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September 2022



Mushield®

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**Industrial Ruggedized
Computing Solutions for
Hazardous Manufacturing
Environments**

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As summer nears a close and we work our way into Q4, we'd love to hear what you're working on? What are you hoping to accomplish before 2022 shuts its doors and we gear up to welcome in 2023. We know, it seems "too soon" to talk about the new year, but it'll be here in the blink of an eye. From a marketing perspective, what are your plans? We'd love for you to consider telling your story here in the pages of The Gateway. It's easy, and it's not going to blow your budget (spoiler alert: it's FREE).

If you've got a story you'd like to share, we'd love to hear it. Send us anything you've got, and we'd be happy to consider it for publication in the pages of this magazine. If you have an idea you'd like to check in with us first before dedicating time to it, by all means, reach out to chris@thegatewaymag.com and he'll set you straight on whether or not it's something we'd be interested in running. That said, he's interested in just about anything, so don't be shy!

In this month's issue we've got some words from our friends at MuShield who provide the ins and outs on magnetic shielding. Did you know that MuShield was the first in the magnetic shielding industry to be ISO 9001 certified more than 10 years ago? They're the OG, and what better resource to fill us in than them. Magnetic shields are abound and if you need a partner to supply you with yours, don't hesitate to reach out to them to sort out your needs.

We've also got a story from trusty penman, Del Williams who put a piece together entitled, "Ruggedized Computing Solutions for Hazardous Environments." In simple terms, a hazardous classified location is any area, building, commercial or industrial premises likely to be exposed to fire or explosion due to the presence of flammable gases, vapors, flammable liquids, combustible dust, and other similar materials in very high amounts. Thanks as always for the words, Dell.

Enjoy the last few weeks of summer, folks!



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MAGNETIC SHIELDING: PROTECTING INTERFERENCE AND KEEPING MODERN, EVERYDAY TECHNOLOGY PERFORMANCE OPTIMAL

Alright, we're welcoming back MuShield into the pages of The Gateway, who are here to tell you all about the magic of magnetic shields and what a critical part of contemporary manufacturing they are. Serving so much of our day-to-day technology, magnetic shields are all around us as working components of our daily lives that we may not even realize. But here we (and they) are.

First things first—the background:

In 1989, David Grilli and Bob Joy purchased the magnetic shielding division of the Gloucester, Massachusetts company BOMCO. David and Bob had experience running the division as the magnetic shielding applications engineer and plant operations manager (respectively) and were now the principal owners of the newly formed MuShield Company. Eventually, David and Bob moved the company to Goffstown, New Hampshire, and within 10 years, had turned the five-person business into a successful 20+ person magnetic shielding solutions and precision metal forming shop.

By the early 2000s, MuShield saw incredible company growth and outgrew their Goffstown building. In 2004, MuShield purchased a 19,000 sq. ft. building in Londonderry, New Hampshire. This additional plant space enabled the company to invest in larger machines such as an IPG LaserCube, Cincinnati Hydroform, Trumpf 5 Axis laser, Multi Axis Hurco Milling Center and a second hydrogen furnace (among other machines). The increase in floor space led to increased work capacity and allowed for MuShield to become more involved with larger and more diverse magnetic shielding applications.

Since the company's inception, David and Bob have welcomed their sons Luke Grilli and Brett Joy into management roles. Following in their fathers' footsteps, MuShield is a true family business.

MuShield and its principals have been an industry leader in magnetic shielding solutions for 40+ years and will continue and build on their tradition of success for decades to come.

MuShield was the first in the magnetic shielding industry to be ISO 9001 certified more than 10 years ago. With our latest ISO9001:2015 and AS9100D certifications, MuShield's manufacturing operations are reliable, repeatable, and efficient.

And now, let's dive into a high-level overview of all there is to know about magnetic shielding...

The MuShield Company got into the business of designing and fabricating magnetic shields because of our love and respect for the science that's the driving force behind the industry and in serving our customers' unique magnetic shielding needs. The projects that fuel the production of our day-to-day is an inspiring challenge that we thrive on. Let us harp for a moment on the fact that it is a challenge, and if you're aligning yourself with a manufacturer that doesn't have the experience of our core engineers and manufacturing personal at MuShield, you're – for all intents and purposes – compromising the overall integrity of your distinctive application.



You see, magnetic fields can pose a problem for electronic equipment, and attempting to shield for these magnetic fields is not as simple and straightforward as it is, for say, electric fields.

