

OCTOBER 2018

SAFETYZONE MAGAZINE

**Hearing Protection
That You Want
To Use**

**Protecting Tank Farms
from Corrosion:
The 3 Most Important
Considerations**

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Guard-Safe Guarding

Utilizing Laser Scanning to Design Machine Guarding



- ❖ **Identify Hazards** – Access over, under, around or through to a moving or rotating part must be guarded.
- ❖ **Scanning & Measurements** – GSG visits your facility to acquire critical dimensions and perform scanning.
- ❖ **Designing Your Guards** – Accuracy of $-1/16"$ ensures that the guards we design from scanning will fit without interference.
- ❖ **Engineered Drawings** – Arrangement and details are approved by client prior to fabrication.
- ❖ **Custom Guards** – Powder coated Safety Yellow, preassembled parts ensure proper fit & function.
- ❖ **Installation** – GSG technicians assure that all guards are mounted rigid and secure.

To learn more about our custom engineered guarding process and our standard offerings including: Coupling Guards, Barrier Guarding, Idler Guards, V-Belt Guards and much more, please contact us via:

website: www.guardsafeguarding.com

phone: 712-754-4838

email: sales@guardsafeguarding.com



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CEO

Christy Hobson

PRESIDENT

Glen Hobson
glen@tipsmag.net

PUBLISHER

Anne Marie Miranda
205-470-1468
annemariamiranda1229@gmail.com

EDITOR

Brandon Greenhill
brandon@tipsmag.net

CREATIVE/ WEB DIRECTOR

Jacklyn Greenhill
jacklyn@handfmedia.net

ADMINISTRATIVE DIRECTOR

Steven Hobson
steven@tipsmag.net



Executive and Advertising Offices

P.O. Box 1568

Pelham, AL 35124

Phone: 205-441-5591 Fax: 205-624-3354

www.safetyzonemagazine.com

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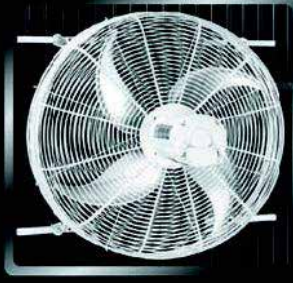
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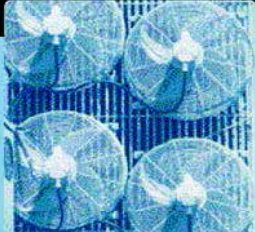
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Guard-Safe Guarding

Five Easy Steps to Successful Machine Guarding!



Identify the Hazards

Not all hazards are created equal. Nor are the solutions for guarding them. Keep in mind the basic principle: Over, Under, Around or Through. If any body part is capable of reaching a moving component by those means, it must be guarded. The example to the left shows an exposed rotating shaft and a fan that present a hazard to employees.



Scanning & Measurements

Set up an appointment with Guard-Safe Guarding to visit your facility and review your goals and primary objectives regarding your hazards. GSG will perform their own safety assessment to assist you in this process. GSG will photograph and measure the application. Some applications may require Laser Scanning to capture interferences and assist us in the design stage. The shaft/fan hazard from above was scanned by GSG, as shown here.

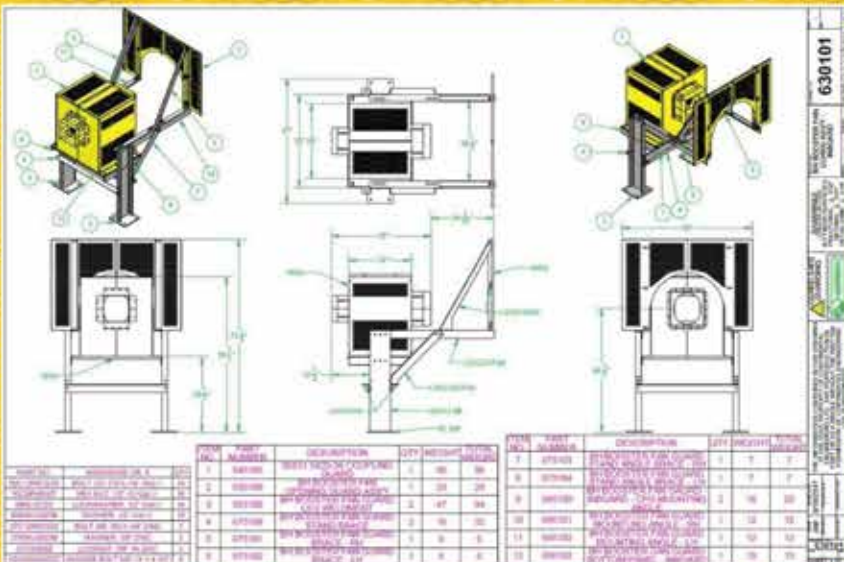


Designing your Guards

Upon processing the Laser Scan, GSG utilizes 3D CAD software to model the new guards and supporting structures. For simpler applications, the model is created based upon site measurements. A 3D CAD image is created and shared with our clients. The client is then able to visualize the final product, ask questions, and provide feedback regarding accessibility, or other concerns.

