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RegScan Country Monitor

Published monthly and authored by environmental lawyers, the RegScan Country Monitor covers the same topical areas (listed below) as our global legal registers and audit protocols. Our globetrotting experts re-view multiple sources for crucial regulatory developments, and provide clear analysis on what they REALLY mean for EH&S professionals.

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How the Multi Gas Clip Simple works in inert environments

Detectors that use pellistor/catalytic bead type LEL sensors require oxygen to be present to perform the necessary heating process to detect combustible gas. The **Multi Gas Clip Simple's** infrared LEL sensor needs no oxygen to detect combustible gas. **It detects with an infrared beam of light**, so there is always an accurate reading in oxygen enriched or oxygen depleted environments.

Benefits of the infrared LEL sensor

Key disadvantages of the pellistor/catalytic bead LEL sensor include: the sensor's fragile bead and filament could break if the detector is accidentally dropped, it has a tendency to heat up and burst when suddenly exposed to high levels of gas and it can be poisoned over time with exposure to typical sensor poisons such as H_2S or silicones. The infrared LEL sensor in the **Multi Gas Clip Simple** **has no fragile filament or bead to break, burst or get poisoned**. The continuous self-test function and fail-to-safe features of the infrared LEL sensor provide assurance of protection. **If the infrared LEL sensor is unable to detect gas for any reason, the detector immediately notifies you.** With the **Multi Gas Clip Simple**, you will know that you are always protected.

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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

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.



Regulations can be complicated, but they don't have to be. RegScan's WIKI feature provides clear analysis on the newest and most important environmental regulations in easy-to-follow articles authored by subject matter experts. The article-based system explains key provisions and requirements so users can proactively stay transparent while preventing and mitigating risks.



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Revised Ambient Air Monitoring Quality Assurance Requirements

ABSTRACT

The revised air monitoring quality assurance requirements are EPA's first comprehensive changes to the air monitoring rules since 2006. These changes formalize many changes that had been informally adopted by Agency memorandum and guidance documents. Many of the changes were driven by improved monitoring technology—such as continuous particulate matter analyzers—that were not commonly available at the time of the previous update.

The revised rules also revert to the pre-2006 structure whereby state and federal monitoring program requirements are set out in Appendix A, with industrial PSD monitoring requirements specified in Appendix B. EPA provides a summary of the changes at the following URL:

https://www3.epa.gov/ttnamti1/files/ambient/pm25/Summary_of_Appendix_A_Changes_%2012_25_2016.pdf

ARTICLE

Key Changes

The revised regulation once again separates the quality assurance requirements applicable to state and federal monitoring programs from those for industrial PSD monitoring. This change recognizes the many differences in the objectives and implementation approach between the state and industrial monitoring programs. Other significant items include:

- Increased emphasis on the role and responsibilities of the Primary Quality Assurance Organization (PQAO)
- Requirement that EPA be provided a courtesy copy of an organization's Quality Assurance Project Plan (QAPP), even if that PQAO has been delegated QAPP review authority by EPA
- Clarification of the applicable system and performance audits and required frequency for each type of monitoring program
- Updated calibration and audit ranges for gaseous analyzers

Impacts On Existing Monitoring Monitoring Programs

Marijuana and Workplace Safety:

It's Getting Very Serious

The train had only left the station 18 minutes prior to striking a backhoe, killing two track workers, derailing, and hospitalizing 41 individuals. Nearly a year later the investigation is ongoing and causes are still under debate. But a report released in early 2017 reveals that all three individuals involved in the crash in Pennsylvania, the engineer and the two track workers, all tested positive for drug use. While drug use is not believed to have been the primary cause of the accident, any positive drug test is an immediate red flag in such a safety-sensitive industry. Amongst oxycodone and cocaine, one of the individuals tested positive for marijuana.

Such stories are still rare and still cause us to pause. Fortunately, in this incident, although there were many injuries, no passengers died. Unfortunately, it was not the first time and may not be the last time that impaired workers are on the job. Drug use is on the rise in the United States. As popular opinion has shifted from "War on Drugs" to "Everybody's Doing It" it is no wonder that accidents are on the rise. The pro-marijuana movement has surged to new heights of success since the turn of the millennium. Before 2000, only four states and the District of Columbia had medical marijuana laws. Today that number has reached 28 and that is not counting those states that have marijuana oil laws like in Georgia. And in just four years, eight states and DC have legalized marijuana for recreational purposes.

Marijuana Use On the Rise... And So Are the Consequences

Concurrently, more Americans are trying marijuana than ever before. Taboos and inhibitions surrounding drug use are on the decline. The National Survey on Drug Use and Health indicates that drug use is on the rise for all age groups, including for marijuana. In 2008, 8.1 percent of those 12 and older were current marijuana users. By 2014, that percentage had risen to 10.2 percent. While that may only be a couple of percentage points difference, it represents

approximately 22 million people who use marijuana on a regular basis (at least once in the past 30 days).¹ This is backed up by a recent Gallup poll that showed that in 2016 about 1 in 8 American adults say they smoke marijuana. That's nearly double the number who said the same thing in 2013 (7 percent in 2013 and 13 percent in 2016).² Also, according to Gallup, support for marijuana legalization is the highest it has been in the 47 years that it has been conducting surveys on the topic. In their late 2016 survey, 60 percent of Americans said they support legalizing marijuana.³

And these are not the only statistics on the rise. From 2007 to 2014, the number of nighttime weekend drivers with marijuana in their system in the U.S. increased nearly 50% (from roughly 8 percent to 13 percent).⁴ In the state of Washington, the percentage of drivers involved in fatal crashes who had recently used marijuana more than doubled from 2013 to 2014 (from approximately 1 in 12 to 1 in 6).⁵ And while some may argue that marijuana-impaired driving is not as big a deal as alcohol-impaired driving, the facts do not change: impaired driving is more dangerous than non-impaired driving.

