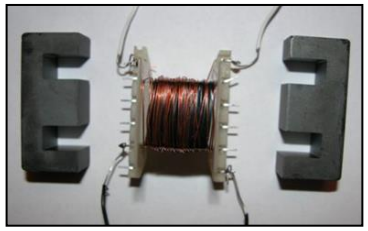
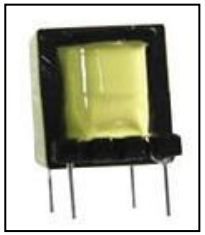
Ferrite Cores Assembly & Application Details:

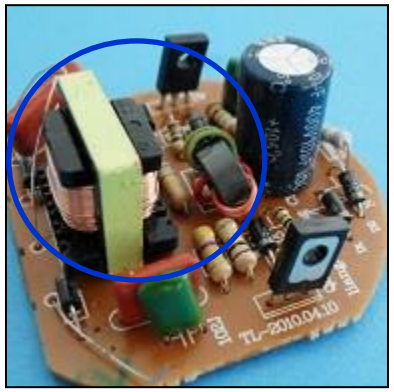
Ferrite Cores:

Component Assembly





PCB Assembly



Product Assembly

Drum cores:

Characteristics: These are open magnetic circuit; that is the flux path is not contained in the core itself and is exposed to air.

Application: Where low magnetic (or inductive) influence on the circuit is needed (Power Factor Correction of low wattage CFLs).

EE Ferrite Cores:

Characteristics: The commonest of all core shapes and simplest in terms of production. Maintaining uniform cross-section is simple, gapping can be done precisely.

The winding is shell type with reduced leakage flux. These cores have higher loss of mating surface with twist angle, average power density, medium EMI (Electro-Magnetic Interference) as parts of the winding are exposed. E cores can also be multiple stacked to increase throughput.

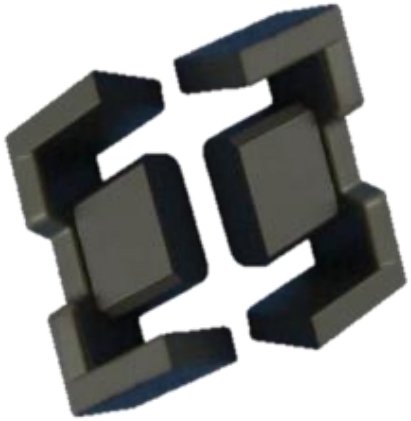
Application: Power conversion and signal processing (high permeability materials).

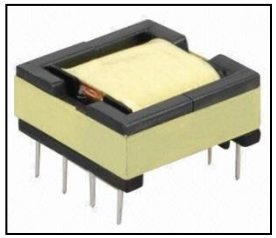
Volume: India consumes about 100 million Pairs / month E core in lighting industry.

EFD Ferrite Cores (Flat E cores):

Characteristics:
Vertically pressed and productivity is lower than ordinary E cores. Difficult to gap owing to their narrow base and cannot be multiple stacked.
The main advantage of these cores is the extended radiating surface which lowers the thermal resistance considerably and the tight winding reduces EMI.

Application: Lower Power Conversion with reduced height and compact housing. (LED Lighting, on-board power supplies, LCD back-plane power supply & etc.).



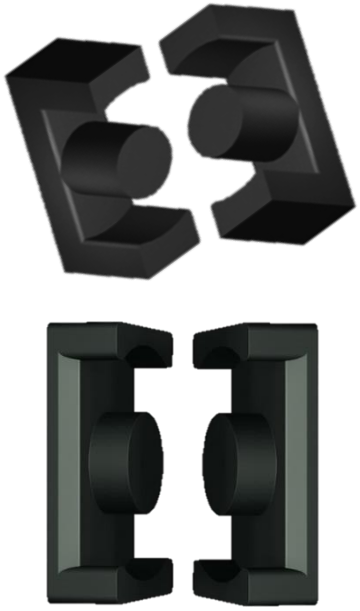


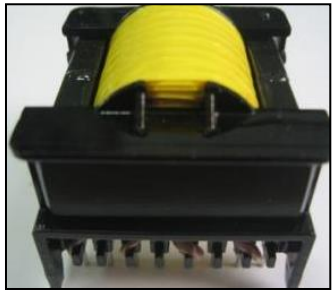
ER & ETD Ferrite Cores:

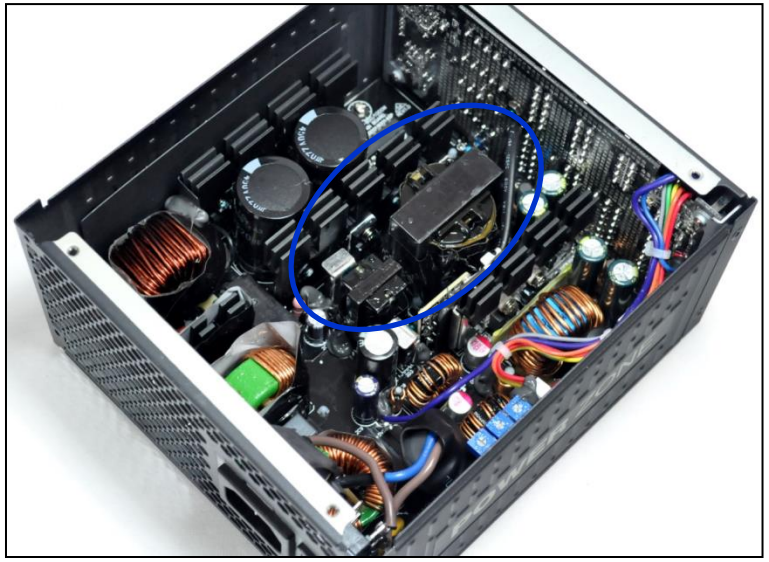
Characteristics: As these cores have to be vertically pressed, they do not have the same ease in productivity as rectangular E cores. The circular limb eases winding complexity though.

Throughput limitation due to the fact that these cores cannot be multiple stacked. Leakage flux and large gaps have the same features as rectangular E cores.

Application: Medium power conversion, particularly in the entertainment industry.







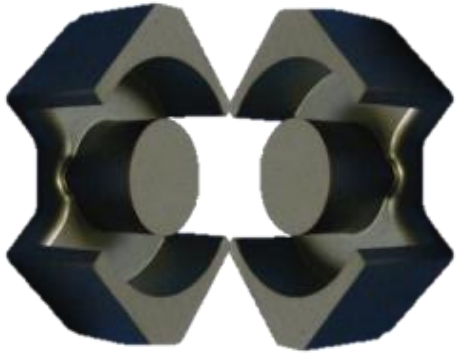
RM cores:

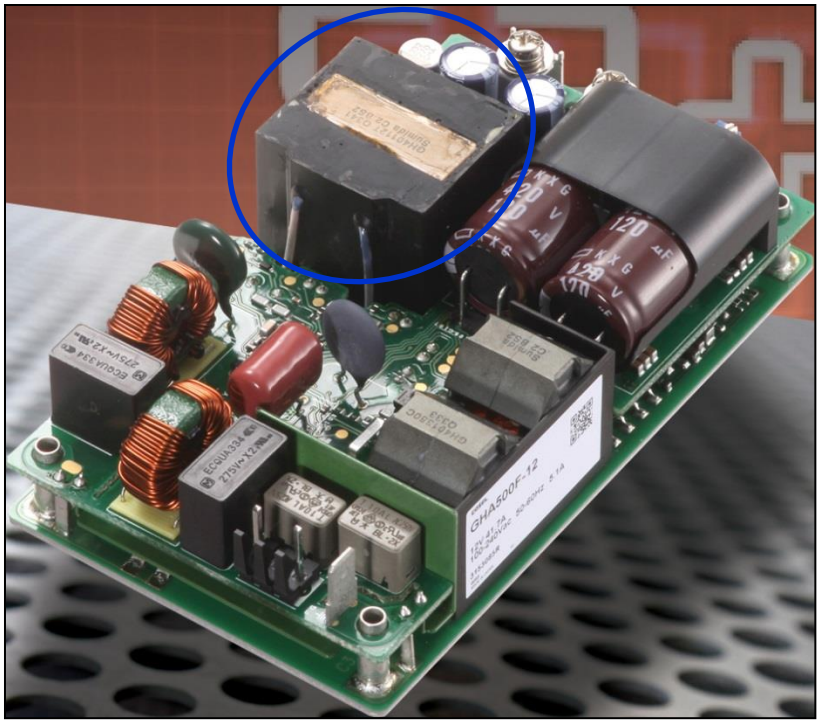
Characteristics: In communication circuits and supporting power supplies, the ferrite core should have negligible leakage flux to avoid EMI hazards. This calls for a winding space covered by the ferrite as far as possible with just space enough to bring out the leads.

Helps compacts the PCB assembly design and has high power density with low thermal resistance. Low contribution to signal distortion and negligible effect of twist during mating.

A European design. From the manufacturing point of view, RM cores are rather a difficult proposition

Application: Communication industry (medium power applications).





