

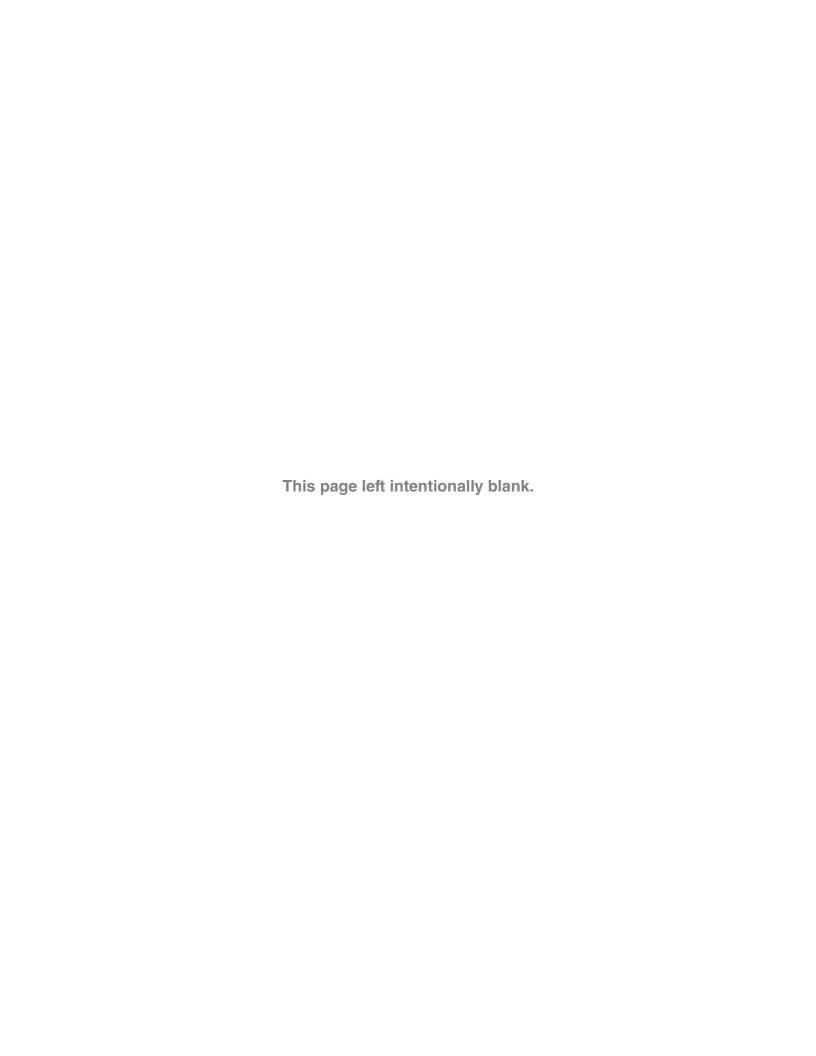
Test Procedure and Acceptance Criteria for — Prime Painted Steel Surfaces for Steel Doors and Frames