Engineering Drawings

Upon approval from the client of the initial concept model from above, GSG proceeds to create complete fabrication, arrangement and installation drawings. The drawings are once again submitted to the client for final approval prior to fabrication and shipment. O&M Manuals & drawings are provided for the client in electronic pdf format and paper format.



Installation

Guard-Safe Guarding powder coats all guards Safety Yellow. GSG preassembles the parts prior to shipping to ensure proper fit and delivers the guards assembled as much as possible to save time at installation. All guards are carefully packaged and shipped in a wooden box. It is recommended that a GSG technician be present during the installation process. All guards must be mounted rigid and secure.



At Guard-Safe Guarding we know that you care about your employees. We understand that guarding your equipment is not a simple or glamorous proposition. Guard-Safe Guarding is well prepared to answer your guarding questions. Typical concerns we hear are from Safety Managers looking for guidance, Maintenance personnel wanting easy access & removal of protective barriers, and from operators wanting to work safely, yet unencumbered. We have heard and addressed all of your concerns with our innovative and time saving products.

Please visit our website at www.guardsafeguarding.com call **712-754-4838** or email sales@guardsafeguarding.com to learn more about our custom engineered guarding process and our standard offerings including: Coupling Guards, Barrier Guarding, Idler Guards, V-Belt Guards and much more!



About Safety Through Engineering

Safety Through Engineering, Inc. is a Structural and Safety Engineering, Expert Witness, Safety Training and Consulting firm with the reputation as a pioneer of innovative design and safety solutions. For over 35 years we have provided cutting-edge design services by expanding traditional engineering approaches.

At STE, we incorporate new concepts and technology throughout our projects with 3D BIM, finite element analysis, fabrication drawings and a plethora of services. Fueled by a forward thinking team, STE serves a superior client base with innovative industry solutions.

Why Choose Us

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Emergency Safety Shower Decontamination Booth

When Time is of the Essence, after an exposure to a hazardous chemical substance, any delay, even for a few seconds, can result in serious injury. OSHA and ANSI require that Emergency Showers be located within 10 seconds walking distance from hazardous site location.

HEMCO Emergency Shower / Decontamination Booths are fully assembled and ready for installation to water supply and waste systems. The shower is molded one piece seamless of

chemical resistant fiberglass and is equipped with a pull rod activated shower and push handle eye/face wash for immediately drenching of personnel that have been exposed to hazardous chemicals. Shower is equipped with frosted front strip curtains, interior grab bars, raised deck grating, and bottom or rear drain outlet. Compliant with A.N.S.I. and O.S.H.A. requirements.

