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Safety
in the
Workplace

Tips
• from Sales Reps

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Establishing a Gas Safety Program

Outlined are the elements you need to set up your safety program

BY DAVID J. MARQUARD

In spite of the risk of serious injury to their employees and stiff fines for violations from the Occupational Safety and Health Administration (OSHA) or other regulatory agencies, many firms do not have a welding gas safety program and/or gas safety equipment. Safety around welding and other compressed gases is the responsibility of both the employee and employer. The absence of gas safety procedures or inattention around welding and compressed gases can lead to serious accidents.

A grinder in Pennsylvania blew dust from his clothing using oxygen. Minutes later he was engulfed in flames when his oxygen-impregnated clothing caught fire. The grinder died from third-degree burns over 60% of his body.

A common error is the belief that welding/industrial oxygen is ordinary room air. Air is made up of nearly 80% nitrogen and 20% oxygen, while welding/industrial oxygen consists of 99.7% or greater pure oxygen. Any concentration of oxygen above 23.5% lowers the ignition point of most materials (materials like oil-stained fabrics may ignite as low as 30°F) and increases the speed and temperature of

combustion. Some materials burst into searing flames with explosive-like force. Employees who spray off their clothing and work areas with oxygen are setting

themselves and their employers up for devastating accidents — Fig. 1.

Oxygen is the most hazardous of welding and industrial gases because of the

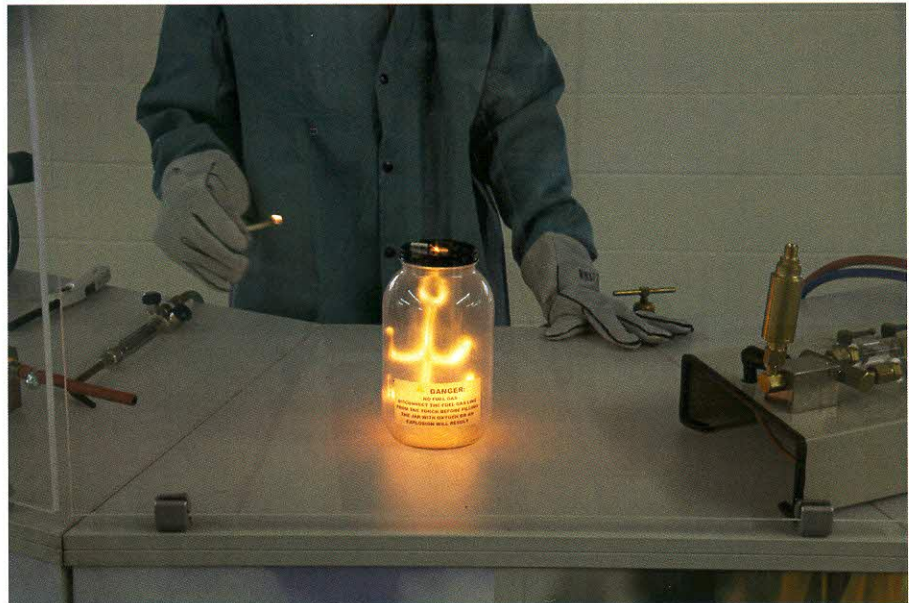


Fig. 1 — During a training demonstration, a stick figure made from ordinary pipe cleaners bursts into flames from a tiny spark in an oxygen-enriched atmosphere to graphically demonstrate why no one should blow off their clothing or work area with oxygen.

DAVID J. MARQUARD (dmarquard@applied-inc.com) is president/owner of Superflash Compressed Gas Equipment, IBEDA Inc., Westlake, Ohio, and owner/partner of IBEDA GmbH & Co., KG, Neustadt-Wied, Germany.