Steel Door Institute

Approved November 21, 2011





ANSI/SDI®
A250.10-2011

American National Standard

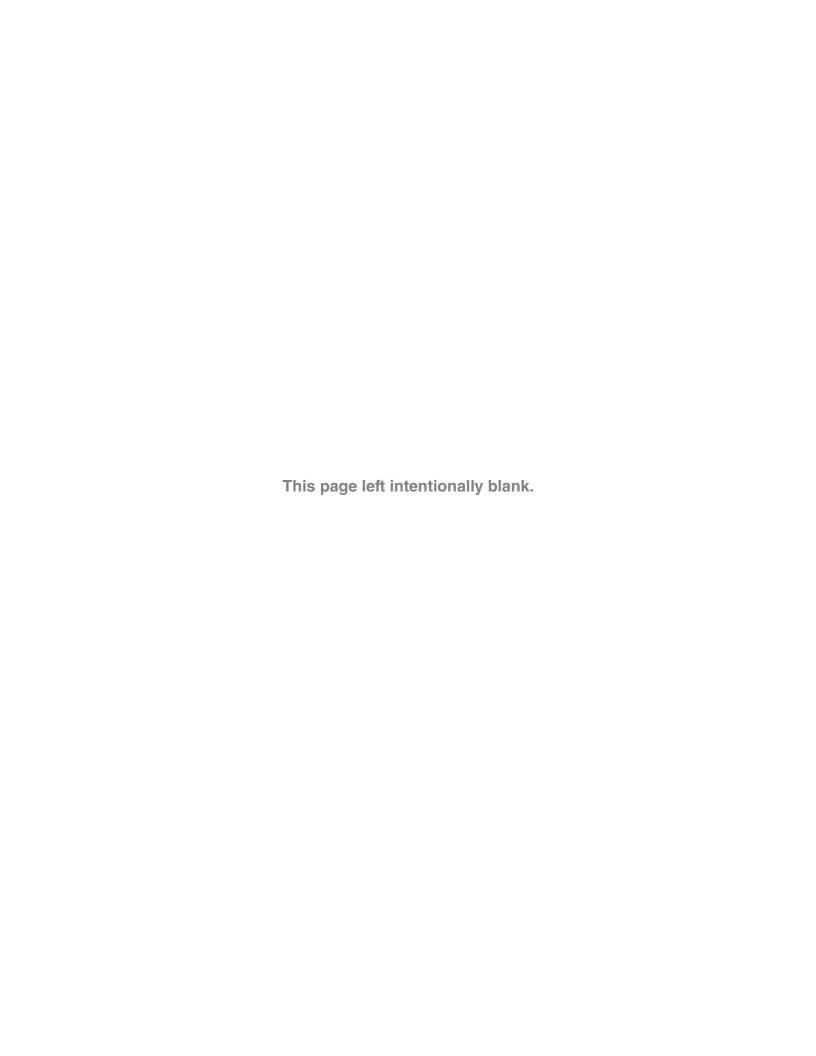
Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames

Secretariat

Steel Door Institute

Approved November 21, 2011

American National Standards Institute, Inc.



National Standard

American Approval of an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

> Consensus is established when, in the judgement of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward their resolution.

> The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether they have approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards.

> The American National Standards Institute does not develop standards and will in no circumstances give any interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

> CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

Published by

Steel Door Institute 30200 Detroit Road, Cleveland, Ohio 44145-1967

Copyright © 2014 by Steel Door Institute All rights reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without prior written permission of the publisher.

Printed in the United States of America

ANSI/SDI A250.10-2011

Contents

	Page				
Foi	Forewordii				
1	Scope1				
2	Material1				
3	Testing1				
	3.1 Salt Spray Test1				
	3.2 Condensation Testing (Humidity)1				
	3.3 Impact Test1				
	3.4 Film Adhesion Test2				
4	Acceptance Criteria2				
4.1 Salt Spray Resistance					
	4.2 Condensation Resistance2				
	4.3 Impact Test2				
	4.4 Film Adhesion2				
5	Report2				
6	General2				
	6.1 Testing Laboratory2				
	6.2 Certification2				
Tal	oles				
1	Rust grades3				
2	Classification of adhesive test results6				
Fig	ures				
1	Visual reference for percentage of rust3				
2	Blister size #24				
3	Blister size #44				
4	Blister size #65				
5	Blister size #85				

Foreword (This Foreword is not part of American National Standard A250.10-2011)

The material contained in this document has been developed under the auspices of the Technical Committee of the Steel Door Institute.

The original standard was issued on July 28, 1980 and was revised in 1990 and 1998, and the 1998 edition was reaffirmed in 2004. The current edition is a revision of the 1998 document with the contents being updated to reflect changes and advances that have take place in the steel door and frame industry.

Suggestions for improvement gained in the use of this standard are welcome and should be sent to the Steel Door Institute, 30200 Detroit Road, Cleveland, OH 44145-1967.

