

## Tangit® FP 550 2C Fire Protection Foam



### Technical Assessment

**Cert. No.: 2011-A-002**

- Fire resistance of cable and pipe penetrations in a light partition wall in combination with Tangit® FP 550 2C Fire Protection Foam

**Nederland**  
Scandinavia – Suomi

**Walraven B.V.**

Postbus 15  
3640 AA Mijdrecht (NL)  
Tel. +31 (0)297 23 30 00  
Fax +31 (0)297 23 30 99  
info@walraven.com



**België / Belgique**

**Walraven BVBA**

Ambachtenlaan30  
3300 Tienen (BE)  
Tel. +32 (0)16 82 20 40  
Fax +32 (0)16 82 01 86  
info@walraven.be

**Walraven Group**

Mijdrecht (NL) · Tienen (BE) · Bayreuth (DE)  
Grenoble (FR) · Banbury (GB) · Madrid (ES)  
Mladá Boleslav (CZ) · Kraków (PL) · Kyiv (UA)  
Moscow (RU) · Wixom - Detroit (US)

# TECHNICAL ASSESSMENT 2011-A-002

## based on an analyse of test results

### SPONSOR

HENKEL NEDERLAND BV  
Brugwal 11  
NL – 3432 NZ NIEUWEGEIN  
THE NETHERLANDS

### SUBJECT

Renewal of Technical Evaluation 2007-G-021 – 1<sup>st</sup> renewal.  
Acceptance and extrapolation of Test Report no. 210003445, drafted by MPA NRW, Erwitte, Germany, concerning the fire resistance of cable and pipe penetrations in a light partition wall.

This document has been drawn up as part of an analysis of test results as described in the RD of 13/06/2007.

## 1. TEST REPORT

### 1.1 Report

Name of the laboratory	Number test report	Owner of the test report	Test standard
MPA NRW	210003445	Henkel KGaA	EN 1366-3 (2004)

On your request, we have examined the above referenced test report.

### 1.2 Description of the tested element

Test report no. 210003445 gives the description and the results of two fire resistance tests carried out according to the European Standard EN 1366-3 (Edition 2004), on cable and pipe penetration seals in a light partition wall (dimensions : 3000 x 3000 x 100 mm), composed of a steel frame (width : 50 mm), protected on both sides by means of two layers reinforced gypsum plaster boards (thickness : 2 x 12,5 mm) and insulated by means of mineral wool (thickness : 40 mm). Rectangular openings (max. dimensions : 350 x 350 mm) were made in the partition wall. All around the opening a gypsum plasterboard board (section : 150 x 12,5 mm) was fixed.

During test n° 1 an overpressure of approx. 15 Pa was realised in the furnace at the lower row penetrations, as prescribed in the Belgian standard NBN 713.020 (edition 1968). During test n° 2 an overpressure of only approx. 10 Pa was realised in the furnace at the lower row penetrations, and not 15 Pa as prescribed in the Belgian standard NBN 713.020 (edition 1968). During both tests a mobile thermocouple was used for the evaluation of the criteria of thermal insulation and a cotton prop for the evaluation of the criteria of integrity.

#### Cable penetrations :

- The cable routes were supported at a distance of 100 mm and 500 mm to the non-exposed and the exposed side of the light partition wall.
- The cables were fixed on the cable route on both sides of the wall.
- Over a length of 150 mm, the cables and cable routes were coated on both sides of the wall with intumescent coating **Tangit FP 800**.
- The remaining opening between the cables (and cable route) and the wall was filled with intumescent foam **Tangit FP 550** (thickness : 150 mm). This foam was coated at both sides with two layers of intumescent coating **Tangit FP 800** (thickness : approx. 1,5 mm).
- The cable rack with reference 13 was loaded with an additional weight equal to the weight of 0,5 m of the tested cables on the fire side. The cable rack with reference 12 was loaded with an additional weight of 10 kg on the fire side.

Pipe penetrations :

- The pipes were supported at a distance of 150 mm and 900 mm to the non-exposed of the light partition wall.

- Synthetic pipes :

The penetrations of the single layer pipes (PE-HD, PVC-U) were executed as following :

- either by means of a fire protection collar of the type **WM Pacifyre MK II** around the pipe at the passage through the wall. These fire protection collars (length : 195 mm) consisted of an external stainless steel sleeve (thickness : 0,25 mm) to which an intumescent product WM Pacifyre IM7 (thickness : 4 mm and 8 mm) was attached over the whole surface. Three PUR stripes (section : 25 x 10 mm) were glued to the ends and into the middle of the collar over the whole perimeter. The fire protection collar was placed in the centre of the wall.
- Or by means of one or more layers of intumescent tape Henkel Tangit FP 6257 (current commercial name according to your declaration : **Henkel Tangit FP 635**) around the pipe at the passage through the wall.

