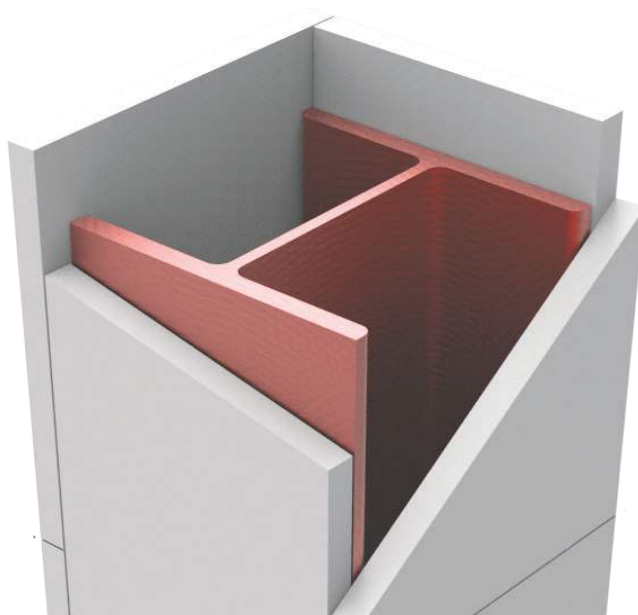




FireFree[®] ScandiBoard 850

Passive Fire Protection of Steel Constructions
R30 - R180



www.scandisupply.dk



Our installation manuals should help you conduct a correct penetration seal or joint seals.



Please visit our website for downloads
www.scandisupply.com

General Product Information

FireFree® ScandiBoard 850 is much lighter than other products in the market. With a weight of just 250 kg/m³ the boards can be handled

and installed by just one man. One board of 22 mm FireFree® ScandiBoard 850 is weighing just 5,5 kg/m².

Before You Start

When steel are exposed to heat or fire, the strength of the steel is gradually reduced. Therefore precautions are necessary, if you want the steel construction to maintain the load bearing ability in case of fire. This can be done by insulating the steel construction from the heat, to keep the steel temperature below the design temperature. The design temperature is determined by the consulting engineer on the project and tells you how warm the steel construction is accepted to be, in case of fire. If the steel reaches a higher temperature,

than the design temperature, there is a risk of a collapse in the steel structure. It is important to be familiar with the design temperature before you start on your project. Please contact Scandi Supply for further instructions or guidelines in case you do not know the design temperature.

At page 9 in this installation manual we have made a thorough description of the design temperature, section factor and fire classifications.

Technical Insulation

Heating	Effects
@ 20°C	0.06 W/(m×K)
@ 200°C	0.08 W/(m×K)
@ 400°C	0.10 W/(m×K)
@ 600°C	0.12 W/(m×K)
@ 800°C	0.14 W/(m×K)

Test: ASTM C-182

Sound Reduction

Thickness of the board	Sound reduction
19 mm	26 dB
38 mm	29 dB
60 mm	31 dB

Test: EN ISO 717-1

Technical Data

Max use temp.	1.000°C
Density	250 kg/m ³ (+/- 10%)
pH value	10.3 (weak basic)
Moisture content	2.5%
Product life	25 years
Bending strength	1.7 MPa (EN 993-6: 1995)
Compressive strength	2.8 MPa (EN 1094-5: 1995)
Colour	Light Gray
Standard EN 13501-1	A1
ETA (European Tech. Ass.)	ETA-12/0231 dated 2014/01/28 ETAG No. 018 fire protective products: 2004 part 1 and part 4
CE	0845-CPD-CXO10101

Testing

CE-Certificate of Conformity (850)
CE-Certificate of Conformity (850)
Classification report, Ventilation Duct
K₂30 - A1, DBI, 25 mm on timber
K₂60 - A1, DBI, 47 mm on steel
European Technical Assessment, ETA

