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ARGWELD WELD TRAILING SHIELDS®

A MESSAGE FROM OUR CHAIRMAN

MAJOR ADVANCES IN WELD PURGE TECHNOLOGY

WELD PURGING PRODUCTS INNOVATORS, MANUFACTURERS AND INTERNATIONALLY RENOWNED SPECIALISTS

MADE IN WALES ‘MANUFACTURER OF THE YEAR’ & WELSH BUSINESS AWARDS – EXPORTER OF THE YEAR

WWW.HUNTINGDONFUSION.COM
Dear Reader,

Welcome to the second issue of Weld Purging World for 2021.

In this month’s issue Chairman and Founder of HFT® Ron Sewell delivers a message to our readers. Ron gives an update on our Argweld Weld Trailing Shields® and welcomes our newest member of the team.

We round up all the latest HFT® news and we feature our Technical Article focusing on some major advances in Weld Purge Technology.

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
I’d like to start by saying a big thank you to all of our readers for supporting us during 2020 and to date in 2021 with the restrictions imposed on us. We have been fortunate to be listed as an essential manufacturer and have therefore been able to retain a full and active staff complement on our premises throughout the pandemic so far.

We’ve received tremendous support from our Customers and Distributors and would like to thank you for helping us increase our turnover from the previous years’ results.

At HFT® we have one of the world’s most comprehensive technical databases specifically directed at Weld Purging and associated technologies. This includes a library of publications, many of them being commissioned papers from leading international journals. When you need help or advice then do contact us – any of the staff at headquarters will provide support. Our resident Engineering Director Mike Fletcher continues to produce new technical papers. They are available by contacting our Editor, Michaela, who will arrange to send you copies.

New Product Launch

Recently we have been asked about our new Argweld Weld Trailing Shields®. I thought you would all like to see something of our UK manufacturing facility so here it is.

We are very proud that our products are designed and manufactured in the UK and that we have not sought out lower cost producers overseas. Total control means that we retain our quality standards and delivery schedules.
New Key Employee

Ffion joined Huntingdon Fusion Techniques in September 2019 as Office Coordinator and has quickly become an important part of the HFT team.

Ffion said: “Georgia has been extremely supportive throughout my time at the company and has continued to help me thrive, giving me opportunities to expand my skill set and knowledge. I’ve enjoyed learning the roles in each department and coming to grips with the world of Weld Purging and more recently I have been working closely with the marketing team.”

Within the last few months Ffion taken up running as a hobby and she will be participating in a charity 5km run every day for 14 days in memory of her Mother with proceeds will be going to Marie Curie Nurses. We all wish Ffion a long and happy career with HFT® and good luck with the Charity Run.

Finally……

I would love to hear from every person that reads this months magazine with any feedback that you have or even a quick “received and read” message. Please contact me by email: rasewell@huntingdonfusion.com.

I wish you all a wonderful, successful and healthy year to come.
Ron

UPDATE FROM HQ

January was another great month with some product specials being manufactured and shipped around the World. Here are some highlights:

Over 50 of our 1 ppm Weld Purge Monitor® were sold including the PurgEye® Nano, PurgEye® 200 and PurgEye® Site.

64” Low Profile Stopper was specially made for applications with temperatures reaching over 300°C (572°F).

Custom QuickPurge® was manufactured with two different sized bladders (8” primary, 6”secondary) to weld reducers offshore with BP.

Special Flexible Welding Enclosure® manufactured with a welding lens built into the chamber.

Rubber Inflatable Stoppers manufactured for use at a UK Power Station.
In January, Huntingdon Fusion Techniques HFT® joined the Welsh Government and Wales Nuclear Forum for their Wales to Canada Nuclear Digital Trade Mission.

Our CEO Managing Director Georgia, who also gave a presentation at the event said: “It was such an successful four-day virtual event. Of course, with the pandemic, we haven’t been able to attend any industry events, so it was a great way to catch up without even leaving the office.”

42 companies represented to highlight opportunities in both countries for the new nuclear construction, reactor refurbishment/ life extension, decommissioning, SMR development, medical isotopes and university research collaboration.

PURGENET™ AUXILIARIES

We’ve recently updated our website to showcase our new PurgeNet™ Auxiliaries Range.

They include:

**PurgeNet® Dew Point Purging Gas Moisture Sensor™**
Measurement of the Dew Point Moisture levels in Purging Gas for Critical Welds has never been easier than with the revolutionary HFT® PurgeNet™ Dew Point Purging Gas Moisture Sensor™.

**PurgeNet™ Smart Cable**
Our revolutionary PurgeNet™ can help by controlling welding power sources such as orbital welders and any other automatic welding systems to switch on and off according to oxygen levels.

