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Quasi-isentropic compression of gaseous helium in cylindrical constructions in pressure range from 130 to 500 GPa MIKHAIL ZHERNOKLETOV, VLADIMIR ARININ, VIKTOR BUZIN, YULIA GRIGORIEVA, NICHOLAS DAVYDOV, VIKTOR KHRUSTALEV, RUSSIAN FEDERAL NUCLEAR CENTER - VNIIEF TEAM — The work includes results of experiments on research of gaseous helium with initial density $\rho_{0He} = 0.019$ g/cm^3 when compressing it in cylindrical constructions, which transform shock compression to quasi-isentropic compression. Using the techniques of preliminary static compression by pressure of 12 MPa and dynamic compression with use of HE, pressures from 130 to 460 GPa were achieved in helium at densities from 1.3 to 2.3 g/cm^3. The helium density was determined by the X-ray radiography method basing on location of boundaries of the steel shells, which compressed gas. For recording X-ray images of the shells in the experiments, we used the diagnostics system, including the DC-complex for digital X-ray radiography. The pressures were obtained basing on gasdynamic calculations. Experimental data were compared to calculations by the helium EOS, which had been developed basing on the updated model of compressed covolume. The obtained data testify to absence of anomalies due to phase transition in the investigated area of pressures and densities.

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