Hochbau
Brandschutz
Technik

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Zulassung

ISIBOARD Brandschutzplatte Typ L
Stahlbekleidung
ETA- 12/0231

Hochbau Brandschutz Technik

I D E N T E R K L Ä R U N G

Hiermit erklären wir, dass die ISIBOARD-Brandschutzplatte Typ L, Baustoffzulassung DIBT Nr. Z-56.412-969 / EN-Klassifizierungsbericht 13.501-1 baugleich ist mit der FireFree ScandiBoard Brandschutzplatte, Baustoffzulassung DIBT Nr. Z-56.412-967 / EN-Klassifizierungsbericht 13.501-1 Daher sind die mit diesen Brandschutzplatten geprüften Brandschutzkonstruktionen auch wechselseitig gültig.

Dies gilt derzeit für die Konstruktionen:

Stahlblech-Luftkanalbekleidung EI 90 – HBT-Klassifizierungsbericht
Stahlstützen-Bekleidung R 30 – R 180 – ETA Scandi Supply
Stahlträger-Bekleidung R 30 - R180 - ETA Scandi Supply.

Frielendorf, den 19.05.2012

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Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

European Technical Assessment ETA-12/0231 of 2014/01/28

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:	FireFree® ScandiBoard 850
Product family to which the above construction product belongs:	PAC 35: Fire stopping, Fire sealing and Fire protective products, Fire retardant products (Fire protective board)
Manufacturer:	Scandi Supply a/s Energivej 2 DK-5492 Vissenbjerg Tel: +45 76 24 48 00 Fax: +45 76 24 48 01 www.scandisupply.dk
Manufacturing plant:	Scandi Supply a/s Manufacturing Plant II Energivej 2 DK-5492 Vissenbjerg
This European Technical Assessment contains:	27 pages including 4 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	Guideline for European Technical Approval (ETAG) No 018 Fire Protective Products, edition November 2004, part 1 General and part 4 Fire protective board, slab and mat products and kits., used as European Assessment Document (EAD).
This version replaces:	ETA-12/0231 issued on 2012/04/17

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

Technical description of the product
The FireFree® ScandiBoard 850 board is a lightweight calcium silicate board. The board is grey in appearance.

Dimensions and density
Dimensions and density of the board is given in table 1.

Table 1: Dimensions and density

Bulk density, dry: 250 kg/m^3			
Tolerance on the length and width: ± 2,5 mm			
Tolerance on the thickness: ± 1,5 mm			
Length, mm	Width, mm	Thickness, mm	Weight kg pr. m^2
1220	1000	22	5,50
1220	1000	25	6,25
1220	1000	30	7,50
1220	1000	35	8,75
1220	1000	40	10,00
1220	1000	45	11,25
1220	1000	47	11,75
1220	1000	50	12,50
1220	1000	55	13,75
1220	1000	60	15,00
2040	1220	22	5,50
2040	1220	25	6,25
2040	1220	30	7,50
2040	1220	35	8,75
2040	1220	40	10,00
2040	1220	45	11,25
2040	1220	47	11,75
2040	1220	50	12,50
2040	1220	55	13,75
2040	1220	60	15,00

Ancillary products
Ancillary products referred to in this ETA, as a part of installation provisions or in the framework of determining performances (e.g. fire resistance test), are not covered by this ETA and cannot be CE marked on the basis of it.

2 Specification of the intended use in accordance with the applicable EAD

The intended use of the board is internal use designated as type Z_2 in ETAG 018-4.

The board is intended to protect elements to be used in assemblies as specified in table 2:

Table 2: Intended use

Protection of	ETAG 018-4 reference	Assessment within the framework of this ETA
Load bearing concrete elements	Type 3	No
Load bearing steel elements	Type 4	Load bearing steel beam and column protection
Load bearing flat concrete profiles sheet composite elements	Type 5	No
Load bearing concrete filled hollow steel elements	Type 6	No
Load bearing timber elements	Type 7	No
Fire separating assemblies with no load bearing requirements	Type 8	No
Technical services in buildings	Type 9	Fire protection of ventilation ducts
Uses not covered by type 1-9	Type 10	No

Table 1 shows the possible intended uses of the boards. Not all of these have been assessed within the framework of this ETA with regard to fire resistance performance. Annex 2 shows a list of the uses for which fire resistance assessment was carried out. This ETA covers assemblies installed in accordance with the provisions given in Annex 2.

With regard to fire resistance performance, the other intended uses are supported by other means at national level (as specified in the note in paragraph 3.2.2 of this ETA).

The provisions made in this European Technical Assessment are based on an assumed intended working

life of the board of 25 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, but are to be regarded only 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

Characteristic		Assessment of characteristic
3.1	**Mechanical resistance and stability (BR1)**	Not relevant.
3.2	**Safety in case of fire (BR2)**	
	3.2.1 Reaction to fire	Euroclass A1
	3.2.2 Resistance to fire	The design charts for determining the resistance to fire performance according to is presented in annex 2. NOTE: In accordance with ETAG 018-4 (foreword), until 10 years after the initial issuing of this ETA, or until the withdrawal of relevant national test and classification standards, CE marking will cover a limited number of assemblies subjected to fire resistance assessment. As time progresses, the performance declaration for fire resistance covered by CE marking should gradually be enlarged by the ETA-holder and incorporated in this ETA by amendment or revision. In the meantime, and taking into account the transitional arrangements for test and classification standards and the corresponding national legislation (see EC Guidance paper J), the ETA-holder shall be permitted to maintain and be able to use - on a national basis - his portfolio of test data for this characteristic, based on relevant national standards, next to the performance declaration covered by the CE marking based on this ETA. The fire protective ability of the board is presented in annex 3.
	3.2.3 Resistance to fire of ventilations ducts	**EI90($v_e h_o i \leftrightarrow o$)S** according to EN 13501-3 The direct field of application for this classification is given in annex 4
3.3	**Hygiene, health and the environment (BR3)**	
	3.3.1 Air and water permeability	This characteristic is not relevant for the intended use Z_2 (internal use)
	3.3.2 Dangerous substances	No dangerous materials *) The boards have no formaldehyde containing components
3.4	**Safety in use (BR4)**	
	3.4.1 Flexural strength	The declared MOR for the board is 1,0 MPa. The boards have sufficient strength to support their own mass. The boards are not intended to support additional loads.
	3.4.2 Dimensional stability	The boards, tested in accordance with EN 1604, are dimensionally stable.
3.5	**Protection against noise (BR5)**	No performance determined
3.6	**Energy economy and heat retention (BR6)**	
	3.6.1 Thermal conductivity	The mean λ_{10}-value for a 50 mm thick board is 0,0659 W/mK
	3.6.2 Water vapour permeability	No performance determined
3.7	**Sustainable use of natural resources (BR7)**	No performance determined

Characteristic	Assessment of characteristic
3.8 Related aspects of product performance	
3.8.1 Resistance to deterioration caused by water	This characteristic is not relevant to the intended use Z2 if no more than accidental wetting is expected.
3.8.2 Resistance soak/dry	This characteristic is not relevant for the intended use Z_2 (internal use)
3.8.3 Resistance to freeze/thaw	This characteristic is not relevant to the intended use Z2 if no frost is to be expected inside the building.
3.8.4 Resistance to heat/rain	This characteristic is not relevant for the intended use Z_2 (internal use)
3.8.5 Basic durability assessment	Product performances of the boards covered by this ETA confirm a working life of 25 years for the intended use type Z2 (internal use if no more than accidental wetting and no frost inside the building is to be expected)
3.8.6 Product properties	See section II.1 of this ETA
3.8.7 Compressive strength	The board have a compressive strength of 2,8 MPa

*) 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.

3.9 General aspects related to the fitness for use of the product

All materials shall be manufactured by Scandi Supply A/S or by subcontractors under the responsibility of Scandi Supply A/S

The European Technical Assessment is issued for the product on the basis of agreed data/information, deposited with ETA-Danmark, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to ETA-Danmark before the changes are introduced. ETA-Danmark will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

Cutting and machining

The fire protective boards shall be cut and machined using conventional woodworking equipment. The use of saw blades with hardened teeth or with tungsten carbide tipped blades is recommended. When machining the fire protective board with power tools, dust extraction shall take place and inhalation of dust should be avoided.

A safety data sheet is available from the manufacturer upon request.

Joints

The fire protective boards shall be butt jointed. The boards can have square or beveled edges. The type of edge shall be in accordance with the assemblies described in annex 2.

Joints in adjacent boards, where possible, shall be staggered over a minimum distance of 300 mm.

Mechanical fasteners

Fastening of the fire protective boards onto the support structure shall be in accordance with the assembly information provided in annex 1.

Surface treatment

The board surface allows most types of decoration.

When applying a surface treatment, the absorption capacity and alkalinity of the boards have to be taken into account.