And as we saw in last year's train accident in Pennsylvania, as attitudes relax and drug use increases, workplace safety and public safety suffer.

Medical or Recreational, Marijuana Poses a Safety Risk

There are 483 known compounds in marijuana. Of those compounds, 65 are cannabinoids – chemical compounds that alter neurotransmission in the brain. Tetrahydrocannabinol (THC) is the principal psychoactive compound (cannabinoid) in marijuana and is responsible for all the classic "high" effects of marijuana use. This includes feelings of euphoria, sleepiness, anxiety, and psychosis. Another important cannabinoid is cannabidiol (CBD). Unlike THC, CBD pro-

vides no feelings of being "high" or "stoned." It doesn't provide feelings of euphoria. In fact, it counteracts the sleepiness, anxiety, and psychosis caused by THC.

These two substances represent two very different approaches to marijuana legalization: marijuana as medicine (CBD) and marijuana as "good fun" (THC). Either way, there are risks involved. Whether someone is honestly sick and seeking relief or bored and seeking escape, marijuana in the workplace is dangerous. This is supported by the documented effects of THC and CBD, as well as by the fact that an unregulated market leads to sick people getting THC strains when they really should be using CBD strains. Before showing how this impacts the workplace, let us look at the science behind these two compounds.

THC: Supposed Benefits and Established Risks

While one may reasonably conclude that a medicine that causes anxiety and psychosis is not worth trying, others may argue that the benefits outweigh the negatives. THC imitates a neurotransmitter that occurs naturally in the body (anandamide), which regulates sleep, hunger, and pain perception. As such, there is evidence that THC can be used to reduce nausea, vomiting, and pain while increasing appetite. This would be beneficial to counteract some of the side-effects of chemotherapy or the symptoms of HIV/AIDS.

But THC isn't a benign substance. THC triggers the release of dopamine, creating feelings of euphoria. This effect of THC is the key reason that marijuana is one of the most widely abused drugs in the world. But, like any other drug, repeated and excessive amounts of dopamine may cause a dependency. This could lead users to rely on marijuana to stabilize and feel "normal." Additionally, THC interferes with the hippocampus, the part of the brain responsible for forming new memories. This leads to

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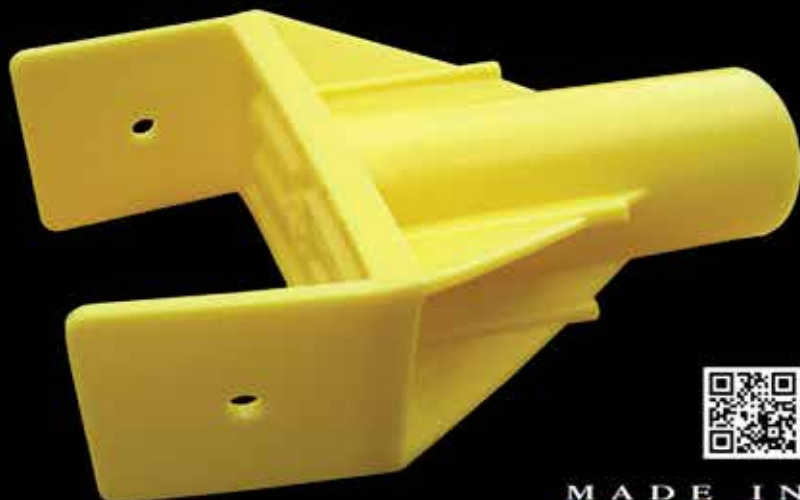
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forgetfulness, which in turn interferes with work, school, and family life. Not to mention the possibility of psychosis, anxiety, and depression. According to the National Institute on Drug Abuse, THC can trigger a relapse in schizophrenic symptoms. Finally, THC can impair motor skills, making tasks like riding a bike or driving a car more difficult and dangerous for marijuana users and those around them.

CBD: Supposed Benefits and Potential Risks

CBD and THC have the same chemical formula, but because the atoms are arranged differently, CBD does not produce the same psychoactive effects or “high” that THC does. CBD can decrease pain, while stimulating appetite, just like THC, but without causing sleepiness, memory loss, and many of the other negative side effects of THC. In fact, CBD can counteract the psychoactive effects of THC, making it potentially useful for individuals suffering from schizophrenia, social anxiety, and depression.

