

LZ 3M™ DI-NOC™ Abstract was tested and met the following flammability requirements:

ASTM E 84 Adhered Class A

3M™ DI-NOC™ Flammability Category 1:

LZ-461



COMMERCIAL TESTING COMPANY

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Standard Method of Test for
Surface Burning Characteristics of Building Materials

ASTM E 84-05

3M™ DI-NOCT™ 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

(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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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 $71 \pm 2^\circ\text{F}$ 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

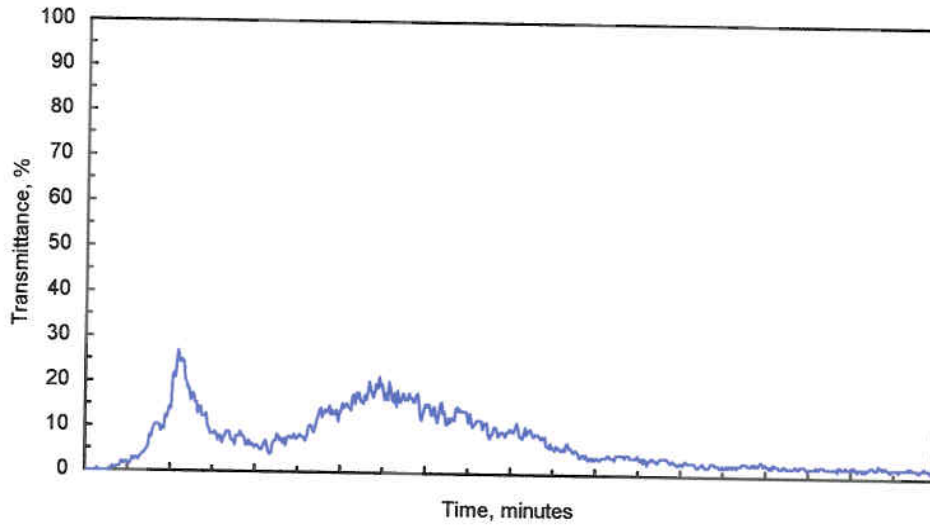
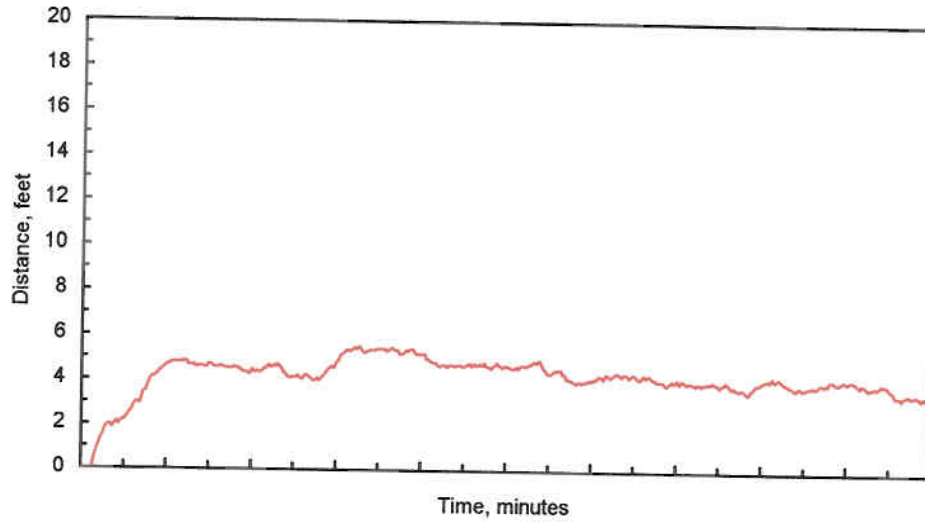
Material Tested: 3M™ DI-NOC™ Film (Category 1)

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





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.

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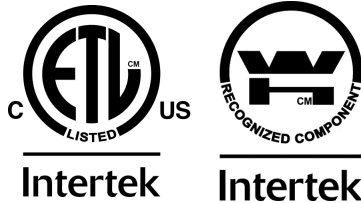
Party Authorized to Apply Mark: See following page(s)

Evaluation Center: Intertek (Elmendorf)

Client Number: 202653

Authorized By: 
Jean-Philippe Kayl, Director of Certification

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

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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.

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None