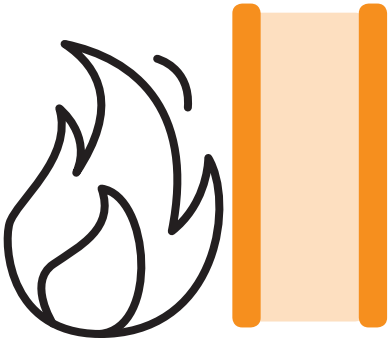
MASTER PANEL

CERTIFICATES OF REACTION TO FIRE

Reaction to fire



In the last decade, polyurethane foams have evolved into construction elements with an excellent reaction to fire. In this context we should emphasize the polyisocyanurate foams (PIR), which are modified polyurethane foams whose molecules, unlike the linear chains of other polyurethanes (PUR), have a network structure that gives them fire-resistant properties. These foams have resulted in a new generation of panels called **Master-PIR**.

These panels are mainly characterized by their reaction to fire, and may be called self-extinguishing, which greatly reduces fire propagation and consequent smoke emissions. The polyurethane does not melt or drip when heated, and can help a building to resist the spread of fire. **Master-PIR** panels exceed fire safety standards and insurance requirements for a wide range of applications.

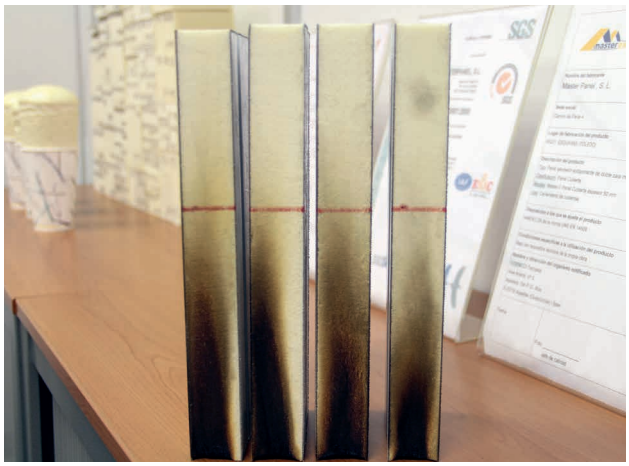
European legislation classifies the reaction to fire of construction products according to UNE- EN 13501 standard: Euroclass, which measures combustibility, quantity and opacity of smoke and inflamed particle fall. **Master-PIR** panels get the best fire reaction rating for polyurethane and polyisocyanurate foams, which is B-s1,d0.

In order to confirm the excellent fire reaction properties of Master-PIR panel foam, Masterpanel has tested **Master-PIR** foam according to ASTM E-84: Standard Test Method for Surface Burning Characteristics of Building Materials, by measuring flame propagation and smoke production. The results of these tests confirm the excellent fire reaction rating of **Master-PIR** panel foam by obtaining the best classification, i.e. Class A.

MASTER - PIR REACTION TO FIRE CLASSIFICATION

Flammability:	Smoke production	Burning droplets
B	S 1	d 0

Reaction to fire **B-S1, d0**



UNE-EN 13501

COMBUSTIBILITY

A1	No contribution to fire
A2	No contribution to fire
B	**Very limited contribution to fire**
C	Limited contribution to fire
D	Moderate contribution to fire
E	High contribution to fire
F	Unclassified, with undetermined performance

SMOKE OPACITY: Amount and speed of emission

s1	**Low**
s2	Medium
s3	High

FALL OF BURNING PARTICLES

d0	**No fall in 600 sec**
d1	No fall in more than 10 sec
d2	No d0, no d1

AFITI LICOF

Classification Report nº C3066T16

Classification obtained in the laboratories of the Association for the promotion of research and technology of security against fires (AFITI), experts in the study of fire performance of multiple products used in construction.

Certificado de ensayo

Nº: C3066T16

Solicitante: MASTERPANEL, S.L. Camino de Toledo, s/n 45221 – ESQUIVIAS (Toledo)

Tipo de muestra: Panel sándwich metálico con alma de PIR. Fabricante: Masterpanel, S.L. Referencia: "MASTER PIR"

Ensayo/s: Ensayo según norma UNE-EN 13823:2012, "Ensayos de reacción al fuego de productos de construcción: Productos de construcción excluyendo revestimientos de suelos expuestos al ataque térmico provocado por un único objeto ardiendo". Ensayo según norma UNE-EN ISO 11925-2:2011 "Ensayos de Reacción al Fuego de los materiales de construcción. Inflamabilidad de los productos de construcción cuando se someten a la acción directa de la llama. Parte 2: Ensayo con una fuente de llama única (ISO 11925-2)".

Fecha Ensayo/s: 22-jul-16

Certificado de los informes: Informe de ensayo nº 3066T16 (emitido por AFITI-LICOF en fecha 14-sep-16). Informe técnico EXAP nº EXAP-3066T16 (emitido por AFITI-LICOF en fecha 14-sep-16). Informe de clasificación nº 3066T16-2 (emitido por AFITI-LICOF en fecha 14-sep-16).

Clasificación de la Reacción al Fuego: B-s1,d0

Toledo, 14 de septiembre de 2016

Fdo: David Sáez García
Director Técnico del Laboratorio de Reacción al Fuego

intertek

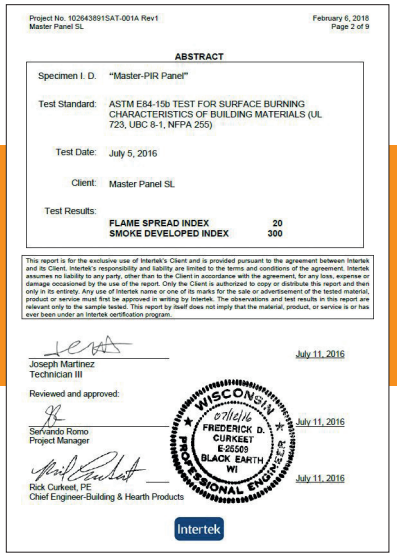
Classification Report nº 102643891SAT-001A REV1

ASTM E84

Flame spread index: 20

Smoke developed index: 300

Class A



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ABSTRACT

Specimen I. D.: "Master-PIR Panel"

Test Standard: ASTM E84-15b TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS (UL 723, UBC 8-1, NFPA 255)

Test Date: July 5, 2016

Client: Master Panel SL

Test Results:

FLAME SPREAD INDEX	20
SMOKE DEVELOPED INDEX	300

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Joseph Martinez
Technician III — July 11, 2016

Reviewed and approved:

Servando Romo
Project Manager — July 11, 2016

WISCONSIN 07/14/16 FREDERICK D. CURKEET E-58509 BLACK EARTH WI PROFESSIONAL ENGINEER

Rick Curkeet, PE
Chief Engineer-Building & Hearth Products — July 11, 2016

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