While CBD is often considered less harmful than THC, it is not completely risk-free. CBD can affect the way the body metabolizes other medicines, since it neutralizes certain enzymes in the liver. Interestingly, it is because of this neutralizing effect that CBD can counteract THC when taken concurrently. It can also cause low blood pressure,

light headedness, and drowsiness. While these effects may not be as severe as those seen with THC, they can easily contribute to workplace accidents and injuries. CBD can also lead to dryness of the mouth or “cotton-mouth.” This is because the receptors in the mouth that accept CBD are linked to saliva production. As well, there are conflicting studies concerning the effect of CBD on sufferers of Parkinson’s disease. Some studies suggest that it may worsen tremors and muscle movement associated with the disease, while others suggest there is no risk.

THC and CBD: A Distinction Lost On Many

Since marijuana is a Schedule I controlled substance under federal law (meaning there is no legally recognized medical application put a dangerous substance into the hands of those who are sick, desperate, and willing to try anything to feel relief. And while compassion and understanding are welcome and valued traits, forgetfulness, anxiety, depression, psychosis, and reduced motor skills can lead to a myriad of other issues including accidents on the roads, rails, air, and in the workplace.

This lack of understanding about CBD and THC is dangerous. Of the 60% of Americans who support legalized marijuana, how many understand the different roles of CBD and THC and the dangers each may pose? Unless

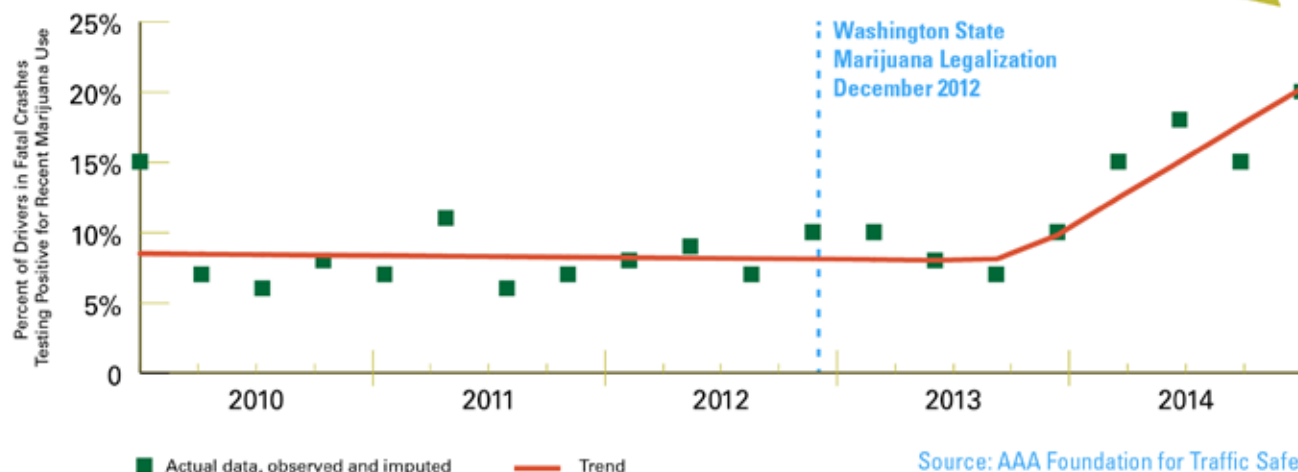
a medical marijuana user is very savvy, there is a distinct possibility that from week to week, his or her supply of medicine could go from relatively safe CBD to demonstrably dangerous THC. A dispensary clerk could unwittingly mix up high-THC and high-CBD strains or worse, not know the levels in each strain or have been trained on the different effects of THC and CBD. With unregulated labeling, usage and dosages of marijuana, a well-intentioned and well-informed patient could be mistakenly dosing herself with high levels of THC. And, because the laws are inconsistent, patients can sometimes grow their own marijuana. Again, unless they are aware of the differences and make sure to purchase high-CBD strains, they could be growing their own high-THC marijuana and ingesting it could cause more harm than good.

THC Concentration Rising

With the risks of high-THC strains of marijuana established, consider the following statistics. A report released in 2015 from Charas Scientific, one of the labs in Colorado certified to test marijuana potency, indicated that today marijuana potency averages around 20 percent THC (with peaks reaching 30 percent THC). That is a drastic shift since the 1980’s when the average THC potency was around 4 percent.⁶ Even more unsettling is the increase in THC potency when compared to just a few years ago. According

Fatal Road Crashes Involving Marijuana Double After State Legalizes Drug

FATAL CRASHES INVOLVING DRIVERS WHO RECENTLY USED MARIJUANA DOUBLED IN WASHINGTON AFTER THE STATE LEGALIZED THE DRUG IN 2012.



Source: AAA Foundation for Traffic Safety

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to the National Institute on Drug Abuse, in 2012 the average THC potency of marijuana confiscated by police was about 15 percent. In just three years, average marijuana potency grew approximately 33 percent.⁷ Combined with statistics showing that marijuana use is on the rise, this not only means there are more people using marijuana than ever before, but they are getting more of the psychoactive effects of marijuana than ever before. This means more employees coming to work impaired and more impaired than they would have been a decade ago.

