

International conference Metrological support of innovative technologies-ICMSIT-2020

«Investigation of the effect of the method of extracting a part from a mold on the presence of stone-like defects in cast steels»

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Problem statement

- Defects are an integral part of any production process and should be kept to a minimum in order to improve product quality. In addition to casting defects, defects in the form of cracks (chips, layered cracks), layers with burnt carbon and carbonized layers, naphthalene and stone-like fractures, etc. can be found in castings.
- Naphthalene and rock-like fractures are the result of severe overheating of the metal before deformation or heat treatment. A naphthalene crack is classified as planar, with the characteristic luster of large grains in cross-section that reflect light. Stone-like fracture—classified as a matte fracture, according to the boundaries of large and small grains that reveal their cut. The naphthalene fracture has the reflectivity of the grain faces and is weakly dependent on the direction of illumination. To determine a rock-like fracture, on the contrary, certain conditions of heat treatment of samples enclosed in quenching and tempering are required.
- Especially often, a stone-like fracture occurs when casting on the produced models. This technology uses a single model made of a refractory ceramic coating that forms a ceramic mold. At the end of pouring and solidifying the metal, it is removed by knocking out.



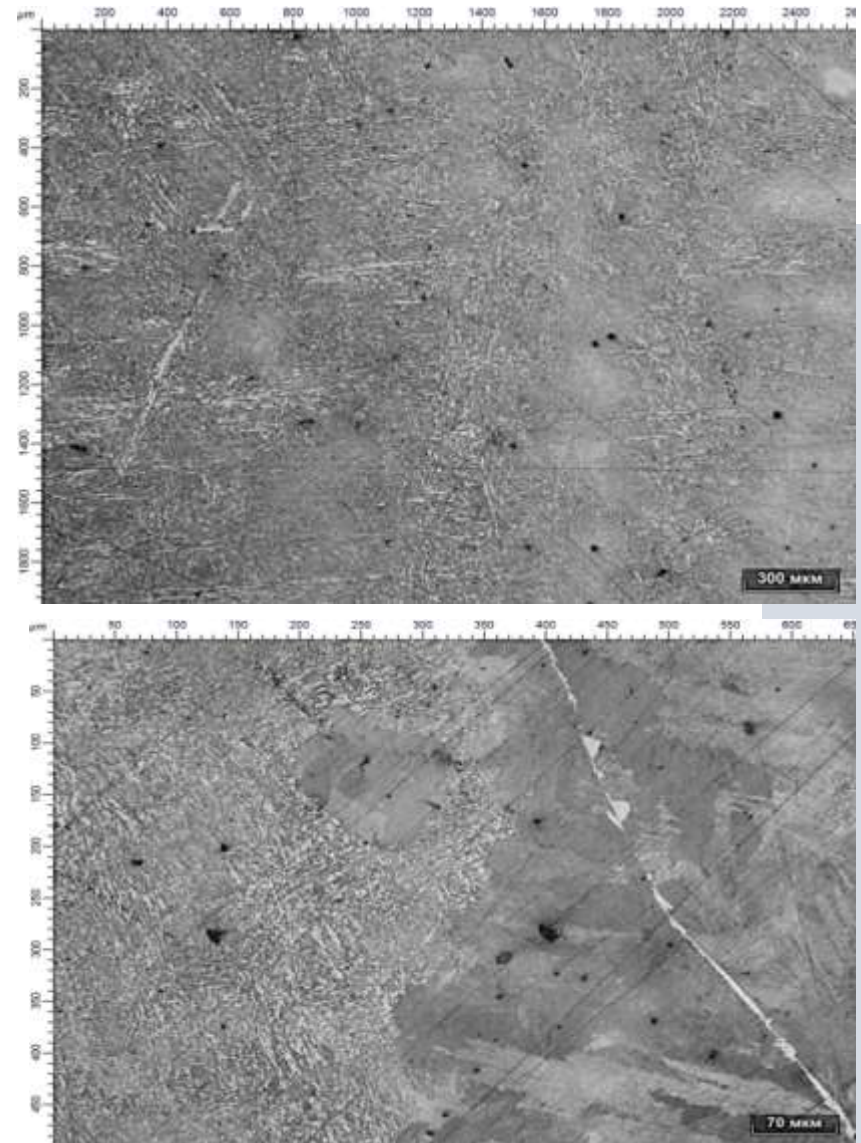
Solution methods

- To study the effect of knocking out castings from the ceramic molds on the presence of a stone-like fracture of 35XGSL steel, several batches of samples were examined after appropriate heat treatment. In addition to homogenization, tests were carried out on knocking out the casting from ceramic molds 15 minutes after pouring the metal, as well as after complete cooling of the casting. The hardness of the cast samples did not differ from each other, HB 285, in contrast to the microstructure



Conclusions

Results, implementation



- Microstructure of cast samples with different exposure times before casting
- - knocking out 15 minutes after casting;
- - knocking out after complete cooling of the casting



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