Topic Page: Capacitors

Definition: **capacitor** from *Processing Water, Wastewater, Residuals, and Excreta for Health and Environmental Protection: An Encyclopedic Dictionary*

A device for accumulating a charge of electricity, consisting of two conductive plates of opposite charge, separated by a nonconductor. Also called a condenser.

Summary Article: **capacitor**
From *The Columbia Encyclopedia*

or condenser, device for the storage of electric charge. Simple capacitors consist of two plates made of an electrically conducting material (e.g., a metal) and separated by a nonconducting material or dielectric (e.g., glass, paraffin, mica, oil, paper, tantalum, or air). The Leyden jar is a simple capacitor. If an electrical potential (voltage) is applied to the plates of a capacitor (e.g., by connecting one plate to the positive and the other to the negative terminal of a storage battery), the plates will become charged, one positively and one negatively. If the externally applied voltage is then removed, the plates of the capacitor remain charged, and the presence of the electric charge induces an electrical potential between the plates. This phenomenon is called electrostatic induction. The capacity of the device for storing electric charge (i.e., its capacitance) can be increased by increasing the area of the plates, by decreasing their separation, or by changing the dielectric. The dielectric constant of a particular dielectric is the measure of the dielectric's unit capacitance. It describes the ratio of the capacitance of a dielectric-filled capacitor to a capacitor of the same size with a vacuum between the plates. Capacitors are used in many electrical and electronic devices. The main capacitor classifications are non-polarized (used for AC circuits) and polarized (used for DC circuits). Capacitors can also be classified as fixed or variable. One type of variable capacitor, formerly used in radio and television tuning circuits, consisted of two sets of semicircular plates, one fixed and the other mounted on a movable shaft. By rotating the shaft the area of overlap of the two plates increases or decreases, thus increasing or decreasing the capacitance. These devices have largely been replaced by frequency synthesizers and a special type of solid-state diode, known as a varactor, whose capacitance changes with the reverse-biased voltage across it.

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