# CONN-OSHA QUARTERLY

**Connecticut Department of Labor - Division of Occupational Safety and Health**

*116th Edition - November 2024*

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## Top Stories



## Other Info



## Planning for Permit-Required Confined Space Rescue

***By David Boutin, Occupational Safety Officer***

No one ever enters a permit-required confined space planning to have an emergency, but life events often remind us that bad stuff happens, whether we like it or not. (See Hazard Corner, page 6)

Permit-required confined spaces are confined spaces that:

- May contain a hazardous or potentially hazardous atmosphere.
- May contain a material which can engulf an entrant.
- May contain walls that converge inward or floors that slope downward and taper into a smaller area which could trap or asphyxiate an entrant.
- May contain other serious physical hazards such as unguarded machines or exposed live wires.

Permit-required confined spaces are one of the places where bad stuff can happen. An effective rescue plan can prevent work-related fatalities. Effective rescue plans require advance planning!

Permit-required confined spaces must be identified by the employer and the employer must inform exposed employees of the existence and location of such spaces and their hazards. In addition, the employer must train the employees on their rescue plan.

A rescue plan does not need to be complex, but it does need to address a lot of information. This article describes several issues that need to be considered. Your space may have other issues as well. Always check your rescue plan against actual site conditions and work activities before you start.

### Hazards

Determine what hazards are present in the space. Make sure to also include any hazards introduced by the work activity you are entering the space to perform. For outdoor spaces, heat, snow, wind, ambient light and other conditions may also need to be addressed. Understand how those hazards will be controlled and how potential failures could affect employees.

### Rescue Time

Slip and fall hazards can cause strains or fractures that incapacitate an employee. The extra minutes needed to perform the rescue of an injured employee may not be a big concern. However, in an oxygen deficient space,

*Continued on Page 2*

exposure times of 4-6 minutes or more can result in permanent harm or death and a rapid rescue response is essential.

To provide a timely rescue for atmospheric hazards, rescue personnel may need to be present at the space during the entry. Personnel on site are more likely to be engaged with entrants and attendants during the work activity. They are more likely to be familiar with the confined space and surrounding conditions and are faster at initiating rescue efforts. In addition, rescue personnel must be trained on the precautions they need to take to protect themselves during the rescue.

Using the local fire department is not recommended for the employer's primary response, especially for atmospheric hazards. Response times and availability of key personnel of local fire departments may also be adversely affected by traffic, weather and other unexpected conditions.

## Rescue Type

The options for a rescue plan are non-entry rescue and entry rescue. Employers should always give first consideration to using non-entry rescue. When the configuration of the space or other hazards prevent the employer from using non-entry rescue or require employees to momentarily disconnect from a lanyard, entry rescue must be planned.

## Rescue Personnel

Rescue personnel may vary based on the size and type of space, number of entrants and type of rescue being used. OSHA lists specific training requirements for rescue personnel. Rescue team personnel must have annual training, including practice entering the same type of space. You don't have a rescue team unless personnel are properly trained. It is strongly encouraged to provide cross training so that attendants, entrants, entry supervisors and rescue personnel understand and can support other functions during an emergency.

*Photo: U.S. Air Force photo/Karen Abeyasekere/Released*

## Rescue Equipment

Rescue equipment needs will vary depending on the type and location of the space, means of access, type of rescue being used and number of personnel. Equipment identified in the plan must be available at the site and ready for use. To prevent missing or damaged parts from causing problems, equipment should be set up and ready to use prior to entry.

## Previous Entries

Some entries are regular events. Personnel know what equipment they need and what to expect while in the space. Do not get complacent about hazards because you have entered the space before without any problems. Review past entries for potential hazards. Other situations may be unique and require careful planning. To prepare for entries into new spaces, you should review entries performed in similar spaces for ideas.

