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to Article 29 of the Regulation (EU)  
No 305/2011 of the European  
Parliament and of the Council of 9  
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MEMBER OF EOTA



## European Technical Assessment ETA-21/0694 of 2021/08/07

### 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:**

Protecta R Board & Protecta FR Adhesive

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

Fire protective board

**Manufacturer:**

Polyseam Ltd  
15. St. Andrews Road  
Huddersfield  
West Yorkshire HD1 6SB  
United Kingdom  
Internet [www.polyseam.com](http://www.polyseam.com)

**Manufacturing plant:**

Polyseam Ltd  
15. St. Andrews Road  
Huddersfield  
West Yorkshire HD1 6SB  
United Kingdom

**This European Technical Assessment contains:**

11 pages including 2 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:**

European Assessment Document no. EAD 350142-00-1106 Fire protective board, slab and mat products and kits

**This version replaces:**

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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## II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

### 1 Technical description of the product

#### Technical description of the product

Protecta R Board & Protecta FR Adhesive system consist of the Protecta R Board, which is a mineral wool fire protective board and the Protecta FR Adhesive which is a water based inorganic adhesive.

#### Dimensions and density

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

	Nominal value	Tolerance
Density	160 kg/m <sup>3</sup>	+/- 10 %
Length	600 mm	< ± 12 mm
	900 mm	< ± 18 mm
Width	1200	< ± 18 mm
Thickness	20 – 60 mm	≤ - 1 mm; ≤ + 3 mm

The boards are CE marked according to EN 13162.

The boards are fastened with Protecta FR Adhesive.

The Protecta FR Adhesive is a water based inorganic adhesive and sealant and is designed to withstand temperatures greater than 1.200 °C. It is applied to the substrate in a single layer with 5 x 5mm toothed trowel leaving a uniform continuous toothed bed of Protecta® FR Adhesive. The

#### Ancillary products

The is ETA covers the board adhered with the Protecta FR Adhesive alone. 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 European Assessment Document (hereinafter EAD)

The intended use of the system is internal use designated as type Z<sub>2</sub> in EAD 350142-00-1106.

The system is intended to protect elements to be used in type 4 applications in accordance with EAD 350142-00-1106; Load bearing steel elements as specified in annex 1 of this ETA.

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.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the system of 10 years.

The Protecta FR Adhesive is considered to have a significantly longer working life than indicated above.

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
<b>3.2 Safety in case of fire (BWR2)</b>	
Reaction to fire	Protecta R Board is classified as Euroclass A1 in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364
Resistance to fire	The design charts for determining the resistance to fire performance according to EN 13501-2 is presented in annex 2.
Durability and serviceability	Z <sub>2</sub>
<b>3.3 Hygiene, health and the environment (BWR3)</b>	
Content, emission and/or release of dangerous substances	No performance assessed
Water permeability	No performance assessed
<b>3.4 Safety in use (BWR 4)</b>	
Flexural strength	No performance assessed
Dimensional stability	No performance assessed
Pull through resistance of mechanical fasteners	Not relevant
Shear load resistance of mechanical fasteners	Not relevant
Resistance to soft body impact	No performance assessed
Resistance to hard body impact	No performance assessed
Resistance to eccentric load	No performance assessed
Adhesive: Durability and serviceability; resistance to freeze/thaw	Viscosity at 23°C after 2,5 min. 2 728 000 mPas Viscosity after 3 cycles at -5 °C after 2,5 min. at 23°C 2 276 000 mPas
Mechanical resistance and stability of adhesive	
Peel resistance	0,33 N/mm approx. Cohesion 30 % Adhesion 70 %
Shear resistance	1,4 N/mm <sup>2</sup> failure in substrate
Viscosity	Viscosity at 23°C after 2,5 min. 2 728 000 mPas
Adhesion	0,008 N/mm <sup>2</sup> failure in substrate
<b>3.5 Protection against noise (BWR 5)</b>	
No performance assessed	
<b>3.6 Energy economy and heat retention (BRW 6)</b>	
Thermal conductivity	The λ <sub>D</sub> -value of the board is 0,035 W/mK
Water vapour permeability	No performance assessed

## **4 Attestation and verification of constancy of performance (AVCP)**

### **4.1 AVCP system**

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

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2021-08-07 by



Thomas Bruun  
Managing Director, ETA-Danmark

## **Annex 1 Specification**

### **Classification**

The system described in this annex has been tested and evaluated according to EN 13381-4 and classified in accordance with EN 13501-2.

