

PADE IPR @ model

One of the most general form of [IPR](#) model below [bubble-point pressure](#):

(1)

$$\Psi^n(p_b) - \Psi^n(p_{wf}) = (q/q_{\max} - q_b/q_{\max}) \left[\frac{1}{(1 - q_b/q_{\max})} \cdot \Psi^n(p_b) + (1 - q/q_{\max}) \cdot H(q) \right]$$

(2)

$$H(q) = \frac{\sum_{k=0}^m a_k (q/q_{\max})^k}{\sum_{k=0}^m b_k (q/q_{\max})^k} = \frac{a_0 + a_1 \cdot (q/q_{\max}) + a_2 \cdot (q/q_{\max})^2 + \dots + a_m \cdot (q/q_{\max})^m}{b_0 + b_1 \cdot (q/q_{\max}) + b_2 \cdot (q/q_{\max})^2 + \dots + b_m \cdot (q/q_{\max})^m}$$

(3)

$$p_b > p_r > p_{wf}$$

where

p_{wf}	bottom-hole pressure (BHP)
p_b	bubble-point pressure
q	sandface flowrate
$q_{\max}$	Absolute Open Flow (AOF)
$\Psi(p)$	pseudo-pressure function specific to fluid type
n	pseudo-pressure curvature
a	laminar flow coefficient
b	turbulent flow coefficient

It needs well tests at least three different rates to assess $\{a, b, p_r\}$ but obviously more tests will make assessment more accurate.

See also

[Petroleum Industry / Upstream / Production / Subsurface Production / Subsurface E&P Disciplines / Field Study & Modelling / Production Analysis / Productivity Diagnostics / Inflow Performance Relation \(IPR\)](#)

[[Vogel IPR @model](#)] [[Richardson and Shaw IPR @ model](#)] [[Wiggins IPR @ model](#)] [[LIT IPR @ model](#)] [[PADE IPR @ model](#)]

References

- [Vogel, J. V. \(1968, January 1\). Inflow Performance Relationships for Solution-Gas Drive Wells. Society of Petroleum Engineers. doi:10.2118/1476-PA](#)
- [Archer, R. A., Del Castillo, Y., & Blasingame, T. A. \(2003, January 1\). New Perspectives on Vogel Type IPR Models for Gas Condensate and Solution-Gas Drive Systems. Society of Petroleum Engineers. doi:10.2118/80907-MS](#)

- Seidle, J. P., & Erickson, D. J. (1993, January 1). Use of Vogel's Inflow Performance Relation for Coal Wells. Society of Petroleum Engineers. doi:10.2118/26201-MS