The penetrations of the multilayer pipes (Unipipe) were executed as following :

- either by means of a rockwool insulation **RS800** (volumic mass : 90 to 115 kg/m<sup>3</sup>). The insulation is applied on the exposed side, as well on the non-exposed side.
- Or by means of a fire protection collar of the type **WM Pacifyre MK II** around the pipe at the passage through the wall. These fire protection collars (length : 195 mm) consisted of an external stainless steel sleeve (thickness : 0,25 mm) to which an intumescent product WM Pacifyre IM7 (thickness : 4 mm and 8 mm) was attached over the whole surface. Three PUR stripes (section : 25 x 10 mm) were glued to the ends and into the middle of the collar over the whole perimeter. The fire protection collar was placed in the centre of the wall. An additional synthetic rubber insulation was applied to the non-exposed side and exposed side.

- Metal pipes:

The penetrations of the metal pipes (Fe + Cu) were executed as following :

- either by means of a rockwool insulation **RS800** (volumic mass : 90 to 115 kg/m<sup>3</sup>). The insulation is applied on the exposed side, as well on the non-exposed side.
- Or by means of a fire protection collar of the type **WM Pacifyre MK II** around the pipe at the passage through the wall. These fire protection collars (length : 195 mm) consisted of an external stainless steel sleeve (thickness : 0,25 mm) to which an intumescent product WM Pacifyre IM7 (thickness : 4 mm and 12 mm) was attached over the whole surface. Three PUR stripes (section : 25 x 10 mm) were glued to the ends and into the middle of the collar over the whole perimeter. The fire protection collar was placed in the centre of the wall. An additional synthetic rubber insulation of the type **SH Armaflex** or **Kaiflex** was applied to the non-exposed side and exposed side.

The metal pipes were sealed on the exposed side.

- The remaining opening between the pipes and the wall was sealed by means of intumescent foam **Tangit FP550** (thickness : 150 mm). This foam was coated at both sides with two layers of intumescent coating **Tangit FP 800** (thickness : approx. 1,5 mm).

## 2. RESULTS

The results obtained for the pipe penetrations of test 1 according to the criteria of the Belgian Standard NBN 713.020 (edition 1968) are given in the table underneath (only the results with a fire resistance higher than 30 minutes are mentioned) :

Pipe penetrations – Test 1					Rf <sup>(1)</sup> (min)
Ref.	Characteristic of the pipe			Seal	
	Material	Ø <sub>u</sub> (mm)	Thick- ness (mm)		
1	Cu	88,9	2,0	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 12 mm) + SH Armaflex (thickness : 52 mm; es <sup>(***)</sup> : 450 mm); nes <sup>(***)</sup> : 950 mm)	85
2	Cu	88,9	2,0	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 12 mm) + SH Armaflex (thickness : 52 mm; es <sup>(***)</sup> : 450 mm); nes <sup>(***)</sup> : 950 mm)	70
3	Fe	88,9	3,2	RS 800 (thickness : 30 mm; es <sup>(***)</sup> & nes <sup>(***)</sup> : 500 mm)	≥ 90
4	PE-HD	32,0	1,8	Tangit FP 635 (section : 30 x 2,5 mm; 1 layer)	≥ 90
5	PE-HD	110,0	2,7	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	83
7	PE-HD	110,0	10,0	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	≥ 90
8	PVC-U	32,0	1,8	Tangit FP 635 (section : 30 x 2,5 mm; 1 layer)	78
<sup>(*)</sup> Fire protection collar type WM Pacifyre MK II					
<sup>(**)</sup> Thickness intumescent product WM Pacifyre IM7					
<sup>(***)</sup> es : length exposed side; nes : length non-exposed side					

- (1) Time during which the three criteria, i.e. thermal insulation, integrity and stability, are satisfied at the same time.