0845 - CPD - CXO10101
0845 - CPD - CXO10102
210005752
PC10270
PC10189
ETA-12/0231



2531-CPR-CXO10102



FireFree® ScandiBoard 850

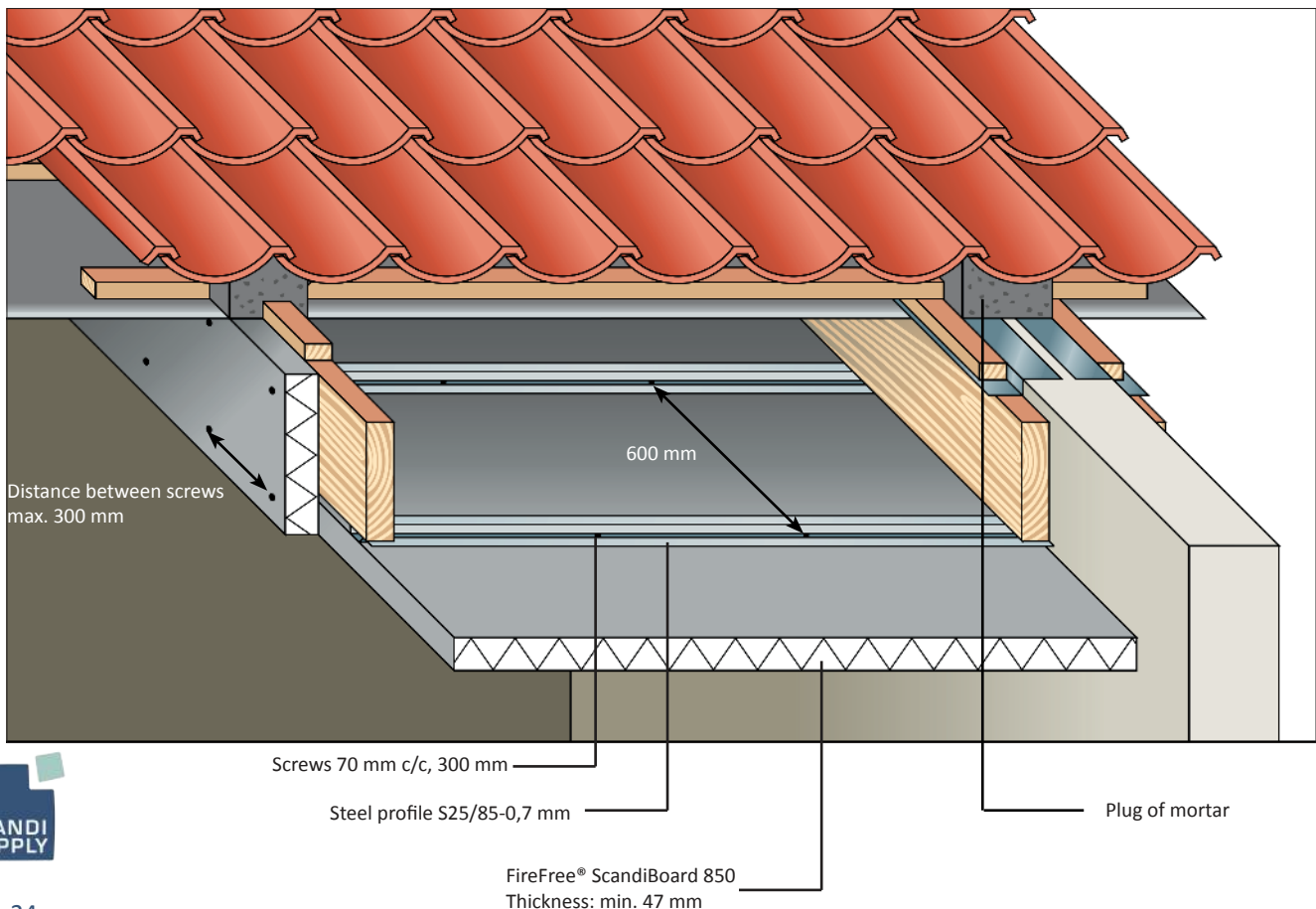
FireFree® ScandiBoard 850 can be installed with shot nails, staples or screws according to the table on page 6. The FireFree® ScandiBoard 850 are cut according to the needs and can be rasped afterwards for smooth joints between the boards and surface.

Item	Thickness	Width	Length	m ²	Board pr. pallet	Area pr. pallet m ²
40110	22 mm	1220 mm	1000 mm	1,22	90	109,80
40121	22 mm	1220 mm	2040 mm	2,49	46	114,54
40122	25 mm	1220 mm	2040 mm	2,49	41	102,04
40123	30 mm	1220 mm	2040 mm	2,49	34	84,62
40124	35 mm	1220 mm	2040 mm	2,49	29	72,18
40131	40 mm	1220 mm	2040 mm	2,49	25	62,22
40126	45 mm	1220 mm	2040 mm	2,49	22	54,75
40132	47 mm	1220 mm	2040 mm	2,49	21	52,26
40128	50 mm	1220 mm	2040 mm	2,49	20	49,78
40129	55 mm	1220 mm	2040 mm	2,49	19	44,80

Firewall - Fire Sectioning Construction

FireFree® ScandiBoard 850 can also be used as a fire sectioning construction, approved according to EN 14135, material class 1. FireFree® ScandiBoard 850 should be installed on the underside of the rafts and on the side of the load bearing construction, as shown on the illustration. The boards are fastened along all rafts by 4,2 x 70 mm screws. The distance between the screws is no to exceed 300 mm. The single board has a maximum size of 1220 x 1000 mm. The boards are to be installed as close as possible to each other. Between the underside of the roof tiles and the rafts, a plug of mortar is installed. The plug of mortar should be minimum 200 mm wide. Another plug of mortar is installed between the fire section wall and the outer side of the roof tiles.

For one-sided firewall, 60 minutes, the 47 mm FireFree® ScandiBoard 850 is installed on steel profiles S25/85 in a lenght of 1000 mm out from the wall. one meter on each side of the wall.
For one-sided firewall, 30 minutes, the 25 mm FireFree® ScandiBoard 850 is installed on timber battens in a lenght of 1000 mm out from the wall.
For two-sided firewall, the FireFree® ScandiBoard 850 is installed on both sides of the wall accordingly, i.e. one meter on each side of the wall.