The assessment of the required thickness of Protecta R boards multilayer system for the relevant resistance to fire period, at the design temperature within the range of 350 °C to 750 °C and in function of the section factor of the steel element, is given in below.

### **Installation requirements**

The system installation should be carried out in accordance with the manufacturer's instructions and the provisions given in this ETA.

### **Structural steel elements**

The supporting structure consists of load-bearing steel elements with the following characteristics:

- 'I' shaped beam and column sections.
- Columns and beams with protection all round.
- Rectangular and circular hollow columns with protection all round.
- Structural steel grades (S designation) in accordance with EN 10025 6, excluding S185.
- Section factors as given in the tables in annex 2
- Three-sided fire exposure for beams and columns.

### **Fire protective boards**

Protecta R boards and Protecta FR Adhesive shall be as described in section 1 of this ETA.

**Annex 2**  
**Design charts**

<b>Protecta R-Board &amp; FR-Adhesive</b>										
<b>Section Factor up to m<sup>-1</sup></b>	<b>Table 1: I-Section Beams and Columns: Fire Resistance Period: 30 Minutes</b>									
	<b>Thickness (mm) Required for a Design Temperature of</b>									
	<b>350°C</b>	<b>400°C</b>	<b>450°C</b>	<b>500°C</b>	<b>550°C</b>	<b>600°C</b>	<b>620°C</b>	<b>650°C</b>	<b>700°C</b>	<b>750°C</b>
45	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
50	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
55	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
60	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
65	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
70	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
75	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
80	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
85	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
90	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
95	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
100	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
105	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
110	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
115	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
120	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
125	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
130	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
135	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
140	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
145	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
150	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
155	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
160	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
165	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
170	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
175	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
180	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
185	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
190	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
195	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
200	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
205	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
210	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
215	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
220	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
225	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
230	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
235	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
240	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
245	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
250	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
255	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
260	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
265	17.5	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
270	17.8	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
275	18.1	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
280	18.4	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
285	18.7	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
290	19.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
295	19.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
300	19.6	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
305	19.9	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
310	20.2	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
315	20.4	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
320	20.7	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
325	21.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
330	21.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
335	21.6	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
340	21.9	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
345	22.1	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3

Table applies to beams with protection to three sides and a concrete slab. Thickness is protection only.

Table also applies to columns and beams with protection all round.