Safety Hazards

Substance abusing employees are not safe employees. Marijuana may not be considered as dangerous as cocaine, meth, and bath salts, but it is not a benign substance either. Substance abuse problems can begin manifesting themselves in employee safety records. Statistics prove that substance abusing employees will be involved in more accidents than other workers, even though they are often not the ones who are injured. They also tend to display carelessness in the operation and maintenance of potentially hazardous materials or dangerous equipment.

ment.

Other safety-related signs of substance abuse may include:

- Risky behavior
- Increased involvement in off-the-job accidents
- Damaging equipment or property

This problem is not exclusive to jobs that are traditionally considered safety-sensitive. It may be obvious why someone impaired by marijuana should not operate a forklift or a jackhammer, but some may not immediately realize the danger when daycare workers, physicians, regional sales managers, and cooks are lighting up. Since marijuana impairs judgement and makes users feel like everything is alright, daycare workers who are high may not realize when infants and toddlers are in danger. Physicians may misdiagnose a critical condition as something more benign or neglect to correct submit a prescription to the pharmacy. A regional sales manager who drives from store to store may cause an accident on the highway or inadvertently cause an accident when checking in on a warehouse. Cooks may mishandle knives or hot cooking oil or ignore food-safety rules. All of these create unsafe work environments, even in workplaces that are not usually considered safety-sensitive or that are not under federal safety regulations. More accidents mean more injuries, work stoppage, increased insurance premiums, direct healthcare costs, and even litigation.

Surely Not My Employees!

A recent *Monitoring the Future* study found that most parents suspected that their teens' friends and peers were using drugs, but claimed that their own children were not possibly using drugs. But it turned out that when these researchers asked teens, many of them were indeed using drugs.⁸ Many parents were shown to be ignorant to the reality of their teen's drug use because they just cannot believe that their own children could be using drugs. The same principle may be true of some employers. Many may recognize that marijuana is a problem in other companies, but surely it is not a problem in their workplace amongst their employees. But again, statistics support that they probably do have employees using marijuana. As established earlier, taboos surrounding drug use, especially marijuana,

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are eroding and more employees are lighting up than ever before.

According to the federal government, the number of drug users who are employed rose from 8.28 million in 2013 to 8.98 million in 2014. That means approximately 700,000 more drug users in the workplace in a single year. Concurrently, drug users who are unemployed dropped from 2.56 million in 2013 to 2.31 million in 2014. That means 250,000 of 700,000 people mentioned above were unemployed drug users, but found employment. That leaves around 450,000 employees who were not drug users in 2013 that began using or experimenting with drugs in 2014 and managed to keep their jobs.⁹

According to the National Council on Compensation Insurance, as many as 50 percent of all workers' compensation claims are related to the abuse of alcohol or drugs in the workplace. Drug users, as a group, use medical benefits at a rate eight times higher than non-users. Substance abusing employees also are absent from work more often than their non-substance abusing co-workers, often resulting in increased workloads for co-workers and decreased employee

morale.

Conclusion

Employers have an obligation to provide safe work environments for their employees and customers. Marijuana is simply incompatible with this imperative. While it may be increasingly unpopular for employers to have drug-free workplace policies, facts do not shift with popular opinion. As marijuana use increases, so do accidents and injuries. This is not a problem that restricts itself to impaired driving. It affects workplaces and their bottom lines too. It is not a problem that is limited to Washington, Colorado, and other states that have legalized the drug for recreational purposes. It is an issue that touches every corner of the nation and the world.

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Fire Extinguisher Selection for Petro-Chemical Facilities



Petro-Chemical facilities face daunting tasks in preventing and suppressing fires. With a tight energy market and unprecedented consolidation of energy companies, plant protection departments and refinery fire departments have found themselves in a position of doing more with less. At the same time, the world's increasing demand for oil has placed new importance on production, pipeline, manufacturing and marketing facilities for oil companies. The loss of a major facility affects our economy and poses concerns about our national security and independence. Now more than ever, it is necessary to provide prevention techniques along with a strategy of "defense in depth" against the possibilities of fire and explosion in petro-chemical facilities.

Ever vigilant prevention methods continue to be improved upon in these facilities. Hot work permits, lock-out tag-out procedures, outside contractor training, gas detection systems and plant modernization help to prevent fires from happening. Should a fire occur, employee training, new suppression technologies, first responder tactics and mutual aid infrastructures provide layers of "defense-in-depth" response as an incident grows in size and magnitude. At the very first step in these various levels of defense, after prevention, is the seemingly mundane and low tech fire extinguisher. Dry chemical extinguishers offer speed, portability and rapid knock down of flammable liquid fires that cannot be matched by most other equipment. Their proper selection, maintenance and training are essential in a successful use of these important fire fighting tools as part of a "defense-in-depth" program.

These three elements can be summarized by a concept that has been used by fire equipment distributors in the U.K referred to as the "Triangle of Safety". Each key element of the triangle is dependant upon the other. With the best selection of equipment and the best maintenance program, without an effective training program, the system fails. With an effective training program and the best equipment available, if maintenance is not performed according to the equipment manufacturer's recommendations, the system fails. An effective training program and proper maintenance will still result in system failure if the proper equipment was not put into service. Each one

of these elements will be discussed in this article, but first let's discuss the role of fire extinguishers, their advantages and disadvantages in a petro-chemical setting.

