Flammability Certificate
CN 3M™ DI-NOC™ Concrete/Mortar

DESIGNTEX

CN 3M™ DI-NOC™ Concrete/Mortar was tested and met the following flammability requirements:

ASTM E84 Adhered Class A

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Flammability Certificate
CN 3M™ DI-NOC™ Concrete/Mortar

DESIGNTEX

3M™ DI-NOC™ Flammability Category 1:

CN-1621
CN-1622
CN-1623
CN-1958
CN-2512

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COMMERCIAL TESTING COMPANY
Post Office Box 985 • 1215 South Hamilton Street • Dalton, Georgia 30722
Telephone (706) 278-3935 • Facsimile (706) 278-3936

Standard Method of Test for
Surface Burning Characteristics of Building Materials

ASTM E 84–05

3M™ DI–NOC™ Film (Category 1)

Report Number 06–08230

Test Number 3798–1663
August 2, 2006

3M Company
St. Paul, Minnesota

Commercial Testing Company is accredited for the ASTM E 84 test by the United States Department of Commerce, National Institute of Standards and Technology (NIST), through the National Voluntary Laboratory Accreditation Program (NVLAP) for conformance with criteria set forth in NIST Handbook 150:2001, and all requirements of ISO/IEC 17025:1999.

Commercial Testing Company

Wenare Jackson

(Authorized Signature)

This report is provided for the exclusive use of the client to whom it is addressed. It may be used in its entirety to gain product acceptance from duly constituted authorities. The test results presented in this report apply only to the samples tested and are not necessarily indicative of apparent identical or similar materials. Sample selection and identification were provided by the client. A sampling plan, if described in the referenced test procedure, was not necessarily followed. This report, or the name of Commercial Testing Company, shall not be used under any circumstance in advertising to the general public.

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Since 1974

INTRODUCTION

This report is a presentation of results of a surface flammability test on a material submitted by 3M Company, St. Paul, Minnesota.

The test was conducted in accordance with the ASTM International fire test response standard E 84–05, *Surface Burning Characteristics of Building Materials*, sometimes referred to as the Steiner tunnel test. This test is applicable to exposed surfaces such as walls and ceilings. The test is conducted with the specimen in the ceiling position with the surface to be evaluated exposed face down to the ignition source. The ASTM E 84 test method is technically identical to NFPA No. 255 and UL No. 723.

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire–hazard or fire–risk assessment of materials, products, or assemblies under actual fire conditions.

PURPOSE

The purpose of the test is to provide only the comparative measurements of surface flame spread and smoke development of materials with that of select grade red oak and fiber–reinforced cement board, Grade II, under specific fire exposure conditions. The test exposes a nominal 24-foot long by 20-inch wide test specimen to a controlled air flow and flaming fire adjusted to spread the flame along the entire length of a red oak specimen in 5.50 minutes. During the 10-minute test duration, flamespread over the specimen surface and density of the resulting smoke are measured and recorded. Test results are calculated relative to red oak, which has an arbitrary rating of 100, and fiber–reinforced cement board, Grade II, which has a rating of 0.

The test results are expressed as Flame Spread Index and Smoke Developed Index. The Flame Spread Index is defined in ASTM E 176 as "a number or classification indicating a comparative measure derived from observations made during the progress of the boundary of a zone of flame under defined test conditions." The Smoke Developed Index, a term specific to ASTM E 84, is defined as "a number or classification indicating a comparative measure derived from smoke obscuration data collected during the test for surface burning characteristics." There is not necessarily a relationship between the two measurements.

The method does not provide for measurement of heat transmission through the surface tested, the effect of aggravated flame spread behavior of an assembly resulting from the proximity of combustible walls and ceilings, or classifying a material as noncombustible solely by means of a Flame Spread Index.

The zero reference and other parameters critical to furnace operation are verified on the day of the test by conducting a 10–minute test using 1/4–inch fiber–reinforced cement board, Grade II. Periodic tests using NOFMA certified 23/32–inch select grade red oak flooring provide data for the 100 reference.

TEST SAMPLE

The test sample, selected by the client, was identified as **3M™ DI–NOC™ Film (Category 1)**, color Woodgrain, a self–adhering film having a thickness of 0.008 inch. Three test panels, each measuring two feet wide by eight feet in length, were prepared by adhering the material to 1/4–inch thick fiber–reinforced cement board, Grade II, using the self–adhering properties of the film. The film was applied to the smooth side of the cement board and smoothed with a brush and roller. After dead–stacking overnight, the prepared panels were transferred to storage racks and conditioned to equilibrium in an atmosphere with the temperature maintained at 71 ± 2°F and the relative humidity at 50 ± 5 percent. For testing, the panels were placed end–to–end on the ledges of the tunnel furnace and tested with no auxiliary support mechanism.

TEST RESULTS

The test results, calculated on the basis of observed flame propagation and the integrated area under the recorded smoke density curve, are presented below. The Flame Spread Index obtained in E 84 is rounded to the nearest number divisible by five. Smoke Developed Indices are rounded to the nearest number divisible by five unless the Index is greater than 200. In that case, the Smoke Developed Index is rounded to the nearest 50 points. The flame spread and smoke development data are presented graphically on Page 4 of this report.

Test Specimen	Flame Spread Index	Smoke Developed Index
Fiber–Reinforced Cement Board, Grade II	0	0
Red Oak Flooring	100	100
3M™ DI–NOC™ Film (Category 1)	**25**	**70**

OBSERVATIONS

Specimen ignition over the burners occurred at 0.07 minute. Surface flame spread was observed to a maximum distance of 5.52 feet beyond the zero point at 3.27 minutes. The maximum temperature recorded during the test was 630°F.

CLASSIFICATION

The Flame Spread Index and Smoke Developed Index values obtained by ASTM E 84 tests are frequently used by code officials and regulatory agencies in the acceptance of interior finish materials for various applications. The most widely accepted classification system is described in the National Fire Protection Association publication NFPA 101 *Life Safety Code*, where:

Class A	0 – 25 Flame Spread Index	0 – 450 Smoke Developed Index
Class B	26 – 75 Flame Spread Index	0 – 450 Smoke Developed Index
Class C	76 – 200 Flame Spread Index	0 – 450 Smoke Developed Index

Class A, B, and C correspond to Type I, II, and III respectively in other codes such as SBCCI, BOCA, and ICBO. They do not preclude a material being otherwise classified by the authority of jurisdiction.

