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**Nº 9/LE 895**

Title:

Classification report for the determination of the fire resistance of a set of penetration seals according to EN 13501-2:2007+A1:2009 Fire classification of construction products and building elements. Part 2: Classification using data from fire resistance tests, excluding ventilation services. (equivalent to UNE EN 13501-2:2009+A1:2010).

Tested material:

Seven penetration seals based on collars reference "MG2-A XL" for plastic pipes, everything supplied by RF Technologies.
Test done in vertical configuration.

File number: 15/10328-1183 Part 2 M1

This report cancels and replaces the original report issued with file number 15/10328-1183 Part 2 on 8 July 2015. It is responsibility of the test solicitor the replacement of the original and all its copies.
Description of the modification: correction of an editorial mistake on table 4.3.

Solicitor:

RF Technologies, S.A
Lange Ambachstraat 40
B-9860 Oosterzete
Belgium

Report Date:

16 October 2015

Tested on:

26 June 2015

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This document consists of 8 pages.**

1.- INTRODUCTION

This Fire Resistance classification report defines the classification for a set of penetration seals for plastic pipes supplied by RF Technologies

2.- DETAILS OF CLASSIFIED ELEMENT

2.1.- Type of function

Tested elements are defined as penetration seals for plastic pipes. Its function is to withstand the integrity and thermal insulation criteria given in clause 5 of EN 13501-2:2007+A1:2009 standard.

2.2.- Description

The complete description of the tested elements can be consulted in the test report (see clause 3 of this classification report).

Construction made of an aerated concrete wall of dimensions 3000 x 3000 mm made out of cellular concrete bricks of 100 mm thick and (650 ± 200) kg/m³.

3.- TEST REPORT

This classification report is based on the following test report:

File nº: 15/10328-1183 Part 1

Issued with date: 8 of July of 2015

Test carried out on: 26 of June of 2015

4.- TEST RESULTS

4.1.- Test standard:

EN 1366-3: 2009 "Fire resistance tests for service installations. Part 3: Penetration seals" (equivalente to UNE EN 1366-3: 2011).

4.2.- Exposure conditions

Time/temperature curve	$T = 345 \log_{10} (8t + 1) + 20$ (acc EN 1363-1:2012)
Number of exposed sides	1 (U/C)
Applied load	No load applied
Support conditions	Standard supporting construction according EN 1366-3. See more details in the test report indicated in clause 3 of this classification report.

4.3.- Result table.

System	Integrity criteria	Thermal insulation
System 1 (MG2-A XL Ø400 collar + PVC-U pipe 400 x 7.9 mm)	It was maintained the entire test, 135 minutes	It was maintained the entire test, 135 minutes
System 2 (MG2-A XL Ø400 collar + PVC-U pipe 400 x 11.7 mm)	It was maintained the entire test, 135 minutes	It was maintained the entire test, 135 minutes
System 3 (MG2-A XL Ø250 collar + PVC-U pipe 250 x 4.9 mm)	It was maintained the entire test, 135 minutes	It was maintained the entire test, 135 minutes
System 4 (MG2-A XL Ø250 collar + PVC-U pipe 250 x 11.9 mm)	It was maintained the entire test, 135 minutes	It was maintained the entire test, 135 minutes
System 5 (MG2-A XL Ø250 collar + PEHD pipe 250 x 7.7 mm)	It was maintained the entire test, 135 minutes	It was maintained the entire test, 135 minutes
System 6 (MG2-A XL Ø250 collar + PEHD pipe 250 x 14.8 mm)	It was maintained the entire test, 135 minutes	Failed at minute 121 (tc 19 >180°C)
System 7 (MG2-A XL Ø250 collar + PEHD pipe 250 x 22.7 mm)	It was maintained the entire test, 135 minutes	Failed at minute 115 (tc 27 > 180°C)

5.- CLASSIFICATION

According to clause 7.5 of EN 13501-2:2007+A1:2009 standard, classification of the tested elements is:

System (all systems assembled in vertical wall)	Classification
System 1 (MG2-A XL Ø400 collar + PVC-U pipe 400 x 7.9 mm)	EI 120 U/C
System 2 (MG2-A XL Ø400 collar + PVC-U pipe 400 x 11.7 mm)	EI 120 U/C
System 3 (MG2-A XL Ø250 collar + PVC-U pipe 250 x 4.9 mm)	EI 120 U/C
System 4 (MG2-A XL Ø250 collar + PVC-U pipe 250 x 11.9 mm)	EI 120 U/C
System 5 (MG2-A XL Ø250 collar + PEHD pipe 250 x 7.7 mm)	EI 120 U/C
System 6 (MG2-A XL Ø250 collar + PEHD pipe 250 x 14.8 mm)	EI 120 U/C
System 7 (MG2-A XL Ø250 collar + PEHD pipe 250 x 22.7 mm)	EI 90 E 120 U/C

6.- FIELD OF DIRECT APPLICATION (according to EN 1366-3:2009)

6.1. General (clause 13 of EN 1366-3:2009)

6.1.1 Orientation.

Test results are only applicable to penetration seals assembled in a vertical division (wall).

6.1.2 Supporting construction.

Results are applicable on seals with a support frame made of aerated concrete with density and thickness equal or higher than the ones used in test (tested supporting construction: $650 \pm 200 \text{ kg/m}^3$ and 100 mm in thickness).

6.1.3 Service support construction.

Metal trays with melting point higher than the furnace temperature at the classification time (e.g: stainless steel, galvanised steel) are covered.

6.1.4 Seal size and distances:

- The test result obtained are valid for any seal (in terms of linear dimensions) equal to or smaller than the tested provided that:
 - o total amount of cross sections of the services (including insulation) does not exceed 60% of the penetration area.
 - o Working clearances are not smaller than the minimum working clearances (defined in the annexes A, B, E and F of EN 1366-3:2009 and according to figure 1 of the test report).
 - o Distance between a single service and the seal edge shall remain within the tested range.

6.2. Plastic pipes (clause E.2.7 of EN 1366-3:2009)

6.2.1 General

Obtained results from a multiple penetration seal can be extended to a single penetration seal of the same type, but not vice versa.

6.2.2 Seal size

- Two design groups were tested:
 - o Design group 1:
 - Material of the active component: Intumescent strip reference "EX 147"
 - Length of the active component: 100 mm
 - Thickness of the active component: 24 mm

- Design group 2:
 - Material of the active component: Intumescent strip reference "EX 147"
 - Length of the active component: 150 mm
 - Thickness of the active component: 30 mm
- The maximum pipe closure device size within a design group covers smaller sizes of this design group (see figure 1).
- Reduction of the thickness of the active component of each design group is not allowed.