The organizations that have approved this standard are as follows:

American Institute of Architects
Architectural Testing
Builders Hardware Manufacturers Association
Canadian Steel Door Manufacturers Association
Cedar Valley Associates
FM Approvals
Door and Hardware Institute
Door Control Services
HMMA/Division of NAAMM
Intertek Testing Services
Steel Door Institute
Therma-Tru
Underwriters Laboratories Inc.
Vetrotech / Saint Gobain
Wind Science & Engineering Research Center

The Accredited Standards Committee A250 TC-1 developed this standard and had the following personnel at the time of approval:

James Urban, Chairman J. Jeffery Wherry, Secretary

Organization Represented American Institute of Architects Architectural Testing	. Dan Johnson . Michael Tierney . Bud Bulley . Stan Horsfall . Tom Janicak . Dave Dedic
Door and Hardware Institute	
Door Components	. Tom Popow
Door Control Services	. Craig Ordmandy
FM Approvals	. Mark Tyrol
HMMA/Division of NAAMM	. Russell Tauscher
Intertek Testing Services	. Nancy Kokesh
Mesker Door, Inc	. Mike Torres
MPI	. Tom Stone
Pioneer Industries, Inc	. Kamal Sheikh
Republic	. Steve Gilliam
Security Metal Products	. Terry Simpson
Steel Door Institute	. J. J. Wherry
Ingersoll Rand	. Kurt Roeper
Therma-Tru	. Steve Jasperson
Underwriters Laboratories Inc	. Matthew Schumann
Vetrotech / Saint Gobain	. Christian Mueller
Wind Science & Engineering Research Center	. Larry Tanner

American National Standard

Test Procedure and Acceptance Criteria for — Prime Painted Steel Surfaces for Steel Doors and Frames

1 Scope

These methods prescribe the procedures to be followed in the selection of material, chemical preparation, painting, testing, and evaluation of prime painted steel surfaces for steel doors and frames.

2 Material

2.1 The test specimen shall be the exact type and gauge of steel used in the manufacturing of the product. It shall be $4" \times 10"$ with a 1/4" hole at the center of the 4" width, 1/2" in from the end. When a specimen greater than 10" in length is used for the coating process, the bottom 10" of the specimen shall be used for all subsequent testing.

Permanent identification marks shall be added to the specimen as required for control purposes.

- **2.2** The specimen(s) shall be hung using a method representative of that used in production.
- 2.3 The specimen(s) shall be cleaned, pretreated and painted in accordance with the manufacturer's normal production method and procedure. All coating weights used on test specimens shall be documented and representative of the individual manufacturer's normal production material.
- **2.4** At the end of the paint cycle, the specimen(s) shall be removed from the paint system with careful handling. The painted surface of the specimen shall not be handled or come in contact with other objects to prevent disruption of the painted surface.
- **2.5** All specimens shall be aged a minimum of 72 hours prior to testing.

3 Testing

3.1 Salt spray test

- a) Apparatus The apparatus used for salt spray testing shall be of such design as to conform to ASTM B117-09, Standard Practice for Operating Salt Spray (Fog) Apparatus.
- b) Test performance Salt spray testing shall be conducted as specified in ASTM B117-09, Standard Practice for Operating Salt Spray (Fog) Apparatus for a test period of 120 continuous hours. The test specimen(s) shall be scribed with an "X" per ASTM D1654-92(2000) Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments, sections 4.1 and 5.1.

3.2 Condensation testing (humidity)

- a) Apparatus The apparatus used for condensation (humidity) testing shall be of such design as to conform to ASTM D4585-99, Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation.
- b) Test performance Condensation (humidity) testing shall be conducted as specified in ASTM D4585-99, Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation, for a test period of 240 continuous hours. Exposure temperatures shall be maintained at a minimum of 100° Fahrenheit. Actual test temperature shall be noted in the report.

3.3 Impact test

The paint shall be tested per ASTM D2794-93 (2010)e1 Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact), with 20 inch pounds of direct impact using a Gardner Impact Tester with

½" diameter ball or punch at room temperature of 70° – 75° Fahrenheit. After impact is made, apply ¾" wide #600 Scotch cellophane tape firmly to the impact area and pull off sharply.

