ELITE POWER GROUP

ALTERNATING AND **DIRECT** CURRENT

(AC & DC)

AC and DC are two types of electrical current. The main difference between them is the direction in which the electrons flow and the way they are used.

DC, or Direct Current, flows in one direction only with the caveat below. It is the type of current used in batteries and electronic devices that have a single power source, such as mobile phones and laptops. DC is also the type of current used in electric vehicles and some forms of industrial equipment such as electric forklift trucks. Note that in the case of for example a battery, current flows in one direction while charging the battery; it flows in the opposite direction while discharging the battery .

AC, or Alternating Current, flows in two directions, switching back and forth at a regular interval, typically 50 or 60 times per second (Hz). It is the type of current used in most homes and buildings, as it can be easily transmitted over long distances with minimal loss of energy. It is also used in power generation and transmission systems. In vehicles quite often the DC battery energy is converted to AC to better utilise certain advantages of AC motors such as smoothness of motor speed control.

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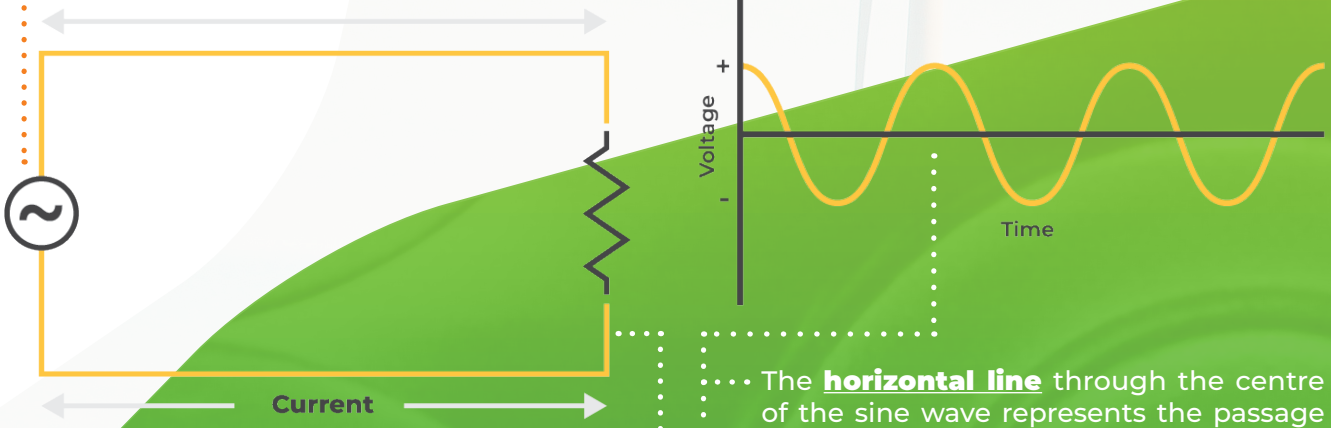
Additionally even though we see the use of low frequency (50Hz) AC voltages in our everyday lives there are much higher frequency AC voltages present in things like microwave ovens where for example the frequency is extremely high in a region called Radio Frequencies (RF) A microwave oven operates at 2.5 GHz which means the current is switching back and forth at 2.5 thousand million times per second. So rapidly in fact that the molecules of water vibrated by the operation get hot through the friction generated by their movement.

Another difference between AC and DC is that AC voltages can be easily transformed to a higher or lower voltage level, while this is not as easy with DC. This feature allows AC to be easily distributed over long distances, making it the preferred choice for power transmission. AC does this by using a component exclusive to AC; the transformer. One exception to this is the transmission of power over very long distances by ultrahigh DC voltages of 500,000 volts or more where effects beyond the scope of this article come into play to favour DC.

In summary, the main difference between AC and DC is the direction of the flow of electrons and the way they are used in different types of applications and power transmission.

ALTERNATING CURRENT

In the diagram, the alternating voltage symbol is depicted by the wavy (sinuoidal) line within the circle.



The **horizontal line** through the centre of the sine wave represents the passage of time.

What the symbol represents is the voltage that rises, first **positively from zero** to a maximum positive value then falls through zero to a maximum negative value.
The process repeats indefinitely.

The circuit diagram shows that the resultant current flows alternately through the circuit in one direction then the other. The current alternates in direction.

DIRECT CURRENT

In the diagram depicting DC symbolically it is obvious that with time the voltage remains steady and unwavering and in the circuit diagram it can be seen that the resultant current flows continuously in the one direction from the battery and through the load which here is a resistor.