www.EmergencyShowerBooths.com •

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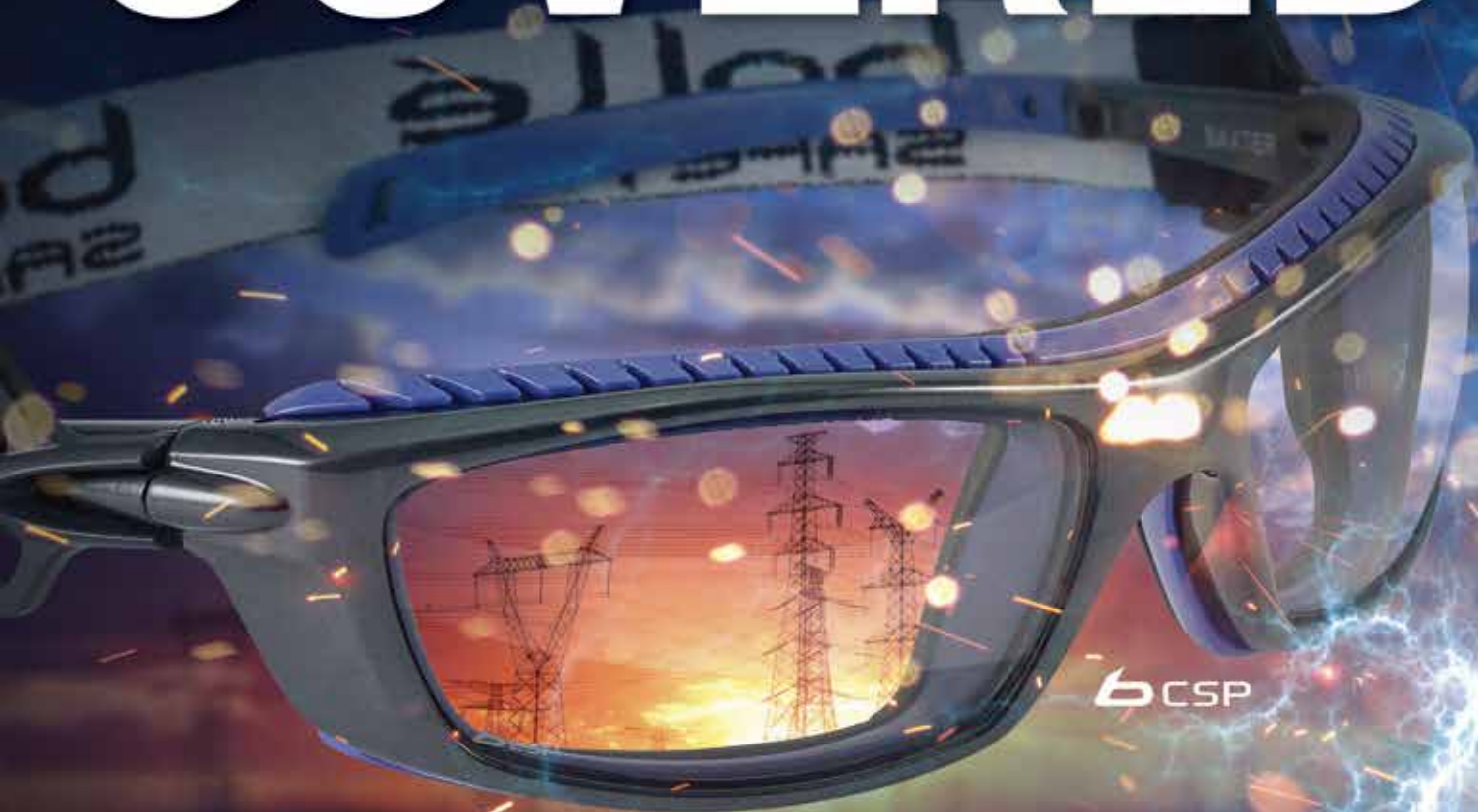


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<http://www.UniMaxFumeHoods.com> •

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JESCOHYDRATILT™ Dumpers which are available in 4000# capacity in .50, .75, 1, 1.5, and 2 cubic yard. The units are operator controlled with the hydraulic system of your forklift and used while seated on the lift. These new units are ideal when controlling the speed of discharging material is critical. The quick-disconnect lines are included on each of the units and a safety retaining chain. To fill out the line even more we have included ten different sizes of our Filter Press Hopper. Then along came the 90 degree Side Pivot Hopper and Low Profile Portable Hoppers with casters already installed.

Wire Mesh Partitions: 2"x1" rectangular mesh 10 gauge wire welded into an angle frame system is easy to use and easy to install. Ideal for around your automation enclosures, prevent your valuable tools from walking away from the tool crib, and quality control on non-conforming material, computer rooms, high security storage and so many more uses. JescoPalletGards® are wire containment backs for the pallet racks with stand-off clips (1.25, 4, 6 or 8 inch) design to fit most standard drilled pallet racks spaced two inch on center. Double hinge doors or double slide doors is an excellent way to secure high value products on the shelves.

1-1/2" Diamond mesh 10 gauge wire partition system are engineered for easy installation allowing unrestricted visibility and total air circulation. Inventory of standard height panels of 7, 8 or 10 high are available; but don't stop there because many industries require partitions to reach the trusses or building joists and that certainly can be accomplished. If you are installing partition on a raised platform (mezzanine) remember this requires zero or "no" sweep to keep everyone safe walking below. This is to prevent tools from dropping from the edge of the platform. (OSHA 1910.23(e)(4) Either partition system will work well but the more project information you are able to supply, the more knowledgeable we all become and it is truly amazing how that works!