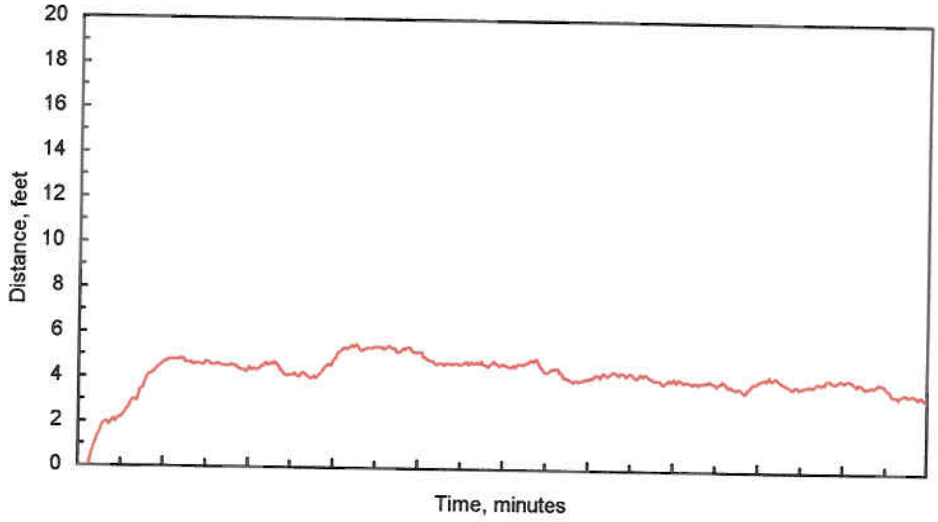
ASTM E 84 TEST DATA

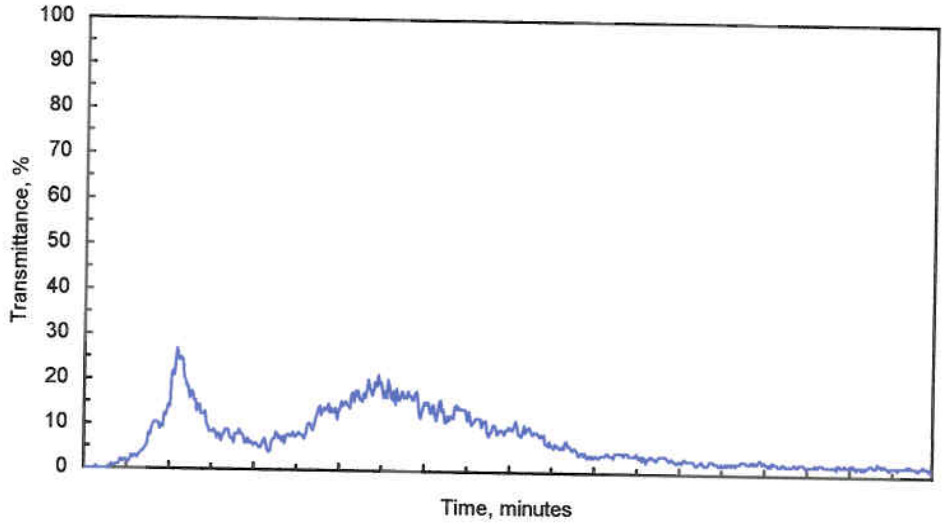
Client: 3M Company
Test Number: 3798-1663
Material Tested: 3M™ DI-NOC™ Film (Category 1)
Date: August 2, 2006

Test Results:

Time to Ignition = 00.07 minutes
Maximum Flamespread Distance = 05.52 feet
Time to Maximum Spread = 03.27 minutes

Flame Spread Index = 25
Smoke Developed Index = 70





3M Commercial Branding and Transportation Division

3M Center
St. Paul, MN 55144-1000
General 1-888-364-3577

May 16th, 2025

Re: 3M™ DI-NOC™ Architectural Finishes ("3M DI-NOC Product")

UL 10(b) / UL 10(c) and CAN ULC/ S104 Testing Information

To Whom it May Concern,

This letter is in response to your request for information regarding UL 10(b) – Standard for Fire Tests of Door Assemblies, UL 10(c) – Standard for Positive Pressure Fire Tests of Door Assemblies, and CAN/ULC S104 Standard Method for Fire Tests of Door Assemblies testing for 3M™ DI-NOC™ Architectural Finishes ("3M DI-NOC Products").

Based on the testing by Intertek Testing Services, the 3M DI-NOC Products listed on the attached Intertek report do not change the performance of the listed wood and mineral core door types but must adhere to all restrictions/requirements that are noted on existing Listed and Labeled Fire Door and Frame Specifications.

Similarly, the 3M DI-NOC Products listed on the attached QAI Laboratories report, do not change the performance of a steel 3 hour rated door and meets the requirements of the test standards for a 3-hour fire-resistance rating with hose stream when applied as described in the report.

A select set of 3M DI-NOC Products were tested by Intertek and QAI. Additional finishes are continually introduced to the 3M DI-NOC Product line. All currently offered 3M DI-NOC Products fall under existing construction categories and have an organic content percentage by weight equal to or less than the tested finishes, therefore are expected by 3M to not change the performance of the listed door types as indicated above.

If you have any questions about the features or performance of this 3M product, please call Commercial Branding and Transportation Division Technical Service at 1-800-328-3908.

Sincerely,
Maria Longo
Sr. Regulatory Affairs Associate mlongo@mmm.com

intertek
Total Quality. Assured.

AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report(s). This authorization also applies to the Multiple Listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The Certification Mark(s) may be applied only at the location of the Party Authorized to Apply Mark.

Applicant:	3M (Minnesota Mining and Manufacturing) 3M Center St. Paul, MN 55144 United States
Contact:	Mark Lund
Phone:	651-733-0973
Fax:	651-736-0957
Email:	mwlund@mmm.com
Party Authorized to Apply Mark:	See following page(s)
Evaluation Center:	Intertek (Elmendorf)
Client Number:	202653

Authorized By: _____
Jean-Philippe Kayl, Director of Certification

Intertek Testing Services NA, Inc.
545 E. Algonquin Road, Ste H., Arlington Heights, IL 60005 USA
Phone: 847-439-5667 Fax: 847-439-7320

C LISTED US Intertek

RECOGNIZED COMPONENT Intertek

This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Testing Standard(s):	CAN4 S104 (1985), UL 10(b) (2008), NFPA 252 (2008), UL 10(c) (2001), IMO FTP Code Part 5 - Bulkhead, Wall and Ceiling Linings (1996), UL 10(b) Revision 1 (2009), IMO 2010 FTP Code Part 5 - Bulkhead, Wall and Ceiling Linings, UL 10(c) (2009), IMO FTP Code Part 2 (1996), CAN / ULC S102.2 (2010), CAN / ULC S104 (2010), NFPA 252 (2012), IMO 2010 FTP Code Part 2
Product:	3M Di-Noc™ Architectural Finishes

Listing Section(s): FIRE DOOR COMPONENTS

CSI Code(s): 08 14 00 Wood Doors

Description:

Description:
3M Di-Noc™ architectural finishes are constructed from polyvinyl chloride film with a permanent adhesive.
RATINGS:

Product	Standard	Rating
All Listed Di-Noc™ Product Numbers	CAN/ULC-S102.2	-Flame Spread Rating: 0 -Smoke Developed Classification: 35
All Listed Di-Noc™ Product Numbers	NFPA 252 UL 10c UL 10b CAN ULC S104 CAN4 S104	See Fire Door Applications Below
USCG Type Approved finishes (except ME-432AR, ME-433AR, ME1467AR, ME-1466AR)*	1996 IMO FTP Code Part 5	Meets low flame spread requirements for bulkhead, wall, and ceiling linings when applied over metal substrate ≥ 0.039 in.
USCG Type Approved finishes (except ME-432AR, ME-433AR, ME1467AR, ME-1466AR)*	1996 IMO FTP Code Part 2	Meets low smoke and toxicity requirements for materials used as surface of bulkheads, linings or ceilings when applied over metal substrate ≥ 0.039 in.
ME-432AR, ME-433AR, ME1467AR, ME-1466AR*	IMO 2010 FTP Code Part 5	Meets low flame spread requirements for bulkhead, wall, and ceiling linings when applied over metal substrate ≥ 0.045 in.
ME-432AR, ME-433AR, ME1467AR, ME-1466AR*	IMO 2010 FTP Code Part 2	Meets low smoke and toxicity requirements for materials used as surface of bulkheads, linings or ceilings when applied over metal substrate ≥ 0.045 in.

