

**ECONOMIC EFFECT FROM IMPLEMENTATION  
OF CASTING TECHNOLOGIES**

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Across the country, hundreds of tons of HSS metal cutting tools fail every year due to natural wear and tear or breakdowns. A failed tool is utilized through the «Vtorchermet» system and sent for remelting to metallurgical plants to Russia and Ukraine. In the same way, technological waste of high-speed steel (shavings, unmeasured remnants of bars, strips, and so on) is disposed. To restore the instrumental park, Belarusian enterprises spend colossal funds for the purchase of high-speed steel outside the country.

Manufacturing of metal-cutting tools with the involvement of foundry technologies makes it possible to more rationally dispose expensive high-speed steel due to the repeated use of tool scrap during remelting. There is also a direct economy of high-speed steel, due to a decrease in the mass of cast workpieces, which more accurately copy the tool compared to prokat. As a result of a reduction in the volume of machining by cutting, the energy consumption and labor intensity of the manufacture of the tool are reduced.

In general, the prime cost of a cast tool is 30–50 % lower than that of a similar tool made of deformed high-speed steels. However, an even greater economic effect is achieved as a result of increasing the tool life when replacing deformed metal with cast metal using special methods for controlling the formation of its structure.

Attention is paid to the use of nanoscale powder elements and chemical compounds (nitrides, carbides, oxides, carbonitrides, etc.) when obtaining new materials and alloys. Possessing unique physicochemical and mechanical properties, they can affect the quality of the resulting alloys due to changes in the morphology of the crystallization and solidification process.