

Abstract Submitted  
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**Studies on the Fracture of HR-2 Steel Cylinder under Imploding**

HAIBO HU, TIEGANG TANG, QINGZHONG LI, XUELING SUN — The fracture phenomena of HR-2 steel cylinder under implosion loading are studied by the dynamic technologies of X-flash photography and high-speed photography. The results of X-flash photography show that the thermo-plastic instability and fracture have occurred in the HR-2 steel cylinder wall during the implosion loading process. The initiation and propagation processes of cracks on the inner wall of the hemi-cylinder have been directly observed by the high-speed photography. The comparison between the two kinds of experimental results shows that the cracks initiate firstly in the inner wall of the steel cylinder. There are clear shear characteristics on the collected fragments. The metallography examinations show that the adiabatic shear bands and microcracks initiate first near the inner wall of the steel cylinder, and propagate along the maximum shear stress paths, which agrees with the previous deduction of experiments. With loading pressure increasing, the dimension of fragments and the width of ABS both become smaller.

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