (PVT) Analysis / Dynamic fluid properties

[Formation Volume Factor (FVF)][Oil formation volume factor (Bo)][Water formation volume factor (Bw)]