

**AWS C4.3/C4.3M:2007**  
**An American National Standard**



# **Recommended Practices for Safe Oxyfuel Gas Heating Torch Operation**



**American Welding Society**



**AWS C4.3M/C4.3M:2007**  
**An American National Standard**

**Approved by the**  
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**Recommended Practices**  
**for Safe Oxyfuel Gas**  
**Heating Torch Operation**

**3rd Edition**

**Supersedes AWS C4.3/C4.3M:2004**

Prepared by the  
American Welding Society (AWS) C4 Committee on Oxyfuel Gas Welding and Cutting

Under the Direction of the  
AWS Technical Activities Committee

Approved by the  
AWS Board of Directors

**Abstract**

The newly revised manual for oxyfuel gas heating torch operation includes the latest procedures to be used in conjunction with oxyfuel gas heating equipment. The manual also includes the latest safety requirements. Complete lists of equipment are available from individual manufacturers.



**American Welding Society**

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## Foreword

This foreword is not part of AWS C4.3/C4.3M:2007, *Recommended Practices for Safe Oxyfuel Gas Heating Torch Operation*, but is included for informational purposes only.

This manual is intended for use by the oxyfuel gas heating torch operator. It describes the oxyfuel gas heating torch operation process, including information relating to equipment, safety, and operating procedures.

Although many references are made to safe practice throughout this manual, it is strongly recommended that all operators become thoroughly familiar with all aspects of a safe oxyfuel heating operation. A suggested standard is ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, available from the American Welding Society.

Much of the information in this manual is necessarily general in nature due to the large number of variations in equipment produced by various manufacturers. The manufacturer's manual should be consulted for details on safe installation and use of all equipment.

When equipment, or parts of equipment, need repair, the work shall be performed by personnel who have been properly instructed by the manufacturers of the equipment.

All revisions to the 2004 edition are identified by a vertical line in the margin next to the text.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS C4 Committee on Oxyfuel Gas Welding and Cutting, American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

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# Recommended Practices for Safe Oxyfuel Gas Heating Torch Operation

## 1. Scope

This manual describes the equipment, procedures, and safe practices for oxyfuel gas heating torch operation. It is written for the operators of torches using single or multiple heating tips and heads. It is also recommended for management personnel associated with the oxyfuel gas heating torch operation and process.

Oxyfuel heating is an operation whereby various metals are heated in order to perform the following operations:

- (1) Straightening and bending with mechanical force
- (2) Flame straightening and cambering
- (3) Stress relieving
- (4) Preweld and postweld heating
- (5) Fusion of coatings
- (6) Flame hardening
- (7) Flame shrinking

The metal is heated by the direct application of single- or multi-flames to a desired elevated temperature. The heating process may be applied to all types of metal forms or shapes. An operator can make proper compensation for the effect of the metallurgical conditions, part geometry, and physical changes that may occur during the heating process.

In general, torch heating does not require any lengthy startup. Operations can be performed in most locations, in confined areas, under most conditions, and with relatively low-cost equipment. Torch heating can also be performed on completed structures without dismantling them.

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.

Although many references are made to safe practices throughout this standard, it is strongly recommended that all operators become thoroughly familiar with all aspects of a safe oxyfuel heating operation. Safety and Health information is available from various sources, including, but not limited to, ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, and applicable federal, state, and local regulations.

## 2. Normative References

The following standards contain provisions, which, through reference in this text, constitute mandatory 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.

AWS documents:<sup>1</sup>

AWS A3.0, *Standard Welding Terms and Definitions, Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*; and

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

Other documents:

ANSI Z49.1, *Safety in Welding, Cutting and Allied Processes*;<sup>2</sup>

ISO 3821, *Gas Welding Equipment — Rubber Hoses for welding, cutting, and allied processes*;<sup>3</sup>

<sup>1</sup> AWS standards are published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

<sup>2</sup> ANSI Z49.1 is published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

<sup>3</sup> ISO standards are published by the International Organization for Standardization, 1 rue de Varembé, Case postale 56, CH-1211 Geneva 20, Switzerland.