3.4 Film adhesion test

The coating film adhesion shall be tested in accordance with method "B" of ASTM D3359-09e2, Standard Test Methods for Measuring Adhesion by Tape Test. A total of (11) parallel cuts are made with a sharp instrument, 1 mm apart in both a vertical and horizontal direction forming a grid. One inch wide pressure-sensitive tape is then firmly applied to the scribed surface and rapidly removed.

4 Acceptance criteria

4.1 Salt spray resistance

The paint film on the unscored surface of the test specimen shall have a rust grade of no less than 6 as defined in ASTM D610-01, Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces. Table 1 shall be used to evaluate the rust grades. The paint film at the scored line shall not be undercut by rust more than ½" each side, when tested in accordance with paragraph 3.1.

4.2 Condensation resistance

The paint film may have any quantity of #8 blisters but, shall have no more than a few #6 blisters as illustrated in ASTM D714-02(2009), Standard Test Method for Evaluating Degree of Blistering of Paints, when tested in accordance with paragraph 3.2. Visual representations of the various degrees of blistering are shown in Figures 2 through 5.

4.3 Impact test

No paint film removal shall occur other than at an area 1/8" in diameter at the center of the impact area, when tested in accordance with paragraph 3.3.

4.4 Film adhesion

There shall be no adhesion loss less than a grade 3B as defined in ASTM D3359-09e2. This grade represents a film removal of between 5 and 15%. Table 2 illustrates the various classifications for adhesion loss.

5 Report

- **5.1** The report shall cover the date the test was performed and the issue date of the report.
- **5.2** Identification of the specimen tested, source of supply, manufacturer, model or series number, or both, and any other pertinent information.
- **5.3** A detailed description of the specimen or specimens tested shall include the type of prime paint, the method of paint application, the procedure used to cure it, and the dry film thickness.
- **5.4** A statement that the test or tests were conducted in accordance with the methods and procedures as specified herein. If deviations from these methods and procedures were made, they shall be described in the report.
- **5.5** When the test is made to check the conformance of the unit specimen to test requirements of a particular specification, the identification or description of the specification shall be included in the report.

6 General

6.1 Testing laboratory

All tests shall be conducted and/or certified by a nationally recognized, independent testing laboratory accredited in accordance with ISO 17025 for the test methods referenced in the standard.

6.2 Certification

Reference may be made to this specification. When reference is made, the following statement shall be used: Prime finish has been tested in conformance with ANSI Standard A250.10-1998.

Table 1 - Rust grades

Rust Grade	Maximum % of rusted area
10	00.01
9	00.03
8	00.10
7	00.30
6	01.00
5	03.00
4	10.00
3	16.67
2	33.33
1	50.00
0	100.00

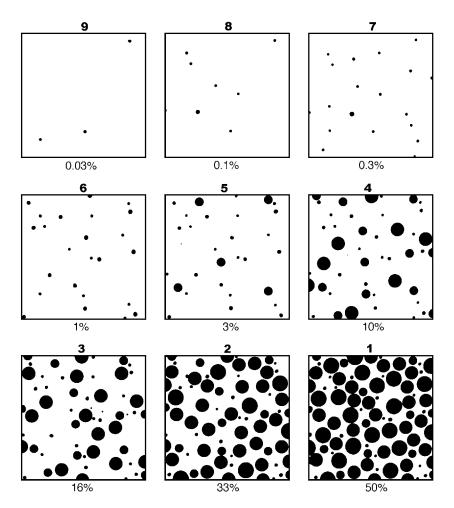
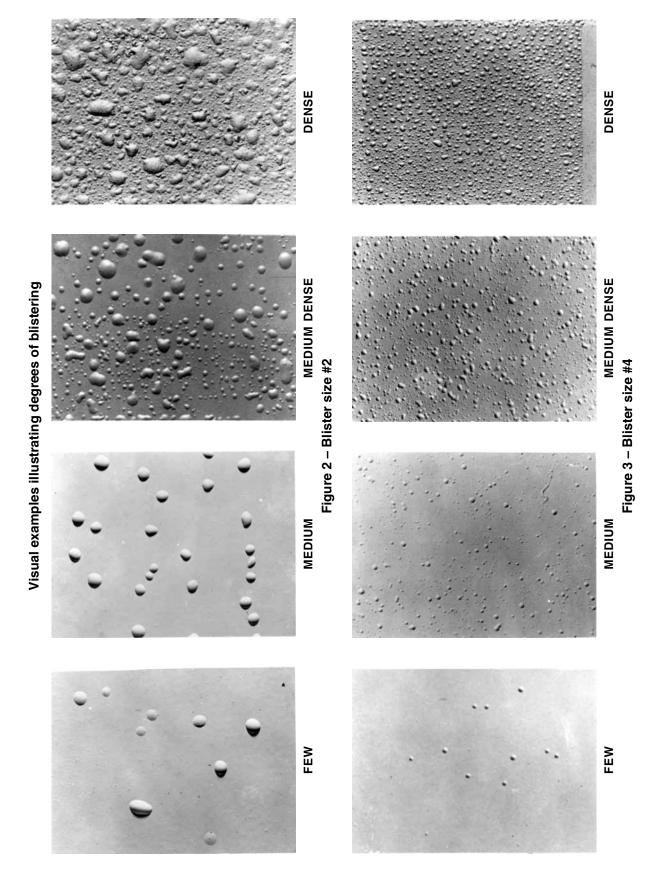