A couple of "fun facts" about the difference between electric and magnetic fields:

- An electric field is a field of force, surrounding a charged particle, while a magnetic field is a field of force surrounding a permanent magnet, or a moving charged particle.
- The strength of an electric field is expressed in Newton's per Coulomb, or Volts per meter, while a magnetic field strength is expressed in Gauss or Tesla.
- The force of an electric field is proportional to the electric charge, while the magnetic field is proportional to the electric charge as well as the speed of the moving charge.
- Electric and magnetic fields oscillate at right angles to one another.





Okay, back to our regularly scheduled program:

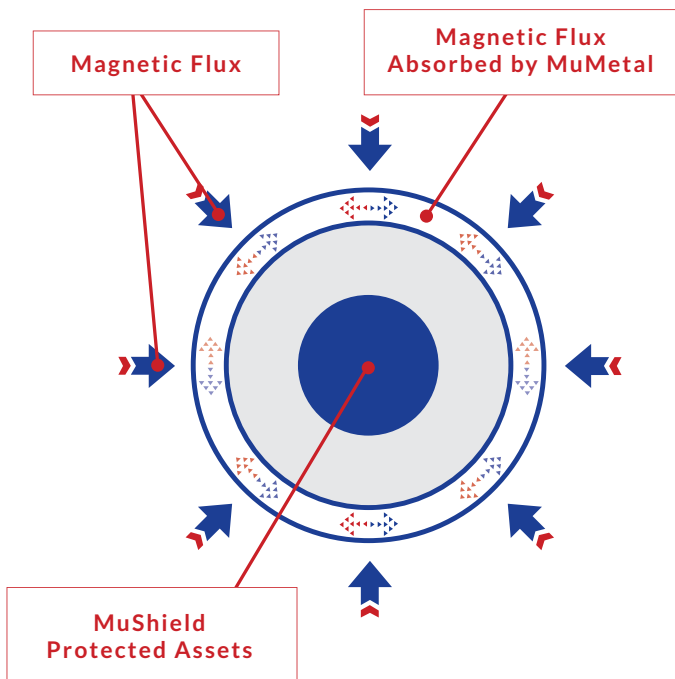
The truth is, no material has the ability to actually (technically) block magnetic fields without itself being attracted to the magnetic force. Magnetic fields, unlike electric fields, can only be redirected, thus, high permeability magnetic shielding materials such as mu metal, or those with the ability to support the formation of a magnetic field within the inherent properties of their own physical makeup are used to shield magnetic interference.

When using high permeability magnetic shielding material to build the applicable enclosure that will protect your electrical components in the presence of a magnetic field, said shield works by diverting the magnetic flux and drawing the magnetic field lines into the magnetic shielding material rather than them passing into the protected space. You can think of this process like a sponge absorbing water. The magnetic shielding material is absorbing the harmful electromagnetic interference that could cause a sensitive instrument to malfunction or render inaccurate data.

Said absorption is exactly why we do what we do as it is the primary driving force when creating shielding to protect your application from low frequency magnetic fields. Absorption is achieved through:

- The permeability of the material.
- The frequency of the incident wave.
- The thickness, or high permeability of the shield.

Be careful when it comes to considering what type of material to use when it comes to your magnetic shield. We may be slightly biased, but there's great benefit in contracting with a team like the one that exists here at MuShield Company because we can strategically look at your unique situation and put together the exact solution – from the design phase to the construction and implementation phases.



For instance, the permeability of whichever unique material you consider is paramount when designing your custom magnetic shield. As an example, at an incidence at 100 kHz the high permeability of mu metal, is the magnetic shielding material of choice and is the most readily available of all the magnetic shielding alloys. Meeting industry specs ASTM A753 Alloy Type 4, and MIL-N-14411 Composition 1, mu metal is the magnetic shielding alloy that will distribute the highest

permeability – High magnetic strengths can cause mu metal to become saturated, which varies based on application to application, but adding layers of high saturation materials such as Alloy 49 or cold rolled steel could solve that problem

We are the magnetic shielding experts, so we are happy to take a look at your specific application and advise what magnetic shielding materials we feel would fit your needs best.



