A vertical image on the left side of the slide showing a fire with bright orange and red flames against a dark blue background.

The direction of Building Material to save a life in the Fire

Aluminium Composite Panel

The main reason of casualties in case of fire

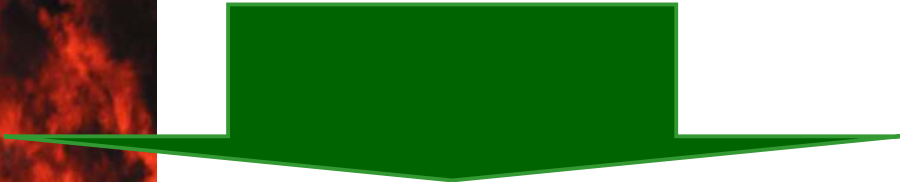
Main Reasons

1. The impassable escape route by collapsed building structure in the fire.
2. The obstruction of visual field by excessive toxic gas.
3. The death by Toxic gas

1. The impassable escape route by collapsed building structure in the fire

Counter plan :

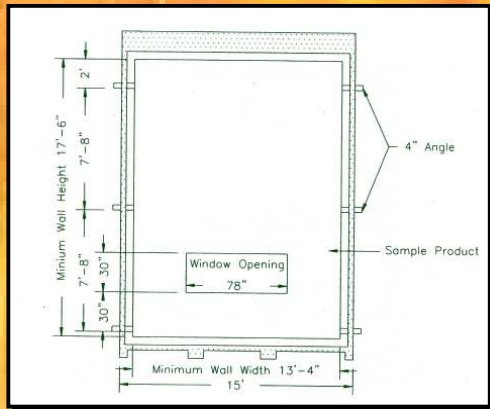
Application of verified building material
to minimize danger of collapse



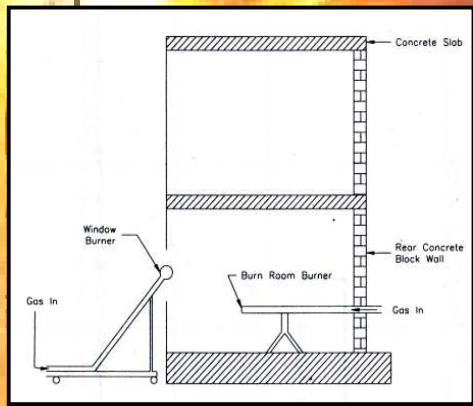
UBC 26-9 (Uniform Building Code) : Method of Test for the Evaluation of Flammability Characteristics of Exterior, Nonload-Bearing Wall Assemblies Containing Combustible Components Using the Intermediate-Scale Multistory Test Apparatus (ISMA)

ASTM E119-00a (American Society for Testing and Materials) :
Fire Tests of Building Construction and Materials

Certificate of Alcopanel/fr - UBC 26-9

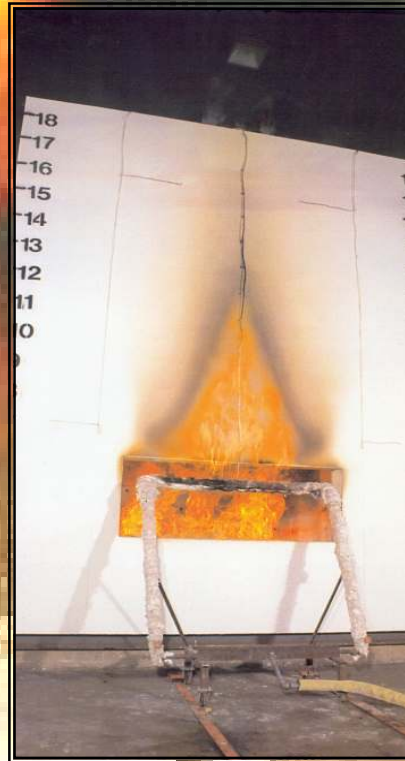


Front view of Test Frame



Side view of Test Frame (Burner)

