

Leverett J-function capillary pressure @model

[@wikipedia](#)

Physical correlation for [capillary pressure](#) on [reservoir saturation](#):

(1)
$$P_{cow}(s_w) = \frac{(\sigma \cos \theta)_{ow}}{\sqrt{\frac{k}{\phi}}} J_{cow}(s_w)$$

(2)
$$P_{cog}(s_g) = \frac{(\sigma \cos \theta)_{og}}{\sqrt{\frac{k}{\phi}}} J_{cog}(s_g)$$

where

σ_{ow}	oil-water surface tension	σ_{og}	oil-gas surface tension
θ_{ow}	oil-gas contact angle	θ_{og}	oil-gas contact angle
k	absolute permeability to air	ϕ	porosity
$J_{cow}(s_w)$	some function of water saturation	$J_{cog}(s_g)$	some function of gas saturation

The functions $J_{cow}(s_w)$ and $J_{cog}(s_g)$ are called [Leverett J-functions](#).

They are individual to every certain rock type, just like relative permeability curves.

There are many correlations for [Leverett J-functions](#) and the most popular is [Brooks-Corey correlation](#):

(3)
$$J_{cow}(s_w) = a (s_{wn})^{-1/\lambda}$$

where

$s_{wn} = \frac{s_w - s_{wc}}{1 - s_{wc}}$ – normalised water saturation,

s_{wc} – critical water saturation,

a, λ – model parameters which are set for laboratory data on capillary pressure and/or on resistivity water saturation during [SHF](#).

Model parameter λ is related to the the size of the pore size distribution.

The most popular value is 2 but it can vary to smaller or higher values.

See also