DCA Power Law @model

@wikipedia

One of mathematical models of Decline Curve Analysis based on the following equations:

(1) $q(t) = q_0 \cdot \exp\left[-D_\infty \cdot \left(t + a \cdot t^{-n}\right)\right]$	(2) $D(t) = D_\infty \cdot (1 + a \cdot (1 - n) \cdot t^{-n})$

where

$q_0 = q(t = 0)$	Initial production rate of a well (or groups of wells)
$D_\infty > 0$	the apex value of Production Decrement at infinite time
a	model parameter characterizing deceleration of production decline
$n > 0$	model parameter characterizing deceleration of production decline
$D(t) = -\frac{dq}{dQ}$	Production Decrement (the higher the D the stronger is decline)
$Q(t) = \int_0^t q(t)dt$	cumulative production

DCA Power Law decline is an empirical correlation for production from both finite-reserves $Q_{\max} \leq \infty$ or infinite-reserves $Q_{\max} = \infty$ reservoir.

The original form of DCA Power Law decline was developed as correction of Arps for tight gas and shales

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See Also

Petroleum Industry / Upstream / Production / Subsurface Production / Field Study & Modelling / Production Analysis / Decline Curve Analysis

[DCA Arps @model] [Production Decrement]

Reference

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