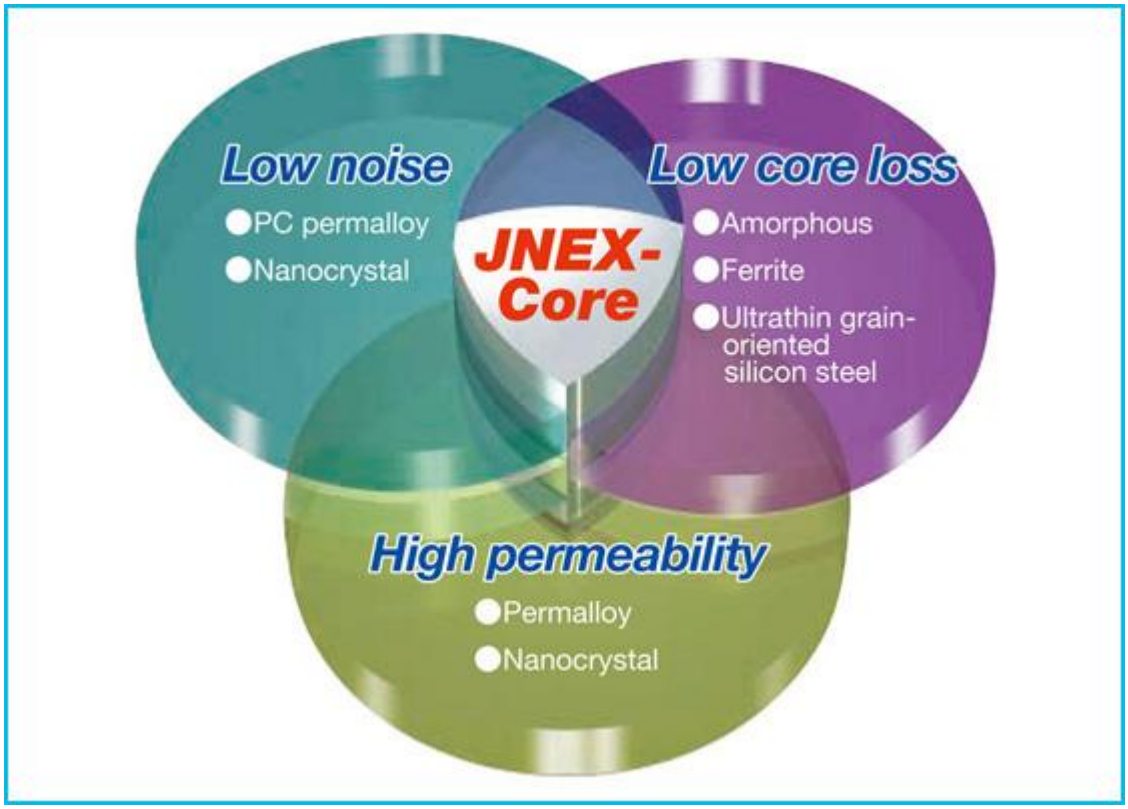
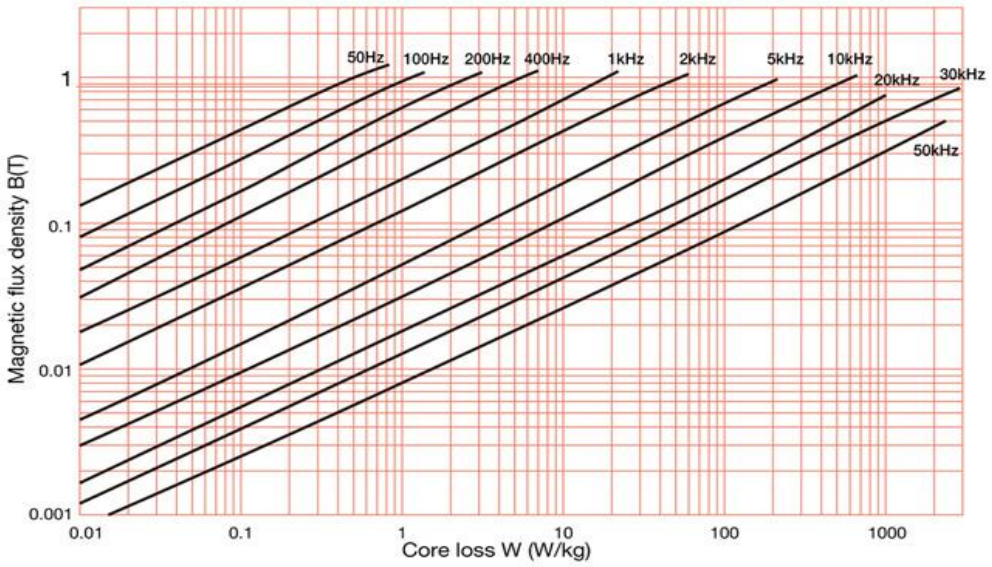