Assessment of the influence of surface treatment (such as plastering, paints, tiles, wallpaper), on the performance of the boards, has not been performed in the framework of this ETA.

Assembly

The boards shall be applied as specified in the assemblies in annex 2.

4 Assessment and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 99/454/EC of the European Commission, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 1.

For initial type testing of the product the tasks for the notified body are limited to the following characteristics:
- Reaction to fire
- Resistance to fire
- Mechanical resistance and stability
- Release of dangerous substances

For initial inspection of the factory and of FPC, and for continuous surveillance, judgment and assessment of the FPC parameters related to the following characteristics are of interest to the approved body:
- Reaction to fire
- Mechanical resistance and stability

4.2 Uses subject to reaction to fire regulations

The system of attestation of conformity is specified in the EC Decision 99/454/EC, as amended by EC Decision 2001/596/EC, is system 1, 3 or 4 described in Regulation (EU) No 305/2011, depending on the classes declared.

For Fire protective Products under systems 1 and 3, regarding the initial type testing of the product, the task for the notified laboratory is limited to the assessment of the Euroclass characteristics for reaction to fire, as indicated in the Commission Decision 94/611/EC.

For Fire Protective Products under system 1, for initial inspection of the factory and of FPC and for continuous surveillance, assessment and approval of the FPC parameters related to the Euroclass characteristics for reaction to fire, as indicated in the Commission Decision 94/611/EC are of interest of the notified body.

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

5.1 Tasks of the manufacturer

5.1.1 Factory production control

The manufacturer has a factory production control system in the plant and exercises permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This production control system ensures that the product is in conformity with the European Technical Assessment.

The manufacturer shall only use raw materials supplied with the relevant inspection documents as laid down in the control plan[1]. The incoming raw materials shall be subject to controls and tests by the manufacturer before acceptance. Check of incoming materials shall include control of the inspection documents presented by suppliers.

The frequency of controls and tests conducted during production and on the assembled anchor is laid down in the control plan taking account of the automated manufacturing process of the anchor.

The results of factory production control are recorded and evaluated. The records include at least the following information:
- designation of the product, basic material and components; type of control or testing;
- date of manufacture of the product and date of testing of the product or basic material and components;
- result of control and testing and, if appropriate, comparison with requirements;
- signature of person responsible for factory production control.

The records shall be presented to the inspection body during the continuous surveillance. On request, they shall be presented to ETA-Danmark

Details of the extent, nature and frequency of testing and controls to be performed within the factory production control shall correspond to the prescribed test plan which is part of the technical documentation of this European Technical Assessment.

5.2. Tasks of notified bodies

5.2.1 Initial type testing of the product

For initial type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary initial type testing has to be agreed between ETA-Danmark and the notified body

5.2.2 Initial inspection of factory and of factory production control

The Notified body shall ascertain that, in accordance with the control plan, the factory and the factory

1 The control plan has been deposited at ETA-Danmark and is only made available to the Notified bodies involved in the conformity attestation procedure.

production control are suitable to ensure continuous and orderly manufacturing of the anchor according to the specifications mentioned in 2.1 as well as to the Annexes to the European Technical Assessment.

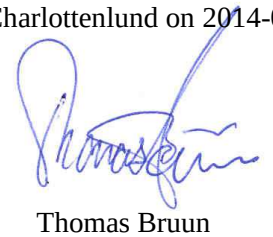
5.2.3 Continuous surveillance

The Notified body shall visit the factory at least once a year for regular inspection. It has to be verified that the system of factory production control and the specified automated manufacturing process are maintained taking account of the control plan.

Continuous surveillance and assessment of factory production control have to be performed according to the control plan.

The results of product certification and continuous surveillance shall be made available on demand by the certification body or inspection body, respectively, to ETA-Danmark. In cases where the provisions of the European Technical Assessment and the control plan are no longer fulfilled the conformity certificate shall be withdrawn.

Issued in Charlottenlund on 2014-01-28 by



Thomas Bruun
Managing Director, ETA-Danmark

Annex 1
Assembly

Assembly of FireFree® ScandiBoard 850 to closed steel sections

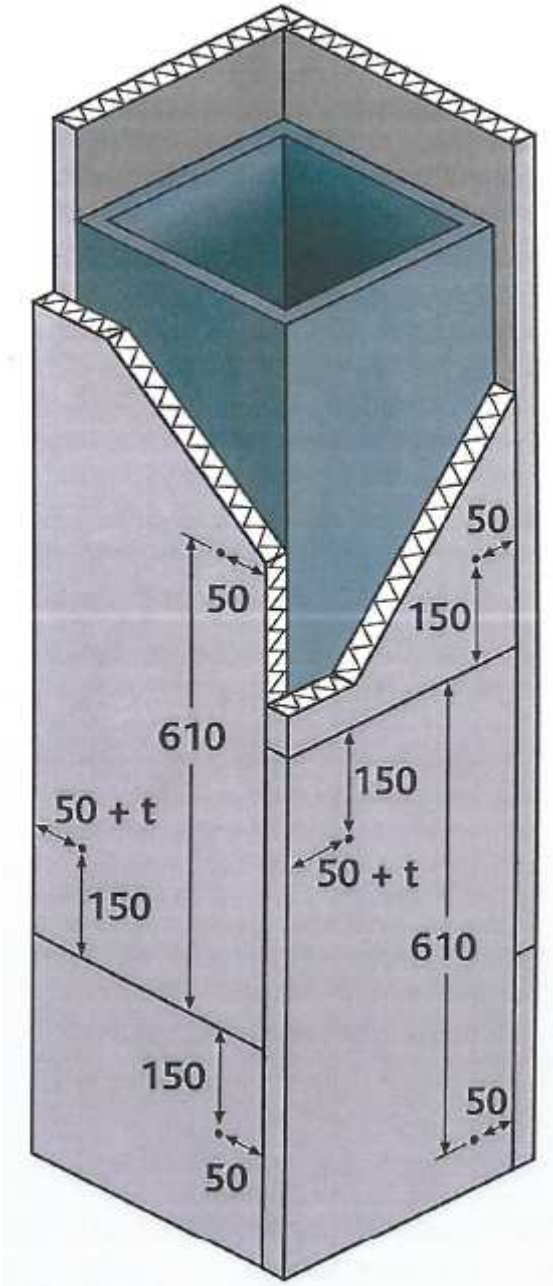


Figure A.1 Position of shot nails in closed profiled steel – four sided protection