ISMA Testing Method



ISMA Testing Photo

The Department of Fire Technology www.fire.swri.org

FIRE PERFORMANCE EVALUATION OF THE 4-MM THICK "ALCOPANEL FR" EXTERIOR WALL PANEL SYSTEM IN ACCORDANCE WITH THE INTERMEDIATE-SCALE MULTISTORY TEST PROCEDURE OUTLINED IN UBC 26-9, 1997 EDITION

FINAL REPORT
Consisting of 137 Pages
SWRI Project No. 01.05561.01.001
August 2002

Prepared for:

Dae-A Industrial Co., Ltd.
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and

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SOUTHWEST RESEARCH INSTITUTE™
Chemistry & Chemical Engineering Division

SAN ANTONIO, TEXAS
Detroit, Michigan • Houston, Texas • Washington, DC

Certificate of UBC
26-9
FROM SWRI

UBC 26-9 Test Process



1. Alcopanel/fr



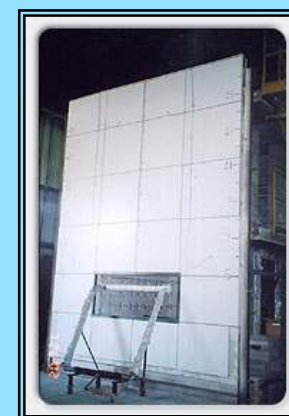
2. The Alcopanel/fr,
Exterior Wall
System Construction



