The hydrogen permeability of low-activation 10Cr12Mn20W and 10Cr9WV steels and the model welded joints were studied earlier [1,2]. Weldability of the 12Cr20Mn1W-type low-activation steels with 0,04; 0,1 and 0,26 % carbon content and doping of Ti (0,1 %) and B (0,0045 %) are studied now, as well as the structure and mechanical properties of welded joints. The steels were melted by VIM method and 50-100 kg ingots were produced. Use of high-purity initial elements and the melting method allowed to receive the material with limited content of high-activated elements (Nb, Co, Mo, Ni etc.).

The tendency to hot crack formation of the studied steels versus Cr18Ni10Ti steel was investigated by an “in situ” test. Thermally treated hot-rolling plates 12 and 3,5-mm thick and cold-rolling sheets 1-mm thick were used for welding. Butt gas tungsten are welding method with the same composition wire was used. The welding torch current was 100-140 A and the voltage was 10-12 V. The molten pool was protected by argon flow.

Welded joins were studied by tensile and impact toughness tests in 20-600°C temperature range. Effect of the prolonged ageing under 400 and 600°C on the structure and mechanical properties of the welded joins was estimated.

The structure of welds has been observed by optical and electron scanning microscopy. Results of tensile test, microstructure and impact toughness are presented in paper.

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