

# TOP EVERYDAY EMERGENCIES

AND WHAT YOU  
NEED TO KNOW

**GRAINGER**  
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# Introduction

Emergencies can disrupt any business, any time. It's impossible to know exactly when they will hit, but certain types of emergencies are more likely to occur than other, more catastrophic events. These are everyday emergencies, and by planning ahead to be prepared for when they happen you can drastically reduce their impact on both employees and operations. "A company's preparedness level will directly impact the speed and likelihood of recovery from these everyday disasters, and because they are more common they can cause as much disruption as a more devastating emergency," says Jeff Metherd, Grainger's Senior Strategy Manager in Emergency Preparedness.

In an earlier eBook, we discussed the ins and outs of [business continuity and disaster recovery planning](#). Here, we'll discuss practical ways for companies and organizations to cope with workplace emergencies that will inevitably arise and recommendations for responding to situations once they occur. Metherd has written a series of detailed articles on the four essential phases of emergency management: [mitigation, preparation, response and recovery](#). Read on to learn how you can apply those concepts to everyday emergencies.



# POWER OUTAGES



Power outages have become commonplace for businesses, especially with increasing incidences of severe weather. According to the Federal Emergency Management Agency (FEMA), weather-related outages have doubled since 2003 and have cost the American economy as much as \$55 billion annually.

## About 44%

of all power outages are caused by storm-related events.

According to Agility Recovery, a company that specializes in business continuity and disaster recovery, statistics show that 70% of businesses and organizations will face a power outage within the next 12 months, so it's important that they understand the potential impact of a power outage and plan accordingly.

# Preparing for an outage

The implications of power outages will often be more far-reaching than they may first appear. For example, does your company run its own data center? If so, information systems may likely crash during an outage unless you prepare ahead. Does your facility allow access only through a radio-frequency identification (RFID) system? Forget about it if you don't have power and there's no backup system in place.



## To prepare for the possibility of a power outage:

- 1 Identify the equipment and systems that are critical to the operation of your facility.
- 2 Provide reliable backup power to the items on that list.
- 3 Know the ratings of fuses, ground fault circuit interrupters (GFCIs) and circuit breakers and keep replacements on hand.
- 4 Remember to back up files and operating systems regularly.

 **GRAINGER PRODUCTS FOR POWER OUTAGES**



## Featured Product: Standby Generators

With many models to choose from, automatic standby generators are a cost-effective solution to protect both operations and profits in the event of a power outage. These permanently installed units start up automatically whenever a blackout occurs, providing 24/7 power protection.



**Grainger offers thousands of products that help companies prepare for power outages, including hundreds of electrical generators.**

These high-quality generators range from:

- 1** Small portable generators ideal for localized emergencies
- 2** Gasoline and diesel generators for remote power needs
- 3** Standby generators of up to 150 kilowatts to power entire facilities

The United States Department of Energy advises that users of standby generators be aware of the danger of carbon monoxide (CO) poisoning from engine exhaust, electric shock or electrocution and fire. That's why generators should be positioned out of doors and well away from any structure—at least 15 feet away from open windows so exhaust does not enter a building.

Other guidelines for using generators include:

- Generators must be properly grounded and kept dry—under an open canopy, for example, and not operated in rainy or wet conditions—and properly grounded.
- Equipment should be plugged directly into the generator using heavy-duty, outdoor-rated extension cords.
- Turn the generator off and let it cool before refueling and use the type of fuel recommended in the manufacturer's instructions.
- Make sure the generator is inspected and maintained regularly.



**You may want to consider the following types of generators:**

- 1** Industrial portable generators to provide a ready backup power source
- 2** Standby commercial generators to provide reliable electricity and help protect business and inventories in the event of a power failure
- 3** Air-cooled standby generators that use fans to force air across the engine for cooling
- 4** Liquid-cooled standby generators that use enclosed radiator systems to prevent overheating

Generator fuel requirements deserve special attention. Know your generator's rate of fuel consumption and consider how much fuel you can safely store, and for how long. Fuels are flammable liquids and 55-gallon drums and 5-gallon safety cans should be stored in flammable storage cabinets. Make sure that you identify weather-proof locations for fuel storage. Anticipate fuel supply shortages by establishing multiple fuel supply vendor sources. Storage tanks may require a permit or have to meet other regulatory requirements. The Environmental Protection Agency also addresses the requirements for containment and secondary containment systems in the Resource Conservation and Recovery Act.

