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Wed-Mo-Po3.07-01 [43]: Magnetizing Technique for Permanent Magnets in IPM Motor Rotors Using HTS Bulk Magnet

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A unique activation technique for permanent Nd-Fe-B magnets which were embedded in the rotors of interior permanent magnet (IPM) motors has been developed as a magnetizing tool using high temperature superconducting (HTS) bulk magnets. The experimental and numerical simulation studies were conducted to evaluate the magnetic field-trapping performances in two manners of we call "scanning"and "stamping"modes for the rotor of air-conditioner compressor in hybrid-type automobiles. The sample rotor with demagnetized permanent magnet plates were exposed in the intense static magnetic fields above the magnetic pole which contained the bulk magnet generating over 3 T. The magnetization property of permanent magnet plates in the rotor was found to follow the magnetization curve of the material with its anisotropic magnetization property. As a result, the sample magnets were perfectly magnetized in the static magnetic fields. The precise simulation on the flux distribution in the rotor clarified that it is important to make the direction of flux in the hales of rotor core and the easy magnetization axis of PM identical. We convinced this activation technique should enable us to promote the degrees of freedom of motor designing and processing.

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