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European Technical Assessment

ETA-14/0293 Of 19/12/2018

General part

Technical Assessment Body issuing the European Technical Assessment:
SKG-IKOB Certificatie BV

Trade name of the construction product

Firetect[®] C

**Product family to which the
construction product belongs**

Fire protective products:
Fire protective board

Manufacturer

KLF Productions & Brandpreventie BV
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Manufacturing plants

A001

**This European Technical Assessment
contains**

30 pages including 1 Annex which form an integral part of
this assessment.

**This European Technical Assessment is
issued in accordance with regulation
(EU) No 305/2011, on the basis of
This version replaces**

EAD 350142-00-1106, edition September 2017

ETA 14-0293, version 1, issued on 23/09/2014

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Specific parts

1 Technical description of the product

Firetect® C is an autoclaved calcium silicate board used as fire resistant board to enhance fire performance of load-bearing steel elements and the use as fire resistant board in fire separating assemblies with no load-bearing requirements.

Load-bearing steel elements with Firetect® C, assembly components:

Product	Description		
Fireprotective board	Firetect® C board Autoclaved calcium silicate board		
	Dimensions		Thickness
	1200 mm x 2400 mm		10, 12, 15, 18, 20, 22, 25 and 27 mm
Mechanical fastener	Non-corrosive Staples, brand Union, type H, c.t.c. distance 100 -120 mm, see annex 1 for detailed specification, (not part of the kit)		

Fire separating assemblies with no load-bearing requirements with Firetect® C, assembly components:

Product	Description			
Fireprotective board	Firetect® C board Autoclaved calcium silicate board			
	Dimensions		Thickness	
	1200 mm x 2400 mm		10, 12, 15, 18, 20, 22, 25 and 27 mm	
Mechanical fastener	Phosphate drylining screws, see annex 1 for detailed specification (not part of the kit). Anchors (steel rawl bolts) into top and bottom profiles, c.t.c. 300 mm (not part of the kit).			
Adhesives	Not applicable			
Jointing material	Joints between the Firetect® C boards up to 3 mm need no finishing. Joints greater than 3 mm are filled with Firetect® Acrylic sealant (not part of the kit).			
Insulation products	Mineral wool, according to EN 13162, see annex 1 for detailed specification (not part of the kit).			
Profiles, framework and studs	Metalstud profile, according to EN14195 (not part of the kit).			
	Position	Code	Size [mm]	Thickness [mm]
	Bottom and top	U 70 F	70 x 40 x 40	0.6
Vertical studs	C 70	68.8 x 49 x 51	0.6	

The applicant has submitted a written declaration that the product and/or constituents of the product contains no substances which have been classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No. 1272/2008 and listed in the 'indicative list on dangerous substances' of the EGDS – taking into account the installation conditions of the construction product and the release scenarios resulting from there.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

According to the manufacturer's declaration the fire protective boards comply with all relevant European and national provisions - known at the date of issuing – applicable for the uses for which they are brought to the market. Firetect® C has no formaldehyde containing components and is 100% asbestos-free.

The use category of Firetect® C in relation to BWR 3 (Hygiene, health and environment, release of dangerous substances) is IA1.

2 Specification of the intended uses in accordance with the applicable European Assessment Document (hereinafter EAD)

2.1 Intended use

The intended use of Firetect® C is to protect elements to be used in assemblies as specified in table 1.

Protection of	EAD 350142-00-1106 reference
Load-bearing steel elements	Type 4
Fire separating assemblies with no load-bearing requirements	Type 8

Table 1: intended use

Detailed information and data of the assemblies is given in Annex 1.

Environmental conditions are type Z₂: intended for use in internal conditions only.

2.2 Working life

The assumed working life of the of Firetect® C is for the intended use 25 years, provided that the assembled product is subject to appropriate installation, use and maintenance. For the intended use type Z₂ no more than accidental wetting and no frost inside the building is to be expected. The indication of 25 years cannot be interpreted as a guarantee given by KLF Productions & Brandpreventie BV, but should only be regarded as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3. Performance of the product and references to the methods used for its assessment

The assessment of fitness for use has been made in accordance with EAD 350142-00-1106.

Kit		
No	Essential Characteristic	Product performances
BWR 2 Safety in case of fire		
1	Reaction to fire	No performance determined
2	Resistance to fire	See annex 1
3	Durability and serviceability	Z ₂
BWR 3 Hygiene, health and environment		
4	Content, emission and/or release of dangerous substances	Declaration of manufacturer
BWR 4 Safety and accessibility in use		
5	Pull through resistance of mechanical fasteners	1025 N *
66	Shear load resistance of mechanical fastening systems	606 N *
7	Resistance to soft body impact	Pass
8	Resistance to hard body impact	Pass
9	Resistance to eccentric load	No performance determined
10	Adhesion	Not applicable
BWR 5 Protection against noise		
11	Airborne sound insulation	No performance determined
12	Sound absorption	No performance determined
13	Impact sound insulation	No performance determined
BWR 6 Energy economy and heat retention		
14	Thermal properties	No performance determined
15	Water vapour transmission coefficient	No performance determined

* Tests have been performed on 12 mm Firetect® C board with phosphate drylining screws Ø 3.5 mm.