Pipe penetrations – Test 1					Rf <sup>(1)</sup> (min)
Ref.	Characteristic of the pipe			Seal	
	Material	Ø <sub>u</sub> (mm)	Thick- ness (mm)		
9	PVC-U	110,0	2,2	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	78
10	PE-HD	32,0	1,8	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	≥ 90
11	PE-HD	140,0	3,5	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 8 mm)	≥ 90
12	PE-HD	32,0	2,9	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	88
13	PE-HD	140,0	12,7	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 8 mm)	88
14	Cu	10,0	1,0	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm) + Kaiflex (thickness : 13 mm; es <sup>(***)</sup> : 450 mm; nes <sup>(***)</sup> : 950 mm)	≥ 90
15	Fe	10,2	2,5	RS 800 (thickness : 20 mm; es <sup>(***)</sup> & nes <sup>(***)</sup> : 450 mm)	88
16	Fe	10,2	2,5	RS 800 (thickness : 20 mm; es <sup>(***)</sup> & nes <sup>(***)</sup> : 450 mm)	≥ 90
17	Cu	10,0	1,0	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm) + Kaiflex (thickness : 13 mm; es <sup>(***)</sup> : 450 mm; nes <sup>(***)</sup> : 950 mm)	≥ 90
19	PE-HD	75,0	6,8	Tangit FP 635 (section : 40 x 2,5 mm; 4 layers)	34
20	PVC-U	75,0	5,6	Tangit FP 635 (section : 40 x 2,5 mm; 4 layers)	74
21	PVC-U	110,0	5,3	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	74
22	Fe	88,9	3,2	RS 800 (thickness : 30 mm; es <sup>(***)</sup> & nes <sup>(***)</sup> : 500 mm)	≥ 90
23	PVC-U	32,0	1,8	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	≥ 90
24	PVC-U	125,0	2,5	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 8 mm)	≥ 90
25	PVC-U	32,0	2,4	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	82
26	PVC-U	125,0	6,0	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 8 mm)	82
<sup>(*)</sup> Fire protection collar type WM Pacifyre MK II					
<sup>(**)</sup> Thickness intumescent product WM Pacifyre IM7					
<sup>(***)</sup> es : length exposed side; nes : length non-exposed side					

- (1) Time during which the three criteria, i.e. thermal insulation, integrity and stability, are satisfied at the same time.

The results obtained for the pipe penetrations of test 2 according to the criteria of the Belgian Standard NBN 713.020 (edition 1968) are given in the table underneath :

Pipe penetrations - Test 2					Rf <sup>(1)</sup> (min)
Ref.	Characteristic of the pipe			Seal	
	Material	Ø <sub>u</sub> (mm)	Thick- ness (mm)		
2a	Unipipe	75,0	7,5	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm) + rubber insulation (thickness : 44 mm; es <sup>(***)</sup> : 250 mm; nes <sup>(****)</sup> : 950 mm)	≥ 90
2b	Unipipe	75,0	7,5	RS 800 (thickness : 30 mm; es <sup>(****)</sup> & nes <sup>(****)</sup> : 500 mm)	≥ 90
3	Cu	88,9	2,0	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 12 mm) + rubber insulation (thickness : 52 mm; es <sup>(***)</sup> : 250 mm; nes <sup>(****)</sup> : 950 mm)	44
4	Cu	88,9	2,0	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 12 mm) + rubber insulation (thickness : 52 mm; es <sup>(***)</sup> : 250 mm; nes <sup>(****)</sup> : 950 mm)	49
5a	Unipipe	32,0	3,0	RS 800 (thickness : 30 mm; es <sup>(****)</sup> & nes <sup>(****)</sup> : 500 mm)	≥ 90
5b	Unipipe	32,0	3,0	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm) + rubber insulation (thickness : 20 mm; es <sup>(***)</sup> : 250 mm; nes <sup>(****)</sup> : 950 mm)	≥ 90
6	PVC-U	110,0	1,8	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	80
7	PVC-U	110,0	1,8	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm)	86
8	Cu	88,9	2,0	RS 800 (thickness : 30 mm; es <sup>(****)</sup> & nes <sup>(****)</sup> : 500 mm)	≥ 90
9	Cu	88,9	2,0	RS 800 (thickness : 30 mm; es <sup>(****)</sup> & nes <sup>(****)</sup> : 500 mm)	≥ 90
10	Unipipe	50,0	4,5	Fire protection collar <sup>(*)</sup> (thickness <sup>(**)</sup> : 4 mm) + rubber insulation (thickness : 32 mm; es <sup>(***)</sup> : 250 mm; nes <sup>(****)</sup> : 950 mm)	≥ 90
11	Fe	139,7	4,0	RS 800 (thickness : 50 mm; es <sup>(****)</sup> & nes <sup>(****)</sup> : 800 mm)	≥ 90 <sup>(2)</sup>
14	Fe	139,7	8,0	RS 800 (thickness : 50 mm; es <sup>(****)</sup> & nes <sup>(****)</sup> : 800 mm)	≥ 90 <sup>(2)</sup>
15a	Unipipe	50,0	4,5	RS 800 (thickness : 30 mm; es <sup>(****)</sup> & nes <sup>(****)</sup> : 500 mm)	≥ 90 <sup>(2)</sup>
15b	Fe	10,2	1,0	RS 800 (thickness : 20 mm; es <sup>(****)</sup> & nes <sup>(****)</sup> : 450 mm)	≥ 90 <sup>(2)</sup>
<sup>(*)</sup> Fire protection collar type WM Pacifyre MK II					
<sup>(**)</sup> Thickness intumescent product WM Pacifyre IM7					
<sup>(***)</sup> es : length exposed side; nes : length non-exposed side					

