

STUDY

REPORT No.

E-115231-001-1-a

CUSTOMER	SUSENSIONES ELÁSTICAS DEL NORTE, S.L. (SEÑOR)
ADDRESS	POL. IND. EL GARROTAL, PARCELA 10 – MÓDULOS 4 Y 5. 14700 PALMA DEL RIO CORDOBA SPAIN
PURPOSE	TECHNICAL STUDY FOR HEIGHT EXTENSION
SAMPLE ANALYSED	FLEXIBLE PARTITION REF. "3PPF15+M90 LM/600+SE-9600+M90 LM/600+3PPF15"
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Technical Manager

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1. INTRODUCTION

Construction materials and products may be supplied to works in different sizes, thicknesses, types of fastening and/or on different supports.

In practice, it is not feasible to test all of the configurations or combinations in each product family, in spite of the fact that they may significantly affect the result of the fire resistance test. On the other hand, there are technical limitations in terms of the size and design of the sample in order to carry out standardised fire resistance tests.

Usually, the fire resistance test result applies to the tested configuration and also includes a direct field of application. It is possible to extend the direct field of application of the test by applying rules based on the concept of testing the sample in its most unfavourable configuration, and widening the result to more favourable configurations.

This extension of results may be carried out based on a harmonised standard for the extension of test results (EXAP Report) or based on the expertise of the laboratory (Technical Assessment).

In this case, a technical study has been carried out, using the test report on a non-loadbearing partition as a base and using other tests performed as evidence.

2. REGULATORY REFERENCES

- [A] *EN 1363-1:2020 “Fire resistance tests – Part 1: General requirements”.*
- [B] *EN 1364-1:2015 “Fire resistance tests for non-loadbearing elements. Part 1: Walls”.*
- [C] *EN 13501-2:2023 “Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services”.*
- [D] *EN 15254-3:2019 “Extended application of results from fire resistance tests - Non-loadbearing walls – Part 3: Lightweight partitions”*

3. PURPOSE OF THE TECHNICAL ASSESSMENT

This technical study was carried out at the request of the customer, Suspensiones Elásticas del Norte, SL (SENOR), to determine the fire resistance classification of a partition on increasing its height.

4. BASE TEST

The following report was used as the base test for the proposed technical study:

4.1 BASE TEST

4.1.1 Test and classification reports

Report No.	Applicant	Issuing laboratory	Product / System tested	Test date	Reference standard
112604-001-1 112604-001-2	SENOR	TECNALIA R&I	"3PPF15+M90 LM/600+SE-9600+M90 LM/600+3PPF15"	23/05/2024	[A], [B] and [C]

4.1.2 Definition of the sample (*)

Materials used (*)

- Framing:

Designation	Make, model	Material	Cross-section (mm)	Thickness (mm)
[C]	PLACO RAIL 90, Ref.MEH84203000	Galvanised steel	30/90/30	0.55
[M]	PLACO MONTANTE 90 Ref.MEH84502990	Galvanised steel	39/88.5/41	0.6

- Spring system / Shock absorber:

Designation	Make, model	Material	Dimensions (mm)
[A]	SENOR SE-9600-TBM2	Shock absorber	Total length: 260 Sheet thickness: +34 1.5

- Soundproofing tape:

Designation	Make, model	Material	Dimensions (mm)
[B1]	Acoustic strip, SENR SE-BEC 10x135	CR140 micro cellular EPDM sheet	Width: 125 Thickness: 10
[B2]	SENR SE-MONT- BICAPA 40	EPDM + cross-linked polyethylene insulation strip	Width: 40 Thickness: 5.5

- Bolts:

Designation	Make, model	Material	Diameter (mm)	Length (mm)
[T1]	SENR SE-TAV-500/11A	Elastic separator	29/36.5	34.5
[T2]	SENR SE-TAV-500/11R	Elastic separator	29/36.5	34.5
[T3]	PLACO TTPC 25 screw Ref.TOH86000025	Self-tapping screw	3.5	25
[T4]	PLACO TTPC 45 screw Ref.TOH86000045	Self-tapping screw	3.5	45
[T5]	PLACO TTPC 70 Screw Ref.TOH86000070	Self-tapping screw	4.2	70
[T6]	FISHER DUOPOWER 6x30	Plastic plug	6	30
[T7]	TRPF 13 Ref.TOH86130000	Self-tapping sheet metal screw	-	13

- Board:

Designation	Make, model	Material	Weight (kg/m ²)	Dimensions (mm)
[P]	PLACO PPF BA15 Ref.P03593000	Fire-break laminated gypsum board	12.5	1200x3000x15

- Insulation:

Designation	Make, model	Material	Dimensions (mm)
[LM]	ISOVER ARENA APTA Ref.KD10991	Mineral wool	1350x600 Thickness: 90

- Joint paste:

Designation	Make, model	Material	Characteristics
[Pa]	PLACO PR1	Powdered gypsum jointing paste + additives	25 kg bag

- Joint tape for joint treatment:

Designation	Make, model	Material	Dimensions (mm)
[Ci]	PLACO GR RLX	Microperforated Paper Joint Tape	Width: 50

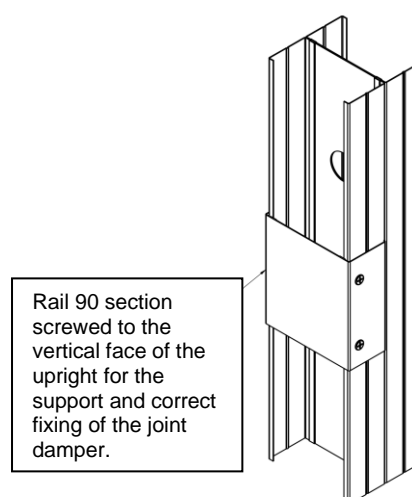
Definition of sample

Partition made of a double metal structure of galvanised steel sheet consisting of standards [M] and rails [C], placed 245mm from the centres of the rails. The vertical standards are reinforced in an "H" shape by joining the rear of two standards with screws [T7] every 400 mm.

Two EPDM sheets [B1] are fixed around the entire perimeter of the sample (except for the free lateral edge) with a gap of 155 mm between the two sheets. The lower rails [C] on the EPDM sheets [B1] are fixed to the floor with plastic plugs [T6] and self-tapping screws [T5] every 700 mm. The elastic spacer (blue) [T1] is incorporated in these fixings.

The upper rails [C] on the EPDM sheets [B1] are fastened to the ceiling with plastic plugs [T6] and self-tapping screws [T5] every 600 mm. The elastic spacer (red) [T1] is incorporated in these fixings. The standard of the fixed edge [M] on the EPDM sheets [B1] is fastened to the side frame edge with plastic plugs [T6] and self-tapping screws [T5] every 600 mm. The elastic spacer (blue) [T1] is incorporated in these fixings.

The H-shaped standards are then installed, connected together with sheet metal screws [T7] at a distance of 600 mm. Small pieces of rail are fixed to these standards at the height of the shock absorbers that connect the double structure. (See detail 1). Shock absorbers [A] are installed by means of [T7] fixings, 6 shock absorbers in total distributed at 1500mm and 2500mm from the floor on two standards and 2000mm from the floor on another two standards.



(Detail 1).

Finally, an insulation strip [B2] is placed on the two front sides of the profiles that will be in contact with the gypsum boards.

The inside of the double profile is made of mineral wool insulation [LM].

Three layers of 15mm gypsum board [P] are installed on each side of the double profile, forming a partition wall with a final width of 425mm.