Firetect® C		
No	Essential Characteristic	Product performances
BWR 2 Safety in case of fire		
16	Reaction to fire	Class A1
17	Resistance to fire	See annex 1
18	Durability and serviceability	Z ₂ *
BWR 3 Hygiene, health and environment		
19	Water permeability	Not relevant
BWR 4 Safety and accessibility in use		
20	Flexural strength	7.46 MPa **
21	Dimensional stability	No performance determined
BWR 6 Energy economy and heat retention		
22	Thermal resistance	No performance determined
23	Water vapour transmission coefficient	No performance determined

* Tests have been performed on 12 mm Firetect® C board. Compressive strength: 8.6 N/mm², Tensile strength perpendicular to the plane of the board: 0.372 N/mm².

** The boards have sufficient strength to support their own mass. The boards are not intended to support additional loads.

Mechanical fasteners		
No	Essential Characteristic	Product performances
BWR 2 Safety in case of fire		
24	Reaction to fire	Class A1
25	Durability and serviceability	Z ₂
BWR 4 Safety and accessibility in use		
26	Pull-out resistance of mechanical fasteners	0.93 kN *

* Tests have been performed on phosphate drylining screws Ø 3.5 mm on metal stud profile U70F, steel sheet thickness 0,6 mm.

Adhesives		
No	Essential Characteristic	Product performances
BWR 2 Safety in case of fire		
27	Reaction to fire	Not applicable
28	Durability and serviceability	Not applicable
BWR 4 Safety and accessibility in use		
29	Mechanical resistance and stability	Not applicable

Jointing material		
No	Essential Characteristic	Product performances
BWR 2 Safety in case of fire		
30	Reaction to fire	See ETA 15/0630
31	Durability and serviceability	Z ₂ , See ETA 15/0630

Insulation products		
No	Essential Characteristic	Product performances
BWR 2 Safety in case of fire		
32	Reaction to fire	Class A1
33	Resistance to fire	See annex 1
BWR 6 Energy economy and heat retention		
34	Thermal resistance	See annex 1
35	Water vapour transmission coefficient	No performance determined

Profiles, framework and studs		
No	Essential Characteristic	Product performances
BWR 2 Safety in case of fire		
36	Reaction to fire	Class A1
37	Durability and serviceability	Z ₂
BWR 4 Safety and accessibility in use		
38	Mechanical resistance and stability	No performance determined
BWR 6 Energy economy and heat retention		
39	Thermal resistance	No performance determined

4 **Assessment and verification of consistency of performance (hereinafter AVCP) system applied, with reference to its legal base**

According to the decision 1999/454/EC – Commission Decision of date 22nd June 1999 on the procedure for attesting the conformity of construction products pursuant to Article 20(2) of Council Directive 89/106/EEC as regards fire stopping, fire sealing and fire protective products, published in the Official Journal of the European Union (OJEU) L178/52 of 14/07/1999, see <http://eur-lex.europa.eu/JOIndex.do> of the European Commission¹, as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table(s) applies (apply).

Product(s)	Intended use(s)	Level(s) or class(es)	System(s)
Fire stopping and fire sealing products	For fire compartmentation and/or fire protection or fire performance	Any	1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Tasks of the manufacturer

Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this European Technical Assessment. The manufacturer may only use initial / raw / constituent materials stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the Control Plan of 13/11/2018 relating to the European technical assessment ETA 14/0293 issued on 19/12/2018 which is part of the technical documentation of this European technical approval. The "Control Plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited at SKG-IKOB. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

Other tasks of the manufacturer

Additional information

The manufacturer shall provide a technical data sheet and an installation instruction with the following minimum information:

(a) Technical data sheet:

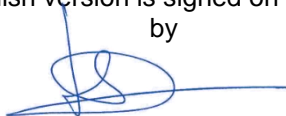
- Field of application:
- Building elements for which the penetration seal is suitable, type and properties of the building elements like minimum thickness, density, and - in case of lightweight constructions – the construction requirements.
- Limits in size, minimum thickness etc. of the penetration seal
- Construction of the penetration seal including the necessary components and additional products (e.g. backfilling material) with clear indication whether they are generic or specific.
- Services which the penetration seal is suitable, type and properties of the services like material, diameter, thickness etc. in case of pipes including insulation materials; necessary/allowed supports/fixings (e.g. cable trays)

(b) Installation instruction:

- Steps to be followed
- Procedure in case of retrofitting
- Stipulations on maintenance, repair and replacement

Issued in Geldermalsen, the Netherlands on 19.12.2018

The original English version is signed on behalf of SKG-IKOB
by



SKG-IKOB, manager productcertification
ir. H.A.J. van Dartel

ANNEX 1: Fire resistance performances and assembly methods for uses of boards covered by this ETA

Annex 1.1 Overview of fire resistance performances for Firetect® C drywall assemblies

1.1.1 Firetect® C10, EI 30

Assembly assessed within the framework of this ETA	Classification according to EN 13501-2	Test Standard	Intended use type according to EAD 350142-00-1106
Non-loadbearing walls protected by Firetect® C board	EI 30	EN 1364-1:1999	Type 8

Assembly with 2 layers of 10 mm Firetect C:

- Dimensions wall partition: maximum height 4000 mm (18 mm play at top), no limitations for width
- 1 layer of Firetect C of 10 mm
- Metalstud profile, according to EN14195

Position	Code	Size [mm]	Material thickness [mm]
Bottom and top	U 70 F	70 x 40 x 40	0.6
Vertical studs	C 70	68.8 x 49 x 51	0.6

- Mineral wool, according to EN 13162, density ~ 45 kg/m³, $\lambda = 0.037$ W/mK and 70 mm thick and melting point > 1000°C
- 1 layer of Firetect C of 10 mm

The following fastening materials were used:

- Phosphate drylining screws \varnothing 3.5 x 25 mm, c.t.c. distance 300 mm screwed into the C70 profiles.
- Anchors (steel rawl bolts) into top and bottom profiles, c.t.c. 300 mm.