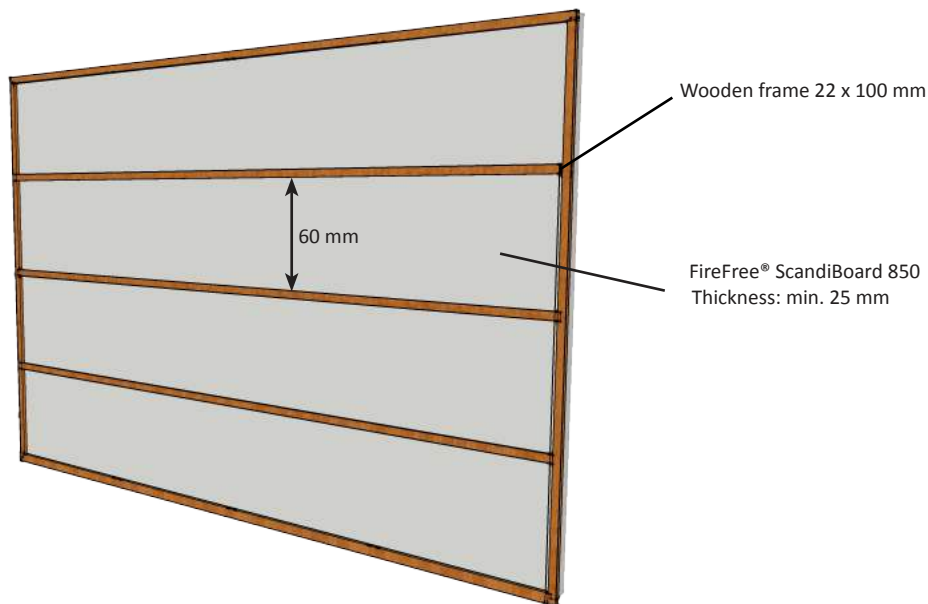
30 and 60 minutes fire protection - Firewalls and Ceilings

FireFree® ScandiBoard 850 used in 30 minutes Firewalls and ceiling constructions – installed on timber

FireFree® ScandiBoard 850 can be used in wall and ceiling constructions. Installing the boards on timber battens 22 mm x 100 mm the fire classification K₂30 can be achieved.

The construction is approved according to EN 14135 under the following conditions. FireFree® ScandiBoard 850 should have a thickness of minimum 25 mm or higher. We recommend the board size 1000 x 1220 mm.

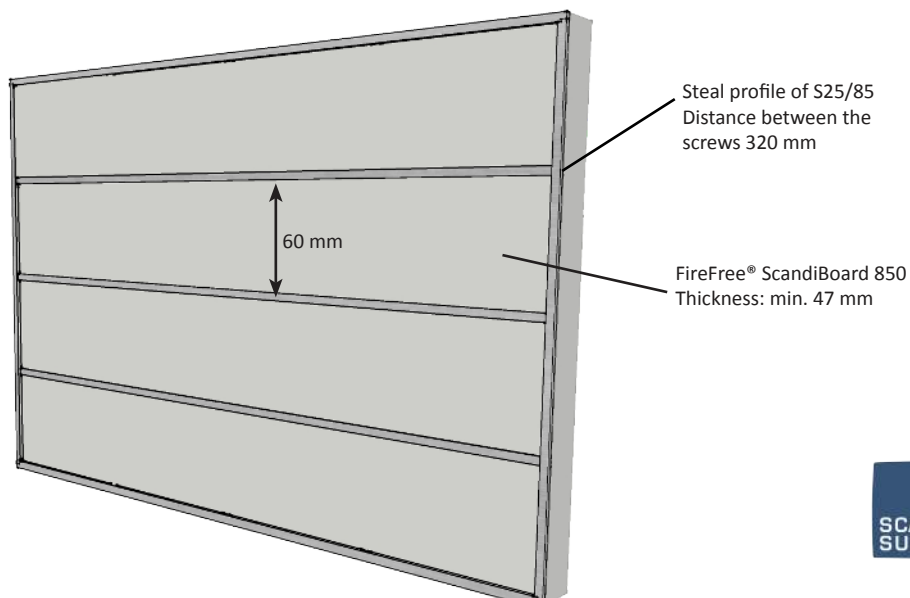
The covering class K₁0 and K₂30 is achieved on all kind of timber, with a density above 300 kg/m³. FireFree® ScandiBoard 850 must be mounted on the timber with screws, with a maximum distance between the screws of 320 mm. K₂30 classification on horizontal as well as vertical installation is valid, when these instructions has been followed.



FireFree® ScandiBoard 850 used in 60 minutes Fire-wall and ceiling constructions – installed on steel

FireFree® ScandiBoard 850 with a thickness of 47 mm can be used as covering on wall and ceiling constructions. The construction is approved according to EN 14135 under the following conditions. Installation should be made on steel profiles S25/85 to obtain K₂60 classification. The construction is approved according to EN 14135 under the following conditions. FireFree® ScandiBoard 850, thickness minimum 47 mm. We recommend board size 1000x1220 and the boards should be installed as close as possible.

The steel profiles should be installed with screws 3,5x51 mm every 600 mm. The height of the steel profile should be minimum 25 mm. The FireFree® ScandiBoard 850 should be installed with screws in a maximum distance of 320 mm to the next. K₂60 classification on horizontal as well as vertical installation is valid when these instructions has been meet.



Installation on Steel Constructions

The FireFree® ScandiBoard 850 can be handled with ordinary tools used for timber. The boards can be cut with a circular saw or in case of special cuttings with a jigsaw. The edges of the boards can be rasped or sanded and installed using screws, shot nails or stables. The boards is cut in oversize of 1-2 mm for smoother fitting. For open profile beams, lugs is cut in oversize 1-2 mm. The lugs are installed/ squeezed between the flanges. If the FireFree® ScandiBoard 850 is to be installed visible places like in offices etc. we recommend you install

the boards with steel edges. FireFree® ScandiBoard 850 can also be surface treated using silicate paint, tapestry etc. Please contact Scandi Supply a/s for further information.

For installation of the FireFree® ScandiBoard 850 using screws, shot nails or stables, please follow the recommendations in the table below.