An alternative to a standby generator is an uninterrupted power supply (UPS) device. It's much smaller and less expensive than a standby generator, but it doesn't generate as much power as a standby generator to keep a business up and running. Rather, in the event of a power outage, this machine will keep machines running long enough to save work and turn them off—for about five minutes in total. That's not going to cut it, however, when it comes to business continuity if the power outage lasts for days. The same is true for equipment that comes with its own battery-powered back-up system.

Creating backup files on flash or external drives is another important step to take when preparing for long power outages. Make sure the files are updated and tested periodically, so you don't get caught short when an emergency strikes.

# Responding to an outage

If and when a power outage strikes, report it to your local electrical utility company immediately. Turn off heat pumps, large equipment and lights to decrease power demand when electricity is restored.

The Centers for Disease Control and Prevention (CDC) note that as power returns after an outage, workers may be at risk of electrical and traumatic injuries as power lines are reenergized and equipment is reactivated. The CDC recommends that employers and employees be aware of those risks and take protective steps if they are in contact with or in proximity to power lines, electrical components and the moving parts of heavy machinery.

Also worth noting is that systems requiring RFID cards to gain access to facilities may not operate during a power outage. Options to consider for keeping out unauthorized personnel include, according to FEMA:

- Installing a battery backup for short-term power outages.
- Ensuring keyed access to at least one door for longer power outages.
- Ensuring someone always has the key on his or her person or that it is in a safe location off-site.



## OTHER PRODUCTS FROM GRAINGER



Grainger offers a selection of temporary power distribution systems that allow businesses to supply reliable, emergency power for a wide range of uses. Most systems are suitable for facilities and job sites and are available with GFCIs.



# Recovering from an outage

In the aftermath of a power outage, make sure that all personnel are cautious around electrical wires and machinery. The power may be returned without notice and these items will suddenly become hot.

- 1** Do not try to help repair power lines, such as by removing trees, as live trees conduct electricity.
- 2** Leave utility repair work to utility companies.
- 3** Never run a generator, pressure washer or any gasoline-powered engine inside an enclosed structure, even if the doors or windows are open.



**Other essential supplies allow personnel to navigate facilities—and to exit them—when the power is out:**

- Uninterruptible power supply systems
- Temporary and portable power stations
- Emergency lighting and accessories
- Barricades and cones
- Solar chargers

[Check out this list of solutions to help you handle power outages.](#)



# SPILLS



Spills of one kind or another occur frequently in many industrial facilities. A 2015 study by the Centers for Disease Control and Prevention (CDC), showed that

**nearly 58,000**

"acute chemical releases" occurred in the United States between 1999 and 2008.

Given the frequency of such incidents, it is important to plan, prevent and react effectively when a spill occurs. Acquiring the right tools and know-how to mitigate hazards and clean up messes is a key element in these processes.

The first step to addressing a potentially hazardous spill is identifying the types of hazardous materials present in the environment. Hazardous materials and wastes are defined by the Environmental Protection Agency (EPA) as those that are potentially harmful to human health and the environment. In the United States, four industries—chemicals manufacturing, metals production, metal fabrication and petroleum processing—are responsible for generating around 90 percent of all industrial materials and wastes. The Environmental Protection Agency also addresses the requirements for containment and secondary containment systems in the Resource Conservation and Recovery Act.

According to the Environmental Protection Agency, some of the most common hazardous chemicals subject to the Emergency Planning and Community Right-to-Know Act, the Comprehensive Environmental Response, Compensation and Liability Act and Section 112 of the Clean Air Act include:

**Ethylene oxide**, used in chemical manufacturing, is both highly reactive and flammable.

**Formaldehyde**, a known human carcinogen, is commonly used in the manufacture of resins. Short-term moderate to high levels of exposure to formaldehyde can be fatal, while low level long-term exposure can cause respiratory problems and eczema.