The JESCOGARD® industrial guard rail 3-rib corrugation system will act as both a visual and physical barrier around your facility. The Economy Rail System is a 2-rib system and has been tested to withstand an impact of 10,000# traveling 4-mph. Should the need arise you can count on its strength without compromising quality at a price you can afford. Each system has available a self-closing single hinge gate with a sound dampening gasket on the gate.

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JESCOHUSKYDUMPERS®, wire partition systems, industrial guard rail systems, wire tenant storage lockers, industrial shelf carts, LP cylinder cabinets, machine guarding just to name a small portion of the products we offer to our customers. Our products are built to be the best in the industry and it is the reason customers keep coming back. Your satisfaction for a project well done is what really counts when the day comes to a close. We look forward for an opportunity to be able to assist your next industrial guarding or material handling requirements. Check out the full product line shown on the website at www.jescoOnline.com

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Topic	Question ID	Question	Answer
OFFICE: ALARM SYSTEMS	OFF-130.1.US	1. Does the facility have an employee alarm system? Cite: 29 CFR 1910.130(c) 29 CFR 1910.130	Yes
OFFICE: ALARM SYSTEMS	OFF-130.1.US	2. Is the employee alarm system tested annually? Cite: 29 CFR 1910.130(d)(4)	Yes

G. AUDIT QUESTIONS

Date: _____

Facility: _____

Auditor: _____

Question ID	Audit Questions	Auditor Guidance And Notes - Audit Questions	Y E S	N O	N A	Comments
ERGONOMICS						
OFF-140.1.US	1. Are workstations configured so that employees can achieve ergonomically correct working postures?	Workstations should be configured to prevent common ergonomic problems. The computer keyboard and mouse should be within easy reach and at a comfortable height (elbow high), the keyboard and monitor should be aligned, and the screen should be at or slightly below eye level. There have been no issues.				
OFF-140.2.US	2. Are chairs used at workstations adjustable and in good condition?	Chairs should be so that employees can work in a comfortable seated position, with good body support. Chair height should allow feet to rest flat on the ground with thighs parallel to the				

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Hearing Protection That You Want To Use

Exposure to environmental noise is one of the leading causes of hearing loss throughout the world. Every day we are flooded with transport, industrial and recreational noises. Some have the added hazard of excessive noise in the workplace, like a construction site or warehouse. This constant exposure wears down the delicate nerve hairs in the inner ear in the same way a toothbrush bristles wear down over time.

That damage is irreparable. When it comes to hearing, once it's gone, it's gone. So, how can we protect our hearing and preserve it, regardless of environmental noise?

Hearing loss can be prevented by simply wearing good quality noise protection.

If you are one of the 30 million workers exposed to hazardous levels of noise on the job, hearing loss is likely already happening. While you can't always control the noise, you can control how you protect yourself. Protective ear buds, plugs or earmuffs that provide Noise Reduction Rating (NRR) of 20 or more can block out a significant percentage of damaging noise.

To best understand what damaging noise is, we need to talk about decibels (dB), or the way we measure sound intensity. On one end, 0 dB is barely audible sound. A

normal conversation hovers around 55-65 dB. From there, we move into the higher ranges.

Highway traffic results in around 75 dB and something as simple as a hairdryer accounts for 85 dB. A lawnmower garners 95dB, then it's around 130 dB for jackhammers and up to 140 dB for firearms or a jet engine. Construction sites, as you can imagine, often creep up over 100dB on a regular basis.

So how loud is too loud? Well, if you are exposed to levels at or over 85 dB, particularly for a prolonged time or on a regular basis, you're at a high risk of hearing loss.

Our audiologist recommended audio lines that incorporate noise control technology to offer a number of benefits to keep your hearing safe. For example, the ToughTested line:

- carries an Noise Reduction Rating of up to 26 dB
- can reduce the influence of environmental and background noise by up to 30%,
- has a microphone for hands free communication
- is compatible with smartphones

When Time is of the Essence

Emergency Shower and Eye / Face Wash / Decontamination Booth



After exposure to a hazardous substance, any delay, can result in serious injury. OSHA & ANSI require that emergency shower is to be located within 10 seconds walking time from the hazardous site location. Delivering immediate full body shower. Eye/ face wash with positive stay open valves.

Industrial Applications Emergency Drench Shower Booth unit is equipped with pull rod activated overhead drench shower & rear wall mounted eye/face wash. **Cat No. 16601**

Laboratory Applications Emergency Drench Shower Booth same specs as above except with finished exterior side panels. **Cat No. 16604**



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Most importantly, they help to protect against hearing loss, tinnitus, and the daily stress of excessive noise by dampening loud vibrations before they can damage your hearing. By blocking out such a large amount of environmental noise, using the earbuds allow you to keep music and conversations to safe, hearing-preserving level.