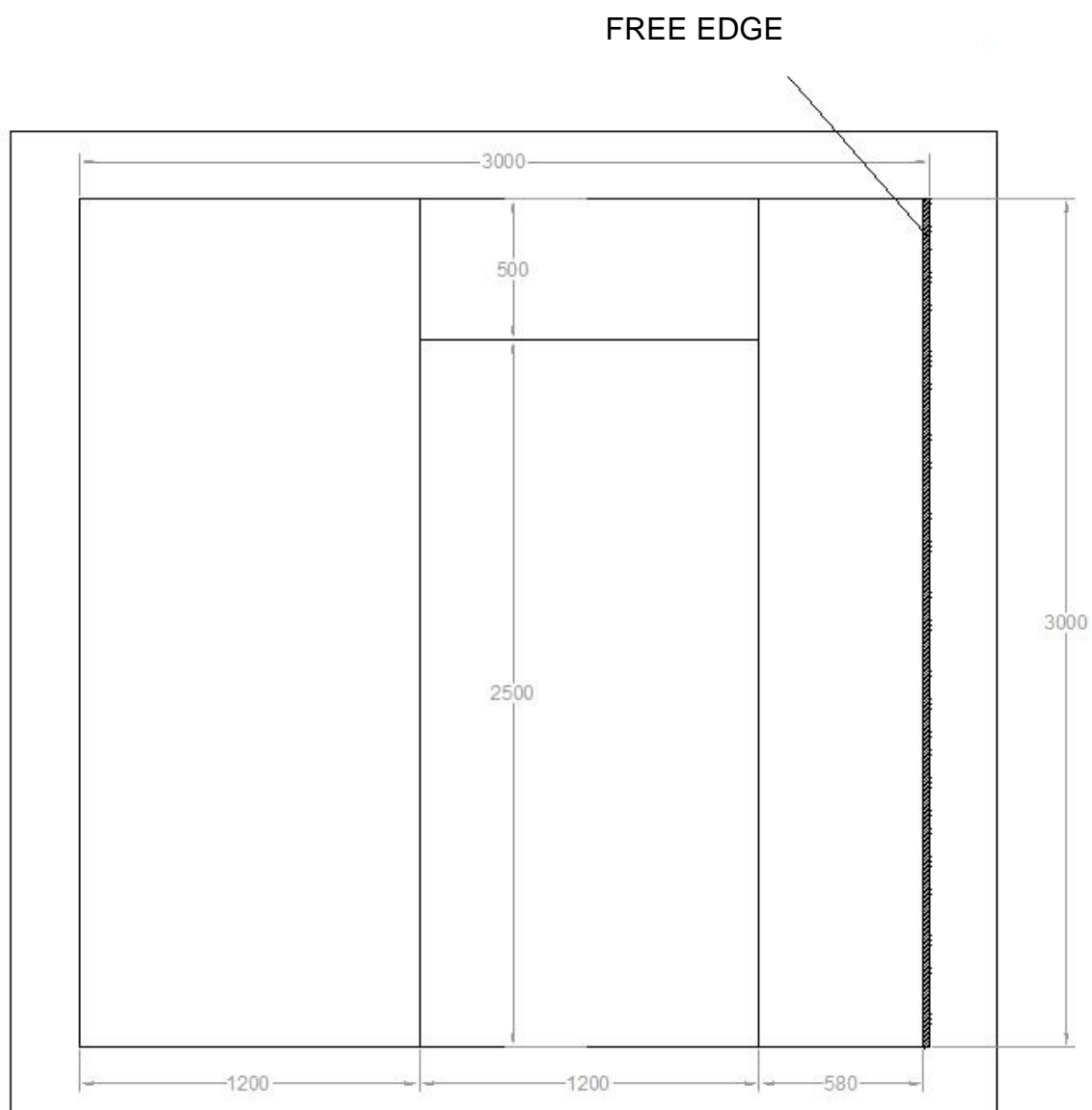
The first layer is fixed to the standards using self-tapping screws [T3] with a distance of 500 mm between screws, on the sides of each board and in the centre, coinciding with the metal structure. The second layer is fixed to the standards using self-tapping screws [T4] with a distance of 500 mm between screws on the sides of each board and in the centre, coinciding with the metal structure. Both the first and second layers end perimetrically against the EPDM sheet [B1]. The assembly of the second board is identical to the first one, except that in this case longer screws [T4] are used and screws [B1] are used in the third one, but this final board is not supported by the EPDM sheet [B1]. The third layer is fixed to the standards using self-tapping screws [T5] with a distance of 250 mm between screws on the sides of each board and in the centre, coinciding with the metal structure. All layers of gypsum boards are installed with the joints butting up against each other on each side, and in turn with the joints butting up against the opposite side.

On each layer, all of the joints between boards are fixed with filler [Pa1] and joint tape [Ci]. The screw heads of all boards are filled [Pa] and the perimeter of the sample is coated with the same paste [Pa].

The butt joints shall be made according to the sketch. A horizontal joint is made 500 mm from the upper edge of the sample.

The sample is tested with dimensions of (3000 x 3000) mm and a free moving edge.

Dimensions of the partition on the unexposed side



Level (mm).

4.1.3 Test results

On completion of the test, carried out in accordance with standards [A] and [B] indicated in Section 2, the following results were obtained for the partition referenced as "PPF15+M90 LM/600+SE-9600+M90 LM/600+3PPF15".

