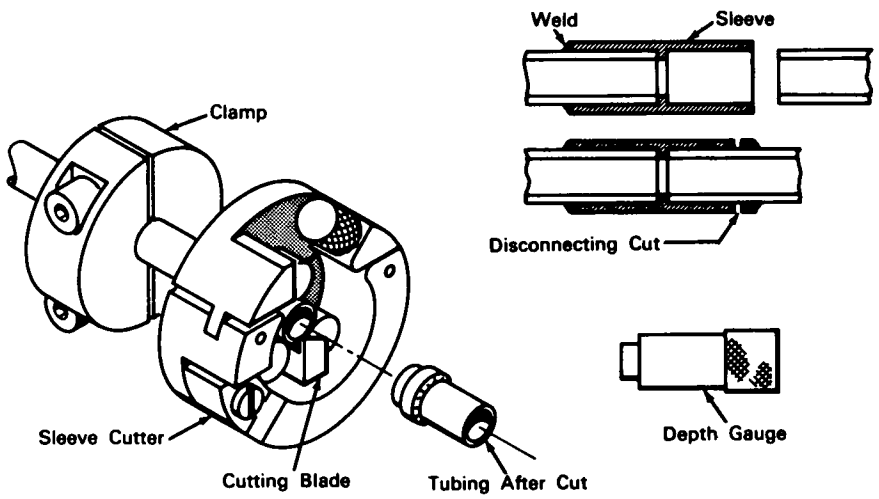
NASA TECH BRIEF

Sleeve and Cutter Simplify Disconnecting Welded Joint in Tubing



The problem: When equipment is constructed for extreme conditions, the tubing joints normally are welded. In order to test such equipment before it leaves the plant, the manufacturer may have to disconnect the welded joints. Subsequent reassembly requires rewelding of the joints. A new method of making welded joints in tubing is needed that will facilitate disconnecting and rewelding. Threaded fittings, or others that can be uncoupled mechanically, are not suitable for certain extreme environmental conditions.

The solution: A nonstandard welding sleeve that permits the pipe or tubing to be welded and then disconnected by means of a sleeve cutter designed for that purpose.

How it's done: The welding sleeve has an internal annular collar near the center of the sleeve, which acts as a stop for the tubing. Pipe can be joined by inserting it into the sleeve and then welding only at the outer end of the sleeve.

When the joint is to be disconnected, the weld is left in place and the cutting tool is placed around the sleeve. One of the distinctive features of the cutting tool is a depth gauge that allows the cutter blade to be set for the depth of cut. Use of the gauges assures that only the sleeve will be cut and not the tubing itself. The cutting tool is first clamped around the tubing or pipe. The blade is then set for depth of cut, and locked in place.

A circular clamp is placed behind the cutting tool to prevent lateral movement during the cutting operation. The sleeve can be cut and rewelded several times with none of the problems usually found in melting and remaking a welded joint.

Notes:

1. Where leaktight joints are a special problem, as, for example, in refrigeration and air-conditioning systems, this sleeve and cutter technique would prove useful, especially in large commercial systems.

(continued overleaf)

2. While the cost of welded sleeve joints is higher than that of conventional coupling methods, the special advantages may warrant its use in a number of applications. Further development could simplify the cutting tool, and it might be possible to add a depth cutting device to standard pipe or tubing cutters.

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

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