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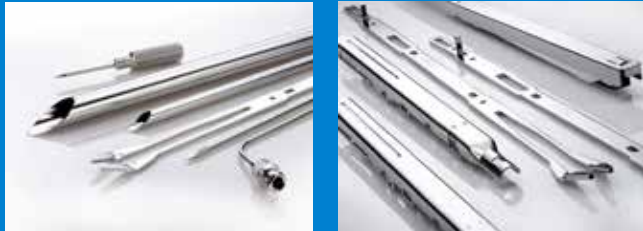
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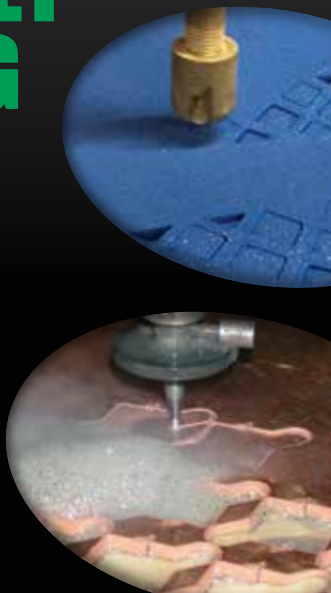
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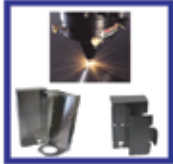
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INDUSTRIAL RUGGEDIZED COMPUTING SOLUTIONS FOR HAZARDOUS MANUFACTURING ENVIRONMENTS



This month's industry spotlight is brought to us by Del Williams, a technical writer based in Torrance, California.

In industrial manufacturing environments, facilities regularly store and dispense large quantities of hazardous, flammable, combustible liquids. Given the potential for gas, vapor, or dust to collect in these areas, the electronic equipment installed for automation and control must be designed specifically to prevent unintentional ignition of these elements due to electrical arcing or other thermal means.

Although much attention is given to the automation system components used to control the process itself, these systems also require computing equipment such as thin clients, panel PCs, remote touch displays, KVM (keyboard, video, mouse) solutions, as well as fixed and mobile operator workstations. Given the risks, this equipment must also meet the requirements for use in areas classified as hazardous and be rugged enough to withstand the harsh chemical and high humidity environment generated during the industrial manufacturing process.

“In industry, the manufacturing, processing, storing, and distribution of flammable materials release gases or vapors in the atmosphere which can result in an explosion or hazard. To create a safe and secure working environment, the computing systems at the worksite must, by regulation, be designed to pass the explosion-proof certification and be able to withstand the corrosive environment,” says Paul Shu of ARISTA

Corporation, a leading provider of computing platforms and visualization display products including thin clients, all-in-one panel computers, ruggedized LCD touch displays, and industrial KVM solutions.

Ruggedized Computing Solutions for Hazardous Environments

In simple terms, a hazardous classified location is any area, building, commercial or industrial premises likely to be exposed to fire or explosion due to the presence of flammable gases, vapors, flammable liquids, combustible dust, and other similar materials in very high amounts.





Hazardous locations can be classified into various categories according to the nature of flammable vapors or liquids. In North America, a class/division system is primarily utilized, and regulations related to the design and manufacturing of industrial equipment are formulated by the:

- NEC
- CEC
- OSHA, and
- NFPA (National Fire Protection Association)

Outside of North America, a similar “zone” system is used to define and categorize hazardous areas and potential risk sources.

To meet the requirements of industrial environments, there are several methods by which equipment can be made flame and explosion-proof. For computing systems, equipment manufacturers that serve the market can design and manufacture thin clients, industrial panel PCs, and touch panel PCs that are UL certified, non-incendive (equipment having electrical/electronic circuitry that is incapable, under normal operating conditions, of causing ignition of a specified flammable gas, vapor, dust, etc. due to arcing or thermal means), and that meet the requirements for the various classes/divisions/zones within a plant or station.

ARISTA, for example, offers a wide range of panel mount and fully sealed touch panel PCs for use in industrial settings. The fully enclosed version is constructed of stainless steel and has no external

vents. This design protects the components from gases, dust, dirt, moisture, chemicals, oil, and other external contaminants in an explosive environment.

According to Shu, the touch panel PCs in various sizes are routinely deployed as HMI workstations in hazardous industrial operations, which can include the storage and distribution of large volumes of flammable and combustible liquids. For this type of application, the panel mount PCs are fanless, ruggedized systems certified for use in Class 1 Division 2, Class 2 Division 2, and Class 3 Divisions 1 & 2 hazardous areas. The systems are installed with a Windows operating system and the high-resolution touch screens can be manipulated by operators wearing heavy duty industrial gloves.

