

ARE YOU UP TO DATE ON THE OSHA CONFINED SPACE RULE?

**OSHA COMPLIANCE WITH ATMOSPHERIC &
TEMPERATURE HAZARDS**

**PRESENTED BY:
BILL SPOHN, TRUTECH TOOLS, LTD**

RESNET NATIONAL CONFERENCE

SCOTTSDALE, AZ

FEBRUARY 28, 2017

BILL SPOHN

1988 – 1998

Bacharach, Inc.

Design Engineering Manager, Strategic Planning Director

1999 – 2009

Testo, Inc.

Product Marketing Manager, North America

2009 – now

TruTechTools, LTD

President & CEO

BS &MS Mechanical Engineering, Professional Engineering License



TruTechTools

More than 50 popular brands! Top sellers....





Key Product Categories



- Digital and Analog A\C gauges
- ***Airflow Measurement & TAB***
- Blower Doors
- Duct Blasters & Duct Leakage Testers
- ***Safety - OSHA***
- A\C Tune-Up Kits
- ***Combustion & Emissions Testing***
- ***Calibration*** & Service Parts
- Data Loggers
- Electrical Measurements
- CO Detectors /Alarms
- Forming and Swaging Tools
- Gas Leak Detectors
- Humidity Measurement
- ***For The Home***
- IAQ & Particulates \ Smoke Tracing
- Manometers
- Temperature Measurement
- Thermal Imaging Cameras
- Vacuum Measurement & Kits

DISCLAIMER

TruTech Tools, LTD is providing this information strictly as an educational resource and is not responsible for the interpretation of the OSHA Confined Spaces in Construction rule.

We recommend that you contact the OSHA Office nearest you for guidance or an interpretation of specific questions regarding situations that contractors or technicians may find themselves in.



TODAY'S TOPICS

- 1) What tools you may need to detect potential confined space hazards on site
- 2) How to utilize the tools you already have to eliminate the need for a confined space permit
- 3) Stay tuned for a special offer at the end!



IMPLEMENTATION AND DETAILS

- 8/3/15 New amendment to OSHA Construction Standard went into effect - extended to confined spaces of attics and crawlspaces (amongst other spaces).
- 3/8/16 Enforcement delayed until this date in residential construction industry, if good faith efforts are being made

ACCA Article in The ACHR News : www.bit.ly/acca-osh



Home » OSHA Alters Confined Spaces Rule

Standards & Legislation

OSHA Alters Confined Spaces Rule

Attics and crawlspaces now classified as confined spaces, affected by new rule requirements