***Consult USCG website for Type Approved DI-NOC™ finishes related to Certificate 164.112/151/0 at: https://cgmix.uscg.mil/equipment**.

Fire Door Applications and Restrictions:
1) All restrictions/requirements that are noted on existing Listed and Labeled Fire Door and Frame Specifications must be adhered to.

2) 20-45 minute single, wood core fire doors with wrapped edges (See Table below of Listed 3M Di-Noc™ Architectural Finishes). Concealed or surface mount edge seal intumescent required on the door or frame.

3) 45 minute single, wood, mineral core fire doors with wrapped edges (See Table below of Listed 3M Di-Noc™

Architectural Finishes). Concealed or surface mount edge seal intumescent required on the door or frame.

4) 45 minute single, hollow metal frame. Wood fire door only (See Table below of Listed 3M Di-Noc™ Architectural Finishes). Frame does not need to be mortar filled. Concealed or surface mount edge seal intumescent required on the door or frame.
3M Di-Noc™ architectural finishes are constructed from polyvinyl chloride film with a permanent adhesive.

List of covered DI-NOC™ Standard Architectural Finishes by Product No.
Note: Bolded Items are not covered by a USCG Type Approval.

AE – Abstract Earth, 1632, 1632AR, 1633, 1633AR, 1634-1636, 1636AR, 1637–1646, **1880MT**, 1717-1722, **1913MT, 1917MT, 1921MT, 1926MT, 1928MT-1933MT, 1944MT**, 1951-1957, **1959MT, 1960MT**

AM – Advanced Metallic, 1696-1702

AR – Abrasion Resistant, 1115, 1116, 1119, 1120, 1245, 1247-1251, 1661, 1662, 1663, 1664

BW – Big Wave, 1310-1316

CA – Carbon, 418, 419-424, 1170

CH – Cross Hairline, 1627, 1628, 1628AR, 1629, 1629AR, 1630, 1630AR, 1631, 1631AR, 1676-1677, 2116-2120

CN – Concrete, 1621-1623, 1958

DW – 1871MT-1879MT, 1881MT-1899MT, 1900MH, 1901MT-1903MT, 1992MT, 1993MT

ET – Effect, 1772-1776

FA – Abstract/Rust, 592, 601, 688, 690, 1094, 1095, 1098, 1099, 1149-1169, 1521, 1523, 1524, 1526, 1526AR, 1527, 1527AR, 1528, 1530, 1530AR, 1531, 1678, 1678AR, 1679, 1680, 1819-1822, 1962, 1963, 7037, 7038

FE – Wave, 801, 804, 805, 813, 1727-1733, 1964, 1966, 1967

FW – Fine Wood
231-233, 233AR, 234-236, 236AR, 237, 239, 240, 324, 326, 327, 329, 330, 330AR, 332-337, 337AR, 338 338AR, 340, 342, 501, 502, 510, 521, 522, 606H, 607H, 608H, 609H, 612-614, 616-619, 625, 625AR, 627, 627AR, 639H, 640-643, 646-651, 653, 655, 656, 677, 788, 789, 791, 795, 796, 799, 886-889, 1020-1022, 1022AR, 1023, 1024, 1034, 1036, 1037, 1038, 1039H, 1040H, 1113, 1114, 1121H, 1121HAR, 1122, 1122AR, 1123-1129, 1129AR, 1130H, 1130HAR, 1131-1135, 1136H, 1137, 1138, 1138AR, 1139H, 1207-1218, 1255-1259, 1261, 1262, 1265, 1266, 1268-1280, 1280AR, 1281, 1282, 1283, 1285-1288, 1289-1293, 1293AR, 1294, 1294AR, 1296, 1297, 1300-1304, 1306, 1307, 1331, 1681-1683, 1734H-1736H,1737-1751, 1751AR, 1752H, 1753H, 1754-1770, 1771H, 1801-1811, 1813, 1970, 1971, 1972, 1974-1988, 7001, 7004, 7006-7009, 7011, 7011AR, 7013-7017, 7017AR, 7018

GE – G-Emboss, 923-24

HG – High Glass, 1201-1206, 1511-1514, 1994-1996

HS – Hide Seek, 1655-1658

LE – Leather, 010, 018, 128, 129, 137, 367, 517, 701-703, 741, 742, 782, 783, 1104-1106, 1108-1110, 1171-1173, 1226-1231, 1551-1556, 2128, 2367, 2741, 2742, 2782

LW – Little Wave, 1081, 1083-1085

LZ – Abstract, 461, 462, 587

ME – Metallic, 009AR, 147, 148, 377, 379, 380, 388, 391, 396, 396AR, 431, 431AR, 432, 432AR, 433, 433AR, 486, 904, 904AR, 1174-1176, 1223-1225, 1434, 1466, 1466AR, 1467, 1467AR, 1468, 1469, 1684, 1684AR, 1685, 1685AR, 1716, 1777-1781, 1781AR, 1997, 1961, 2020, 2022-2027

MW – Metallic Wood, 776, 777, 1177, 1242, 1243, 1244, 1416-1421, 1782-1783, 1832-1834

NU – Nuno, 1237-1241, 1601-1605, 1784-1799, **1934MT-1943MT**, 2001-2017

PA – Metallic, 036, 038, 039, 045, 045AR, 046, 138AR, 175, 177-181, 181AR, 183-185, 187, 187AR, 320, 389, 389AR, 390, 683, 683AR

PC – Sand, 491, 672, 754, 758, 760, 1178-1181

PG – Abstract, 189, 190, 193-195, 197, 1182

PS – Single Color, 001AR-008AR, 022, 027, 031, 034, 042, 048, 073, 074, 075, 090, 091, 093, 096, 106, 107, 110, 112, 116, 121, 132, 134, 135, 139, 140, 141, 151, 280, 281, 292, 293, 294, 503, 504, 506, 539, 665, 668, 713, 719, 721, 885, 900, 910, 912, 914, 917, 920, 948-950, 952, 954, 955, 957, 959, 971, 975, 976,980, 982, 983, 992, 998, 999, 1005, 1008-1010, 1183-1088, 1436-1459, 1820-1826, **1863MT-1867MT, 1869MT, 1870MT, 1904MT, 1989MT**, 2060