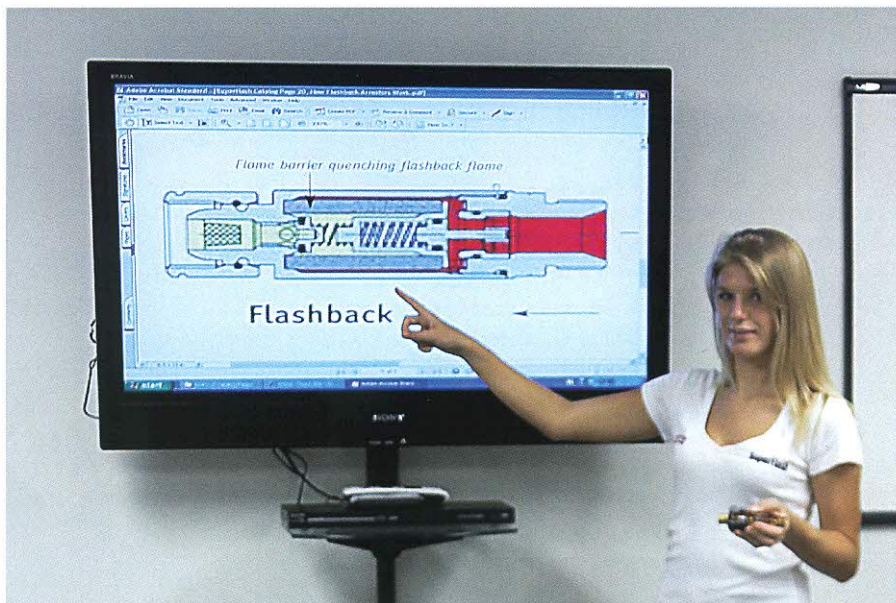


Fig. 2 — Regular welding gas safety training as is shown here should be included in every safety program.

common misunderstanding that oxygen is ordinary air. Oxygen is not air (Refs. 1, 2).

In Indiana, a welder using oxy-propane gas was killed when leaking gas exploded in his confined workspace. The welder may have been aware of the small amount of leaking oxy-propane, but just didn't realize the enormous amount of energy present in flammable gases.

All the common welding and industrial gases found in the workplace are hazardous when safety procedures and equipment are not used or are ignored. Welding and industrial gas safety requires training and equipment that is readily available from gas and welding equipment suppliers (Ref. 3). You can find videos containing some of this information at www.oxyfuelsafety.com/data/files/superflash_safety_video.wmv.

In the southwest, a welder was killed when a flashback occurred that ignited mixed gases in a homemade shop gas manifold. The employer was found to be grossly negligent and fined \$113,000 by OSHA. This case is currently pending in the courts for punitive costs and fines.

Setting up a Gas Safety Program

- A gas safety program (Ref. 4) starts with, and requires, regular self auditing. Knowing the status of a gas safety program is critical before an accident or violation occurs. Free self-audit checklists are available from your gas and welding equipment supplier or in the "downloads" section at www.oxyfuel.com.

- A comprehensive gas safety program includes regular gas safety training for any employee who uses welding or industrial gases, or who requisitions, completes paperwork, or supervises areas where gases are used, stored, or transported — Fig. 2.
- Next, gas safety devices like flashback arrestors should be installed on all welding guns/torches and regulators, gas filters should be installed on pipelines, and individual regulators should be installed on line stations or tapping points. In addition, personal protection equipment should always be used. Gas manifolds and piping must be manufactured by competent and qualified suppliers, and installations must be inspected and certified prior to being put into service.

It is never too late to start or update a gas safety program. Don't wait until a devastating accident involving welding or compressed gas occurs. ♦

References

1. Gases & Welding Distributors Association (GAWDA). Improper Uses of Gaseous Oxygen. <http://gawda.org/Content.aspx?id=466&terms=oxygen>.
2. Standard G-4, Oxygen. 2008. Chantilly, Va.: Compressed Gas Association. www.cganet.com/customer/publication.aspx
3. ANSI Z49.1:2005, Safety in Welding, Cutting, and Allied Processes. Miami, Fla.: American Welding Society. www.aws.org/safety/index.html
4. Superflash Compressed Gas Equipment, IBEDA Inc., OSHA citations, self-audit check lists, and safety information, www.oxyfuelsafety.com.