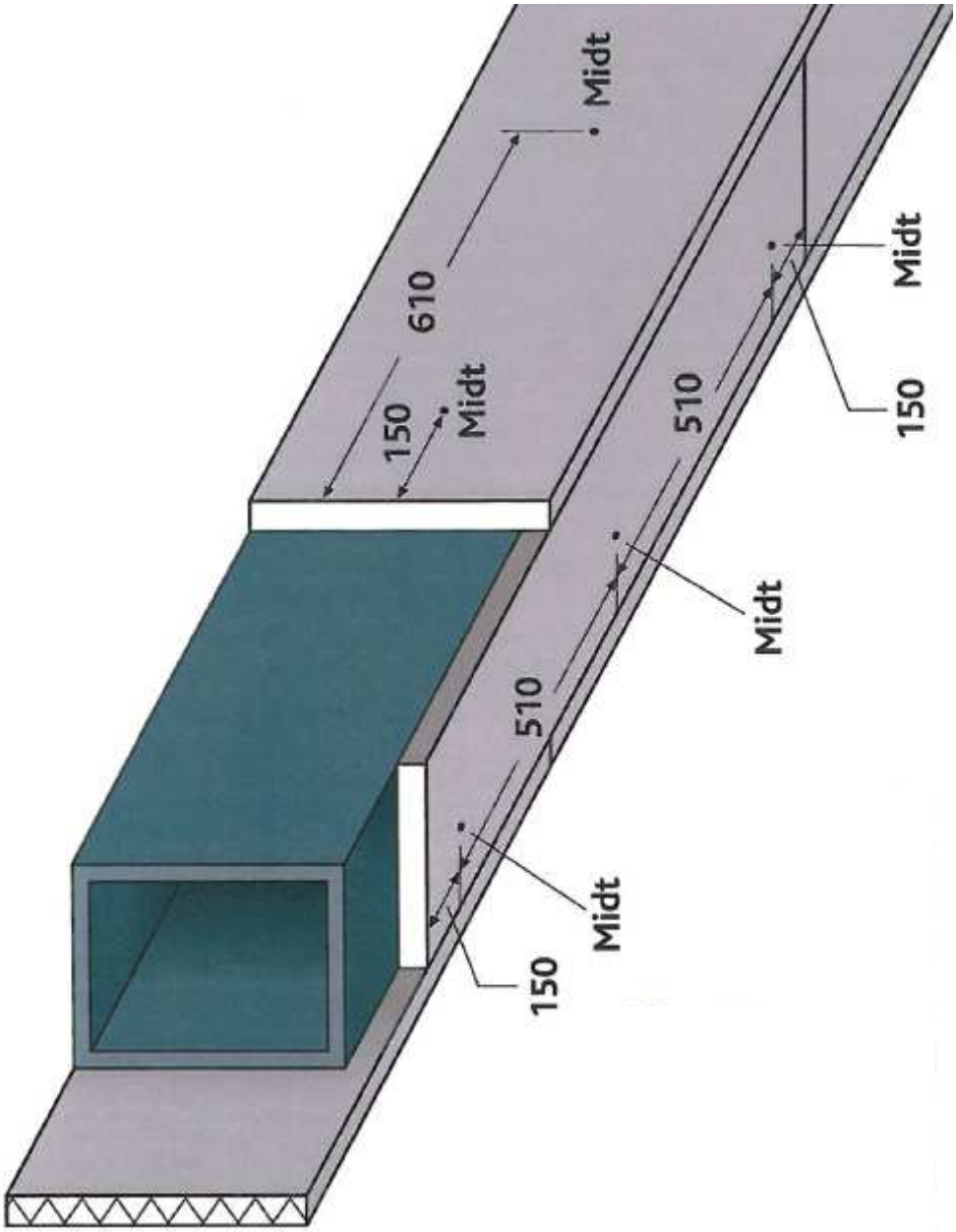


Figure A.2 Position of shot nails in closed profiled steel – three sided
Shot nails length 37 mm with Ø30 mm washer used for 25 mm fire protection
Shot nails length 62 mm with Ø30 mm washer used for 50 mm fire protection
Midt = centre

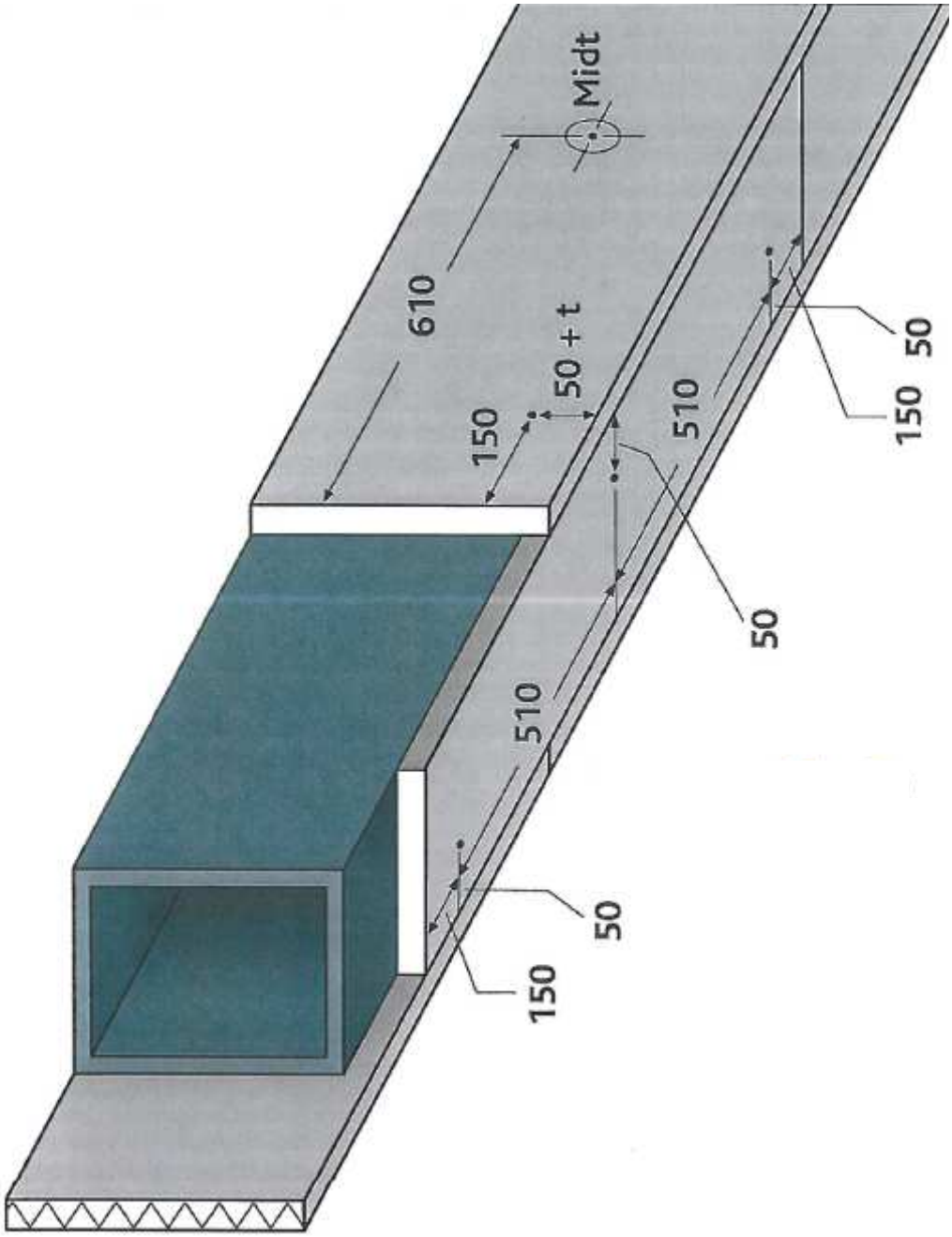


Figure A.3 Position of shot nails in closed profiled steel – three sided
Shot nails length 37 mm with Ø30 mm washer used for 25 mm fire protection
Shot nails length 62 mm with Ø30 mm washer used for 50 mm fire protection
Midt = centre

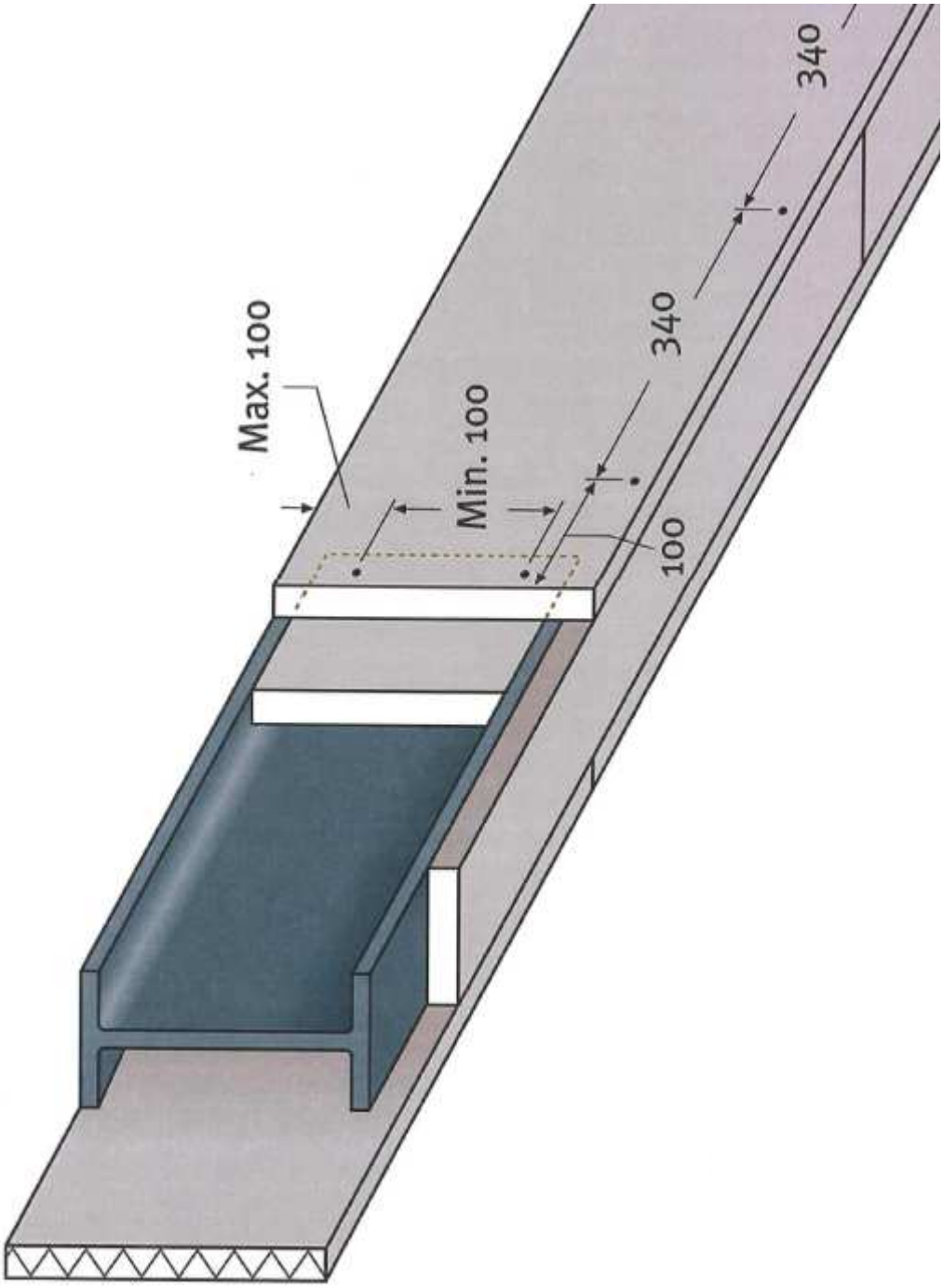


Figure A.4 Position of screws in open profiled steel – three sided
Screws 3,8 × 45 mm used for 25 mm fire protection
Screws 5,0 × 90 mm used for 50 mm fire protection

