

40. The capacitor can be viewed as two capacitors C_1 and C_2 in parallel, each with surface area $A/2$ and plate separation d , filled with dielectric materials with dielectric constants κ_1 and κ_2 , respectively. Thus

$$C = C_1 + C_2 = \frac{\varepsilon_0(A/2)\kappa_1}{d} + \frac{\varepsilon_0(A/2)\kappa_2}{d} = \frac{\varepsilon_0 A}{d} \left(\frac{\kappa_1 + \kappa_2}{2} \right) .$$