**PurgeAlarm Visual Alarm Indicator™**
The PurgeAlarm™ Visual Alarm Indicator PNA-02 is an IP66 rated industrial traffic light style column to convey the alarm status of your PurgEye® Weld Purge Monitor®™. Can be fitted with single red light (stop) or green (go) and red light combination.

**PurgeLog™ Data Logging Software**
PurgeLog™ Data Logging Software, PurgeLog™, is standard on all high spec HFT® PurgEye® Weld Purge Monitors measuring down to 1 ppm.

**PurgeNet™ Machine Interface**
Our revolutionary PurgeNet™ can help by controlling welding power sources such as orbital welders and any other automatic welding systems to switch on and off according to oxygen levels.

Visit our website for more information on our PurgeNet™ Auxiliaries Range.
ARGEWELD WELD TRAILING SHIELDS®

As you may know, we updated our Weld Trailing Shields® last year. Simply innovative developments and improvements on our Weld Trailing Shields, we constantly striving to improve our welding technology.

What’s new...

- A quality engineered removable torch fixture, so that you can fit it to your welding torch first and then connect the rest of the Trailing Shield using a thumbscrew and quick release fittings on the argon hose (no tools required).

- Greater stability and manoeuvrability of the torch during welding.

- Main support bracket attached with stainless steel, threaded machine bolts.

- Along with the new sleek design, our Trailing Shields® have a NEW 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 Argweld Weld Trailing Shield®, you can be sure the Shield you are using is a HFT design, we guarantee quality and 100% craftsmanship.

- Multi-mesh gas distribution system to ensure even, non-turbulent gas flow over the surface being welded.

- Simple to set up, the welder connects argon feed hose the swivel elbow connector on the torch fixture.

All of our Argweld Weld Trailing Shields® are manufactured at our HQ in the UK.

CALENDAR: EVENTS IN THE INDUSTRY

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<th>Event</th>
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<tr>
<td>FABTECH</td>
<td>13 - 16 September 2021</td>
<td>Chicago, USA</td>
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<tr>
<td>WIN EURASIA</td>
<td>10 - 13 November 2021</td>
<td>Istanbul, Turkey</td>
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<td>ADIPEC</td>
<td>8 - 11 November 2021</td>
<td>Abu Dhabi, UAE</td>
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<td>TECHNISHOW</td>
<td>March 2022</td>
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The exposure to oxygen during the welding process on alloys such as stainless steel will result in discolouration and can severely reduce corrosion resistance properties. It is therefore crucial that the oxygen level is monitored throughout the welding process and kept to a desired level.

However, is often difficult for welding personnel to get an accurate reading of the oxygen level at the welding zone when welding lengths of tube and pipework of 20 metres length and more.

Huntingdon Fusion Techniques HFT®, a Weld Purging Products Manufacturer, has created the PurgEye® 1000 Weld Purge Monitor®, enabling operators to read the weld purge gas level from a distance for the first time.

Ron Sewell, Chairman for HFT® said: “The PurgEye® 1000 incorporates a sensing head, which can be fitted onto any Pipe Weld Purging System. The oxygen level is then measured directly at the weld location and the information is electronically transferred to the monitor up to 1 km away.”

“The PurgEye® 1000 now features PurgeNet™, a networking device designed for communicating the current oxygen reading from the Monitor, to another piece of equipment, such as the visual warning accessory PurgeAlarm™ which indicates rising or falling purge levels.”

“If exhaust gas from a normal weld purge system is piped down a hose to a distant measuring instrument, it may take many minutes, or even hours in some cases, for a stable reading to reach the sensor. The exhaust gas may even be contaminated on the way by outgassing from the walls of the hose material or from air drawn in through a leaky connection.”

The PurgEye® 1000 measures oxygen levels from 1,000 parts per million (ppm), right down to 1 ppm (accurate to 10 ppm), ideal for welding metals such as stainless steels, duplex steels, titanium and zirconium where oxide free, zero colour welds are required time after time.
Supporting the backside or under side of weld joints will help prevent oxidation, eliminate re-welding and require much less post-weld cleaning.

Weld Backing Tape® available from Huntingdon Fusion Techniques HFT® supports weld roots, reducing sugaring and oxidation.

Georgia Gascoyne CEO Managing Director for HFT® said: “Low cost Weld Backing Tape® is very easy to use. By simply attaching the tape onto the root gap using the adhesive aluminium tape either side of the glass fibre centre, which keeps the weld joint free from weld tacks.”

“After welding, the Weld Backing Tape® is removed, leaving the weld free from oxidation with no back gouging or grinding required.”