3. Finished
installing



4. Fix sensor to
Alcopanel/fr



5. Prior to Test
UBC 26-9 ISMA



6. Start of the
UBC 26-9 ISMA
Test



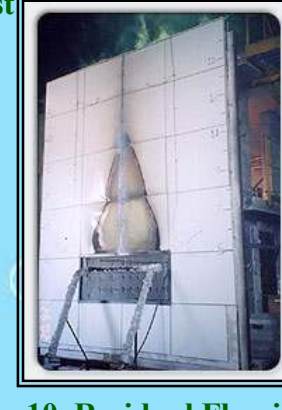
7. Fire window
burner after 5
min



8. 15 min. Into the
UBC 26-9 ISMA
Test

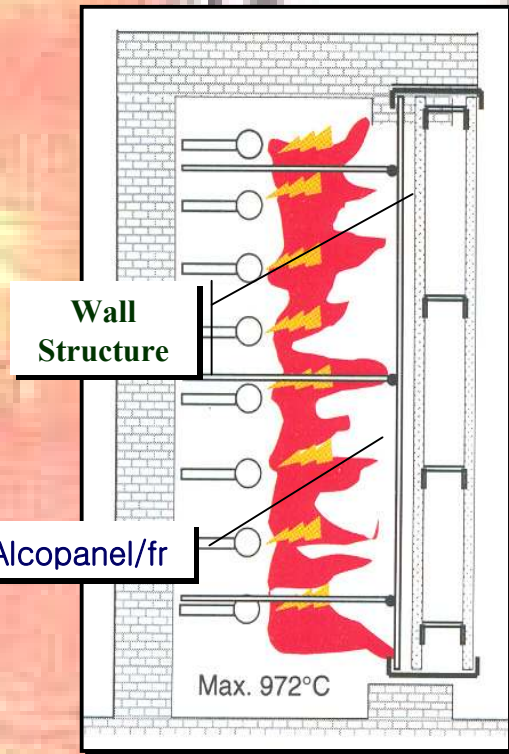


9. 25 min. Into the
UBC 26-9 ISMA
Test



10. Residual Flaming
After UBC 26-9 ISMA
Test

Certificate of Alcopanel/fr - ASTM E119



*Fire Resistant
Test Method
(2 hour)*

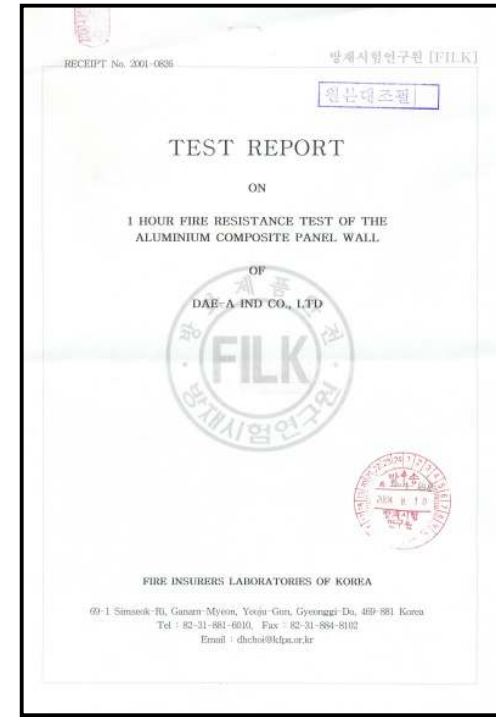


*Unexposed
face of the
specimen
before Fire
Test*



*Test Photo
(Before/After)*

*Unexposed
face of the
specimen
after Fire
Test*



*Certificate from Fire
Insurers Lab. Of KOREA
(ASTM E119)*



2.The obstruction of visual field by excessive toxic gas.

Counter plan : Recommendation on use the building material diminished poisonous gas & Impose restriction on the building material caused toxic gas.

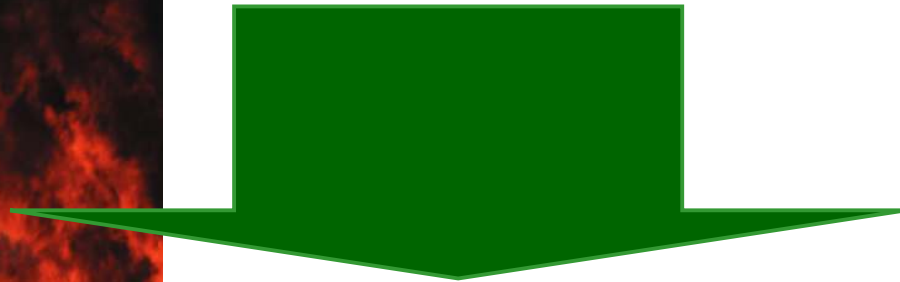


ASTM E84-98 (American Society for Testing and Materials) :
Surface Burning Characteristics of Building Materials

ASTM E662 (American Society for Testing and Materials) :
Fire Tests of Building Construction and Materials

3.The death by Toxic gas

Counter plan : Regulation on use harmful building material for human body



ASTM E84-98 (American Society for Testing and Materials) : Surface Burning Characteristics of Building Materials

IEC 60754-1 : 대표적 유해물질인 Cl₂의 농도를 측정하는 시험.

Certificate of Alcopanel/fr - ASTM E84



Frame Spread



Smoke Density Test

Classification	Smoke Density	Frame Spread	Test Method
Alcopanel/fr	0	0	Core Only
Alpolic/fr	15	5	-
Alucobond PLUS	30	15	Core Only
Reynobond FR	5	5	Composite
Class 1	30	15	Core Only
	0	10	Composite
	0-80	0-25	Level Standard

Comparison Chart

👉 LOI (Limiting Oxygen Index) of Alcopanel/FR : 35 %

The Department of Fire Technology www.fire.swri.org

INVESTIGATION OF THE SURFACE BURNING CHARACTERISTICS OF A 4 MM THICK ALUMINUM COMPOSITE PANEL WITH A FR CORE
MATERIAL ID: ALUMINUM COMPOSITE PANEL, ALCOPANEL FR

FINAL REPORT
Consisting of 6 Pages
SwRI Project No.: 01.04913.01.258
Test Date: August 29, 2002
Report Date: September 12, 2002

Prepared for:
DAE-A INDUSTRIAL CO., LTD.
5F, KOAMI BUILDING
13-31 YOIDO-DONG
YOUNGDEUNGO-KU, SEOUL, KOREA

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Certificate of ASTM E84 FROM SWRI

FR Compounds are based on polyolefin and flame retardant which **do not generate toxic gases**, especially halogen gases, and have excellent **low smoke properties**. This FR Compounds offer an optimized balance between mechanical and flame retardant properties.