(1) Time during which the three criteria, i.e. thermal insulation, integrity and stability, are satisfied at the same time.

(2) An overpressure of only approx. 10 Pa was realised in the furnace at these penetrations, and not 15 Pa as prescribed in the Belgian standard NBN 713.020 (edition 1968). During Test no. 210003445 – 1 (Test 1; see Technical Evaluation 2011-A-003) iron pipes with diameter 139,7 mm (thickness : 4 en 8 mm) were tested through a cellular concrete floor and sealed as described here above. The temperature elevation on the pipe penetrations through the floor and the light partition wall was parallel. As a consequence, we are of the opinion that the difference in pressure for these penetrations will have no influence on the fire resistance.

The results obtained for the cable penetrations according to the criteria of the Belgian Standard NBN 713.020 (edition 1968) are given in the table underneath :

Ref.	Cable penetrations – Test 2	Rf <sup>(1)</sup> (min)
12	Cable rack : perforated, 400 x 60 x 1.75 mm Cables : 10 cables, 5 x 1.5 mm <sup>2</sup> , Ø 14 mm (NYY) 10 cables, 5 x 1.5 mm <sup>2</sup> , Ø 11.2 – 14.4 mm (H07RNF)	≥ 90 <sup>(2)</sup> ≥ 90 <sup>(2)</sup> ≥ 90 <sup>(2)</sup>
	Cable rack : perforated, 400 x 60 x 1.75 mm Cables : 10 cables, 5 x 1.5 mm <sup>2</sup> , Ø 13 mm (N2XH) 2 cables, 1 x 95 mm <sup>2</sup> , Ø 21 mm (NYY)	≥ 90 <sup>(2)</sup> ≥ 90 <sup>(2)</sup> ≥ 90 <sup>(2)</sup>
13	Cable rack : perforated, 400 x 60 x 1.75 mm Cables : 20 cables, 4 x 10 mm <sup>2</sup> , Ø 17.8 mm (NYY) 20 cables, 5 x 1.5 mm <sup>2</sup> (NYY)	≥ 90 <sup>(2)</sup> ≥ 90 <sup>(2)</sup> ≥ 90 <sup>(2)</sup>
	Cable rack : perforated, 400 x 60 x 1.75 mm Cables : 1 cable bundle (Ø 100 mm) 3 cables, 1 x 150 mm <sup>2</sup> , Ø 32.5 mm (N2XSY)	≥ 90 <sup>(2)</sup> ≥ 90 <sup>(2)</sup> ≥ 90 <sup>(2)</sup>

<sup>(1)</sup> Time during which the three criteria, i.e. thermal insulation, integrity and stability, are satisfied at the same time.

<sup>(2)</sup> An overpressure of only approx. 10 Pa was realised in the furnace at these penetrations, and not 15 Pa as prescribed in the Belgian standard NBN 713.020 (edition 1968). During Test no. 210003445 – 1 (Test 2; see Technical Evaluation 2011-A-003) identical cable penetrations were tested through a cellular concrete floor and sealed as described here above. The temperature elevation on the penetrations through the floor and the light partition wall was parallel. As a consequence, we are of the opinion that the difference in pressure for these penetrations will have no influence on the fire resistance.

An opening (dimensions : 350 x 350 mm) was completely filled with intumescent foam **Tangit FP 550** (thickness : 150 mm) and coated with two layers of intumescent coating **Tangit FP 800** (thickness : 1,5 mm). The result obtained for this seal according to the criteria of the Belgian Standard NBN 713.020 (edition 1968) is given in the table underneath :

Ref.	Test 2	Rf <sup>(1)</sup> (min)
1	Opening (350 x 350 mm) completely filled with Tangit FP 550	70

<sup>(1)</sup> Time during which the three criteria, i.e. thermal insulation, integrity and stability, are satisfied at the same time.



