



Certificate of Compliance

This certificate is issued for the following:

KS103SSF, KS103MSF, AND KS110CTF PANELS AS CLASS 1 INTERIOR WALL AND CEILING PANELS FOR INSTALLATION WITH NO HEIGHT RESTRICTION

Prepared for:

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

FM Approvals Class: 4880

Approval Identification: 3043774 Approval Granted: 10 April 2012

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.

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to reduce property losses.*

A handwritten signature in dark ink, appearing to read 'R. P. Ferron', is written over a horizontal line.

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APPROVAL REPORT

APPROVAL EXAMINATION OF KS103SSF, KS103MSF, AND KS110CTF PANELS AS CLASS 1 INTERIOR WALL AND CEILING PANELS FOR INSTALLATION WITH NO HEIGHT RESTRICTION

Prepared for:

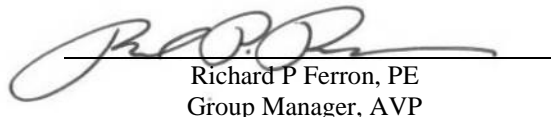
**Izopoli Yapi Elemanlari Taah. San. ve Tic. A.S.
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Project ID: 3043774

Class: 4880

Date of Approval: 10 April 2012

Authorized by:



Richard P Ferron, PE
Group Manager, AVP

APPROVAL EXAMINATION OF KS103SSF, KS103MSF, AND KS110CTF PANELS AS CLASS 1 INTERIOR WALL AND CEILING PANELS FOR INSTALLATION WITH NO HEIGHT RESTRICTION

from

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

I INTRODUCTION

- 1.1 Izopoli Yapi Elemanlari Taah. San. ve Tic. A.S submitted their KS103SSF, KS103MSF, and KS110CTF wall and ceiling panels to determine if they meet the Approval requirements of the **Standard** listed below for Class 1 interior wall and ceiling panels for installation with no height restriction.
- 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 a 16 ft (4.9 m) high parallel panel test. Flammability characterization and UBC 26-3 room fire test data from project ID 3031787 was used to satisfy the requirements of the referenced Standard. Apparent density, heat of combustion, ignition residue, and surface burning characterization data from project IDs 3013471 and 3018419 was used to satisfy the requirements of the referenced Standard.
- 1.5 Examination shows KS103SSF, KS103MSF, and KS110CTF wall and ceiling panels, as tested, meet the Approval requirements of the **Standard** listed above in the category of *Class 1 Metal-Faced with Combustible Core, Interior Wall-Ceiling Construction with No Installation Height Restriction*.
- 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 www.ApprovalGuide.com, an online resource of FM Approvals.

II DESCRIPTION

- 2.1 All products are described in www.ApprovalGuide.com.
- 2.2 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 Witnessing of the production of panels by an FM Approvals representative was waived since the panels were produced at a Izopoli Yapi Elemanlari Taahhut San. Tic. A.S facility audited under the FM Approvals Surveillance audit program and the panels arrived at the FM Approvals test facility properly labeled as Approved by FM Approvals. 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, 3018419, 3031787, and 3043774, along with other documents and correspondence applicable to this project.
- 3.2 FM Approvals 16 ft (4.9 m) High Parallel Panel Test
- 3.2.1 A 16 ft (4.9 m) parallel panel fire test with a propane gas ignition source of 360 kW was conducted in accordance with Revision 3 of TEST PROCEDURE CLASS NUMBER 4882: FM APPROVALS 16 ft (4.9 m) HIGH PARALLEL PANEL TEST using the FM Approvals 16 ft (4.9 m) parallel panel test structure.
- 3.2.2 The 16 ft (4.9 m) parallel panel fire test apparatus consists of two 192 in. (4875 mm) high by 42 in. (1065 mm) wide parallel panels 21 in. (535 mm) apart (face to face with test samples in place) and a 42 in. (1065 mm) long by 21 in. (535 mm) wide by 12 in. (305 mm) high sand burner located at the bottom of the panels under a 5 MW calorimeter with gas flow control equipment for the sand burner and smoke measurement equipment located in the exhaust duct for the 5 MW calorimeter.
- 3.2.2.1 The 16 ft (4.9 m) parallel panel test structure consists of two 210 in. (5335 mm) high by 42 in. (1065 mm) wide angle iron frames sheathed on one side with 1 in. (25 mm) thick Marinite I refractory over ½ in. (13 mm) thick plywood from the top of each frame to 18 in. (455 mm) above the bottom of each frame.
- 3.2.2.2 The ignition source is a 42 in. (1065 mm) long by 21 in. (535 mm) wide by 12 in. (305 mm) high sand burner connected to a flexible 2 in. (50 mm) diameter high pressure hose. The hose is connected through a gas flow control panel which is in turn connected to a 2 in. (50 mm) diameter propane gas line. The flexible 2 in. (50 mm) hose is connected through a reducer to a 1 in. (25 mm) stainless steel pipe burner at the entrance to the sand burner. The output of the sand burner is set by controlling the propane gas flow rate to the burner with a gas flow control panel. The 2 in. (50 mm) main gas supply pipe providing propane at 20 psi (138 kPa) is connected to a tee which splits the gas line into two 1 in. (25 mm) piping systems. There are two Hasting flow meters, each controlling flow through one of the 1 in. (25 mm) piping systems. The Model 305 flow meter has a range of 0 to 600 standard liters/minute of propane while the Model 301 flow meter has a range of 0 to 260 standard liters/minute of propane. The Model 305 flow meter is used with the Model 301 flow meter blocked using a by-pass valve. A 1 in. (25 mm) control needle valve controls the gas flow to maintain the specified burner output of 360 ± 10 kW. The sand burner is ignited with a propane torch and the moment of ignition is taken as 0 minutes.

