IN THIS ISSUE:

THE LATEST NEWS FROM OUR UK HQ

TECHNICAL ARTICLE: LEAK TESTING OF TUBES AND PIPES

WE ARE PURGING PRODUCTS INNOVATORS, MANUFACTURERS AND INTERNATIONALLY REIGNED SPECIALISTS
Dear Reader,

Welcome to issue two of Weld Purging World for 2022.

This month we take a look at how our PurgEye® Desk is a crucial measuring instrument for titanium welding in Aerospace applications.

On page 7 you will find our Technical Article Leak Testing of Tubes and Pipes, which examines the impact of using the correct sealing technique, covering two categories: mechanically expandable plugs and inflatable dams.

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
Prior to welding of titanium, widely practiced in the aerospace Industry, the oxygen content of the purge gas must be reduced to a level below 50 ppm.

Engine components such as discs, blades, shafts and casings, from the front fan to the rear of the engine, and fasteners, airframe components and landing gear are all examples where titanium is used. Further examples are fuel tanks for satellites and military jets. Components such as wing spars have also been made recently out of titanium using the Wire Arc Additive Manufacturing (WAAM) process.

The innovative PurgEye® Desk, a new monitor designed and manufactured by weld purging experts Huntingdon Fusion Techniques HFT®, is leading the way in inert gas weld purging technology by reading oxygen levels from 1,000 ppm, right down to levels as low as 1ppm (highly accurate to 10 ppm), ensuring welders achieve perfect oxide free, zero colour welds time and time again.

Ron Sewell, Chairman for HFT® said: “The PurgEye® Desk is for use with Welding Chambers and Enclosures, as well as with Orbital Welding Machines and other Automatic Welding Systems. One huge addition to the PurgEye® Desk is the revolutionary PurgeNet™, for the in-line connection of additional accessories that allows the Weld Purge Monitor® to control welding systems based upon oxygen level as well as to provide indications of high and low oxygen levels and even give dew point measurements.”

The rugged, high frequency proof PurgEye® Desk has automatic fault finding diagnostics that can detect and report a number of possible faults. It also features an OLED (organic light-emitting diode) display giving brighter, sharper readings at longer distances.

With a unique, fast-response, long-life sensor having little maintenance requirement, the PurgEye® Desk Weld Purge Monitor® comes complete with an integral pump to deliver the exhausting purge gas to the measuring sensor on a consistent basis to allow precision control of the welding systems.

The PurgEye® Desk® is also a highly recommended monitor when welding in the Additive Manufacturing, automotive and titanium bicycle industries.
For closure welds, tight bends, T piece joints and dome end connections, a range of low cost, single ended Weld Purging Dams is available from Weld Purging Experts, Huntingdon Fusion Techniques HFT®.

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.”

Weld Purge Dams are fitted with a dual inflation and purge hose, an additional purge gas hose and an exhaust which can be connected to one of the HFT® Weld Purge Monitors®

The additional purge gas hose is suitable for introducing extra purge gas into the weld zone at any time to cool welds to meet interpass temperature specifications, or to provide more inert gas in the event of titanium, zirconium or special stainless applications needing a guaranteed zero colour weld.

Once the Dam is inflated using the purge gas and seals all around the internal circumference of the pipe, the excess inert purge gas spills out and purges the space around the weld joint. The air (oxygen) is then released out and into the open through a series of venting exhausts on the dam.

### CALENDAR: EVENTS IN THE INDUSTRY

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube 2022</td>
<td>20 - 24 Jun 2022</td>
<td>Düsseldorf</td>
</tr>
<tr>
<td>TechniShow</td>
<td>30 Aug - 2 Sep 2022</td>
<td>Holland</td>
</tr>
<tr>
<td>Adipec</td>
<td>31 Oct - 3 Nov 2022</td>
<td>Abu Dhabi</td>
</tr>
<tr>
<td>Fabtech</td>
<td>8 - 10 Nov 2022</td>
<td>Atlanta, USA</td>
</tr>
</tbody>
</table>
Pipe freezing is fast becoming one of the most efficient ways to make pipe repairs or to carry out pipeline maintenance. By creating an ice plug, fluids inside the pipe can remain present, rather than having to drain down the entire system.

Here are some of our frequently asked questions regarding the Pipe Freezing System, Accu-Freeze™.

**Q. What applications is Accu-Freeze™ designed for?**
Accu-Freeze™ utilises liquid nitrogen to create the cryogenic temperature necessary to form ice plugs. Freeze sealing is most often used to isolate a section of a piping system where no other ready means of isolation (such as valving) is available. Freeze sealing refers to the process of applying an external refrigerant to a point in a process in order to cause the formation of a solid internal plug from the frozen process fluid contained in the pipe.

**Q. What size pipes is Accu-Freeze™ suitable for?**
The Accu-Freeze® insulating jacket accommodates pipe sizes from 6 – 12” (150 – 305 mm). Copper coil is used for the smaller sizes. Aluminium clam shells are available for 2” – 16” (50 mm – 400 mm).

**Q. Can I freeze contents that are moving within a pipe?**
No, the liquid contents of the pipe have to be stationary and non-vibrating.

