IN THIS ISSUE:

THE LATEST NEWS FROM OUR UK HQ

TECHNICAL ARTICLE:
DAIRY AND FOOD PIPE WELDING

WELD PURGING PRODUCTS INNOVATORS, MANUFACTURERS AND INTERNATIONALLY RENOWNED SPECIALISTS
WHAT’S IN THIS MONTH’S ISSUE

Introducing the NEW PurgEye® 100 .................................................. 3
TEG-1000 Tungsten Electrode Grinder ........................................... 4
Argweld® Weld Trailing Shields ......................................................... 5
Technical Paper: Dairy and Food Pipe Welding ................................. 7 - 9

A WELCOME FROM THE EDITOR

Dear Reader,

Welcome to issue six of Weld Purging World for 2022. Can you believe that we are already halfway through 2022?

We are very excited to be launching our NEW PurgEye® 100 Weld Purge Monitor®, which is featured on page 2.

On page 7 you will find our Technical Article Dairy and Food Pipe Welding, which discusses adequate inert gas coverage in complex dairy processing plant pipework.

If you have any information that you would like to be featured in future issues of this publication, please contact me.

As always, we hope you enjoy the issue.

Best wishes,
Michaela
Marketing and Social Media Manager
michaelahess@huntingdonfusion.com

CALENDAR: EVENTS IN THE INDUSTRY

TechniShow
30 Aug - 2 Sep 2022
Holland

ADIPEC
31 Oct - 3 Nov 2022
Abu Dhabi

FABTECH
8 - 10 Nov 2022
Atlanta, USA
This month we have unveiled our updated PurgEye® 100, with new features that place this monitor at the forefront of Weld Purge Monitoring.

Weld Purging requires the removal of oxygen and it is important that welders know exactly when it is safe to start welding to ensure welds remain free from oxidation. This state-of-the-art Weld Purge Monitor® accurately reads down to 100ppm, suitable for welding stainless steel.

Technical Sales Manager Luke Keane said: “We are very excited to be launching our new PurgEye® 100. Guesswork is eliminated with the monitor and welders can know exactly what the oxygen content is before, during and after welding.”

The hand held PurgEye® 100 now features a metal housing, which has been upgraded from a plastic one. Readings are from atmospheric oxygen level (20.94%), right down to 100 ppm (0.01%) of oxygen.

The PurgEye® 100 is IP65 rated and comes with leak-tight push buttons, auto calibration features, vacuum-sealed leak-tight probe assembly and wrist/neck strap.

Boasting a clear, easy to read LCD screen, the PurgEye® 100’s display features a low battery icon as well as the low sensor icon. When the monitor is not in use, an automatic sleep mode activates to conserve battery life.

The Weld Purge Monitor® was invented by HFT® in the 1970’s and with over 45 years of innovation, design and manufacturing experience. The Argweld® product line is the only one to offer a complete Family of PurgEye® Weld Purge Monitors® to measure oxygen levels from atmospheric content (20.94%) down to 1 ppm (accurate to 10 ppm) for all applications and to suit every budget.
Proud to be referred to as World Leading Designers of Weld Purging Equipment, we continue to manufacture the very popular Tungsten Electrode Grinder at our UK HQ.

Celebrating 47 years of successful business this year and with our UK HQ located in Burry Port, Carmarthenshire, we are proud to continue to contribute to the British Manufacturing Industry.

All of our Weld Purge Monitors® and Inflatable Pipe Purging Systems are manufactured right here in the UK and we are proud to have our TEG-1000 Tungsten Electrode Grinder on that list too.

Using a Grinder that has been designed and manufactured specifically for tungsten metal is not only a much safer option, they provide more accurate results leading to as many as ten times greater number of arc strikes and giving very directional arcs without flicker or wander.

The use of the TEG-1000 Grinder will give repeatable Tungsten Electrode points every time, enabling consistent arc performance and welding results. Sizes 1.0 to 3.2 mm can be ground as standard, with other sizes catered for on request.

TIG welding requires Tungsten Electrodes to have perfectly ground and polished tips. HFT®’s TEG-1000 provides these, time after time, to exactly the same size and shape. The design of the TEG-1000 is such, that the diamond wheel grinds the Tungsten Electrodes longitudinally, preventing arc flicker or wander caused by circumferential lines or ridges found on electrodes, which have been ground incorrectly.
Protecting titanium and stainless steel welds from coming into contact with air whilst they cool prevents oxidation, weld defects and rework.

Our recently re-designed Weld Trailing Shields® provide an additional inert gas coverage during welding, preventing the hot metal from coming into contact with air while it cools.

Along with the new sleek design, our Trailing Shields® have a Unique clip design, which means the welder can interchange different trailing shield sizes without having to change the welding torch.

With our name and logo stamped onto every new Trailing Shield, you can be sure the Shield you are using is a HFT design. We manufacture our Weld Trailing Shields® right here in the UK so we can guarantee quality and 100% craftsmanship.

