COMING PROBLEMS FOR THE EASTERN INSTITUTE OF REFRACTORIES

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At the 23rd congress of the CPSU copious figures were presented on the successful work of our industry in recent years. At the same time it was mentioned that the advantages and benefits of the socialist system are not being completely used. The weakening of regional control by the regional-economic councils, the severing of scientific institutions from industrial concerns adversely affects the proper development of the refractories industry.

The variety and diversion of the refractories concerns controlled by different regional economic councils have delayed the execution of a single technical policy.

With the conversion to regional control of industry after the September (1965) plenum of the central committee, conditions were created for increasing technical levels and the use of the latest scientific achievements.

Problems of the Eastern Institute of Refractories in the new conditions of work consist of contributing to technical progress in refractories, increasing the quality of the goods, development of new effective types of refractories and highly refractory materials. Speeding up processes of combustion, extensive introduction of natural gas and oxygen, re-equipping high-temperature electric furnaces, the use of vacuum, and also the possibility of using new methods of heating, electron-beam melting and other new technical, improved methods will provide the refractories industry with methods of producing better materials. Together with the all-round improvement in the quality of mass-production it is necessary to create refractory materials which can work in new, heavier conditions.

An important task is the technical re-equipping of refractory production in the Urals. The directives of the 23rd congress specify more intense development of industry in the eastern regions of the country. At the present time in the east the industry makes 927,000 tons of refractories, including 286,000 tons in the Urals and 307,000 in Kazakhstan. To eliminate irrational bottlenecks we require the reconstruction of existing, and the building of new refractory plants.

It is specially important to select the proper trends in developing the refractory industry. It is necessary to organize in the east the production of kaolin refractories, fireclay class A, semiacid alumina-graphite, electrofusion-cast refractories, highly refractory products made from pure oxides, and non-oxide compounds. Special attention should be given to the production of refractory concretes and blocks of different composition.

It would be desirable to arrange the production of kaolin refractories at the Magnitogorsk Steel Combine. For this, it will be necessary to speed up the building of the factory for enriching Eleninsk kaolins. On the basis of Arkalyksk clays we should organize the production of class-A goods, mainly at the Bogdanovich factory and in the refractories department of the Chelyabinsk Steel Plant.

It is necessary to organize selective mining of clays at the Arkalyksk mine. In connection with the fact that the clays are mined indirectly with bauxites we should establish (by suitable calculations) how to stimulate the use of clays in the refractories industry of the Urals. All-round development of the Arkalyksk sources will permit us to reduce the cost of bauxites. During the 5-year plan in connection with the development of the metal industry it is necessary to put into action the first stage of the refractories produc-
tion department at the Karagandinsk metallurgical factory.

To supply the firebrick factories of the Urals with raw materials it is necessary to build a mine at the Berlinsk source of refractory clays.

An important problem is the development of semiacid refractories. It is known that semiacid clays in many cases can be used for making ladle brick, refractory products for the titano-magnesium industry and other purposes, when we require volume-stable products at high temperatures.

However, the production of these articles will be economically suitable since the use of semiacid clays permits the all-round use of all the stocks of clays which are extracted. The production of semiacid articles should be arranged at the Sukholozhsk and Kyshtymsk factories.

It is necessary to develop the production of lightweight refractories. Saving of fuel from the use of lightweight is substantial. It is necessary to arrange the production of lightweight refractories for different service conditions; firebrick for service at up to 1250°, silica for service up to 1600°.

We should also arrange the production of lightweight refractories for special conditions based on silicon carbide, corundum and zirconia.

A very important task is improving the quality of magnesia refractories which depends on the quality of the original materials. In connection with this it is necessary to accelerate the building of the plant for enriching magnesite in the "Magnesit" factory and to enrich chromite ores at the Domsk chromite mine. We should extend the production of forsterite refractories mainly at the Nizhne-Tagil'sk Combine on the basis of dunites and asbestos waste.

Extensive development should be carried out for the production of refractory concretes and blocks. In 1966-70 we should set up substantial capacity for the production of concretes and blocks.

It is necessary to accelerate the building of an experimental factory in the Eastern Institute of Refractories which will become the main base for semi-industrial production of new types of refractories and testing them in service. This will sharply accelerate the work done on scientific research, improve the quality, extend the range of products being developed, and accelerate the introduction of these products. The management of the Eastern Institute of Refractories intends to carry out a range of studies on improving the quality of refractories including a search for effective methods of enriching magnesites, obtaining dense metallurgical powders from caustic dust, increasing the density and thermal resistance of articles, the development of a method for producing articles based on fused magnesites, obtaining chrome-magnesite articles with a direct bond, improving the technology and improving the quality of forsterite refractories, the involvement, for their production, of new sources of raw materials, and also the development of rational applications; and finally, development of a technology for dense kaolin fireclay articles Class I, and semi-acid refractories.

It is necessary to continue investigations on lightweight refractories to obtain the technical-economic effectiveness for producing them with combustible additives by the semidry and plastic methods of pressing and also the foam method, to determine the most desirable region of their use, improve the technology of their production, equipment for grinding and mixing the bodies, the processes of obtaining foamed bodies, drying and firing the products.

The Eastern Institute of Refractories will carry out extensive work on the technology of refractories, concrete and blocks and magnesite, magnesite-chromite magnesia-silicate, corundum, high-alumina, fireclay and quartz aggregates using as the bond high-alumina cements, caustic magnesite, water glass, phosphates, etc. Much attention will be given to mechanizing the production of concretes and blocks on their basis. We are determining the rational dimensions and shapes for these products. The institute will offer help to concerns in organizing and developing technological processes, and systematic studies will be made of the behavior of concretes and blocks in service.

To increase the life of refractories the institute will develop compositions and methods of applying coatings to refractory linings by guncrete methods. It is intended to develop methods of guncreting the shafts of blast furnaces, walls, sloping sections, and the roofs of open-hearth furnaces, mixers and steel-casting ladles. Work will be continued on ramming bodies.

In 1966 the Eastern Institute of Refractories together with the Magnitogorsk steel combine and Makeev metallurgical factory will carry out work on guncreting the walls and roofs of open-hearth furnaces and