We've all heard the old adage that an ounce of prevention is worth a pound of cure. One place where that is certainly the case is with hearing protection. Don't take your hearing for granted, keep it protected and safe for years to come.

ToughTested (toughtested.com), a leader in audio and power solutions for smartphones and portable devices, put together a piece of contributed content dedicated to hearing safety and what busy workers on the job, driving delivery or snow trucks this winter season should be doing to protect their hearing.

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MACHINE GUARDING ASSESSMENTS

What is a Machine Guarding Assessment? An assessment is an evaluation of the machinery in a facility to identify hazards that may cause physical harm to personnel working on or near equipment.

The Assessment Process:

- ❖ Guard-Safe Guarding will arrange a convenient time to visit your facility.
- ❖ It is recommended that the client provide us with a list of equipment, complete with identification names/numbers that are to be inspected.
- ❖ We will meet with your Safety Committee and share our knowledge of machine safety guarding, provide useful advice and discuss the operation of the equipment we will be evaluating.
- ❖ Perform a physical inspection of the equipment and area around the equipment.
- ❖ During the inspection process we will be photographing, measuring and possibly performing a laser scan of the machine.
- ❖ Questions. We ask a lot of questions to the operators and maintenance personnel to gain a firm understanding of what operations are performed on and around the equipment. A guard that is not user friendly is often modified or discarded leaving the operator at risk and the employer vulnerable. We strive to make our guards purposeful and convenient for operators and inspections.

Follow Up:

- ❖ Guard-Safe Guarding will provide a report detailing the hazards that were identified complete with regulatory references.
- ❖ The report will contain our recommended actions & designs for correcting the hazards.
- ❖ We will also send you a proposal to provide the required guarding.
- ❖ All dialogue, observations, notes and media acquired are strictly confidential.

The Package:

- ❖ Safety Education Meeting
- ❖ Hazard Identification
- ❖ Site Measurements
- ❖ Project Analysis
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Safety Rail Company is your one-stop destination for OSHA compliant safety solutions to prevent falls and injury. Every product is designed for simple installation and flexible integration into any commercial or industrial application. All of our products work together to create a comprehensive fall-prevention solution.