The low cost, lightweight Argweld® Trailing Shields® will fit any make of TIG, MIG or Plasma (GTAW, GMAW, PAW) welding torch for welding flat sheet or plate and the OD or ID of tubes or pipes. For pipes and vessels the radiused versions are manufactured to suit diameters from 25 mm and upwards.

By using an Argweld® Trailing Shield® welds will be left bright and shiny and eliminate discolouration and oxidation. The silicone (side skirt) gasket is resistant to temperatures up to 230°C.

Titanium and stainless steels are chosen for their corrosion resistant properties in particular and if they are then allowed to oxidise during the weld cycle, expensive post welding cleaning techniques become necessary. Using a Trailing Shield® guarantees an oxide free, zero colour, bright shiny weld, time and time again.
Argweld Weld Trailing Shields®

For Additional Inert Gas Coverage During Stainless Steel and Titanium Welding

INVENTORS, INNOVATORS, DEVELOPERS and MANUFACTURERS of WELD PURGING ACCESSORIES

www.huntingdonfusion.com
Most industries using stainless steel pipes do so because of their corrosion resistance.

The dairy and food sectors are major users since the end products must be contamination free. Pipe and tube joints inevitably contain crevices and any build-up of contaminants here present a potential problem. Large facilities manufactured by major producers such as Alfa Laval AB in Sweden can contain not metres but kilometres of pipes and joints.

Welded joints are common. Well made, they offer a smooth transition from one section to another, high strength and are cosmetically attractive. However, the welding process itself can lead to significant loss of corrosion resistance in the joint area and a reduction in mechanical properties unless precautions are taken to prevent oxidation.

Welds carried out on most metals without adequate inert gas coverage oxidise. The effect is even noticeable with many stainless steels. To some, the discolouration due to oxidation is an inconvenient feature that can be removed after welding, but this may be difficult and costly, especially if access is restricted. Unfortunately, any oxidation can result directly in a reduction in corrosion resistance and in some cases loss of mechanical strength. This is significant in dairy and food pipe applications where stainless steels are employed principally for their corrosion resistance and mechanical properties.

It will come as a surprise to many that oxygen contents as low as 50 ppm (0.005%) in the protective gas can produce discolouration or ‘heat tint’.
Fig 1a. The result of unprotected underbead in welded austenitic stainless steel

Fig 1b. To ensure no discolouration occurs the oxygen content needs to be reduced to 20 ppm (0.002%).

The Mechanism of Corrosion

Stainless steels owe their resistance to corrosion to the formation of a very thin (10-5 mm), transparent surface layer of chromium oxide. This provides a passive film that acts as a barrier to penetration by an invasive environment. When heated to a high temperature in the presence of oxygen this film increases in thickness until it becomes visible – the colour becomes darker with increasing film thickness.

At a critical film thickness the film becomes unstable and begins to break down. The fractured zones created offer sites for localised corrosion.

Protection is thus essential and this is achieved by surrounding the joint with an inert gas such as argon or helium. The gas shield associated with a GTAW torch will protect the upper surface of the joint but the inside of pipes and tubes needs special attention. To meet the need for total internal protection, called weld purging, dedicated equipment has evolved over the past 25 years.
Pipe and tube purging

Systems for weld root protection are based on sealing the inside of a pipe on either side of the weld zone then displacing air with an inert gas. The seals must be reliable and leak tight, effective and easy to insert and remove.

Residual oxygen measurement instruments

Any effective weld purge process needs to be supported by suitable oxygen detecting equipment. Weld purge monitors have now been developed to meet the need for reliable, robust and sensitive measurements.

For reactive and refractory alloy welding these must be capable of measuring oxygen levels down to 10 ppm.

As an example, the PurgEye® 600 instrument manufactured by Huntingdon Fusion Techniques reads down to 10 ppm with extreme accuracy and has a display range from 1,000 to 10 ppm.

The entire Argweld product range is supported by an extensive library of publications including Technical Notes, White Papers, Conference Proceedings and peer-reviewed International Articles. These are available on-line by application to Huntingdon Fusion Techniques Ltd.

References

1. Microbiologically influenced corrosion of stainless steel, 2nd symposium on orbital welding in high purity industries, La Baule, France
5. ASM International. Corrosion in Weldments. 2006
6. www.huntingdonfusion.com

Fig 2. The Argweld® PurgEye® 600 Weld Purge Monitor®, has a USB connection and data logging capability allowing the operator ease of data transfer without the need for a computer connection.
PurgEye® 100
IP65
Sealed dustproof and waterproof
Long life sensor and self calibrating

Scientifically Designed for Welding

INVENTORS, INNOVATORS, DEVELOPERS and MANUFACTURERS of WELD PURGE MONITORS®

www.huntingdonfusion.com