MA-Loaded Cavities for Barrier Bucket Experiment, M. FUJIEDA, S. MACHIDA, Y. MORI, H. NAKAYAMA, C. OHMORI, K. SAITO, SHIN'YA SAWADA, Y. SATO, Y. TANABE, T. UESUGI, M. YAMAMOTO, KEK-TANASHI, E. EZURA, A. TAKAGI, M. TODA, T. YAN, M. YOSHII, KEK - Magnetic Alloy (MA) loaded cavities have been developed for barrier bucket experiments and for a test cavity of Japanese Hadron Facility (JHF). A new material, "FINEMET", which has very broad band impedance for the RF frequency is used for the cavities. Because the permeability of the material is more than 10 times larger than ferrite cores, the required drive current of the cavity can be minimized and is much less than that of ferrite loaded cavity. Barrier voltage of 10 kV per gap has been successfully achieved by a MA-loaded cavity which has two acceleration gaps. In the cavity, only four MA cores per gap were loaded.