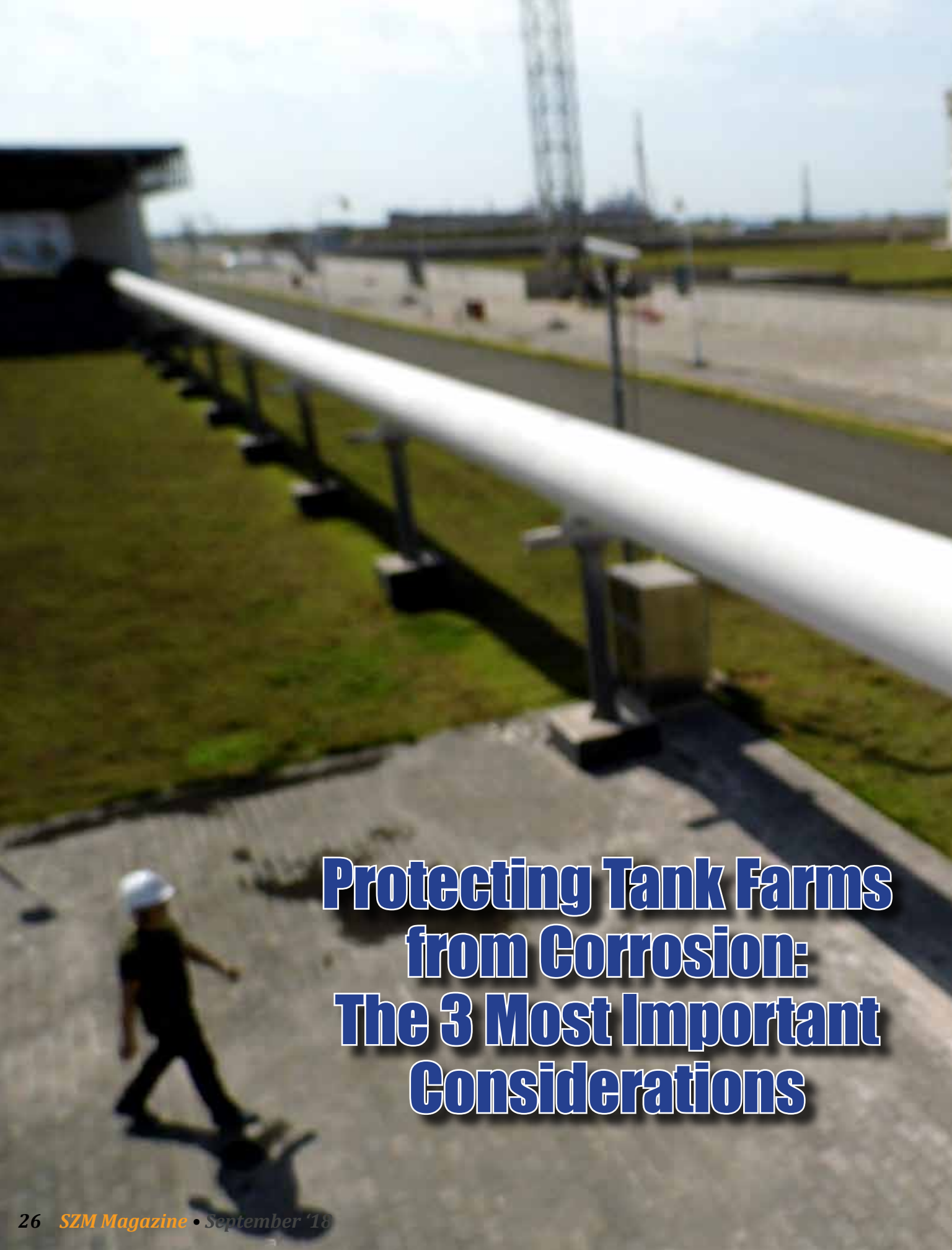


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A large white industrial pipe runs diagonally across a grassy field at a tank farm. In the foreground, a worker wearing a white hard hat and dark clothing is walking on a paved path. The background shows various industrial structures, including a tall distillation column and other piping, under a clear sky.

Protecting Tank Farms from Corrosion: The 3 Most Important Considerations



Going beyond barrier coatings, addressing CUI, and speeding turnaround is achievable with an innovative, cost effective approach

With asset utilization critical and community and regulatory pressure always looming, it is essential that tank farm owners proactively prevent any loss of containment with reliable, cost effective corrosion protection. This is crucial since atmospheric corrosion is one of the main culprits of tank leaks, containment loss, and early replacement.

As oil depots and terminals are often comprised of ample pipeline through which to draw product, it is also vital to address corrosion under insulation (CUI), which can cause serious problems including forced shutdowns, lost production, etc. CUI, which involves the corrosion of vessels or pipe beneath insulation due to water penetration, is insidious because it can remain undetected until leaks occur or the insulation is removed for inspection. Consequently, dealing with CUI and inspecting for it are very costly.

Fortunately, by addressing a few important considerations regarding corrosion, tank farm owners can stop corrosion and CUI for years to dramatically extend tank and pipe service life. In doing so, they can also improve safety, reduce downtime, and expedite maintenance turnaround.

Go Beyond Barrier Coatings

Tank farm corrosion protection typically involves applying polymer paints and rubber type coatings. Such methods create a physical barrier to keep corrosion promoters such as water and oxygen away from steel substrates. However, this only works until the paint is scratched, chipped, or breached and corrosion promoters enter the gap between the substrate and coating. When this occurs the coating can act like a greenhouse – trapping water, oxygen and other corrosion promoters – which allows the corrosion to spread.

Instead, as a better alternative, a growing number of the world's largest petrochemical companies with tank farms are finding success with an innovative approach toward stopping corrosion.

To extend the service life of tank farm assets, including those already experiencing atmospheric corrosion, owners and facility managers are turning to a new category of tough, Chemically Bonded Phosphate Ceramics (CBPCs) that can stop the corrosion, ease application, and reduce production downtime even in very wet, humid conditions.

One example of this is EonCoat, a spray applied inorganic coating from the Raleigh, North Carolina-based company of the same name.

In contrast to traditional polymer coatings that sit on top of the substrate, the EonCoat corrosion resistant CBPC coating bonds through a chemical reaction with the substrate. The surface of steel is passivated as an alloy layer is formed. This makes it impossible for corrosion promoters like oxygen and humidity to get behind the coating the way they can with ordinary paints.

