Gage Vertical Surfacing
Fire Rating

Item 1

Gagecast has obtained a Class B Fire Rating as tested in accordance with ASTM E-84. Refer to the attached IBC Flame Spread Table 803.4 (Item # 3) to determine where a Class B product can be used. Refer to Item # 4 for use in elevator cab interiors. Items # 5a and 5b demonstrate the testing methods used and results received when Gagecast was tested at Southwest Research Institute's Department of Fire Technology in San Antonio, Texas.

Item 2 - FLAME SPREAD/SMOKE DEVELOPMENT FOR WALL AND CEILING SPACES IN VARIOUS AREAS OF INTERIOR BUILDING SPACES

The above Flame Spread Table is part of the International Building Code (IBC). There are two main sets of criteria spelled out, one set for spaces that are equipped with a fire suppression sprinkler system, one set for spaces that are not equipped with a fire suppression sprinkler system. Another key element is the building occupancy type classification. These occupancy type classifications are defined in Chapter 3 of the IBC. As used throughout the code, the classification of an occupancy into a group is established by the requirements of this Chapter 3. The purpose of these provisions is to provide rational criteria for the classification of various occupancies into groups based on their relative fire hazard and life safety properties. This is necessary because the code utilizes group classification as a fundamental principle for differentiating requirements in other parts of the code related to fire and life safety protection. The flame spread requirements for rooms and enclosed spaces are all basically Class "B" (26-75) and Class "C" (76-200) values for spaces that are/are not equipped with a fire suppression sprinkler system. Smoke Development values for Class "A", "B" and "C" flame spread ratings are all 0-450. Spaces that are equipped with a fire suppression sprinkler system are usually part of new "grounds-up" construction. Spaces that are not equipped with a fire suppression sprinkler system are usually part of remodeled space construction. Although the United States has adopted the IBC, local jurisdiction authorities may have written and adopted local "modifiers".

Item 3 - INTERNATIONAL BUILDING CODE (IBC)
TABLE 803.4

INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY k

GROUP I	SPRINKLERED i			UNSPRINKLERED		
	Vertical Exits and Exit Passageways a,b	Exit Access Corridors and Other Exitways	Rooms and Enclosed Spaces c	Vertical Exits and Exit Passageways a, b	Exit Access Corridors and Other Exitways	Rooms and Enclosed Spaces c
A-1 & A-2	B	B	C	A e	A e	B
A-3 f , A-4, A-5	B	B	C	A	A d	C
B, E, M, R-1, R-4	B	C	C	A	B	C
F	C	C	C	B	C	C
H	B	B	C g	A	A	B
I-1	B	C	C	A	B	B
I-2	B	B	B h, j	A	A	B
I-3	A	A	C	A	A	B
I-4	B	B	B h, j	A	A	B
R-2	C	C	C	B	B	C
R-3	C	C	C	C	C	C
S	C	C	C	B	B	C
U	NO RESTRICTIONS			NO RESTRICTIONS		

NOTE: LOCAL JURISDICTIONS MAY ALTER THE ABOVE TABLE. VERIFY WITH LOCAL CODE OFFICIAL.

a. Class C interior finish materials shall be permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fire-blocked as required by Section 803.1.

b. In vertical exits of buildings less than three stories in height of other than Group I-3, Class B interior finish for unsprinklered buildings and Class C interior finish in sprinklered buildings shall be permitted.

c. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered enclosing spaces and the rooms and spaces on both sides shall be considered one. In determining the applicable for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor of the group classification of the building or structure.

d. Lobby areas in A-1, A-2 or A-3 shall not be less than Class B materials.

e. Class C interior finish materials shall be permitted in places of assembly with an occupant load of 300 or less.

f. For churches and places of worship, wood used for ornamental purposes, trusses, paneling or chancel furnishing shall be permitted.

g. Class B material required where building exceeds two stories.

h. Class C finish materials shall be permitted in administrative spaces.

i. Class C interior finish materials shall be permitted in rooms with a capacity of four or less.

j. Class B materials shall be permitted as wainscoting extending not more than 48 inches above the finish floor in exit access corridors.

k. Finish materials as provided for in other sections of this code.

• Refer to SECTION 3-OCCUPANCY CLASSIFICATIONS of the IBC for Group definitions.

Item 4 - ASME A17.1-1996

Rule 204.2 Passenger-Car Enclosures

204.2a Material for Car Enclosures, Enclosure Linings. and Floor Coverings . All materials exposed to the car interior and the hoistway shall be metal, laminated glass [Rule 204.1h(3) (a)], or shall conform to the following:

(1) Materials in their end use configuration, other than those covered by Rules 204.2a(2), (3), and (4), shall conform to the following requirements, based on the tests conducted in accordance with the requirements of ASTM E 84, UL 723, or NFPA 255:

(a) flame spread index of 0 to 75;

(b) smoke development of 0 to 450.

(2) Napped, tufted, woven, looped, and similar materials in their end use configuration on car enclosure walls shall conform to the requirements of Section 1104. The enclosure walls to which this material is attached shall conform to the requirements of Rule 204.2a(1).

