Japan watching

Coke oven gas desulfurizer starts operation at Mizushima Works

On April 17th the Mizushima Works of Kawasaki Steel Corp. started the operation of desulfurization equipment for the #1 and #4 coke ovens. The equipment is capable of handling 200,000 cu meters of gas per hour. The unit is designed to remove at least 90% of the sulfur in the gas. The equipment cost approximately $12.7 million and has been under construction since December 1972.

The hydrogen sulfide contained in the coke oven gas is absorbed by an alkaline solution in two desulfurizing towers. The sulfur is finally removed in a Kraus reaction tower. The waste water is treated by an activated sludge to produce clean water.

The equipment was developed by Mitsubishi Chemical Industries and Mitsubishi Kakoki KK and is being marketed under the name of the Diamox process.

A similar unit is now under construction at the Mizushima Works to process the gas from the #5 and #6 coke ovens.

40,000 KVA closed type electric furnace for ferro manganese to start operation

The Chuo Electric Industry Co., Ltd. announced that the No. 2 electric furnace at the Kashima Works will begin operation in June. The furnace has a capacity of about 100,000 tons per year of high carbon, ferro manganese or about 60,000 tons per year of silico manganese. The furnace is a fully closed type, 3-phase, 170 cm diam. electrodes, and is rated at 40,000 KVA.

The ore used for this furnace is pelletized and sintered before being charged into the furnace. The sintering furnace has a capacity of about 9,000 tons per month.

Of the total construction cost of about $13.5 million approximately $3.8 million were spent on the dust collection and other environmental pollution control equipment.

New production record for Fukuyama blast furnace

Nippon Kokan KK recently claimed the world record pig iron production for a single blast furnace as the #5 furnace at the Fukuyama Works turned out 316,500 metric tons of pig iron in April. This is a daily average for the month of 10,550 metric tons per day. When blown in during November 1973, the blast furnace was the largest in the world, having an inner working volume of 4,617 cubic meters.

The previous record holder is said to have been the #4 blast furnace at the Mizushima Works of Kawasaki Steel Corp. This blast furnace has an inner working volume of 4,323 cu meters and was blown in during April 1973. The highest daily average production over a month long period was 10,361 metric tons per day.

Nippon Steel Corp. adopts free-standing blast furnace design as future standard

Nippon Steel Corp., after acquiring confidence in the free-standing type blast furnace structure with the operation of the No. 4 Tobata furnace, has adopted this design for all future furnace construction. The No. 4 Tobata blast furnace has been in operation for about two years, having been blown in during July 1972, and has an inner volume of 3,799 cu meters.

The Oita No. 2 and Kimitsu No. 4, for which the design was completed some time ago and preliminary construction has started, will not be free-standing but of the semi-free-standing type.

The main advantages of the free-standing design are: it is less costly than supported types and working arrangement at the hearth level can be greatly improved.

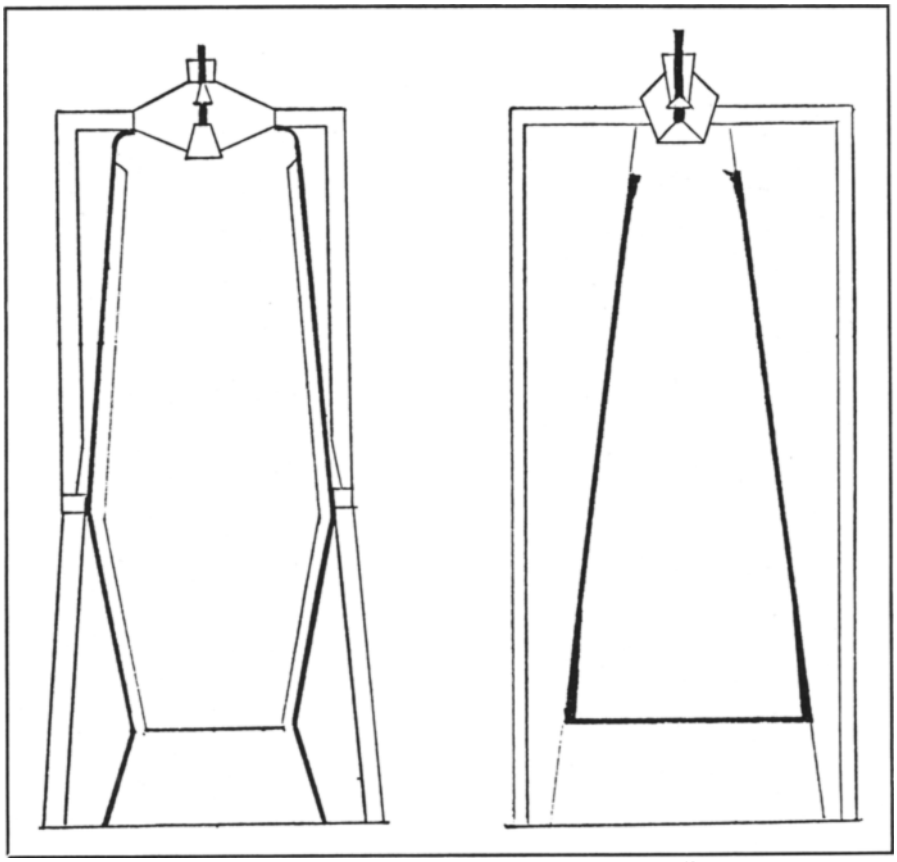
In the free-standing construction the furnace top is held up by supports but the furnace body supports itself. The figure below shows both a free-standing blast furnace and a supported furnace of the double, ring girder type.

The free-standing construction was adopted for the Chiba No. 1 and No. 2 furnaces built by Kawasaki Steel Corp. during the 1950's, based on technology introduced to Japan from the Wolf Co. of West Germany. This design suffered from two problems: the brick laying process was complicated, and the larger the furnace the greater the construction problems related to the earthquake resistance necessary in Japan.

Most of the large size blast furnaces in Japan are of the following types: the middle part of the furnace shaft is supported by a double, ring girder and the lower part of the furnace is supported by uniformly thick walls with a double, ring girder. These types are subject to some operational problem. Where the middle part of the furnace is supported by a double, ring girder operational troubles often occur inside the furnace shaft in the area of the girder. Where the lower part of the shaft is supported by thick walls and double, ring girder the work area is normally congested.

The semi-free-standing structure nearly becomes free standing during operation but the body of the shaft requires support when the furnace is shut down. The cost of construction of the supported and semi-free-standing furnaces is about the same.

Nippon Steel Corp. expects to achieve lower construction costs, eliminate operational problems, and eliminate congested tapping floor and work area by using the free-standing design for the new, large sized blast furnaces to be built in the future. ■



Two types of blast furnace design illustrated in the above diagram are: Left double, ring girder and Right free-standing