


**AWS F2.3M:2011**  
**An American National Standard**



**Specification  
for Use and  
Performance of  
Transparent  
Welding Curtains  
and Screens**



**American Welding Society**



**AWS F2.3M:2011**  
**An American National Standard**

**Approved by the**  
**American National Standards Institute**  
**July 7, 2010**

# **Specification for Use and Performance of Transparent Welding Curtains and Screens**

**2nd Edition**

**Supersedes AWS F2.3M:2001**

Prepared by the  
American Welding Society (AWS) Committee on Safety and Health

Approved by the  
AWS Board of Directors

## **Abstract**

This standard informs the reader of reasonable and adequate means, ways, and methods for the testing, selection, and safe use of transparent welding curtains and screens. These devices are designed to provide outside viewers, at some distance from the welding arc or operation, a safe view of the operation and operator.



**American Welding Society**

550 N.W. LeJeune Road, Miami, FL 33126

International Standard Book Number: 978-0-87171-779-5  
American Welding Society  
550 N.W. LeJeune Road, Miami, FL 33126  
© 2010 by American Welding Society  
All rights reserved  
Printed in the United States of America

**Photocopy Rights.** No portion of this standard may be reproduced, stored in a retrieval system, or transmitted in any form, including mechanical, photocopying, recording, or otherwise, without the prior written permission of the copyright owner.

Authorization to photocopy items for internal, personal, or educational classroom use only or the internal, personal, or educational classroom use only of specific clients is granted by the American Welding Society provided that the appropriate fee is paid to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, tel: (978) 750-8400; Internet: <[www.copyright.com](http://www.copyright.com)>.

## Statement on the Use of American Welding Society Standards

All standards (codes, specifications, recommended practices, methods, classifications, and guides) of the American Welding Society (AWS) are voluntary consensus standards that have been developed in accordance with the rules of the American National Standards Institute (ANSI). When AWS American National Standards are either incorporated in, or made part of, documents that are included in federal or state laws and regulations, or the regulations of other governmental bodies, their provisions carry the full legal authority of the statute. In such cases, any changes in those AWS standards must be approved by the governmental body having statutory jurisdiction before they can become a part of those laws and regulations. In all cases, these standards carry the full legal authority of the contract or other document that invokes the AWS standards. Where this contractual relationship exists, changes in or deviations from requirements of an AWS standard must be by agreement between the contracting parties.

AWS American National Standards are developed through a consensus standards development process that brings together volunteers representing varied viewpoints and interests to achieve consensus. While the AWS administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in its standards.

AWS disclaims liability for any injury to persons or to property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this standard. AWS also makes no guarantee or warranty as to the accuracy or completeness of any information published herein.

In issuing and making this standard available, AWS is neither undertaking to render professional or other services for or on behalf of any person or entity, nor is AWS undertaking to perform any duty owed by any person or entity to someone else. Anyone using these documents should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. It is assumed that the use of this standard and its provisions are entrusted to appropriately qualified and competent personnel.

This standard may be superseded by the issuance of new editions. Users should ensure that they have the latest edition.

Publication of this standard does not authorize infringement of any patent or trade name. Users of this standard accept any and all liabilities for infringement of any patent or trade name items. AWS disclaims liability for the infringement of any patent or product trade name resulting from the use of this standard.

Finally, the AWS does not monitor, police, or enforce compliance with this standard, nor does it have the power to do so.

On occasion, text, tables, or figures are printed incorrectly, constituting errata. Such errata, when discovered, are posted on the AWS web page ([www.aws.org](http://www.aws.org)).

Official interpretations of any of the technical requirements of this standard may only be obtained by sending a request, in writing, to the appropriate technical committee. Such requests should be addressed to the American Welding Society, Attention: Managing Director, Technical Services Division, 550 N.W. LeJeune Road, Miami, FL 33126 (see Annex D). With regard to technical inquiries made concerning AWS standards, oral opinions on AWS standards may be rendered. These opinions are offered solely as a convenience to users of this standard, and they do not constitute professional advice. Such opinions represent only the personal opinions of the particular individuals giving them. These individuals do not speak on behalf of AWS, nor do these oral opinions constitute official or unofficial opinions or interpretations of AWS. In addition, oral opinions are informal and should not be used as a substitute for an official interpretation.

This standard is subject to revision at any time by the AWS Committee on Safety and Health. 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 Committee on Safety and Health 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 Committee on Safety and Health 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, 550 N.W. LeJeune Road, Miami, FL 33126.

## Personnel

### **AWS Safety and Health Committee**

D. E. Clark, Chair	<i>Idaho National Engineering and Environmental Laboratory</i>
J. D. Jennings, 2nd Vice Chair	<i>Miller Electric Manufacturing Company</i>
S. P. Hedrick, Secretary	<i>American Welding Society</i>
S. E. Ferree	<i>ESAB Welding &amp; Cutting Products</i>
D. A. Fink	<i>The Lincoln Electric Company</i>
S. R. Fiore	<i>Edison Welding Institute</i>
D. G. Harvey	<i>Hobart Brothers</i>
K. A. Lyttle	<i>Praxair, Incorporated</i>
A. F. Manz	<i>A. F. Manz Associates</i>

### **Advisors to the AWS Safety and Health Committee**

J. F. Hinrichs	<i>Friction Stir Link, Incorporated</i>
N. Jenkins	<i>The Ohio State University</i>
T. Lyon	<i>Consultant</i>
J. Petkovsek	<i>The Lincoln Electric Company</i>
D. H. Sliney	<i>Consultant</i>
R. J. Tucker	<i>Consultant</i>

## Foreword

This foreword is not part of AWS F2.3M:2011, *Specification for Use and Performance of Transparent Welding Curtains and Screens*, but is included for informational purposes only.