Integrity (E)		222 min
Performance criterion		
Cotton pad	Flaming or glowing of the cotton pad.	222 min ⁽¹⁾
Gauge Ø 6 mm	Openings in the sample allowing the gauge to move more than 150 mm along the gap.	222 min
Gauge Ø 25 mm	Openings in the sample allowing the gauge to pass through.	222 min ⁽¹⁾
Sustained flaming > 10 s	Sustained flaming on the unexposed side of the sample for more than 10 s.	222 min ⁽¹⁾
Insulation (I)		222 min
Performance criterion		
Maximum temperature	Initial temperature of each thermocouple not to be exceeded by 180 °C.	222 min ⁽¹⁾
Average temperature	Initial average temperature of thermocouples TR1 to TR5 not to be exceeded by 140 °C.	222 min ⁽¹⁾

⁽¹⁾: The measurement is stopped if a gap of more than Ø 6 mm and 150 mm occurs.

4.1.4 Obtained classification

The tested solution referenced as "3PPF15+M90 LM/600+SE-9600+M90 LM/600+3PPF15", obtained the following classification according to Standard [C] indicated in Section 2.

Fire Resistance Classification: EI 180

5. ANALYSIS.

An analysis of the results obtained during the test has been carried out, paying special attention to the internal temperatures obtained in the profiles and the deformation of the partition. The following failure criteria have been defined by the laboratory:

- Indoor temperatures: increase of 180 °C
- Deflection: 100 mm

5.1 INDOOR TEMPERATURES

During the test, thermocouples are placed on two inner profiles to record the temperature rise at the following points:

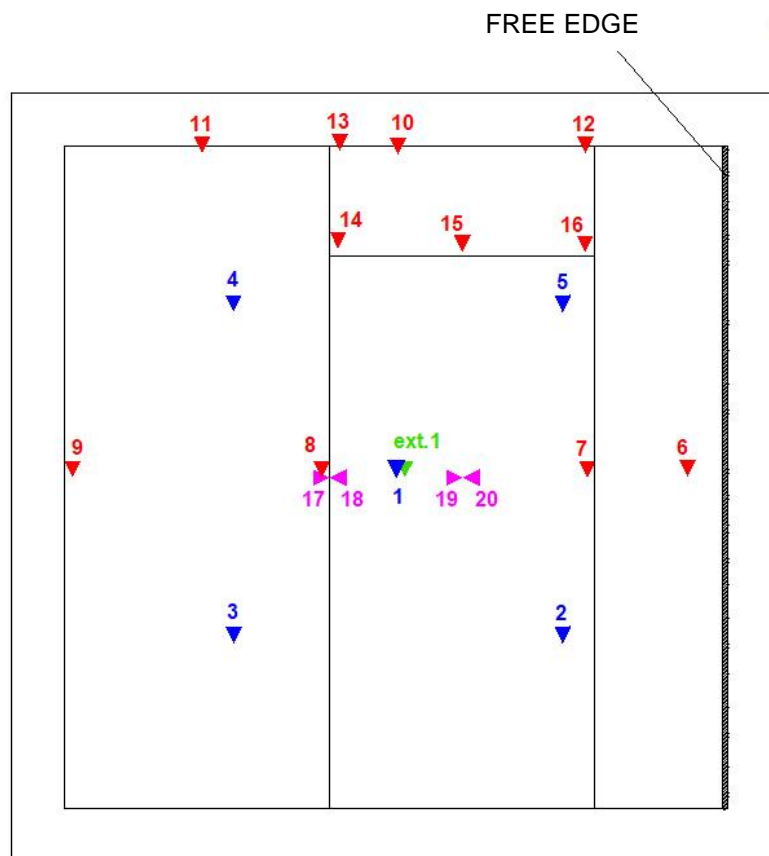


Figure 1: Elevation

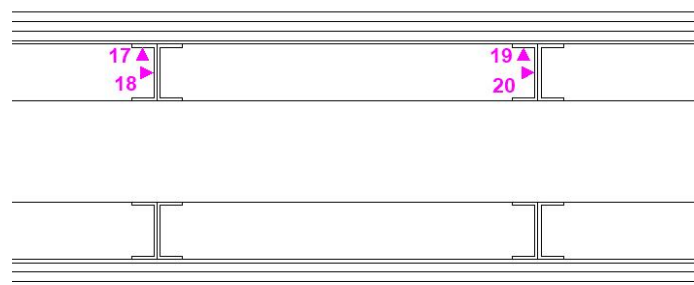
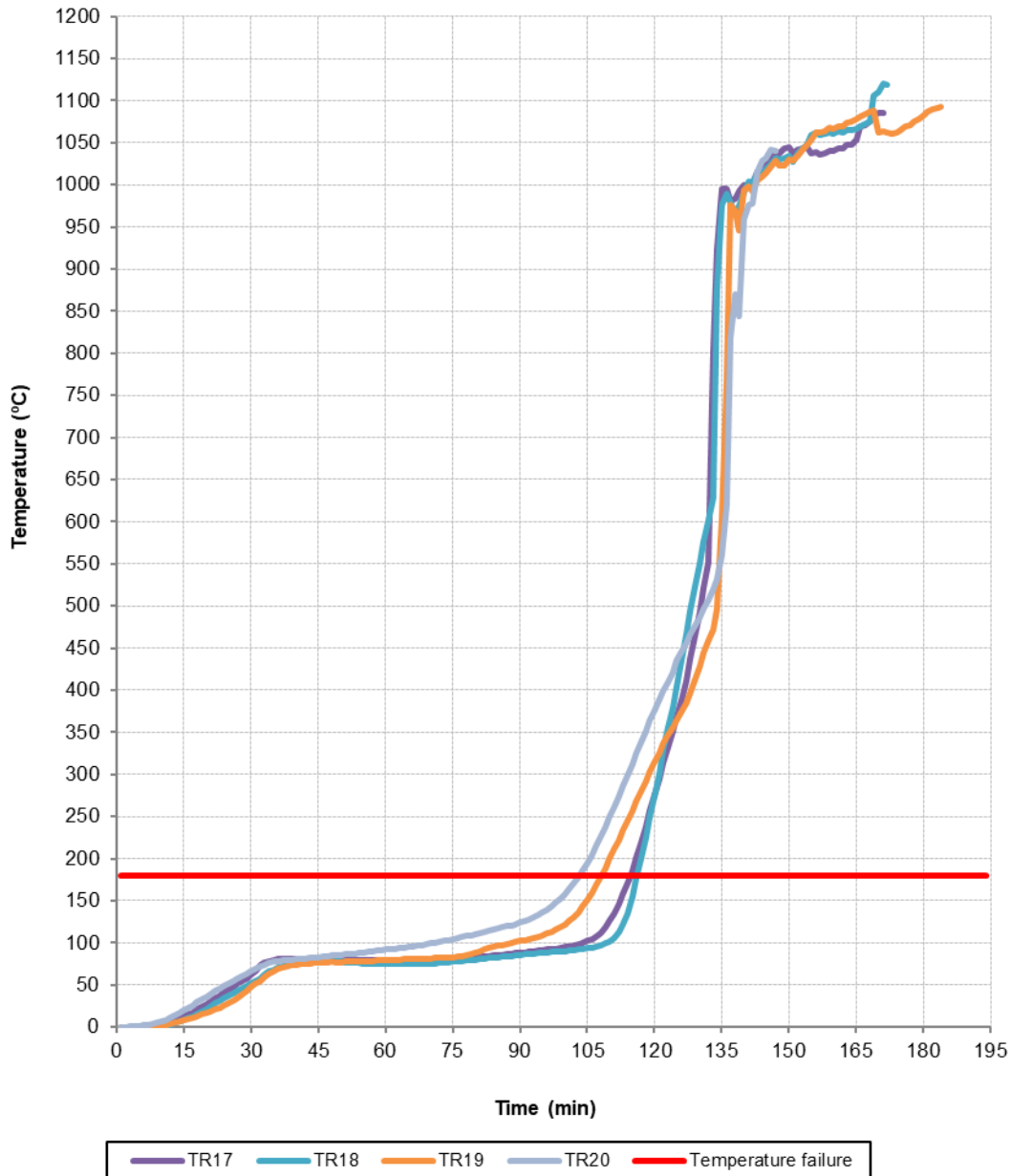


