DIRECT REDUCTION OF PELLETS
OF THE DASHKESAN MAGNETITE CONCENTRATE BY NATURAL GAS
IN PURPOSES OF STEEL PRODUCTION IN AZERBAIJAN

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The improvement of the technology of dressing ores and concentrates, more
fuller and complex extraction of the useful components from the ore, and mastering of
the most rational ways of their processing and economic utilization directly in
Azerbaijan should be the main direction of development - of the mining and
metallurgical industries.

As many years of our investigation have shown, the development of the ferrous
metallurgy of the Republic consists in the rational use of resources of the iron-ore raw
material on the spot by means of direct reduction using natural gas and smelting of
high-quality steels in electric furnaces on the basis of iron-rich pellets. Production of
the iron-rich pellets will set up a strong raw material base of steel-smelting production
and close the missing link in the complete metallurgical cycle: ore - iron-rich
concentrate - metallized pellets - steel - products; it will allow enhancement of the
profitability of all ferrous metallurgy.

The Dashkesan magnetite ores are quite suitable for obtaining the rich
concentrates and superconcentrates with an iron content of 68 -70%. At one of the
production sections of the dressing works of the Azerbaijan Ore Dressing Plant, a
superconcentrate with an iron content of 70% was obtained, in accordance with our
proposed scheme of additional dressing of the industrial concentrate by separation in
step-change magnetic fields. The work on pelletizing these concentrates with water
by adding 0.5% of the local Dashsalakhlin bentonites, on the reduction of the pellets
with natural gas and with obtaining the iron-rich raw materials showed that the
strengthened metallized pellets obtained from the Dashkesan ore are quite suitable in
respect to their physical and chemical properties to be used in electric furnaces for
smelting high-quality steel.

Our investigations on all stages of processing Dashkesan ore and production
tests laid the scientific foundations for production without blast furnaces of iron to be
used for smelting steel and powder metallurgy, with a considerable reduction of
expenses and environmental pollution.