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Constitutive Modelling of Shock Compression of a Porous Copper ANATOLY RESNYANSKY, Weapons Systems Division, Defence Science and Technology Organisation — A substantial number of equations of state have been built up from the Hugoniot data obtained from laboratory and undeground nuclear tests. It is generally accepted that testing porous modifications of a material allows researchers to move into the high temperature area of material states. Therefore, the pressure-volume data restored from the porous Hugoniots are very valuable. However, a large amount of the Hugoniots have been obtained from the shock velocity data in a porous samples and in a standard. Primary experimental methods employed for such measurements are time-of-arrival methods, for instance, methods using the pin technique. The present work analyses the data for the material porosity m=4 using a constitutive two-phase rate-sensitive model that was used earlier for description of experimental stress profiles in dry and hydrated sand. The model employs conventional equations of states for the phases of porous copper and available compression curve obtained in independent gas gun experiments. The modelling results demonstrate a good description of the test data.

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