(3) Padded protective linings, for temporary use in passenger cars during the handling of freight, shall be of materials conforming to either Rule 204.2a(1) or (2). The protective lining shall clear the floor by not less than 4 in. (102 mm).

(4) Floor covering, underlayment, and its adhesive shall have a critical radiant flux of not less than 0.45 W/cm 2 as measured by ASTM E 648.

(5) Handrails, operating devices, ventilating devices, signal fixtures, audio and visual communication devices, and their housings are not required to conform to the requirements of Rules 2O4.2a(1) through (4).

FLAME SPREAD / SMOKE DEVELOPMENT FOR VERTICAL SURFACES IN ELEVATOR CAB ENCLOSURES

The elevator cab enclosure vertical surfaces flame spread and smoke development requirements are governed by the American National Standards Institute (ANSI) code ANSI A17.1. The International Building Code (IBC) by reference adopts this ANSI code as part of the overall IBC set of code requirements. Refer to 204.2a.1 (a) and (b) above to note that a Class "A" flame spread (0-25) is not required.

Item 5A - INTRODUCTION

This report presents the results of an ASTM E 84 test on a specimen submitted by the Client, tested at Southwest Research Institute's (SwRI's) Department of Fire Technology, located in San Antonio, Texas. The test is conducted in accordance with the procedure outlined in ASTM E 84-03, "Standard Test Method for Surface Burning Characteristics of Building Materials" (NFPA 255, ANSI/UL 723 and UBC 8-1).

This test method is applicable to exposed surfaces, such as ceilings or walls, provided that the material or assembly of materials, by its own structural quality or the manner in which it is tested and intended for use, is capable of supporting itself in position or being supported during the test period. The test is conducted with the material in the ceiling position.

The purpose of this test method is to determine the relative burning behavior of the material by observing the flame spread along the specimen. Flame Spread and Smoke Developed index are reported. However, there is not necessarily a relationship between these two measurements.

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

Test specimens are conditioned as appropriate in an atmosphere maintained between 68 and 78°F and 45 to 55% relative humidity. Immediately prior to the test, the specimen is mounted in the furnace with the side to be tested facing the test flame. Sometimes, because of the nature of the material undergoing testing, additional support (e.g. wire, wire and rods, rods, and/or bars) is used to ensure that the specimen will remain in position during the test. The use of supporting materials on the underside of the test specimen may lower the Flame Spread Index from that which might be obtained if the specimen could be tested without such support, and the test results do not necessarily relate to indices obtained by testing materials without such support.

The flame front position and light obscuration are recorded throughout the 10-minute test and used to calculate the Flame Spread and Smoke Developed indices. The temperature at 23 ft is also recorded. The Flame Spread and Smoke Developed indices reported herein are relative to the results obtained for mineral fiber- reinforced cement board and select grade red oak (moisture content between 6 and 8%). The mineral fiber- reinforced cement board is the

calibration material used to obtain 0 values for Flame Spread and Smoke; red oak decks are used to obtain 100 values for Flame Spread and Smoke.

The results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials.

Two model building codes (2000 International Building Code®, Chapter 8 *Interior Finishes , Section 803 Wall and Ceiling Finishes* ; NFPA 5000, Chapter 10 *Interior Finish* , Section 10.3 *Interior Wall or Ceiling Finish Testing and Classification*) classify materials based on the Flame Spread and Smoke Developed indices. For reference purposes, the classification criteria are listed below:

Classification	Flame Spread Index	Smoke Developed Index
A	0-25	0-450
B	26-75	0-450
C	76-200	0-450

Item 5B - ASTM E 84-03 REPORT

CLIENT: NORTHERN ENGRAVING CORPORATION
SWRI PROJECT NO.: 01.10083.01.233
TEST DATE: AUGUST 2, 2004
DAILY TEST NO.: 1

TEST RESULTS (ROUNDED TO NEAREST 5)	
FLAME SPREAD INDEX (FSI):	55
SMOKE DEVELOPED INDEX (SDI):	275
TEST DATA	
UNROUNDED FSI:	56.1
UNROUNDED SD!:	274.8
FS*TIME AREA (Ft*Min):	52423.1
SMOKE AREA (%*Min):	302.0
FUEL AREA (°F*Min):	6847.2
OBSERVATIONS DURING TEST	
IGNITION TIME (Min:Sec):	1:31
MAXIMUM FLAME FRONT ADVANCE (Ft.):	19.5
TIME TO MAXIMUM ADVANCE (Min:Sec):	7:06
MAXIMUM TEMP. AT EXPOSED TC (°F):	1063
TIME TO MAXIMUM TEMP. (Min:Sec):	8:54
TOTAL FUEL BURNED (Cu. Ft.):	52.0
DRIPPING (Min:Sec):	None
FLAMING ON FLOOR (Min:Sec):	3:00
AFTERFLAME TOP (Min:Sec):	3:00+
AFTERFLAME FLOOR (Min:Sec):	3:00+
CALIBRATION DATA (LAST RED OAK)	
RED OAK SMOKE AREA (%*Min):	110.9
RED OAK FUEL AREA (°F*Min):	8664.4
GRC BOARD FUEL AREA (°F*Min):	5350.7