**Methylene chloride** is a hazardous material used in cleaning and degreasing metal in the metals fabrication industries. The Occupational Safety and Health Administration (OSHA) considers this substance to be a potential carcinogen and to increase cardiovascular, central nervous system and liver risks.

**Benzene** is a hazardous material used in petroleum refining, petrochemicals, rubber tire manufacturing and the manufacture of plastics. Short-term exposure to high levels of benzene can cause dizziness, drowsiness, unconsciousness and death. Long-term exposure may affect blood production and the body's bone marrow.

If workers are using hazardous materials at a given location, the spill may be considered an emergency under OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) guidelines. Spills that expose workers to high levels of toxic or harmful substances, that could cause a fire or explosion, that dangerously impact indoor air quality or that require workers to evacuate an area are all considered "emergency spills." The HAZWOPER standard is designed to protect employees and help them handle hazardous substances safely and effectively.

Toxic chemicals pose a wide range of health and physical hazards to employees, including skin injuries and infections, skin cancers, allergies, asthma, burns, reproductive problems, birth defects, asphyxiation, injuries to internal organs and possibly death.

It's also worth keeping in mind that spills of non-hazardous materials and those which are not considered to be emergencies can still present dangers to workers and workplaces.

## GRAINGER PRODUCTS FOR SPILLS



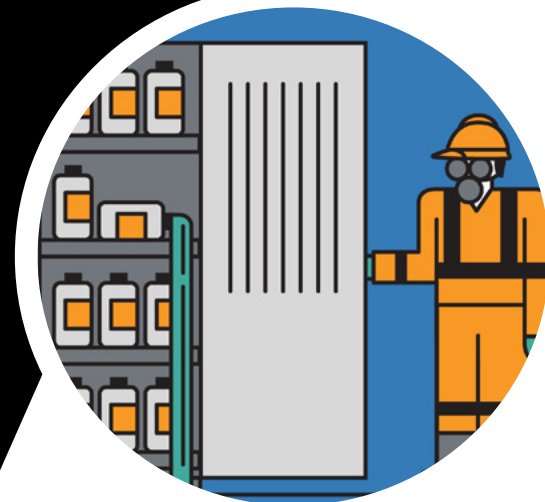
### **Featured Product:** **Spill Cleanup and Absorbent Kits**

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Kits used to clean up spills are central to the spill response action plan. When selecting a kit, it's best practice to call in the spill response team (or work with a trusted third party if you haven't yet created a spill response team). Having team members involved in the selection process helps them better understand the types of kits that are available and how to use them.

# Preventing spills

Mastering the procedures required to clean up spills is important, but even more important is putting in place the right processes to prevent spills from happening in the first place. Equipment used in facilities can leak, so it's important to regularly inspect key elements such as hydraulic lines, pipes, hoses and fluid-holding containers.



## Other keys to preventing spills include:

Inspecting containers that have recently been moved or transported.

OSHA standards prohibit the use of drums or containers that may rupture or spill when moved. "To the extent feasible," the OSHA standards warn, "the moving of drums or containers must be kept to a minimum."

- Using pallets to reduce the risk of containers being knocked over.
- Not storing liquid containers too close to the front of a shelf and positioning all containers with the opening on top.

Installing seep-through floor mats around containers will allow spillages to fall below the walking surface into a secondary containment area or into a base free of cracks or gaps until the material can be removed (additional guidelines can be found in "Containment and Secondary Containment Requirements").



## Other things to keep in mind when selecting a spill kit:

- Keep it simple and suited to your particular workplace
- Employees working in areas where chemicals are used or stored must be trained to use the kits
- Multiple kits may be needed for the different chemicals that may be on site to cover an entire facility
- Keep cleanup kits handy—time is of the essence when it comes to spill response

The HAZWOPER standard requires employers to develop and implement a written safety and health program that identifies, evaluates and controls safety and health hazards, and provides emergency response procedures for hazardous and non-hazardous waste sites. The program must include, among other things, site-specific safety and health plans, a safety and health training program and a medical surveillance program.

Employers also must ensure that workers are educated in safe work practices before they are allowed to open a drum or container. For example, according to OSHA, only tools or equipment that prevent ignition are allowed to be used during this process. The OSHA standards also require that employers inform employees of hazard warnings for the contents of containers and drums, as well the dangers of handling unlabeled drums and containers before identifying their contents.

