

Remarks on Special Issue on Refractory Technology in the Steel Industry



Ikuya YAMAMOTO

Director, Environment & Process Technology Center,
Technical Development Bureau

In the past few years, the world's crude steel production, spurred by brisk demand for steel products in the BRICs nations, has increased to almost 1.2 billion tons/year. In Japan, crude steel output hit its low in 1994-1995, but has since been increasing steadily, and currently exceeds 100 million tons. At Nippon Steel, production of crude steel has far exceeded 30 million tons for the first time. The present target for the Nippon Steel Group is to produce more than 40 million tons annually. In the past, the company has made various improvements to its crude steel production system, such as increasing productivity, reducing production costs and enhancing manufacturing flexibility during the period that steel production ebbed. In the field of refractories too, the company has made continual efforts to develop new technologies, improve the productivity of refractory maintenance work, and so on.

On the other hand, the quality requirements of steel products have become more stringent than ever. In terms of sheet steel products, typified by automotive sheet, higher-tensile products are required for lighter yet safer body structures, etc. as we all strive to conserve the environment and save energy. Concerning heavy plate steel products, there is increasing demand for weatherproof plates for unpainted bridges, corrosion-resistant plates for gigantic container vessels, and pitting corrosion-resistant plates for oil tankers (to prevent water contamination should tankers collide while at sea).

With respect to other steel products too, their functions have rapidly been enhanced. Accordingly, their quality requirements have become increasingly stringent. It is no exaggeration to say that those requirements can hardly be met without progress in terms of refractory technology.

In the face of worsening environmental problems, the public clamor to save energy and reduce CO₂ emissions is ever louder. The steel industry - a high profile target since it requires huge amounts of heat - has seen expectations for its refractory technology growing markedly.

Our company is publishing this Special Issue on Refractory Technology for the first time in 20 years. This issue not only contains technical papers on R&D projects carried out over the past two decades - a period that has witnessed many dramatic changes - but it also introduces the historical events pertaining to the refractory technology and some vivid reminiscences of the days when workers had to battle extreme heat in the words of our predecessors, their proposals for improvements, and several new products from our affiliated companies. I am confident that the reader will find this special issue both unique and interesting. Since there are very few technical books on refractory materials, those who want to obtain a comprehensive understanding of refractory technology or garner information about the latest refractory technology are sure to find this special issue worth reading.

Quite a few people may have the impression that refractory technology as applied to the steel industry is virtually at its zenith. Actually, however, there are still a number of exciting new technologies with tremendous development potential. They include material science at the nano scale, dynamic sensing under extremely high temperatures, the use of robots for furnace-building work, and the most advanced assessment/analysis techniques, etc.

Our company is set to press ahead with further refinement of existing refractory technology and development of innovative new technologies so as to remain a world leader in this particular field. We look forward to the continuing cooperation of all persons concerned.