Proper Equipment.

Portability: Fire extinguishers have some unique and distinct advantages, particularly as it relates to the first line of defense in a flammable liquid fire situation. One of these advantages is portability. Fire extinguishers, whether hand portable or wheeled, in addition to being placed throughout the hazard areas of a petro-chemical plant, can be carried to nearly any part of the facility including areas where hot work is being performed. Since they are not dependent upon any fixed infrastructure, like hose lines and foam delivery systems, they can be quickly deployed throughout the facility, even in anticipation of a problem. This portability comes with a price – limited agent quantity. Your fire fighting capabilities will be limited by skill, training and the amount of equipment you could carry (or wheel) to the incident.

Speed: Another advantage that dry chemical extinguishers have in flammable liquid fire situations is speed. Getting fire extinguishing agent onto the fire may be as simple and as quick as Pull Aim Squeeze Sweep (P.A.S.S.) depending on the type and size of the extinguisher being used. Flammable liquid fires grow and intensify very quickly so speed is a large factor in achieving successful extinguishment in the fire's initial stages, or perhaps more importantly, knocking the intensity of the fire down to allow personnel to get to a safe area and gaining time for first responders to arrive. Speed, like portability, comes with a trade-off – discharge time. Depending on the size of the extinguisher, the flow rate and other factors, discharge time may be as little as 15 seconds for a hand portable and up to 60 seconds for a large wheeled extinguisher.

Rapid "Knock-Down" and Flow Rates: Dry chemical has another advantage over other extinguishing agents when applied to flammable liquid fires – rapid and profound effect on the flame front, commonly referred to as flame "knock-down". The effect of dry chemical application on a flammable liquid fire will be determined by several factors – the type of flammable liquid fire involved – the flow rate of the extinguisher being used as expressed in lbs/sec. – the operator's application of the chemical to the fire. The flow rate of the extinguisher can be a key issue contributing to not only successful extinguishment, but also more rapid extinguishment of incipient flammable liquid fires other than simple spill fires. As another way of expressing dry chemical flow rates, think of the difference between fighting a flammable liquid fire with a single 60 gpm fog nozzle compared with fighting the same size and type of flammable liquid fire with a 90 gpm fog nozzle, the 90 gpm fog nozzle will have more effect on the fire and

accomplish extinguishment more easily and more rapidly than the 60 gpm nozzle.

Flammable liquid fires can be divided into 5 categories: Spill Fire, Flammable liquid in depth (like a pan fire), Obstacle fires, Gravity-fed/Three Dimensional (like a punctured drum dripping or flowing onto the floor), Flammable liquid or gas under pressure (like a failed flange or packing or a broken propane valve or line). All five of types of flammable liquid fires are likely to occur in a petro-chemical setting, however, only one type, flammable liquid in depth, is used in the UL testing protocol, since it is most easily duplicated and repeatable with consistent circumstances. For this reason, ANSI/UL 711 uses flammable liquid in depth fires for rating the relative fire fighting capability of dry chemical extinguishers. Below is a chart outlining the UL Class B rating, the corresponding size pan used for the fire test and the minimum discharge time assigned to the extinguisher that bears the UL rating.

Rating	Min. D. Time	Pan Size
20B	8 Sec.	50 Ft. Sq.
40B	13 Sec.	100 Ft. Sq.
60B	17 Sec.	150 Ft. Sq.
80B	20 Sec.	200 Ft. Sq.
120B	26 Sec.	300 Ft. Sq.

The concept behind the minimum required discharge time for the higher ratings was to allow the novice operator more time to correct any application mistakes that were made. This also increases the time that the extinguisher operator will be exposed to the fire incident, the associated radiant heat and possible spread of the fire. Live fire tests using various flow rates under controlled circumstances conducted by several manufacturers in the 1950's and 1960's proved that a higher flow rate would result in faster extinguishment of most flammable liquid fire situations. Many facilities would prefer to hit the fire with a higher flow rate to increase the "knock down" even though the effective discharge time is decreased because it limits the operators exposure to the fire in its initial stages.

A common rating available for a 20 lb. Extinguisher would be 120B:C, however, it may be more advantageous when choosing extinguishers for a petro-chemical facility to use a 20 lb extinguisher with a lower "B" rating such as 40B:C or even 20B:C because of the increased flow rate. A 40B rated 20 lb extinguisher would have nearly twice the flow rate of the 20 lb extinguisher that has a 120B rating and therefore would have a more profound effect on the fire and more success when dealing with gravity-fed fires and flammable liquids under pressure. 20 lb. and 30 lb. Dry chemical extinguishers with increased flow rates are available from several manufacturers and may be designated "Fast Flow" or "High Flow" models. Regarding flammable gases under pressure – it is not usually suggested that these fires be extinguished since a vapor cloud may

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form that would compound the problem. The best way to deal with pressure fires is obviously to shut off the source of fuel through the "blocking" of valves – isolating the leak point.

NFPA 10 – 2013 Edition requires "Large capacity dry chemical extinguishers of 10 lb (4.54 kg) or greater and a discharge rate of 1 lb/sec (0.45 kg/sec) or more..." for the protection of pressurized flammable liquid, pressurized flammable gas, obstacle and three dimensional fires. See 5.5.1, 5.5.2 and 5.5.4.