Figure 2: Cross-section detail

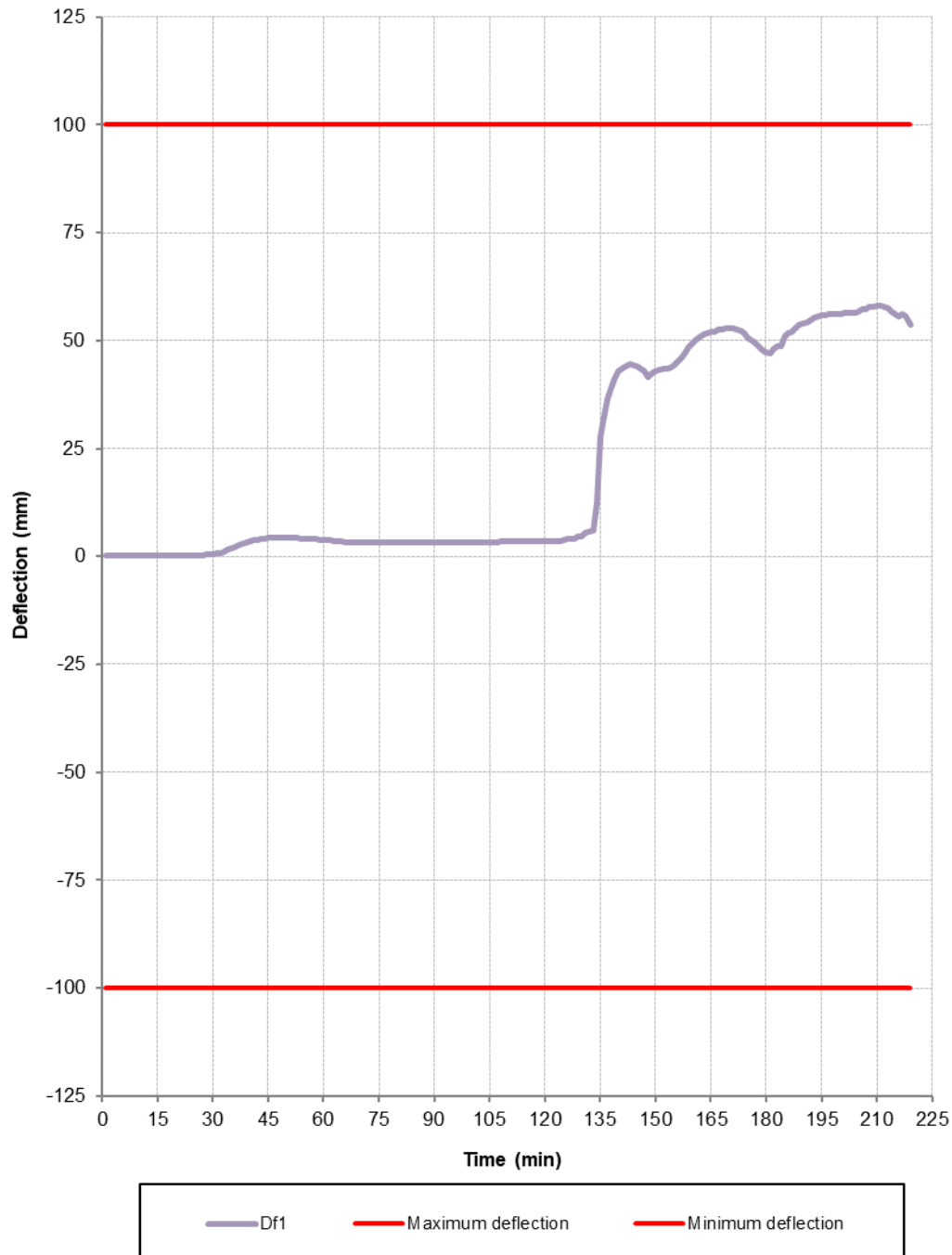
The evolution of temperatures at the aforementioned points was as follows:



The graph above shows that temperature failure occurs at minute 104, at which moment thermocouple 20 exceeds the temperature rise of 180 °C.

5.2 DEFORMATION

During the test, the deformation is measured at the centre of the sample, as specified in the EN 1364-1 test standard. The evolution of the deformation is shown in the following graph:



It is observed that the sample does not undergo any deformation during around the first 120 minutes of testing.

6. CONCLUSIONS

Based on this study it is considered that the height of the tested partition "3PPF15+M90 LM/600+SE-9600+M90 LM/600+3PPF15" can be increased to a height of 12 m for an EI 90 classification.

Additional Statement

The results of the extended application related to the product / product family performance under the specific testing conditions are not intended to be the only criterion for the potential fire risk assessment of the product / product family in use.

7. VALIDITY

This assessment was conducted based on the laboratory's experience and current knowledge of the systems and products described, prevailing test methods and test evidence provided by the manufacturer.

Due to possible changes in products and the prevailing regulation or the provision of further test evidence, an initial validity of 2 years is set for this technical assessment as of the issue date, or in other words, until 27/02/2027.