Specifications - Core loss curves

10JNEX900

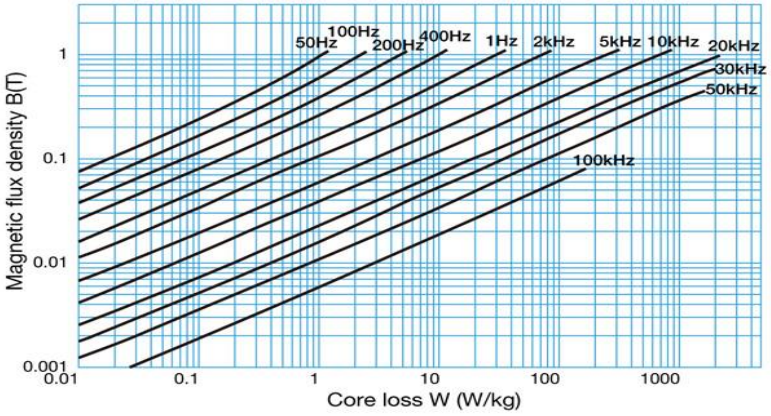
●High-frequency core loss curve



Measurement : 25 cm Epstein test
Rolling direction, shear cross-section

10JNHF600

●High-frequency core loss curve



Measurement: 25 cm Epstein test
Rolling direction, shear cross-section

Characteristics

■ Low Core Loss

Low core loss at high frequencies improves equipment efficiency and reduce energy consumption of reactors and transformers.

■ Low Magnetostriction

Magnetostriction causes nearly zero noise and vibration and significantly reduces the noise of magnetic components such as reactors and transformers.

■ High Permeability

For shields applications and CT.

■ Stable Quality

The high-temperature process improves thermal stability. Since machining can cause performance degradation, stress-relieving annealing is not required.

■ Non-oriented

There is virtually no difference between the rolling direction (L-direction) and the transverse (C-direction) in the characteristics. Therefore, the Super Core can be used for stationary or rolling machines.

Comparison of magnetic characteristics (JFE in-house data) : Rolling direction, shear cross-section

Material	Thickness (mm)	Specific resistance ($\mu\Omega$·m)	DC max relative permeability	Saturation magnetization (T)	Magnetic flux density B_8(T)	Magnetic flux density B_{25}(T)	Magneto-striction λ10/400 ($\times10^{-6}$)	Core loss (W/kg)						
								W10/50	W10/400	W10/1k	W5/2k	W2/5k	W1/10k	W0.5/20k
JNEX-Core	0.10	0.82	23,000	1.80	1.29	1.40	0.1	0.5	5.7	18.7	13.7	11.3	8.3	6.9
Grain-oriented silicon steel	0.05 0.10 0.23 0.35	0.48	– 24,000 92,000 94,000	2.03	1.75 1.84 1.92 1.92	– 1.91 1.96 1.96	−0.8	0.8 0.7 0.3 0.4	6.4 6.0 7.8 12.2	17.2 22.7 35.0 55.0	13.5 22.0 33.0 49.5	9.2 20.0 33.0 49.5	7.1 18.0 30.0 47.0	5.2 14.0 32.0 49.0
Non-oriented silicon steel	0.10 0.20 0.35	0.57	12,500 15,000 18,000	2.05 2.03 1.96	1.58 1.44 1.45	– 1.53 1.56	7.8	0.8 0.7 0.7	8.5 11.0 14.4	27.1 38.5 62.0	22.4 33.2 50.2	16.5 26.2 38.0	13.3 23.0 33.0	– – –
Fe-based amorphous	0.025	1.30	300,000	1.50	1.38	–	27.0	0.1	1.5	5.5	8.1	4.0	3.6	3.3
Ferrite	Bulk	–	3,500	–	0.37	–	21.0	–	–	–	–	2.2	2.0	1.8

* W10/50 is the core loss at 50Hz, 1T(=10kG) when the magnetic flux sine wave is excited.
* B_8 is the magnetic flux density at 800A/m.
* λ10/400 is the magnetostviction at 400Hz, 1T when the magentic flux sine wave is excited.