Although traditional polymer coatings mechanically bond to substrates that have been extensively prepared, if gouged, moisture and oxygen will migrate under the coating's film from all sides of the gouge.



By contrast, the same damage to the ceramic coated substrate will not spread corrosion because the carbon steel's surface has been chemically transformed into an alloy of stable oxides. Once the steel's surface is stable (the way noble metals like gold and silver are stable) it will no longer react with the environment and therefore cannot corrode.

Visible in scanning electron microscope photography, EonCoat does not leave a gap between the steel and the coating because the bond is chemical rather than mechanical. Since there is no gap, even if moisture was to get through to the steel due to a gouge, there is nowhere for the moisture to travel. This effectively stops atmospheric corrosion on carbon steel assets.

Address the "Silent Killer" CUI

Corrosion Under Insulation (CUI) is the root cause of many of the global petrochemical industry's most serious problems including forced shutdowns, lost production, early repair and replacement, as well as safety and environmental consequences that can cost millions of dollars per incident.

"CUI is the silent killer," explains Merrick Alpert, President of EonCoat. "The insulation creates a terrarium on the steel in which corrosion is guaranteed to occur if traditional coatings are used. And the insulation then hides the corrosion from being detected until it's too late." Pipe is particularly susceptible to mechanical damage

from shipping, installation, or facility operation that may breach traditional coatings and accelerate CUI.

Because of the risk of CUI, a dedicated team is often required to inspect vessels or extensive piping on a virtually continuous basis. However, removing pipe insulation and spot-checking that portion of pipe does not eliminate the risk of CUI along the entire pipe network at the tank farm.

As an alternative that helps to curtail this costly inspection and maintenance cycle, a CBPC coating like EonCoat provides a corrosion barrier that is covered by a ceramic layer that further resists corrosion, water, impact, abrasion, chemicals, fire and high temperatures.

In this way, the ceramic layer provides a tough outer coating that dramatically reduces mechanical damage and any potential breach of the coating.

The CBPC coating's chemical bond further ensures that even if moisture were to get through to the steel due to a gouge, it would travel no farther than the boundaries of the gouge. This quality effectively prevents the hidden spread of corrosion, which is arguably the most insidious aspect of CUI.

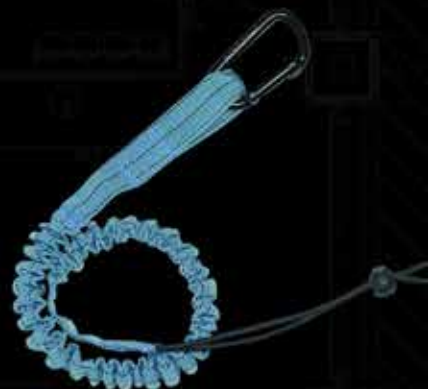
Faster Turnaround Time

One of the greatest benefits of the CBPC coating, however, is the rapid return to service that minimizes facility

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downtime. The time saved on an anti-corrosion coating project with the ceramic coating comes from less surface preparation, the elimination of the intermediate coat and expedited curing time.

With a typical corrosion coating, near white metal blast cleaning (NACE 2 / SSPC-SP 10) is required to prepare the surface. But with the ceramic coating, only a NACE 3 / SSPC-SP 6 commercial blast is typically necessary.

Furthermore, with traditional coatings, extensive surface preparation is required and done a little at a time to avoid surface oxidation, commonly known as 'flash rust', which then requires re-blasting.

However, with the CBPC coating, the flash rust is no issue. There is no need to 'hold the blast'. The reason for this unique CBPC characteristic is due to the presence of iron in the rust, which helps to create the magnesium iron phosphate alloy layer. It is this alloy layer that allows CBPCs to so effectively protect carbon steel from corrosion.

For traditional 'three part system' coatings utilizing polyurethanes or epoxies, the cure time may also be days

or weeks before the next coat can be applied, depending on the product.

In contrast, a corrosion resistant coating for carbon steel utilizing the ceramic coating in a single coat requires almost no curing time. Return to service for tank farms can be achieved in as little as one hour, which can potentially save hundreds of thousands of dollars per day in reduced facility downtime.

Boosting the Bottom Line

For petrochemical tank farms with massive carbon steel structures, corrosion and CUI have been a costly, perennial problem.

Now, however, by proactively using best in class anti-corrosion products like CBPC coatings, facility managers will be able to deter corrosion and CUI for decades, reduce downtime, and postpone tank and pipe replacement. This will significantly help the bottom line.