1.1.2 Firetect® C18, EI 60

Assembly assessed within the framework of this ETA	Classification according to EN 13501-2	Test Standard	Intended use type according to EAD 350142-00-1106
Non-loadbearing walls protected by Firetect® C board	EI 60	EN 1364-1:1999	Type 8

Assembly with 2 layers of 18 mm Firetect C:

- Dimensions wall partition: maximum height 4000 mm (22 mm play at top), no limitations for width
- 1 layer of Firetect C of 18 mm.
- Metalstud profile, according to EN14195

Position	Code	Size [mm]	Material thickness [mm]
Bottom and top	U 70 F	70 x 40 x 40	0.6
Vertical studs	C 70	68.8 x 49 x 51	0.6

- Mineral wool, according to EN 13162, density ~ 45 kg/m³, $\lambda = 0.037$ W/mK and 70 mm thick and melting point > 1000°C
- 1 layer of Firetect C of 18 mm.

The following fastening materials were used:

- Phosphate drylining screws \varnothing 3.5 x 25 mm, c.t.c. distance 300 mm screwed into the C70 profiles.
- Anchors (steel rawl bolts) into top and bottom profiles, c.t.c. 300 mm.

1.1.3 Firetect® C15, EI 90

Assembly assessed within the framework of this ETA	Classification according to EN 13501-2	Test Standard	Intended use type according to EAD 350142-00-1106
Non-loadbearing walls protected by Firetect® C board	EI 90	EN 1364-1:1999	Type 8

Assembly with 4 layers of 15 mm Firetect C:

- Dimensions wall partition: maximum height 4000 mm (22 mm play at top), no limitations for width
- 2 layers of Firetect C of 15 mm.
- Metalstud profile, according to EN14195

Position	Code	Size [mm]	Material thickness [mm]
Bottom and top	U 70 F	70 x 40 x 40	0.6
Vertical studs	C 70	68.8 x 49 x 51	0.6

- Mineral wool, according to EN 13162, density ~ 45 kg/m³, $\lambda = 0.037$ W/mK and 70 mm thick and melting point > 1000°C
- 2 layers of Firetect C of 15 mm.

The following fastening materials were used:

- Phosphate drylining screws \varnothing 3.5 x 35 mm (for the first layer of panelling), c.t.c. distance 300 mm screwed into the C70 profiles.
- Phosphate drylining screws \varnothing 3.5 x 55 mm (for the second layer of panelling), c.t.c. distance 300 mm into the C70 profiles.
- Anchors (steel rawl bolts) into top and bottom profiles, c.t.c. 300 mm.

1.1.4 Firetect® C18 EI 120

Assembly assessed within the framework of this ETA	Classification according to EN 13501-2	Test Standard	Intended use type according to EAD 350142-00-1106
Non-loadbearing walls protected by Firetect® C board	EI 120	EN 1364-1:1999	Type 8

Assembly with 4 layers of 18 mm Firetect C:

- Dimensions wall partition: maximum height 4000 mm (24 mm play at top), no limitations for width
- 2 layer of Firetect C of 10 mm.
- Metalstud profile, according to EN14195

Position	Code	Size [mm]	Material thickness [mm]
Bottom and top	U 70 F	70 x 40 x 40	0.6
Vertical studs	C 70	68.8 x 49 x 51	0.6

- Mineral wool, according to EN 13162, density ~ 45 kg/m³, $\lambda = 0.037$ W/mK and 70 mm thick and melting point > 1000°C
- 2 layer of Firetect C of 18 mm.

The following fastening materials were used:

- Phosphate drylining screws \varnothing 3.5 x 35 mm (for the first layer of panelling), c.t.c. distance 300 mm screwed into the C70 profiles.
- Phosphate drylining screws \varnothing 3.5 x 55 mm (for the second layer of panelling), c.t.c. distance 300 mm into the C70 profiles.
- Anchors (steel rawl bolts) into top and bottom profiles, c.t.c. 300 mm.

1.1.5 Firetect® C15, EI 240

Assembly assessed within the framework of this ETA	Classification according to EN 13501-2	Test Standard	Intended use type according to EAD 350142-00-1106
Non-loadbearing walls protected by Firetect® C board	EI 240	EN 1364-1:1999	Type 8

Assembly with 6 layers of 15 mm Firetect C:

- Dimensions wall partition: maximum height 4000 mm (16 mm play at top), no limitations for width
- 3 layers of Firetect C of 15 mm.
- Metalstud profile, according to EN14195

Position	Code	Size [mm]	Material thickness [mm]
Bottom and top	U 70 F	70 x 40 x 40	0.6
Vertical studs	C 70	68.8 x 49 x 51	0.6

- Mineral wool, according to EN 13162, density ~ 45 kg/m³, $\lambda = 0.037$ W/mK and 70 mm thick and melting point > 1000°C
- 3 layers of Firetect C of 15 mm.

