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Magnetic Properties of High Permeability Iron Powder"KIP MG270H"for Line Filter Cores

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Synopsis :
The initial permeability of reduced iron powder cores has been investigated in relation to impurities (O, C, P and S) and coarsening of grains have been found effective for improving the permeability. Transmission electron microscope observation around the grain boundaries of an iron particle revealed that nonmagnetic inclusions are formed along the grain boundaries with sizes comparable to the domain wall thickness of pure iron. This fact suggests that the grain boundaries act as the sites of strong pinning of the domain wall displacement. On the basis of these findings, Kawasaki Steel has developed a new reduced iron powder "KIP MG270H", realizing permeability higher than the conventional materials up to several hundreds Hertz. This material is applicable to line noise filter cores.

The body can be viewed from the next page.

Magnetic Properties of High Permeability Iron Powder "KIP MG270H" for Line Filter Cores*

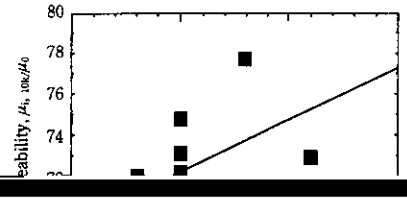
Synopsis:

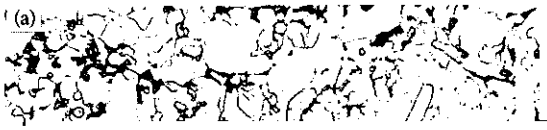
The initial permeability of reduced iron powder cores has been investigated in relation to the effects of material characteristics dependence, impurity concentration, grain size and residual strain introduced during the compacting process. The reduction of impurities (O, C, P and S) and coarsening of grains have been found

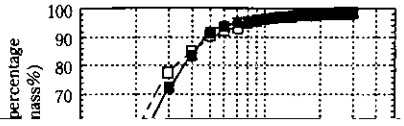
powder cores, in which powders are pressed with lubri-

Table 2 Initial permeability at 10 kHz and integrated width on the surface of green compacts of iron powders

Sample	Initial permeability	Integrated width




(a)


100
90
80
70
percentage
nass%)

was not observed with the exception of inclusions (the arrows in Fig. 5 (a)) 40 to 50 nm in diameter observed

Table 3 Typical values of characteristics of iron powders