



Element Materials Technology
Rotterdam B.V.
Zekeringstraat 33
1014 BV Amsterdam
Netherlands
Tel: +31 (0) 20-55633555
www.element.com



Member of



www.eota.eu

European Technical Assessment

ETA - 20/1258
of 2020/12/16

General Part

Technical Assessment Body Issuing the European Technical Assessment:	Element Materials Technology Rotterdam B.V.
Trade Name of the Construction Product:	PROMAPAIN [®] SC3
Product Family to Which the Construction Product Belongs:	35. Fire Protective Products Reactive Coating for the Fire Protection of Steel Elements
Manufacturer:	Promat International N.V. Bormstraat 24, B-2830, Tisselt, Belgium
Manufacturing Plant(s):	F/033
This European Technical Assessment Contains:	34 pages including 1 Annex which form an integral part of this assessment.
This European Technical Assessment is Issued in Accordance with Regulation (EU) No 305/2011, On the Basis Of:	EAD 350402-00-1106 Fire Protective Products: Reactive Coatings For Fire Protection of Steel Elements
This Version Replaces:	ETA 13/0356, issued on 2020/10/12

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

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

TERVEZÉSI SEGÉDLET

1. Technical Description of the Product

PROMAPAIN[®] SC3 is a spray or brush/roller applied intumescent paint formulated for the fire protection of structural steel elements.

In accordance with EAD 350402-00-1106, PROMAPAIN[®] SC3 may be considered as a reactive coating kit that includes one or more primers and/or topcoats (Option 3).

According to the manufacturer's declaration, the product specification has been compared with Annex XVII of REACH and the ECHA Candidate List of Substances of Very High Concern to verify that it does not contain such substances.

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.

2. Specification of the Intended Use(s) in Accordance with the Applicable European Assessment Document (hereinafter EAD)

The intended use of PROMAPAIN[®] SC3 is to fire protect various sizes of structural steel 'I' and 'H' shaped beam and column sections and structural steel rectangular/square hollow beam sections for up to a fire resistance classification of R150, and circular and rectangular/square hollow column sections for up to a fire resistance classification of R120 and for design temperatures in the range of 350°C to 750°C. Table of results for additional times also form part of the evaluation.

The provisions made in this ETA are based on an assumed working life of the applied coating for the intended use of at least 10 years, provided that it is subject to appropriate use and maintenance according to manufacturer's instruction. The indications given on the intended working life cannot be interpreted as a guarantee given by the producer, but are to be used as a means for selecting the appropriate product in relation to the expected economically reasonable working life of the works.

PROMAPAIN[®] SC3 has been assessed as being compatible with the following primers and top coats:

Primers and Primer Sets				
Primer Reference	Primer Type	Tested Nominal Primer DFT (mm)	Permitted Primer Thickness Range (mm) ¹	
			Minimum	Maximum
Generic primer type	Alkyd ¹	0.050 and 0.120	0.025	0.180
Generic primer type	Zinc rich epoxy ²	0.080	0.040	0.120
Generic primer type	Zinc silicate ²	0.070	0.035	0.105
Sika [®] Permacor [®] 2706 EG ²	Two component epoxy ²	0.030 and 0.060	0.015	0.090
Sika [®] Permacor [®] -1705 ²	Solvent containing single component zinc-phosphate primer ²	0.050	0.025	0.075
Zinga ³	Zinc rich naphtha ³	0.030	0.015	0.045
(Zinga/Zingaceram ZMEP MIO HS (mist coat)) ³	(Zinc rich naphtha/Epoxy sealer)	0.030/0.030	0.015/0.015	0.045/0.045
(Zinga/Zingaceram ZMEP MIO HS (mist coat + full coat)) ³	(Zinc rich naphtha/Epoxy sealer)	0.030/0.085	0.015/0.015	0.045/0.125
(SikaCor [®] Zinc ZS + Sika [®] Permacor [®] 2706 EG) ¹	SikaCor [®] Zinc ZS: Zinc rich epoxy + Sika [®] Permacor [®] 2706 EG: Two component epoxy	(0.050 + 0.050) 0.100	(0.025 + 0.025) ⁴ 0.050	(0.060 + 0.060) ⁶ 0.120
(SikaCor [®] EG Phosphat Plus + SikaCor [®] EG1 Plus + SikaCor [®] EG4) ³	SikaCor [®] EG Phosphat Plus: Epoxy zinc phosphate + SikaCor [®] EG1 Plus: Epoxy intermediate coat + SikaCor [®] EG4: A two pack Polyurethane topcoat	(0.066 + 0.066 + 0.066) 0.198	(0.033 + 0.033 + 0.033) ⁶ 0.099	(0.080 + 0.080 + 0.080) ⁶ 0.240
SikaCor [®] Aktivprimer Plus (corroded) ⁴	Single component corrosion protection primer containing zinc phosphate	0.070	0.035	0.105
Sika Poxicolor [®] Primer HE Neu (corroded) ⁴	Two component epoxy primer containing zinc phosphate	0.090	0.045	0.135
Sika [®] Permacor [®] 2706 EG (galvanised) ⁵	Two component epoxy	0.050	0.025	0.075
Interguard 269 (Galvanised) ¹	Two component epoxy	0.090	0.045	0.135

