

FOR A CLEANER ATMOSPHERE

In shop Nr 4 of Chasov Yar Combine two dust removers with meshed filters were installed¹⁾. The efficiency of the mesh filter is 0.96. The clay and grog dust is re-used in the production of slip. In view of the satisfactory performance of the two installations, the plant

intends to equip the flue gas pipes of the dryers with the same same type of filters as well as the exhaust fans of presses used for the semi-dry method, feeders, elevator heads and ground clay and grog bins.

V.N. BELOUSOV,
Chasov Yar Combine
of Refractory Goods

¹⁾ I. P. Vas'kov, Ogneupory, 1961, Nr 2.

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At Krasnyy Oktyabr' Refractory Plant in Konstantinovka, flue gas from dryers is purified by means of installation designed by M. P. Dovnar¹⁾. A blade shaft whirls up the dust particles that settle in the tank and the suspension is repumped for further use; then the

tank is refilled with clean water. These dust removers are installed in all drying drums. With a proper operation of the unit, the degree of purification amounts to about 98%.

A. L. LIMANSKAYA,
Krasnyy Oktyabr'
Refractory Plant in
Konstantinovka

¹⁾ M. P. Dovnar, Ogneupory, 1958, Nr 4.

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NEWS IN BRIEF

MODERN METHODS OF REFRACTORY TESTING AND CONTROL

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In recent years the volume of production and the variety of goods have been greatly expanded at Semiluki Refractory Plant. The increasing variety of service calls upon workers and researchers alike to devise methods for the rapid and exact determination of the suitability of refractories under specified working conditions. It goes without saying, that the methods must be adjusted to the peculiarities of a given plant. It is the feeling of the authors that this problem has been insufficiently considered in the current all-union specifications for test methods.

Frequently, too few samples serve for the determination of physical and chemical properties, giving an incomplete picture.

The standard testing methods for refractory articles are often time-consuming and laborious. It also happens that specific working conditions are not considered.

By way of example we refer to the "Volumetric Test for After-Shrinkage or Expansion," (State Standards 5402-50) and "Test for Thermal Stability of Refractory Goods at a Temperature of 1300° C" (State Standards 7875-56). The authors of these State Standards tried to approximate the testing method to the service conditions; however, in both cases the testing time is doubled or even tripled and the methods made more complex. Moreover,

¹⁾ M. N. Blubshteyn, Ogneupory, 1960, Nr 12.

State Standards 7875-66 provides for the testing of normal-size bricks. Smaller goods cannot be tested for thermal stability.

Resistance to the action of slag at service temperatures and abrasion at elevated temperatures are factors which were not taken into account in quality tests. In preparing new State Standards the duty of refractories as well as testing time and complexity should be given adequate attention. The new testing methods should be carried out automatically.

At Semiluki Refractory Plant a project is under way to introduce rapid and accurate methods for production control and certification. A statistical method for the determination of apparent density, porosity and compressive strength was elaborated in collaboration with the All-Union Institute of Refractories. A frequency meter for mechanical oscillations is used for measuring. The statistical method is applied at the plant in preparing certifications for normal, sleeve, checker (chamotte and high-alumina) and cupola bricks. Work continues on the application of that method to the certification of other types of brick including blast furnace brick. The statistical method has the advantage of classical method in that it allows property determination of the entire brick and not only of a part of it. Therefore, it characterizes the property of refractories to a much larger extent. The statistical method allows the increase of test pieces without destruction and gives a more accurate evaluation of a batch of refractories. For five years the Semiluki Plant has been preparing certifications and this experience facilitates the assessment of the material and the mathematical calculations in elaborating draft standards.

The available experimental data are commended to the attention of the All-Union Institute of Refractories in designing a new method of testing compressive strength, apparent density and porosity by determining the frequency of oscillations of the article.

The large-scale production of instruments for the introduction of the statistical methods at all refractory plants is also recommended. A more powerful panel for the apparatus should also be designed and quality control by sound method elaborated for specially intricate 20 to 300 kg refractories.

Problems concerned with the mechanization and automation of laboratory tests for quality control and certification have not been given adequate attention by laboratories. Sampling, the preparation of specimens and testing require considerable physical effort. A system of complex automation of quality control including sampling is still to be elaborated. It is up to the research institutes to assume the responsibility.

It does not seem absolutely necessary to specify the initial softening point of ladle brick. The refractoriness of aluminosilicate refractories should be determined. The practice of the Semiluki Refractory Plant proved that by using raw material from the same deposit and with an invariable production process the calculation of refractoriness is more reliable than tests according to State Standards 4069-48.

Certifications on the technical properties of refractories according to a given production process should be prepared by each refractory plant. This practice would greatly facilitate the certification of refractories and enhance the responsibility of refractory plants for the quality of their goods.

BOOK REVIEW

"DINAS BRICK"

I.S. KAYNARSKYI
Metallurgizdat, 1961

This monograph deals with dinas refractories. The author discusses the physical and chemical properties as well as the practical aspects of the production and use of dinas bricks.

In the chapter "Physical and Chemical Bases and Production Process of Dinas Brick" silica minerals are discussed along with such problems as physical and chemical systems of silica with different oxides, conversion of silica properties of silica rock, binders, the preparation of dinas mixtures, the processes that occur during pressing, drying and burning of dinas brick. The author is the first Soviet writer to give a detailed account of the new silica inoculants coecite, citite, silica W and silica O and report on the existence of two inoculants for low-temperature tridymite, i.e. stable inoculant S and metastable inoculant M. The mechanism and kinetics of silica conversion are also explained in that chapter. The discussion of outside ions as a decisive factor in the diffusion mechanism of silica conversion is a novel

approach to the problem. The author considers the melt as a means to supply cations to the solid phase. He notes, *inter alia*, that there is no consensus on the mechanism of cristobalite conversion to tridymite.

The part of the book on the physical chemistry of silica closes with a discussion of the silica system in combination with various oxides and their importance for dinas production. Then, the author describes the physical and chemical processes that occur in the production of dinas, in general with a particular emphasis on pressing and firing.

The physical, chemical and technological data in the book are primarily a generalization of all aspects of Soviet Dinas production and of numerous investigations carried out in the Soviet Union over the past thirty years.

The chapter "General Dinas Brick Production" discusses the preparation of raw material, aggregates, powders and mixing techniques. It also deals with pressing, drying