

Equipment and Products

CHROMITE RECOVERY FOR FOUNDRIES

Foundry and Technical Liaison Ltd. has developed a separator to recover chromite from mixed silica backing sand in foundries producing high-quality steel castings. The machine consists of two stages of high-intensity permanent magnet separation. In the first stage pieces of metal and sand/metal agglomerates are removed from sand. In the second stage chromite is recovered for return to the casting process. The treated silica is then returned to the conventional return sand treatment line. Processing rates of up to 5 t/h have been achieved.

SUPERCONDUCTING MAGNETIC BEARING

A superconducting magnetic bearing has been developed by Superconductivity Research Laboratory and Nippon Seiko KK. The bearing in which a rotor weighing 2.4 kg can spin at a rate of 30 000 rpm, utilizes a pinning force between an Y-Ba-Cu-O superconductor and a magnet. The Y-based superconductor has a critical temperature of 77 K.

Reportedly, the new achievement is almost within reach of practical application and could find uses in those areas where high-speed rotation is required.

HIGH SILICON STEEL

NKK developed the technology for the first commercial-scale production of 6.5% Si steel sheets. The new product, available in coils and sheets has excellent magnetic properties: ten times greater permeability and one eighth the magnetostriction, compared to 3% Si steel.

SALES OF RARE-EARTH MAGNETS CLIMB

Global sales of Nd-Fe-B permanent magnets reached US\$360 million in 1990 and are expected to climb to \$2.7 billion by the year 2000.

The Japanese production of rare-earth magnets increased in the first half of 1991 by 20% over the same period of 1990. The rate of growth is likely to fall in the second half of 1991 because of lower demand from the computer disk industry. The rate of growth is likely to fall below 10% in late 1991.

In 1991, production of Nd-magnets, which account for around 60% of output of rare-earth magnets, is estimated at 520 t. In 1991 increasing demand for Nd-magnets will more than offset the decline in consumption of Sm-Co magnets. Production of rare-earth magnets is estimated to increase by 20% to 862 t in 1991 and by 10% to around 950 t in 1992. As a result, all major Japanese producers of rare-earth magnets are reducing output of Sm-Co magnets and raising production of Nd-Fe-B magnets.

It is predicted that the value of Japanese production of rare-earth magnets will exceed that of ferrite magnets in 1992. Japanese production of permanent magnets in 1990 and 1991 is reviewed in the following Table.

	Volume (t)		Value (mill Yen)	
	1990	1991	1990	1991
Cast magnets	959	841	3 832	3 442
Ferrite magnets	40 332	40 323	28 420	28 306
Rare earth magnets	717	862	22 541	26 216
Others	5	6	276	319
Total	42 013	42 032	55 069	58 283