EXPLOSION WELDING

Description
Explosion welding is a unique method for producing continuous surface joints of two or more metals or alloys with an area of up to dozens of square meters. The applied layer can be 0.1-30 mm thick and the thickness of the base metal is not limited. By explosion welding, it is possible to join together almost all metals or alloys used in industry with a high durability of the joints. The durability of a joint, as a rule, exceeds that of the less durable metal or alloy. Explosion welding can be used to join together flat or cylindrical billets. The main dimensions of billets depend on the properties of the metals or alloys of which they are made. A new method of explosion welding for producing sheet billets of bimetals or multilayer metallic materials was developed, which yields durable joints of metals or alloys on an area of hundreds of square meters. In this case, the billet is a bimetal rolled in a multi-turn roll 0.5-1.5 meters high and one to several meters long, depending on the thickness of the metals or alloys to be welded. The metals to be joined are 0.1 mm to 2 mm thick.

Technical appraisal and economic benefits
Explosion welding, which is in fact “cold welding,” allows joining metals with different physicomechanical properties, for example, low-melting metals and alloys with steel and other refractory materials, which is difficult to achieve by other methods. Explosion welding can be used as the initial step in the production of bimetallic materials with subsequent rolling of the bimetallic billets to the required sizes. Compared to traditional explosion welding, the rolling method increases the efficiency of the technological process by severalfold and can be used in automated production processes followed by rolling, punching or other types of treatment.
**Application areas**
Ferrous and nonferrous metallurgy; machine building.
The use of steel-copper bimetal in the manufacture of parts for smelting furnaces considerably increases the service life of the latter and raises the equipment reliability. The use of steel-copper, steel-zirconium, etc. bimetals for the production of molds raises the reliability and the service life of machinery.
The joining of steel-aluminum alloys by explosion welding is used in the production of electrodes in the aluminum industry; the replacement of babbits in the heavily loaded plane bearings of diesel engines by steel-AO20 alloy plane bearings increases the service life and reduces production costs.

**Development stage**
The technology of producing materials and parts of machinery using explosion welding have been successfully employed for more than ten years by plants in Siberia, the European part of Russia, and abroad.

**Patent situation**
Patents can be granted but have not been applied for.
Know-how is available.

**Commercial offers**
Customized development of explosion welding technologies.
Production and delivery contract.
Contract for the fabrication and delivery of process equipment for explosion welding.

**Estimated cost**
Price is to be negotiated.

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