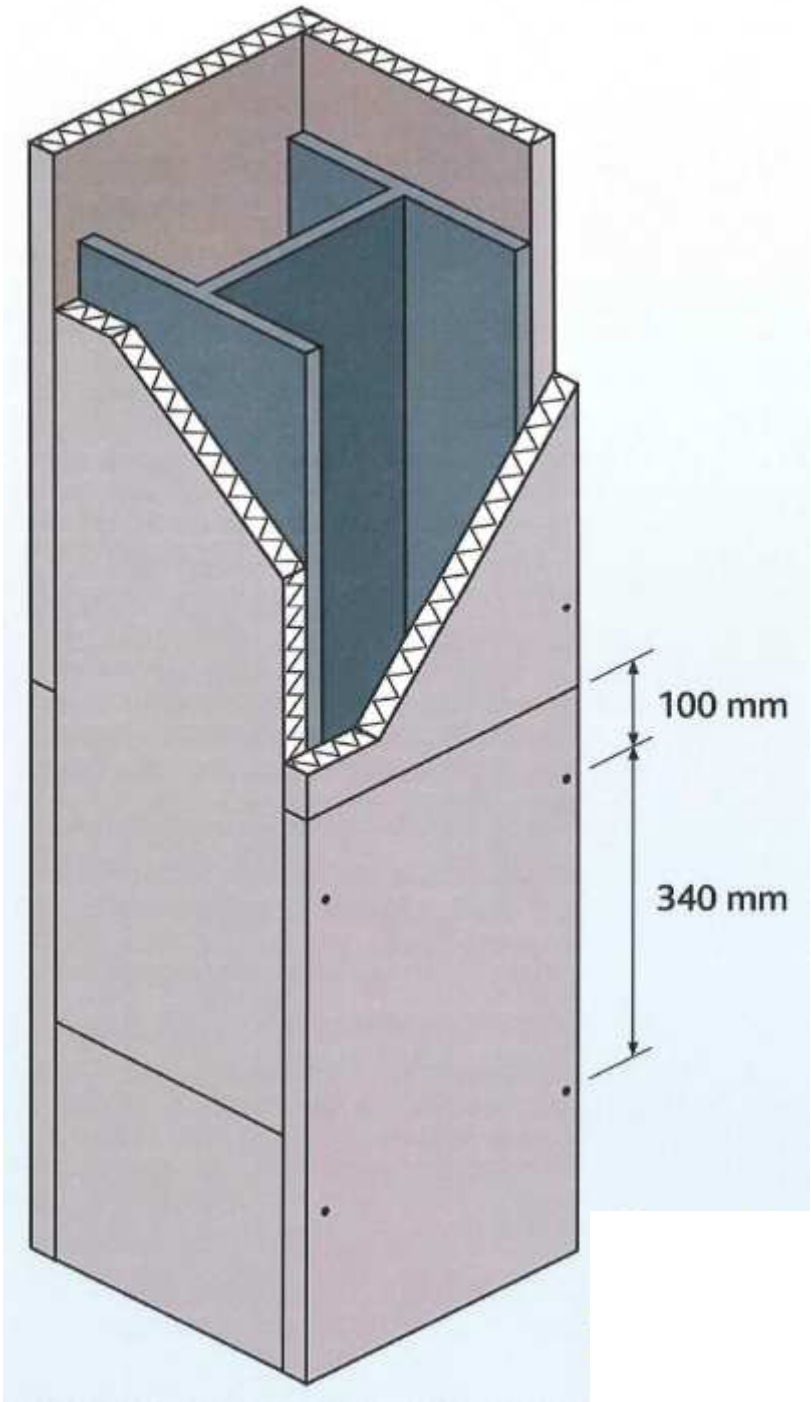


Figure A.5 Position of screws in open profiled steel – four sided
Screws 3,8 × 45 mm used for 25 mm fire protection
Screws 5,0 × 90 mm used for 50 mm fire protection

Annex 2
Design charts

FireFree® ScandiBoard 850 for Passive Fire Protection of steel - for HSQ and closed profiles when using shot nails

	R 30		R 60						
A_m/V m^{-1}	350ºC	400-750ºC	350ºC	400ºC	450ºC	500ºC	550ºC	600ºC	650-750ºC
60	25	25	25	25	25	25	25	25	25
65	25	25	25	25	25	25	25	25	25
70	25	25	25	25	25	25	25	25	25
75	25	25	30	25	25	25	25	25	25
80	25	25	30	25	25	25	25	25	25
85	25	25	30	25	25	25	25	25	25
90	25	25	30	25	25	25	25	25	25
95	25	25	30	25	25	25	25	25	25
100	25	25	30	30	25	25	25	25	25
105	25	25	30	30	25	25	25	25	25
110	25	25	30	30	25	25	25	25	25
115	25	25	35	30	25	25	25	25	25
120	25	25	35	30	25	25	25	25	25
125	25	25	35	30	25	25	25	25	25
130	25	25	35	30	25	25	25	25	25
135	25	25	35	30	30	25	25	25	25
140	25	25	35	30	30	25	25	25	25
145	25	25	35	30	30	25	25	25	25
150	25	25	35	35	30	25	25	25	25
155	25	25	35	35	30	25	25	25	25
160	25	25	40	35	30	25	25	25	25
165	25	25	40	35	30	25	25	25	25
170	25	25	40	35	30	25	25	25	25
175	25	25	40	35	30	25	25	25	25
180	25	25	40	35	30	25	25	25	25
185	25	25	40	35	30	25	25	25	25
190	25	25	40	35	30	30	25	25	25
195	25	25	40	35	30	30	25	25	25
200	25	25	40	35	30	30	25	25	25
205	25	25	40	35	30	30	25	25	25
210	25	25	45	35	35	30	25	25	25
215	25	25	45	40	35	30	25	25	25
220	25	25	45	40	35	30	25	25	25
225	25	25	45	40	35	30	25	25	25
230	25	25	45	40	35	30	25	25	25
235	25	25	45	40	35	30	25	25	25
240	30	25	45	40	35	30	25	25	25
245	30	25	45	40	35	30	25	25	25
250	30	25	45	40	35	30	25	25	25
255	30	25	45	40	35	30	25	25	25
260	30	25	50	40	35	30	25	25	25
265	30	25	50	40	35	30	25	25	25
270	30	25	50	40	35	30	25	25	25
275	30	25	50	40	35	30	25	25	25
280	30	25	50	40	35	30	30	25	25
285	30	25	50	45	35	30	30	25	25
290	30	25	50	45	35	30	30	25	25

NOTE: If the U/A is placed between two different board thicknesses, please take the thickest

Table B.1 30 and minute fire resistance closed profiles

FireFree® ScandiBoard 850 for Passive Fire Protection of steel - for HSQ and closed profiles when using shot nails

