impedance

Electrical impedance is the measure of the opposition that a circuit presents to a current when a voltage is applied.

Impedance in AC circuits is equivalent to Resistance in DC circuits. It is quite clear the concepts of **resistance** in the writings of Keely and Russell are more akin to AC **Impedance** than DC **Resistance** (as commonly understood). [see 12.31 - Heat Generated Through Resistance to Compression for a more complex expose]

We can use the idea of **impedance** when considering the rhythmic balanced interchange between syntropy force and entropy energy as they see-saw back and forth. see also Dynaspheric Force and Universal Heart beat. DP [see Antagonism]

Impedance
Impedance is the total amount of resistance and reactance. Reactance occurs when a component that has inductance or capacitance causes an additional restriction to the alternating current. For example, a speaker has resistance due to the coil's wire, but also has reactance caused by the coil's inductance when powered by alternating current.

Electrical impedance
Electrical **impedance** is the measure of the opposition that a circuit presents to the passage of a current when a voltage is applied. In quantitative terms, it is the complex ratio of the voltage to the current in an alternating current (AC) circuit. **Impedance** extends the concept of resistance to AC circuits, and possesses both magnitude and phase, unlike resistance, which has only magnitude. When a circuit is driven with direct current (DC), there is no distinction between **impedance** and resistance; the latter can be thought of as **impedance** with zero phase angle.

It is necessary to introduce the concept of **impedance** in AC circuits because there are other mechanisms impeding the flow of current besides the normal resistance of DC circuits. There are an additional two impeding mechanisms to be taken into account in AC circuits: the induction of voltages in conductors self-induced by the magnetic fields of currents (inductance), and the electrostatic storage of charge induced by voltages between conductors (capacitance). The **impedance** caused by these two effects is collectively referred to as reactance and forms the imaginary part of complex **impedance** whereas resistance forms the real part.

The symbol for **impedance** is usually and it may be represented by writing its magnitude and phase in the form . However, complex number representation is often more powerful for circuit analysis purposes. The term **impedance** was coined by Oliver Heaviside in July 1886. Arthur Kennelly was the first to represent impedance with complex numbers in 1893.

Impedance is defined as the frequency domain ratio of the voltage to the current. In other words, it is the voltageâ€“current ratio for a single complex exponential at a particular frequency ï‰. In general, **impedance** will be a complex number, with the same units as resistance, for which the SI unit is the ohm (Î©). For a sinusoidal current or voltage input, the polar form of the complex **impedance** relates the amplitude and phase of the voltage and current. In particular,

1 - The magnitude of the complex **impedance** is the ratio of the voltage amplitude to the current amplitude.
2 - The phase of the complex **impedance** is the phase shift by which the current is ahead of the voltage.
3 - The reciprocal of**impedance** is admittance (i.e., admittance is the current-to-voltage ratio, and it conventionally carries units of siemens, formerly called mhos). Wikipedia, Electrical Impedance

See Also

Acoustic Impedance

Antagonism
Ohms Law
Poynting component
Reactance
Resistance