Figure 1 – Visual reference for percentage of rust



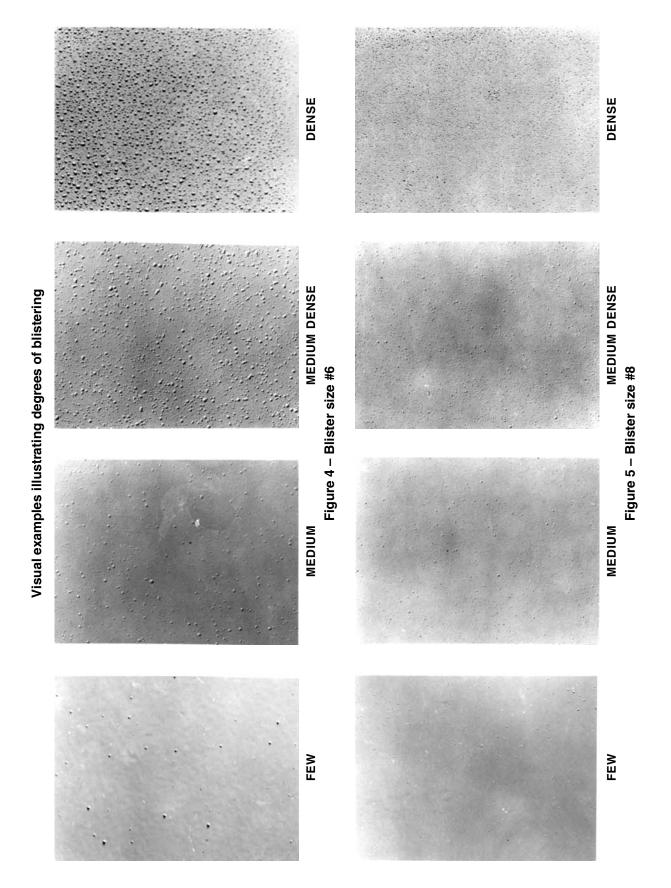


Table 2 - Classification of adhesive test results

Classification	Surface of cross-cut areas from which listing has occurred. (Example for six parallel cuts.)	Rate of adhesion
5B	None	The edges of the cuts are completely smooth; none of the squares or the lattice are detached.
4B		Small flakes of coating are detached at intersections; less than 5% of the area is affected.
3B		Small flakes of coating are detached along edges and at intersections of cuts. The area affected is 5 to 15% of the lattice.
2B		The coating has flaked along the edges and at parts of the squares. The affected area is 15 to 35% of the lattice.
1B		The coating has flaked along the edges of cuts in large ribbons and entire squares have detached. The area affected is 35 to 65% of the lattice.
0В	Flaking and detachment in excess of 65%.	