PT – Abstract, 345, 345AR, 346, 347, 735

RS – Random Style, 1189, 1190-1194

RT – Rust, 1111, 1112, 1827

SE – Abstract/Stucco, 010AR, 567, 567AR, 568, 568AR, 570, 684, 685, 824, 828, 1087

SI – Silk, 1232-1235, 1611-1613, 1686-1689

ST – Stone, 011AR, 440, 442, 526, 553, 555-557, 736, 736AR, 737, 1195, 1586, 1587, 1588, 1828-1831, **1911MT, 1912MT, 1914MT-1916MT, 1918MT-1920MT, 1927MT**

TE – Tech Fiber, 1650-1654, 1690, 1713-1715

VM – Metallic, 167, 168, 305, 306, 381, 383, 425, 452, 800, 1486-1489, 1691-1695, 1855MT, 1856MT, 1858MT-1862MT, 1990MT, 1991MT, 2121, 2122, 2034-2039, 2090

WG – Wood Grain, 115, 156, 157, 159, 166, 242-248, 250, 251, 254, 256, 304, 364, 364GN, 372, 373, 376, 408, 410, 411, 416, 417, 428, 430, 453, 467, 477, 478, 624, 629, 657-664, 693-699, 705, 707, 709, 763, 763GN, 765, 765GN, 766, 767, 831-833, 835-837, 839, 841, 845, 846, 854-857, 860, 862, 863, 865-866, 877-880, 940, 941, 943, 944, 946, 947, 960, 962, 964, 1041-1044, 1046-1050, 1052, 1056-1058, 1063, 1064, 1066, 1067, 1069, 1070, 1071, 1140-1144, 1145H, 1146-1148, 1196, 1219-1222, 1336-1372, 1372AR, 1373-1378, 1380-1391, 1392H, 1703-1710, 1711GN, 1712GN, 1812, 1814, 1815, 1816, 1817, 1818, 1835-1841,1842GN, 1843-1848, 2019, 2033, 2041, 2042, 2047-2049, 2056, 2070-2079, 2080H-2084H, 2085-2088, 2115, 2244, 2246, 2304, 2705, 2707, 2839, 2860, 2862, 2944, 7019, 7022-7024, 7024AR, 7025, 7029, 7033

Certified Products can be identified by the Intertek Warnock Hersey (WH) Recognized Component mark or the ETL Certification Mark.

Party(s) Authorized by Manufacturer To Apply Mark:

3M (Minnesota Mining and Manufacturing) (5500, Osanagi, Higashine, Yamagata)
5500, Osanagi
Higashine, Yamagata 999-3737
Japan
Contact: Kazuhiko Shito
Phone: +81-237-48-4260
Fax: +81-237-48-4365
Email: kshito@mmm.com

Party(s) Authorized by Other Parties To Apply Mark:

None

QAI Laboratories
3980 North Fraser Way
Burnaby, B.C. V5J 5K5
604.527.8378 ph. | 604.527.8368 fx.

CLIENT: **3M COMMERCIAL SOLUTIONS DIVISION**
3M Center, 280-04-EW422-10
St. Paul, MN
55144-1000

Test Report No: BUR0001-FT-1 Rev. 1	Revision Date: June 9, 2023

SAMPLE ID: 3M™ DI NOC™ Vinyl Architectural Finishes, FA-1164, WG-159, ST-1916 and FW-1022AR tested on two separate steel door assemblies.

SAMPLING DETAIL: The test samples were submitted directly by the client. The material was not independently selected for testing.

DATE OF RECEIPT: The samples were received at the QAI Burnaby laboratory on March 30, 2023.

TESTING PERIOD: April 28 and May 1, 2023.

AUTHORIZATION: QAI Test Proposal Number 2023MV0125-01, dated January 30, 2023 and signed by Madison McMahon.

TEST PROCEDURE: Testing was conducted to the following requirements:

- UL 10c (2021) Standard for Positive Pressure Fire Tests of Door Assemblies (UL 10c).
- UL 10b (2020) Standard for Fire Tests of Door Assemblies (UL 10b).
- CAN/ULC S104-15 – Standard Method for Fire Tests of Door Assemblies (ULC S104).

TEST RESULTS: The 3M™ DI-NOC™ Vinyl Architectural Finishes when applied on a steel 3 hour rated door met the requirements of the test standards for a 3-hour fire-resistance rating with hose stream when applied as described in this test report.

Prepared By

Signed for and on behalf of
QAI Laboratories, Ltd.

Scott Leduc
Project Manager

Matt Lansdowne
VP of Operations

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Table of Contents

Introduction: 3

Assembly Description: 3

Test Apparatus: 4

Test Conditions: 5

Test Results: 5

Conclusions: 6

APPENDIX A 7

APPENDIX B 12

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Introduction:

This report documents the fire testing conducted by QAI Laboratories Ltd. for 3M Commercial Solutions Division on four 3M™ DI-NOC™ Vinyl Architectural Finishes in accordance with UL 10c, UL 10b and ULC S104. The 3M™ Vinyl covering was applied by QAI technicians to both faces and the sides of a listed 3 hour steel door to determine if the film would have any detrimental effects on the listed doors performance in accordance with the noted test procedures.

Assembly Description:

Table 1: Test Assembly Description

COMPONENT	DESCRIPTION		
Door	Type:	3-hour Intertek listed steel door.	
	Manufacturer:	Vision Hollow Metal Limited.	
	Construction:	18 gauge hollow metal door.	
	Dimensions:	36 in. x 84 in. x 1.75 in.	
Frame	Type:	16 Gauge welded steel frame.	
	Frame Dimensions:	5.75 in. deep by 2 in. frame with a 0.625 in. stop.	
	Opening Dimensions:	36 in. wide by 80 in. high.	
	Installation:	The steel frame was installed in a concrete block wall. The frame was mounted using 8 wire anchors to secure the sides of the frame to the concrete block wall.	
Vinyl Covering		**Assembly 1**	**Assembly 2**
	Product Type:	3M™ DI-NOC™ Vinyl Architectural Finish.	
	Model:	FA-1164 and WG-159	ST-1916MT and FW-1022AR
	Description:	Decorative vinyl film with adhesive backing.	
	Dimensions:	The Vinyl covering was packaged in a 48 in. wide roll and 0.2 mm thick.	
	Installation:	Two Vinyl coverings were installed on each door split vertically down the middle. The hinge and latch sides were also covered.	
Hardware	Latch:	Listed Cylindrical Passage Lever.	
	Hinges:	Three 4-1/2 in. by 4 in. steel butt hinges.	

A 3-hour steel door was chosen for this testing to evaluate the effects of high unexposed surface temperatures on the vinyl covering over a long test period.

