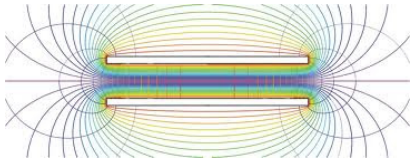
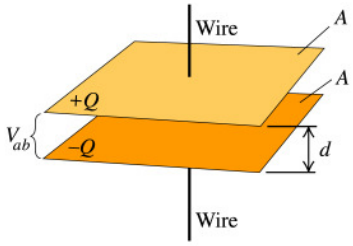
Condensador plano

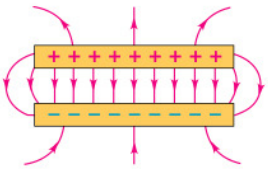


Condensador plano



$$Q = \sigma A \qquad V = E d$$

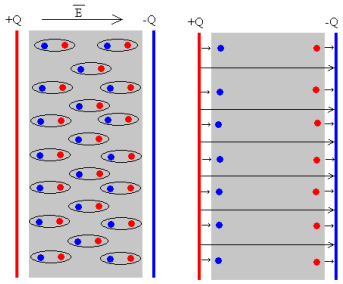
$$E = \frac{\sigma}{\varepsilon_0} \qquad C = \frac{Q}{V}$$

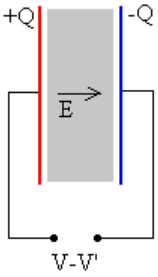


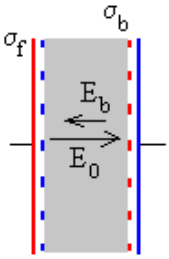
$$C = \frac{\sigma A}{E d} = \frac{E \varepsilon_0 A}{E d} \quad \Leftrightarrow \quad C = \varepsilon_0 \frac{A}{d}$$

$$[C] = F$$

Condensador plano com dieléctrico





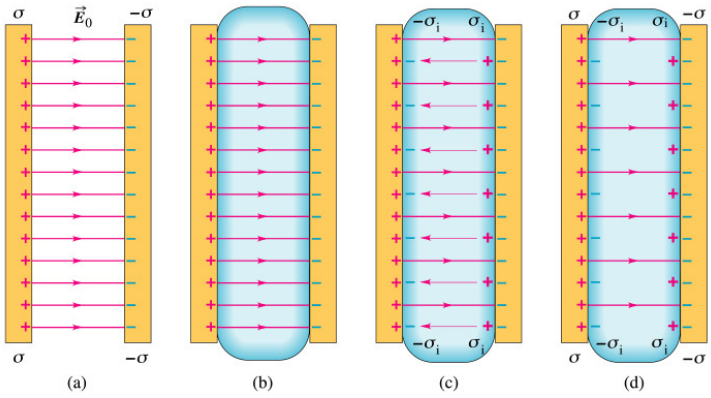


$$\vec{E} = \vec{E_0} + \vec{E_b}$$

$$E = E_0 - E_b$$

$$C = \varepsilon \frac{A}{d}$$

Condensador plano com dieléctrico

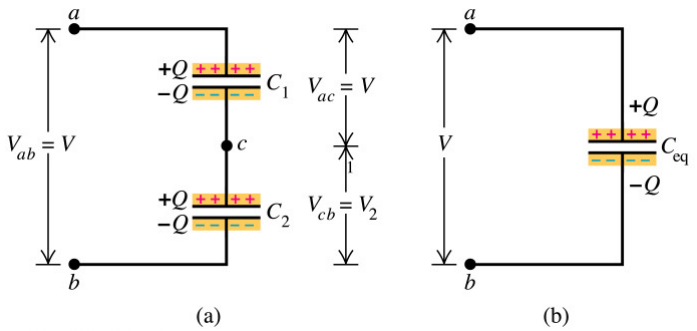


Condensador plano com dieléctrico

$$K = \frac{\varepsilon}{\varepsilon_0}$$

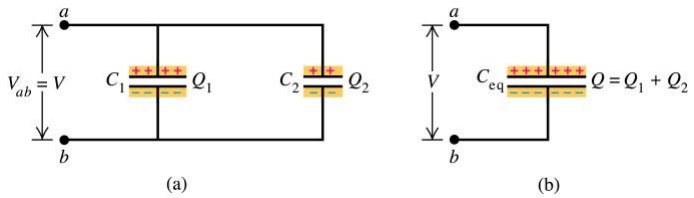
Dielétrico	Constante dielétrica
Ámbar	2.7–2.9
Água	80.08
Ar	1.00059
Álcool	25.00
Baquelite	4–4.6
Cera de abelhas	2.8–2.9
Glicerina	56.2
Hélio	1.00007
Mica moscovita	4.8–8
Parafina	2.2–2.3
Plástico vinílico	4.1
Plexiglás	3–3.6
Porcelana eletrotécnica	6.5
Seda natural	4–5

Condensadores em série



$$\begin{cases} V_{eq} = V_1 + V_2 \\ Q_1 = Q_2 = Q_{eq} \end{cases} \qquad \frac{Q_{eq}}{C_{eq}} = \frac{Q_1}{C_1} + \frac{Q_2}{C_2} \quad \Leftrightarrow \quad \frac{1}{C_{eq}} = \frac{1}{C_1} + \frac{1}{C_2}$$

Condensadores em paralelo



$$\begin{cases} V_{eq} = V_1 = V_2 \\ Q_{eq} = Q_1 + Q_2 \end{cases}$$

$$C_{eq}V_{eq} = C_1V_1 + C_2V_2 \quad \Leftrightarrow \quad C_{eq} = C_1 + C_2$$

Energia armazenada

$$U = \int V\,dq = \int \frac{q}{C}dq = \frac{1}{C}\int q\,dq = \frac{1}{C}\frac{Q^2}{2}$$

$$U = \frac{1}{2}\frac{Q^2}{C} = \frac{1}{2}CV^2 = \frac{1}{2}QV$$