

Relationships between Magnetic Shielding Properties and Metallurgical factors of Cold-Rolled Steel Plate

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Abstract

Current heavy use of electricity, especially low frequency A/C power, requires a new electromagnetic shielding material with reasonable price for wide application. Cold-rolled steel sheet is a promising candidate because of its excellent magnetic shielding property. Consideration should be paid to optimize the magnetic shielding effectiveness (SE) and the mechanical properties as a structural material.

We examined magnetic shielding effectiveness (SE) of cold-rolled steel sheets with different residual stress and texture, made by controlling the rolling, annealing and skin pass conditions. Textures in the sheets were observed by X-Ray pole figure analysis. Residual stress was estimated by XRD stress analysis. Magnetic SE was examined at 5~10,000 Hz with specially designed magnetic yokes. Sheets with higher {110}<001> texture had higher SE. The SE was also affected by density and distribution of the texture. However, the magnetic SE degraded much more sensitively with the residual stress. Attempts had been made to draw quantitative relationships.

References

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