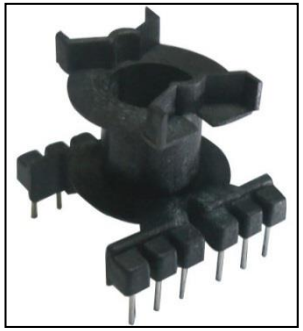
PQ cores:

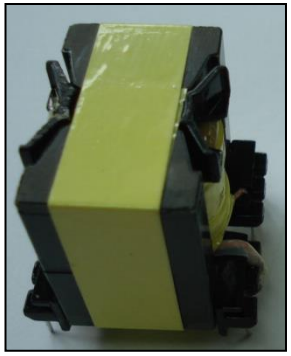
Characteristics: Developed by the Japanese and Americans. PQ cores are improvised RM cores with the highest Area Product to footprint ratio and least thermal resistance among all core families. Also offer a closed winding space comparable to RM cores and cross-section designed to reduce signal distortion. Being circular limb, they also have negligible mating surface loss due to twist.

Better productivity compared to RM cores and not limited by size.

Recently the Japanese have come out with very large PQ cores which have replaced original E-U combinations with reduced EMI and temperature rise and space saving.

Application: Communication industry (medium power applications).

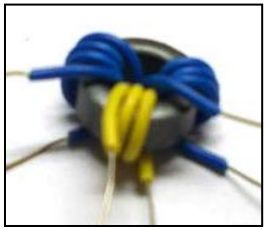


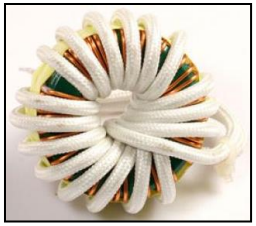


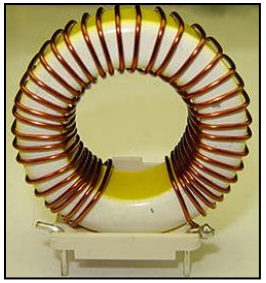
Ring (toroidal cores):

Characteristics: These are the magnetically ideal cores but require special winding efforts and hence, not finding them used in many applications. Have natural sintering tolerance of ±25% which also limits from their extensive application.

Application: Ring cores find exclusive use in Common Mode Chokes, Current Transformers in Energy-Meters and as Drive Transformer in Compact Fluorescent Lamps. In general, Toroids find their application in all the Electronics Circuits (Industrial, Consumer, Electrical Distribution & etc.)



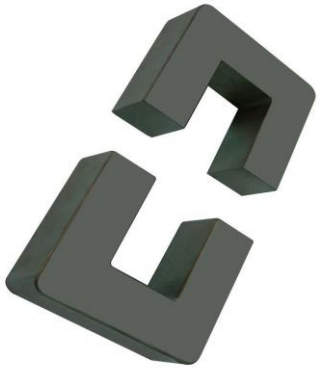


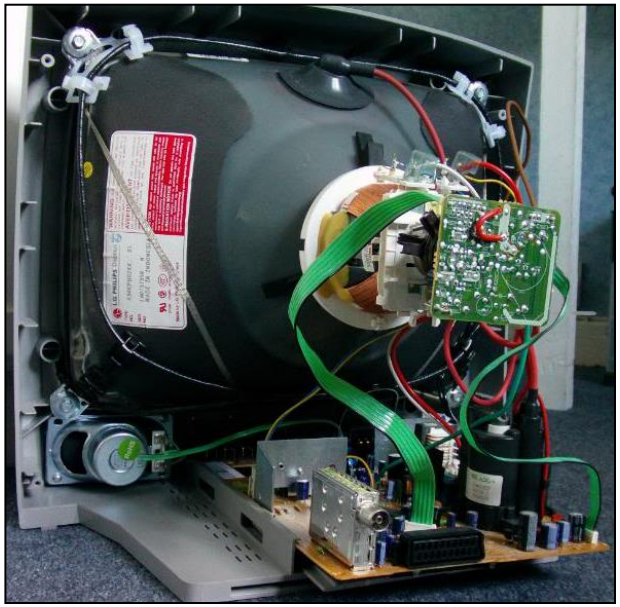
U Cores:

Characteristics: These are difficult to produce as bending at the open end cannot be precluded during sintering and special steps as double core preparation and then splitting may have to be applied. These cores have core type (one side open) windings and more leakage flux. Strict dimensional tolerance calling for special care during pressing and sintering is needed for assembly as E cores.

Gapping of U cores is also an unbalanced operation and gaps have to be created artificially by insulating spacers which may yield discrete values for inductance and cannot be precisely controlled.

Application: Large U cores are extensively used in high power (welding, traction, induction furnace) applications.
Small U cores with polished mating surface are used for EMI suppression and precise gapped for Hall sensors.
Also used in fly-back transformers that applied in Cathode-ray-tubes.





Thank You

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