The following fastening materials were used:

- Phosphate drylining screws $\varnothing 3.5$ x 35 mm (for the first layer of panelling), c.t.c. distance 300 mm screwed into the C70 profiles.
- Phosphate drylining screws $\varnothing 3.5$ x 55 mm (for the second layer of panelling), c.t.c. distance 300 mm into the C70 profiles.
- Phosphate drylining screws $\varnothing 3.5$ x 70 mm (for the third layer of panelling), c.t.c. distance 300 mm into the C70 profiles.
- Anchors (steel rawl bolts) into top and bottom profiles, c.t.c. 300 mm.

1.2 Overview of fire resistance performances for Steel Columns and beams with Firetect® C assemblies

Assembly assessed within the framework of this ETA	Classification according to EN 13501-2	Test Standard	Intended use type according to EAD 350142-00-1106
Load-bearing steel elements protected by Firetect® C board	R 30 – R 60 R 90 – R 120 R 180	EN 13381-4:2013	Type 4

The following fastening materials were used:

Non-corrosive staples, brand Union, type H, c.t.c. distance 100 -120 mm.

- For single board ≤ 15 mm layer: staple with crown 8.6 mm, thread 1.05 x 1.27 mm, staple length: minimum board layer thickness + 20 mm.
- For single and multiple board > 15 mm layer: staple with crown 10.8 mm, thread 1.05 x 1.27 mm, staple length: minimum board layer thickness + 20 mm.

Joints:

Joints between the Firetect® C boards up to 3 mm need no finishing.

Joints greater than 3 mm are filled with Firetect® Acrylic sealant.

1.2.1 I-section Columns: Intercepts

Steel Temp. [°C]	Fire Resistance [min]	Board Thickness					
		12mm		30mm		50mm	
		Intercept [m]	Am/V [m-1]	Intercept [m]	Am/V [m-1]	Intercept [m]	Am/V [m-1]
350 °C	30 min	0.009699	103	0.002165	462	0.000748	-
	60 min	0.022494	44	0.007241	138	0.001522	-
	90 min	0.035290	28	0.015130	66	0.002295	436
	120 min	0.048085	21	0.023019	43	0.003069	326
	150 min	0.060880	16	0.030908	32	0.006508	154
	180 min	0.073675	14	0.038797	26	0.011125	90
400 °C	30 min	0.008425	119	0.002127	-	0.000728	-
	60 min	0.019726	51	0.006701	149	0.001492	-
	90 min	0.031027	32	0.013762	73	0.002257	443
	120 min	0.042328	24	0.020823	48	0.003022	331
	150 min	0.053630	19	0.027884	36	0.005937	168
	180 min	0.064931	15	0.034945	29	0.010125	99
450 °C	30 min	0.007330	136	0.002085	-	0.000719	-
	60 min	0.017374	58	0.006269	160	0.001491	-
	90 min	0.027417	36	0.012678	79	0.002263	442
	120 min	0.037461	27	0.019086	52	0.003035	330
	150 min	0.047504	21	0.025495	39	0.005694	176
	180 min	0.057548	17	0.031904	31	0.009373	107
500 °C	30 min	0.006330	158	0.001938	-	0.000678	-
	60 min	0.015196	66	0.005460	183	0.001430	-
	90 min	0.024061	42	0.011259	89	0.002183	-
	120 min	0.032927	30	0.017059	59	0.002935	341
	150 min	0.041793	24	0.022858	44	0.005015	199
	180 min	0.050659	20	0.028657	35	0.008388	119
550 °C	30 min	0.005392	185	0.001791	-	0.000636	-
	60 min	0.013178	76	0.004747	211	0.001375	-
	90 min	0.020963	48	0.009914	101	0.002115	-
	120 min	0.028749	35	0.015082	66	0.002854	350
	150 min	0.036534	27	0.020250	49	0.004451	225
	180 min	0.044320	23	0.025417	39	0.007402	135

Steel Temp. [°C]	Fire Resistance [min]	Board Thickness					
		12mm		30mm		50mm	
		Intercept [m]	Am/V [m-1]	Intercept [m]	Am/V [m-1]	Intercept [m]	Am/V [m-1]
600 °C	30 min	0.004919	203	0.001673	-	0.000587	-
	60 min	0.012088	83	0.004361	229	0.001316	-
	90 min	0.019256	52	0.009102	110	0.002045	-
	120 min	0.026424	38	0.013844	72	0.002774	360
	150 min	0.033592	30	0.018585	54	0.004010	249
	180 min	0.040760	25	0.023327	43	0.006606	151
650 °C	30 min	0.004513	222	0.001592	-	0.000526	-
	60 min	0.011076	90	0.004303	232	0.001251	-
	90 min	0.017639	57	0.008722	115	0.001977	-
	120 min	0.024202	41	0.013142	76	0.002702	370
	150 min	0.030765	33	0.017561	57	0.003712	269
	180 min	0.037328	27	0.021980	45	0.006132	163
700 °C	30 min	0.004116	243	0.001413	-	0.000449	-
	60 min	0.010111	99	0.004064	246	0.001181	-
	90 min	0.016106	62	0.008234	121	0.001912	-
	120 min	0.022101	45	0.012404	81	0.002643	378
	150 min	0.028096	36	0.016574	60	0.003518	284
	180 min	0.034091	29	0.020745	48	0.005772	173
750 °C	30 min	0.003591	278	0.001087	-	0.000331	-
	60 min	0.009030	111	0.003556	281	0.001051	-
	90 min	0.014470	69	0.007378	136	0.001771	-
	120 min	0.019909	50	0.011199	89	0.002492	401
	150 min	0.025349	39	0.015021	67	0.003212	311
	180 min	0.030788	32	0.018843	53	0.005016	199