### 3. FIELD OF APPLICATION

On the basis of the above mentioned results, we are of the opinion that **the fire resistance** of pipe penetrations, described in § 1.2 of this technical evaluation, in a wall made of stony material (min. thickness : 100 mm; min. volumic mass: 650 kg/m<sup>3</sup>) or in a light partition wall (min. thickness : 100 mm; provided with two layers reinforced gypsum plaster boards (min. thickness : 2 x 12,5 mm) at both sides and with alternating joints, min. fire resistance : 60 minutes), will not be less than **30 minutes** according to the Belgian Standard NBN 713.020 (edition 1968) on the condition that the pipes are sealed as described in § 1.2.

For specific applications with pipe penetrations, reference is made to the above-mentioned tables.

On the basis of the above mentioned results, we are of the opinion that **the fire resistance** according to the Belgian Standard NBN 713.020 (edition 1968) of :

- cable penetrations mentioned underneath in a wall made of stony material (min. thickness : 100 mm; min. volumic mass: 650 kg/m<sup>3</sup>) or in a light partition wall (min. thickness : 100 mm; provided with two layers reinforced gypsum plaster boards (min. thickness : 2 x 12,5 mm) at both sides and with alternating joints, min. fire resistance : 60 minutes), will not be less than **60 minutes** on the condition that the cables are sealed as described in § 1.2 :
  - \* Cables (with copper or aluminium conductor), with the exception of hollow cables :
    - single cables, on the condition that  $\varnothing_{\text{single cable}} \leq \varnothing_{\text{single cable tested}}$ .
    - cable bundles, on the condition that
      - number of cables  $\leq$  number of cables tested,
      - the  $\varnothing_{\text{cable bundle}} \leq \varnothing_{\text{cable bundle tested}}$  ;
      - the  $\varnothing_{\text{individual cable}} \leq \text{max. } \varnothing_{\text{individual cable tested}}$  .
  - \* Cable racks : continuous or interrupted cable racks with maximum dimensions of 400 x 60 mm (thickness : 1,75 mm) and composed as tested.
- an opening (maximum dimensions : 350 x 350 mm) in a wall made of stony material (min. thickness : 100 mm; min. volumic mass: 650 kg/m<sup>3</sup>) or in a light partition wall (min. thickness : 100 mm; provided with two layers reinforced gypsum plaster boards (min. thickness : 2 x 12,5 mm) at both sides and with alternating joints, min. fire resistance : 60 minutes), will not be less than **60 minutes** on the condition that the opening is filled with intumescent foam **Tangit FP 550** (thickness : 150 mm) and coated at both sides with 2 layers of intumescent coating **Tangit FP 800** (thickness : approx. 1,5 mm).

### 4. CONDITIONS FOR THE USE OF THE PRESENT ASSESSMENT

This evaluation is only valid as far as the maximum dimensions of the opening in the non-loaded wall are 350 x 350 mm and a gypsum plasterboard board (section : 150 x 12,5 mm) is fixed all around the opening.

This evaluation is only valid as far as the composition of the products has not been modified with respect to the one of the products that have been subjected to the above referenced test.

This evaluation is only valid when accompanied by the above referenced test report.

This technical evaluation can not be combined with another technical evaluation, except when mentioned explicitly.

This assessment is issued on the basis of test data and information handed over at the time of the demand by the sponsor. If contradictory evidence becomes available afterwards, the assessment will be unconditionally withdrawn and the sponsor will be notified on this. The validity of the present assessment is limited to 3 years after the delivery date mentioned in the present assessment and can be extended after a favourable exam.

Also the sponsor has confirmed in writing that – according to his data – the element, described in the present assessment, has not yet been submitted for a fire test according to the standard to which the assessment above refers.

The sponsor also confirms that he has not been informed about any non public information which could influence this assessment, and in consequence the obtained conclusions

If the sponsor is informed afterwards about such information, he agrees to withdraw the assessment above and its use for regulated purposes – if applicable.

The sponsor also agrees to withdraw this assessment and its use for regulated purposes – if applicable – if the element, which is part of this assessment, is tested according to the standard to which the assessment above refers.

This document is a translation into English of the technical assessment N° 2011-A-002, originally issued in Dutch. In case of doubt, the original version in Dutch prevails.

This technical assessment may be used only literally and completely for publications. For publications of certain texts, in which this technical assessment is mentioned, our permission must be obtained in advance.

Present assessment contains 9 pages.

Date : 4 April 2011

End date of validity : 21 March 2014

Drawn up by :



ir. Pieter Poppe  
Project leader Assessments

Reviewed by



dr. ir. Aloïs Bruls  
Technical Director ISIB Liège