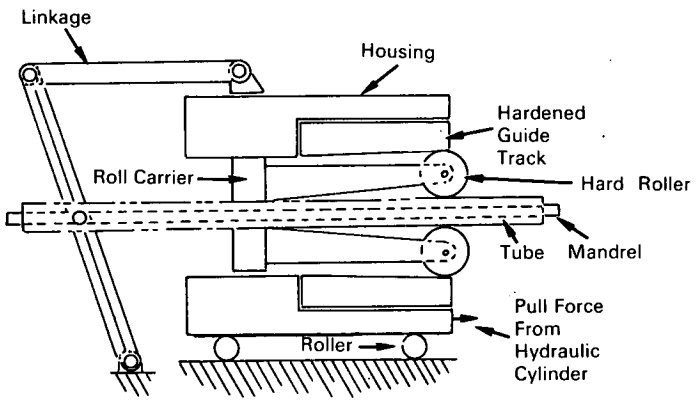
AEC-NASA TECH BRIEF

Metal Tube Reducer Is Inexpensive and Simple to Operate



The problem:

To construct a device to reduce tube diameters, which is accurate, simple to operate, and inexpensive. Existing commercial tube reducing equipment is extremely expensive.

The solution:

A simple, low-cost tube reducer, a modification of an earlier device, which accepts tubing up to 1 inch outer diameter and can reduce this diameter to less than 1/2-inch with controlled wall thickness. A reciprocating three-cluster roll housing, traveling along tapered guide tracks, flows the tube wall over a mandrel or plug to reduce the tube cross-section. A mechanical linkage provides the carrier and housing motion required for the reducing operation.

How it's done:

The three-roll tube reducer, shown in the schematic diagram, consists of a reciprocating housing having three tapered guide tracks at the working end. A carrier for the three rolls is attached to a piston plate, which is driven by a mechanical linkage at half the reciprocating speed of the housing. The reciprocating motion is provided by a hydraulic cylinder.

The tube to be reduced is slipped over the mandrel or plug whose opposite end is held in a feed-index mechanism. Each time the rolls travel across the tube to reduce its cross-section, the tube is rotated 60° and the pass is duplicated. The tube is then advanced a predetermined amount, and the reducing-rolling action is repeated. The sequence is duplicated until the entire tube is reduced to the required outer diameter and wall thickness.

Notes:

1. The tube reducer has been used on stainless steels, Zircaloys, vanadium-base alloys and soft metals such as copper.
2. This device can reduce all of the tube without waste, an important factor when handling high-priced alloys. It produces extremely good surface finishes, with the outside and inside diameters true within 0.003-inch diameter. This device costs approximately 1/20 of existing devices.

(continued overleaf)

3. Additional details are contained in the following, Argonne National Laboratory publications: (a) ANL-7127, p. 18–20; (b) ANL-7176, p. 27–29; and (c) CAPE Dwg. No. 1549. Purchase orders for these reports ($3.00 each), microfiche ($0.65 each) and orders and inquiries regarding CAPE packages in full print or microcopy forms should be sent directly to Clearinghouse for Federal Scientific and Technical Information, Springfield, Va. 22151.
4. Inquiries concerning this innovation may be directed to:

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Patent status:

Inquiries about obtaining rights for commercial use of this innovation maybe made to:

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