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Test Apparatus:

The furnace used in the test is a mid-scale fire burning apparatus with interior dimensions of 10 ft. 4 in. (1.78 m) in height, 5 ft. 5 in. (1.65 m) in width, and 52 in. (1.32 m) in depth.

Temperatures within the furnace were monitored using eight thermocouples. The temperatures are controlled by adjusting fuel to the furnace burners to conform to the time/temperature curve specified by the test standards. Temperature measurements are recorded by a Keithley 2750 data acquisition unit (ID# DMM1) which passes the readings to a computer for graphical display and storage.

The door and frame assemblies were mounted in a vertical steel test frame. The test frame is then rolled up to the furnace and secured by chain and straps to the furnace opening.

Two pressure taps are installed along the longitudinal center line of the test assembly. The pressure taps are each attached and monitored by Setra model 264 pressure transducers (ID# Pressure T3 and Pressure T4). The furnace pressure is controlled by adjusting a damper in the furnace exhaust stack.

Figure 1: Test Furnace

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Test Conditions:

The 3M test assembly was constructed in a mid-scale moveable steel restraint frame. The space between the furnace and test assemblies was comprised of ceramic fiber batt to prevent air movement.

The pressure was continuously monitored using calibrated pressure transducers. After the first 5 minutes of the test the pressure 40 in. from the sill was set to zero for the remainder of the test. This pressure condition is required by UL 10c and is considered a higher requirement than the pressure conditions required for UL 10b and CAN/ULC S104 hence by testing to UL 10c the product can show compliance to all 3 standards.

Prior to the fire endurance test the test assembly was fastened to the front of the furnace, and the burners were ignited. The fire endurance test was initiated after igniting the burners. The temperature inside the furnace was controlled to follow the time/temperature curve within the limits described in the test standards.

Test Results:

Observations

Table 2: Test Observations – Assembly 1

Test Time (min)	Unexposed	Exposed
2:39		Surface ignition.
4:34	Light venting from the top of the door.	Door surface has self-extinguished.
5:15	Venting from the latch up. Light smoke from the surface.	
6:52	LH film is turning black. RH film is bubbling. Surface smoking is heavier.	
8:15	Large blisters forming on the LH film.	
9:00	Both films are beginning to flake off the door.	
9:45	Surface smoke is reduced.	
11:00	The door face is deforming. The edges are still tight against the stop.	
12:50	95% of the film has charred.	
19:45	Surface smoke has reduced.	
25:15	Charred film has fall from the top 2/3 of the door.	
45:00	95% of the charred film has fallen from the door.	
1:03:45	All of the charred film has fallen from the door.	
2:00:00	No change.	
3:00:00	Test discontinued.	

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Table 3: Test Observations – Assembly 2

Test Time (min)	Unexposed	Exposed
1:20		Surface ignition.
1:40	Venting from the header.	
2:15	Venting has reduced.	The surface has self-extinguished.
5:50	Large blisters are forming on the RH film, small blisters are forming on the LH film.	
7:00	LH film is turning black. RH film blisters are flaking off. Heavy smoke from the surface.	
12:37	90% of the surface has charred.	
17:23	RH film is beginning to flake off.	
21:00	LH film is charred and flaking off.	
27:29	50% of char has flaked off.	
42:53	95% of the charred film has flaked off. The door is deforming.	
1:00:00	Both charred films have fallen from the door.	
2:00:00	No change.	
3:00:00	Test discontinued.	

Flaming and Penetration

There was no flaming of the vinyl coverings on the unexposed surface of the doors. There was no flaming of the test assemblies for the duration of the tests.

Hose Stream Test

Immediately after the fire tests, a hose stream test was conducted for 72 seconds after the fire endurance test. The test assemblies successfully met the conditions of acceptance for the hose stream test: no through openings were developed that would allow a projection of water from the stream beyond the unexposed face during the time of the hose stream test.

Conclusions:

QAI performed testing in accordance with UL 10c, UL 10b and CAN/ULC S104 on 3M Commercial Solutions Division on 3M™ DI-NOC™ Vinyl Architectural Finishes, FA-1164, WG-159, ST-1916 and FW-1022AR tested on two separate 3-hour steel door assemblies.

The assemblies did not experience flaming on the unexposed face of the doors and no through openings formed on the test assembly. The 3M Vinyl Architectural Finishes applied to listed 3 hour assemblies met the requirements of UL 10c, UL 10b and ULC S104 for a 3-hour fire-resistance rating with hose stream.

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APPENDIX A

Page	Title
8	Assembly 1 Furnace Time Temperature Curve
9	Assembly 1 Furnace Time Pressure Curves
10	Assembly 2 Furnace Time Temperature Curve
11	Assembly 2 Furnace Time Pressure Curves

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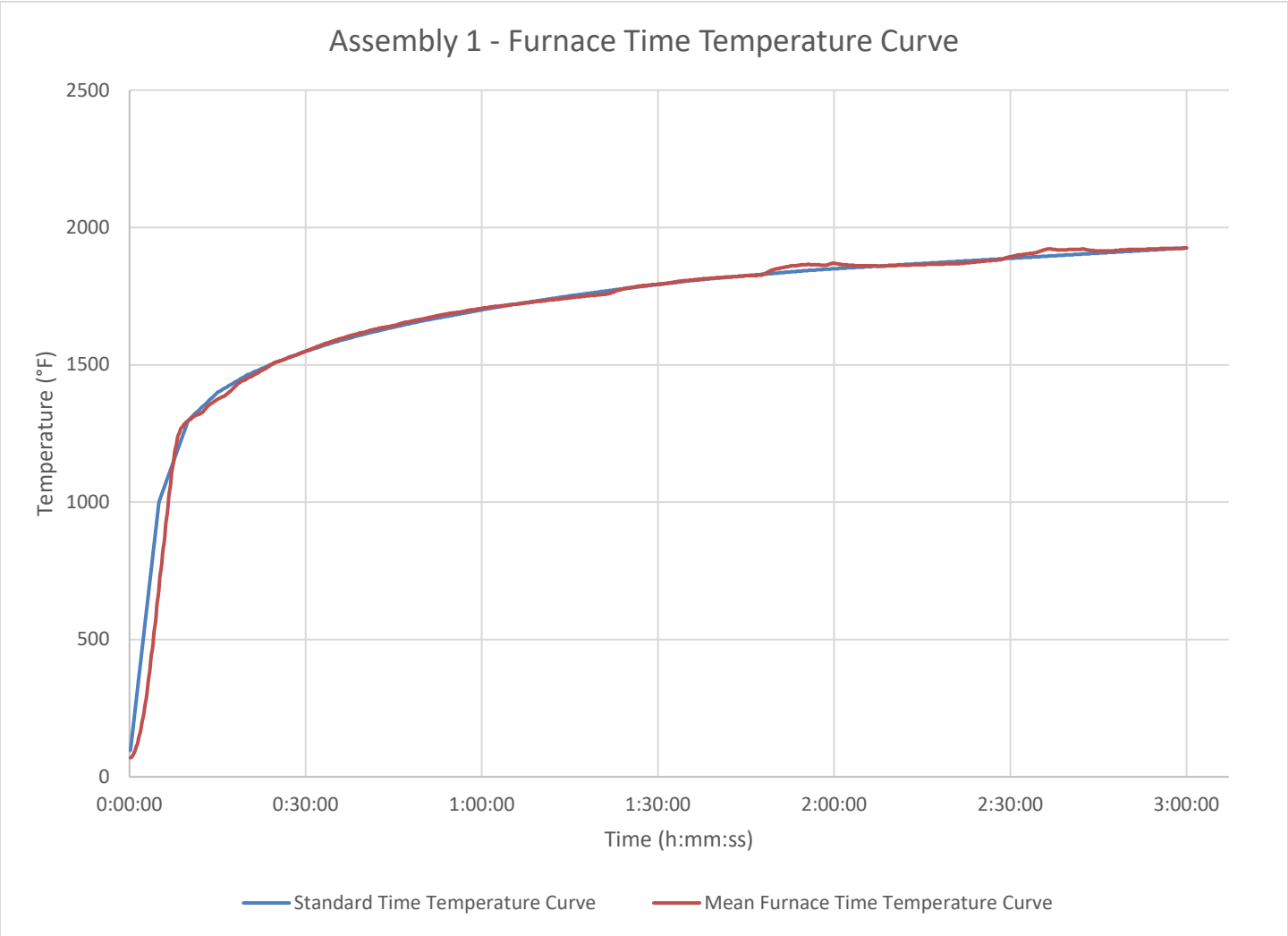