This specification was originally developed by the AWS Safety and Health Committee, with the assistance from manufacturers and users of transparent welding curtains and screens. The goal was a standard to provide the minimum safety requirements for these products and to differentiate them from welding filters. This revision is the second edition of *Specification for Use and Performance of Transparent Welding Curtains and Screens* and supersedes the edition published in 2001. The major change from the first edition is the inclusion of the new Annex C, Measurement of Spectral Transmittance, and the guidance to exclude the measurement of any fluorescence.

# Table of Contents

	<b>Page No.</b>
<i>Personnel</i> .....	v
<i>Foreword</i> .....	vii
<i>List of Tables</i> .....	x
<b>1. Scope and Purpose</b> .....	1
1.1 Scope .....	1
1.2 Purpose .....	1
<b>2. Normative References</b> .....	1
<b>3. Terms and Definitions</b> .....	2
<b>4. Compliance</b> .....	3
4.1 Performance Requirements .....	3
4.2 Variations .....	3
<b>5. General Requirements</b> .....	3
<b>6. Requirements for the Use of Transparent Welding Curtains/Screens</b> .....	3
6.1 Prevention of Injuries .....	3
6.2 Hazardous Environment .....	3
6.3 Protectors .....	3
6.4 Adequate Protection .....	3
<b>7. Performance Requirements</b> .....	4
7.1 View .....	4
7.2 Bystander Protection .....	4
7.3 Transmittance Properties .....	4
7.4 Weathering Resistance .....	4
<b>8. Precautions</b> .....	4
<b>9. Marking</b> .....	4
<b>10. Maintenance</b> .....	4
<b>11. Selection and Use</b> .....	4
<b>12. Flammability Test</b> .....	4
<b>13. Large Area Viewing</b> .....	5
Annex A (Informative)—Calculation of Luminous Transmittance, $T_L$ .....	7
Annex B (Informative)—Calculation of Blue Light Transmittance, $T_B$ .....	9
Annex C (Informative)—Measurement of Spectral Transmittance .....	11
Annex D (Informative)—Guidelines for the Preparation of Technical Inquiries .....	13

## List of Tables

<b>Table</b>		<b>Page No.</b>
1	Grade Chart.....	2
A.1	Values for $V(\lambda)$ and $S(\lambda)$ .....	7
B.1	Values for $B(\lambda)$ .....	9



# Specification for Use and Performance of Transparent Welding Curtains and Screens

## 1. Scope and Purpose

**1.1 Scope.** This standard shall apply to transparent welding curtains and screens used for all welding and cutting operations or processes where harmful sparks, spatter, and radiation are emitted, and excludes those sources that emit x-rays, gamma rays, particulate radiation (such as alpha and beta radiation), laser light, or electron beams. This standard makes use of the International System of Units (SI).

**1.2 Purpose.** The purpose of this standard is to provide reasonable and adequate means, ways, and methods for the testing, selection, and safe use of transparent welding curtains and screens. In order to carry this out, the function of these transparent welding curtains and screens needs to be understood clearly. These devices are designed to provide outside viewers, at some distance from the welding arc or operation, a safe view of the operation and operator. Transparent welding curtains and screens are not meant to replace a welding filter plate or to provide a close-up view of the welding operation. It is recommended that the transparent welding curtain or screen be at least 1 meter from the arc or operation. In establishing safety requirements, the hazards for a viewer at least 1 meter away were considered, with an 8 hour viewing time. In addition, a worst-case welding arc for ultraviolet and blue light emission was used (GMAW on aluminum with an argon shield gas). This represents a conservative approach for eye safety.

Because of this philosophy, curtain or screen grades were not referenced to the welding or cutting operation. The user is free to choose a device of whatever level of visible light transmission for the particular situation. Consequently, all devices must provide a minimally adequate level of ultraviolet and blue light attenuation. For example, if a low level of glare attenuation is desired, a light shade curtain can be selected, and the user would be assured of adequate levels of attenuation of ultraviolet and blue light radiation.

## 2. Normative References

The standards listed below 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.

(1) AWS A3.0, *Standard Welding Terms and Definitions, Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*<sup>1</sup>

(2) ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*

(3) ANSI Z87.1, *Practice for Occupational and Educational Eye and Face Protection*<sup>2</sup>

<sup>1</sup> AWS standards and ANSI Z49.1 are published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

<sup>2</sup> ANSI Z87.1 is published by the International Safety Equipment Association, 1901 North Moore Street, Suite 808, Arlington, VA 22209.