1.2.2 Overview of fire resistance performances for I-section Beams and Columns with Firetect® C assemblies:

Design Steel Temperature 350°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	12	15	25	32	35	38
55	12	15	25	32	35	40
60	12	18	30	32	35	42
65	12	18	30	32	38	45
70	12	18	32	32	38	45
75	12	18	32	35	38	48
80	12	20	32	35	38	48
85	12	20	32	35	40	50
90	12	22	32	35	40	50
95	12	22	32	35	42	-
100	12	25	32	35	42	-
105	15	25	35	35	42	-
110	15	25	35	35	45	-
115	15	27	35	38	45	-
120	15	27	35	38	45	-
125	15	30	35	38	48	-
130	15	30	35	38	48	-
135	15	30	35	38	48	-
140	15	32	35	38	48	-
145	15	32	35	38	50	-
150	15	32	35	38	50	-
155	15	32	35	38	-	-
160	15	32	38	40	-	-
165	18	32	38	40	-	-
170	18	32	38	40	-	-
175	18	32	38	40	-	-
180	18	32	38	40	-	-
185	18	32	38	42	-	-
190	18	35	38	42	-	-
195	18	35	38	42	-	-
200	18	35	38	42	-	-
205	18	35	38	42	-	-
210	18	35	38	42	-	-
215	18	35	40	45	-	-

Design Steel Temperature 350°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
220	18	35	40	45	-	-
225	20	35	40	45	-	-
230	20	35	40	45	-	-
235	20	35	40	45	-	-
240	20	35	40	45	-	-
245	20	35	40	45	-	-
250	20	35	40	45	-	-
255	20	35	42	45	-	-
260	20	35	42	48	-	-
265	22	35	42	48	-	-
270	22	38	42	48	-	-
275	22	38	42	48	-	-
280	22	38	42	48	-	-
285	22	38	42	48	-	-
290	22	38	45	48	-	-
295	22	38	45	48	-	-
300	22	38	45	50	-	-
305	25	38	45	50	-	-
310	25	38	45	50	-	-
315	25	38	45	50	-	-
320	25	38	45	50	-	-
325	25	38	45	50	-	-
330	25	38	45	-	-	-
335	25	38	45	-	-	-
340	25	38	45	-	-	-
345	25	38	48	-	-	-
350	25	40	48	-	-	-
355	25	40	48	-	-	-
220	18	35	40	45	-	-
225	20	35	40	45	-	-
230	20	35	40	45	-	-
235	20	35	40	45	-	-
240	20	35	40	45	-	-
245	20	35	40	45	-	-

Design Steel Temperature 400°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	12	12	20	32	35	38
55	12	15	25	32	35	38
60	12	15	25	32	35	40
65	12	15	27	32	35	42
70	12	18	30	32	38	42
75	12	18	32	32	38	45
80	12	18	32	35	38	45
85	12	20	32	35	38	48
90	12	20	32	35	40	48
95	12	22	32	35	40	50
100	12	22	32	35	40	-
105	12	22	32	35	42	-
110	12	25	32	35	42	-
115	12	25	35	35	42	-
120	15	25	35	38	45	-
125	15	27	35	38	45	-
130	15	27	35	38	45	-
135	15	30	35	38	45	-
140	15	30	35	38	48	-
145	15	30	35	38	48	-
150	15	32	35	38	48	-
155	15	32	35	38	50	-
160	15	32	35	38	50	-
165	15	32	35	40	50	-
170	15	32	38	40	-	-
175	15	32	38	40	-	-
180	18	32	38	40	-	-
185	18	32	38	40	-	-
190	18	32	38	42	-	-
195	18	32	38	42	-	-
200	18	32	38	42	-	-
205	18	35	38	42	-	-
210	18	35	38	42	-	-
215	18	35	38	42	-	-
220	18	35	38	45	-	-
225	18	35	40	45	-	-
230	18	35	40	45	-	-

Design Steel Temperature 400°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
235	18	35	40	45	-	-
240	20	35	40	45	-	-
245	20	35	40	45	-	-
250	20	35	40	45	-	-
255	20	35	40	45	-	-
260	20	35	42	45	-	-
265	20	35	42	48	-	-
270	20	35	42	48	-	-
275	20	35	42	48	-	-
280	22	38	42	48	-	-
285	22	38	42	48	-	-
290	22	38	42	48	-	-
295	22	38	42	48	-	-
300	22	38	45	48	-	-
305	22	38	45	50	-	-
310	22	38	45	50	-	-
315	25	38	45	50	-	-
320	25	38	45	50	-	-
325	25	38	45	50	-	-
330	25	38	45	50	-	-
335	25	38	45	-	-	-
340	25	38	45	-	-	-
345	25	38	45	-	-	-
350	25	38	45	-	-	-
355	25	38	48	-	-	-