The company also offers fanless thin client versions as well, which are increasingly popular in industry as a cost-effective way to develop a virtual desktop for more centralized management. With remote accessibility, it is easier to manage, store, and use the data, and IT administrators can conveniently access any device connected to the server and make changes. Moreover, thin clients are easiest to configure, manage and deploy.

To maintain a completely safe industrial working environment, industrial manufacturers must install computing systems and peripherals that meet regulations and security standards for hazardous locations across the globe.

By working with leading providers of computing platforms with experience in the industry, facility managers can obtain the UL-certified, non-incendive, corrosion-resistant thin clients, industrial panel PCs, touch panel PCs, and other critical equipment that will stand up to harsh industrial environments.

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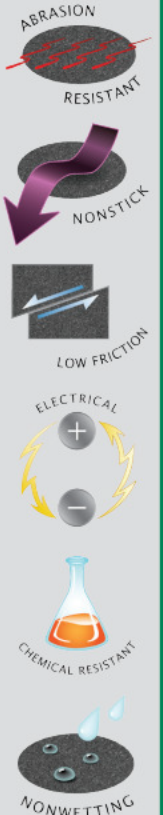
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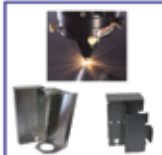
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Powerhold Inc. - announces the release of JDM Clamps (patent pending). A flexible clamping system designed to drastically reduce machining center setup time and steps. Ideal for machining plates of various shapes and sizes on virtually any machining center. JDM clamps will allow for quick and accurate setups by less experienced operators.

Setting up a machine tool to machine a plate can be cumbersome. Indicating the vise or clamps, confirming squareness and flatness. Then making sure the tool path will not contact the clamps or vise during machining.

Ground in sets, the bases will create a flat Z-axis position and are elevated from the table to aid in chip evacuation. The central shaft of the clamps acts as the part stop, creating a known X and Y position of your workpiece. With the JDM clamps in your tool library, you will easily avoid any collisions with the clamps during your tool path.

JDM clamps are quickly and accurately positioned on the machine table using positions specified in the NC program. The program will move the machine spindle to the first location. The locator/plunger in the spindle is then slid down and into the clamp base. Tighten the base to the table and release the locator/plunger. Repeat these steps for the location of all the desired clamps.

The modular bases can be moved to a new position for a different workpiece in a matter of minutes. Their shape is designed to make sure they will always be able to reach a T-slot in the machine table. The standard JDM clamps can accommodate workpieces up to 3" thick.

Powerhold is the exclusive builder of JDM Clamps. See the clamps at our IMTS Booth 432039 or our website www.powerholdinc.com.

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Bold Laser Automation, Inc. of Bedford, NH USA, announces its CTIS1010 series for 2D/3D critical inspection system for manufactured medical, aerospace and automotive tubing components. This platform inspects for defects such as voids, extrusion defects and contamination as well as quality measurements such as length, diameter, fluidic ports, attached features or machined notches, through accurate inline measurement, utilizing Keyence LJ-X8000 series 2D/3D sensors.

"Hiring skilled QA/QC staff is nearly impossible in this economic climate, especially if such employees end up in a complicated and tedious inspection task. Our measurement tools group has developed a core set of capabilities to leverage Keyence Sensors into turnkey semi & automated inspection platforms. These inspection tools supplement workforce hiring issues while increasing inspection quality and speed for critical medical devices, aerospace, microelectronics, and precision microfluidic devices." Said Todd Lizotte, President and CEO of Bold Laser Automation

Equipped internally with a caterpillar drive, options for the CTIS1010 include go / no go inspection with sorting using a flipper trough. The LJ-X8000 Series in our CTIS1010 platform can be adapted to inspect any target shape such as cylindrical objects, square and round tubing, and more. Other features include cylindrical lens for reliable reflections, large aperture lens to increase received light intensity, and high-resolution CMOS for high resolution measurements.

At Bold Laser Automation, Inc, we only aim to provide the highest quality turnkey systems and platforms to help our clients achieve and succeed in their industry. By ensuring cost effective results, customers can rely on the Bold team to deliver solutions for whatever your need may be.

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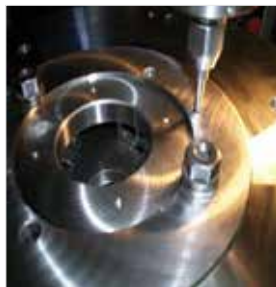
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