Novel Magnetizing Method for Permanent Magnets by Using Static Magnetic Field Generated by HTS Bulk Magnet

Tetsuo Oka[1], Nobutaka Kawasaki[1], Tomoki Muraya[1], Satoshi Fukui[1],
Jun Ogawa[1], Takao Sato[1], Toshihisa Terasawa[2],
Yoshitaka Itoh[2], Ryohei Yabuno[2]
e-mail;okat@eng.niigata-u.ac.jp

[1]Faculty of Engineering, Niigata University,
8050 Ikarashi-Ninocho, Nishi-ku, Niigata, 950-2181 Japan
[2]IMRA MATERIAL CO., Aichi, 2-1 Asahi-machi, Kariya, 448-0032 Japan

Abstract - Demagnetized rare earth magnets (Nd-Fe-B) can be fully magnetized by placing them in the intense static fields of over 3 T which are generated by the HTS bulk magnets cooled to the superconducting state at the temperature range lower than 77 K with use of cryo-coolers. A permanent magnet plate was alternately scanned twice in the open space just above the magnetic pole of HTS bulk magnet. The 'rewritten' magnetic field distributions have indicated steep gradients at the borders of each magnetic pole. Instead of conventional pulse field magnetization methods, this technique is to be utilized as a novel practical method for magnetizing the rare earth magnets which have excellent performances and require the intense fields more than 2 T to activate them.

IEEE/CSC & ESAS European Superconductivity News Forum (ESNF), No. 15, January 2010