Design Steel Temperature 450°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	12	12	18	30	32	35
55	12	12	20	32	35	38
60	12	15	25	32	35	38
65	12	15	25	32	35	40
70	12	15	27	32	35	42
75	12	15	30	32	38	42
80	12	18	32	35	38	45
85	12	18	32	35	38	45
90	12	18	32	35	38	48
95	12	20	32	35	40	48
100	12	20	32	35	40	50
105	12	22	32	35	40	50
110	12	22	32	35	42	-
115	12	25	32	35	42	-
120	12	25	35	35	42	-
125	12	25	35	38	45	-
130	12	25	35	38	45	-
135	12	27	35	38	45	-
140	15	27	35	38	45	-
145	15	30	35	38	48	-
150	15	30	35	38	48	-
155	15	30	35	38	48	-
160	15	30	35	38	48	-
165	15	32	35	40	50	-
170	15	32	38	40	50	-
175	15	32	38	40	50	-
180	15	32	38	40	-	-
185	15	32	38	40	-	-
190	15	32	38	40	-	-
195	18	32	38	42	-	-
200	18	32	38	42	-	-
205	18	32	38	42	-	-
210	18	32	38	42	-	-
215	18	35	38	42	-	-
220	18	35	38	45	-	-
225	18	35	40	45	-	-
230	18	35	40	45	-	-

Design Steel Temperature 450°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
235	18	35	40	45	-	-
240	18	35	40	45	-	-
245	18	35	40	45	-	-
250	18	35	40	45	-	-
255	20	35	40	45	-	-
260	20	35	40	45	-	-
265	20	35	42	48	-	-
270	20	35	42	48	-	-
275	20	35	42	48	-	-
280	20	35	42	48	-	-
285	20	35	42	48	-	-
290	22	38	42	48	-	-
295	22	38	42	48	-	-
300	22	38	45	48	-	-
305	22	38	45	50	-	-
310	22	38	45	50	-	-
315	22	38	45	50	-	-
320	22	38	45	50	-	-
325	22	38	45	50	-	-
330	25	38	45	50	-	-
335	25	38	45	-	-	-
340	25	38	45	-	-	-
345	25	38	45	-	-	-
350	25	38	45	-	-	-
355	25	38	48	-	-	-

Design Steel Temperature 500°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	12	12	18	25	32	35
55	12	12	18	30	32	35
60	12	12	20	32	35	38
65	12	12	22	32	35	38
70	12	15	25	32	35	40
75	12	15	25	32	35	40
80	12	15	27	32	35	42
85	12	15	30	32	38	42
90	12	18	32	35	38	45
95	12	18	32	35	38	45
100	12	18	32	35	38	48
105	12	18	32	35	38	48
110	12	20	32	35	40	48
115	12	20	32	35	40	50
120	12	22	32	35	40	-
125	12	22	32	35	42	-
130	12	22	35	38	42	-
135	12	25	35	38	42	-
140	12	25	35	38	45	-
145	12	25	35	38	45	-
150	12	25	35	38	45	-
155	12	27	35	38	45	-
160	15	27	35	38	45	-
165	15	30	35	38	48	-
170	15	30	35	38	48	-
175	15	30	35	40	48	-
180	15	30	35	40	48	-
185	15	32	38	40	50	-
190	15	32	38	40	50	-
195	15	32	38	40	50	-
200	15	32	38	40	-	-
205	15	32	38	42	-	-
210	15	32	38	42	-	-
215	15	32	38	42	-	-
220	18	32	38	42	-	-
225	18	32	38	42	-	-
230	18	32	38	45	-	-

Design Steel Temperature 500°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
235	18	35	38	45	-	-
240	18	35	40	45	-	-
245	18	35	40	45	-	-
250	18	35	40	45	-	-
255	18	35	40	45	-	-
260	18	35	40	45	-	-
265	18	35	40	45	-	-
270	18	35	40	45	-	-
275	18	35	42	48	-	-
280	20	35	42	48	-	-
285	20	35	42	48	-	-
290	20	35	42	48	-	-
295	20	35	42	48	-	-
300	20	35	42	48	-	-
305	20	35	42	48	-	-
310	20	35	42	48	-	-
315	20	38	45	50	-	-
320	22	38	45	50	-	-
325	22	38	45	50	-	-
330	22	38	45	50	-	-
335	22	38	45	50	-	-
340	22	38	45	50	-	-
345	22	38	45	-	-	-
350	22	38	45	-	-	-
355	22	38	45	-	-	-

Design Steel Temperature 550°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	12	12	15	22	32	35
55	12	12	15	25	32	35
60	12	12	18	27	32	35
65	12	12	18	30	32	38
70	12	12	20	32	35	38
75	12	12	22	32	35	38
80	12	15	25	32	35	40
85	12	15	25	32	35	40
90	12	15	27	32	35	42
95	12	15	30	35	38	42
100	12	18	30	35	38	45
105	12	18	32	35	38	45
110	12	18	32	35	38	45
115	12	18	32	35	38	48
120	12	18	32	35	40	48
125	12	20	32	35	40	48
130	12	20	32	35	40	50
135	12	20	32	35	40	50
140	12	22	35	38	42	-
145	12	22	35	38	42	-
150	12	22	35	38	42	-
155	12	25	35	38	45	-
160	12	25	35	38	45	-
165	12	25	35	38	45	-
170	12	25	35	38	45	-
175	12	27	35	38	45	-
180	12	27	35	40	45	-
185	12	27	35	40	48	-
190	15	30	35	40	48	-
195	15	30	38	40	48	-
200	15	30	38	40	48	-
205	15	30	38	40	48	-
210	15	30	38	42	50	-
215	15	32	38	42	50	-
220	15	32	38	42	50	-
225	15	32	38	42	50	-
230	15	32	38	42	-	-