NEWS

July 2016

ACCA lobbied for and received *extensive* clarification

Minimizes residential impact

Electrical/mechanical hazard must impede exit, not just be present

Activities outside the attic will rarely make it a permit required space

Presence of asbestos does not make it a permit required space

Evaluation of space may be done remotely, if adequate knowledge is present

<https://www.osha.gov/confinedspaces/faq.html>

27 Year Old Lubbock AC Worker Dies After Found Unconscious In An Attic



By Hannah Rucker | hrucker@klbk13.tv

Published 08/02 2016 07:05PM

Updated 08/03 2016 11:02AM

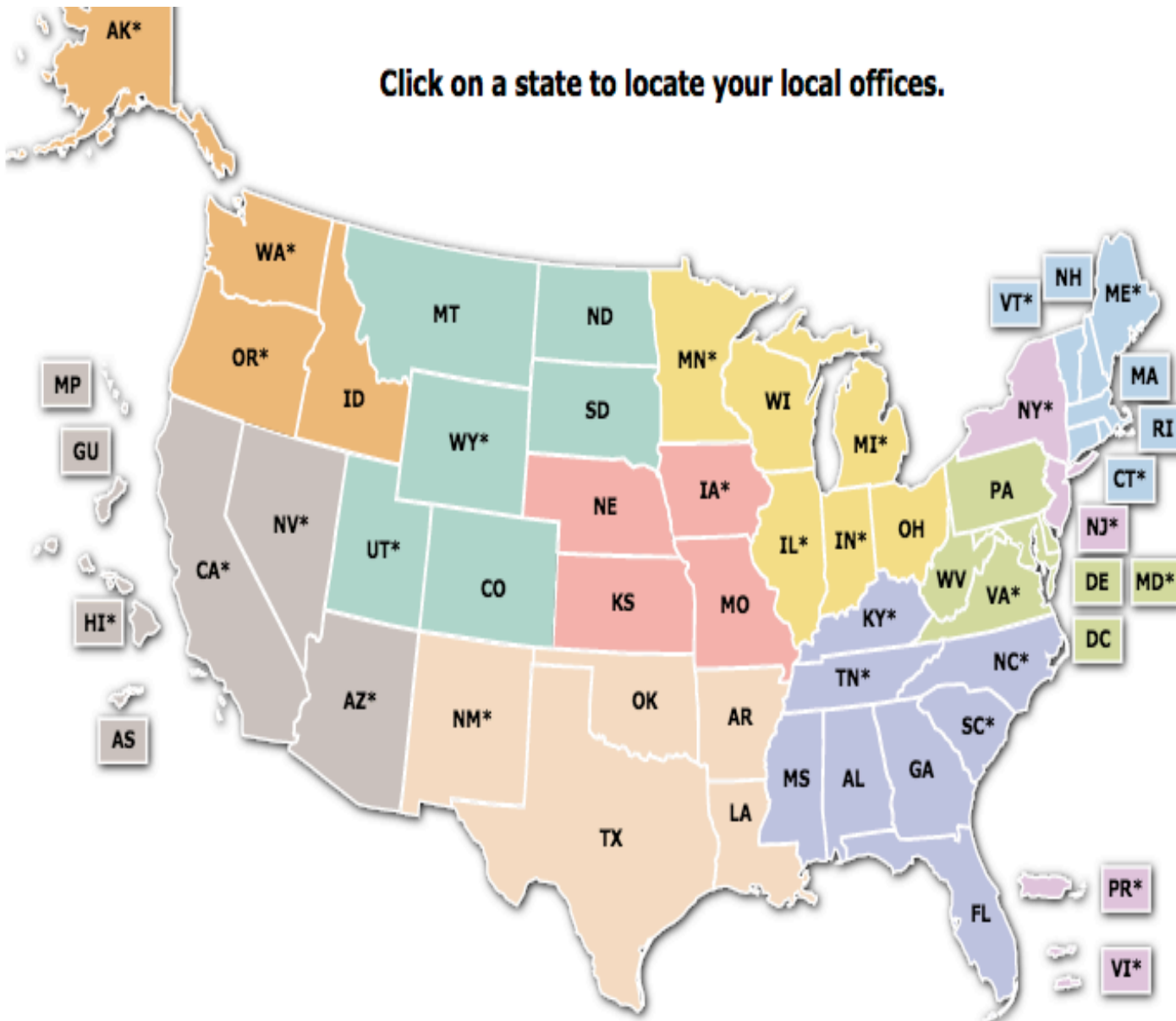
April 04, 2016

OSHA cites Athens contractor after fall through skylight kills worker ***Martin Mechanical Contractors failed to provide proper safety protections***

ATHENS, Ga. - The life of a 39-year-old HVAC installer who fell through a roof skylight ended suddenly because his employer failed to put proper workplace protections in place, the U.S. Department of Labor's [Occupational Safety and Health Administration](#) has found.

| | | | | | |
|------------|---|---------------------------|---|----------|-------------------------|
| 9/2/2015 | Edmundo Lopez dba Edmundo Lopez, Norridge, IL 60656 | Moises Villagomez-Obregon | Employee electrocuted during attempt to energize HVAC unit. | Fatality | 1089380 |
| 5/22/2015 | HVAC Contractors, San Jose, CA 95131 | Kelly Lea Ross | Worker killed in fall from ladder. | Fatality | 987088 |
| 12/11/2014 | Texas Hvac Installers, Dallas, TX 75201 | | Three workers asphyxiated from smoke in underground tank. | Fatality | 1013517 |

INTERPRETATION: www.bit.ly/OSHAoff



Find Office by State

OSHA Region Offices

- [Region I: Boston](#)
- [Region II: New York](#)
- [Region III: Philadelphia](#)
- [Region IV: Atlanta](#)
- [Region V: Chicago](#)
- [Region VI: Dallas](#)
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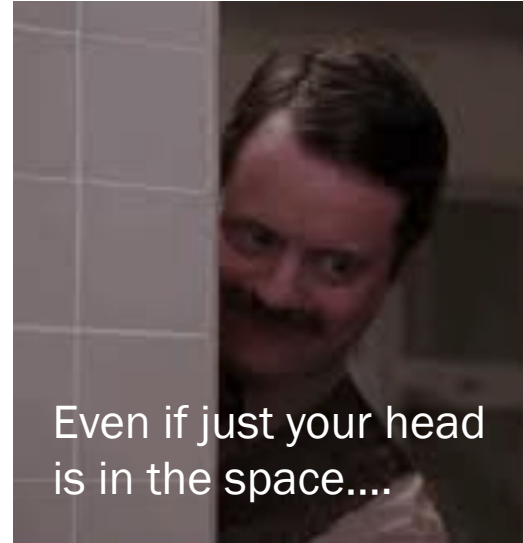
OVERVIEW

3 Mandatory characteristics of a Confined Space

1. Be large enough for a worker to enter it.
2. Not be intended for regular continuous entry.
3. Be difficult to enter or exit

Permit for Confined Spaces

1. Not a building or construction Permit
2. Specific to a work site
3. Keep on file at your business and at work site



Even if just your head
is in the space....