Table also applies to rectangular and circular columns with protection all round

Protecta R-Board & FR-Adhesive										
Section Factor up to $m^{-1}$	Table 2: I-Section Beams and Columns: Fire Resistance Period: 45 Minutes									
	Thickness (mm) Required for a Design Temperature of									
	350°C	400°C	450°C	500°C	550°C	600°C	620°C	650°C	700°C	750°C
45	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
50	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
55	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
60	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
65	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
70	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
75	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
80	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
85	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
90	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
95	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
100	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
105	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
110	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
115	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
120	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
125	17.5	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
130	18.2	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
135	18.9	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
140	19.6	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
145	20.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
150	21.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
155	21.7	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
160	22.4	17.8	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
165	23.1	18.4	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
170	23.7	18.9	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
175	24.4	19.5	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
180	25.1	20.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
185	25.7	20.5	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
190	26.4	21.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
195	27.1	21.6	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
200	27.7	22.1	17.6	17.3	17.3	17.3	17.3	17.3	17.3	17.3
205	28.3	22.6	18.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3
210	29.0	23.0	18.4	17.3	17.3	17.3	17.3	17.3	17.3	17.3
215	29.6	23.5	18.8	17.3	17.3	17.3	17.3	17.3	17.3	17.3
220	30.3	24.0	19.2	17.3	17.3	17.3	17.3	17.3	17.3	17.3
225	30.9	24.5	19.6	17.3	17.3	17.3	17.3	17.3	17.3	17.3
230	31.5	24.9	20.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3
235	32.1	25.4	20.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
240	32.7	25.8	20.7	17.3	17.3	17.3	17.3	17.3	17.3	17.3
245	33.3	26.3	21.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3
250	34.0	26.7	21.4	17.3	17.3	17.3	17.3	17.3	17.3	17.3
255	34.6	27.2	21.7	17.5	17.3	17.3	17.3	17.3	17.3	17.3
260	35.2	27.6	22.0	17.8	17.3	17.3	17.3	17.3	17.3	17.3
265	35.7	28.0	22.4	18.1	17.3	17.3	17.3	17.3	17.3	17.3
270	36.3	28.4	22.7	18.3	17.3	17.3	17.3	17.3	17.3	17.3
275	36.9	28.9	23.0	18.6	17.3	17.3	17.3	17.3	17.3	17.3
280	37.5	29.3	23.3	18.8	17.3	17.3	17.3	17.3	17.3	17.3
285	38.1	29.7	23.6	19.1	17.3	17.3	17.3	17.3	17.3	17.3
290	38.7	30.1	23.9	19.3	17.3	17.3	17.3	17.3	17.3	17.3
295	-	30.5	24.2	19.6	17.3	17.3	17.3	17.3	17.3	17.3
300	-	30.9	24.5	19.8	17.3	17.3	17.3	17.3	17.3	17.3
305	-	31.2	24.8	20.1	17.3	17.3	17.3	17.3	17.3	17.3
310	-	31.6	25.1	20.3	17.3	17.3	17.3	17.3	17.3	17.3
315	-	32.0	25.4	20.5	17.3	17.3	17.3	17.3	17.3	17.3
320	-	32.4	25.7	20.7	17.3	17.3	17.3	17.3	17.3	17.3
325	-	32.7	25.9	21.0	17.3	17.3	17.3	17.3	17.3	17.3
330	-	33.1	26.2	21.2	17.3	17.3	17.3	17.3	17.3	17.3
335	-	33.5	26.5	21.4	17.4	17.3	17.3	17.3	17.3	17.3
340	-	33.8	26.7	21.6	17.6	17.3	17.3	17.3	17.3	17.3
345	-	34.2	27.0	21.8	17.8	17.3	17.3	17.3	17.3	17.3

Table applies to beams with protection to three sides and a concrete slab. Thickness is protection only.

Table also applies to columns and beams with protection all round.