ScandiBoard	Screws		Cramps		Shot nails	
	Thickness	Distance	Dimension	Distance	Size	Distance
22 mm	340 mm	4,0 x 50	340 mm	63 mm	-	-
25 mm	340 mm	4,0 x 50	340 mm	63 mm	460 mm	37 mm
30 mm	340 mm	4,0 x 60	340 mm	63 mm	460 mm	42 mm
35 mm	340 mm	4,0 x 70	340 mm	63 mm	460 mm	47 mm
40 mm	340 mm	5,0 x 80	-	-	460 mm	52 mm
45 mm	340 mm	5,0 x 90	-	-	460 mm	57 mm
50 mm	340 mm	5,0 x 100	-	-	460 mm	62 mm
55 mm	340 mm	5,0 x 100	-	-	-	-
60 mm	340 mm	5,0 x 120	-	-	-	-

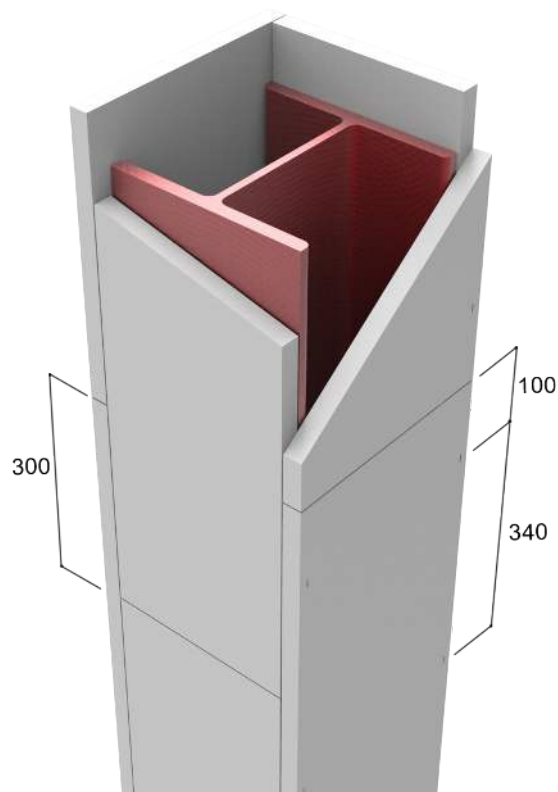
Detail Drawings

Open steel profiles – columns

The thickness of the FireFree® ScandiBoard 850 depends on the requirements of passive fire protection and is calculated according to the tables within this brochure.

The FireFree® ScandiBoard 850 can be installed on a column side-by-side. Screws can be used installing the FireFree® ScandiBoard 850. The screws are mounted in the edges. We recommend screws are 2 x the thickness of the board in length. By mounting side-by-side the boards are cut according to the following instructions. Two pieces of FireFree® ScandiBoard 850 are cut according to the width of the steel profile and two pieces are cut in the width of the steel profile + 2 x the thickness of the board.

In case higher stability, within the insulation construction, is wanted the board joints must be displaced relative to each other by minimum of 300 mm from side to side.



Detail Drawings

Closed profiles – Columns

The thickness of the FireFree® ScandiBoard 850 depends on the requirements of passive fire protection and is calculated according to the tables in this brochure.

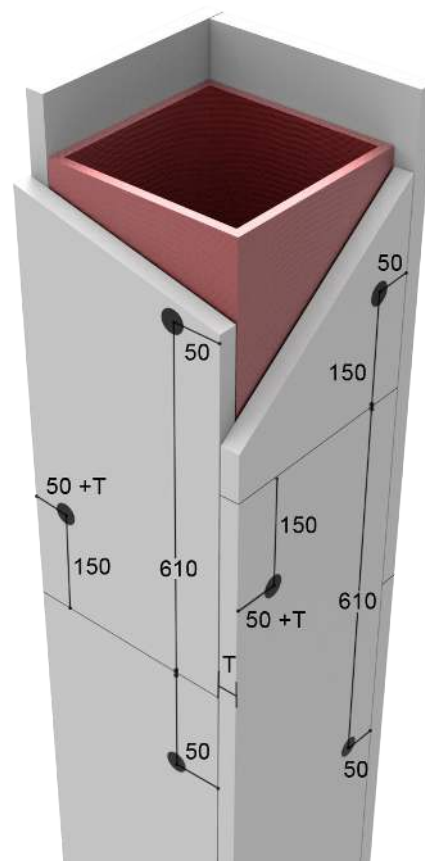
FireFree® ScandiBoard 850 can be installed on a column in verband or side-by-side.

For closed profiles, shot nails could be used. Screws can also be used to the installation and should then be used at the edges of the FireFree® ScandiBoard 850. We recommend screws in the length of 2 times the thickness of the insulation.

By installation in verband the FireFree® ScandiBoard 850 is cut according to the width of the steel profile + the thickness of the insulation. By installation side-by-side the FireFree® ScandiBoard 850 is cut according to the following. Two pieces are cut in the width of the steel profile and to pieces are cut in the width of the steel profile + 2 times the thickness of the board.

In case higher stability, within the insulation construction is wanted, the board joints must be displaced relative to each other by minimum of 300 mm from side to side.

Shot nails has to be mounted according to the following instructions. At joints of the FireFree® ScandiBoard 850 the shot nails must be installed minimum 150 mm from the joint. The FireFree® ScandiBoard 850 is fastened alongside the steel profile with a maximum distance between the shot nails of 610 mm. The distance from the edges of the FireFree® ScandiBoard 850 to the shot nails should be minimum 50 mm + the thickness of the insulation.



