



CERTIFICATE OF COMPLIANCE

This certificate is issued for the following:

APPROVAL EXAMINATION OF KS103SSF, KS103MSF AND KS110CTF
INSULATED WALL AND CEILING PANELS
PRODUCED AT KINGSPAN-IZOPOLI IN ADANA, TURKEY
AS CLASS 1 PANELS FOR INSULATION TO 30 FT. (9.1m)

Prepared for:

Izopoli Yapi Elemanlari Taah. San. ve Tic. A.S.
Adana Yumartalik Serbest Bolgesi
Ceyhan/Adana
Turkey

FM Approvals Class 4880

Approval Identification: 3031787

Approval Granted: April 8, 2009

Said Approval is subject to satisfactory field performance, continuing follow-up Facilities and Procedures Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

*For more than 160 years FM Approvals has partnered with business and industry
to reduce property losses.*



Member of the FM Global Group

Richard P. Ferron, P.E.
Asst. Vice President, Group Manager



Not to be distributed outside of FM Approvals and its affiliates except by Customer

Member of the FM Global Group

APPROVAL REPORT

**APPROVAL EXAMINATION OF KS103SSF, KS103MSF,
AND KS110CTF INSULATED WALL AND CEILING
PANELS PRODUCED AT KINGSPAN-IZOPOLI IN
ADANA, TURKEY AS CLASS 1 PANELS FOR
INSTALLATION TO 30 ft (9.1 m)**

**Prepared for:
Izopoli Yapi Elemanlari Taah. San. ve Tic. A.S.
Adana Yumurtalik Serbest Bolgesi
Ceyhan/Adana
Turkey**

Project ID: 3031787

Class: 4880

Date of Approval: *FEBRUARY 10, 2009*

Authorized by:

Roger F. Allard

Roger Allard
Assistant Vice President

FM Approvals
1151 Boston Providence Turnpike
P.O. Box 9102
Norwood, MA 02062

APPROVAL EXAMINATION OF KS103SSF, KS103MSF, AND KS110CTF INSULATED WALL AND CEILING PANELS PRODUCED AT KINGSPAN-IZOPOLI IN ADANA, TURKEY AS CLASS 1 PANELS FOR INSTALLATION TO 30 ft (9.1 m)

from

**Kingspan a.s.
Vážní 465
500 03 Hradec Králové
Czech Republic**

I INTRODUCTION

- 1.1 Kingspan-Izopoli submitted their KS103SSF, KS103MSF, and KS110CTF wall and ceiling panels produced in Adana, Turkey to determine if they meet the Approval requirements of the **Standard** listed below for Class 1 insulated wall and ceiling panels for installation to 30 ft (9.1 m).
- 1.2 This Report may be reproduced only in its entirety and without modification.
- 1.3 **Standard:**

Title	Class Number	Date
Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings, and Exterior Wall Systems	4880	October, 2005

- 1.4 Examination included UBC 26-3 room fire testing and flammability characterization. Apparent density, heat of combustion, ignition residue, and surface burning characterization data from project IDs 3013471 and 3018419 was authorized by their sponsor for use in this project.
- 1.5 Tests show that KS103SSF, KS103MSF, and KS110CTF wall and ceiling panels produced in Adana, Turkey, as tested, meet the Approval requirements of the **Standard** listed above for Class 1 insulated wall and ceiling panels for installation to a maximum height of 30 ft (9.1 m).
- 1.6 **Listings:** The tested constructions meet the Approval criteria of FM Approvals when installed as specified in the **CONCLUSIONS** of this report and when Approval is effective will be listed in the FM Approval Guide.

II DESCRIPTION

- 2.1 KS103SSF wall and ceiling panels consist of minimum 0.012 in. (0.30 mm) thick interior and 0.016 in. (0.40 mm) exterior coated galvanized steel facers with a 1.6-3.9 in. (40-100 mm) thick isophenic core foam system. Panels are available 40.6 in. (1030 mm) wide with various lengths. Panel side joints consist of overlapping internal and external profiles.
- 2.2 KS103MSF wall and ceiling panels consist of minimum 0.012 in. (0.30 mm) thick interior and 0.016 in. (0.40 mm) exterior coated galvanized steel facers with a 1.6-3.9 in. (40-100 mm) thick isophenic core foam system. Panels are available 40.6 in. (1030 mm) wide with various lengths.