Table also applies to rectangular and circular columns with protection all round

Protecta R-Board & FR-Adhesive										
Section Factor up to m <sup>-1</sup>	Table 3: I-Section Beams and Columns: Fire Resistance Period: 60 Minutes									
	Thickness (mm) Required for a Design Temperature of									
	350°C	400°C	450°C	500°C	550°C	600°C	620°C	650°C	700°C	750°C
45	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
50	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
55	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
60	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
65	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
70	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
75	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
80	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
85	18.2	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
90	19.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
95	20.4	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
100	21.5	17.9	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
105	22.7	18.9	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
110	23.7	19.8	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
115	24.8	20.8	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
120	25.9	21.7	18.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3
125	27.0	22.6	18.8	17.3	17.3	17.3	17.3	17.3	17.3	17.3
130	28.0	23.5	19.6	17.3	17.3	17.3	17.3	17.3	17.3	17.3
135	29.1	24.4	20.4	17.3	17.3	17.3	17.3	17.3	17.3	17.3
140	30.1	25.3	21.1	17.6	17.3	17.3	17.3	17.3	17.3	17.3
145	31.2	26.1	21.9	18.2	17.3	17.3	17.3	17.3	17.3	17.3
150	32.2	27.0	22.6	18.9	17.3	17.3	17.3	17.3	17.3	17.3
155	33.2	27.8	23.3	19.5	17.3	17.3	17.3	17.3	17.3	17.3
160	34.3	28.6	24.0	20.1	17.3	17.3	17.3	17.3	17.3	17.3
165	35.3	29.4	24.7	20.7	17.3	17.3	17.3	17.3	17.3	17.3
170	36.3	30.2	25.3	21.3	17.8	17.3	17.3	17.3	17.3	17.3
175	37.3	31.0	26.0	21.8	18.3	17.3	17.3	17.3	17.3	17.3
180	38.2	31.8	26.6	22.4	18.8	17.3	17.3	17.3	17.3	17.3
185	-	32.6	27.2	22.9	19.2	17.3	17.3	17.3	17.3	17.3
190	-	33.3	27.9	23.4	19.7	17.3	17.3	17.3	17.3	17.3
195	-	34.1	28.5	24.0	20.2	17.3	17.3	17.3	17.3	17.3
200	-	34.8	29.1	24.5	20.6	17.3	17.3	17.3	17.3	17.3
205	-	35.5	29.7	24.9	21.0	17.5	17.3	17.3	17.3	17.3
210	-	36.3	30.2	25.4	21.4	17.9	17.3	17.3	17.3	17.3
215	-	37.0	30.8	25.9	21.8	18.2	17.3	17.3	17.3	17.3
220	-	37.7	31.3	26.4	22.2	18.6	17.3	17.3	17.3	17.3
225	-	38.4	31.9	26.8	22.6	18.9	17.5	17.3	17.3	17.3
230	-	39.0	32.4	27.3	23.0	19.3	17.8	17.3	17.3	17.3
235	-	-	33.0	27.7	23.4	19.6	18.2	17.3	17.3	17.3
240	-	-	33.5	28.1	23.7	19.9	18.5	17.3	17.3	17.3
245	-	-	34.0	28.5	24.1	20.2	18.7	17.3	17.3	17.3
250	-	-	34.5	28.9	24.4	20.5	19.0	17.3	17.3	17.3
255	-	-	35.0	29.3	24.8	20.8	19.3	17.4	17.3	17.3
260	-	-	35.5	29.7	25.1	21.1	19.6	17.6	17.3	17.3
265	-	-	35.9	30.1	25.4	21.4	19.9	17.9	17.3	17.3
270	-	-	36.4	30.5	25.8	21.7	20.1	18.1	17.3	17.3
275	-	-	36.9	30.9	26.1	21.9	20.4	18.4	17.3	17.3
280	-	-	37.3	31.2	26.4	22.2	20.6	18.6	17.3	17.3
285	-	-	37.8	31.6	26.7	22.4	20.9	18.8	17.3	17.3
290	-	-	38.2	31.9	27.0	22.7	21.1	19.0	17.3	17.3
295	-	-	38.6	32.3	27.2	22.9	21.3	19.3	17.3	17.3
300	-	-	-	32.6	27.5	23.2	21.6	19.5	17.3	17.3
305	-	-	-	33.0	27.8	23.4	21.8	19.7	17.3	17.3
310	-	-	-	33.3	28.1	23.6	22.0	19.9	17.3	17.3
315	-	-	-	33.6	28.3	23.9	22.2	20.1	17.3	17.3
320	-	-	-	33.9	28.6	24.1	22.4	20.3	17.3	17.3
325	-	-	-	34.2	28.9	24.3	22.6	20.5	17.3	17.3
330	-	-	-	34.5	29.1	24.5	22.8	20.6	17.3	17.3
335	-	-	-	34.8	29.4	24.7	23.0	20.8	17.3	17.3
340	-	-	-	35.1	29.6	24.9	23.2	21.0	17.4	17.3
345	-	-	-	35.4	29.8	25.1	23.4	21.2	17.6	17.3

Table applies to beams with protection to three sides and a concrete slab. Thickness is protection only.

Table also applies to columns and beams with protection all round.

