SibFU metallurgists developed non-stick coating without flaw

Scientists at the School of Non-Ferrous Metals and Materials Science of Siberian Federal University have developed technologies for producing aqueous and self-drying non-stick coatings based on natural and mechanically activated graphites used in the production of cast iron products. Results were published in the journal CIS Iron and Steel Review.

To make the surface of cast iron castings better, non-stick coatings are applied to the working surfaces of casting molds and cores — paints, which are a suspension consisting of a powdery refractory filler, a binder component, additives uniformly distributed in the solvent. The coating makes the mold less rough, and as a result, the surface of the casting is smoother and cleaner. In addition, the coating isolates the grains of the refractory filler from contact with metals, which reduces the burn on the surface of the castings.

"We offered a new model of «pseudo-sol-gel» formation of technological and operational properties, based on which an aqueous non-stick coating was developed, which has increased sedimentation stability (twice higher) and reduced strength (6–8 times higher), reduced thickness of the coating layer (1.5 times less) and the consumption of dry components, reduced by 30–40 % compared with a standard coating. We also managed to develop unique self-drying non-stick coating with increased density, viscosity and reduced strength. The thickness of the penetrating layer is increased up to 4.64 mm, and the thickness of the coating layer is reduced to 0.26 mm. This was made possible due to the partial replacement of natural graphite in the composition with mechanically activated one", — said **Tatyana Gilmanshina** Ph.D, Associate Professor at the Foundry Engineering Department of the School of Non-Ferrous Metals and Material Science.

This researches by Krasnoyarsk scientists will help reduce burn-in on the surface of iron castings by 70–85 % while reducing the roughness and size of graphite inclusions in the surface layer of the casting.

At present, the research results are being introduced at Krasnoyarskgrafit JSC, in the iron foundries of Yenisei Repair and Mechanical Plant OJSC, Siberian Tool Plant OJSC, and Rus Engineering LLC.

10 september 2019