FM APPROVALS
Project ID: 3043774

- 3.2.2.3 The propane supply to the sand burner was tuned off 15 minutes after ignition of the burner and the sample panels were extinguished with water 20 minutes after ignition of the burner.
- 3.2.2.4 Digital video and still photographs were taken of the 16 ft (4.9 m) parallel panel fire test. Duct thermocouple data, gas flow meter data, smoke measurement data, and mass flow in the duct of the 5 MW calorimeter were taken at intervals of 0.1 second and then averaged to intervals of 1 second.
- 3.2.2.5 Performance in the 16 ft (4.9 m) parallel panel fire test is satisfactory for Class 1 Approval without height restriction if the peak chemical heat release rate (PCHRR) of the test panels during the test with a propane gas ignition source of 360 kW is less than, or equal to, 830 kW for combustible walls with a noncombustible ceiling or combustible walls with a combustible ceiling.
- 3.2.2.6 Four KS110CTF wall panels were prepared. The panels consist of 0.016 in. (0.40 mm) thick interior and exterior coated galvanized steel facers and IPN core foam system. Panels were supplied 43.3 in. (1100 mm) wide, 7.9 in. (200 mm) thick, and 16 ft (4.9 m) long. Facers were supplied with a smooth profile and were coated with 100 micron thick plastisol. Panel side joints consisted of overlapping internal and external profiles.
- 3.2.3 Sample panels were cut to provide two 42 in (1065 mm) wide by 16 ft (4.9 m) tall samples with center vertical joints. Panels were installed vertically on both the east (left) and west (right) 42 in. (1065 mm) wide by 16 ft (4.9 m) high parallel panel frames. Panels were fastened through 1 in. (25 mm) thick Marinite I refractory to 0.5 in. (13 mm) thick plywood secured to the steel parallel panel frames with fasteners and 1 in. (25 mm) diameter washers located approximately 24 in. (610 mm) on center starting approximately 6 in. (150 mm) from the bottom of each panel and ending approximately 6 in. (150 mm) from the top of each panel in rows approximately 10 in. (255 mm) apart starting approximately 6 in. (150 mm) from one side of each parallel panel frame and ending approximately 6 in. (150 mm) from the other side of each parallel panel frame.
- 3.2.4 Raw panel edges on the bottom of each test panel were covered with 1 by 4 by 1 in. (25 by 100 by 25 mm) 16 gauge angle iron frame. Raw panel edges on the top and both sides of each test panel were covered with 2 by 4 by 2 in. (50 by 100 by 50 mm) 16 gauge angle iron frame. The joints between the bottom and side angle irons were welded. The joints between the top and side angle irons were not welded.
- 3.2.5 The results of the 16 ft (4.9 m) parallel panel fire test were as follows:
- 3.2.5.1 Visual observations during the test period were:

<u>Time(min:sec)</u>	<u>Observation</u>
0:00	ignition of exposure fire.
1:00	flame to 6 ft (1.8 m)
2:00	flame to 8 ft (2.4 m), flame in ignited seams up to 6 ft (1.8 m)
3:00	flame to 9 ft (2.7 m), flame in ignited seams up to 8 ft (2.4 m)
4:00	flame to 10 ft (3.0 m), flame in ignited seams up to 9 ft (2.7 m)
5:00	flame to 10 ft (3.0 m), flame in ignited seams up to 9 ft (2.7 m)
6:00	flame to 9 ft (2.7 m), flame in ignited seams up to 9 ft (2.7 m)
7:00	flame to 9 ft (2.7 m), flame in ignited seams up to 9 ft (2.7 m)
8:00	flame to 9 ft (2.7 m), flame in ignited seams up to 9 ft (2.7 m)
9:00	flame to 9 ft (2.7 m), flame in ignited seams up to 7 ft (2.1 m)
10:00	flame to 8 ft (2.4 m), flame in ignited seams up to 8 ft (2.4 m)
11:00	flame to 8 ft (2.4 m), flame in ignited seams up to 8 ft (2.4 m)
12:00	flame to 8 ft (2.4 m), flame in ignited seams up to 8 ft (2.4 m)

FM APPROVALS
Project ID: 3043774

13:00 flame to 8 ft (2.4 m), flame in ignited seams up to 10 ft (3.0 m)
14:00 flame to 8 ft (2.4 m), flame in ignited seams up to 10 ft (3.0 m)
15:00 flame to 8 ft (2.4 m), flame in ignited seams up to 10 ft (3.0 m), propane
turned off
16:00 flame in ignited seams up to 8 ft (2.4 m)
17:00 flame in ignited seams up to 4 ft (1.2 m)
18:00 flame in ignited seams up to 4 ft (1.2 m)
19:00 flame in ignited seams up to 4 ft (1.2 m)
20:00 flame in ignited seams up to 4 ft (1.2 m), test ended, sample panels
extinguished with water

- 3.2.6 The PCHRR of the test panels during the test was 705 kW. This compares favorably with the maximum 830 kW PCHRR for Class 1 Approval without height restriction for combustible walls with a combustible ceiling.
- 3.2.7 A digital record of duct thermocouple data, gas flow meter data, smoke measurement data and mass flow in the duct of the 5 MW calorimeter taken at intervals of 0.1 second and averaged to intervals of 1 second are on file in the Technical Information Center at FM Approvals under Project ID 3043774.

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 SURVEILLANCE AUDITS

The Izopoli Yapi Elemanlari Taah. San. ve Tic. A.S. 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.

FM APPROVALS
Project ID: 3043774

- 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

New documentation did not originate from this project.

IX CONCLUSIONS

- 9.1 Test results show KS103SSF, KS103MSF, and KS110CTF wall and ceiling panels, as described in www.ApprovalGuide.com, meet the Approval requirements of Standard class number 4880 in the category of *Class 1 Metal-Faced with Combustible Core, Interior Wall-Ceiling Construction with No Installation Height Restriction*.
- 9.2 Test results show 1) the panels in and of themselves would not create a need for automatic sprinklers and 2) the panels would be acceptable in a combustible occupancy protected by automatic sprinklers as defined by FM Global Property Loss Prevention Standards.
- 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 attachment of the interior panel facer to the external panel facer with mechanical fasteners.
- 9.4 See www.ApprovalGuide.com for the Approved assemblies.
- 9.5 Since a duly signed Master Agreement is on file for this customer, Approval is effective as of the date of this report.
- 9.6 Continued Approval will depend upon satisfactory field experience and periodic Surveillance Audits.

TESTING SUPERVISED BY: Michael Slocumb

PROJECT DATA RECORD (PDR): 3043774

ORIGINAL TEST DATA: PDR under project IDs 3013471, 3018419, and 3031787

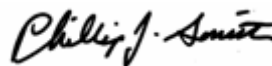
ATTACHMENTS: none

REPORT BY:



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REPORT REVIEWED BY:



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