

TABLE A-1. SUMMARY OF ANIMAL EXPOSURE DATA, ANALYTICAL DATA, AND MATERIAL PERFORMANCE CHARACTERISTICS.

SAMPLE: 3

LC₅₀: 20.7 (14.7 – 29.3) G

STARTING TEMPERATURE OF EXPOSURE: 310.4 °C

Run ID	12-089	12-090	12-094	12-094
Sample Weight (g)	10.00	29.86	42.99	89.16
Percent Weight Loss	9.4	8.6	8.6	8.7
Flaming Temp. (°C)	N/D	N/D	N/D	N/D
Temp. Range at Most Rapid Weight Loss (°C)	288-378	300-377	289-380	317-412
Number Responding/Number Exposed	0/4	0/4	3/4	3/4
Percent Response	0	0	75	75
Maximum CO (ppm)	1250	2960	3790	9480
Total CO (Ct)(ppm-min)	6572	19,123	25,153	59,317
Temperature at CO Maximum (°C)	386	379	379	419
Maximum CO ₂ Concentration (%)	0.21	0.51	0.68	1.17
Total CO ₂ , (Ct)(percent-min)	4.68	7.33	8.57	15.43
Temperature at CO ₂ Maximum (°C)	466	444	482	504
Minimum O ₂ (%)	20.68	20.32	20.12	19.38
Temperature at O ₂ Minimum (°C)	386	409	465	419
Eye Condition ⁽¹⁾	A	A	C	C

⁽¹⁾ Eye Condition of Surviving Animals

- (A) All apparently normal
- (B) Some apparent damage
- (C) Some severe damage

N/A = Not Applicable

N/D = Not Detected

No Spontaneous Ignition Detected
Residue (Sample Avg.): 91.2%

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INVESTIGATION OF THE TOXIC POTENCY OF COMBUSTION PRODUCTS IN ACCORDANCE WITH THE UNIVERSITY OF PITTSBURGH TEST PROTOCOL AND ARTICLE 4, SECTION 27-335.1(2) AND ARTICLE 5, SECTION 27-348E OF THE BUILDING CODE OF THE CITY OF NEW YORK

MATERIAL ID: 3


**FINAL REPORT
Consisting of 15 Pages**

**SwRI® Project No. 01.16920.02.037a
Test Dates: March 29, 30, and April 3, 2012
Report Date: April 23, 2012**

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ABSTRACT

submitted a material identified as 3, for testing in accordance with the *University of Pittsburgh Test Protocol for Measurement of Acute Lethality of Thermal Decomposition Products of Specimens* (UPitt), issued December 1988. The material was described by the Client as *1/8-in. Ceiling (lower): 7 Coats Polyester no Additive*.

When tested under the controlled laboratory conditions specified in this report, the LC_{50} value for 3 was 20.7 g. The Building Code of the City of New York requires the material to be "not more toxic than wood", which requires a passing value of greater than or equal to 19.7 g. Therefore, the 3 **meets** the requirements for finish materials as defined by Title 27, Chapter 1, Subchapter 5, Articles 4 and 5, of the Building Code of the City of New York. Detailed toxicity data can be found in the text.

This test method is intended to measure and describe the properties of materials, products, or assemblies in response to heat under controlled laboratory conditions, and should not be used to describe or appraise the fire hazard or the fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment, which takes into account all the factors that are pertinent to an assessment of the fire hazard of a particular end use.

3.0 EXPERIMENTAL DESIGN

3.1 Description of Test Material

The test material was received from _____ and is described in Table 1. The sample consisted of a material on an aluminum substrate.

TABLE 1. DESCRIPTION OF MATERIAL.

Date Received	March 15, 2012
Date Tested	March 29, 30, and April 3, 2012
Material ID ¹	3
Sample Description ¹	1/8-in. Ceiling (louver): 7 Coats Polyester no Additive
Color	Brown
Nominal Thickness	0.16 in. (4.1 mm)
Nominal Unit Weight	1.9 lb/ft ² (9.3 kg/m ²)
Nominal Density	139 lb/ft ³ (2227 kg/m ³)
Amount Received	3 panels

¹ Information provided by the Client.

3.2 Combustion

The thermal decomposition of the test material is accomplished by heating the sample in the system depicted in Figure 1. The combustion device is a Lindbergh Box Furnace (model 51894-S-PIT) with inside dimensions of 229 × 241 × 357 mm and a volume of 19.7 liters (l). The weighed test samples are heated, starting at a temperature no greater than 70 °C, and increasing at a rate of 20 °C ±2 °C/min. A load cell connected to the sample platform continuously monitors sample mass.

3.5 *Biological Measurements*

A sufficient number of experiments are typically conducted with varying amounts of sample weight to enable the development of the concentration-response relationship and the derivation of the LC₅₀ and 95% confidence limits by the moving averages method of Weil [4]. Each experiment is followed by a 10-min recovery period, during which the animals are observed for lethality and examined for the presence of eye damage (corneal opacity), as required by the test method.

3.6 *Combustion Atmosphere Analysis*

Analysis for O₂, CO, and CO₂ is made continuously at a sampling rate of 0.5 to 1.0 l/min. The experimental setup for the analysis of CO, CO₂, and O₂ is shown in Figure 1. Routine calibration of the CO, CO₂, and O₂ analyzers is performed prior to each day's testing.

4.0 TEST RESULTS

The tests were conducted on March 29, 30, and April 3, 2012, at the Fire Technology Department of SwRI, located in San Antonio, TX. A summary of the test results presented in a manner consistent with the Building Code of NYC filing format (Section 27-131) is provided in Table 2. A tabular summary of the individual test runs is included in Appendix A. Performance characteristics of the test materials during thermal decomposition at the representative LC₅₀ weight is provided graphically in Figure 2, which shows continuous mass loss and CO, CO₂, and O₂ levels as a function of furnace temperature. Additional curves depicting exposure chamber and furnace temperatures are provided in Appendix B.

When tested under the controlled laboratory conditions specified in this report, the LC₅₀ value for 3, was 20.7 g, with a 95% confidence interval of 14.7–29.3 g. The Building Code of NYC requires the material to be “not more toxic than wood”, which has been established to require a passing value of greater than or equal to 19.7 g.

5.0 CONCLUSION

When tested in accordance with the combustion toxicity protocol developed at the University of Pittsburgh, the 3 **meets** the requirements for finish materials as defined by Title 27, Chapter 1, Subchapter 5, Articles 4 and 5, of the Building Code of NYC.