

## Overview of the steel industry in Russia

**Ferrous metallurgy** is one of the types of metallurgical industry orientation in Russia. The share of Russia in the world reserves of iron ore is 32% (57 billion tons), and their annual production in the country is 15% of the world. The share of the metallurgical industry in Russia's GDP (gross domestic product) is about 5%, in industrial production it amounts to about 18%, in exports – about 14%. The volume of metallurgical production is 1.87 trillion rubles (2009). Investments in fixed capital in metallurgical production are 280 billion rubles (2008). Average wages in metallurgical production is approximately 65,6 rubles / month.

The share of ferrous metallurgy in the volume of industrial production in Russia is about 10%. Ferrous metallurgy includes more than 1.5 thousand enterprises and organizations, 70% of them are city-forming. The number of employees is more than 660 thousand people. As of 2020, Russia ranked 4th in the world in steel production (73.4 million tons per year). Also, as of 2020, Russia ranks 4th in the world (after China Japan and South Korea) in exports of steel products (29.5 million tons per year).

In 2016, the share of production of ingots and cast billets produced in converters and electric furnaces in the total volume of steel production was 97.4%; the ratio of production of finished rolled products to steel smelting was 86.6%; share of flat rolled products (without coatings) in the total production of finished rolled products was 46.6%; the share of cold-rolled sheet in the total production of rolled sheet products (without coatings) was 29.1%.

Today in Russia there are 3 metallurgical bases: 1. Ural metallurgical base; 2. Central metallurgical base; 3. Siberian metallurgical base.

More than 80% of the volume of industrial production of the Russian ferrous metallurgy falls on 9 large companies: EvrazHolding (NTMK and ZSMK), Severstal, Novolipetsk Iron and Steel Works, Magnitogorsk Iron and Steel Works, Management Company Metalloinvest (Oskol Electrometallurgical Plant, Uralskaya Steel), Mechel (Izhstal), Pipe Metallurgical Company, United Metallurgical Company, Chelyabinsk Pipe Rolling Plant Group.

The smelting of steel for castings is very high, since the 1990s the CCM has been spread, earlier steel was poured into ingots. In 2017 47,800 thousand tons of steel were smelted in converters, 22,000 thousand tons – in electric furnaces, and 4,575 thousand tons in open-hearth furnaces (including 1,690 thousand tons in open-hearth furnaces).

Ferrous metallurgy products:

- production of hot-rolled steel (for 2017) – 48,640 thousand tons
- railway rails – 1289 thousand tons,
- heavy sections – 1522 thousand tons,
- reinforcing bars – 7247 thousand tons,
- wire rod – 3071 thousand tons,
- hot-rolled sheets – 5119 thousand tons,
- hot rolling, sheets and strips – 13,714 thousand tons,
- pipe products – 11603 thousand tons,
- underwater pipes – 3542 thousand tons,
- welded pipes – 7897 thousand tons,
- export of ingots – 15,141 thousand tons,
- export of long bars – 4467 thousand tons,
- export of flat products – 4748 thousand tons,
- export of pipes – 2156 thousand tons,
- internal use of steel – 44,396 thousand tons.

Pig iron production amounts to 52036 thousand tons, export of pig iron – 4819 thousand tons; production of hot briquetted iron (HBI) – 7200 thousand tons, export of hot briquetted iron 2848 thousand tons. Production of iron ore is 106 508 thousand tons, export of iron ore – 21 040 thousand tons.

HBI is obtained by direct reduction from iron ore or iron ore oxidized hot pellets, followed by pressing into briquettes (length is 100-110 mm, width – 45-55 mm, thickness – 32-38 mm, weight – 0.5-0.7 kg).

Direct reduced iron is used almost exclusively in electrometallurgy. The HBI manufacturing process is the most environmentally friendly way to produce iron today. Compared to pig iron production, energy consumption for HBI production is 35% lower and greenhouse gas emissions are 60% lower. Loading electric arc furnaces with HBI makes it possible to use higher smelting energy while increasing the productivity of the furnace. The blast furnace process in such production is excluded. Therefore, the use of HBI makes it possible to reduce the negative impact of metallurgical production on the environment, including by reducing emissions of carbon dioxide (sulfur oxide, etc.) into the atmosphere.



According to data for 2010, the share of non-ferrous metallurgy in Russian GDP is 2.6%, in industrial production – 10.2%.

As of 2008, Russia ranks 1st in the world in nickel production, nickel exports and aluminum exports, and 2nd in the world in aluminum production (after China) and titanium rolled products.