Another preventative step is to make sure that work areas are kept as clutter-free as possible. The OSHA standards also require employers to make available a continuous means of communication, such as radios or telephones during the handling of hazardous materials, and a distinct alarm to signal the beginning and end of activities where explosive wastes are being handled.



Spill kits are made to be appropriate for the chemicals on hand, such as acids, bases, cleaners, degreasers and biohazards. Most spill kits include products to soak up a spill, personal protective equipment (PPE) and instructions for safe disposal.

A spill cleanup kit should include the following:

- **An absorbent packet**  
Look for a packet that can pick up 70 to 90 times its own weight
- **Disposable gloves**  
as well as scoops, towels and disinfectant towelettes
- **Quaternary ammonia**  
Quats (as it is called) is the key ingredient in many disinfectants and is used to sanitize biohazards—the spill area must be cleaned up thoroughly before using quats; chemical neutralizers can be used for other types of spills other than biohazards

# Responding to spills

The first step required in dealing with potential spills is to be aware of what types of spills might occur in a given location. Making sure that all liquid containers and their ingredients are identified and labeled is one path toward that awareness. This will also be of considerable help when it comes to cleanup operations.

Another essential step in responding to a spill is to develop a response plan. In formulating such a plan, one thing to consider is the size of the spill. Spills involving 50 gallons or more of a liquid usually qualify as a major spill. But a major spill at some workplaces could also involve a gallon of liquid or less. It is important to set up a spill response team to execute the spill response action plan. These are staffers who have been trained on how to handle cleanup operations safely and effectively.

According to Occupational Health & Safety, the action plan should contain the following elements:

## **Isolate the area**

Install warning cones around a 25-foot radius of the immediate spill area. Depending on the size and type of the spill, isolating the area may also involve evacuating the immediate workspace.

## **Identify the contents**

Safety Data Sheets provide warnings and hazard information relating to the liquid that has been spilled. If the spilled substance could be a hazardous material, police and/or the fire department should be called.



OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) guidelines require employers to continually evaluate and implement new technology for improving the protection of employees on worksites. Examples include new foams, absorbents, adsorbents and neutralizers that can be used to decrease the level of exposures to hazardous substances. These new technologies, equipment and control measures must be evaluated by employers to determine their effectiveness for employee protection before being implemented.



## **OTHER PRODUCTS FROM GRAINGER:**

- PPE
- Chemical neutralizers
- Safe storage equipment

[Check out this list of solutions to help you handle chemical spills.](#)

### **Don safety gear**

This has to happen before beginning any cleanup operations. Appropriate gear may include gloves, eye protection, masks, gowns and other equipment.

### **Control the spill**

Properly trained personnel (see OSHA standard 1910.120) should put smaller leaking containers inside larger containers to prevent further release of fluids. Use materials like sand, clay or other absorbent materials to block the spill from spreading. OSHA requires that employers furnish workers with salvage drums or containers, an adequate quantity of absorbent material and approved fire extinguishing equipment in areas where spills, leaks or ruptures may occur.

### **Clean up**

Use one or more spill cleanup kits to absorb what remains of the spill. Walls and equipment near the spill must be wiped down to remove splatter. Debris caused by the spill and the cleanup operation should be swept up and disposed of properly. Drums and containers used during cleanup must meet OSHA and Department of Transportation regulations and must be properly inspected and labeled. Damaged drums and containers must be emptied of contents using a classified device and must be properly transferred and discarded. (See OSHA's Hazardous Waste Operations and Emergency Response guidelines and an overview of the U.S. Department of Transportation's Federal Hazmat Law)

