

Skin-factor (geometrical)

Normalised dimensionless difference between the sandface bottomhole pressure (BHP) $p_{wf}(t)$ and the sandface reservoir pressure $p(\mathbf{r}, t)|_{r=r_w}$ at the well-reservoir contact.

(1)
$$S_G = \frac{2\pi\sigma}{q_t} \left[p_{wf}(t) - p(\mathbf{r}, t)|_{r=r_w} \right]$$

where

q_t	total sandface rate
σ	formation transmissibility at the well-reservoir contact: $r = r_w$

It characterises the pressure drop at well-reservoir contact due to well-reservoir contact geometry.

The geometrical skin is negative for fractured wells and slanted.

It also negative for horizontal wells when lateral permeability is not much lower than vertical.

The geometrical skin is positive for limited entry wells.

For the fractured vertical well the geometrical skin-factor S_G is related to Fracture half-length X_f as:

(2)
$$S_G = -\ln\left(\frac{X_f}{2r_w}\right)$$

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