Figure 2: Furnace Time Temperature Curve.

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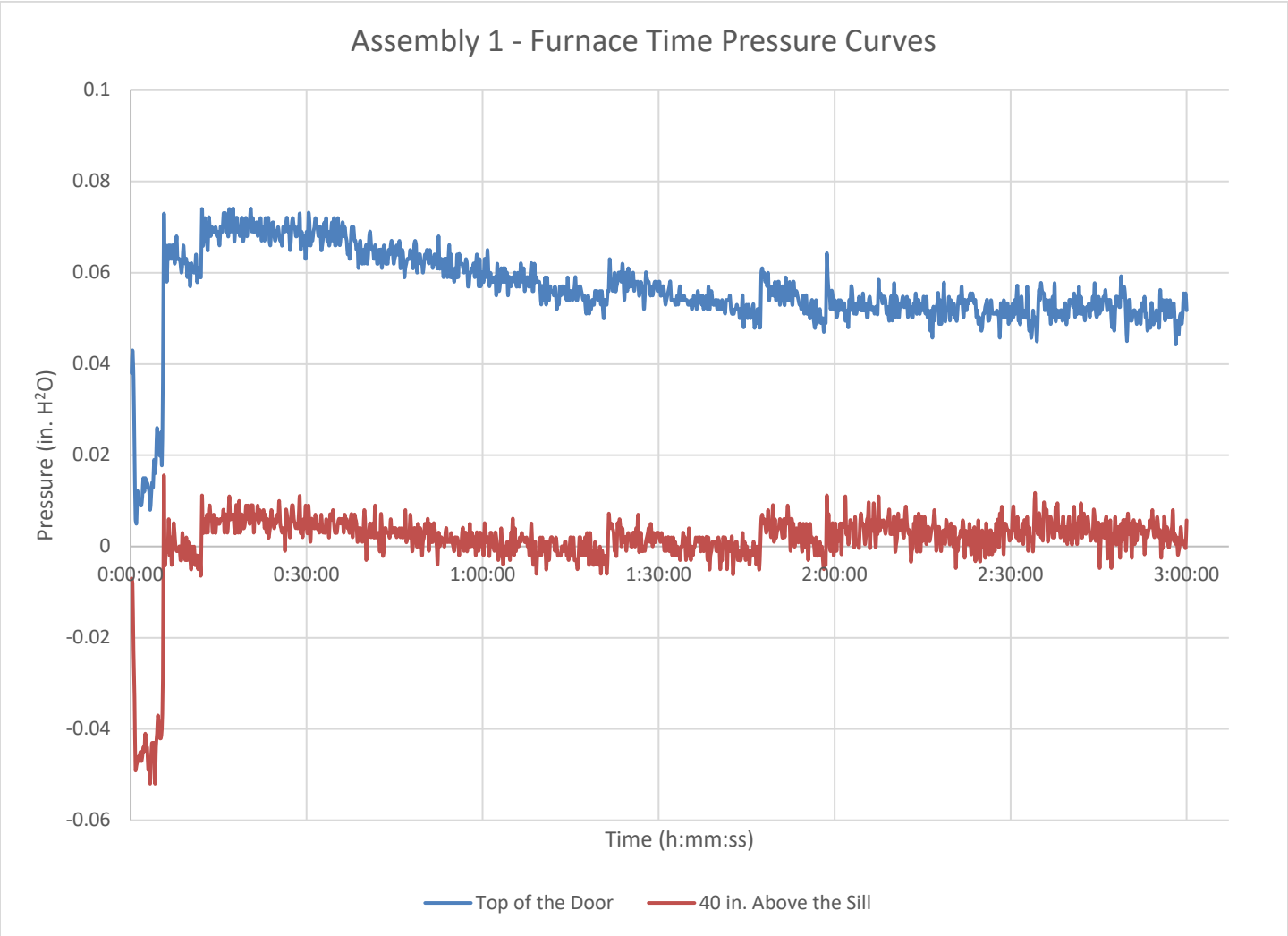

Figure 3: Furnace Time Pressure Curves.

