

ABSTRACT

Development of the Manufacturing Capabilities of the Hydrostatic Extrusion Process

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The purpose of the present program is to develop the manufacturing capabilities of the hydrostatic extrusion process. Specific applications to be studied are fabrication of wire, tubing, and shapes from relatively difficult-to-work materials such as refractory metal alloys, high-strength steels and aluminum alloys, titanium alloys, beryllium, and other selected materials.

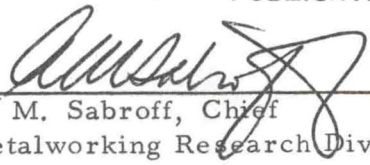
During this interim report period, investigation of critical process variables was continued for cold hydrostatic extrusion of AISI 4340 steel, 7075-0 Al, and Ti-6Al-4V. Also, initial attempts were made to extrude beryllium at room temperature. In addition, a pressure transducer, designed and fabricated under this program, for use at high pressures and elevated temperatures was calibrated. Some of the important cold hydrostatic extrusion results include

- (1) extrusion of Ti-6Al-4V alloy rounds at a ratio of 3.33:1 with surface finishes in the order of 25 microinches, rms, made possible by an improved lubrication system
- (2) extrusion of AISI 4340 steel tubing at a ratio of 3.77:1 (74 percent area reduction) with excellent surface finishes
- (3) extrusion of beryllium at a ratio of 2.5:1 (60 percent area reduction) with partial success, indicating that die design modifications may help to overcome surface-cracking problems.

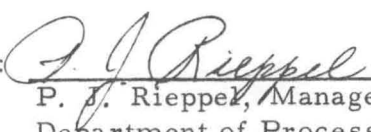
Another phase of the program initiated during this report period was the fabrication of beryllium wire by the hydrostatic process; the major effort in this area included tooling design and material procurement. It is expected that extrusion and drawing of beryllium wire will be started during the next interim report period.

PUBLICATION REVIEW

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