DFT: Dry Film Thickness

¹ The permitted theoretical minimum and maximum DFTs cannot be less or exceed the DFT for each product as recommended by the manufacturer. The practical information given by the manufacturer must be followed

² The generic approval is applicable to other primers from the same generic group provided the thickness is within the tolerance given. The approval does not cover galvanised steel

³ The approval is applicable to specific primer/primer set (trade name and type) and no generic approach is possible. The approval does not cover galvanised steel

⁴ The approval is applicable to specific primer (trade name and type) and no generic approach is possible. Steel plate was shot blast cleaned to ISO 8501-1 Sa2.5 and left outside before got covered with rust but no pitting visible. Then hand tool cleaning method (wire brush) was used to prepare steel surface to grade St2 according to ISO 8501-1 prior application of primer

⁵ The approval is applicable to specific primer only (trade name and type) and no generic approach is possible. The approval covers galvanised steel

⁶ Each product should be increased/reduced as recommended by the manufacturer in order to ensure compatibility

Top Coats				
Top Coat Reference ¹	Top Coat Description ¹	Tested Nominal Top Coat DFT (mm)	Permitted Top Coat Thickness Range (mm)	
			Minimum	Maximum ²
Interthane 990	A two component, high gloss, polyurethane	0.050	0.050	0.075
Interlac 665	A single pack alkyd	0.040	0.040	0.060
Sika [®] Unitherm [®] Top S	A high build single pack	0.060 - 0.100	0.060	0.150
Sika [®] Unitherm [®] Top W	A single pack water based	0.060	0.060	0.090
SikaCor [®] EG-5	A two pack polyurethane top coat with good gloss and colour retention	0.080 - 0.100	0.080	0.150
SikaCor [®] -870W	A single pack polyurethane	0.100	0.100	0.150

DFT: Dry Film Thickness

¹ The approval is limited to the specific product (trade name and type) and no generic approach is possible

² The permitted theoretical maximum DFT cannot exceed the DFT for each product as recommended by the manufacturer. The practical information given by the manufacturer must be followed

PROMAPAIN[®] SC3 has been assessed as having passed the requirements for durability according to EAD 350402-00-1106 with and without the top coats:

Top Coat Reference ¹	Topcoat Description ¹	Approved Top Coat Colours	Permitted Top Coat Thickness Range (mm)	Durability Approvals Based On The Carried Out Testing			
				Type Z ₂	Type Z ₁	Type Y	Type X
No Top Coat	-	-	-	✓			
Sika [®] Unitherm [®] Top W	A single pack water based topcoat	All Colours	0.060 - 0.090	✓			
SikaCor [®] -870W	A single pack polyurethane topcoat	All Colours	0.100 - 0.150	✓			
Sika [®] Unitherm [®] Top S	A high build single pack topcoat	All Colours	0.060 - 0.150	✓	✓		
Interlac 665	A two component, high gloss, polyurethane	All Colours	0.040 - 0.060	✓	✓		
Interthane 990	A single pack alkyd	All Colours	0.050 - 0.075	✓	✓	✓	✓
Sika [®] Unitherm [®] Top S	A high build single pack topcoat	All Colours	0.100 - 0.150	✓	✓	✓	✓
SikaCor [®] EG 5	A two pack polyurethane topcoat with good gloss and colour retention	All Colours	0.080 - 0.150	✓	✓	✓	✓