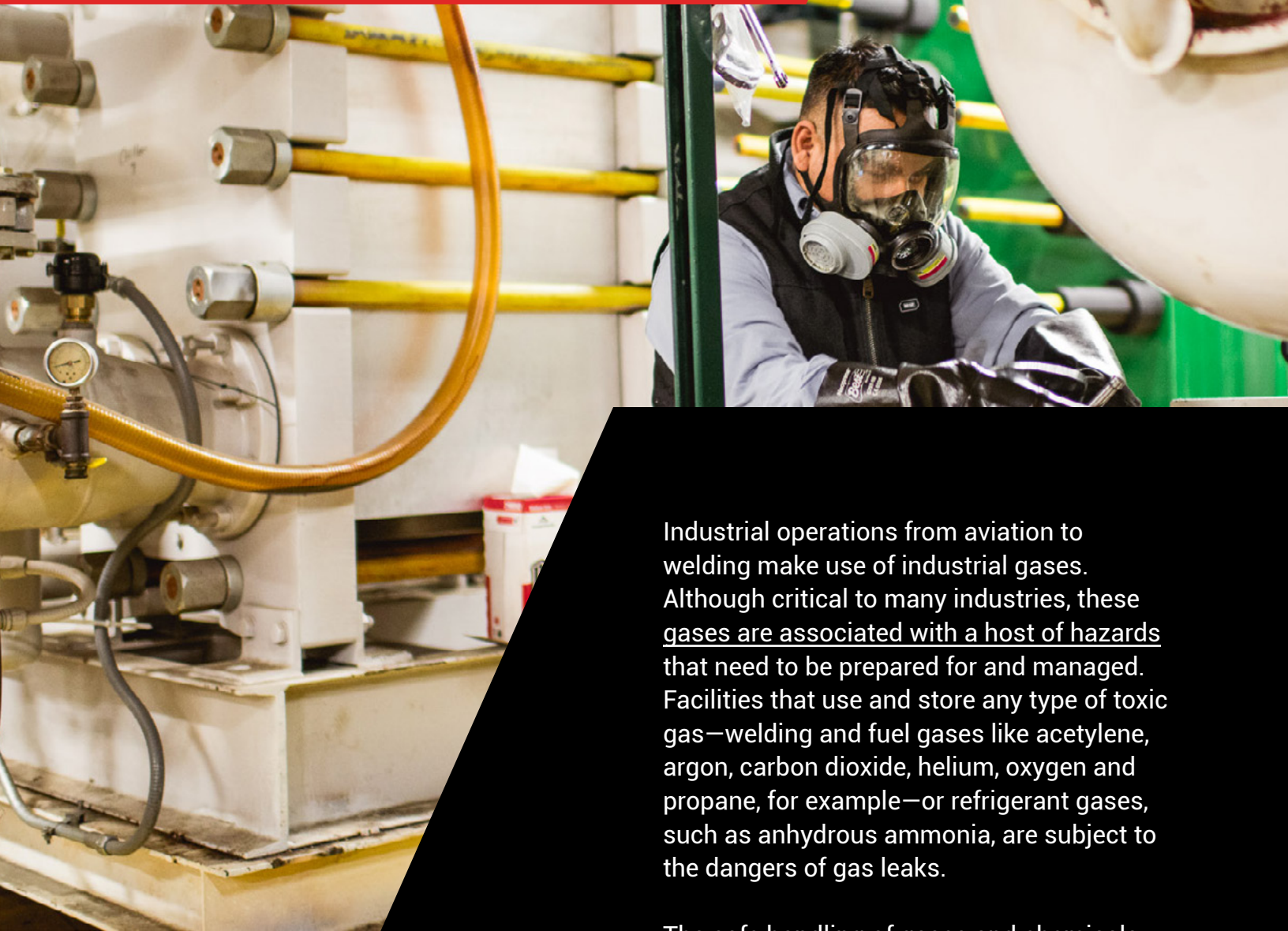
### **Evaluate**

It's a good idea to document the spill and cleanup operations in order to determine how effectively the spill response plan worked and to look for ways to prevent spills and improve response effectiveness.





# TOXIC GAS LEAKS



Industrial operations from aviation to welding make use of industrial gases. Although critical to many industries, these gases are associated with a host of hazards that need to be prepared for and managed. Facilities that use and store any type of toxic gas—welding and fuel gases like acetylene, argon, carbon dioxide, helium, oxygen and propane, for example—or refrigerant gases, such as anhydrous ammonia, are subject to the dangers of gas leaks.

The safe handling of gases and chemicals is vital, and the failure to do so can result in injuries, health issues and even death. The proper storage and use of these products, as well as preparation and response in case of a leak, is required to maintain safety at facilities that use industrial gases. A responsible approach involves identifying hazards and evaluating the risks from these products to workers and the environment, with the aim of avoiding or reducing them.

