



COMPRESSED GAS ASSOCIATION, INC.

SAFETY BULLETIN

SB-8—2009

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USE OF OXY-FUEL GAS WELDING AND CUTTING APPARATUS

Oxy-fuel gas welding and cutting apparatus can be used safely. However, *failure to take basic safety precautions can result in personal injury, death, and property damage*. Following the DOs and DO NOTs listed below can reduce the chance of a serious accident.

DO:

- DO carefully read the equipment manufacturer's operating instructions before using any equipment. If you do not have the operating instructions, obtain a copy from the manufacturer or your local distributor. Additional information on equipment may be found in the publications listed in the additional references section at the end of this publication;
- DO have a trained person demonstrate the proper procedures before you attempt to set up or use the equipment unless you have already been trained;
- DO follow the equipment manufacturer's operating instructions at all times. Deviation from these instructions can result in *personal injury, death, and property damage*;
- DO inspect oxygen regulators before installing them on cylinders. Inlet connections shall be clean. If there is evidence of oil, grease, or other contaminants on the nut, nipple, or filter, remove the regulator from service and have it inspected and cleaned by a qualified repair facility before using it;
- DO inspect the oxygen cylinder valve outlet connection before attaching the regulator to ensure that there is no oil, grease, or other contaminants present. If any contamination is evident or if the valve is damaged, immediately remove the cylinder from service and return it to the supplier;
- DO back off the pressure adjusting screw of the regulator to release spring force before opening the cylinder valve;
- DO open the cylinder valves very slowly. Opening oxygen valves quickly can result in a violent reaction if contaminants are present;
- DO stand with the cylinder between yourself and the regulator (cylinder valve outlet facing away) when opening the cylinder valve;
- DO wear protective clothing (e.g. gloves, flame resistant clothing with long sleeves, hearing protection, cap or hard hat, and face mask/shield) and appropriate eye protection with shaded lenses when operating oxy-fuel gas apparatus. Severe injury can result from sparks, splashing metal, and intense light. See ANSI/AWS Z49.1, *Safety in Welding, Cutting, and Allied Processes* [1].
- DO purge hose lines individually before lighting the torch tip. This will ensure that no oxy-fuel gas mixture is present in the hoses, which can cause a flashback that results in an explosion or fire when the torch is ignited;
- DO refer to the manufacturer's instructions for proper lighting and shutdown procedures;
- DO ensure that the work area is kept free of combustible materials. Sparks can ignite paper, rags, wood, and plastic, causing serious fire damage. Sparks can fly 35 ft (10.7 m) or more;

- DO ensure that the work area is adequately ventilated to remove fumes and provide an adequate supply of breathable air to avoid ill effects and the possibility of asphyxiation. See ANSI/AWS Z49.1 [1];

NOTE—Welding, cutting, and heating processes can enrich or deplete the oxygen concentration in air. An oxygen-deficient atmosphere can cause death by asphyxiation in seconds. An oxygen-enriched atmosphere is a severe risk for accelerated fire or explosion. See Title 29 of the U.S. *Code of Federal Regulations* (29 CFR) Part 1910.146 “Permit-required confined spaces”, for confined space entry procedures [2]. Also see CGA P-39, *Oxygen-Rich Atmospheres* and CGA SB-2, *Oxygen-Deficient Atmospheres* [3, 4]. Welding, cutting, and heating processes can also produce toxic gases. Be aware of the materials being cut and take appropriate precautions. See ANSI/AWS Z49.1[1].

- DO have equipment inspected periodically in accordance with the manufacturer’s instructions and have repairs made by a qualified repair facility;
- DO ensure that hose line check valves and flashback arrestors are inspected and tested at the interval recommended by the manufacturer so that they function as intended;
- DO obtain material safety data sheets (MSDSs), which provide information about the gases being used;
- DO keep the equipment clean and in good working condition, ensuring that all gas passages are unobstructed before use and protected from obstruction and contamination when in storage. Obstructed passages can cause overheating, backfiring, and flashbacks;
- DO ensure that regulators, hoses, fittings, check valves and/or flashback arrestors (if used), and torch handles are properly sized to provide adequate flow with minimum restriction to the torch tip. Contact the manufacturer or distributor if you need assistance in properly sizing the equipment;
- DO examine work material before startup for possible hazards such as flammable parts, plastic, paint, or metal coated surfaces, oil, grease, chemical and solvent residue, insulation, and chambers or voids that can contain flammable materials. Unexpected fires, fumes, or explosions can occur;
- DO ensure that the proper fire extinguishing equipment is available and that you are familiar with its use. Provide a fire watch as recommended in ANSI/AWS Z49.1 [1];
- DO use Grade T hose for all oxy-fuel applications;

NOTE—CGA recommends the exclusive use of Grade T hose because of its gas compatibility, oil resistance, and flammability resistance. Exclusive use of Grade T hose eliminates the incorrect application of other grades of hose.

- DO examine hose before each use. Replace hose when worn, burned, cracked, weathered, damaged, or when the fabric braid shows;
- DO open an acetylene cylinder the minimum amount required to provide acceptable flow so it can be closed as quickly as possible in an emergency situation. One and one-half turns is usually sufficient to provide adequate flow; and
- DO limit the withdrawal rate of an acetylene cylinder to 1/7 of the capacity of the cylinder per hour to prevent solvent from being withdrawn from the acetylene cylinder which may damage equipment.

DO NOT:

- DO NOT handle equipment with oily or greasy hands or gloves. Oil and grease should be kept away from the area. Oil or grease can burn violently or explode when in contact with oxygen;
- DO NOT attempt to repair or substitute parts on equipment, particularly regulators. Special tools, cleaning procedures, and techniques are necessary to safely repair oxy-fuel gas apparatus. Only trained personnel should make repairs and only the parts and procedures specified by the equipment manufacturer should be used;
- DO NOT change regulators from one gas service to another or replace a pressure gauge with one taken from any other service. Contamination can result in a fire or explosion;
- DO NOT use oxygen in place of compressed air to supply pneumatic equipment, tools, hoses, or blow guns. A serious fire or explosion can result;