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**RAMTECH LABORATORIES**

14104 ORANGE AVENUE, PARAMOUNT, CALIFORNIA 90723-2019 •
TELEPHONE (562) 633-4824 • FAX (562) 633-4128

# Revised
# TEST REPORT

## LABORATORY NUMBER:

## TEST CONDUCTED AT:

Ramtech Laboratories, Inc.
14104 Orange Avenue
Paramount, CA 90723

REPORTED BY:

Steven Berggren

Digitally signed by Steven Berggren
DN: CN = Steven Berggren, C =
US, O = Ramtech Laboratories
Date: '00'

STEVEN BERGGREN
LABORATORY ADMINISTRATOR

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# BODY OF REPORT

LABORATORY NUMBER:
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## INTRODUCTION:

This test report has been revised as follows:
Section 1.1 Clarify "DTL" Specification.

1 **The identification of the test method used:**
1.1 Military Specification MIL-DTL-15562G (Navy)

2 **A description of the items tested:**
2.1 The sampled material was a "Sheet Floor Covering Material" having a smooth surface and the following characteristics:
Type: One (1)
Length: 75 ft.
Width: 3 ft
Thickness: 1/8 inch
Color: No. 5 (Blue Marbleized)

3 **Unambiguous identification of the items tested:**
3.1 Ramtech Laboratories identified the test specimens as follows:
Name: PVC Electrical Grade

4 **The date of sampling:**
4.1 Ramtech Laboratories independently sample the material on May 30, 2007

5 **Unambiguous identification of the product sampled:**
5.1 Ramtech Laboratories independently sampled the material identified as:
Lot No.: 547
Roll Numbers: 30
Date of Manufacture: April 2007

6 **The location of sampling:**
6.1 Ramtech Laboratories independently sampled the material at warehouse in California.

7 **A reference to the sampling plan and procedure:**
7.1 Ramtech Laboratories sampled the material in accordance with MIL-DTL-15562G (Section 4.3.2.1) from an inventory of 34 rolls.

8 **Details of the environmental conditions during sampling:**
8.1 Ramtech Laboratories sampled the material from Lonseal's warehouse having the following environmental conditions:
Temperature: 75 +/- 20 degrees F
Humidity 50 +/- 20%

9 **The date of receipt of the test items:**
9.1 Ramtech Laboratories received the test specimens on May 30, 2007

10 **The date of performance of the test:**
10.1 Testing was conducted June, 2007

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# TEST RESULTS

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## A Summary of Results

| Test Conducted | Test Requirements | Test Results |
|---|---|---|
| Thickness (Overall) | 0.125 inches (Minimum) | 0.129 inches |
| Thickness (Wear surface) | 0.040 inches (Minimum) | 0.051 Inches |
| Tensile Strength (Initial) | 800 psi (Minimum) | 1221 psi |
| Tensile Strength (Sulfuric Acid) | 70% of Initial | 103% of Initial |
| Tensile Strength (Oxygen Bomb) | 80% of Initial | 107% of Initial |
| Tensile Strength (Light Aging) | 65% of Initial | 88% of Initial |
| Tensile Elongation | 75% (Minimum) | 189% |
| Permanent Set | 25% (Maximum) | 8.1 % |
| Hardness | 95 +/- 5 | 90.7 |
| Abrasion | 10 mil (Maximum) | 1.6 mil |
| Flexibility | No cracking | No cracking |
| Voltage | No rupture or weakness @ 15,000 V | Passes |
| Dielectric Strength | 30,000 Volts Minimum | 45,300 |
| Fire Resistance | 10 inch char (Maximum)<br>4 minute combustion (Maximum) | 7.5 inch char<br>2:05 minute combustion |
| Dimensional Stability | +/- 0.020 in/ft (Maximum) | Longitudinal -0.019 in/ft<br>Transverse 0.018 in/ft |
| Gloss | 50 (Minimum) | 88.1 |

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## B Thickness Test

**B1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.4)

| Sample ID | Wear Surface Thickness (inches) | Overall Thickness (inches) |
|---|---|---|
| 1 | 0.051 | 0.129 |
| 2 | 0.050 | 0.129 |
| 3 | 0.051 | 0.128 |
| **Average** | **0.051** | **0.129** |

**Conditions of Acceptance:**

The thickness of Type 1 material shall be 0.125-inch minimum. The wear surface, if calendared to the base sheet, shall be 0.040-inch thick minimum

## C Tensile Strength

**C1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.7)

| Sample ID | Initial (psi) | Sulfuric Acid (psi) | Oxygen Bomb (psi) | Light Aging (psi) |
|---|---|---|---|---|
| 1 | 1263 | 1263 | 1333 | 1079 |
| 2 | 1263 | 1263 | 1281 | 1088 |
| 3 | 1193 | 1263 | 1298 | 1088 |
| 4 | 1193 | 1228 | 1298 | 1053 |
| 5 | 1193 | 1281 | 1333 | 1088 |
| **Average** | **1221** | **1260** | **1309** | **1079** |
| | **% of Initial** | **103%** | **107%** | **88%** |

