

Abstract Submitted
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Explosive Welding of Pipes OLEG DRENNOV, ANDREY DRENNOV, OLGA BURTSEVA, RFNC-VNIIEF — For connection by welding it is suggested to use the explosive welding method. This method is rather new. Nevertheless, it has become commonly used among the technological developments. This method can be advantageous (saving material and physical resources) comparing to its statical analogs (electron-beam welding, argon-arc welding, plasma welding, gas welding, etc.), in particular, in hard-to-reach areas due to their geographic and climatic conditions. Explosive welding of cylindrical surfaces is performed by launching of welded layer along longitudinal axis of construction. During this procedure, it is required to provide reliable resistance against radial convergent strains. The traditional method is application of fillers of pipe cavity, which are dense cylindrical objects having special designs. However, when connecting pipes consecutively in pipelines by explosive welding, removal of the fillers becomes difficult and sometimes impossible. The suggestion is to use water as filler. The principle of non-compressibility of liquid under quasi-dynamic loading is used. In one-dimensional gasdynamic and elastic-plastic calculations we determined non-deformed mass of water (perturbations, which are moving in the axial direction with sound velocity, should not reach the layer end boundaries for 5-7 circulations of shock waves in the radial direction). Linear dimension of the water layer from the zone of pipe coupling along axis in each direction is $\geq 2R$, where R is the internal radius of pipe.

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