

## Construction of dc Machines:

The rotor in a dc machine is called an *armature*.

The armature has cylindrical steel core that is composed of a stack of slotted laminations.

Slots in laminations are aligned axially along rotor or shaft. Armature windings are placed in slots.

The stator in a dc machine is the *field* part of the machine.

Field poles are located on stator and project inward.

Each pole has a narrow iron core around which the exciting winding or *field coil* is placed.

Field coil may consist of two or more separate windings.

A pole shoe distributes pole flux over rotor surface across a narrow air gap.

Leads from the armature coils are connected to the *commutator*. Commutator consists of radial copper segments separated by an insulating material, usually mica.

Current is conducted to the armature by carbon *brushes* that are held against the surface of the commutator by springs. Brushes wear with time, must be inspected regularly, and occasionally replaced.

Copper commutator segments wear also and sometimes have to be resurfaced, or "turned down." If not, the harder mica protrudes above the copper, and the brushes bounce, resulting in arcs that damage the commutator surface.

Reference: Figure 5.2 in *An Introduction to Electrical Machines and Transformers*, by G. McPherson and R. D. Laramore, John Wiley & Sons, 1990.