Discharge Ranges. Another option available from different extinguisher manufacturers is a longer effective discharge range. Longer range may be necessary to reach potential hazards in the facility either in a vertical or horizontal plane. It may also be of benefit to employ long range extinguishers to keep personnel back further from the fire incident for safety and a more effective means of escape. A typical effective range for a "standard" extinguisher may be 12 to 15 feet while a "long-range" extinguisher may be 25 to 30 feet for a hand portable extinguisher and 40 to 50 feet for a wheeled extinguisher. Long range, coupled with a higher flow rate could give the greatest knock down on the fire from the greatest possible distance making the extinguisher more effective and safer to operate.

Corrosion Protection. Since many petro-chemical facilities are located near oceans, bays estuaries and rivers, corrosion can be a major concern for fire extinguishers. Many manufacturers offer special options on extinguishers to extend the life of the

unit in harsh environments. Different components using stainless steel, chrome plated brass or specially anodized aluminum are available in addition to "CR" paint processes to retard the rate of corrosion. Even hot-dipped galvanized extinguisher shells and wheeled unit carriages are available. If corrosion is a problem, these options are available from several different manufacturers and should be considered based upon the environment where the extinguishers will be installed.

Manufacturer's Recommended Maintenance. Once the proper equipment has been chosen that matches the needs of the facility, including long range and increased agent flow options, it must be maintained properly in order to be effective. NFPA 10 requires inspections of extinguishers at 30 day intervals. These inspections are a "quick check" of the unit to assure reasonable confidence in its operation. NFPA 10 – 2013 Edition has detailed information on how and what to check on the extinguisher during a 30 day inspection. NFPA 10 also requires an annual maintenance to be performed on every extinguisher. Annual maintenance is a thorough examination of the unit and should be performed only by "...trained persons having available the appropriate servicing manual(s), the proper types of tools, recharge materials, lubricants, and manufacturers replacement parts or parts specifically listed for use in the fire extinguisher". If you are currently performing annual maintenance "in house" by using full time employees, you may want to re-evaluate that position. Unless you have employees trained, equipped and solely dedicated to this function, your

maintenance program will be inadequate. It may be more advantageous to contract this work out to fire equipment distributors who have professional technicians that are trained, have the appropriate parts, manuals and supplies to do the job properly. In any case, it is imperative that the maintenance be performed in accordance with NFPA 10, local codes and the manufacturer's maintenance manual. Some manufacturers offer warranties up to 12 years in length as long as the equipment has been maintained by one of their authorized distributors and that maintenance has been performed in accordance with their manual. As part of the "Triangle of Safety", even the most expensive equipment and comprehensive training will be wasted if proper maintenance is not performed.

Effective Training. Fire extinguisher training is necessary for effective, safe extinguisher use and required by OSHA. Live fire training exercises, still considered the most effective method for training employees on using extinguishers to suppress flammable liquid fires, is becoming increasingly difficult perform. Ever stricter air quality standards and employee scheduling make conducting live fire training exercises on site nearly impossible. Some fire extinguisher manufacturers still offer live fire training at off site facilities on a limited basis and there are many industrial fire schools throughout the country. Fire Equipment distributors will often offer specialized or customized extinguisher training that is tailored to a facilities particular needs and schedule.

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equipment being used for training is the same as the equipment that is available to the employees in the facility. Many facilities have taken extinguishers out of service, because of age or condition, and relegated them to use as "training units". This is not a sound practice for several reasons. If the extinguishers were no longer considered serviceable, then they should be removed and destroyed – if they are not deemed reliable or safe for in plant service, they are not appropriate for use in training. The older extinguishers may have different flow rates, effective discharge ranges and nozzle discharge patterns than the extinguishers in the plant. Training with one set of performance specifications and then using a piece of equipment that performs differently in the plant during an incident is asking for trouble – use the same extinguishers that you have in the plant for training the employees.

Many options are available today that were unavailable 15 years ago. With the current widespread use of the Internet, www.fireextinguisher.com provides a free training session in the classes of fire, proper extinguisher use and will even issue a certificate upon successful completion. Computer based fire simulators are available and cleaner burning propane fueled mobile training props are also being used.

Whichever form of training that you choose, make sure that it fits your company's policies on emergency response, your employee's needs and your particular hazard or situation. Always, always stress the importance of turning in an alarm immediately on any fire incident and confirming safe evacuation routes. If your plant has purchased the best equipment available and has taken great care to maintain the equipment properly, it will be of no use if the employees that will use the equipment have had little or ineffective training in the proper use of that equipment.