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Designing Dust Collectors with Expert Guidance



Consulting with a specialist can help MEs ensure compliance and safe performance

Dust collectors are used to capture, convey, and collect dust for a wide variety of manufacturing and industrial processes. Whether involving wood, plastic, metal, or chemical dust particles, this is done to improve safety by reducing fire, explosion, and dust inhalation hazards.

When it comes to dust collection, however, the challenge for mechanical engineers (MEs) is that, by definition, mechanical engineering is one of the broadest engineering disciplines. As such, they are often tasked with designing machinery or systems that provide a variety of functions, including generating power/electricity; conveying people/materials; and furnishing HVAC/refrigeration.

With such a broad focus, MEs are often unfamiliar with some of the technicalities of dust collection safety code compliance, since dust collection systems account for just a tiny fraction of their work.

When MEs have questions regarding dust collection on topics ranging from airflow to meeting NFPA and IMC codes, seeking guidance from an industry expert can help to achieve compliance, safe performance, and better indoor air quality.

Design Challenges

Since dust collection is so important for safety – and depends on factors such as the dust sources, air filtration, facility usage, and HVAC – it often has to be customized and not based on previous design plans.

Peter Levitt, a NFPA member, who for over two decades has been a committee member of NFPA 664, which oversees revisions of the woodworking code, outlines the five main components of a dust collection system.

These components include a hood to confine the dust at its source; a duct system to convey the dust; a fan to provide hood suction and maintain transport velocity in the ducts; a collector to separate the dust from the air stream and a device to store the collected dust.

“When dealing with dust collection, MEs often have questions about duct sizing, and how much air to allocate for suction at the hood and at each



woodworking machine,” says Levitt. “They may not know what the velocity should be in the ducts, and often do not know what the code specifies for the dust collection system.”

Levitt notes that a properly designed and maintained dust collection system will dramatically enhance shop safety. This can not only reduce the risk of dust explosion and fire, but also help to minimize any dust inhalation while improving indoor air quality.

“MEs are often not aware of the incompatibility of some machines, materials and processes for a dust collection system,” says Levitt.

As an example, he cites a relatively common mistake. “In a wood shop you might have a grinding wheel to sharpen tools,” he says. “However, you cannot have common suction at the grinder because any sparks produced could ignite the wood dust and trigger a fire or explosion. So the grinder cannot be part of the dust collection system.”

He adds that for a similar reason, PVC ducts should not be used with a dust collection system. The problem is that if static electricity is generated by the dust being conveyed in the duct, it can also cause a dust explosion.

Best Practice Dust Control

To help MEs learn best practice options for dust control, Levitt, who is also a product manager at Sternvent, Inc., conducts lunch and learn presentations at engineering firms.

Union, NJ based Sternvent has over 50 years of experience in the design, manufacture, and application of dust collection systems. The company, which specializes in systems for the wood, metal finishing and chemical industries, provides up-to-date guidance for compliance with NFPA, OSHA and IMC.

In the presentations, Levitt covers topics such as determining the location of the dust collector, explosion venting, spark detection/suppression, and NFPA 664 recommended exhaust requirements. He also surveys the range of dust collection system equipment choices from indoor enclosureless positive pressure to outdoor shaker and pulse jet types.

While Levitt provides guidance, he defers sales to the Sternvent network of professional sales representatives, who have developed ongoing, trusted relationships with MEs.



One aspect of dust collection that needs more attention is the design of the ductwork, according to Levitt. “For good airflow, good duct work is essential. Even with a powerful dust collector, if the duct work is not designed properly, you will have so much airflow resistance you won’t have enough airflow or suction.”

Another aspect that he says often needs consideration is whether the dust collector is located indoors or outdoors and how that affects filtered air.

“Typically, the dust collector is located outdoors for fire safety,” says Levitt. “However, in regards to filtered air, if you don’t return it properly, then in winter you will have a hard time heating the building. The result is like having a fan exhausting the warm indoor air outside.”

While many factors should be examined in designing a safe and effective dust collection system, it is also important to not over specify it.

“If a dust collector is over-sized, it will not only cost more than required, but also create excessive noise due to high velocity airflow in the ducts,” concludes Levitt. “Knowing your options up front by collaborating with an expert can help MEs deliver the best equipment for the situation at the best price.”

For more info, call 908-688-0807; Fax: 908-688-0718; email Peter Levitt: plevitt@sternvent.com; visit www.sternvent.com; or write to Sternvent, Inc. at 5 Stahuber Ave, Union, NJ 07083.

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