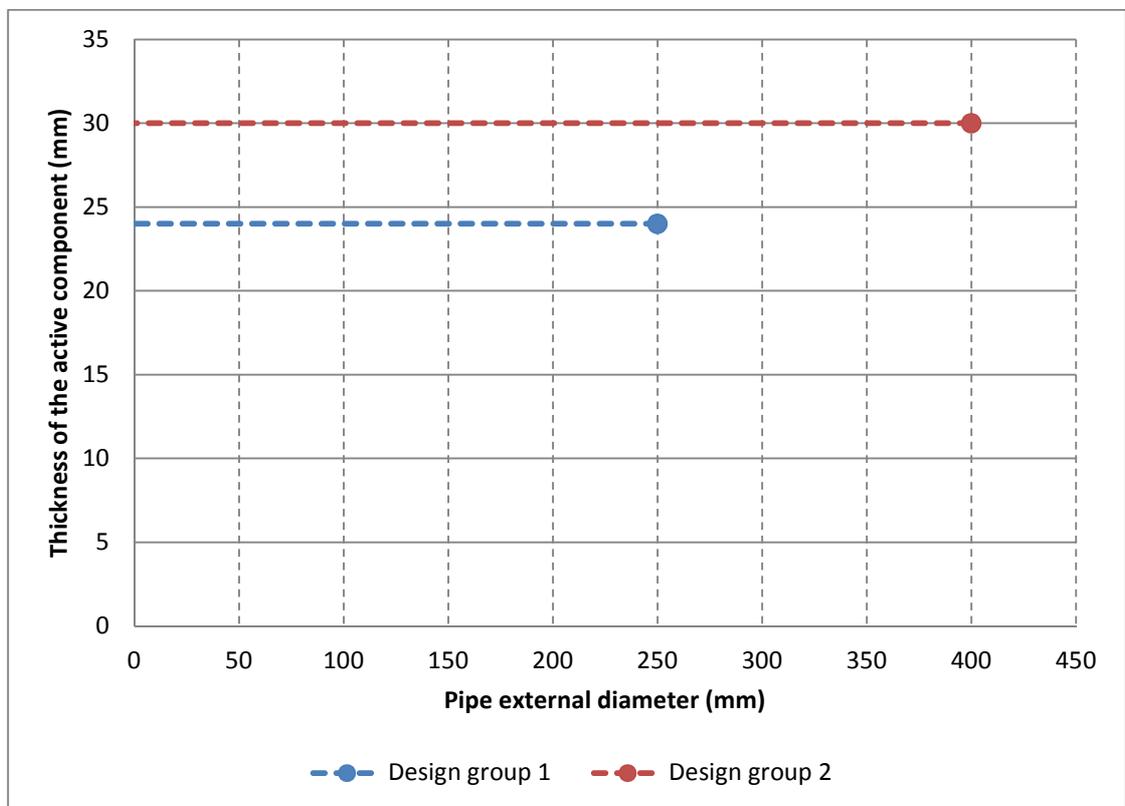


Figure 1. Covered sizes according to each design group.

6.2.3 Pipe end configuration.

- Tested configuration: U/C
- Covered configurations: U/C and C/C
- U/U and C/U are not covered.

6.2.4 Pipe material.

- Design group 1:
Test results are valid for pipes made by PVC-U according to EN 1329-1, EN 1453-1 and EN 1452-1 and PVC-C according to EN 1566-1.

Test results are also valid for pipes made from PE-HD according to EN 13244 and EN 12201 standards.

- Design group 2:
Test results are valid for pipes made by PVC-U according to EN 1329-1, EN 1453-1 and EN 1452-1 and PVC-C according to EN 1566-1.

6.2.5 Pipe wall thickness

- Design group 1:
 - o PVC-U: covered pipe thicknesses from 4,9 mm to 11,9 mm
 - o PE-HD: covered pipe thicknesses from 7,7 mm to 22.7 mm
- Design group 2:
 - o PVC-U: covered pipe thicknesses from 7,9 mm to 11,7 mm

6.2.6. Pipe orientation

Test results are valid for all pipes assembled perpendicular to the seal (90°)

6.2.7 Separations.

The annular space (a1 acc. to EN 1366-3:2009 and values indicated in figure 2 of test report) between the pipe and the supporting construction shall remain within tested range. Separation a2 (acc. to EN 1366-3:2009 and values indicated in figure 2 of test report) may be increased,

The annular space between pipe and construction element (wall) is external diameter of the pipe + 3 mm.

The distance between pipes is not less than 200 mm.

6.3 SUMMARY OF COVERED SAMPLE (according to available dimension supplied by the test solicitor).

Supporting construction aerated concrete wall of 100 mm thick and (650 ± 200) kg/m³.

Pipe material	Pipe external diameter (mm)	Pipe wall thickness range (mm)	Thickness of active component (mm)	Classification
PVC-U	315/355/400	7.9 - 11.7	30	EI 120 U/C
PVC-U	200/250	4.9 – 11.9	24	EI 120 U/C
PE-HD	200/250	7.7 – 14.8	24	EI 120 U/C
PE-HD	200/250	14.8 – 22.7	24	EI 90 E 120 U/C

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This document is not neither a type approval nor a product certification.

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