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Space Nuclear Systems Office

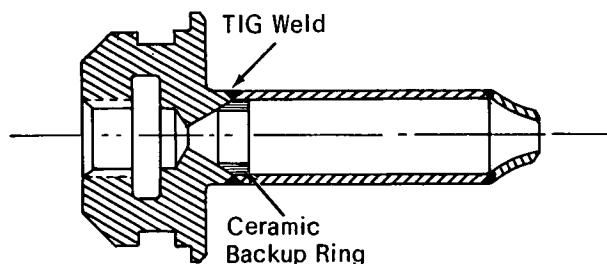


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Ceramic Backup Ring Prevents Undesirable Weld-Metal Buildup

The problem:

A common welding difficulty is the penetration of weld metal to the back side of the weld joint, leaving a metal buildup which must be removed



by grinding. If the buildup occurs in a restricted area, such as the inside of a small-diameter tube, removal without damage to the joint becomes extremely difficult.

The solution:

Use an easily removable ceramic backup material butted against the back of the weld zone to prevent the buildup of weld metal at that site.

How it's done:

In a typical, difficult welding configuration (see fig.), a heat-resistant ceramic ring is slip-fitted to the inside diameter of the two pieces to be welded. The ring, machined from a commercial vitreous aluminum silicate, spans the weld junction. After

welding is completed, the ring is easily chipped out, leaving a highly smooth inner surface.

This method has been successfully used in the manual tungsten-inert gas (TIG) welding of 316 corrosion resistant steel (CRES) pieces with a 0.76 cm (0.30 in.) throat diameter and a 1.57 cm (0.64 in.) pipe i.d.

Notes:

1. The use of removable backup material to prevent weld metal buildup is not restricted to TIG welding.
2. A variation of this method has previously been employed in ship riveting.
3. Requests for further information may be directed to:

Technology Utilization Officer
AEC-NASA Space Nuclear Systems Office
U.S. Atomic Energy Commission
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No patent action is contemplated by AEC or NASA.

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