AVAILABLE PUBLICATIONS

Specifications

ANSI/SDI A250.6 Recommended Practice for Hardware Reinforcings on Standard

Steel Doors and Frames

SDI 100 Specifications for Standard Steel Doors & Frames **ANSI/SDI A250.8**

SDI-108 Recommended Selection & Usage Guide for Standard Steel Doors

SDI-118 Basic Fire Door, Fire Door Frame, Transom/Sidelight Frame, and

Window Frame Requirements

SDI-128 Guidelines for Acoustical Performance of Standard Steel Doors &

Frames

SDI-129 Hinge & Strike Spacing

Test Procedures

ANSI/SDI A250.3 Test Procedure & Acceptance Criteria for Factory Applied Finish

Coatings for Steel Doors & Frames

Test Procedure & Acceptance Criteria for Physical Endurance for **ANSI/SDI A250.4**

Steel Doors, Frames and Frame Anchors

ANSI/SDI A250.10 Test Procedure & Acceptance Criteria for Prime Painted Steel

Surfaces for Steel Doors & Frames

ANSI/SDI A250.13 Testing and Rating of Severe Windstorm Resistant Components

for Swinging Door Assemblies for Protection of Building Envelopes

(Not applicable for FEMA 320/361 or ICC-500 Shelters)

SDI-113 Standard Practice for Determining the Steady State Thermal

Transmittance of Steel Door & Frame Assemblies

Accelerated Physical Endurance Test Procedure for Steel Doors, **SDI-131**

Frames and Frame Anchors

Construction Details

ANSI/SDI A250.11 Recommended Erection Instructions for Steel Frames

SDI-110 Standard Steel Doors & Frames for Modular Masonry Construction

SDI-111 Recommended Details for Standard Details Steel Doors, Frames,

Accessories and Related Components

SDI-122 Installation Troubleshooting Guide for Standard Steel Doors &

Frames

Miscellaneous Documents

SDI-112 Zinc-Coated (Galvanized/Galvannealed) Standard Steel Doors &

Frames

SDI-117 Manufacturing Tolerances for Standard Steel Doors & Frames

SDI-124 Maintenance of Standard Steel Doors & Frames

SDI-127 Industry Alert Series (A-L) **SDI-130 Electrified Hinge Preparations**

SDI-134 Nomenclature for Standard Steel Doors & Steel Frames

AUDIO-VISUAL PROGRAMS ALSO AVAILABLE

MEMBERS OF THE STEEL DOOR INSTITUTE

CECO DOOR

9159 Telecom Drive Milan, TN 38358 (731) 686-8345 www.cecodoor.com

CURRIES

P.O. Box 1648

Mason City, IA 50402-1648

(641) 423-1334 www.curries.com

DEANSTEEL MANUFACTURING CO.

931 S. Flores Street

San Antonio, TX 78204-1406

(210) 226-8271 www.deansteel.com

DOOR COMPONENTS INC.

7980 Redwood Avenue Fontana, CA 92336-1638

(909) 770-5700

www.doorcomponents.com

HOLLOW METAL XPRESS

602 S. 65th Avenue Phoenix, AZ 85043 623-936-7000 www.HMXpress.com

MESKER DOOR, INC.

3440 Stanwood Boulevard Huntsville, AL 35811-9021 (256) 851-6670 www.meskerdoor.com

MPI

319 North Hills Road Corbin, KY 40701 (606) 523-0173

www.metalproductsinc.com

PIONEER INDUSTRIES, INC.

171 South Newman Street Hackensack, NJ 07601 (201) 933-1900

www.pioneerindustries.com

REPUBLIC DOORS & FRAMES

155 Republic Drive McKenzie, TN 38201-0580 (731) 352-3383

www.republicdoor.com

SECURITY METAL PRODUCTS

5700 Hannum Avenue, Suite 250 Culver City, CA 90230

(310) 641-6690 www.secmet.com

STEELCRAFT

9017 Blue Ash Road Cincinnati, OH 45242 (513) 745-6400 www.steelcraft.com





STEEL DOOR INSTITUTE

30200 DETROIT ROAD · CLEVELAND, OHIO 44145 440.899.0010 · FAX 440.892.1404 www.steeldoor.org