INDUCTIVE Vs NON-INDUCTIVE

**INDUCTIVE TYPE CAPACITOR**

Fig 1.1 Inductive film/foil construction at winding

Fig 1.2 Wound element

Fig 1.3a Current flow in the Foil

Fig 1.3b Current flow in Wound element

**NON-INDUCTIVE TYPE CAPACITOR**

Fig 2.1 Non-Inductive Metallized film Construction at winding

Fig 2.2 Element Wound, Pressed & then End sprayed

Fig 2.3 Current flow in the Element
Fig 1.1 shows the simple Film/Foil Inductive type construction and lead wire is welded by spot welding process

Fig 1.2 shows the wound element of films and foils

Fig 1.3a shows the current flow in the foil.

As the lead wire is welding at the center of the foil, the current from the lead wire travels a long path equal to the length of the foil.

The total current in the foil is I throughout the capacitor and no branches.

When this current flows in a wound construction, it forms high Inductance. Fig 1.3b shows the current flow in the wound construction

That is why; this type of capacitor is called Inductive type capacitors.

Advantages:
- Suitable for Low frequency and low voltage applications
- Less expensive to produce
- Production process is simple
- Suitable for Low capacitance values

Disadvantages:
- High capacitance values cannot be produced as size becomes large
- Not suited for High frequency and High voltage applications
- Reliability is less (>10 FITs)

Fig 2.1 shows the simple Metallized Non-Inductive type construction

Fig 2.2 shows the wound & pressed element which is metal sprayed at the ends

Fig 2.3 shows the Current flow in the construction

Here in this construction, every layer of windings has the connection with the end spray. Hence the current injecting through the end spray will be divided into several branches and travels equal to the length of the capacitor.

Total current = I1 + I2 + I3 + ... + In

Where ‘n’ is the number of turns of winding of metallized film.

Since the current travel distance (length of the capacitor/Pitch) is very smaller, a very low inductance is formed across the capacitor. That is why; this type of capacitor is called Non-Inductive type capacitors.

The Non-Inductive capacitors have to undergo End spray process; this process makes the capacitors 25 to 30% more expensive than Inductive capacitors for a same capacitance value.

Advantages:
- Suitable for Low as well as High frequency & Voltage applications
- High capacitance value is obtained in compact size
- Reliability is high (<10 FITs)

Disadvantages:
- Expensive to produce
- Production process is complicated