1. Composition

Raw Material	Contents (W'T %)	Remarks
Polymer	28%	Polyolefin (Polyethylene, EVA)
Frame	69%	Magnesium Hydroxide
Retardants	1%	
Antioxidant		
Etc.	2%	

*. If use **halogen material** on the core, It should be happen **Dioxin gas** incase of fire. **Dioxin Gas** is one of **strong carcinogen gas**. So, All of developed country do **not allow** to use **halogen material** for **Fire Resistance**.

PL23FR - Polyolefin Halogen-Free Flame-retardant Compound



2. Structure

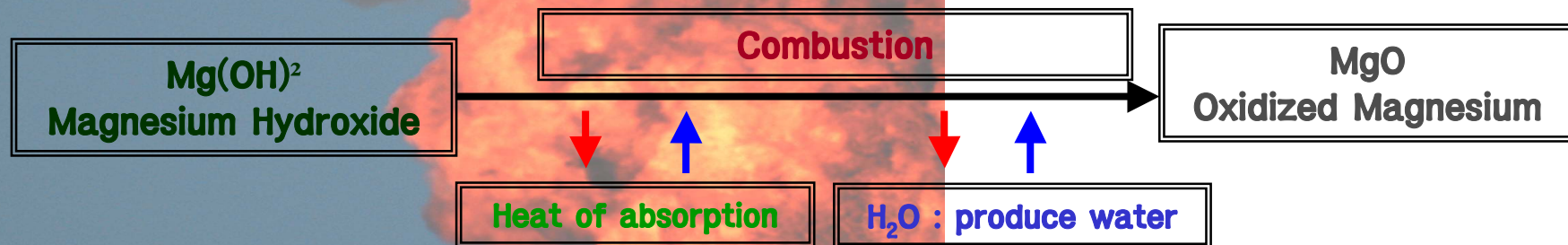


3. Physical properties

Test Items	Grade	FR-642
Specific Gravity	g/cc	1.45±0.05
MI (@190°C, 2.16kg)	g/10min	14±3
(@190°C, 10kg)		6.5±1.0
Tensile Strength	kg/cm ²	53
Elongation	%	200
Hardness	shore A	90
UL 94 Rating (3mm)		V-0
Low Brittleness Temp.	°C	< -50
T-Peel Strength	kg/25mm	15-17

• T-Peel Strength : Test specimen preparation : 300mm × 25mm
Test speed : 50mm/min

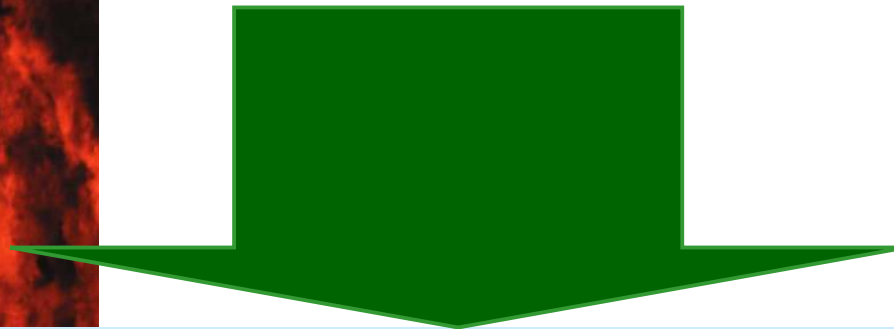
4. Fire-Resistant Mechanism



4.The Proposal of establishment of KS standards

Promotion to use incombustible/qua si-noncombustible building material

Recommendation on use non-toxic building material & control on use toxic building material.



The contribution to supply much safe & sure building material by drawing up of compositive plans for incombustible & toxic gasses of building material.