	R 90								
	Design temperature								
A_m/V m^{-1}	350ºC	400ºC	450ºC	500ºC	550ºC	600ºC	650ºC	700ºC	750ºC
60	30	30	25	25	25	25	25	25	25
65	35	30	25	25	25	25	25	25	25
70	35	30	30	25	25	25	25	25	25
75	35	30	30	25	25	25	25	25	25
80	35	35	30	25	25	25	25	25	25
85	35	35	30	30	25	25	25	25	25
90	40	35	30	30	25	25	25	25	25
95	40	35	30	30	25	25	25	25	25
100	40	35	35	30	25	25	25	25	25
105	40	35	35	30	25	25	25	25	25
110	40	40	35	30	30	25	25	25	25
115	45	40	35	30	30	25	25	25	25
120	45	40	35	30	30	25	25	25	25
125	45	40	35	35	30	25	25	25	25
130	45	40	35	35	30	25	25	25	25
135	45	40	40	35	30	30	25	25	25
140	45	45	40	35	30	30	25	25	25
145	50	45	40	35	30	30	25	25	25
150	50	45	40	35	30	30	25	25	25
155	50	45	40	35	35	30	25	25	25
160	50	45	40	35	35	30	25	25	25
165	50	45	40	40	35	30	25	25	25
170	55	45	40	40	35	30	25	25	25
175	55	50	45	40	35	30	30	25	25
180	55	50	45	40	35	30	30	25	25
185		50	45	40	35	30	30	25	25
190		50	45	40	35	30	30	25	25
195		50	45	40	35	35	30	25	25
200		50	45	40	35	35	30	25	25
205		50	45	40	35	35	30	25	25
210		55	45	40	35	35	30	25	25
215		55	45	40	40	35	30	25	25
220		55	50	45	40	35	30	25	25
225		55	50	45	40	35	30	30	25
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235			50	45	40	35	30	30	25
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245			50	45	40	35	30	30	25
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265			50	45	40	35	35	30	25
270			55	45	40	35	35	30	25
275			55	45	40	35	35	30	25
280			55	45	40	35	35	30	25
285			55	50	40	35	35	30	25
290			55	50	45	40	35	30	25

NOTE: If the U/A is placed between two different board thicknesses, please take the thickest

Table B.2 90 minutes fire resistance closed profiles

FireFree® ScandiBoard 850 for Passive Fire Protection of steel - for HSQ and closed profiles when using shot nails

	R 120								
	Design temperature								
A_m/V m^{-1}	350ºC	400ºC	450ºC	500ºC	550ºC	600ºC	650ºC	700ºC	750ºC
60	35	35	30	30	25	25	25	25	25
65	40	35	35	30	25	25	25	25	25
70	40	35	35	30	30	25	25	25	25
75	40	40	35	30	30	25	25	25	25
80	45	40	35	35	30	30	25	25	25
85	45	40	40	35	30	30	25	25	25
90	45	40	40	35	35	30	25	25	25
95	45	45	40	35	35	30	30	25	25
100	50	45	40	40	35	30	30	25	25
105	50	45	40	40	35	30	30	25	25
110	50	45	45	40	35	35	30	25	25
115	50	50	45	40	35	35	30	30	25
120	55	50	45	40	40	35	30	30	25
125		50	45	40	40	35	30	30	25
130		50	45	45	40	35	35	30	25
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190				50	50	45	40	35	35
195				55	50	45	40	35	35
200				55	50	45	40	35	35
205				55	50	45	40	35	35
210					50	45	40	35	35
215					50	45	40	40	35
220					50	45	40	40	35
225					50	45	40	40	35
230					50	45	45	40	35
235					50	45	45	40	35
240					55	50	45	40	35
245					55	50	45	40	35
250					55	50	45	40	35
255					55	50	45	40	35
260					55	50	45	40	35
265						50	45	40	35
270						50	45	40	40
275						50	45	40	40
280						50	45	40	40
285						50	45	40	40
290						50	45	40	40

NOTE: If the U/A is placed between two different board thicknesses, please take the thickest

Table B.3 120 minutes fire resistance closed profiles

FireFree® ScandiBoard 850 for Passive Fire Protection of steel - for HSQ and closed profiles when using shot nails

	R 180								
	Design temperature								
A_m/V m^{-1}	350ºC	400ºC	450ºC	500ºC	550ºC	600ºC	650ºC	700ºC	750ºC
60	45	45	40	40	35	35	30	30	25
65	50	45	45	40	40	35	35	30	30
70	50	50	45	45	40	35	35	30	30
75	55	50	50	45	40	40	35	35	30
80		55	50	45	45	40	40	35	30
85			50	50	45	40	40	35	35
90			55	50	45	45	40	40	35
95				50	50	45	45	40	35
100				55	50	45	45	40	35
105					50	50	45	40	40
110					55	50	45	40	40
115					55	50	45	45	40
120						50	50	45	40
125						55	50	45	40
130						55	50	45	45
135							50	45	45
140							50	50	45
145							55	50	45
150							55	50	45
155							55	50	45
160								50	50
165								50	50
170								55	50
175								55	50
180								55	50
185									50
190									50
195									50
200									55
205									55
210									55
215									55
220									
225									
230									
235									
240									
245									
250									
255									
260									
265									
270									
275									
280									
285									
290									

NOTE: If the U/A is placed between two different board thicknesses, please take the thickest

Table B.4 180 minutes fire resistance closed profiles

FireFree® ScandiBoard 850 thickness for Passive Fire Protection of steel – for open profiles when using screws and stables

	R 30	R 60						
A_m/V m^{-1}	350-650ºC	350ºC	400ºC	450ºC	500ºC	550ºC	600ºC	650ºC
40	22	22	22	22	22	22	22	22
45	22	22	22	22	22	22	22	22
50	22	22	22	22	22	22	22	22
55	22	22	22	22	22	22	22	22
60	22	22	22	22	22	22	22	22
65	22	22	22	22	22	22	22	22
70	22	22	22	22	22	22	22	22
75	22	22	22	22	22	22	22	22
80	22	22	22	22	22	22	22	22
85	22	22	22	22	22	22	22	22
90	22	22	22	22	22	22	22	22
95	22	22	22	22	22	22	22	22
100	22	22	22	22	22	22	22	22
105	22	22	22	22	22	22	22	22
110	22	22	22	22	22	22	22	22
115	22	22	22	22	22	22	22	22
120	22	22	22	22	22	22	22	22
125	22	25	22	22	22	22	22	22
130	22	25	22	22	22	22	22	22
135	22	25	22	22	22	22	22	22
140	22	25	22	22	22	22	22	22
145	22	25	25	22	22	22	22	22
150	22	30	25	22	22	22	22	22
155	22	30	25	22	22	22	22	22
160	22	30	25	22	22	22	22	22
165	22	30	30	22	22	22	22	22
170	22	30	30	25	22	22	22	22
175	22	30	30	25	22	22	22	22
180	22	35	30	25	22	22	22	22
185	22	35	30	25	22	22	22	22
190	22	35	30	30	25	22	22	22
195	22	35	30	30	25	22	22	22
200	22	40	35	30	25	22	22	22
205	22	40	35	30	25	22	22	22
210	22	40	35	30	25	22	22	22
215	22	40	35	30	30	25	22	22
220	22	40	35	30	30	25	22	22
225	22	40	35	30	30	25	22	22
230	22	45	40	35	30	25	22	22
235	22	45	40	35	30	25	22	22
240	22	45	40	35	30	30	25	22
245	22	45	40	35	30	30	25	22
250	22	45	40	35	30	30	25	22
255	22	45	40	35	35	30	25	22
260	22	50	40	35	35	30	25	22
265	22	50	45	40	35	30	25	22
270	22	50	45	40	35	30	30	25
275	22	50	45	40	35	30	30	25
280	22	50	45	40	35	30	30	25
285	22	50	45	40	35	30	30	25
290	22	55	45	40	35	35	30	25
300	22	55	50	40	35	35	30	25

NOTE: If the A_m/V is placed between two different board thicknesses, please take the thickest

Table B.5 30 and 60 minutes fire resistance open profiles

FireFree® ScandiBoard 850 thickness for Passive Fire Protection of steel – for open profiles when using screws and stables

	R 90						
A_m/V m^{-1}	350ºC	400ºC	450ºC	500ºC	550ºC	600ºC	650ºC
40	22	22	22	22	22	22	22
45	22	22	22	22	22	22	22
50	22	22	22	22	22	22	22
55	22	22	22	22	22	22	22
60	22	22	22	22	22	22	22
65	22	22	22	22	22	22	22
70	22	22	22	22	22	22	22
75	25	22	22	22	22	22	22
80	25	22	22	22	22	22	22
85	30	25	22	22	22	22	22
90	30	25	22	22	22	22	22
95	30	30	25	22	22	22	22
100	35	30	25	22	22	22	22
105	35	30	25	22	22	22	22
110	35	30	30	25	22	22	22
115	40	35	30	25	22	22	22
120	40	35	30	30	25	22	22
125	40	35	30	30	25	22	22
130	45	40	35	30	25	22	22
135	45	40	35	30	30	25	22
140	45	40	35	30	30	25	22
145	50	40	35	35	30	25	22
150	50	45	40	35	30	30	25
155	50	45	40	35	30	30	25
160	55	45	40	35	30	30	25
165	55	45	40	35	35	30	25
170	55	50	45	40	35	30	30
175	60	50	45	40	35	30	30
180	60	50	45	40	35	35	30
185	60	55	45	40	35	35	30
190		55	50	40	40	35	30
195		55	50	45	40	35	30
200		55	50	45	40	35	35
205		60	50	45	40	35	35
210		60	50	45	40	40	35
215		60	55	50	45	40	35
220			55	50	45	40	35
225			55	50	45	40	35
230			55	50	45	40	35
235			60	50	45	40	40
240			60	55	45	45	40
245			60	55	50	45	40
250			60	55	50	45	40
255				55	50	45	40
260				55	50	45	40
265				60	50	45	40
270				60	55	50	45
275				60	55	50	45
280				60	55	50	45
285					55	50	45
290					55	50	45
295					60	50	45
300					60	55	45