Table also applies to rectangular and circular columns with protection all round

Protecta R-Board & FR-Adhesive										
Section Factor up to $m^{-1}$	Table 4: I-Section Beams and Columns: Fire Resistance Period: 90 Minutes									
	Thickness (mm) Required for a Design Temperature of									
	350°C	400°C	450°C	500°C	550°C	600°C	620°C	650°C	700°C	750°C
45	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
50	18.1	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
55	20.1	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
60	22.0	19.0	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
65	23.9	20.8	17.8	17.3	17.3	17.3	17.3	17.3	17.3	17.3
70	25.9	22.6	19.5	17.3	17.3	17.3	17.3	17.3	17.3	17.3
75	27.8	24.3	21.1	18.1	17.3	17.3	17.3	17.3	17.3	17.3
80	29.7	26.0	22.7	19.6	17.3	17.3	17.3	17.3	17.3	17.3
85	31.5	27.7	24.2	21.0	18.0	17.3	17.3	17.3	17.3	17.3
90	33.4	29.4	25.7	22.4	19.3	17.3	17.3	17.3	17.3	17.3
95	35.2	31.0	27.2	23.7	20.5	17.4	17.3	17.3	17.3	17.3
100	37.1	32.6	28.6	25.0	21.7	18.5	17.3	17.3	17.3	17.3
105	38.9	34.2	30.0	26.3	22.9	19.6	18.3	17.3	17.3	17.3
110	-	35.8	31.4	27.5	24.0	20.6	19.3	17.4	17.3	17.3
115	-	37.3	32.7	28.7	25.1	21.6	20.2	18.4	17.3	17.3
120	-	38.8	34.1	29.9	26.2	22.6	21.2	19.3	17.3	17.3
125	-	-	35.4	31.0	27.2	23.5	22.1	20.1	17.3	17.3
130	-	-	36.6	32.2	28.2	24.4	22.9	20.9	17.5	17.3
135	-	-	37.9	33.2	29.1	25.3	23.8	21.7	18.3	17.3
140	-	-	-	34.3	30.1	26.1	24.6	22.5	19.0	17.3
145	-	-	-	35.3	31.0	26.9	25.4	23.2	19.6	17.3
150	-	-	-	36.3	31.9	27.7	26.1	24.0	20.3	17.3
155	-	-	-	37.3	32.7	28.5	26.9	24.7	20.9	17.3
160	-	-	-	38.3	33.6	29.3	27.6	25.3	21.5	17.5
165	-	-	-	-	34.4	30.0	28.3	26.0	22.1	18.0
170	-	-	-	-	35.2	30.7	28.9	26.6	22.7	18.5
175	-	-	-	-	36.0	31.4	29.6	27.2	23.2	19.0
180	-	-	-	-	36.7	32.0	30.2	27.8	23.8	19.5
185	-	-	-	-	37.5	32.7	30.8	28.4	24.3	20.0
190	-	-	-	-	38.2	33.3	31.4	28.9	24.8	20.4
195	-	-	-	-	38.9	33.9	32.0	29.5	25.3	20.8
200	-	-	-	-	-	34.5	32.5	30.0	25.7	21.3
205	-	-	-	-	-	35.1	33.1	30.5	26.2	21.7
210	-	-	-	-	-	35.6	33.6	31.0	26.6	22.0
215	-	-	-	-	-	36.2	34.1	31.5	27.1	22.4
220	-	-	-	-	-	36.7	34.6	31.9	27.5	22.8
225	-	-	-	-	-	37.2	35.1	32.4	27.9	23.2
230	-	-	-	-	-	37.7	35.6	32.8	28.3	23.5
235	-	-	-	-	-	38.2	36.1	33.3	28.6	23.8
240	-	-	-	-	-	38.7	36.5	33.7	29.0	24.2
245	-	-	-	-	-	-	37.0	34.1	29.4	24.5
250	-	-	-	-	-	-	37.4	34.5	29.7	24.8
255	-	-	-	-	-	-	37.8	34.9	30.1	25.1
260	-	-	-	-	-	-	38.2	35.3	30.4	25.4
265	-	-	-	-	-	-	38.6	35.6	30.7	25.7
270	-	-	-	-	-	-	39.0	36.0	31.0	26.0
275	-	-	-	-	-	-	-	36.4	31.4	26.2
280	-	-	-	-	-	-	-	36.7	31.7	26.5
285	-	-	-	-	-	-	-	37.0	32.0	26.8
290	-	-	-	-	-	-	-	37.4	32.2	27.0
295	-	-	-	-	-	-	-	37.7	32.5	27.3
300	-	-	-	-	-	-	-	38.0	32.8	27.5
305	-	-	-	-	-	-	-	38.3	33.1	27.7
310	-	-	-	-	-	-	-	38.6	33.3	28.0
315	-	-	-	-	-	-	-	38.9	33.6	28.2
320	-	-	-	-	-	-	-	-	33.8	28.4
325	-	-	-	-	-	-	-	-	34.1	28.6
330	-	-	-	-	-	-	-	-	34.3	28.8
335	-	-	-	-	-	-	-	-	34.5	29.0
340	-	-	-	-	-	-	-	-	34.8	29.2
345	-	-	-	-	-	-	-	-	35.0	29.4

Table applies to beams with protection to three sides and a concrete slab. Thickness is protection only.