Closed profiles – Beams

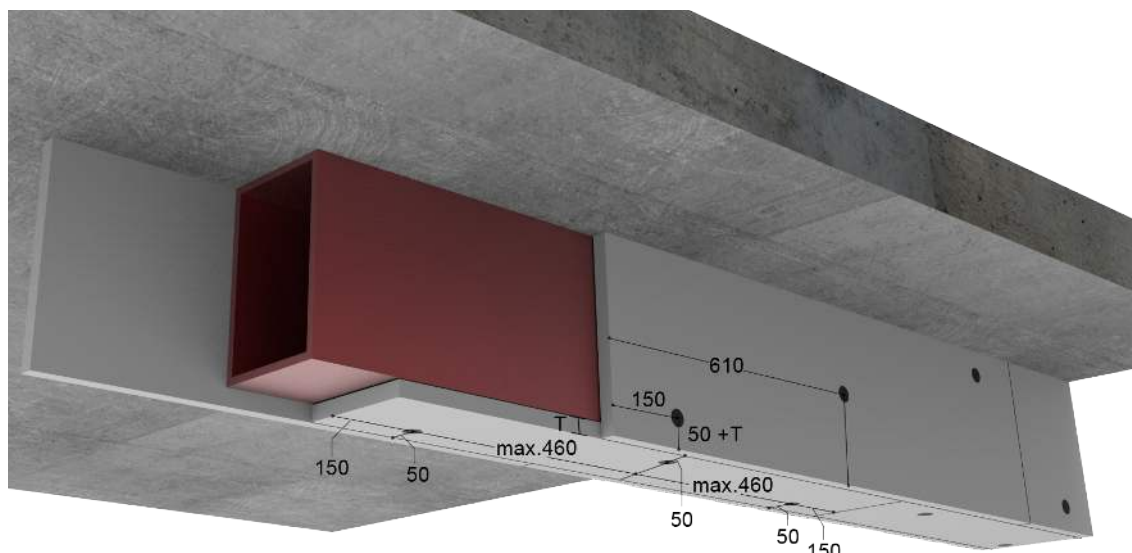
The thickness of the FireFree® ScandiBoard 850 depends on the requirements of passive fire protection and is calculated according to the tables within this brochure.

The FireFree® ScandiBoard 850 are cut oversize of 1-2 mm. (When installing several boards in succession the Boards are installed edge to edge).

In closed steel profiles shot nails are to be used. The boards are cut according to the following instructions. The boards which should cover the sides of the profile is cut at the width (high) of the steel profile + the thickness of the insulation. The boards to cover the underside of the steel profile should be cut according to the width of the steel profile.

Then installing the shot nails has to be mounted along the centre line of the downside of the steel profile at a maximum distance of 460 mm, using screws the maximum distance is 340 mm. The sides are installed using shot nails or screws along the centreline (maximum distance 460/340 mm). At joints between Boards the shot nails should be placed in a distance of 150 mm from the joint. At the sides of the steel profile the shot nails/screws should be fastened in a distance from the edge of 50 mm + the thickness of the insulation. The underside of the steel profile is fastened with screws from the side. The distances has been applied to the illustration.

In case higher stability within the insulation construction is wanted the board joints must be displaced relative to each other by minimum of 300 mm from side to side.



Detail Drawings

Open profiles – Beams

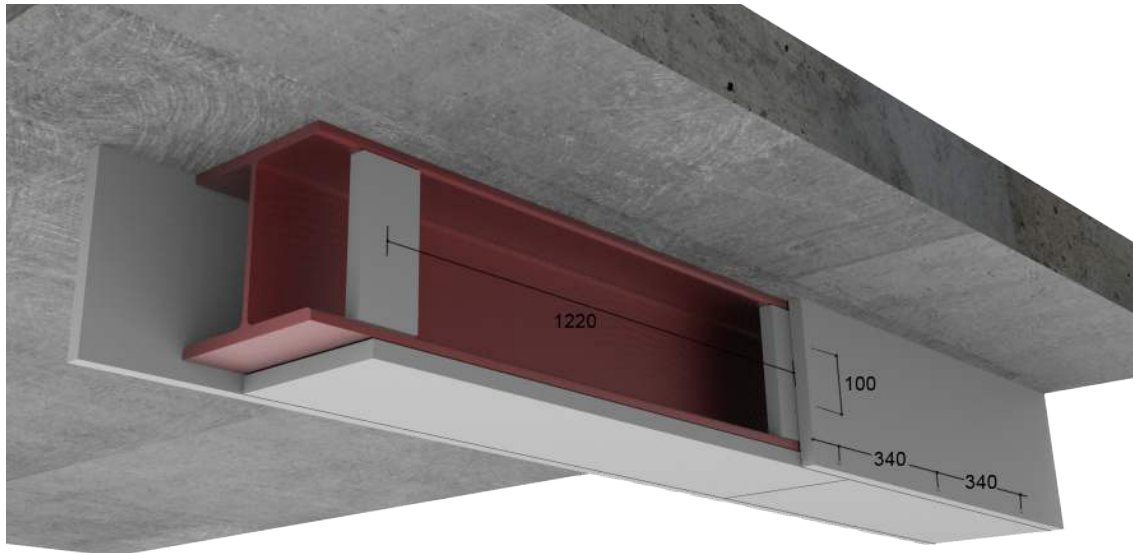
The thickness of the FireFree® ScandiBoard 850 depends on the requirements of passive fire protection and is calculated according to the tables within this brochure.

FireFree® ScandiBoard 850 are cut according to the following instructions. As a start some installation pieces or lashes are cut from FireFree® ScandiBoard 850. The lashes are cut with a width of minimum 200 mm, and are also cut oversized by 1-2 mm. Press the lashes between the flanges behind the joints. The lashes are to be installed behind every joint of the insulation in a maximum distance of 1220 mm between the center of two lashes. The FireFree® ScandiBoard 850 to be installed on the sides of the steel profile is cut in a width of the steel profile + the thickness of the insulation.

