WA Technology

Optimize Shielding Gas Use and Eliminate Waste –LWM-SG

Assign your lead welder, welding foreman or welding supervisor the task of measuring gas flow. Have them review the information provided in our ***"Lean Welding Manufacturing–Shielding Gas" –Learning Program; (Part Number LWM-SG)*** that defines the maximum shielding gas flow rates that should be used. It shows excess shielding gas pulls air into the gas stream making shielding quality worse not better. It recommends measuring flow at the MIG gun nozzle on all welding machines and discusses desirable flow rates with all welding related employees.

Setting the proper gas flow rate is very important. Unfortunately welders often follow the adage, **"If some gas is good more must be better."** Our training material outlines the **maximum flow that should be used** before air is pulled into the shielding gas stream. It defines **how much draft or wind can be tolerated** in MIG welding and why increasing flow beyond defined levels makes shielding worse not better.

With a little monthly information from purchasing, total shop shielding gas purchases divided by the pounds of wire purchased can be plotted. A simple way is shown to develop a 3 to 6 month rolling average of this ratio to raise a red flag when values increase. Benchmark data is provided for comparison.

Findings can be communicated to all those involved in welding by posting on a manufacturing bulletin board **a simple "Gas Usage" moving average graph** that is easy to understand. Maintaining a focus on gas usage will reinforce waste and poor weld performance that occurs from excessive gas flow rates occurring at the weld start.

An understanding of gas waste due to weld start surge is presented and a simple solution defined. How this gas surge creates start problems is also discussed.

You'll Receive a 7 Module Learning Program That Includes:

- Over 70 pages of bullet points, figures, graphs and tables.
- A method of making an Excel Spreadsheet is included allowing simple calculation of a pipeline and hose gas leak rate. Methods of finding leaks including the use of an Ultrasonic leak detector are presented.
- Notes are supplied for each page.
- Information defining problems associated with excess gas use.
- Training material they can be used to educate all welders.
- Production data shows how weld quality improved with a reduction in weld start surge.
- A method to check gas flow rates at the MIG gun nozzle and compare flows with flowmeter or flowgauge.
- Example tables show ways the data can be recorded and maintained.
- Information on why gun and flowmeter flow rates will be different. If significantly different, possible reasons and solutions are provided to fix the problems.
- A suggested approach to plot purchase data each month is suggested to keep a focus on gas waste problems and monitors results for each welding machine.
- Examples of gas usage and savings are provided and explained.
- Information showing a 0.035 " leak in a 50 psi gas pipeline or hose can cost over **$14,000/year**. Fixing one leak will provide a very quick payback this programs cost!
- Separate questions and answers can be provided, if desired.

Module Titles and Outline

Module 1 - Overview and Summary Outline

- Summary of what is covered in each of the Learning Modules.

Module 2 - Reasons for Gas Waste

- Average user of MIG welding uses 3 to 6 times as much shielding gas as necessary.
- Published references documenting losses. Three reasons for losses are covered:
  1. **Excess gas surge at each weld start creates waste and increased weld spatter**
  2. **Excess flow settings**
  3. **Leaks**

Module 3 - Reasons for Gas Surge at Weld Start

- High Pressure in gas delivery hose creates excess gas surge flow
- Discussion of "Choked Flow"
- Reasons for high gas pressures

Module 4 - Solution to Excess Start Gas Surge

- Simple patented solution, ***Gas Saver System (GSS)*** reviewed
- How ***GSS*** works:
- Production examples of savings
- Conventional applications
- Installation
- Payback calculations
- Need for extra gas at start
- Past solutions create other problems
- Simple orifice can reduce surge flow but may not save significant gas!
- High pressure needed for automatic
- flow compensation
- Restriction orifice controlling flow create problems
- Where flow restrictions come from in production.
- How "Choked Flow" automatically compensates for changing flow restrictions.

Module 5 - Setting Proper Gas Flow Rates (Why more isn't better)

- Flow that creates turbulence –TWI
- Tests to check flow needed to handle drafts
- Production result confirms benefits of surge reduction
- Minimum flow rates
- A recently patented lock is discussed that fits most flowmeters used on cylinders and pipelines.

Module 6 - Gas Leaks and Solutions

- Leaks in fittings and solenoid
- Leaks in MIG gun gas connections
- Leaks in cylinder valve
- Leaks in pipeline
- Pressure decay test to quantify the amount of leaks in a pipeline system.

Includes method of preparing an Excel Spreadsheet to make calculations easy.

- Method of estimating you're your shielding gas usage should be relative to wire purchases
- Method of preparing a 3 to 6 month moving average of gas versus wire usage ratio
- Other methods of finding leaks including Ultrasonic Leak Detectors

Module 7 - Advanced Topics

- Gas leaking out of a hose or fitting means air is leaking back in!
- Ideal Gas Delivery System
- For pipeline gas supply an orifice can be used effectively to set desired flow rate.

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