NOTE: If the A_m/V is placed between two different board thicknesses, please take the thickest

Table B.6 90 minutes fire resistance open profiles

FireFree® ScandiBoard 850 thickness for Passive Fire Protection of steel – for open profiles when using screws and stables

	R 120						
A_m/V m^{-1}	350ºC	400ºC	450ºC	500ºC	550ºC	600ºC	650ºC
40	22	22	22	22	22	22	22
45	22	22	22	22	22	22	22
50	25	22	22	22	22	22	22
55	30	22	22	22	22	22	22
60	30	25	22	22	22	22	22
65	35	30	25	22	22	22	22
70	35	30	25	22	22	22	22
75	35	35	30	25	22	22	22
80	40	35	30	25	25	22	22
85	40	35	30	30	25	22	22
90	45	40	35	30	30	25	22
95	45	40	35	30	30	25	22
100	50	45	40	35	30	30	25
105	50	45	40	35	30	30	25
110	55	45	40	35	35	30	25
115	55	50	45	40	35	30	30
120	60	50	45	40	35	35	30
125	60	55	45	40	40	35	30
130		55	50	45	40	35	30
135		55	50	45	40	35	35
140		60	50	45	40	40	35
145		60	55	50	45	40	35
150			55	50	45	40	35
155			60	50	45	40	40
160			60	55	45	45	40
165			60	55	50	45	40
170				55	50	45	40
175				60	50	45	40
180				60	55	50	45
185				60	55	50	45
190					55	50	45
195					55	50	45
200					60	55	50
205					60	55	50
210					60	55	50
215						55	50
220						60	55
225						60	55
230						60	55
235						60	55
240							55
245							60
250							60
255							60
260							60
265							
270							
275							
280							
285							
290							

NOTE: If the A_m/V is placed between two different board thicknesses, please take the thickest

Table B.7 120 minutes fire resistance open profiles

FireFree® ScandiBoard 850 thickness for Passive Fire Protection of steel – for open profiles when using screws and stables

	R 180						
A_m/V m^{-1}	350ºC	400ºC	450ºC	500ºC	550ºC	600ºC	650ºC
40	35	30	25	22	22	22	22
45	40	35	30	25	22	22	22
50	45	35	35	30	25	22	22
55	45	40	35	30	30	25	22
60	50	45	40	35	30	30	25
65	55	50	45	40	35	30	30
70	60	50	45	40	35	35	30
75		55	50	45	40	35	30
80		60	50	45	40	40	35
85			55	50	45	40	35
90			60	50	45	40	40
95			60	55	50	45	40
100				60	50	45	45
105				60	55	50	45
110					55	50	45
115					60	55	50
120					60	55	50
125						60	55
130						60	55
135							55
140							60
145							60
150							
155							
160							
165							
170							
175							
180							
185							
190							
195							
200							
205							
210							
215							
220							
225							
230							
235							
240							
245							
250							
255							
260							
265							
270							
275							
280							
285							
290							

NOTE: If the A_m/V is placed between two different board thicknesses, please take the thickest

Table B.8 180 minutes fire resistance open profiles

Annex 3
Fire protective ability

47 mm thick FireFree® ScandiBoard 850 boards mounted on steel profiles have a fire protection ability classification of: **K_2 60**

The classification is valid for the following end use conditions for the covering:

- For boards thickness of 47 mm or more
- For board size (width x height) up to 1000 x 1220 mm (or 590 x 1250 mm)
- A distance between adjoining boards of not more than 1 mm
- On all substrates
- Increase in height above 25 mm of the air gap (the cavity) behind the covering
- With closer spacing between the screws than 320 mm
- Horizontal, vertical and sloped application of the covering

The combined fire protection ability and reaction to fire class for the product is: **K_2 60 A1**, which is valid under the end use conditions as described above

25 mm thick FireFree® ScandiBoard 850 boards mounted on timber battens have a fire protection ability classification of: **K_1 10 and K_2 30**

The classification is valid for the following end use conditions for the covering:

- For boards thickness of 25 mm or more
- For board size (width x height) up to 1500 x 1220 mm (or 550 x 2400 mm)
- For covering class **K_1 10**: on all substrates with a density of at least 300 kg/m^3
- For covering class **K_2 30**: on all substrates
- Increase in height above 22 mm of the air gap (the cavity) behind the covering
- With closer spacing between the screws than 320 mm
- Horizontal, vertical and sloped application of the covering

The combined fire protection ability and reaction to fire class for the product is: **K_1 10 A1 and K_2 30 A1**, which is valid under the end use conditions as described above

Annex 4
Resistance to fire of ventilation ducts.

The FireFree® ScandiBoard 850 has been classified as **EI90($v_e h_o i \leftrightarrow o$)S**

The following field of application applies for the classification of FireFree® ScandiBoard 850 in accordance with EN 1366-1:

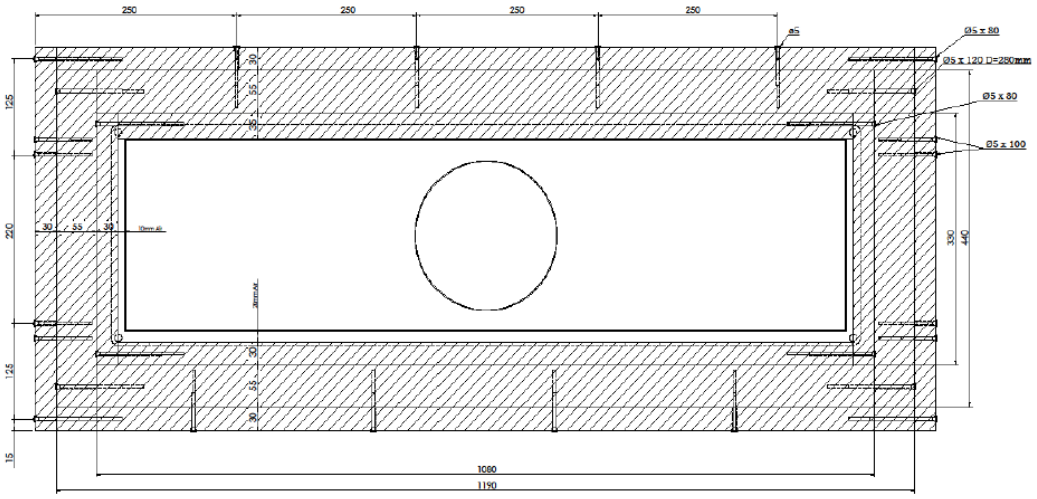
DIN EN 1366-1, clause:	**Field of application:**
13.1	Rectangular ventilation duct
13.2	Horizontal and vertical ventilation duct with branch
13.3	Maximum dimension of the cross-section 1250 mm x 1000 mm (width x height)
13.4	Pressure difference + 300 Pa (overpressure) up to – 300 Pa (underpressure)
13.5.1	Vertical ventilation ducts have to be supported at each storey. The number of storeys is optional, provided that: - the distance between supporting constructions does not exceed 5 m - limitation on buckling are satisfied according to clause 13.5.3
13.5.3	In order to prevent damage to the construction from buckling of vertical ducts, the test results are only applicable to situations where no ratio between the length of the duct exposed in the compartment to the smallest outer diameter does not exceed 8:1, unless additional supports are provided. In cases where additional supports are provided, the ratio of the distance between the additional supports, or the distance between the supports and the supporting construction to the smallest lateral dimension across the outside face of the duct shall not exceed 8:1.
13.6.1	As the test configuration does not allow an assessment of the load-bearing capacity, the suspension devices shall be made of steel and be sized such that the calculated stresses do not exceed the values given in DIN EN 1366-1, table 8.
13.6.2	The elongation in mm of the suspension devices of the test ducts can be calculated on the basis of temperature increases and stress levels. For unprotected steel suspension devices, the temperature used shall be the maximum furnace temperature.
13.6.3	The largest distance between suspension devices used in the test construction cannot be exceeded.
13.6.4	If suspension devices have been used at all joints within the furnace, the suspension devices must be also located at all joints in practice.
13.6.6	The horizontal load-bearing component of the suspension device must be sized in such a way that the bending stress does not exceed that applied to the equivalent building element in the test.
13.7	The ventilation duct may be passed through supporting constructions with fire resistance duration equal to or greater than that of the standard supporting construction used in the test (greater thickness, higher density, more layer): - floors must consist of at least aerated concrete d > 150 mm; $\rho \geq 650$ kg/m³ - walls must consist of at least 100 mm thick lightweight partition walls (2 x 12,5 GKF with insulation)
13.8	The test results may be applied to those steel ducts having a lower leakage rate, because the proof of the leakage with a steel duct of classification A (highest leakage rate) has been achieved according to prEN 1507.