¹ The approval is limited to the specific product (trade name and type) and no generic approach is possible

PROMAPAIN[®] SC3 was subjected to the identification testing in accordance with the methods of identification defined in Table 4 of EAD 350402-00-1106. Tests for 'fingerprinting' as described in Annex E (Thermoanalytical analyses (TG) and Infrared spectroscopy analyses (IR)) have been done and reported in the MPA Brunswick Test Report No. 2300/981/18 – 5/2019 Br/Mü vom 07.11.2019.

3. Performance of the Product and References to the Methods Used for its Assessment

Product: Reactive coating		Intended use: Fire protection of structural steel elements
Assessment method	Essential characteristic	Product performance
BASIC WORKS REQUIREMENT 2: SAFETY IN CASE OF FIRE		
EN 13501-1	Reaction to fire	Class E
EN 13501-2	Fire resistance	(R15 to R120) - IncSlow (I/H Beams and Columns) and (R15 to R120) - IncSlow (Hollow Beams) and (R30 to R120) - IncSlow (Hollow Columns) (see Annex A) ¹
BASIC WORKS REQUIREMENT 3: HYGIENE, HEALTH AND THE ENVIRONMENT		
Manufacturer's declaration and indoor air quality	Content, emission and or release of dangerous substances	Product specification doesn't contain dangerous substances given in Annex XVII of REACH and the ECHA Candidate List of Substances of Very High Concern Use categories: IA1 and S/W2 Results for reactive coating to DIN ISO 16000-6 after 28 days: TVOC (770µg/m ³)
BASIC WORKS REQUIREMENT 4: SAFETY AND ACCESSIBILITY IN USE		
EAD 350402-00-1106 Clause 2.2.4 and Clause 2.2.5	Adhesion and Durability	<ul style="list-style-type: none"> • Primer and top coat compatibility • Type X durability • Type Y durability • Type Z₁ durability • Type Z₂ durability
EAD 350402-00-1106 Table 4	Identification	Thermoanalytical analyses (TG) and Infrared spectroscopy analyses (IR)

¹ Assessments for I/H beams and columns, and hollow beams concern fire resistance periods up to 150 minutes. Therefore, table of results for additional times also form part of this European Technical Assessment.

4. Assessment and Verification of Constancy of Performance (hereinafter AVCP) System Applied, with reference to its Legal Base

According to the decision 1999/454/EC of the European Commission Decision of date 22 June 1999 on the procedure for attesting the conformity of construction products pursuant to Article 20(2) of Council Directive 89/106/EEC as regards fire stopping, fire sealing and fire protective products, the system of assessment and verification of constancy of performance (see Annex V to the Regulation (EU) No 305/2011) given in the following table apply:

Products	Intended uses	Level or Class	System
Fire protective products (including coatings)	Fire protection of steel elements	Any	1

5. Technical Details Necessary for the Implementation of the AVCP System, as Provided for in the Applicable EAD

The manufacturer shall exercise permanent internal control, record and evaluate the results of factory production in accordance with the provisions laid down in the "Control Plan" related to this European Technical Assessment. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. The production control system shall ensure that the product is in conformity with this European Technical Assessment.

The manufacturer may only use verified by Technical Assessment Body initial/raw/constituent materials stated in the technical documentations related to this European Technical Assessment.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

In cases where the provisions of the European technical assessment and its "Control Plan" are no longer fulfilled the certification body shall withdraw the Certificate of Constancy and inform the relevant authorities e.g. NANDO, EOTA.

The Table 5 in EAD 350402-00-1106 presents an example of the properties that shall be controlled and minimum frequencies of control. The exact test method and threshold have been laid down in the factory production control plan, operated by the manufacturer and deposited at Element Materials Technology Rotterdam B.V.

