

AWS C4.3/C4.3M:2018
An American National Standard

Recommended Practices for Oxyfuel Gas Heating Torch Operation



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Approved by the
American National Standards Institute
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Recommended Practices **for Oxyfuel Gas Heating** **Torch Operation**

4th Edition

Supersedes AWS C4.3/C4.3M:2007

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.



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This standard is subject to revision at any time by the AWS C4 Committee on Oxyfuel Gas Welding and Cutting. It must be reviewed every five years, and if not revised, it must be either reaffirmed or withdrawn. Comments (recommendations, additions, or deletions) and any pertinent data that may be of use in improving this standard are required and should be addressed to AWS Headquarters. Such comments will receive careful consideration by the AWS C4 Committee on Oxyfuel Gas Welding and Cutting and the author of the comments will be informed of the Committee's response to the comments. Guests are invited to attend all meetings of the AWS C4 Committee on Oxyfuel Gas Welding and Cutting to express their comments verbally. Procedures for appeal of an adverse decision concerning all such comments are provided in the Rules of Operation of the Technical Activities Committee. A copy of these Rules can be obtained from the American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

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Foreword

This foreword is not part of this standard but is included for information 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.

A vertical line in the margin or underlined text in clauses, tables, or figures indicates an editorial or technical change from the 2007 edition.

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, 8669 NW 36 St, # 130, Miami, FL 33166.

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Recommended Practices for Oxyfuel Gas Heating Torch Operation

1. General Requirements

1.1 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. Although this recommended practice is not written with mandatory requirements, mandatory language, such as the use of “shall,” will be found in those portions of the document where failure to follow the instructions or procedures could produce inferior, misleading, or unsafe results.

1.2 Units of Measure. 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.

1.3 Safety. Safety issues and concerns are addressed in this standard although health issues and concerns are beyond the scope of this standard. Safety and health information is available from the following sources:

American Welding Society:

- (1) ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*
- (2) AWS Safety and Health Fact Sheets
- (3) Other safety and health information on the AWS website

Material or Equipment Manufacturers:

- (1) Safety Data Sheets supplied by materials manufacturers
- (2) Operating Manuals supplied by equipment manufacturers