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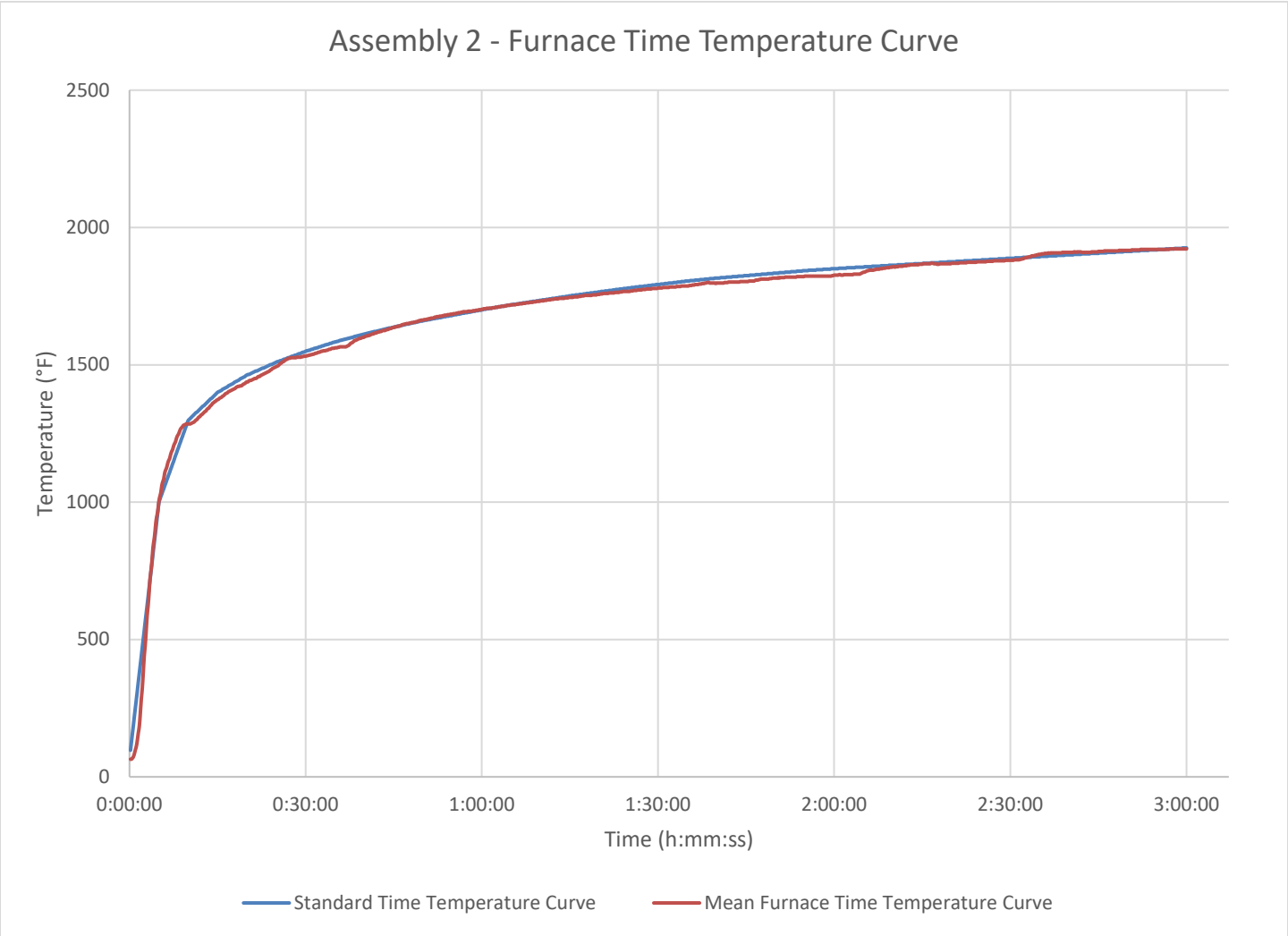

Figure 4: Furnace Time Temperature Curve.

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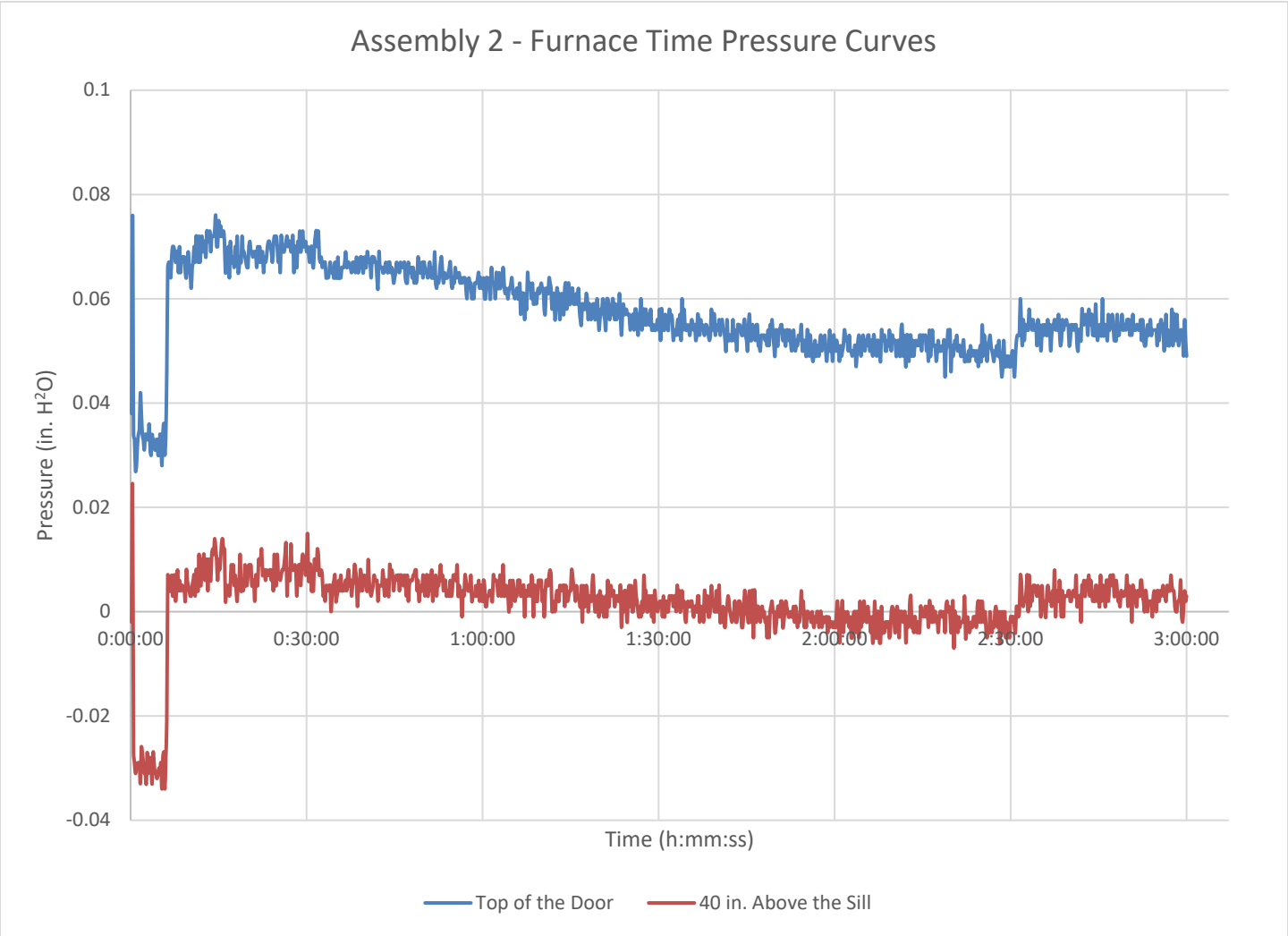

Figure 5: Furnace Time Pressure Curves.

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APPENDIX B

Page	Title
13-18	Test Photos

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Figure 6: The exposed side of assembly 1 prior to the fire test.

Figure 7: The latch edge of assembly 1 prior to the fire test.

