

#### 4.7 Fast Precise Dead-End Welding Device

**Statement:** This technology solves the problem of unacceptable welds in dead-end configurations. It produces consistently high-quality dead-end welds in a fraction of time required when using conventional welding techniques.

**Problem:** The welding of tubing presents specific challenges, particularly in dead-end configurations. 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 tube 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.

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

**Technology description:** 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. 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.

**Benefits of the product:** 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. This technology is:

- **Fast:** By eliminating the need for multiple practice runs to get an acceptable bead, this technology significantly 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:** The dead-end welds produced with this technology are consistent, structurally sound, and of high quality.
- **Versatile:** The technology has been proven effective on many alloys and in many configurations.

**Areas of application:** The technology can have many industrial applications where welding is required:

- Pneumatic or hydraulic tubing.
- Fossil and nuclear power plants.
- Gas processing facilities.
- Brake lines.
- Transportation.