Magnet

What is a Magnet?

A magnet is defined as

An object which is capable of producing magnetic field and attracting unlike poles and repelling like poles.

Properties of Magnet

Following are the basic properties of magnet:

- When a magnet is dipped in iron filings, we can observe that the iron filings cling to the end of the magnet as the attraction is maximum at the ends of the magnet. These ends are known as poles of the magnets.
- Magnetic poles always exist in pairs.
- Whenever a magnet is suspended freely in mid-air, it always points towards north-south direction. Pole pointing towards geographic north is known as the North Pole and the pole pointing towards geographic south is known as the South Pole.
- Like poles repel while unlike poles attract.
- The magnetic force between the two magnets is greater when the distance between these magnets are lesser.

Types of Magnets

There are three types of magnets, and they are as follows:

- Permanent magnet
- Temporary magnet
- Electromagnets

Permanent Magnet

Permanent magnets are those magnets that are commonly used. They are known as permanent magnets because they do not lose their magnetic property once they are **magnetized.**

Following are the ways to demagnetize the permanent magnets:

- Exposing magnets to extreme temperatures.
- The magnetic attraction between the magnet's atoms gets loosened when they are hammered.
- Stroking one magnet with the other in an inappropriate manner will reduce the magnetic strength.

There are four types of permanent magnets:

- Ceramic or ferrite
- Alnico
- Samarium Cobalt (SmCo)
- Neodymium Iron Boron (NIB)

Temporary Magnet

Temporary magnets can be magnetized in the presence of a magnetic field. When the magnetic field is removed, these materials lose their magnetic property. Iron nails and paper-clips are examples of the temporary magnet.

Electromagnets

Electromagnets consist of a coil of wire wrapped around the metal core made from iron. When this material is exposed to an electric current, the magnetic field is generated making the material behave like a magnet. The strength of the magnetic field can be controlled by controlling the electric current.

Characteristics of Magnet

Following are the characteristics of a magnet:

- **Attractive property:** This property proves that the magnetic strength at the ends of the poles is strong.
- **Directive property:** This property helps to understand which pole of the magnet is north and south by suspending the magnet in mid-air.
- **Law of magnetic poles:** Like poles repel while unlike poles attract.
- **Pair property:** When a magnet is cut into two pieces, both the pieces will have the North Pole and the South Pole.
- **Sure test of magnetization:** This test is conducted to check if a given rod is magnetized or not by checking either the attraction or the repulsion of the iron rod and magnet.

Uses of Magnets

Following are the uses of magnets:

- Magnets are used for constructing magnetic needles and mariner's compass.
- Permanent magnets find applications in generators, electric accelerators, and electric motors.
- Electromagnets find application in speakers, electric bells, and electric cranes.
- Magnets are used for the separation of iron filling from other solid mixture.

Laws Of Magnetism

Fleming's left - hand rule states that if we **stretch the thumb, middle finger and the index finger of the left hand in such** a way that they make an angle of 90 degrees(Perpendicular to each other) and the conductor placed in the magnetic field experiences Magnetic force.