# Preparing for gas leaks

The first step in preparation for this type of hazard is to understand the risks presented by dangerous gases. It is imperative that all relevant personnel know and understand the properties, uses and safety precautions before using any gas or gas mixture. Be sure to determine the appropriate equipment required to use the product and that personnel are all properly trained on how to safely operate that equipment.

**Toxicity is the chief hazard involved when handling gases. Examples of toxic gases include:**

- Carbon monoxide
- Hydrogen sulfide
- Carbonyl sulfide

Asphyxiation is another hazard associated with toxic gases and occurs where there is a lack of oxygen, such as when oxygen has been displaced by nitrogen. Nitrogen is often used in industrial plants to enhance safety, but it brings its own hazards.

**2** deep breaths in a low-oxygen environment will deprive an individual of consciousness.

Continuing to inhale nitrogen while unconscious will likely result in the loss of life. Asphyxiation is a silent killer because there is usually no warning that dangerous inert gases are present in large volumes.



**GRAINGER PRODUCTS FOR GAS LEAKS**



## Featured Product: Gas Monitors

Gas leak detection monitors for the types of gas present in a given facility help monitor the air and determine when a leak has occurred. These monitors are sensitive enough to detect small leaks, allowing repairs to be completed before a catastrophic leak takes place. Monitors can be either installed or carried, allowing for continuous measurement or portable monitoring.

On the other hand, some industrial plants use oxygen in large quantities, and the presence of too much oxygen also presents a safety issue.

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If oxygen levels exceed

# 23%

combustion procedures such as those used in welding are altered. A welding flame, for example, would unexpectedly burn much larger if there was too much oxygen present. This oxygen enrichment could be caused by a leak and is therefore a potential hazard.

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Corrosive gases have the potential to cause rashes, skin damage and severe respiratory problems. Ammonia and hydrogen chloride, used in plants for de-scaling piping and process equipment, fall into this category. Some gases are flammable, and flammability implies the possibility of explosion. Many gases are classified as flammable, but many of them pose a flammability hazard only when mixed with air or other oxidants. The pressure under which many gases are stored can also cause a potential hazard:

- The sudden release of pressure can harm workers and damage the plant and equipment.
- Gases in cylinders placed in intense sunlight can heat up and increase in pressure.
- Compressed gas cylinders should only be handled by those familiar with the hazards and trained with proper handling techniques. Cylinders should never be dragged, slid, dropped or subjected to mechanical shocks.



**Gas detectors are used to monitor for and warn of the existence of specific toxic or combustible gases and oxygen deficiency or enrichment hazards.**

**Typical measurement levels are as follows:**

- In the low parts per million levels for toxic gas
- Percent levels related to the lower explosive limit (LEL) for combustible gases
- Percent level of oxygen around the target of 21 percent oxygen deficiency and enrichment



## Gas detection monitors also fall into four categories:

- 1 A fixed system** refers to a stationary monitoring system permanently installed in the facility and may be hardwired or use wireless signals to report to a central station and may be equipped with an alarm system. The type of sensor used will be defined by the system, as well as the gas or gases to be detected. Fixed systems detect gases indoors and can also be used to monitor plant perimeters. Grainger offers around a dozen fixed-system products that can be configured to detect a specific gas or a combination of gases.
- 2 Measuring oxygen presence**—whether to identify enrichment or deficiency—**versus detecting flammable gas leaks**, such as methane, or a toxic gas like sulfur dioxide. Gas detection systems can be tailored to specific plant needs, depending on which gases are being handled in a particular location.

Products like liquefied petroleum gas (LPG) may begin to vaporize when cylinders are heated. Cylinders exposed to fire can have pressure build to a point where it will rupture and explode with potentially severe consequences. Dissolved acetylene gas, used for welding, cutting metal and for a variety of maintenance operations in plants, is particularly sensitive to heat sources. Heat exposure can sometimes take place unbeknownst to plant personnel, and cause cylinders to explode.