The employer must have a rescue plan for every permit-required confined space they enter. When developing a rescue plan, the employer must consider how all items come together to affect entrants and rescue activities. Rescue plans always need to be reviewed prior to entry to assure hazards, equipment, personnel and other details are correct and understood by all personnel.

Each space is different. Each entry is different. Do the proper planning and preparation before doing a confined space entry and everyone can go home safe! OSHA's standards and resources for permit confined space rescue plans should be consulted for both General Industry and Construction settings.

## Requesting a Consultation

**To learn more or request your free consultation from CONN-OSHA:**

**Call us at 860-263-6900, or visit our webpage**

# Can You See Me Now?

## High-Visibility Safety Apparel vs. Enhanced Visibility Clothing

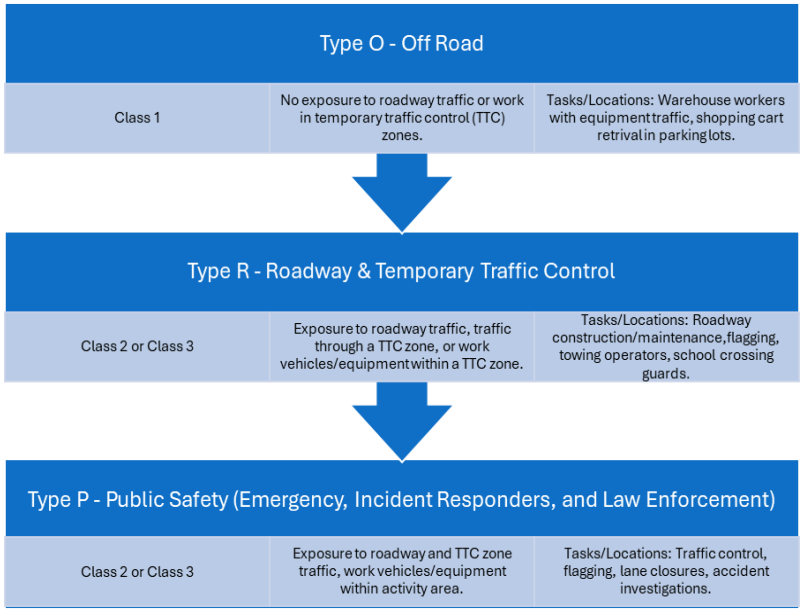
***By Brian Testut, Occupational Hygienist***

High-Visibility Safety Apparel (HVSA) is a type of personal protective equipment (PPE). Unlike other types of PPE which prevent or reduce injury and illness by using physical barriers, filtering/absorbing media, shaded eyewear, or harnesses/restraints to protect the wearer from workplace hazards; the protective features of HVSA alerts operators of motor vehicles and worksite equipment of their presence to avoid striking them.

> In 2019, struck-by incidents involving *vehicles* accounted for 47% of all construction fatalities.[1]

For an article of clothing to be a HVSA the item must meet the specifications within the American National Standards Institute/ International Safety Equipment Association (ANSI/ISEA) 107 American National Standard for High-Visibility Safety Apparel[2]. This standard provides requirements for color, retroreflection, minimum areas of background, retroreflective and combined-performance materials as well as placement and configurations of the materials. These elements increase the visibility of the wearer during daytime light conditions, low light conditions (dusk/dawn), as well as under illumination by vehicle lights at night.

Based on the risk of struck-by hazards present in the work environment, three types of HVSA are available along with three performance classes. The three types are:



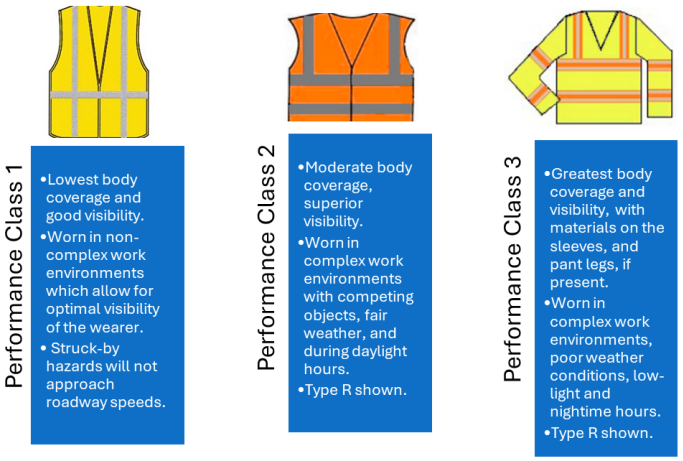

## Performance Classes

Performance classes outline the minimum area of background material and retroreflective or combined performance materials to be used. Each class offers a range of design options for users to choose from within the expected risk environment.

High-visibility background and combined-performance colors must consist of fluorescent yellow-green, fluorescent orange-red or fluorescent red (not as common) and provide the following coverage per ANSI/ISEA 107.

| Garment Type | Performance Class | Background Material | Retroreflective or Combined-Performance Material | Width of Retroreflective Material |
|---|---|---|---|---|
| Type O | Class 1 | 217 $in^2$ | 155 $in^2$ | 1 in |
| Type R^ | Class 2 | 775 $in^2$ | 201 $in^2$ | 1 in* 1.38 in. |
| | Class 3 | 1,240 $in^2$ | 310 $in^2$ | 1 in* 2 in. |
| Type P | Class 2 | 450 $in^2$ | 201 $in^2$ | 1 in* 2 in. |
| | Class 3 | 775 $in^2$ | 310 $in^2$ | 1 in* 2 in. |

^Smaller background materials are available for use by smaller framed workers and must cover 540 $in^2$ for Class 2 and 1,000 $in^2$ for Class 3.
*For use with split-trim designs.




## Supplemental Class E

The availability of pants, overalls, shorts, and gaiters made from approved background material and retroreflective or combined performance materials can be worn along with a Performance Class 2 or 3 apparel to achieve an overall classification of a Class 3 ensemble. NOTE: These items cannot be worn alone for the purpose of meeting the HVSA requirements.

*Continued on Page 4*

## Disposable HVSA Coveralls

The 2020 update to ANSI/ISEA 107 includes specifications on single-use, disposable coveralls, which may be worn when the job task will result in heavy soiling of the garment.

## Enhanced Visibility Clothing

Many employers provide or require employees to wear shirts and other clothing made from fluorescent colored fabric or work uniforms that may include retroreflective materials to enhance their visibility while on the job. These items are often marketed as "High-Visibility" or "Enhanced Visibility" clothing, however they do not meet the ANSI/ISEA 107 standard as previously described.

## When is ANSI/ISEA 107 High-Visibility Safety Apparel required to be worn?

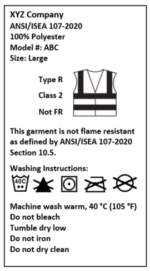
The Manual on Uniform Traffic Control Devices (MUTCD) for streets and highways 2009 edition requires Class 2 or Class 3 HVSA for workers, flaggers and emergency responders within the right of way who are exposed to either traffic or to work vehicles and construction equipment within the temporary traffic control zone. Exceptions for firefighters or other emergency responders engaged in emergency operations that directly expose them to flame, fire, heat and/or hazardous materials may wear retroreflective turnout gear.[3]

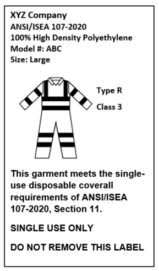
Additionally, a 2009 OSHA Letter of Interpretation provides additional clarification on the requirements of High-Visibility Safety Apparel for construction workers in work zones. https://www.osha.gov/laws-regs/standardinterpretations/2009-08-05

A person designated by the employer to be responsible for worker safety shall make the selection of the appropriate class of garment. A risk assessment addressing the types of struck-by hazards present, and complexity of work environments (attention of wearer to traffic/ equipment and proximity to traffic/equipment) will assist in determining which performance class should be chosen. Guidelines for selecting the color of the garment should include the competing colors of the work environment such as color of traffic barriers and/or constructions vehicles.