The insulation to be installed on the under flange of the steel profile should be cut in the same width as the steel profile.

On the sides of the steel profile the FireFree® ScandiBoard 850 is fixed to the slaps using screws in a distance from the joint of 50 mm. On the underside of the flange the insulation is fixed from the sides using screws. The screws is mounted in a maximum distance of 340 mm. The distances and positions has been applied to the illustration.

In case higher stability within the insulation construction is wanted the board joints must be displaced relative to each other by minimum of 300 mm from side to side.

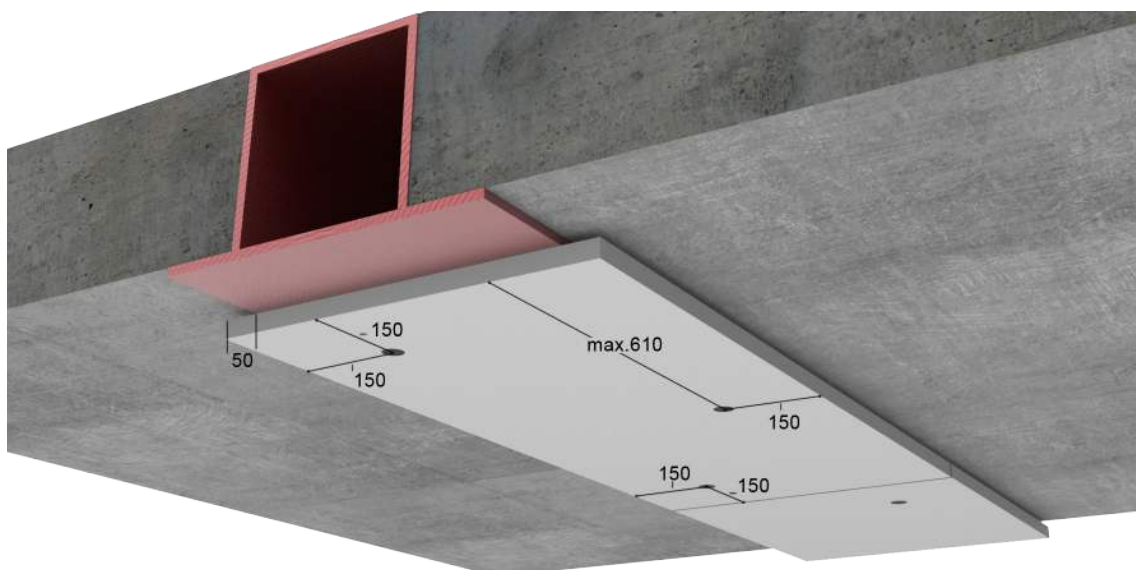


WQ-Beam

FireFree® ScandiBoard must be installed with suitable shot nails
FireFree® ScandiBoard must be minimum 100 mm wider than WQ beam.
The minimum distance from the edge of the WQ beam to the edge of the FireFree® ScandiBoard, must be 50 mm, on both sides – according to illustration. Mount the FireFree® ScandiBoard to the WQ - beam at a distance of 150 mm from all edges of the FireFree® ScandiBoard and 150 mm. The distance between the shot nails – on the length of the board - should not exceed 610 mm. The board-thickness depends on the requirement and is calculated in accordance with closed profiles. FireFree® ScandiBoard can protect closed steel sections in structural steelwork from R30 - R180.

After installation:

According to fire testings, it is not necessary to install any material in the gap between the edge of the FireFree ScandiBoard and the underside of the concrete.



Calculate Insulation

Calculate the FireFree® ScandiBoard 850 insulation thickness

When calculating the thickness of the insulation using the FireFree® ScandiBoard 850, the following elements should be considered. The section factor, the design temperature and the classification. The thickness of the insulation might vary from steel profile to steel section.

The section factor is calculated as the relation between the exposed surface (perimeter) and the cross sectional area. When fire protecting load bearing steel constructions, using boards, the exposed area is identical to the inside area of the insulation material.

The section factor is often named A/V , F/V or F/A . The increase in temperature of the steel profile, depends on the section factor. Low section factor leads to a slower temperature rise than in case of a higher section factor. For this reason, steel profiles with high section factors, will need more insulation, at the same design temperature and classification. For open sections, the A/V ratio also depends whether the profile is exposed from 3 sides or 4 sides.

On closed steel sections, the A/V ratio depends on the section thickness. The design temperature is the second determination factor when calculating the thickness of insulation needed. The design temperature, is the maximum temperature of the steel section, in case of fire. In case the steel section reaches a higher temperature than the design temperature, the steel construction might collapse.

The final factor that influences the Insulation thickness is the classification. By European standards R , is defined as the load carrying capacity. The time that the structural element is able to carry the load during fire. The classification usually begins by $R30$, where 30 is referring to the period in time i.e. 30 minutes. The classification is typically divided in steps of 30 minutes until $R180$. The classification is the number of minutes accepted until the steel section reaches the design temperature. Higher classification will often result in additional insulation thickness.

Example:

Cladding of an Steel section HEB140 beam to a 60 minutes classification, Design temperature: 500 °C – 4 sided exposure.