**Conditions of Acceptance:**

The tensile strength of the floor covering shall not be less than:

| | |
|---|---|
| As received condition: | 800 psi |
| After sulfuric acid | 70% of control |
| After oxygen bomb | 80% of control |
| After light aging | 65% of control |

## D Ultimate Elongation

**D1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.8)

| Sample ID | Control (%) | Sulfuric Acid (%) | Oxygen Bomb (%) | Light Aging (%) |
|---|---|---|---|---|
| 1 | 200 | 190 | 213 | 163 |
| 2 | 200 | 190 | 213 | 172 |
| 3 | 181 | 190 | 220 | 173 |
| 4 | 181 | 180 | 198 | 164 |
| 5 | 181 | 196 | 212 | 171 |
| **Average** | **189** | **189** | **211** | **168** |
| | **% of Initial** | **100%** | **112%** | **89%** |

**Conditions of Acceptance:**

The ultimate elongation for type 1 shall not be less than 75%:

## E Permanent Set Test

**E1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.9)

| Sample ID | Elongation @ Time = 0 min (%) | Elongation @ Time = 10 min (%) |
|---|---|---|
| 1 | 75 | 9.0 |
| 2 | 75 | 8.0 |
| 3 | 75 | 6.5 |
| 4 | 75 | 7.8 |
| 5 | 75 | 9.0 |
| **Average** | **75** | **8.1** |

**Conditions of Acceptance:**

The permanent set shall not be greater than 25%

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## F Hardness Test

**F1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.10)

| Sample ID | Hardness (No.) |
|---|---|
| 1 | 90.6 |
| 2 | 90.7 |
| 3 | 90.8 |
| **Average** | **90.7** |

**Conditions of Acceptance:**

The material shall have a Shore "A" durometer hardness of 95 +/- 5 for Type 1

## G Abrasion Test

**G1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.11)

| Sample ID | Loss in Thickness (inches) |
|---|---|
| 1 | 0.0021 |
| 2 | 0.0029 |
| 3 | 0.0012 |
| 4 | 0.0002 |
| **Average** | **0.0016** |

**Conditions of Acceptance:**

The thickness loss of three samples, averaged, shall not exceed 10 mils (0.010 in) for Type 1

## H Flexibility Test

**H1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.12) using a ¾" mandrel & 180 degree bend

| Sample ID | Results |
|---|---|
| L1 | No cracking |
| L2 | No cracking |
| T1 | No cracking |
| T2 | No cracking |

**Conditions of Acceptance:**

The floor covering shall not crack or show any indication of weakness

## I VOLTAGE TEST:

**I1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.13) between electrodes consisting of rectangular metal sheet, having smooth and round edges and corners. The tests were conducted progressively until the entire area of the material was covered. Fifteen Thousand (15,000) volts alternating current was applied for one minute at each position of the electrodes on 12" x 18" samples of the PVC Material. There was no abnormal heating or adverse affects on the material.

**I2 Results:**

There was no abnormal heating or adverse affects.on the material. The material complies with the specification requirements (3.13).

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## J DIELECTRIC STRENGTH:

**J1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.14) between a 2" diameter disk electrodes. The potential was applied at a low value and gradually and steadily raised at a rate of 800 to 1,000 volts per seconds until breakdown was reached.

| Sample Mark | Breakdown Volts |
|---|---|
| 1 | 45,500 |
| 2 | 45,000 |
| 3 | 45,000 |
| 4 | 45,500 |
| 5 | 45,500 |
| **Average:** | **45,300** |

**Conditions of Acceptance:**

The floor covering shall not have a reading less than 30,000 Volts

## K Fire Resistance

**K1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.15) using test method MIL-STD-1623 and FED STD No. 501A

| Sample ID | Time to Ignition (Min & Sec) | Total Combustion Time (Min & Sec) | Combustion Time (Min & Sec) | Char Length (Inches) |
|---|---|---|---|---|
| 1 | 1:51 | 3:56 | 2:05 | 7.5 |
| 2 | 2:00 | 4:00 | 2:00 | 8.0 |
| 3 | 2:05 | 4:15 | 2:10 | 7.0 |
| **Average** | | **Average** | **2:05** | **7.5** |

**Conditions of Acceptance:**

Maximum char length = 10 inches
Maximum combustion time = 4 min

## L Dimensional Stability

**L1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.16) with test specimens heated to a temperature of 158 degrees F for 2 +/- ¼ hours.

| Sample ID | Longitudinal (Inches per foot) | Transverse (inch per foot)) |
|---|---|---|
| 1 | -0.020 | 0.019 |
| 2 | -0.018 | 0.018 |
| **Average** | **-0.019** | **0.018** |

**Conditions of Acceptance:**

The floor covering shall not change in linear dimensions more than plus or minus 0.020 inch/foot

## M Gloss

**M1 Procedure:**

Tested in accordance with MIL-DTL-15562G (Section 3.17) with test specimens evaluated at 60 degree gloss angle

| Sample ID | Reading (60 Degree Angle) |
|---|---|
| 1 | 88.3 |
| 2 | 87.9 |
| 3 | 88.0 |
| **Average** | **88.1** |

**Conditions of Acceptance:**

The floor covering shall not have a reading less than 50