The product performance has been established on the following basis

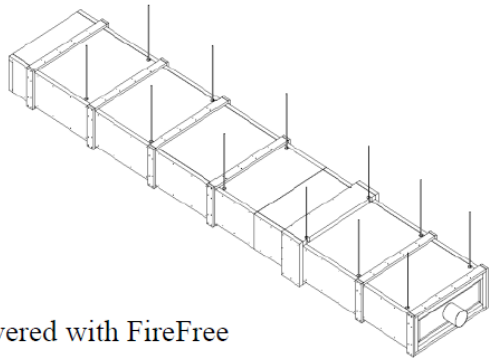
The duct sections shall be a maximum of 1200 mm in length and performed in accordance with DIN EN1507, leakage class A (d = 1 mm). The assembly shall be performed with steel flanges of 30 mm and the assembly shall be sealed with rubber strips i.e VKP Plus. The flanges shall be assembled with bolts in the corners. Between the corners, the flanges are assembled with clamps, with a maximum distance of 200 mm in-between. In the center of the duct, a M10 rod shall be mounted as reinforcement. The duct sections are suspended in M12 rods or other dimensions that meets the requirements to stress, specified in DIM 1366-1 Table 8, with a maximum distance of 1200 mm.

On the duct bottom a 50 x 30 x 4 mm U-shaped profile is mounted, which the rods are attached to with a bolt. When the duct is suspended and adjusted, a frame of FireFree ScandiBoard 850 in the dimensions of 35 x 100 mm is mounted on the top and 30 x 100 mm on the other three sides. The framework will form the base for the covering and shall be assembled in the corners with two Ø5 x 80 mm screws. Between the duct and the lower part of the frame, there shall be a distance of 20 mm. A frame shall also be mounted into the penetrations.

The fire protection consists of FireFree ScandiBoard 850 at thickness of 55 mm shall be so that the width fits with the base. Hereafter the two sides shall be assembled in the corners with Ø5 x 120 mm screws, with a distance of 280 mm between. Then the bottom shall be assembled with Ø5 x 120 mm screws. When all four sides are together, FireFree ScandiBoard 850, 30 x 100 mm which is with Ø5 x 100 mm screws, distance between the screws up to 250 mm. is assembled the joints. (detail 1 and 2)



Detail 1: Steel duct cross section

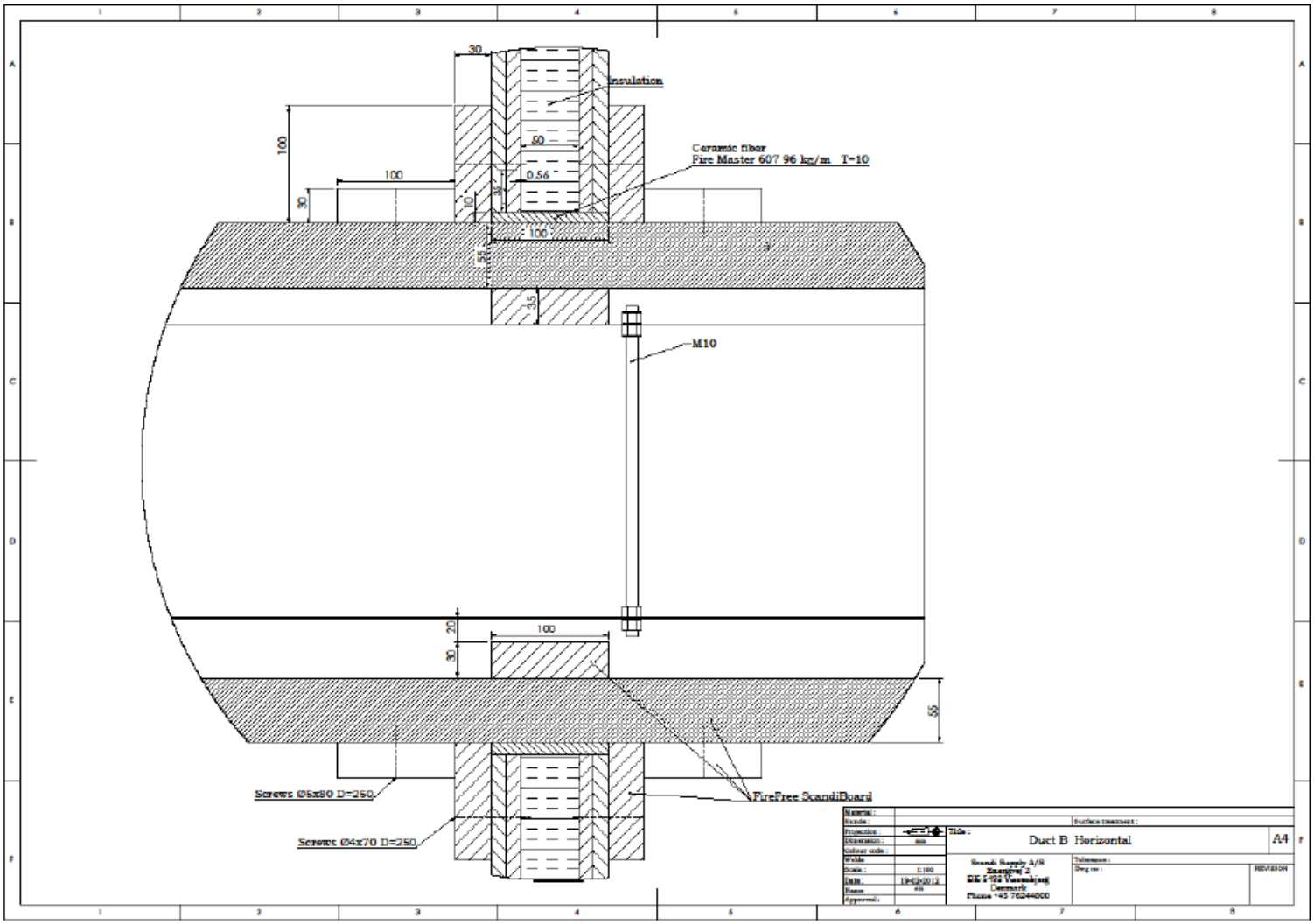


Detail 2: Steel duct covered with FireFree ScandiBoard 850.

Lightweight wall

Penetration with a width of min. 100 mm

Detail 3: The joint between the fire protection and wall is filled with ceramic fiber as Firemaster 607, with a density of min. 96 kg/m^3. The width of the joint shall be between 10-20 mm. On the wall a FireFree ScandiBoard 850, 30 x 100 mm is mounted and fastened with Ø4 x 70 mm self-tapping screws, with a distance between the screws of 250 mm. Hereafter a FireFree ScandiBoard 850, 30 x 100 mm is fastened to the board around the duct, with Ø5 x 80 mm screws, with a distance of 250 mm between.