Measurements of the steel: High: 0,14 m and width: 0,14 m

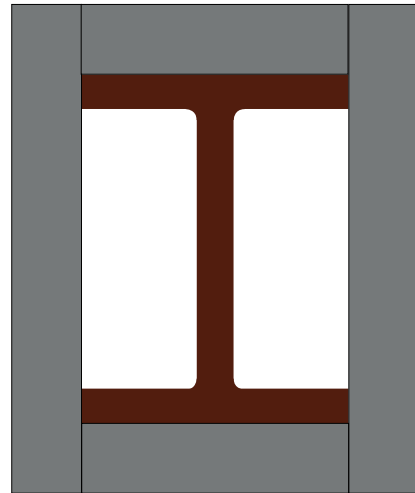
$$V = 0,0043 \text{ m}^3$$

$$A = (2 \times 0,14) + (2 \times 0,14) = 0,56 \text{ m}$$

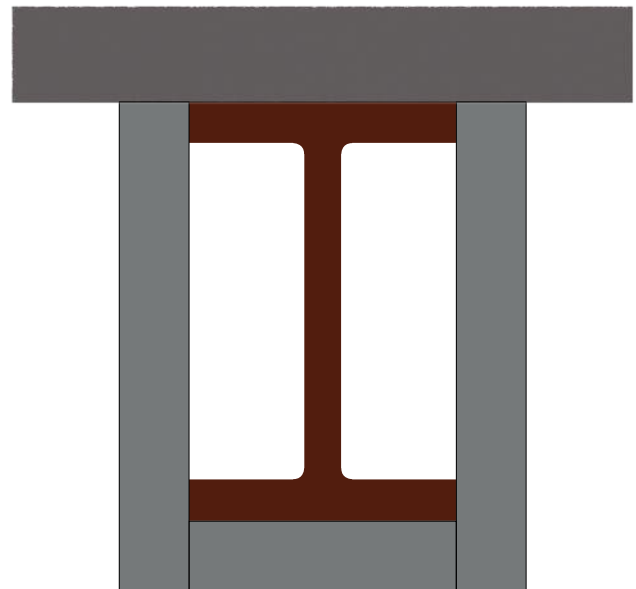
$$A/V = 0,56/0,0043 = 130,2 \text{ m}^{-1}$$

From the tables we read, considering: Open profile, $R60$, design temperature, $A_m/V_m = 130,2$

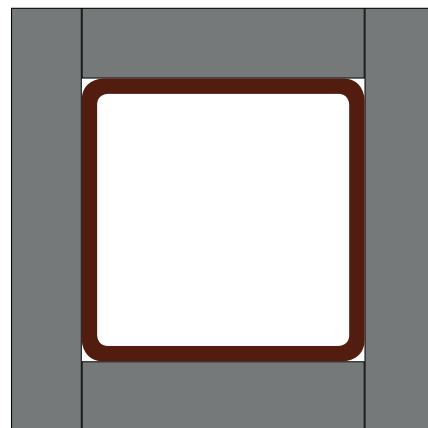
FireFree® ScandiBoard 850; 22 mm board thickness.



Cladding an open steel profile, 4 sided.
The exposed area is defined as
 $2 \times \text{section height} + 2 \times \text{section width}$.



Cladding an open steel profile, 3 sided.
The exposed area is defined as
 $2 \times \text{section height} + 1 \times \text{section width}$.



The section factor depends on
the thickness of the steel

Section factors A_m/V_m^{-1} when using screws or stables

HEA			HEB			HEM		
Sections	$A_m/V_m^{-4^1}$	$A_m/V_m^{-3^2}$	Sections	$A_m/V_m^{-4^1}$	$A_m/V_m^{-3^2}$	Sections	$A_m/V_m^{-4^1}$	$A_m/V_m^{-3^2}$
HE 100A	185	138	HE 100B	154	115	HE 100M	85	65
HE 120A	184	137	HE 120B	141	106	HE 120M	80	61
HE 140A	174	129	HE 140B	130	98	HE 140M	76	58
HE 160A	161	120	HE 160B	118	89	HE 160M	71	54
HE 180A	155	115	HE 180B	110	83	HE 180M	68	52
HE 200A	145	108	HE 200B	103	77	HE 200M	65	49
HE 220A	134	100	HE 220B	97	73	HE 220M	62	47
HE 240A	122	91	HE 240B	91	68	HE 240M	52	40
HE 260A	118	88	HE 260B	88	66	HE 260M	51	39
HE 280A	113	84	HE 280B	85	64	HE 280M	50	38
HE 300A	105	78	HE 300B	81	60	HE 300M	43	33
HE 320A	98	74	HE 320B	77	58	HE 320M	43	33
HE 340A	94	72	HE 340B	75	57	HE 340M	43	33
HE 360A	91	70	HE 360B	73	57			
HE 400A	87	68	HE 400B	71	56			
HE 450A	83	66	HE 450B	69	55			
HE 500A	80	65	HE 500B	67	55			
HE 550A	79	65	HE 550B	67	55			
HE 600A	79	65	HE 600B	67	55			
HE 650A	79	65	HE 650B	66	55			

IPE			UPE			UNP		
Sections	$A_m/V_m^{-4^1}$	$A_m/V_m^{-3^2}$	Sections	$A_m/V_m^{-4^1}$	$A_m/V_m^{-3^2}$	Sections	$A_m/V_m^{-4^1}$	$A_m/V_m^{-3^2}$
IPE 80	330	270	UPE 80	230	185	UNP 80	227	186
IPE 100	300	247	UPE 100	223	183	UNP 100	222	185
IPE 120	279	230	UPE 120	214	178	UNP 120	206	174
IPE 140	259	215	UPE 140	205	173	UNP 140	196	167
IPE 160	241	200	UPE 160	194	165	UNP 160	188	160
IPE 180	226	188	UPE 180	185	158	UNP 180	179	154
IPE 200	211	176	UPE 200	177	152	UNP220	147	127
IPE 220	198	165	UPE 220	166	143			
IPE 240	184	153	UPE 240	156	135			
IPE 270	176	147	UPE 270	148	129			
IPE 300	167	139	UPE 300	142	124			
IPE 330	156	131	UPE 330	129	113			
IPE 360	146	122	UPE 360	121	107			
IPE 400	137	116	UPE 400	112	100			
IPE 450	130	110						
IPE 500	121	104						
IPE 550	113	98						
IPE 600	105	91						

