

(1) Pressure on the fracture
deforms adjacent rock
(Elasticity problem)

(2) Fracture propagates if the
“stress intensity factor” is
higher than what the rock can
resist “rock toughness”
(Fracture mechanics problem)

(3) Fracturing fluids
can leak off to the
formation
(Mud-cake design)

(4) Pressure gradient
leads to flow of
fracturing fluid
through the fracture
(Lubrication problem)

$$\text{Net pressure} \\ p_{\text{net}} = p - S_3$$