Panel side joints consist of overlapping internal and external profiles.

- 2.3 KS103CTF wall and ceiling panels consist of minimum 0.016 in. (0.40 mm) interior and exterior coated galvanized steel facers with a 1.6-7.9 in. (40-200 mm) thick isophenic core foam system. Panels are available 43.3 in. (1100 mm) wide with various lengths. Panel side joints consist of overlapping internal and external profiles. Available coatings are 20 micron thick polyester and 100 micron thick plastisol.
- 2.4 Foam system formulation and panel specifications and drawings are on file at FM Approvals.

III EXAMINATIONS AND TESTS

- 3.1 Samples were submitted for examination and testing as follows:
 - 3.1.1 Tests conducted were as required by the **Standard** listed in paragraph 1.3.
 - 3.1.2 Production of the foam system and test panels was witnessed by a representative of FM Approvals at the Kingspan-Izopoli production facility in Adana, Turkey on January 7, 2008. All samples were considered to be representative of standard production and were examined and tested as indicated below.
 - 3.1.3 Sample panels incorporated into test samples were selected by FM Approvals personnel. Test samples were prepared by, or under the supervision of, FM Approvals personnel.
 - 3.1.4 All data is on file at FM Approvals under Project IDs 3013471, 3018149, and 3031787 along with other documents and correspondence applicable to this program.
- 3.2 Room Fire Test
 - 3.2.1 One room fire test was conducted in accordance with Uniform Building Code Standard No. 26-3 "Room Fire Test Standard for Interior of Foam Plastic Systems" by British Research Establishment Ltd. (BRE). An inter-laboratory agreement exists between FM Approvals and BRE which includes room tests per Uniform Building Code Standard No. 26-3.
 - 3.2.1.1 Performance in the room fire test is satisfactory if charring of the panel cores does not extend to the outer extremities of the test area within 15 minutes of the ignition of the excelsior and smoke levels generated during the test are not excessive.
 - 3.2.2 See BRE Test Report 246128 dated December 12, 2008, which is on file in the Technical Information Center at FM Approvals under project ID 3031787, for sample test panel installation details.
 - 3.2.3 The results of the Uniform Building Code Standard 26-3 room test were as follows:
 - 3.2.3.1 See BRE Test Report 246128 dated December 12, 2008 for visual observations during the test periods.
 - 3.2.3.2 Upon examination of the test panels after the room fire test, BRE found no charring of the foam cores at the extremities of the test panel area.
 - 3.2.3.3 Smoke levels generated by the test panels during the test period were not considered excessive.

3.2.3.4 See BRE Test Report 246128 dated December 12, 2008 for peak and average heat release, smoke production rates, and a record of temperatures recorded at the thermocouple locations required by the room test standard.

3.3 Flammability Characterization

3.3.1 A series of measurements was made in the 50 kW FM Approvals Flammability Apparatus to determine the material flammability properties of the isophenic foam core of KS103SSF, KS103MSF, and KS110CTF wall and ceiling panels.

3.3.1.1 The critical heat flux for ignition (q''_{cr}) and the thermal response parameter (TRP) were determined by exposing the surfaces of several 4 by 4 in. (102 by 102 mm) samples coated with a high absorptivity selective black coating to known radiant heat fluxes and recording the time to piloted ignition. The inverse square root of the time to ignition was plotted against the applied external radiant heat flux. The intercept on the applied heat flux axis is defined as the critical heat flux for ignition (the value of the external heat flux at or below which the sample can no longer achieve piloted ignition during the 15 minute exposure). The inverse of the slope at large external heat fluxes is the thermal response parameter (a measure of the thermal inertia of the material).

3.3.1.2 The convective flame spread parameter (FSP_c) was determined from the chemical heat of combustion, effective heat of gasification, net heat flux and the thermal response parameter.

3.3.1.3 Performance in the 50 kW FM Approvals Flammability Apparatus is considered acceptable if the FSP_c is 0.39 or less.

