Abstract

The new revised manual for oxyfuel gas cutting includes the latest procedures to be used in conjunction with oxyfuel gas cutting equipment. The manual also includes the latest safety recommendations. Complete lists of equipment are available from individual manufacturers.
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1. Scope

This manual describes the equipment, procedures, and safe practices for the oxyfuel cutting of steel. It is for the operators of both hand and machine torches and is recommended for management personnel associated with the oxyfuel cutting process.

Oxyfuel gas cutting is a process whereby a metal (usually an iron base alloy) is heated to its kindling temperature (well below the melting point) by an oxyfuel gas flame and then burned rapidly by a regulated jet of oxygen. A cutting torch is used for this operation.

This standard makes use of both U.S. Customary Units and the International System of Units (SI). The latter are shown within brackets [ ] or in appropriate columns in tables and figures. The measurements may not be exact equivalents; therefore, each system must be used independently.

Safety and health issues are concerns beyond the scope of this Recommended Practice and, therefore, are not fully addressed herein. Some safety and health information is available from other sources, including, but not limited to ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes, and applicable federal and state regulations.

2. Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this AWS standard. For undated references, the latest edition of the referenced standard shall apply. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply.

1. ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes; and

2. AWS F4.1, Recommended Safe Practices for Preparation for Welding and Cutting of Containers and Piping.

3. Terms and Definitions

The terms listed are used in various sections of this document and require definition for correct interpretation. Most of these terms are not contained in AWS A3.0-2001, Standard Welding Terms and Definitions, or if they are listed in AWS A3.0, their definitions have been enhanced to clarify their use in this document.

For the purposes of this document, the following terms and definitions apply:

backfire. The momentary return of the flame into the torch that is usually signaled by a popping sound. The flame may either extinguish or reignite at the end of the tip.

flashback. The return of the flame through the torch and into the hose and/or regulator. It may also reach the cylinder. This event is caused by the oxygen and fuel mixing in one side of the oxyfuel system and subsequently being ignited at the tip. This condition is generally caused by the reverse flow of one gas into the other side of the system. Flashback can be hazardous, whereby; it can potentially cause an explosion at any point in the system.

sustained backfire. The return of the flame into the torch with continued burning inside the torch. This event can be identified by an initial popping sound followed by a squealing or hissing sound caused by the continued burning inside the torch.

These terms are potentially hazardous events that can occur when using oxyfuel equipment. It is important for the operator to understand these events and the terms that are associated with them.

See 6.2 and Clause 10 for additional information.