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MAGNETIC AND STRUCTURAL PROPERTIES OF AMORPHOUS ALLOYS AND APPLICATIONS

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Iron-rich metallic glasses are potential candidates for a variety of electromagnetic applications. It has been found that for some situations the completely amorphous state is not always advantageous , and partial crystallization may lead to improved or even novel properties.

Surface crystallization in amorphous alloys with positive magnetostriction produces a perpendicular magnetic anisotropy (1), with consequent improvement of some macroscopic properties. Here it is shown a little review on the influence of partial crystallization on magnetic properties of iron-rich amorphous alloys (2) , with particular enfasis on power losses .

We studied an amorphous alloy with composition $Fe_{78}B_{14}Si_8$ and the development of a crystalline phase has been checked by means of different techniques. The effect of thermal treatments on power losses has been determined (3).

Isothermal measurements of the power losses show a minimum displaced towards low times at high annealing temperatures. An increasing on the crystallization process produces an increase of the power losses and, in general, a deterioration of the soft

magnetic properties of the sample. A correlation can be observed between power losses and crystalline fraction ; the cristalline fraction is obtained through X-ray diffraction measurement.

The effect of partial crystallization in the amorphous matrix on the power losses is discussed in terms of the current models.

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