¹ A_m/V_m^{-4} : 4 sided fire protection

² A_m/V_m^{-3} : 3 sided fire protection



FireFree® ScandiBoard thickness for Passive Fire Protection of steel

A_m/V_m	R 30	R 60						
	Design Temperature							
	350-650°C	350°C	400°C	450°C	500°C	550°C	600°C	650°C
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_m is placed between two different board thicknesses, please consider the highest A_m/V_m



FireFree® ScandiBoard thickness for Passive Fire Protection of steel

A _m /V _m	R 90						
	Design Temperature						
	350°C	400°C	450°C	500°C	550°C	600°C	650°C
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_m is placed between two different board thicknesses, please consider the highest A_m/V_m



FireFree® ScandiBoard thickness for Passive Fire Protection of steel

A _m /V _m	R 120						
	Design Temperature						
	350°C	400°C	450°C	500°C	550°C	600°C	650°C
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_m is placed between two different board thicknesses, please consider the highest A_m/V_m



FireFree® ScandiBoard thickness for Passive Fire Protection of steel

R 180							
Design Temperature							
A_m/V_m	350°C	400°C	450°C	500°C	550°C	600°C	650°C
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_m is placed between two different board thicknesses, please consider the highest A_m/V_m



Section factors A_m/V_m for HSQ and closed sections when using shot nails

RHS/SHS Sections *	
Thickness	A_m/V_m
3,20	312
3,60	277
4,00	250
4,50	222
4,85	206
5,00	200
5,40	185
6,00	166
6,30	158
7,00	142
8,00	125
8,87	113
9,00	111
10,00	100
11,00	90
12,00	83
12,50	80
16,00	63
20,00	50

Flat profiles and angel profiles *	
Thickness	A_m/V_m
5	400
6	333
7	285
8	250
9	222
10	200
11	182
12	166
13	153
14	143
15	133
16	125
17	118
18	111
19	105
20	100
22	91
25	80
30	67

CHS **		
Diameter	Thickness	A_m/V_m
60,30	2,90	461
60,30	4,50	305
76,10	2,90	456
76,10	4,50	301
88,90	3,20	413
88,90	4,85	278
114,30	3,60	365
114,30	5,40	277
139,70	4,00	327
139,70	5,40	245
168,30	4,50	289
165,10	5,40	243
219,10	6,30	208
273,00	6,30	207
323,90	7,10	183
355,60	8,00	163
406,40	8,80	148
457,00	10,00	130
508,00	11,00	118

* RHS/SHS as well as flat and angel profiles is calculated 4-sided.

** CHS profiles must be protected as a square, i.e. 4-sided

FireFree® ScandiBoard for Passive Fire Protection of steel - for HSQ and closed sections

A_m/V_m	R 30		R 60						
	Design Temperature								
	350°C	400-750°C	350°C	400°C	450°C	500°C	550°C	600°C	650-750°C
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 A_m/V_m is placed between two different board thicknesses, please consider the highest A_m/V_m



FireFree® ScandiBoard for Passive Fire Protection of steel - for HSQ and closed sections

R 90									
Design Temperature									
A_m/V_m	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
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
230			50	45	40	35	30	30	25
235			50	45	40	35	30	30	25
240			50	45	40	35	30	30	25
245			50	45	40	35	30	30	25
250			50	45	40	35	30	30	25
255			50	45	40	35	30	30	25
260			50	45	40	35	35	30	25
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 A_m/V_m is placed between two different board thicknesses, please consider the highest A_m/V_m



FireFree® ScandiBoard for Passive Fire Protection of steel - for HSQ and closed sections

R 120									
Design Temperature									
A_m/V_m	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
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
135		55	50	45	40	35	35	30	30
140		55	50	45	40	35	35	30	30
145		55	50	45	40	40	35	30	30
150			50	45	40	40	35	30	30
155			50	45	45	40	35	35	30
160			55	50	45	40	35	35	30
165			55	50	45	40	35	35	30
170			55	50	45	40	35	35	30
175				50	45	40	40	35	30
180				50	45	40	40	35	30
185				50	45	45	40	35	30
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 A_m/V_m is placed between two different board thicknesses, please consider the highest A_m/V_m



FireFree® ScandiBoard for Passive Fire Protection of steel - for HSQ and closed sections

R 180									
Design Temperature									
A_m/V_m	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
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 A_m/V_m is placed between two different board thicknesses, please consider the highest A_m/V_m



Passive fire protection is an important factor, when it comes to saving human lives and buildings in case of fire. Scandi Supply is one of the leading companies in the market for passive fire protection.

Safety has first priority at Scandi Supply when it comes to finding the right solution. We are focused on making every job easy for the clients and to create valuable and durable results.

More than 25 years of experience our company advice and guidance are fully tested. Just like our products. We will stay focused and keep developing innovative solutions and options.

Please feel free to contact Scandi Supply a/s for any questions or if you need our assistance.



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