Gases handled in plants for maintenance purposes or produced as byproducts of industrial processes shouldn't pose a threat as long as systems are working properly. But these gases can, especially in high-moisture environments, cause corrosion in pipes with the resulting escape of gases. For safe handling standards, the Occupational Safety and Health Administration (OSHA) references the Compressed Gas Association (CGA).

It is also a good idea, especially for companies that operate internationally, to familiarize personnel with international standards governing the safe handling, use and transportation of gas and chemicals, such as the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations (UN Model Regulations), International Maritime Dangerous Goods Code (IMDG Code), and the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions).

The GHS provides a basis for the worldwide harmonization of rules and regulations pertaining to chemical classification and labeling, but it is important to note that regulations are still hardly uniform from one country to the next. Some regulations in the United States, for example, are more stringent in some of their aspects than those embodied in the GHS.

# Mitigating the risks of toxic gas leaks

In a perfect world, plant personnel would ensure that leaks from pipes and equipment never occur. You should constantly test for the presence of leaks.

In the case of refineries and other plants, extended use, vibration and age can cause components to loosen and corrosion to occur. Plants need to constantly monitor for gas leaks using sensors and detectors placed around the refinery that can detect specific kinds of gas leaks.

One essential way to mitigate leak risks on-site is to keep workers informed of potential hazards through Safety Data Sheets and proper product labeling. This information is critical to risk assessments and proper handling and usage.

Inventory management represents yet another form of mitigation. More gas and chemicals present on an industrial site mean more opportunity for cylinder leakages. Facilities can reduce the probability of a potentially hazardous leak by storing only what is needed. Regardless of the extent of gas and chemical usage in an industrial setting, teaching personnel about the properties and potential risks of different gases and chemicals will improve safety.

Preventive maintenance is another critical component of safety when it comes to gas handling. Routine inspections should be carried out by trained professionals to ensure that pressurized gas systems are in compliance with regulations and optimized to operate at peak performance. Any non-compliance with regulations, or early warning signs of leaks or breakdowns, should be addressed immediately.

**3 Area monitoring** detection offers the benefits of a multi-gas fixed system in a transportable unit. These units are designed for team protection or short-term area surveillance.

**4 Portable devices** allow personnel to walk through areas where gases are being used and detect leaks.

# Responding to gas leaks

Gas cylinders suspected of having been exposed to a heat source should be cooled down before being handled. [Acetylene cylinders](#), for example, which have been exposed to significant heat, must be cooled for at least one hour after a fire has been extinguished.

Using emergency drills to practice implementing emergency plans will allow personnel to respond to leaks more efficiently and effectively. Informing local hospitals, fire departments and other emergency response organizations of the gases in use allows those organizations to be well-prepared in the event of an emergency. Appropriate personal protective equipment (PPE) is an absolute must when responding to leaks of corrosive or pressurized gases. Complete chemical bodysuits are used to protect personnel entering atmospheres that contain high levels of toxic gases or where the presence of these gases is suspected—for more information on appropriate PPE, see the [Level A and Level B protection classifications](#) from the EPA.

Specialized equipment addressing industrial gas safety issues is required to keep employees safe and facilities operating smoothly. The more protections that are in place to detect and respond to leaks, the higher the chances are for an injury-free incident. Gas monitors, ventilation and protection supplies better prepare facilities to respond to a gas leak. It's a good idea to locate other safety equipment such as fire extinguishers, eye wash stations and showers throughout the facility.



## OTHER PRODUCTS FROM GRAINGER:

- Ventilation equipment
- PPE
- Decontamination supplies

[Check out this list of solutions to help you handle a toxic gas leak.](#)

It's undeniable that business executives and managers need to prepare for the unexpected. But what about the expected? These everyday emergencies we've been discussing are likely to occur at some point, making advance planning and preparation that much more crucial. Everyday emergencies can have consequences far beyond what you initially suspect. Companies that handle potentially hazardous chemicals and gases must be prepared to handle worst-case scenarios associated with those substances. The failure to do so could have irreparable consequences for the life and health of company personnel—and for the company itself.

As we've demonstrated in this eBook, education, planning and preparation are required to handle everyday emergencies effectively. That approach, coupled with having the proper products on hand to help mitigate and respond to each potential incident, will set your business and your employees up for long-term success.