## How do I know what I wear now is a High Visibility Safety Apparel, Enhanced Visibility uniform or High Visibility clothing?

Check the label. All compliant High-Visibility Safety Apparel types and performance classes must be labeled. See sample labels below.




## When is it time to replace my High-Visibility Safety Apparel?

All garments have a useful service life that will be affected by type of item, laundering method, length of time and task performed in the work environment. If the brightness, reflectivity and general condition are noticeably faded, soiled, burned, heavily abraded or damage when compared to a new garment, replacement consideration should be made. While wearing a soiled or faded HVSA could be a badge of honor for a hardworking employee, its use can place the wearer at increased risk of struck-by hazards as the person is not as well seen.

## Looking Beyond High-Visibility

Like all personal protective equipment, the use of high visibility safety apparel is the last line of defense in worker protection. The design and use of temporary traffic control zones, worksite barricades, and effective training for laborers and operators of vehicles and equipment can reduce struck-by hazards.

**References**


1. Struck-By Injuries in the Construction Sector: Common Hazards, Barriers, and Opportunities to Keep Workers Safe. Accessed September 2024. https://blogs.cdc.gov/niosh-science-blog/2023/04/04/2023-struck-by-stand-down/
2. American National Standards Institute/International Safety Equipment Association (ANSI/ISEA) 107-2020 American National Standard for High-Visibility Safety Apparel. (Available for purchase at the ANSI webstore) https://webstore.ansi.org/standards/isea/ansiisea1072020?source=blog&_gl=1*148r5d2*_gcl_au*MTIzMDEzMzA1OS4xNzI3NDYyNTQ5
3. The Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways 2009 edition. https://mutcd.fhwa.dot.gov/pdfs/2009/pdf_index.htm
4. 3M Technical Bulletin December 2020. ANSI/ISEA 107-2020 Made Easier: A Quick Reference to the High-Visibility Safety Apparel Standard.
5. High-Visibility Clothing for Highway and Heavy Construction. https://workzonesafety-media.s3.amazonaws.com/workzonesafety/files/documents/training/toolbox_talks/osha_alliance/OSHA_alliance_high_viz_brochure.pdf

# Virtual Training Schedule

| | |
|---|---|
| **Hazard Communication**<br><br>*11/19/24* | The Hazard Communication Standard, 29 CFR 1910.1200, provides workers exposed to hazardous chemicals with the right-to-know the identities and hazards of those materials. as well as appropriate protective measures. This session will provide an overview of the standard and help attendees develop an effective Hazard Communication Program. |
| **OSHA Reporting and Recording Requirements**<br><br>*12/17/24* | The purpose of this workshop is to introduce the requirements and procedures related to OSHA Injury & Illness Recordkeeping, including the electronic reporting of injuries and illnesses requirements. The class will help develop skills to accurately report occupational injuries and illnesses. Resources and reference materials will be provided. If you are responsible for completing the documents required by this rule (OSHA 300, OSHA 300A and OSHA 301), or if you supervise the person that completes the forms, or if you are a safety committee member, this class is a must. |
| **Powered Industrial Trucks**<br><br>*1/22/25* | The OSHA 1910.178 Powered Industrial Truck Standard requires formal instruction, practical training, and evaluation of operator performance for both General Industry and Construction Industry material handling operations. Does your training program meet the standards requirements? This one-hour virtual class will provide an overview of the standard and its requirements. |
| **Noise and Hearing Conservation**<br><br>*2/5/25* | OSHA requires a hearing conservation program whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty percent. This class will provide an overview of 29 CFR 1910.95, Occupational Noise standard. |
| **New England Roundtable**<br><br>*Every Wednesday of the Month* | Bringing business together to network and share ideas in the occupational safety and health community. The roundtable meetings are held from 9:00 am to 10:15 am every Wednesday. For more information on the New England Roundtable visit: oshaedne.com/roundtables |

