PLAN FOR DEVELOPING THE REFRACTORY INDUSTRY IN 1962

The working people of the establishments of the refractory industry together with the staffs of refractory institutes are competing for the fulfilment ahead of schedule of production programs, and in 1961 achieved considerable progress in the output of parts and the improvement of their quality.

Last year refractory plants carried out important work in introducing new machinery and improving technology.

At the Nikitovka Dolomite Combine and the Panteleymonovo Refractory Plant the rotary and tunnel-type kilns have been switched to natural gas.

The staff of the Novomoskovsk Chamotte Plant has completed construction of a tunnel-type kiln and put it into operation in a very short time.

The staff of the Podol'sk Plant has begun manufacture of all types of glass-foundry blocks on an automatic hydraulic press with a force of 5000 tons.

At the Zaporozh'ye Refractory Plant a high-alumina part shop has been put into operation and the manufacture of siphon parts by the semi-dry method using a press designed by I. F. Yurchenko has been begun.

At the Semiluki Refractory Plant multichamotte blocks for blast furnace stacks are now pressed on an automated hydraulic press at a force of 1500 tons.

High-efficiency "Model 115" mixers have been installed at a number of plants for processing refractory mixtures.

The Panteleymonovo Refractory Plant together with the UNIIO has manufactured and tested magnesite-chrome brick for heat-insulated roofs.

At the Nizhniy-Tagil' Metallurgical Combine, parts are now being made for coke furnaces by a new semi-dry pressing method, and at the Chasov Yar Refractory Combine the procedure for manufacturing non-fired magnesite stoppers has been improved.

Together with the Borovichi Combine, the All-Union Refractory Institute has begun production of graphite-containing refractories for an experimental unit pumping liquid pig iron; in conjunction with the Podol'sk and Vnukovo Plants the institute has begun production of superduty inserts for continuous steel-pouring stoppers.

The Ukrainian Scientific Research Institute of Refractories has studied the pressing of parts from clay and kaolin in a thermo-plastic state and has begun production of zirconium and forsterite lightweight parts.

The Eastern Institute of Refractories, in collaboration with the Pervoural'sk Dinas Plant, has developed a procedure for manufacturing dinas concrete.

Research institutes, collaborating with operating plants, have developed a production technique for chrome-magnesite, dinas and other mixtures used to make concretes, blocks, ramming and gunnite mixtures, and have now introduced them.

The All-Union Institute of Refractories has designed a tunnel-type kiln 200 m long for firing large blocks and larger glass-foundry blocks; the construction of these kilns will be carried out by the Podol'sk and Semiluki Plants.

The All-Union Institute of Refractories, together with specialized planning institutes and design offices, has drafted a program for the reconstruction, automation and mechanization of refractory output at the Zaporozh'ye Refractory Plant, through which the productivity of labor will be more than doubled.

A great deal of work in implementing the automation and mechanization programs has been done by the local design offices set up by the Councils of the NTO ChM at the "Magnezit", Semiluki, Zaporozh'ye, Chasov Yar and other plants.

In 1962 there will be an increase of 4% in the production of chamotte parts, 3.7% in magnesite and chrome-magnesite parts, 14.2% forsterite parts, 11.1% in magnesite powder and 8% in fired dolomite, compared with 1961.

A considerable increase is scheduled in the production of high-efficiency refractory parts: 22.7% for periclase-spinal parts, 27.7% for high-alumina parts, 19.2% for high-density multichamotte parts, 33.3% for ultralightweight parts, and 8.3% for lightweight parts.

New levels of output must be attained in order to step up the production of refractories in 1962; an increase of 550,000 tons chamotte parts, 50,000 tons high alumina parts, 30,000 tons magnesite and chrome-magnesite parts, 25,000 tons forsterite parts, 200,000 tons magnesite powder, 170,000 tons fired dolomite, and 335,000 tons clay fired for chamotte.

The transfer of the heating units at the Borovichi Combine and Chasov Yar Refractory Combine to natural gas heating is due for completion in 1962. The Konstantinovka Refractory Plant ("Red October") and Styl' Dolomite Combine should also change to natural gas.