PERMIT REQUIRED CS

Can become a Permit Required Confined Space with presence of:

- *Hazardous or potentially hazardous atmosphere*
- *Potential for engulfment or suffocation*
- Physical hazard (eg. *Temperature*, electricity, *oxygen level*, flammable materials, animals/insects, etc.)
- Physical characteristics that create obstacles to entry or exit (Eg. Joist-only floor, converging walls, sloping floor, etc.)
- Hot Permits – do not necessarily mean a thermally hot area!



ENTRY REQUIREMENTS

A pre-entry plan

- Confined Spaces or Permit Required Confined Spaces
- Appropriate entry and exit points
- Ventilation methods
- Control or elimination of all potential hazards in the space

Ensure air in Confined Space is tested for

- Oxygen, flammable and toxic substances

If Permit required, rescue procedures and rescue equipment determined in advance

Monitor while occupied for changes and ensure compliance throughout work



WHY MEASURE TEMPERATURE/ HUMIDITY?

Heat Stress – an early stage of dangerous and deadly Hyperthermia

Also known as Heat Prostration or Heat Exhaustion

Body Temperatures above 104° F can be life threatening

Body loses heat through sweating (evaporative cooling)

Therefore *ambient temperature and humidity* factor into to heat stress situations

Wet Bulb Temperature is good, but *Wet Bulb Globe Temperature* (WBGT) is a better measurement as it takes into account radiant heat from building surfaces (eg. attic roofs and walls) as well as the sun

Skin Temperature tells a more complete story about the individual's heat stress



WHY MEASURE OXYGEN?

Normal atmosphere is 20.8% to 21.0%

Oxygen-deficient atmospheres (< 19.5%) – “*you pass out*”

may be created when oxygen is displaced by inerting gases, such as carbon dioxide, nitrogen, argon, or firefighting system. Oxygen can also be consumed by rusting metal, ripening fruits, drying paint, or coatings, *combustion*, or *bacterial activities*. Accidental *release of refrigerants* (ASHRAE 15)

Oxygen-enriched atmospheres (> 22%) – fire and explosion hazard

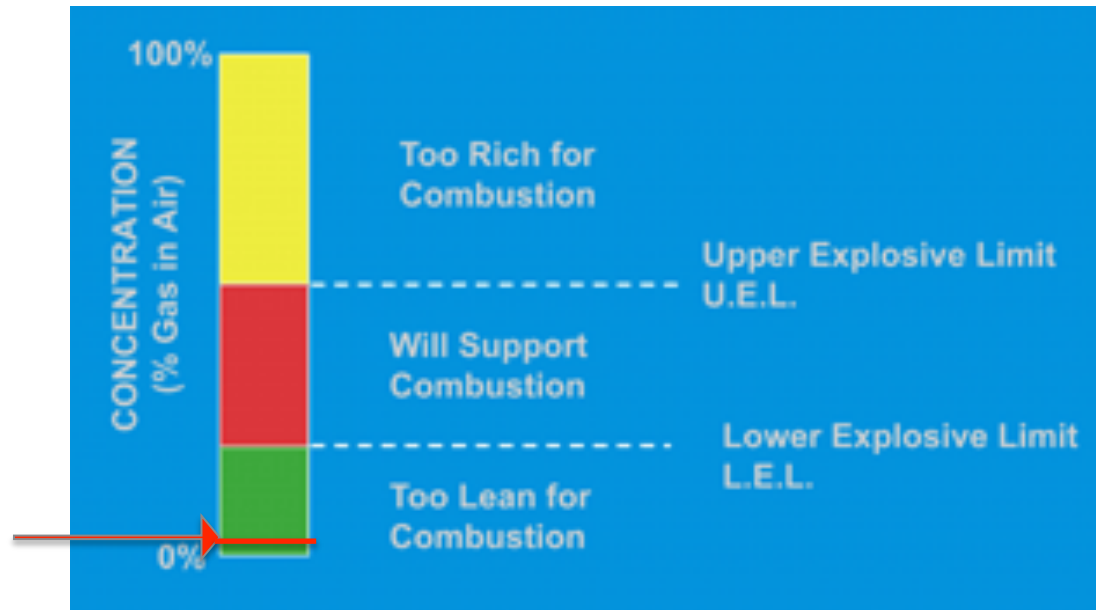
may be produced by certain *chemical reactions*, industrial settings caused by leaking oxygen hoses and torches. Oxygen enriched atmospheres present a significant fire and explosion risk.



WHY MEASURE FLAMMABLE GASES?