Issued in Amsterdam, Netherlands on 2020/12/16

By

A handwritten signature in black ink, appearing to read "Paul Duggan", enclosed in a thin black rectangular border.

Paul Duggan
Deputy TAB Manager

TERVEZÉSI SEGÉDLET

Annex A - Product Performance: Fire Resistance

- 1 This Annex relates to the use of PROMAPAIN[®] SC3 for the fire protection of 'I' and 'H' shaped beam and column sections, rectangular/square hollow beam sections and circular and rectangular/square hollow column sections. The precise scope is given in Tables 1 to 25 which show the total dry film thickness of PROMAPAIN[®] SC3 (excluding primer and top coat) required to provide classifications of R15 to R150 for 'I' and 'H' shaped beam and column sections, and of R15 to R150 for rectangular/square hollow beam sections, and of R30 to R120 for circular and for rectangular/square hollow column sections for various design temperatures and section factors. Table of results for additional times also form part of this European Technical Assessment.
- 2 The product is approved on the basis of:
 - i) Approval testing in accordance with the principles of EN 13381-8.
 - ii) A design appraisal against this ETA adopting the numerical regression method defined in Annex E of EN 13381-8.
- 3 The data presented in the tables in this Annex refers to both beams (three-sided fire exposure) and columns (four sided or surface exposure).
- 4 The data shown is applicable to steel sections blast cleaned to ISO 8501-1 Sa2.5 or equivalent and primed with the compatible primers and top coats listed in this ETA. The primer and top coat permitted dry film thicknesses are provided in the body of this European Technical Assessment.
- 5 The data for the 'I' and 'H' shaped beams and columns applies also to other shaped steel sections that have re-entrant details such as channels, angles and tees.
6. PROMAPAIN[®] SC3 has been exposed to the slowing heating regime (IncSlow) defined in Annex A of EN 13381-8 and has satisfied the requirements to provide classification according to EN 13501-2.

Table 3: I/H-Beam Sections 45 Minutes

Section Factor up to m ¹	Thickness (mm) Required for a Design Temperature of											
	350°C	400°C	450°C	500°C	520°C	550°C	570°C	600°C	620°C	650°C	700°C	750°C
66	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
70	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
75	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
80	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
85	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
90	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
95	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
100	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
105	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
110	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
115	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
120	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
125	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
130	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
135	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
140	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
145	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
150	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
155	1.865	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
160	1.888	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
165	1.910	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
170	1.932	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
175	1.953	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
180	1.973	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
185	1.992	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
190	2.011	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
195	2.030	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
200	2.048	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
205	2.065	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
210	2.082	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
215	2.098	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
220	2.114	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
225	2.130	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
230	2.145	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
235	2.160	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
240	2.174	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
245	2.188	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
250	2.201	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
255	2.215	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
260	2.227	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
265	2.240	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
270	2.252	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
275	2.264	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
280	2.276	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
285	2.287	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
290	2.299	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
295	2.309	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
300	2.320	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
305	2.331	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
310	2.341	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
315	2.351	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
320	2.360	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
325	2.370	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
330	2.379	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
335	2.388	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
340	2.397	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
342	2.400	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845

Thickness is intumescent only.

