

NEW DEVELOPMENT IN ELECTRICAL STRIP STEELS
CHARACTERIZED BY FINE GRAIN STRUCTURE
APPROACHING THE PROPERTIES OF A
SINGLE CRYSTAL¹

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Abstract

It has been found by experiment that single crystals of silicon steel or pure iron have extremely low hysteresis losses in certain crystallographic directions; however, such single crystal structures have the disadvantage of having exceedingly high eddy current losses when used in alternating current apparatus, as transformers, for example.

A new electrical strip steel has been developed which is fine-grained and has single crystal properties. These properties are obtained by the proper distribution of hot rolling, heat treating and cold rolling. The whole idea is based on a radical departure from present day theories regarding the ferromagnetic properties of single crystals and fine grain aggregates.

The final strip is characterized by a grain structure in which the crystals are quite perfect in structure and are distributed entirely at random and the magnetization curves of these fine-grained aggregates have the same symmetry and magnitude as the single crystal of the same substance.

This paper will show in some detail the principles which must be adhered to in order to develop single crystal properties in fine-grained ferromagnetic materials.

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