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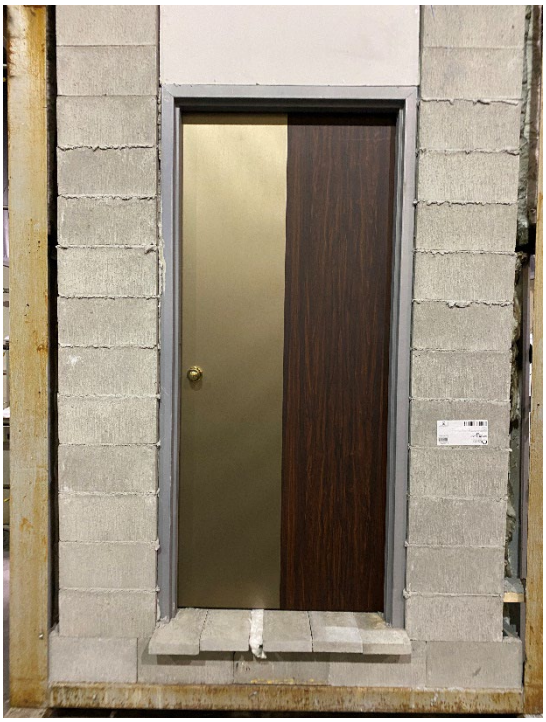

Figure 8: The unexposed side of assembly 1 prior to the fire test.

Figure 9: The unexposed side of assembly 1 32 minutes into the fire test.

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Figure 10: The exposed face of assembly 1 at the end of the fire test.

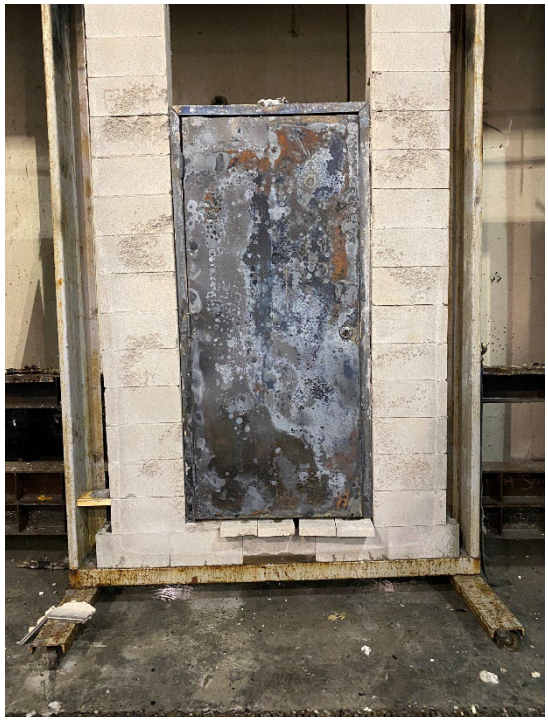

Figure 11: The exposed side of assembly 1 after the hose stream test.

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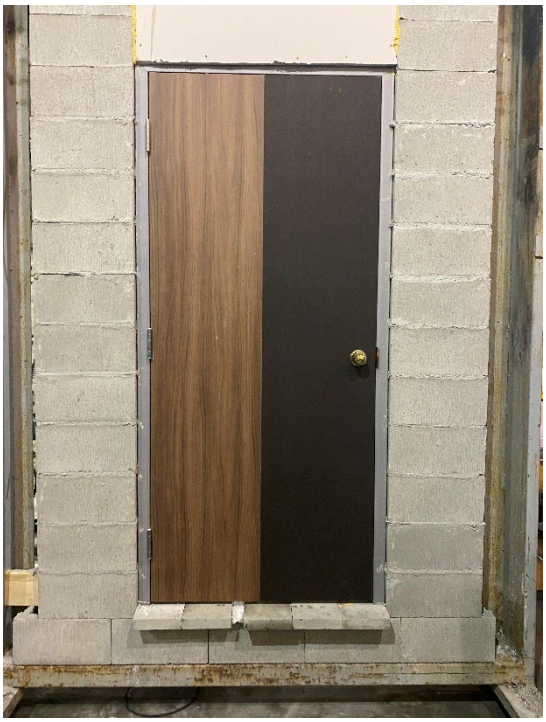

Figure 12: The exposed side of assembly 2 prior to the fire test.

Figure 13: The unexposed side of assembly 2 prior to the fire test.

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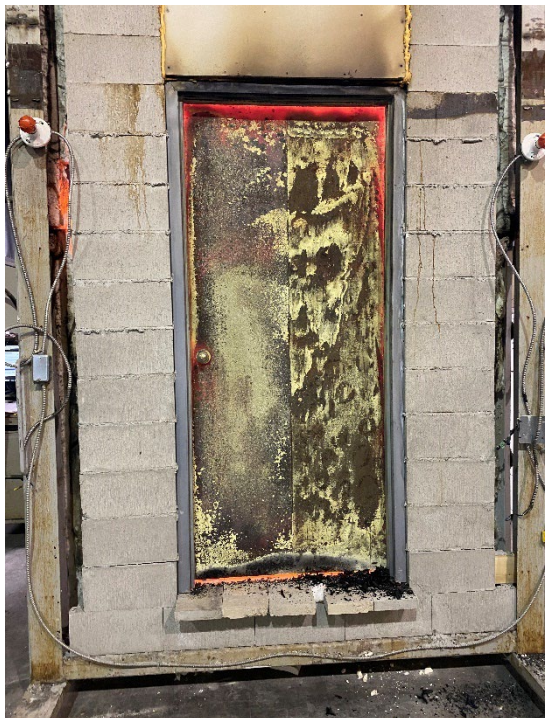

Figure 14: The unexposed side of assembly 2 near the end of the fire test.

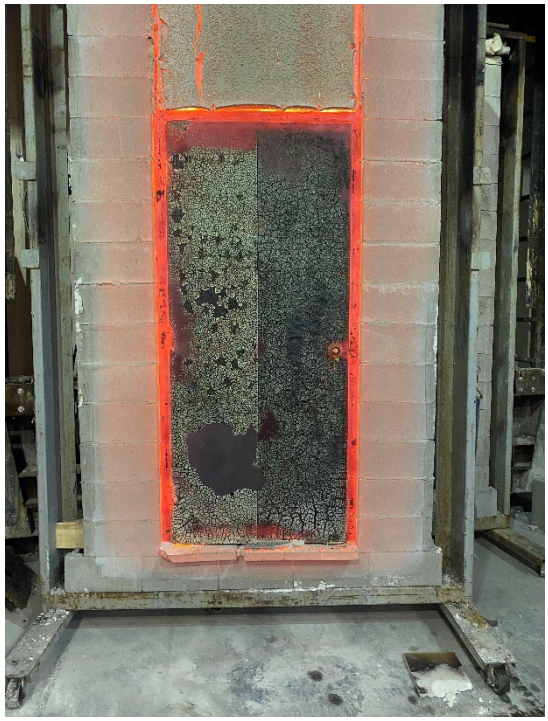

Figure 15: The exposed face of assembly 2 at the end of the fire test.

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Figure 16: The exposed side of assembly 2 after the hose stream test.

Table 4: Revision History

Date	Pages	Description	Author
May 4, 2023	All	Original issue.	SL
June 9, 2023	1, 6	Corrected model number FW-1022AR.	SL

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