Design of Insulations

The fundamental consideration in the design of insulation of transformer

- Electrical
- Mechanical
- Thermal
Electrical consideration

- Consideration of voltage between individual turns between coil or layers between core and windings and tank

- Test- sustained frequency high voltage test and impulse test

- To check- the strength of insulation between the various parts - to ensure reasonable life (avg 20 years)
  - able to withstand under abnormal condition lighting, switching surges and other transient phenomenon.
Mechanical Consideration

- The insulation must be capable of withstanding the mechanical stresses imposes on it during the manufacturing process.
- The insulation must be able withstand stresses which are developed in the winding due to electromagnetic phenomenon
  --- forces small during normal conditions
  --- hundred time during fault conditions
Thermal Consideration

- Material type
- Selection of safe maximum operating temperature
- Types of cooling method

The insulation of transformer is divided into four types

- Major insulation
- Minor insulation
- Insulation relative to tank
- Insulation between phases
Major insulation

The insulation between winding and core and the insulation between the winding of the same phase is called major insulation.

Minor insulation

Insulation between different parts of one winding i.e. Insulation between turns, coils, and layers. Etc is called minor insulation