Table 4: I/H-Beam Sections 60 Minutes

Section Factor up to m ¹	Thickness (mm) Required for a Design Temperature of											
	350°C	400°C	450°C	500°C	520°C	550°C	570°C	600°C	620°C	650°C	700°C	750°C
66	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
70	1.902	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
75	1.975	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
80	2.044	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
85	2.111	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
90	2.174	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
95	2.235	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
100	2.293	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
105	2.349	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
110	2.402	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
115	2.454	1.871	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
120	2.503	1.913	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
125	2.551	1.953	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
130	2.597	1.992	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
135	2.641	2.029	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
140	2.684	2.066	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
145	2.725	2.101	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
150	2.765	2.135	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
155	2.804	2.168	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
160	2.841	2.199	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
165	2.877	2.230	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
170	2.911	2.260	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
175	2.945	2.289	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
180	2.978	2.318	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
185	3.009	2.345	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
190	3.040	2.372	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
195	3.070	2.397	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
200	3.099	2.423	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
205	3.127	2.447	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
210	3.154	2.471	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
215	3.181	2.494	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
220	3.206	2.517	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
225	3.231	2.539	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
230	3.256	2.560	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
235	3.280	2.581	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
240	3.303	2.601	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
245	3.325	2.621	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
250	3.347	2.641	1.851	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
255	3.369	2.660	1.866	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
260	3.389	2.678	1.881	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
265	3.410	2.696	1.895	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
270	3.430	2.714	1.909	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
275	3.449	2.731	1.922	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
280	3.468	2.748	1.936	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
285	3.486	2.764	1.949	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
290	3.504	2.780	1.962	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
295	3.522	2.796	1.974	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
300	3.539	2.811	1.987	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
305	3.556	2.826	1.999	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
310	3.573	2.841	2.010	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
315	3.589	2.856	2.022	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
320	3.604	2.870	2.033	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
325	3.620	2.884	2.044	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
330	3.635	2.897	2.055	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
335	3.650	2.910	2.066	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
340	3.664	2.923	2.076	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
342	3.669	2.928	2.080	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845

Thickness is intumescent only.