The transfer of the rotary kilns in shop No. 3 and tunnel-type kilns in shop No. 1 (magnesite brick) is to be completed shortly at the "Magnezit" Plant; a new system of trapping dust in the exhaust gases from the rotary kilns Nos. 7 and 8 is to be installed and operated; and a new crushing section with short cone crushers for pulverizing coarse grain magnesite powder

is to be constructed.

In the first quarter of 1962 work is due to be completed at the Zaporozh'ye Refractory Plant on the production of a head specimen for a 1200-ton mechanical toggle press, as well as the production of high-alumina parts made of Kirovka Clay for air heaters in blast furnaces and checker brick for open-hearth regenerators.

The Semiluki Refractory Plant is to begin firing high-alumina chamotte in a rotary kiln; the new system for trapping dust in the flue gases from this kiln is to be started up, and high-density multichamotte parts are to be made for blast-furnace stack linings.

1500-ton hydraulic presses are to be started up at the Chasov-Yar Refractory Combine and the mass production of high-density magnesite-chrome parts is to be organized.

At the Konstantinovka Refractory Plant, "Red October" and Borovichi Combine, 1500-ton presses are to be installed and mass production of high-density ladle brick is to be organized.

The mass production of brick using chrome-alumina slags is to be organized at the Bogdanovich Refractory Plant.

The Yerevan Glass-Mullite Plant is scheduled to carry out measures aimed at greatly improving the quality of fused parts; by the end of the year the production of "bakor-33" is to be boosted to 120 tons a month.

Establishments and institutes of the refractory industry should move ahead in the introduction of techniques for the manufacture of new types of refractories by seeking the extra available reserves in industry for this purpose, by widely employing the initiative and creative effort of efficiency-experts, inventors, design offices and plant laboratories.

A great deal of attention should be devoted to improving the output of powders and mixtures for concrete, non-fired blocks and parts, of great importance for the rapid introduction of industrial methods of kiln construction.

For the purposes of improving the equipment available in the refractory industry, the engineering industry should supply refractory establishments with a large amount of contemporary mixing and pressing equipment, rotary and electrothermal kilns and equipment for tunnel-type kilns.

It is the job of the staffs of refractory establishments to carry out the plans for the manufacture of new equipment and for putting it into service as quickly as possible.

The fulfilment of the production and construction programs scheduled for 1962 and also the measures for the installation and starting up of new machinery at refractory establishments will make it possible to raise the technical level of refractory enterprises, to boost the output of super-duty refractories and satisfy the needs of the national economy in high grade refractories more fully.

The tasks facing the refractory industry are complex, but there is no doubt that the staffs of refractory enterprises and institutes, inspired by the historic solutions of the XXII Communist Party Congress, will help carry them out honorably.

PRODUCTION

PRODUCTION OF SHAPED CHECKER BRICK FOR BLAST FURNACE AIR BEATERS

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In order to reach blast temperatures of the order of 1200° and to improve the efficiency of air heaters, apart from using super-duty materials it is advisable to alter the shape of the checker brick in order to increase the heating surface.

The authors of this article have supplied an efficient checker brick shape (Figure 1).

Two types of experimental brick were made: chamotte brick with 36-39% Al_2O_3 and high-alumina with 45-50% Al_2O_3.

Chamotte brick. Both class A and B chamotte brick were manufactured for the air heaters by the standard production technique for shop No. 1.

Chamotte with 4.5-6% water absorption, made from LT-2 clay fired in a shaft-type kiln, was used to make the class A air heater brick, while the brick used for Class B was chamotte with 8-11% water absorption made from LT1PK, LT2PK and LTU clays.

The grain composition of the chamotte was as follows: 3% fraction coarser than 3 mm; 59±5% 3-0.5 mm; 38±5% finer than 0.5 mm. The binder used was LT1 and LT2 clays containing not more than 1% fraction coarser than 1 mm and at least 70% finer than 0.5 mm. The mixture was tempered in mullers or roller mills for 5-7 minutes. The composition of the charge was: 80-75% chamotte and 20-25% clay, and the moisture content of the mixture was: 6-8%.

Parts were mixed on SM-143 presses, except for certain types in Class A which were made on "International Presses".

The bulk density of the green wire for the class A part at least 2.15 g/cm³ and at least 2.00 g/cm³ for Class B parts.

The green ware was dried in tunnel-type dryers until the residual moisture content was 1.0-2.5%, after which it was