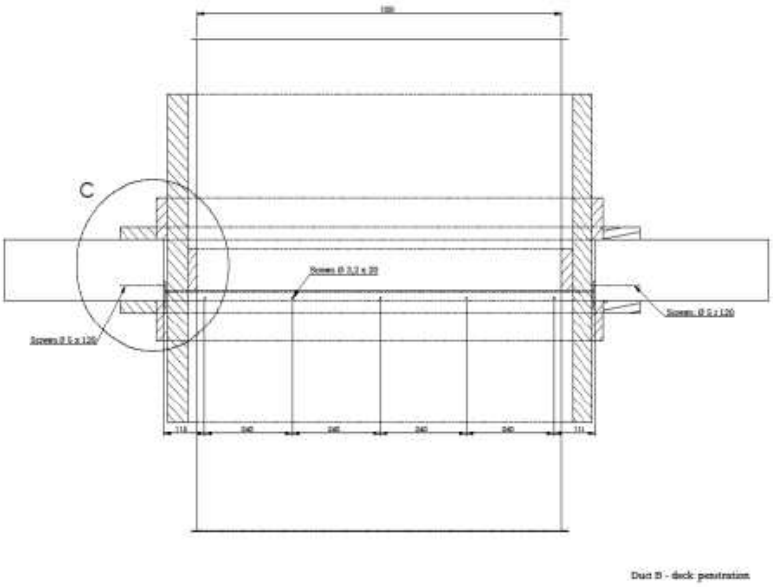


Detail 3: Wall penetration, min. 100 mm

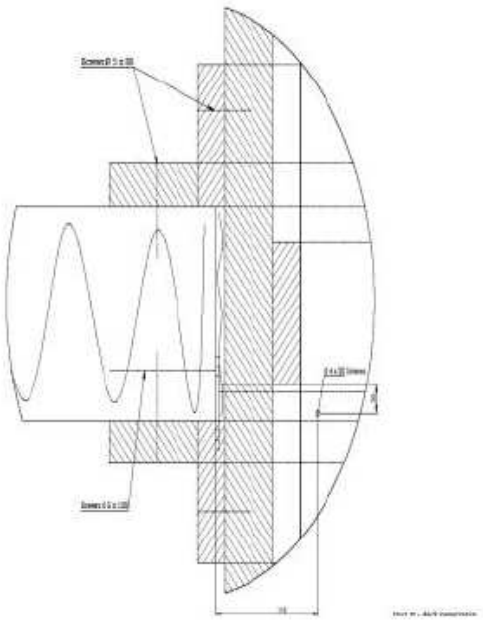
Deck construction

Penetration with a width of 150 mm

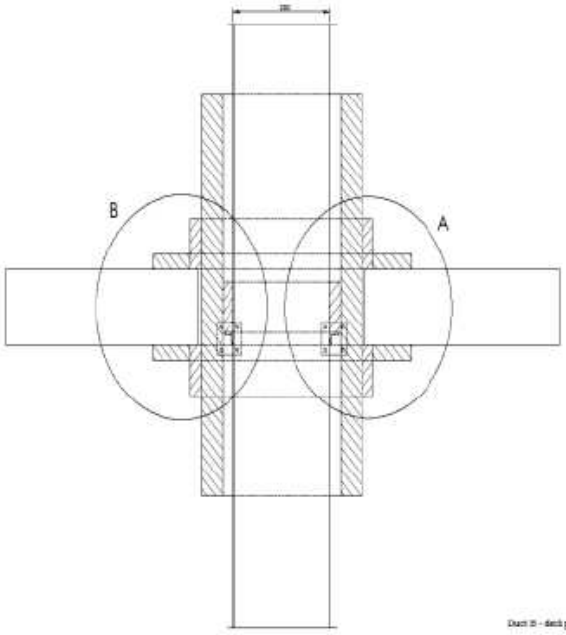
Detail 4 – 7: On the long side of the duct an angular section of 25 x 25 x 4 mm is mounted, which is attached to the duct to secure it in the penetration hole. Self-tapping Ø3,2 x 20 mm screws for every 240 mm shall be used for the mounting. There is welded a 4 mm plate 65 x 65 mm with four holes on both ends of the welded angle. These are fastened with two Ø76 x 100 mm screws, in each plate onto the deckplate. The joint between the fire protection and the sides in the deck, shall be filled with ceramic fiber, as Fire Master 607, with a density of min. 96 kg/m^3. The width of the joint shall be between 10-20 mm. A FireFree ScandiBoard 850, 30 x 100 mm is mounted on the plate around the the duct, attached with Ø5 x 80 mm screws, with a distance of 250 mm between. Hereafter a FireFree ScandiBoard 850, 30 x 100 mm is fastened to the deck with Ø5 x 80 mm screws, with a distance of 250 mm between.



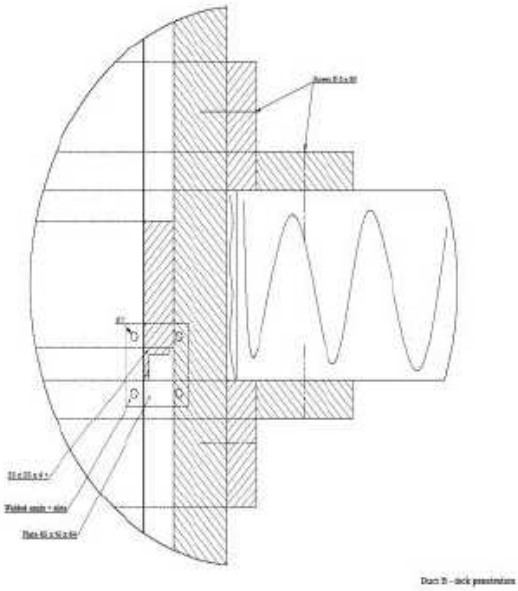
Detail 4



Detail 5: Section C



Detail 6



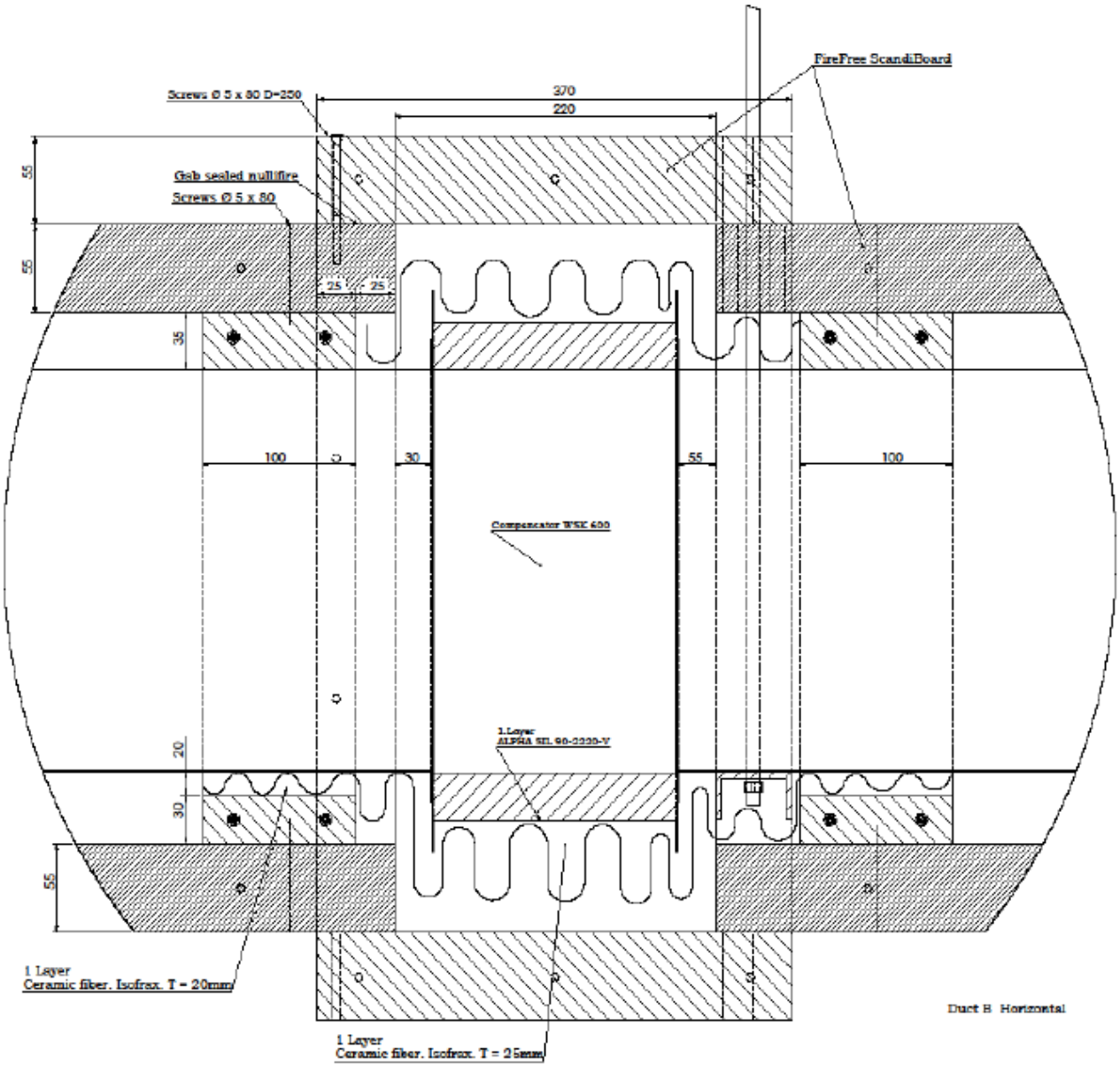
Detail 7: Callout A

Fire insulation around a compensator

Detail 8: The compensator shall be mounted in the duct as described by the manufacturer's guidelines and on the moveable part of the duct, a suspension shall be mounted. When mounting the FireFree ScandiBoard 850, it shall be ensured that the installation is not preventing the compensator to function as intended, therefor all dimensions and distances shall be observed.

Around the condenser there shall be mounted a 25 mm ceramic material, Isofrax min. 128 kg/m^3.

Above the compensator a 55 mm FireFree ScandiBoard 850 fills the gap/opening. The Board is fastened on the fixed part of the duct with Ø5 x 80 mm screws, with a distance of 250 mm between. When the duct is fire protected with FireFree ScandiBoard 850 all holes are sealed with ceramic fiber as Fire Master 607, with a density of min 96 kg/m^3, where the suspension arrangement (M12 threaded rods) breaks through the top plate.



Detail 8: Mounting of a compensator