Table 5: I/H-Beam Sections 90 Minutes

Section Factor up to m ¹	Thickness (mm) Required for a Design Temperature of											
	350°C	400°C	450°C	500°C	520°C	550°C	570°C	600°C	620°C	650°C	700°C	750°C
66	2.983	2.473	1.949	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
70	3.091	2.570	2.032	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
75	3.219	2.685	2.131	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
80	3.341	2.796	2.227	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
85	3.458	2.902	2.319	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
90	3.570	3.004	2.408	1.890	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
95	3.677	3.102	2.493	1.964	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
100	3.780	3.197	2.576	2.036	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
105	3.878	3.288	2.656	2.105	1.894	1.845	1.845	1.845	1.845	1.845	1.845	1.845
110	3.973	3.375	2.733	2.173	1.957	1.845	1.845	1.845	1.845	1.845	1.845	1.845
115	4.064	3.459	2.808	2.238	2.018	1.845	1.845	1.845	1.845	1.845	1.845	1.845
120	4.151	3.541	2.880	2.301	2.077	1.845	1.845	1.845	1.845	1.845	1.845	1.845
125	4.235	3.619	2.949	2.363	2.135	1.845	1.845	1.845	1.845	1.845	1.845	1.845
130	4.316	3.695	3.017	2.422	2.191	1.856	1.845	1.845	1.845	1.845	1.845	1.845
135	4.394	3.768	3.082	2.480	2.246	1.905	1.845	1.845	1.845	1.845	1.845	1.845
140	4.470	3.839	3.146	2.536	2.299	1.953	1.845	1.845	1.845	1.845	1.845	1.845
145	4.542	3.907	3.207	2.591	2.351	2.000	1.845	1.845	1.845	1.845	1.845	1.845
150	4.612	3.973	3.267	2.644	2.401	2.046	1.845	1.845	1.845	1.845	1.845	1.845
155	4.680	4.038	3.325	2.696	2.450	2.091	1.845	1.845	1.845	1.845	1.845	1.845
160	4.746	4.100	3.381	2.746	2.498	2.134	1.883	1.845	1.845	1.845	1.845	1.845
165	4.809	4.160	3.436	2.795	2.544	2.177	1.923	1.845	1.845	1.845	1.845	1.845
170	4.871	4.218	3.489	2.843	2.590	2.218	1.961	1.845	1.845	1.845	1.845	1.845
175	4.930	4.275	3.541	2.889	2.634	2.259	1.999	1.845	1.845	1.845	1.845	1.845
180	4.988	4.330	3.591	2.935	2.677	2.298	2.036	1.845	1.845	1.845	1.845	1.845
185	5.043	4.384	3.640	2.979	2.719	2.337	2.072	1.845	1.845	1.845	1.845	1.845
190	5.097	4.436	3.687	3.022	2.760	2.375	2.107	1.845	1.845	1.845	1.845	1.845
195	5.150	4.486	3.734	3.064	2.800	2.411	2.141	1.845	1.845	1.845	1.845	1.845
200	5.201	4.535	3.779	3.105	2.839	2.447	2.175	1.846	1.845	1.845	1.845	1.845
205	5.250	4.583	3.823	3.145	2.877	2.483	2.208	1.877	1.845	1.845	1.845	1.845
210	5.299	4.629	3.866	3.184	2.915	2.517	2.240	1.906	1.845	1.845	1.845	1.845
215	5.345	4.675	3.907	3.222	2.951	2.551	2.271	1.935	1.845	1.845	1.845	1.845
220	5.391	4.719	3.948	3.260	2.987	2.584	2.302	1.964	1.845	1.845	1.845	1.845
225	5.435	4.762	3.988	3.296	3.022	2.616	2.332	1.992	1.845	1.845	1.845	1.845
230	5.478	4.803	4.027	3.332	3.056	2.648	2.362	2.019	1.845	1.845	1.845	1.845
235	5.520	4.844	4.065	3.367	3.089	2.679	2.391	2.046	1.845	1.845	1.845	1.845
240	5.561	4.884	4.101	3.401	3.122	2.709	2.420	2.072	1.845	1.845	1.845	1.845
245	5.600	4.923	4.138	3.434	3.154	2.739	2.447	2.098	1.845	1.845	1.845	1.845
250	5.639	4.961	4.173	3.466	3.185	2.768	2.475	2.123	1.845	1.845	1.845	1.845
255	5.677	4.997	4.207	3.498	3.216	2.796	2.502	2.148	1.845	1.845	1.845	1.845
260	5.713	5.033	4.241	3.530	3.246	2.824	2.528	2.172	1.863	1.845	1.845	1.845
265	5.749	5.069	4.274	3.560	3.275	2.852	2.554	2.196	1.885	1.845	1.845	1.845
270	5.784	5.103	4.306	3.590	3.304	2.879	2.579	2.220	1.906	1.845	1.845	1.845
275	5.818	5.137	4.338	3.619	3.332	2.905	2.604	2.243	1.927	1.845	1.845	1.845
280	5.852	5.169	4.369	3.648	3.360	2.931	2.628	2.266	1.948	1.845	1.845	1.845
285	5.884	5.202	4.399	3.676	3.387	2.956	2.652	2.288	1.968	1.845	1.845	1.845
290	5.916	5.233	4.428	3.704	3.414	2.981	2.675	2.310	1.988	1.845	1.845	1.845
295	5.947	5.264	4.457	3.731	3.440	3.006	2.699	2.331	2.008	1.845	1.845	1.845
300	5.978	5.294	4.486	3.757	3.465	3.030	2.721	2.352	2.027	1.845	1.845	1.845
305	6.007	5.323	4.514	3.783	3.490	3.053	2.743	2.373	2.046	1.845	1.845	1.845
310	6.036	5.352	4.541	3.809	3.515	3.076	2.765	2.394	2.065	1.845	1.845	1.845
315	6.065	5.380	4.567	3.834	3.539	3.099	2.787	2.414	2.083	1.845	1.845	1.845
320	6.093	5.408	4.594	3.859	3.563	3.121	2.808	2.434	2.102	1.845	1.845	1.845
325	6.120	5.435	4.619	3.883	3.586	3.143	2.829	2.453	2.119	1.845	1.845	1.845
330	6.146	5.461	4.644	3.906	3.609	3.165	2.849	2.472	2.137	1.845	1.845	1.845
335	6.172	5.487	4.669	3.930	3.632	3.186	2.869	2.491	2.154	1.845	1.845	1.845
340	6.198	5.512	4.693	3.952	3.654	3.207	2.889	2.510	2.171	1.845	1.845	1.845
342	6.207	5.521	4.702	3.960	3.661	3.214	2.896	2.516	2.177	1.845	1.845	1.845

Thickness is intumescent only.

