IMPROVING THE PROPERTIES AND RELIABITY OF OPERATION OF METAL STRUCTURES AT LOW CLIMATIC TEMPERATURES USING METHODS OF COMPLEX MODIFICATION OF PROTECTIVE COATINGS[1]

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The main way to improve the performance properties (wear and corrosion resistance) of products is surfacing coatings. Modern methods of surfacing, allow to regulate the speed of cooling of the surfacing zone, to control the processes of melting, crystallization and formation of the metal structure and, accordingly, its physical and mechanical properties. In this regard, an important task is to study the influence of technological modes of surfacing on the physical, mechanical and operational properties of the surfaced coatings of structural steels in order to increase their use of new filler materials modifying the melt, and pulsed energy, reducing the structural heterogeneity of the metal.

The aim of this work is the study of structure, physico-mechanical and service properties of deposited coatings using pulsed methods of welding with modification of molten metal composite powder materials with submicrocrystalline structure.

Samples from deposited compounds of steel 09G2S were investigated. surfacing was carried out by composite electrodes power source FEB-315 "MAGMA" with a remote "Pulse" to implement the pulse-arc process. Registration of parameters of the surfacing process was carried out using the device AWR-224 MD.

This paper presents a comprehensive approach to improve the properties of deposited coatings using the method of modification of materials by compounds of carbide and nitride of titanium with submicrocrystalline structure in the pulsed mode of welding.

The influence of modification by dispersed particles and electric arc influence on the structure, physical-mechanical and operational properties of coatings is studied. It is established that modification by refractory compounds with submicrocrystalline structure allows to increase dispersion of structure and hardness of coatings.

It is shown that the application of the pulsed-arc surfacing method with the modification of the molten metal by a composite powder material of carbide and chromium nitride and titanium with submicrocrystalline structures allows these hardening phases to be stored in the molten coating. Modification of coating compounds of carbide and nitride of chromium and titanium with submicrocrystalline structure in the pulsed mode of welding allows to increase the homogeneity of the structure of the deposited coating increases its hardness and durability.

The structure of the coating metal made by pulsed-arc surfacing does not contain a significant amount of extended dendrites in contrast to constant current surfacing. The use of surfacing electrodes T590 and EN-60M low-carbon steel 09G2S pulsed arc technology allows the formation of coatings with a fine-grained structure compared to those obtained at direct current.

It is experimentally confirmed that the use of new surfacing materials modified powders with submicrocrystalline structure under pulsed conditions surfacing coatings increases the performance of products operating at low climatic temperatures.

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