By using the "Triangle of Safety" concept when discussing fire extinguishers for petro-chemical plants, facilities can optimize the effectiveness of their "defense-in depth" strategy toward fire protection. Choose the proper equipment for the particular hazard and situation, establish a quality maintenance program that follows the manufacturers manuals and provide effective training for employees – then the triangle is complete and success will be assured. •



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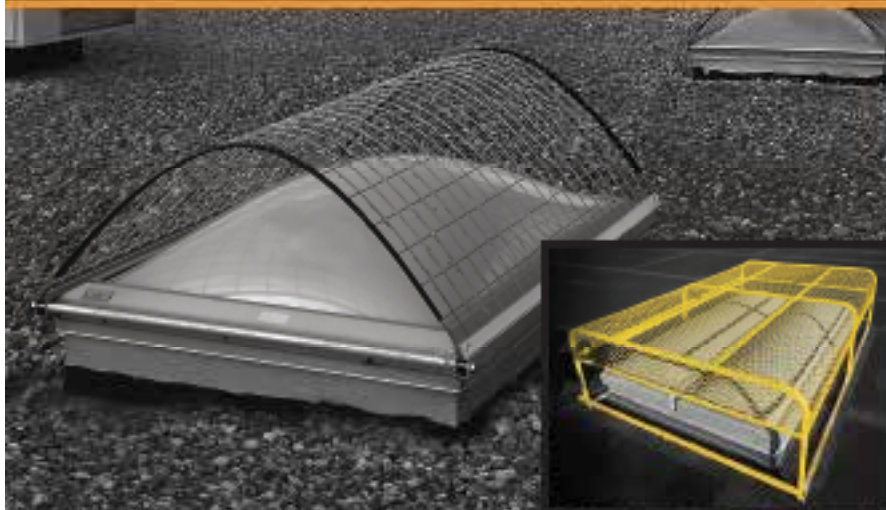
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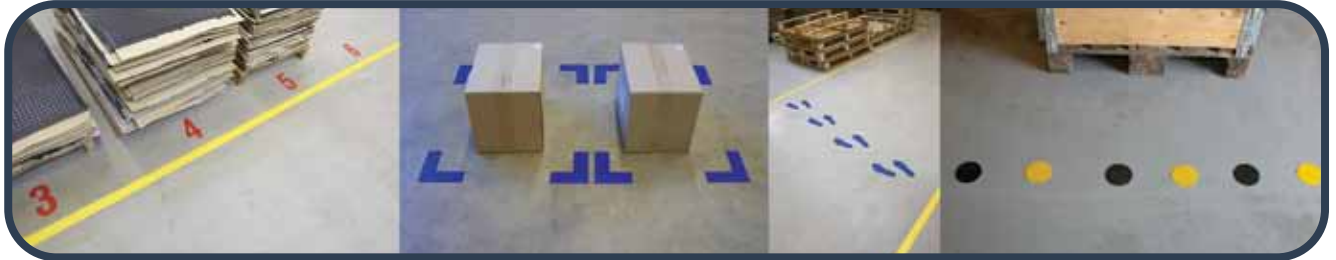


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‘Modular’ Dual-Line Lubrication System Offers Economical Monitoring and Lube Flexibility

A new automated lubrication system design gives heavy industry an economical means of validating that critical bearing points receive proper amounts of grease or oil.

The increasingly crushing costs of bearing failures continue to plague heavy industrial plants, including steel and metals mills, particularly in, rolling mills, multi-roll cluster mills, wire and rod mills, and continuous casting operations.

Frequently these costs are a consequence of the failure to verify that bearings are receiving the proper amounts and types of lube oil or grease via the integration of monitoring capabilities into large, automated lubrication systems.

Without proper lubrication bearings seldom survive more than 5-10 percent of their potential service life. This is due to multiple factors, among which corrosion, heat, caustic elements and high shock loads are major players. However, according to Richard Hanley, president of Lubrication Scientifics (Irvine, CA), failure to properly lubricate production equipment, particularly at the critical points, can be an even greater cause of bearing failures and resulting in unnecessary downtime and replacement costs.

Lubrication Scientifics engineers and manufactures a variety of automated lubrication systems and components that are installed on equipment used in a wide variety of applications in industries including steel, pulp & paper, petrochemicals and mining.

The critical points Hanley refers to include those bearing points that, if not provided the appropriate lubricant at necessary intervals, will cause the most extensive damage to equipment or present risks to plant personnel. “You can’t be sure that you are lubricating all of those

points successfully unless you have consistently accurate monitoring, or verification, that the lubricant is dispensed through the pump to the point where it should be injected – at proper intervals,” Hanley explains.

Yet, the large investments required to install and maintain lubrication systems with monitoring capabilities – often \$500,000 or more - discourages steel and metals processing plants from doing so. Or, if they are installed, they often require frequent and expensive repair or replacement.

The conventional approach

The traditional methodology for heavy industrial lubricating applications is the conventional dual-line lubrication system.





Capable of delivering varied amounts of lubricant, this type of automated system is ideal for lubricating thousands of points over long distances, with lube oil or grease output being controlled individually at each point. Also important, a single blockage will not shut down the entire system.

Yet, there are drawbacks to this standard dual-line system. Because it is composed of multiple one-piece lubrication dispensing blocks (each servicing up to eight points), whenever a single lube point fails, the entire block must be replaced, resulting in added time and labor to the cost of a replacement block. But even more significant to many applications, critical point monitoring, or verification, is very expensive with standard dual line systems. "In heavy industrial application such as steel mills and metal

working plants, the cost of critical point monitoring has become a key issue," Hanley says. "In large systems, it can cost thousands of dollars to monitor a single bearing point."