"Lower explosive limit (LEL)"

the minimum concentration of vapor in air below which propagation of a flame does not occur in the presence of an ignition source.



10% of LEL for Methane (CH_4) is 0.5% gas
10% of LEL for Propane (C_3H_8) is 0.215% gas

CX

WHY MEASURE TOXIC GASES?

Carbon Monoxide (CO) Poisoning

Silent Killer, Combustion Sources, Venting Issues, often misdiagnosed

Debilitating, Cumulative Poison, long term effects under study

Permissible Exposure Limit (PEL, by TWA) - 50 ppm, 8 hrs.

Ceiling (max. value, 15 min.) - 200 ppm

Hydrogen Sulfide (H₂S) Poisoning

Most can smell low levels (<2 ppm), but nose is not a reliable sensor

Respiratory effects: makes “acid” in your lungs

General Industry Ceiling Limit: 20 ppm

General Industry Peak Limit: 50 ppm (up to 10 minutes if no other exposure during shift)



CO & H₂S

SELECTING A GAS MONITOR

Do I get a Single gas or multi-gas unit?

Separate cost, maintenance, size, displays,etc.

Why get a 3 or 4 gas unit?

O₂, CO, Combustibles, Hydrogen Sulfide

Why get a Pump or non-pump unit?

Measure the space before entry

“Gassie-stick” and hose



GEAR YOU MAY HAVE VS. OSHA

Combustion analyzer

NEGATIVES: Zeros to ambient, always needs pump on

Gas Leak Detector

probably does not measure LEL

NON-COMPLIANT: Testo 316-1, Bacharach Leakator 10 or Leakator Jr.

Personal CO Monitor

EG> Sensit P-100 or Macurco CM-1

NON-COMPLIANT: Testo 317-3 & Fluke CO-220

Use the right tool in the right place

Use the tool for its designed purpose

CO-220 English Instruction Sheet
Page 1

⚠ Safety Information - Read First

- ⇒ Do not use the Meter as a personal safety monitor.
- ⇒ Learn and recognize the effects of CO poisoning.

Original factory calibration: 0.1 PPM, Normal background levels, gas flow rate



Do not use testo 317-3 as a monitoring instrument for personal safety.



***BPI 1200: SECTION: 7.1.1.3* LEL ALARM**

Be capable of providing a digital display of percentage of Lower Explosive Limit (LEL) and/or provide an alarm when detecting combustible gas concentrations exceeding 10% Lower Explosive Limit (LEL).

LEL for methane is 5% gas

- 10% of LEL for methane is 0.5% gas
- 10% of LEL for methane is 5000 PPM gas

LEL for propane is 2.15% gas

- 10% of LEL for propane is 0.215% gas
- 10% of LEL for propane is 2150 PPM gas

**NO LEL DISPLAY or
ALARM
NO GO**

BPI 1200 COMPLIANT CGDS



Sensit

← HXG-2D

\$443.65

5% discount

EXCO+1200 →

\$995

53% discount



PRODUCT MAINTENANCE

Bump test

Verifies “the performance of the gas detector and ensures that sensors are responding to their target gas.” A bump test does not calibrate the sensors.

Calibration

Sensor replacement



COMBINATION TOOLS

Combined contractor needs for *BOTH* the OSHA Confined Space Rules and *new* BPI 1200 standard

Look for one tool if possible, with one mode, one screen, all the test data.

Remember the Accessories!

probes (confined space entry and flue gas)

filters (water particulates and NOx)

carry case.



Continuous gas pump is critical and combustible sensor at the tip of the probe gives fast leak detection.

THE SENSIT GOLD EXCO+1200

MEASURES AND DISPLAYS

% LEL (EX) from 0.0% up to 100% LEL (*BPI & OSHA*)

% Oxygen (O₂) 0.0% up to 25% (*OSHA*)

PPM CO from 0 to 2000 PPM (*BPI & OSHA*)

* PPM CO-AirFree (CF) from 0 to 9999 PPM (*BPI*)

* Test must be performed in flue gas using the included flue gas probe and NO_x filter to be compliant with ANSI/BPI-1200-S-2015

ALARMS

Combustibles: Gradually increasing visible alarms from 5% to 10% LEL, Audible alarm at 10% LEL and greater per BPI 1200 standard (*BPI & OSHA*)

Oxygen: visible and audible alarms below 19.5% and above 22.5% (*OSHA*)

Carbon Monoxide Audible alarm: 35 PPM (*BPI & OSHA*)

MEMORY STORAGE

Stores the last 10 tests (all parameters) with date and time stamp, tests can be printed on a Testo printer (except testo 310 printer)

BPI / OSHA BASICS KIT

BPI 1200

- CGD with LEL display
- COAF
- Continuous Personal Monitor

OSHA

- 3 gas monitor with pump

\$1164.95

- Save \$450



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