Unlike ceramic fibre, Weld Backing Tape® has no true melting point so it works satisfactorily with TIG or MIG welding (GTAW or GMAW) where temperatures can reach up to 6,000°C. This overcomes the concerns associated with ceramic fibre versions that have a melting point of 1,800°C.

Weld Backing Tape® is available up to 600 amps and can be used for manual and automatic welding. It can help achieve higher welding speeds and dramatically reduce the amount of post weld cleaning required.

Each tape consists of a 3” (75mm) wide aluminium adhesive tape, in the centre of which is a 1” (25mm) wide band of woven glass fibre. The glass fibre matting has differing thicknesses to match the welding current in use.

**AVOID PUTTING WELDS AT RISK WITH WELD PURGING DAMS**

Manufactured from low vapour pressure materials, Weld Purging Dams are in use for where a conventional Tandem Weld Purging System cannot be used.

Ron Sewell, Chairman at Huntingdon Fusion Techniques HFT® said: “Even today, many companies are still allowing their technicians to spend time fabricating dams made of foam, cardboard, adhesive tape, wood and so on. Like paper, these materials contain a high percentage of moisture, which is undesirable to have in the presence of a weld.”

“As these poor quality materials are warmed by the welding operation, they start to outgas their water vapour, which starts to circulate around the weld joint and combine with the weld pool to cause porosity and oxidation.”

Apart from the benefit of having a metallurgically sound weld, the difficulties of cleaning an oxidised weld are eliminated, saving vast amounts of money in labour and material costs as well as the disposal costs where acids are concerned. Now there is no more reason to put welds at risk by using apparently cheaper materials, when for a very low cost, Argweld® Inflatable Weld Purge Dams can be purchased instead!
Few would disagree with the fact that making high quality welds demands skill. Most metallurgical obstacles have been overcome through progressive development of filler materials. Contemporary equipment for use in GTAW and GMAW is probably as good as it is likely to get. Of the few difficulties remaining, the production of sound and oxide-free weld underbeads is arguably the most underestimated.

One of the principle requirements of the pipeline industry is a weld underbead that is physically positive, i.e., no undercut, smooth and free of oxidation and debris such as ‘grapes’ or ‘sugaring’. These defects can usually be removed by post weld grinding and polishing but this practice can be very expensive. Far better to address the problem through the use of dedicated inert gas weld purging techniques. They provide a stable, oxygen-free environment throughout the welding cycle and thus eliminate oxidation.

The purging solution has been recognised for many years but only recently have the welding accessory manufacturers developed dedicated equipment.

The last few months have seen the launch of several innovative improvements to the range of internationally approved weld purge systems manufactured by Huntingdon Fusion Techniques Ltd. Exploiting current engineering developments in materials, electronics and specialist products such as gas valves, HFT®’s designers, encouraged by customer feedback, have been able to make significant improvements to its range of purge equipment and instrumentation.

Three principle products form the thrust of HFT®’s Argweld® purge range; QuickPurge®, PurgElite® and PurgEye®.

The Argweld® Product Range was developed to help speed up the welding process for engineers involved in the fabrication of pipes and tubes. This was realised by using a design, which allows for easy and positive insertion into position and by limiting the purge volume. The product range has been used extensively and internationally during the welding of stainless steel gas and oil transmission pipework.

The QuickPurge® body employs synthetic fabrics throughout and incorporates an integral protective lining below the weld zone to resist thermal damage. Hoses used to transmit inert gas to and from the purge cavity and to provide inflation pressure are made from engineering grade nylon. Brass gas fittings are located well outside the weld zone so that post weld radiography and ultrasonic inspection can take place with the purge system left in place.

It is impractical to be specific across the entire spectrum of diameters and welding procedures other than to say that savings are significant. As an example, users report that a 900 mm diameter pipe can be fully purged to less than 0.1% oxygen in under 10 minutes. There are reported savings in excess of 80% on purge time compared with alternative purging systems so that gas usage can be reduced dramatically as a result.

PurgElite® systems have been developed to help speed up the welding process for engineers involved in the fabrication of pipes and tube lines and assemblies up to 300 mm diameter. welding ancillary that offers considerable savings in time and inert gas.

The ‘Elite’ development incorporates many advances in engineering technology and extends the size range to include purge systems as small as 25 mm diameter.

The inflatable components employ low vapour pressure synthetic fabrics with low outgassing rates throughout and incorporate a connecting hose with a protection sleeve to resist thermal damage. Hoses used to transmit inert gas to and from the purge cavity and to provide inflation pressure are made from engineering grade nylon.
PurgEye® monitors were developed by HFT® specifically for the weld purge industry to provide sensitive oxygen measuring instrumentation. Most fabricators, but stainless steel fabricators in particular, need to ensure that the weld root is protected against oxidation. If the root becomes oxidised, the affected metal may need to be cleaned and this can be an expensive operation. Protection is best effected by providing inert gas purging. Of course the purge gas itself needs to be free of oxygen and a measure of the oxygen content of the purged volume is thus a crucial need for the welder.

