

# Nanocrystalline and Amorphous

## Fe-based Amorphous Alloy Iron Core for Distribution Transformer

### Performance characteristics:

Iron core is provided with high saturation magnetic displacement, low coercive force, low loss (equivalent to 1/3~1/5 of silicon steel sheet), low exciting current and remarkable temperature stability.

### Comparison between Fe-based amorphous alloy and silicon steel material:

Performance Index	Fe-Based Amorphous Alloy	Cold-Rolled Silicon Steel Disc
Saturation induction density Bs(T)	1.56	2.03
Maximum magnetic inductivity $\mu_m$ (Gs/Oe)	$45 \times 10^4$	$4 \times 10^4$
Coercive force Hc(A/M)	4	30
Iron loss P(w/Kg)	$P(1.3T/50Hz) \leq 0.2$	$P(1.7T/50Hz) \leq 1.2$
Exciting power Pe(Va/Kg)	$Pe(1.3T/50Hz) \leq 0.5$	$Pe(1.3T/50Hz) \leq 0.83$
Resistivity $\rho(\mu\Omega.cm)$	130	47
Specific gravity d(g/cm <sup>3</sup> )	7.2	7.65
Laminated iron core coefficient $\eta(\%)$	$\geq 70$	$\geq 95$

## Comparison between no-load losses of amorphous and Fe-silicon steel distribution transformers

Capacity(KVA)	Amorphous Distribution Transformer(W)			Silicon Steel Transformer Non-Load Loss(W)	
	Non-load loss	Lower than S9	Lower than S7	S9	S7
160	91	77.2%	80.2%	400	460
200	116	75.8%	78.5%	480	540
315	160	76.1%	78.9%	670	760
500	232	75.8%	78.5%	960	1080