Comparison of magnetic characteristics (JFE in-house data) : Rolling direction, shear cross-section

Material	Thickness (mm)	DC max relative permeability	Saturation magnetization (T)	Magnetic flux density B_8(T)	Magnetic flux density B_{25}(T)	Core loss (W/kg)						
						W10/50	W10/400	W10/1k	W5/2k	W2/5k	W1/10k	W0.5/20k
JNHF-Core	0.10 0.20	4,100 3,900	1.88 1.94	1.15 1.09	1.44 1.47	1.1 1.2	10.1 14.5	30.0 51.6	20.2 29.1	11.5 17.9	7.1 12.7	5.0 9.5
JNEX-Core	0.10	23,000	1.80	1.29	1.40	0.5	5.7	18.7	13.7	11.3	8.3	6.9
Grain-oriented silicon steel	0.10	24,000	2.03	1.84	1.91	0.7	6.0	22.7	22.0	20.0	18.0	14.0
Non-oriented silicon steel	0.35	18,000	1.96	1.45	1.56	0.7	14.4	62.0	50.2	38.0	33.0	–
Amorphous	0.025	300,000	1.50	–	–	0.1	1.5	5.5	8.1	4.0	3.6	3.3

* W10/50 is the core loss at 50 Hz, 1 T (=10kG) when the magnetic flux sine wave is excited
* B_8 is the magnetic flux density at 800A/m.

Application - Transformers

With the characteristic of low core loss at high-frequency, the Super Core can be used for various types of transformers in a wide range of frequencies (x Hz to y kHz).

Super Core helps reduce heat generation in transformers and provides higher magnetic induction intensity than conventional silicon steel sheets, which can reduce the size of transformers. Other required components of transformer, such as the copper wire, can be downsized accordingly, resulting in overall cost reduction.

By taking the advantage of the low magnetostriction characteristics of JNEX-Core, the noise of transformers CAN be reduced dramatically.

Application - Reactors

With the characteristics of high saturation magnetic flux density, low core loss at high-frequency, and high permeability, Super Core is ideal for applying to reactors with high-frequency current superimposition over a broad range of frequencies.

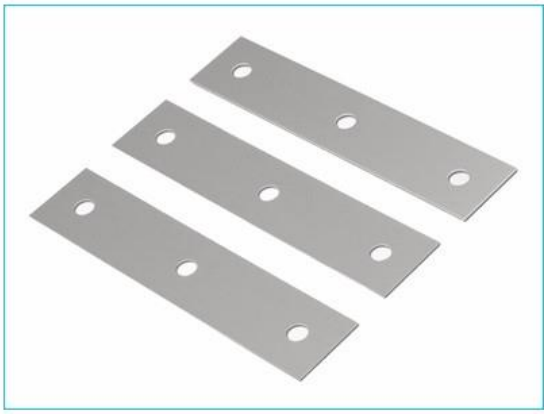
Super Core meets all high frequency wave regulations and power factor improvements. The demand is on the increase for its use in inverter output reactors, active filters, PWM converter reactors. It serves many market sectors, including consumer electronics, industrial renewable power generation, and automobile market.

Super Core meets diverse needs of customers. It can be formed into wound cores in various shapes, such as C-Cores and toroidal cores, as well as into lamination cores, glued block cores by cutting or pressing.

Core types

Block core with Round edge

A laminated core made in virtually the same shape as a cut core, so that it is possible to use the same washers and clamp bands.

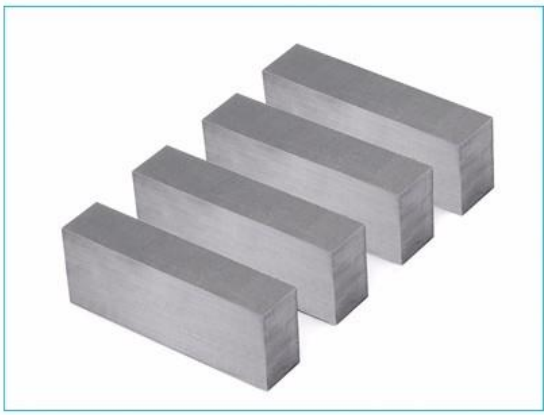


Stacked Laminations

These cores are used mainly with medium- and large-sized transformers and reactors. The user stacks the strips and affixes them using bolts.

Wound Core(C-Core & Toroidal Core)

After the steel is formed and annealed it is soaked in varnish and fixed, cut(if necessary). The sheet thickness is 0.1mm. Both standard & non-standard sizes C-Core are available.



Block Core

Block cores are for small and medium sized reactors and transformers. Effectively cost reduction for mass-producing. Standard lamination fixing method is adhesive fixation.