For routine welding of the majority of stainless steels there is a requirement for the purge gas to contain less than 0.1% oxygen or 1000 parts per million (ppm). For these applications the HFT® PurgEye® monitors are more than adequate. More sensitive materials such as titanium alloys and some special stainless steels may require oxygen levels to be below 0.01% or 100 ppm.

**Case Histories**

A major US Nuclear Site employs QuickPurge® and Argweld® Weld Purge Monitors® to fabricate stainless steel duct work ranging in size from 150 to 600 mm.

Before using QuickPurge® the practice was to purge a complete pipe system.

Other types of stand-alone dams were unsuitable because of the risk of dams being accidentally left in place leading to costly obstruction issues. Water soluble dams were not allowed because post-weld flushing with water was unacceptable.

A number of observations have been made:

- Argon usage has been reduced by up to 90%.
- Productivity has increased dramatically and overheads reduced due to the elimination of wasted down-time with welders spending hours waiting for purges.
- A significant benefit has been the elimination of a major jobsite safety issue. Before using QuickPurge®, they would end up with hundreds of feet of ducting that were filled with argon. When the argon was to be expelled from the lines it produced a serious safety issue requiring the evacuation of areas due to dangerously lowered oxygen levels caused by the exhausted argon.

Pennecon Energy in Newfoundland selected Argweld® purge systems for a large piping project.

Pennecon was awarded a contract that required hundreds of welds on titanium and stainless steel piping with sizes up to 1500 mm diameter and they were in the process of gearing up a brand new welding facility with multiple welding stations to handle the job.

The company evaluated several alternatives for effective and efficient methods of weld purging in order to achieve a purge below 50 parts per million of oxygen. Following testing and evaluation and after studying the return on investment that the Argweld® products offered with reduced operating costs, a decision was made to move forward with the procurement of QuickPurge®II systems and PurgEye® Weld Purge Monitors®.

They are now using the equipment extensively on 250, 450 and 500 mm pipe joints and plan to continue to use other Argweld® equipment as they move into other pipe sizes.

**Latest Innovations**

PurgeGate® has been added to all QuickPurge® systems. This patented device prevents inflatable systems from being over-pressurised even when operators try to increase pressure to increase the flow of weld purge gas.

The RootGlo® illuminating tape is now sewn on the centreline of the QuickPurge® system. Inside the dark pipe, the centering band glows brightly to give welders the opportunity to see all aspects of the purge device alignment and the quality of the weld root as it is being welded.
IntaCal® is a calibrated gas release system to purge the interspace between the dams. IntaCal® removes the need for expensive and complicated valve systems that need presetting before each weld. This time-consuming process is now eliminated, as is the previous problem of incorrectly setting valves which frequently led to bursting dams.

Weld Purge Monitors®, the exhaust gases are fed directly to the weld purge monitor and can be set to alert the user automatically when the required oxygen level has been reached.

Fig 1. Effective gas seals need to be provided on either side of the joint and these need to be far enough away to be unaffected by the temperature rise during welding. This schematic section illustrates how QuickPurge® equipment works.

Fig 2. Engineers prepare to fabricate large diameter pipework on the Isle of Grain Natural Gas installation using QuickPurge®.

Fig 3. PurgEye® monitors have been specifically designed for indicating oxygen levels in inert gas during weld purging. These rugged instruments have a measuring range down to 1 part per million on an alpha-numeric display.

Fig 4. PurgElite® inflatable purge system designed to accommodate tube and pipe sizes between 25 and 300 mm diameter. The 25 mm version is the world's smallest fully integrated purge system.

Conclusion

Advances in weld purging systems for pipeline fabrication have led to the development of equipment that meets the requirement for reliability and robustness under site conditions.

Without appropriate purging, oxidation of the weld underbead will usually require removal and the cost of this is significant.

A recent document published in the UK by the Royal Academy of Engineering (Reference: www.twi.co.uk/news-events/news/2012-07. Guidance on Best Practice for Welding) directs welding engineers to recognise the significance of appropriate training. In the case of purging they must address the need for education on the necessity for purging and the choice and application of appropriate purging techniques.
PurgElite®
Inflatable Pipe Weld Purging Systems
Drastically Restrict Weld Purge Volumes

Scientific Developers of Weld Purging Technology and Manufacturers of Weld Purging Products since 1975
Celebrating our 45th Anniversary

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