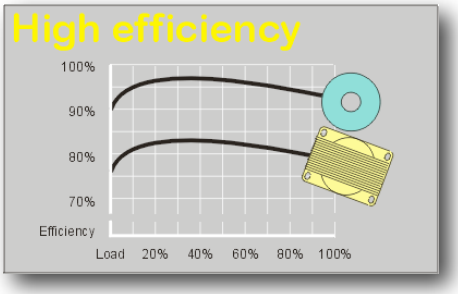
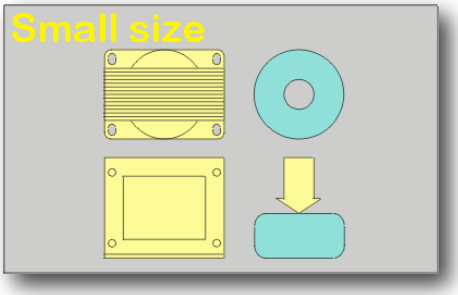
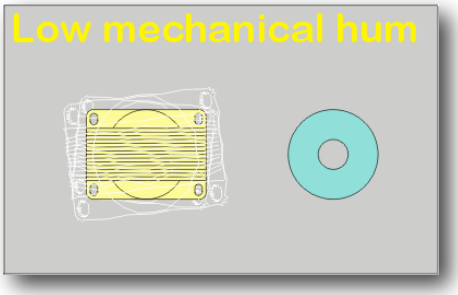
Toroidal Advantages



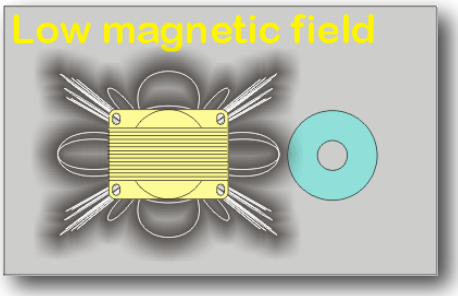
The key to all toroidal transformer advantages is its efficiency. And the key to its efficiency is the core. The core is a continuous strip of grain oriented silicon steel, wound like a clock spring, under tension. It is annealed to relax the molecular structure which ensures that all grains are in the magnetic direction (unlike the old standard EI, with about 40% in the wrong direction). There is no air gap, resulting in a stacking factor of 97.5% of its weight. Since all the windings are symmetrically spread over the entire round, gapless core, a higher flux density is possible (toroidal transformers operate at flux densities of 16 to 18 kilo gauss, while traditional EI transformers operate at 12 to 14 kilo gauss). The magnetic flux is in the same direction as the grain oriented silicon steel core, thus achieving very high electrical efficiencies. Typical efficiency figures for toroidal transformers are 95% (e.g. 18kVA at 98% efficiency).



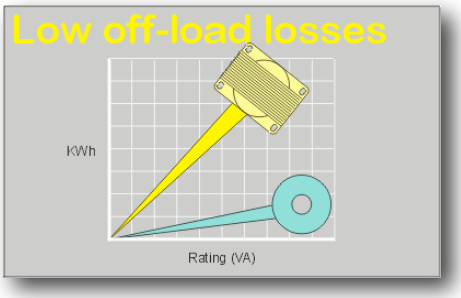
This efficiency yields the most easily identifiable feature of the toroid, its size benefit. Toroidal transformers are about half the size and weight of standard transformers.



Toroidal transformers are also acoustically quieter than EI transformers. The absence of an air gap typically provides an 8:1 reduction of acoustic noise. In addition the windings tightly envelope the entire core, effectively reducing magneto striction - the main source of the familiar mechanical hum found in standard vertically laminated EI transformers. Compared to EI transformers, toroids are silent.



Another type of noise is magnetic. Toroidal transformers radiate about 1/10 the magnetic field of EI transformers; this is, again, because of the inherent efficiency and unique construction. The windings which cover the core act as a shield. The magnetic field is contained doing what it should, transforming energy from primary to secondary. This may eliminate the need for special shielding and makes toroidal transformers especially suitable for applications in sensitive electronic equipment, such as: low level amplifiers, medical equipment, and near CRTs.



It takes a lot less energy to maintain the magnetic field in a toroidal core. This is known as excitation or quiescent power. Toroids require about 1/16 the excitation power of conventional transformers. That's 1/16 the electricity required by EI transformers in standby mode. This can translate into big savings in large transformer applications such as industrial controls.