Table also applies to columns and beams with protection all round.

Table also applies to rectangular and circular columns with protection all round

Protecta R-Board & FR-Adhesive										
Section Factor up to m <sup>-1</sup>	Table 5: I-Section Beams and Columns: Fire Resistance Period: 120 Minutes									
	Thickness (mm) Required for a Design Temperature of									
	350°C	400°C	450°C	500°C	550°C	600°C	620°C	650°C	700°C	750°C
45	23.4	20.7	17.9	17.3	17.3	17.3	17.3	17.3	17.3	17.3
50	26.2	23.3	20.5	17.7	17.3	17.3	17.3	17.3	17.3	17.3
55	28.9	25.9	22.9	20.1	17.3	17.3	17.3	17.3	17.3	17.3
60	31.6	28.4	25.3	22.4	19.5	17.3	17.3	17.3	17.3	17.3
65	34.3	30.9	27.6	24.6	21.6	18.6	17.3	17.3	17.3	17.3
70	37.0	33.4	29.9	26.7	23.6	20.5	19.2	17.4	17.3	17.3
75	-	35.8	32.2	28.8	25.5	22.3	21.0	19.1	17.3	17.3
80	-	38.2	34.3	30.8	27.4	24.0	22.7	20.8	17.5	17.3
85	-	-	36.5	32.7	29.2	25.7	24.3	22.4	18.9	17.3
90	-	-	38.5	34.6	31.0	27.3	25.8	23.9	20.3	17.3
95	-	-	-	36.5	32.6	28.9	27.4	25.3	21.7	17.6
100	-	-	-	38.3	34.3	30.4	28.8	26.7	22.9	18.8
105	-	-	-	-	35.9	31.8	30.2	28.0	24.2	19.9
110	-	-	-	-	37.4	33.2	31.5	29.3	25.3	21.0
115	-	-	-	-	38.9	34.6	32.8	30.5	26.5	22.0
120	-	-	-	-	-	35.9	34.1	31.7	27.5	23.0
125	-	-	-	-	-	37.1	35.3	32.8	28.6	23.9
130	-	-	-	-	-	38.3	36.4	33.9	29.6	24.8
135	-	-	-	-	-	-	37.5	35.0	30.5	25.7
140	-	-	-	-	-	-	38.6	36.0	31.4	26.5
145	-	-	-	-	-	-	-	37.0	32.3	27.3
150	-	-	-	-	-	-	-	37.9	33.2	28.1
155	-	-	-	-	-	-	-	38.8	34.0	28.8
160	-	-	-	-	-	-	-	-	34.8	29.5
165	-	-	-	-	-	-	-	-	35.6	30.2
170	-	-	-	-	-	-	-	-	36.3	30.8
175	-	-	-	-	-	-	-	-	37.0	31.5
180	-	-	-	-	-	-	-	-	37.7	32.1
185	-	-	-	-	-	-	-	-	38.4	32.7
190	-	-	-	-	-	-	-	-	39.0	33.3
195	-	-	-	-	-	-	-	-	-	33.8
200	-	-	-	-	-	-	-	-	-	34.4
205	-	-	-	-	-	-	-	-	-	34.9
210	-	-	-	-	-	-	-	-	-	35.4
215	-	-	-	-	-	-	-	-	-	35.9
220	-	-	-	-	-	-	-	-	-	36.4
225	-	-	-	-	-	-	-	-	-	36.8
230	-	-	-	-	-	-	-	-	-	37.3
235	-	-	-	-	-	-	-	-	-	37.7
240	-	-	-	-	-	-	-	-	-	38.1
245	-	-	-	-	-	-	-	-	-	38.5
250	-	-	-	-	-	-	-	-	-	38.9
255	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-	-

Table applies to beams with protection to three sides and a concrete slab. Thickness is protection only.

Table also applies to columns and beams with protection all round.

Table also applies to rectangular and circular columns with protection all round