Design Steel Temperature 550°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
235	15	32	38	42	-	-
240	15	32	38	45	-	-
245	15	32	38	45	-	-
250	18	32	40	45	-	-
255	18	32	40	45	-	-
260	18	32	40	45	-	-
265	18	35	40	45	-	-
270	18	35	40	45	-	-
275	18	35	40	45	-	-
280	18	35	40	48	-	-
285	18	35	40	48	-	-
290	18	35	42	48	-	-
295	18	35	42	48	-	-
300	18	35	42	48	-	-
305	18	35	42	48	-	-
310	20	35	42	48	-	-
315	20	35	42	48	-	-
320	20	35	42	48	-	-
325	20	35	45	50	-	-
330	20	35	45	50	-	-
335	20	35	45	50	-	-
340	20	35	45	50	-	-
345	20	38	45	50	-	-
350	20	38	45	50	-	-
355	22	38	45	-	-	-

Design Steel Temperature 600°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	12	12	12	20	27	32
55	12	12	15	22	32	35
60	12	12	15	25	32	35
65	12	12	18	27	32	35
70	12	12	18	30	32	35
75	12	12	20	32	35	38
80	12	12	22	32	35	38
85	12	15	25	32	35	38
90	12	15	25	32	35	40
95	12	15	27	32	35	40
100	12	15	27	32	35	42
105	12	15	30	35	38	42
110	12	18	30	35	38	45
115	12	18	32	35	38	45
120	12	18	32	35	38	45
125	12	18	32	35	38	48
130	12	18	32	35	38	48
135	12	20	32	35	40	48
140	12	20	32	35	40	48
145	12	20	32	38	40	50
150	12	22	35	38	40	50
155	12	22	35	38	42	-
160	12	22	35	38	42	-
165	12	25	35	38	42	-
170	12	25	35	38	42	-
175	12	25	35	38	45	-
180	12	25	35	38	45	-
185	12	25	35	38	45	-
190	12	27	35	40	45	-
195	12	27	35	40	45	-
200	12	27	35	40	45	-
205	15	30	38	40	48	-
210	15	30	38	40	48	-
215	15	30	38	40	48	-
220	15	30	38	42	48	-
225	15	30	38	42	48	-
230	15	32	38	42	50	-

Design Steel Temperature 600°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
235	15	32	38	42	50	-
240	15	32	38	42	50	-
245	15	32	38	45	50	-
250	15	32	38	45	-	-
255	15	32	38	45	-	-
260	15	32	38	45	-	-
265	15	32	40	45	-	-
270	18	32	40	45	-	-
275	18	32	40	45	-	-
280	18	32	40	45	-	-
285	18	35	40	45	-	-
290	18	35	40	48	-	-
295	18	35	40	48	-	-
300	18	35	42	48	-	-
305	18	35	42	48	-	-
310	18	35	42	48	-	-
315	18	35	42	48	-	-
320	18	35	42	48	-	-
325	18	35	42	48	-	-
330	18	35	42	48	-	-
335	20	35	42	50	-	-
340	20	35	45	50	-	-
345	20	35	45	50	-	-
350	20	35	45	50	-	-
355	20	35	45	50	-	-

Design Steel Temperature 650°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	12	12	12	18	25	32
55	12	12	12	20	30	32
60	12	12	15	22	32	35
65	12	12	15	25	32	35
70	12	12	18	27	32	35
75	12	12	18	30	32	38
80	12	12	20	32	35	38
85	12	12	22	32	35	38
90	12	12	25	32	35	38
95	12	15	25	32	35	40
100	12	15	27	32	35	40
105	12	15	27	32	35	42
110	12	15	30	35	35	42
115	12	18	30	35	38	42
120	12	18	32	35	38	45
125	12	18	32	35	38	45
130	12	18	32	35	38	45
135	12	18	32	35	38	48
140	12	20	32	35	38	48
145	12	20	32	35	40	48
150	12	20	32	38	40	48
155	12	22	35	38	40	50
160	12	22	35	38	40	50
165	12	22	35	38	42	-
170	12	25	35	38	42	-
175	12	25	35	38	42	-
180	12	25	35	38	42	-
185	12	25	35	38	45	-
190	12	25	35	38	45	-
195	12	27	35	40	45	-
200	12	27	35	40	45	-
205	12	27	35	40	45	-
210	12	30	35	40	45	-
215	12	30	38	40	45	-
220	12	30	38	40	48	-
225	15	30	38	42	48	-
230	15	30	38	42	48	-