A modular alternative

To dramatically reduce those monitoring investments and simultaneously reduce bearing maintenance and replacement costs,





Lubrication Scientifics has introduced a new design in dual-line lubrication systems, one that can continuously lubricate and monitor critical equipment bearing points over long distances. The new system, known as the MDL-50 Series, is a modular design with lower investment costs and higher system sustainability.

Because of its modular design, the MDL-50 retains all of the benefits of standard dual-line systems; the MDL series offers several additional features that dramatically reduce lifetime maintenance costs. For example, it is never necessary to disconnect MDL supply or discharge valves to change out a non-working section. When valve replacement is required, only the piston section – rather than the entire valve block – is replaced, a job that takes only about two minutes instead of two hours.

In order to meet the largest lubrication system requirements, the MDL-50 system design also permits the creation of dual-line valves with an infinite number of outlets, making this technology ideal for the automated lubrication of equipment used in the steel, cement, pulp & paper, mining and other heavy industries.

“Essentially, the user can tap into the dual lines anywhere and insert a dual-line valve, a capability that enables and the grouping of critical lubrication points into zones,” Hanley explains. “Creating zones enables system designers to economize on monitoring hardware. In effect, this provides systems design options that have never before been available.”

The new modular system is available in both carbon steel and 316 stainless steel for use in highly caustic environments, including those that are washed down with caustic solutions.

Plus, the MDL-50 series provides the flexibility of a “hybrid” system because it can be easily converted to dispense either grease or oil without having to abandon the original investment in dual-line components.

Long-term benefits, short-term payback

Hanley says that conventional dual-line systems with monitoring capabilities cost users in excess





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of \$100 per point to incorporate monitoring hardware, plus installation expenses.

“Using the new modular dual-line approach with critical points grouped in zones, users can monitor everything tied to that valve, up to 360 points, for less than \$1,000,” Hanley says.

He adds that, with modular dual-line systems dispensing grease, significant reduction of lubricant usage is required – sometimes a reduction of 90 percent. “This not only saves on grease costs but also virtually eliminates the high costs of grease disposal.”

Hanley adds that while the savings of lube oil will not be as great as that of grease, by ensuring that a constant supply of clean oil in the required amount and intervals will also greatly improve on bearing life, which is the biggest payoff of the modular system.

For more information, contact Lubrication Scientifics, LLC., 17651 Armstrong Avenue, Irvine, CA 92614; Toll-free: 877-452-0157; sales@lubricationscientifics.com or visit www.lubricationscientifics.com



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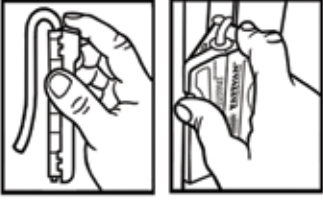
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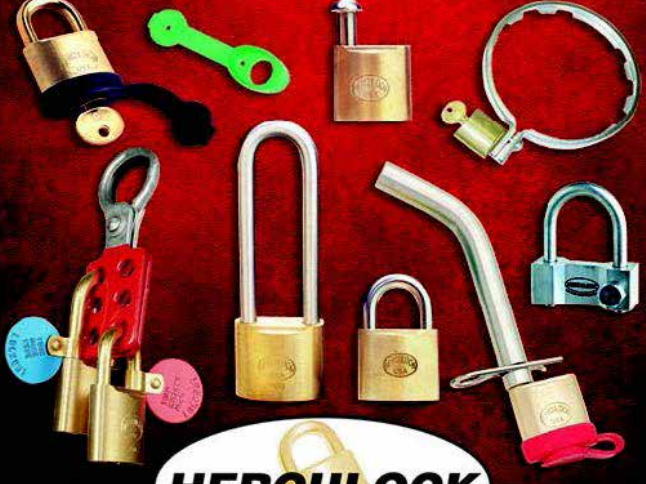


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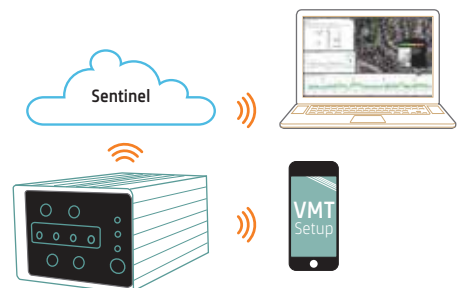
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Topic	Question ID	Question	Answer
OFFICE: ALARM SYSTEMS	OFF-130.1.US	1. Does the facility have an employee alarm system? Cite: 29 CFR 1910.130(c) 29 CFR 1910.130	As employer must have and maintain an employee alarm system that is able to be heard, seen, or otherwise perceived by everyone in the workplace. The employee alarm system must be distinctive and recognized by all employees as a signal to evacuate the workplace or perform actions identified in the EPP/SAP.
OFFICE: ALARM SYSTEMS	OFF-130.1.US	2. Is the employee alarm system tested annually? Cite: 29 CFR 1910.130(d)(4)	Employee alarm systems must be tested at least annually for reliability and adequacy.

G. AUDIT QUESTIONS

Date: _____
Facility: _____
Auditor: _____

Question ID	Audit Questions	Auditor Guidance And Notes-Audit Questions	Y	N	N	Comments
			E	O	A	
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 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 ground.				

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