Table 6: I/H-Beam Sections 120 Minutes

Section Factor up to m ¹	Thickness (mm) Required for a Design Temperature of											
	350°C	400°C	450°C	500°C	520°C	550°C	570°C	600°C	620°C	650°C	700°C	750°C
66	4.126	3.580	3.010	2.532	2.352	2.095	1.923	1.845	1.845	1.845	1.845	1.845
70	4.280	3.724	3.140	2.650	2.465	2.201	2.024	1.845	1.845	1.845	1.845	1.845
75	4.463	3.896	3.296	2.792	2.601	2.329	2.146	1.934	1.845	1.845	1.845	1.845
80	4.639	4.061	3.446	2.929	2.733	2.453	2.264	2.046	1.863	1.845	1.845	1.845
85	4.806	4.219	3.590	3.061	2.861	2.574	2.379	2.156	1.967	1.845	1.845	1.845
90	4.966	4.371	3.730	3.189	2.984	2.691	2.491	2.262	2.068	1.845	1.845	1.845
95	5.120	4.517	3.864	3.313	3.104	2.804	2.600	2.366	2.166	1.870	1.845	1.845
100	5.267	4.657	3.993	3.433	3.220	2.914	2.705	2.467	2.262	1.958	1.845	1.845
105	5.408	4.792	4.118	3.550	3.333	3.021	2.808	2.566	2.356	2.045	1.845	1.845
110	5.544	4.922	4.239	3.662	3.442	3.125	2.908	2.662	2.448	2.129	1.845	1.845
115	5.674	5.047	4.356	3.771	3.548	3.226	3.005	2.756	2.537	2.211	1.845	1.845
120	5.799	5.168	4.469	3.877	3.651	3.324	3.100	2.847	2.624	2.292	1.845	1.845
125	5.919	5.285	4.578	3.980	3.751	3.420	3.192	2.936	2.710	2.371	1.845	1.845
130	6.035	5.398	4.684	4.080	3.848	3.513	3.282	3.023	2.793	2.448	1.845	1.845
135	6.147	5.506	4.787	4.177	3.942	3.604	3.369	3.108	2.874	2.524	1.903	1.845
140	6.255	5.612	4.886	4.271	4.034	3.692	3.455	3.191	2.954	2.596	1.965	1.845
145	6.359	5.714	4.982	4.363	4.124	3.778	3.538	3.272	3.031	2.670	2.027	1.845
150	-	5.812	5.076	4.452	4.211	3.862	3.619	3.351	3.107	2.741	2.087	1.845
155	-	5.908	5.167	4.538	4.295	3.944	3.699	3.428	3.182	2.811	2.146	1.845
160	-	6.000	5.255	4.623	4.378	4.023	3.776	3.504	3.255	2.879	2.204	1.845
165	-	6.090	5.340	4.705	4.458	4.101	3.852	3.578	3.326	2.946	2.261	1.845
170	-	6.177	5.424	4.785	4.537	4.177	3.926	3.650	3.396	3.011	2.317	1.845
175	-	6.261	5.504	4.862	4.613	4.251	3.998	3.721	3.464	3.075	2.373	1.845
180	-	6.343	5.583	4.938	4.688	4.324	4.069	3.790	3.531	3.138	2.427	1.845
185	-	-	5.660	5.012	4.760	4.394	4.137	3.858	3.596	3.200	2.480	1.845
190	-	-	5.734	5.084	4.831	4.463	4.205	3.924	3.660	3.260	2.532	1.845
195	-	-	5.807	5.155	4.901	4.531	4.271	3.989	3.723	3.320	2.584	1.880
200	-	-	5.877	5.223	4.968	4.597	4.335	4.053	3.785	3.378	2.634	1.922
205	-	-	5.946	5.290	5.034	4.662	4.399	4.115	3.845	3.435	2.684	1.963
210	-	-	6.013	5.356	5.099	4.725	4.460	4.176	3.905	3.491	2.733	2.004
215	-	-	6.079	5.420	5.162	4.786	4.521	4.236	3.963	3.546	2.781	2.044
220	-	-	6.143	5.482	5.224	4.847	4.580	4.295	4.020	3.600	2.828	2.084
225	-	-	6.205	5.543	5.284	4.906	4.638	4.352	4.076	3.653	2.875	2.123
230	-	-	6.266	5.603	5.343	4.964	4.695	4.408	4.130	3.706	2.921	2.162
235	-	-	6.325	5.661	5.401	5.021	4.751	4.464	4.184	3.757	2.966	2.200
240	-	-	-	5.718	5.457	5.076	4.805	4.518	4.237	3.807	3.010	2.237
245	-	-	-	5.774	5.513	5.131	4.859	4.571	4.289	3.857	3.054	2.274
250	-	-	-	5.828	5.567	5.184	4.911	4.623	4.340	3.905	3.097	2.311
255	-	-	-	5.882	5.620	5.236	4.963	4.675	4.390	3.953	3.139	2.347
260	-	-	-	5.934	5.672	5.287	5.013	4.725	4.439	4.000	3.181	2.382
265	-	-	-	5.985	5.722	5.338	5.063	4.775	4.488	4.047	3.222	2.417
270	-	-	-	6.035	5.772	5.387	5.111	4.823	4.535	4.092	3.263	2.452
275	-	-	-	6.084	5.821	5.435	5.159	4.871	4.582	4.137	3.302	2.486
280	-	-	-	6.132	5.869	5.483	5.206	4.918	4.627	4.181	3.342	2.520
285	-	-	-	6.180	5.916	5.529	5.252	4.964	4.672	4.224	3.380	2.553
290	-	-	-	6.226	5.962	5.575	5.297	5.009	4.717	4.267	3.418	2.586
295	-	-	-	6.271	6.007	5.620	5.341	5.053	4.760	4.309	3.456	2.618
300	-	-	-	6.315	6.051	5.663	5.384	5.097	4.803	4.350	3.493	2.650
305	-	-	-	6.359	6.095	5.707	5.427	5.140	4.845	4.391	3.530	2.681
310	-	-	-	-	6.137	5.749	5.469	5.182	4.887	4.431	3.566	2.713
315	-	-	-	-	6.179	5.791	5.510	5.223	4.928	4.470	3.601	2.743
320	-	-	-	-	6.220	5.832	5.551	5.264	4.968	4.509	3.636	2.774
325	-	-	-	-	6.260	5.872	5.591	5.304	5.007	4.547	3.671	2.804
330	-	-	-	-	6.300	5.911	5.630	5.344	5.046	4.585	3.705	2.833
335	-	-	-	-	6.339	5.950	5.668	5.383	5.084	4.622	3.738	2.862
340	-	-	-	-	-	5.988	5.706	5.421	5.122	4.658	3.771	2.891
342	-	-	-	-	-	6.001	5.720	5.434	5.135	4.671	3.783	2.901