Design Steel Temperature 650°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
235	15	32	38	42	48	-
240	15	32	38	42	48	-
245	15	32	38	42	48	-
250	15	32	38	42	50	-
255	15	32	38	45	50	-
260	15	32	38	45	50	-
265	15	32	38	45	50	-
270	15	32	38	45	-	-
275	15	32	40	45	-	-
280	15	32	40	45	-	-
285	15	32	40	45	-	-
290	18	35	40	45	-	-
295	18	35	40	45	-	-
300	18	35	40	48	-	-
305	18	35	40	48	-	-
310	18	35	40	48	-	-
315	18	35	42	48	-	-
320	18	35	42	48	-	-
325	18	35	42	48	-	-
330	18	35	42	48	-	-
335	18	35	42	48	-	-
340	18	35	42	48	-	-
345	18	35	42	50	-	-
350	18	35	45	50	-	-
355	18	35	45	50	-	-

Design Steel Temperature 700°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	12	12	12	15	25	32
55	12	12	12	18	27	32
60	12	12	12	20	30	32
65	12	12	15	22	32	35
70	12	12	15	25	32	35
75	12	12	18	27	32	35
80	12	12	18	30	32	38
85	12	12	20	32	35	38
90	12	12	22	32	35	38
95	12	12	25	32	35	38
100	12	15	25	32	35	40
105	12	15	27	32	35	40
110	12	15	27	32	35	40
115	12	15	30	35	35	42
120	12	15	30	35	38	42
125	12	18	32	35	38	45
130	12	18	32	35	38	45
135	12	18	32	35	38	45
140	12	18	32	35	38	45
145	12	18	32	35	38	48
150	12	20	32	35	40	48
155	12	20	32	35	40	48
160	12	20	32	38	40	48
165	12	22	35	38	40	50
170	12	22	35	38	40	50
175	12	22	35	38	42	-
180	12	22	35	38	42	-
185	12	25	35	38	42	-
190	12	25	35	38	42	-
195	12	25	35	38	45	-
200	12	25	35	40	45	-
205	12	25	35	40	45	-
210	12	27	35	40	45	-
215	12	27	35	40	45	-
220	12	27	35	40	45	-
225	12	30	38	40	45	-
230	12	30	38	42	48	-

Design Steel Temperature 700°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
235	12	30	38	42	48	-
240	12	30	38	42	48	-
245	15	30	38	42	48	-
250	15	32	38	42	48	-
255	15	32	38	42	48	-
260	15	32	38	45	48	-
265	15	32	38	45	50	-
270	15	32	38	45	50	-
275	15	32	38	45	50	-
280	15	32	38	45	50	-
285	15	32	40	45	-	-
290	15	32	40	45	-	-
295	15	32	40	45	-	-
300	15	32	40	45	-	-
305	15	32	40	48	-	-
310	15	35	40	48	-	-
315	15	35	40	48	-	-
320	15	35	40	48	-	-
325	18	35	42	48	-	-
330	18	35	42	48	-	-
335	18	35	42	48	-	-
340	18	35	42	48	-	-
345	18	35	42	48	-	-
350	18	35	42	50	-	-
355	18	35	42	50	-	-

Design Steel Temperature 750°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
50	12	12	12	12	20	30
55	12	12	12	15	25	32
60	12	12	12	18	27	32
65	12	12	12	20	30	32
70	12	12	15	22	32	35
75	12	12	15	25	32	35
80	12	12	15	27	32	35
85	12	12	18	30	32	35
90	12	12	18	32	32	38
95	12	12	20	32	35	38
100	12	12	22	32	35	38
105	12	12	22	32	35	38
110	12	12	25	32	35	38
115	12	15	25	32	35	40
120	12	15	27	32	35	40
125	12	15	30	35	35	40
130	12	15	30	35	38	42
135	12	15	30	35	38	42
140	12	18	32	35	38	42
145	12	18	32	35	38	45
150	12	18	32	35	38	45
155	12	18	32	35	38	45
160	12	18	32	35	38	45
165	12	18	32	35	40	48
170	12	20	32	38	40	48
175	12	20	32	38	40	48
180	12	20	35	38	40	48
185	12	20	35	38	40	50
190	12	22	35	38	42	50
195	12	22	35	38	42	50
200	12	22	35	38	42	-
205	12	22	35	38	42	-
210	12	25	35	38	42	-
215	12	25	35	40	45	-
220	12	25	35	40	45	-
225	12	25	35	40	45	-
230	12	25	35	40	45	-

Design Steel Temperature 750°C						
Firetect C Required Board Thickness						
Hp/A	30 min	60 min	90 min	120 min	150 min	180 min
[m-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
235	12	27	35	40	45	-
240	12	27	35	40	45	-
245	12	27	38	40	45	-
250	12	27	38	42	45	-
255	12	30	38	42	48	-
260	12	30	38	42	48	-
265	12	30	38	42	48	-
270	12	30	38	42	48	-
275	12	30	38	42	48	-
280	15	30	38	45	48	-
285	15	32	38	45	48	-
290	15	32	38	45	50	-
295	15	32	38	45	50	-
300	15	32	38	45	50	-
305	15	32	38	45	50	-
310	15	32	40	45	50	-
315	15	32	40	45	-	-
320	15	32	40	45	-	-
325	15	32	40	48	-	-
330	15	32	40	48	-	-
335	15	32	40	48	-	-
340	15	32	40	48	-	-
345	15	32	40	48	-	-
350	15	35	40	48	-	-
355	15	35	42	48	-	-