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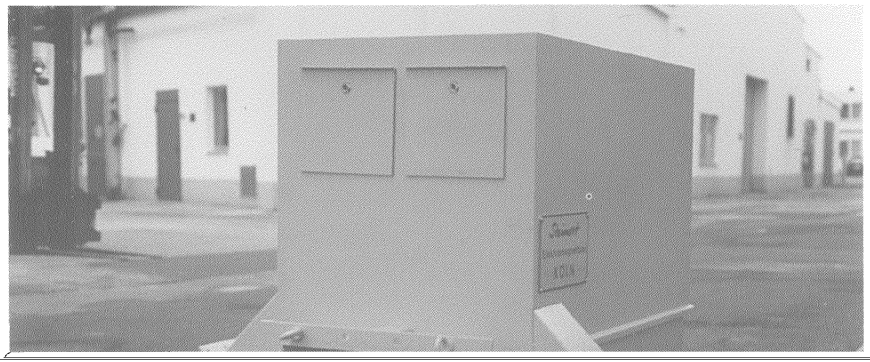
Equipment and Products

SUPERCONDUCTING PERMANENT MAGNET

A superconducting permanent magnet with remarkable magnetic properties has been prepared at the Superconducting Research Laboratory, Tokyo, Japan (*S.Gotoh et al.: J. Appl. Phys. 72, 1992, 2404*). This magnet has a composition of $YBa_2Cu_3O_x$ (1:2:3) and produces an energy product of 110 MGOe while in the superconducting state of 5 K. The authors prepared and studied two separate melt –processed 1:2:3 samples. One sample was prepared by a quench and melt growth process (QMG) and the second by the melt–powder–melt–growth process (MPMG). The powders were heated in air to 1400° C and then quenched. The sample was reheated to 1100°C in the QMG process, held for 2O minutes, cooled to 1000°C in one hour, followed by slow cooling at 5°C/hr. A final anneal at 600° for 1 hour was carried out in an oxygen atmosphere and then slowly cooled to room temperature. The MPMG samples were powdered, mixed and pressed after the initial quench step. This material was then melted at ~1100°C and slow–cooled at several different rates, depending on the temperature regime.

FERROUS SEPARATION FROM AIR FEEDERS

Steinert Elektromagnetbau GmbH, Cologne, Germany has developed a permanent magnetic separator for air feeders. The separator is designed to extract tramp iron



from pulverized bulk materials. A typical application is in the cement industry where tramp iron from grinding balls and other steel parts could damage the process machinery and contaminate the product itself. The process of extraction of tramp iron from such streams is complicated by the fact that air is continuously blown into a conveyor chute from below so that the cement floats and is transported in the stream of air. There is a constant excess pressure in such an air feeder, and, moreover, the tramp iron must be extracted continuously.

In the Steinert magnetic separator, magnetic particles are extracted by a rotating magnetic field generated by Nd–Fe–b rare–earth permanent magnets. After being deflected from the stream into a zero–magnetic field region, magnetic particles are discharged from the system. It claimed that this new separator can be easily fitted into existing air feeders.

TANDEM SCRAP–HANDLING MAGNETS

O.S. Walker Co., Inc. has introduced tandem scrap–handling magnets capable of lifting up to 10 tons. The magnets are designed for unloading rail cars and for other application requiring a maximum lifting capacity and narrow width. The magnets can be supplied in sizes up to 2400 mm wide and 5100 mm long and feature a heavy–duty case with heavy rolled manganese bottom plate and alloy chains.

SUPERCONDUCTING SEPARATOR AT A KAOLIN PLANT

Carpco SMS has installed one of its laboratory cryofilter HGMS at a US kaolin plant. The separator features a 6 Tesla superconducting magnet, weighs approximately 680 kg and consumes 2.5 kW in normal operation. It offers complete testing for plant or drill core samples of clays and other minerals. A production–size unit can be scaled up to 60 t/h.

NEW FERROFILTER FROM S.G. FRANTZ

S.G. Frantz Co. Inc. has introduced a new series of high–power electromagnetic FerroFilters F2. These separators are designed to process dry powders and granular materials. The separating unit of the F2 separators is magnetized by two concentric solenoids that are cooled by water coils between them and at their outer and inner circumferences. The collecting elements are composed of a matrix of grids with inclined, parallel vanes. The inclination of the vanes is reversed with each grid, giving a zigzag flow of material. Vibrations shake the separating chamber and the matrix.