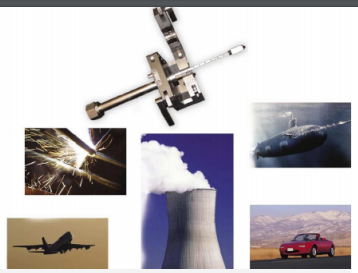

National Aeronautics and Space Administration

Mechanical and Fluid Systems

Fast, Precise Dead-End Welding Device

for superior, high-quality welds in tubing

NASA Goddard Space Flight Center invites companies to license this dead-end welding device for use in the welding of tubing. This technology solves the problem of unacceptable welds in dead-end configurations. This technology produces consistently high quality dead-end welds in a fraction of the time required when using conventional welding techniques.

BENEFITS

- Fast: By eliminating the need for multiple practice runs in order to get an acceptable bead, this technology sig-nificantly saves time in the welding process;
- Precise: The technology allows monitoring and precision control of the internal purge pressure for dead-end welds;
- High quality: Consistently above NASAs standard requirements, the dead-end welds produced with this technology are consistent, structurally sound, and of high quality; and
- Versatile: The technology has been proven effective on many alloys and in many configurations.

technology solution

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THE TECHNOLOGY

The welding of tubing presents specific challenges, particularly in dead-end configurations. In order to meet welding standards, typical tubal welding requires an internal gas flow-through purge with a restrictor on the end of the purge component. The restrictor controls the internal pressure to prevent the weld from falling in or blowing out. When confronted with a tubes closed end (i.e., a dead-end configuration), however, the gas purge has no exit. The increase in pressure within the component produces a faulty weld. Using conventional techniques, the only way to get an acceptable weld in a dead-end configuration is to do numerous practice welds before welding the actual component.

By controlling the internal pressure of the gas purge during welding, this new technology produces consistently reliable and high quality welds with minimal setup time.

The unique device is composed of a vent tube with vent holes, a gas supply, a flexible Teflon tube connected to a flow meter, and a T fitting (see diagram). Gas flows from the gas supply to the T fitting and then flows through the tube to the dead-end weld configuration assembly. As the pressure within the tube increases, the flow of gas exits through holes in the vent tube and escapes through the Teflon tube. The flow meter, which is attached to the Teflon tube and preset to a specific value based on the tube size, regulates the pressure along the Teflon tubing.

This technology has been proven to be highly successful with many dead-end weld configurations as well as with various alloys. It produces a consistently higher quality dead-end weld than conventional welding techniques and does so in a fraction of the time. Its monitoring capability enables precision control in any dead-end configuration. It is a reliable and very low maintenance device that presents no safety concerns.

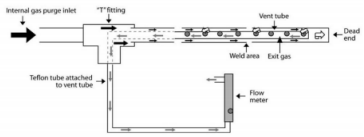

Diagram of Dead-End Welding Device

APPLICATIONS

The technology has several potential applications:

- Pneumatic or hydraulic tubing
- Submarines
- Satellite propulsion systems
- Nuclear power plants
- High-purity gas processing facilities
- Brake lines
- Automobiles
- Aircraft

PUBLICATIONS

Patent No: 7,992,760