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www.oxyfuelsafety.com



Scan here with your Smart Phone to view Safety Video

Please read: It is critical to know the state of your safety regulatory compliance before an accident or an inspection. You can use the brief Gas Safety Checklist on the back cover as part of your strategy to determine the status of your gas safety compliance. E-mail the completed form to tech@oxyfuelsafety.com or fax to: 440 871 9964 for feedback on how to address problem areas or additional information.

Instructions: Complete form, scan, & e-mail to tech@oxyfuelsafety.com or fax 440 871 9964 for feedback and suggestions.

Contact: _____ Company: _____ Phone: _____ E-mail: _____

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TRAINING

1. _____ _____ *Is welding and gas safety awareness training conducted at least once per year for all welders, gas users, and supervisors of these personnel? Does this training include all parts of 29 CFR Part 1910, 1915, 1917, and 1926 that are relevant to your operation?*
2. _____ _____ *Are equipment repair and maintenance personnel qualified and experienced to identify equipment and compressed gas safety and productivity issues such as worn or leaking welding hose, broken regulator gauges, leaking pipelines, defective or improper selection of equipment (I.e. gas flow capacity too small or too large for the job)?*
3. _____ _____ *Are all employees instructed in the location of appropriate fire extinguishing equipment and proper procedures in case of an accident or emergency?*
4. _____ _____ *Have vendors provided evidence and copies of documents on file of their qualifications to specify, supply, service, train, and / or repair the equipment or service they provide?*

EQUIPMENT

5. _____ _____ *Are proper operating instructions provided for each operator and are they required to follow all of them?*
6. _____ _____ *Are all hoses, torches, couplings, gauges, and other equipment inspected at the beginning of each work session?*
7. _____ _____ *Are there safety mechanisms in place that prevent oxygen and fuel gas hoses from being interchanged or otherwise ensure that each hose has no more than one gas passing through it?*
8. _____ _____ *Have gas pipelines and gas supply systems been installed and serviced according to the manufacturer's instructions by a qualified vendor?*
9. _____ _____ *Are welders and gas users provided with appropriate and adequate personal protective equipment, trained to use it, and using it?*
10. _____ _____ *Are welders and gas users using equipment that has third party (U/L, ERL, or FM) approvals (no homemade or inexpensive unqualified imported equipment)?*
11. _____ _____ *Are regulators, torches, and point of use for all gases being evaluated supplied with proper approved safety devices like flashback arresters and check valves?*
12. _____ _____ *Are cylinders, cylinder valves, couplings, regulators, hoses, and apparatus always kept free of oil, grease and other contaminants?*
13. _____ _____ *Are operators ensuring that the mixture of oxygen or air and fuel gases other than in approved torch mixers being avoided?*

REFERENCES

REFERENCES & FURTHER READING / LINKS (in addition to those cited in the Gas Welding article, AWS Journal, November, 2010)

1. United States Department of Labor, OSHA, Welding Cutting, & Brazing, Safety & Health Tips: <http://www.osha.gov/SLTC/weldingcuttingbrazing/index.html>
2. American Welding Society (AWS) Safety & Health Fact Sheet 1: 2005
3. Protective equipment check list (OSHA 29 CFR 1910.252), Lab Safety & Industrial: <http://www.labsafety.com/refinfo/ezfacts/ezf109.htm>
4. ESAB Oxy Handbook: http://www.esabna.com/EUWeb/OXY_handbook/589oxy1_1.htm
5. Fire Hazards from Gas Welding: http://www.youtube.com/watch?v=ui3ynOqihYY&feature=player_embedded
6. Preventing Welding Flashback: <http://www.toolboxtopics.com/Gen%20Industry/Preventing%20Welding%20Flashback.htm>

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The information in this document is provided by SuperFlash Compressed Gas Equipment LLC, as general guidance only and may not explain all relevant safety regulatory hazards or requirements for your application.