**Visit this link for more info and to sign up.**

## Hazard Corner

### Two Rescuers Die in Fracturing Tank in West Virginia Gas Field

Two workers died while attempting to rescue a third worker who had entered a fracturing tank at a natural gas well. A total of four men entered the tank and were overcome by natural gas. The two workers who died drowned in 30 inches of liquid (water, gas, acid, and possibly oil) which had been released into the tank during "blow down" procedures. The other two workers, both rig hands, required medical treatment at local hospitals.

**Synopsis of Events**

On the day of the accident, a five-man crew assembled in the office of the field supervisor to receive their instructions for the day. The crew was informed that they were to "blow the well down" (relieve the internal pressure). If they could get the pressure down to acceptable levels, they were to start putting the tubing down. All members of the crew were familiar with the procedures necessary to blow down the well and insert the tubing.

When the well is "blown down," gas, water, acid, and occasionally oil are released. These substances are directed into the fracturing tanks through two-inch steel "flow back" lines. When the well had blown down sufficiently to begin inserting the tubing, the operator and one of the rig hands began to disconnect the well from the fracturing tanks. The remaining members of the crew were near the service rig when they heard the operator yell that a rig hand was in the tank. The operator then entered the tank himself. Despite warnings by the rig supervisor to stay out of the tank, the other rig hand entered the tank, followed by the tool pusher. When the supervisor got to the top of the tank and looked in, he could only see two of the men and they were unresponsive and "dazed looking." He immediately got off of the tank and opened the valves to release the water in the tank. He then called for help on the truck radio.

When the second crew arrived, they helped the supervisor remove two clean-out panels at the bottom of the tank. When the panels were removed, the bodies of the operator and tool pusher were found lying on the bottom of the tank. One of the rig hands was found standing in the tank, but was unresponsive; the other rig hand, also unresponsive, was found attempting to climb up the internal support bars of the tank but appeared ready to fall. The two rig hands who had entered the tank and survived the incident reported that within 10 – 15 seconds of entering, they were overcome by the gas. They could not remember anything past that point.

The autopsy reports indicated that the rig operator and the tool pusher died by drowning due to asphyxiation.

**General Conclusions**

The following factors contributed to this fatal incident:

1. "Blowing the well" releases water, acid, oil, and natural gas into the fracturing tanks. In this area of the country, the primary component of natural gas is methane (75-85%). Although methane is not considered a toxic gas, it is a simple asphyxiant. In high concentrations, it displaces the oxygen required to sustain life. When methane is present in concentrations exceeding 20 to 30 percent (by volume), the inspired air is usually oxygen deficient, and signs and symptoms of oxygen deficiency may be noted. In addition, methane is an anesthetic at high concentrations. Either oxygen deficiency or the anesthetic qualities of methane could account for the workers being overcome so quickly.
2. The use of a Kelly hose as a flow back line necessitates entry into a confined space to secure the line to prevent it from whipping around when it's under pressure. Had a sufficient number of metal flow back lines been available, the need to enter the tank would have been precluded.
3. There were no written or verbal safety policies or procedures for safe entry into a confined space. Appropriate procedures would have required testing for oxygen and/or methane levels prior to entry.
4. **There were neither policies nor procedures for emergency rescue from a confined space.**
5. **The workers had not received specialized training for entering confined spaces. The employees stated that they knew what a confined space was. However, they had never received any training classes to inform them about the potential hazards associated with confined spaces, let alone training in confined space entry or emergency procedures.**

**Fatality & Casualty Reporting**

**State & Town:**

- **Report to CONN-OSHA**
- **(860) 263-6946**

**Private Employers:**

- **Report to Federal OSHA**
- **(800) 321-OSHA (6742)**

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