APPLICATION OF THE INTERNAL PROTECTIVE LAYER FROM CORROSION-RESISTANCE STEEL TO THE SURFACE OF A LONG-LENGHT PIPES WITH AN EXPLOSIVE WELDING[1]

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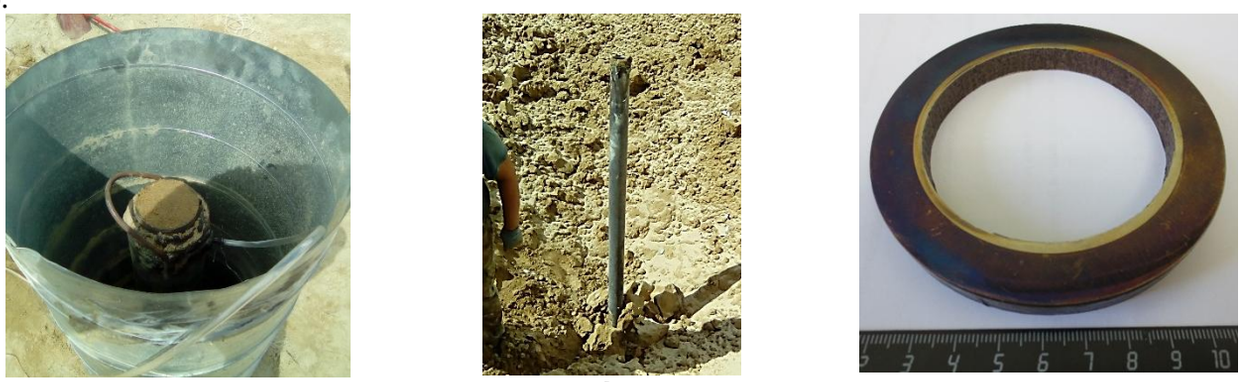
The using special types of metal coating leads to an increase in the service life of the equipment. There is a wide range of protective materials depending on operating conditions. There is a serious problem in the petroleum industries now. It consists in excessive wear of the inner surface of pump-compressor pipes. Consequently, at the report it is suggested that an explosive welding for the cladding inner side of a steel tube by corrosion-resistance steel. However, it should be noted that, in the practice of using explosive welding for the production of bimetallic pipes, there is such a problem as a significant reduction in the quality of the joint as the point of contact is far removed from the site of initiation [1]. At a distance of about 8-10 or more diameters from the point of initiation, the mechanical properties of the welded joint decreases and even leads to the destruction of the cladding layer. It should be noted that the quality of the connection is undoubtedly influenced by the gas in the gap between the welded pipes that is compressed and moves ahead of the contact point with hypersonic speed. Since in this case there is no lateral outflow of gas, there is an increase in its temperature and, accordingly, the temperature of the surfaces of the pipes in contact with the heated gas. As the distance from the initiation point increases, the gas warms up more and thus affects the stability of the process and the quality of the connection of the initial elements [2].

In the work were carried out experiments to evaluate of influence parameters of explosive welding and experimental scheme on the quality welding joint and the degree of deformation of the two layer tube blanks 2,5 meter length.

The raw materials used were pipes made of steel 37Mn2V (base layer 12 mm thick) and 08Cr18Ni10T steel (cladding layer 2,5 mm thick). The outer diameter of the pipe for the main layer was 108 mm and that of the stainless pipe was 80 mm. The pipes were 2,5 meter long. The welding gap was filled with an inert gas – helium. According to the scheme, the internal cavity of the collected pipes was filled with a solid-liquid medium as a mixture of a steel shot and water was used as the supporting element. The speed of the contact point was 2800–2900 m/s. Sandblasting was used to stabilize the detonation and prevent excessive expansion of explosives. As a result of experiments 2,5 meter samples of bimetallic tube billets were produced (Figure 1).



a b c

Figure 1 – Production of bimetallic tube: a – assemble before explosive welding; b – produced according bimetallic tube said method; c – bimetallic annular sample

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