The green material was dense with a bulk density of 2.26 g/cm³, and the corners and edges were clear-cut and firm.

The compressive strength of the experimental green ware was determined for 20 specimens. It amounted to 34–45 kg/cm², or a mean 39 kg/cm².

After it had been pressed, the green ware with a moisture content of 2.8% was stacked directly onto the tunnel-type and compartment-type kiln cars.

The experimental green ware was stacked on the tunnel-type kiln cars in the following sequence.

Ninety green bricks were placed on end of the floor of the car as the first column, and gas channels were left between them.

In the second column, four bricks were placed in an open-hearth type row above the belt, and covered over with two rows of standard brick; two bricks without load were placed in the top row of this column.

In the third column, two bricks were placed in one open-hearth type row above the belt, and covered with two rows of standard brick (see diagram).

In the compartment-type furnace the experimental green ware was batched at a height of 2 m from the floor under a load of three rows of standard brick. There were twelve bricks in each column.

Experimental brick was fired in tunnel-type and compartment-type kilns under the normal regime for the plant.

The experimental dinas was sorted into coke parts on the basis of the GOST 8023-56 standards. Results of the sorting are shown in Table 1.

The chemical composition of the dinas fired in the tunnel-type kiln was: 94.75% SiO₂, 1.08% Al₂O₃ + TiO₂, 1.69% Fe₂O₃, 2.46% CaO. The characteristics of the experimental parts (Table 2) come up to GOST 8023-56 requirements.

CONCLUSIONS

The experiment showed the theoretical possibility of firing green dinas without pre-drying.

Modification of the technique will make it possible to mechanize and automate the stacking of straight types of green ware onto tunnel-type kiln cars.

The possibility has been established of stacking green dinas with a moisture content of 3–4%.

In order to fire green ware with a moisture content of 3–4%, tunnel-type kiln designs must make provision for elongation of the pre-heating zone, since this will considerably improve the grade of the products.

A production technique for dinas under batching conditions in which the drying operation can be bypassed should be worked out and introduced with the cooperation of UNIO specialists on the basis of our experiments.

REFERENCES

1. I. S. Kaynarskiy and others, Ogneupory, 1958, No. 11.
2. K. G. Romanchenko and others, Ogneupory, 1961, No. 1.

MECHANIZATION AND AUTOMATION OF PRODUCTION

MEKHANOBR-600 INERTIA CRUSHER

A. K. RUNDKVIST
(Mekhanobr Institute)

A. P. STAVORKO AND N. V. KONETSKII
(Semiluki Refractory Plant)

A. G. SLEPUKHIN
(All-Union Refractory Institute)

At plants in the refractory industry, chamotte and chamotte brick grog are usually ground in ball mills 2.2–2.7 m in diameter with peripheral discharge. The mills are used to pulverize material which has first been crushed to a size of 50–60 mm in the jaw crushers.

The output of the ball mills as a function of the degree to which the chamotte is sintered ranges between 2.3 and 10.9 tons/hr.

The experience gained by the plants shows that a reduction in the porosity of the chamotte causes a considerable reduction in the output of the mills.

Intensification and complex mechanization or production and improvement in the grade of output through the use of high-fired, low-porosity and high-alumina chamotte necessitate the use of new, improved and more productive equipment.

The new inertia cone crusher — the Mekhanobr 600 — seems promising in that it provides a higher degree of crushing together with a better output than other crushers.

The Mekhanobr-600 crusher (Fig. 1), which is made by the Uralmashzavod Plant, consists of the crushing cone, 1, and body, 2, connected by the spherical hinge, 3. Both the body and the cone of the crusher are lined with wear-
resistant G13L manganese steel plating, 4 and 5, and it is between these plates that the material is actually crushed.

The crushing cone is set in motion by the vibrator, 6, the main unit in which is an unbalanced load, 7, rotating on rubber bearings, 8, at a high speed (985 rpm). The vibrator is connected to the motor, 9, by a shaft, 10, with two gimbal universal joints, 11 and 12, and a spline area, enabling slight movement of the cone and body of the crusher in any direction [1, 2].

The centrifugal force created when the imbalance rotates causes circular oscillations of the cone, 1. When the crusher is properly adjusted, the cone rolls against the inside surface of the plate, 5, of the body, 2, at a rate governed by the degree to which the plates slide about at the point where they come into contact with the material being ground. When the cone moves in this fashion, a centrifugal force of up to 30 or 40 tons is developed, and this can pulverize materials of high strength.

Since the crushing machinery enables the plates to come into contact without any gap in between (as distinct from eccentric cone crushers), the material fed in may be ground down to a very fine size (grinding ratio up to 40 or higher).

The grinding efficiency is further improved by the large number of oscillations of the crushing cone, which prevent the coarser grains leaving the crusher. A fine-grain product is ensured by keeping the crushing force created during movement of the cone and imbalance fairly high: the design of the crusher provides for a crushing force corresponding to a pressure of the order of 20 kg per 1 cm of area of meridional section of the crushing cone on the material [2].

To prevent the vibration being transferred to surrounding equipment, the body of the crusher is suspended from a special frame, 14, by means of cables, 15, and springs, 16. There is a circulating lubrication system for the spherical joint: the rubber bearing liners of the vibrator are lubricated and cooled at the same time by running water.