**Q. Can I freeze liquids other than water?**
Yes, milk and beer are all examples of other liquids that can be frozen. Some liquids containing refrigerants can be frozen too, just check with our Technical Team on the type and % content.

**Q. Can I do a freeze either side of the repair joint?**
Yes, this is called a double freeze and necessary accessories can be purchased along with the Accu-Freeze™ kit. A double freeze is required when a valve needs replacing for example.

**Q. What kind of pipes can Accu-Freeze™ be used on?**
Accu-Freeze™ can be used on iron, lead, steel and copper pipes. It is also applicable to plastic pipes, but these will take up to three times longer.

**Q. What about bursting or fracturing pipes?**
Pipe fractures are not caused by the ice plug or the freezing process. They are caused by a failure to allow enough space between the ice plug and closed connections. This is due to the increase in pressure that is caused by water that is displaced by the ice plug as it grows that can create a ‘hydraulic ram’ if enough space is not allowed.
SAFER WELDING by Switching to Blue-Tipped MULTISTRIKE® TUNGSTEN ELECTRODES

Huntingdon Fusion Techniques HFT® design and manufacture blue-tipped MultiStrike® Tungsten Electrodes.

- MultiStrike® Tungsten Electrodes are non radio-toxic, non-thoriated, non-carcinogenic.

- They will strike 10 times more arcs than a red tipped thoriated tungsten, when tested under identical conditions.

- Suitable for a wide variety of welding operations, particularly effective in the welding of titanium, stainless steel and aluminium AC and DC.

- Providing savings through longer life, more strikes per electrode before grinding, less re-work, less wastage and lower power requirements.

Eliminate the thoriated dust in the atmosphere by changing to MULTISTRIKE® TUNGSTENS so that when there is tungsten grinding dust, it is not radio-toxic.

www.huntingdonfusion.com
The oil, gas, water, food and beverage, aerospace, power generation, construction and pharmaceutical industries all fabricate many thousands of metres of tubes and pipes every year and all joints need to be tested for leak tightness before release for use. This is particularly so in the nuclear sector where potential release of toxic compounds presents a health hazard. It’s also a significant requirement in the aerospace industry where leaks could endanger life.

Hydrostatic testing is the safest and most common method employed for testing pipes and pressure vessels and this is normally undertaken using water. Pneumatic testing using compressed inert gas or air may be used, but only under carefully controlled conditions. Failure during testing with water releases only nominal energy because water is almost incompressible. Escape of gas during pneumatic procedures can be dangerous because it can result in the sudden release of very large amounts of energy.

In principle, tests are simple operations. The pipe or vessel joint being examined is isolated and the test medium is introduced and then pressurised. Leaks are detected either by measuring pressure fall or by examination of the surface for visual evidence.

Selecting the optimum sealing technique prior to testing requires a sound knowledge of available products. The operator needs to consider tube or pipe diameter, test pressure and possible contamination by the sealing equipment.

Products for sealing fall generally into two categories: mechanically expandable plugs and inflatable dams. Routinely available products cover diameters between 12 and 3000 mm but special versions have been developed to accommodate testing of smaller and larger pipes. Access for pressurising is through a standard fitting in all plugs and dams.

**Expandable Plugs**

Plugs are available from manufacturers such as Huntingdon Fusion Techniques with nylon, steel and aluminium bodies. Sandwiched between each body is a flexible seal that can be expanded by applying a radial force through a manually operated machine screw/bar on the shaft. These seals are available in a variety of materials including nitrile, Viton, natural rubber and silicone.

Specially braced plugs and double disc plugs are available for use at higher pressures.

*Fig 1. A comprehensive choice of nylon bodied plugs is available covering the range 12 to 150 mm diameter. They can even be made to meet customer colour preferences.*
As the diameter of expandable plugs increases, so does the weight. For some applications where these plugs may be useful, they often become too heavy to handle with safety (the weight of an 1800 mm diameter steel plug is 178 Kg). The solution is to use inflatable dams – these are available to accommodate pipe diameters between 35 and 3000 mm.

**Inflatable Dams**

Manufacturers such as Huntingdon Fusion Techniques have a range of dams, each having a wide degree of flexibility in diameter. The dams are capable of withstanding a temperature range between -40 to +70°C – (up to 300°C with heat-resistant covers).

These devices can be inflated quickly to sealing and working pressure and are resistant to most hydrocarbon gases and fluids. The dams are manufactured from a variety of materials depending on the application.

Generally, the length of inflatable dams ensures that the sealing area is very large compared with expanding plugs and also ensures that tilting of such mechanical plugs, once inside the pipe, does not occur.

Inflation is carried out using a compressor or foot pump through an integrated valve system. An optional by-pass facility allows for admission of liquids or gases to the sealed volume following inflation. The by-pass is also used for draining after testing.

The dams can also be used to prevent build-up of debris and ingress of unwanted material or animals.
Further information


Detailed technical information is available in a publication Inflatable Rubber Plugs from Huntingdon Fusion Techniques.

Huntingdon Fusion Techniques. Technical notes. Expandable Plugs (TN 1) and inflatable stoppers (TN 2).
MONITOR YOUR CRITICAL WELDS

PURGEYE® 500 DESK
WELD PURGE MONITOR®

Innovators, Manufacturers and Internationally Renowned Specialists

www.huntingdonfusion.com