3.3.2 A specimen of isophenic foam core of KS103SSF, KS103MSF, and KS110CTF wall and ceiling panels was cut into 3 by 4 by 4 in. (76 by 102 by 102 mm) samples. Each sample was coated with a high absorptivity selective black coating prior to placement in the sample holder of the 50 kW FM Approvals Flammability Apparatus.

3.3.3 The material flammability properties of the test sample were as follows.

	core	Class 1 limit
q''_{cr} (kW/m ²)	30	-
TRP (kW/m ² s ^{-1/2})	74	-
FSP_c (s ^{-1/2})	0.30	0.39

IV MARKING

4.1 The manufacturer shall mark each panel or packing container with the manufacturer's name and product trade name. In addition, the panel or container must be marked with the Approval Mark of FM Approvals.

4.2 Markings denoting Approval by FM Approvals shall be applied by the manufacturer only within and on the premises of manufacturing locations which are under the FM Approvals Facilities and Procedures Audit program.

4.3 The manufacturer agrees that use of the FM Approvals name or Approval Mark is subject to the conditions and limitations of the Approval by FM Approvals. Such conditions and limitations must be included in all references to Approval by FM Approvals.

V REMARKS

The foam core has not been evaluated for the toxicity of the products of combustion.

VI FACILITIES AND PROCEDURES AUDITS

The Kingspan-Izopoli production facility in Adana, Turkey is subject to periodic audit inspections to determine that the quality and uniformity of the materials have been maintained and will provide the same level of performance as originally Approved. The facilities and quality control procedures in place have been found to be satisfactory to manufacture product identical to that examined and tested as described in this report.

VII MANUFACTURER'S RESPONSIBILITIES

- 7.1 To ensure compliance with his procedures in the field, the manufacturer shall supply to the installer and owner such necessary instruction or assistance required to produce the desired performance achieved in the tests.
- 7.2 The manufacturer shall notify FM Approvals of any planned change in the Approved products, prior to general sale or distribution, using Form 797, Approved Product Revision Report.

VIII DOCUMENTATION

The following documents describe the Kingspan-Izopoli panels and isophenic foam system and are filed under project ID 3031787.

Documents	Revision	Description
Facilities And Procedures Audit Manual for Kingspan-Izopoli wall and ceiling panels	Issued 2/09	F&PA Manual
Facilities And Procedures Audit Manual for Kingspan-Izopoli isophenic core foam system	Issued 2/09	F&PA Manual

IX CONCLUSIONS

- 9.1 Test results indicate that KS103SSF, KS103MSF, and KS110CTF wall and ceiling panels produced in Adana, Turkey, as described in Section II, meet the requirements of FM Approvals Standard 4880 referenced in paragraph 1.3 for walls and ceiling installation to a maximum height of 30 ft (9.1 m).
- 9.2 Tests show 1) that the panels in and of themselves would not create a need for automatic sprinklers and 2) that the panels would be acceptable in a combustible occupancy protected by automatic sprinklers as defined by FM Global Loss Prevention Data Sheets.
- 9.3 The steel facings of the panels must be positively secured to the foam core by 1) attachment of the entire panel assembly to supporting structural members with mechanical fasteners or 2) positive

FM APPROVALS
Project ID: 3031787

attachment of the interior panel facer to the external panel facer with mechanical fasteners.

- 9.4 Since a duly signed Master Agreement is on file for this customer, Approval is effective as of the date of this report.
- 9.5 Continued Approval will depend upon satisfactory field experience and periodic Facilities and Procedures Audits.

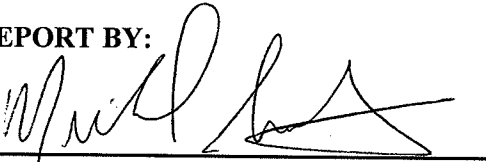
TESTING SUPERVISED BY: Michael Slocumb

PROJECT DATA RECORD: 3031787

ORIGINAL TEST DATA: PDR under project IDs 3013471 and 3018419, BRE test report 246128 dated December 12, 2008

ATTACHMENTS: None

REPORT BY:



Michael Slocumb
Engineer - Materials Group

REPORT REVIEWED BY:



Leonard D'Angelo
TTM --Materials Group