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PLASMA-LIQUID WELDING OF ELECTRICAL STEEL PRODUCTS *)

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Welding is one of the most common and significant methods in the field of metalworking. Metal welding equipment forms permanent connections of various components, structures and buildings, joining them by melting the surface, which leads to the formation of strong bonds between atoms. Currently, there are many welding methods, which can be divided into two main categories: metal fusion welding and metal deformation welding. All other methods are either combinations of them or their varieties [1].

Welding of electrical steel sheets is a common task used to join magnetic cores for both DC and AC electrical machines. The process of joining multilayer electrical steel sheets is influenced by several factors: the unique structure of the block consisting of hundreds of electrical steel sheets; insulating coatings on both sides of the sheet, which affect the dynamics of the molten pool during fusion welding and the formation of pores in the weld; and complex requirements for strength and magnetic properties [2].

The limits and prospects of plasma-liquid welding of products made of electrical steel grade E-310 by direct current electric discharge at atmospheric pressure were investigated [3], [4]. Welding of parts was carried out by immersing a metal cathode (welded products) into a liquid (nonmetallic) anode. Electrophysical parameters of welding were determined, including the volt-ampere characteristic, current and voltage fluctuations. The results of the analysis of the microhardness and morphology of the welded seam are presented.

References

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