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Welding by the shipped tungstic electrode of thick-walled designs of flying devices from titanic alloys

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For thick-walled responsible designs from titanic alloys it is recommended to use electron beam welding (EBW) which main advantages is a high quality of seams and significant depth penetration. To lacks EBW it is possible to relate high cost of the equipment and need for specially trained staff for service of the vacuum equipment.

In this connection under production conditions it is much more convenient to use welding by the shipped tungstic electrode (ITEW) which under the characteristics can make competition EBW in some cases.

Mechanical properties of the connections received ITEW, on different alloys, have high parameters and differ satisfactory stability.

Process ITEW is a version of automatic welding by a tungstic electrode in the environment of inert gases without application присадочной a wire.

The essence of way ITEW consists in embedding a column of the arc category and the end of a tungstic electrode surfaces of the basic welded material are lower.

The deterrent at use ITEW is unsatisfactory stability of standard tungstic electrodes use of welding currents above 1200 A.

With increase of diameter of an electrode the surface of a rounding off of a working end face, i.e. a working surface of an electrode is increased. On this surface the cathodic stain, and intensity current loadings on this surface settles down (the density of a current on a working surface j) defines its stability.

In practice it is possible to avoid destruction of an electrode on currents 1500 A and is higher only at welding short joints when during welding the electrode has not time to collapse; after each pass the electrode follows regrind.

In the cardinal image the designated problem is authorized by application of tungstic electrodes with toroidal sharpening.

The rounded surface toroidal an electrode in radius r is his working surface from which the ring arch is raised. The area of a working surface of a toroidal electrode can change in very wide limits.

If the area of a rounding off on a standard electrode in diameter makes of 10 mm×25.12 mm^2 the maximal working surface of a toroidal electrode in diameter makes of 10 mm×123 mm^2, that is five times it is

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more. So advanced area of a working surface of a toroidal electrode allows to predict his satisfactory stability a welding current about 2500 A, and depth penetration for one pass up to 60 mm.

The toroidal electrode favourably differs from analogues simplicity of execution and high dynamism of this basic characteristic. It is necessary to note rather high quality of received welded connections. Numerous researches have shown, that the welded seams executed by a shipped electrode, practically have no defects at strict observance of technology of assembly and welding, the form of a seam considerably does not vary, the factor of the form of a seam remains former. The comparative estimation of stability of electrodes with the toroidal and usual form of sharpening of a working part has shown, that electrodes with toroidal sharpening after welding do not change the geometrical parameters and weight.

The given data testify to the big potential opportunities of a toroidal electrode.