Thickness is intumescent only.

Table 7: I/H-Beam Sections 150 Minutes

Section Factor up to m ¹	Thickness (mm) Required for a Design Temperature of											
	350°C	400°C	450°C	500°C	520°C	550°C	570°C	600°C	620°C	650°C	700°C	750°C
66	5.268	4.688	4.072	3.566	3.377	3.109	2.928	2.727	2.553	2.298	1.859	1.845
70	5.469	4.879	4.249	3.732	3.538	3.263	3.077	2.872	2.693	2.429	1.975	1.845
75	5.708	5.107	4.461	3.931	3.732	3.449	3.258	3.048	2.862	2.589	2.117	1.845
80	5.936	5.326	4.665	4.123	3.919	3.630	3.433	3.218	3.027	2.745	2.256	1.945
85	6.154	5.536	4.862	4.309	4.101	3.805	3.603	3.384	3.188	2.897	2.391	1.933
90	6.363	5.737	5.051	4.489	4.276	3.975	3.768	3.546	3.344	3.046	2.524	2.051
95	-	5.931	5.234	4.663	4.447	4.139	3.929	3.703	3.497	3.191	2.655	2.167
100	-	6.117	5.410	4.831	4.612	4.299	4.085	3.856	3.646	3.333	2.783	2.281
105	-	6.296	5.581	4.994	4.772	4.455	4.237	4.006	3.791	3.472	2.908	2.393
110	-	-	5.745	5.152	4.927	4.606	4.384	4.151	3.933	3.607	3.030	2.503
115	-	-	5.904	5.305	5.078	4.753	4.528	4.293	4.071	3.740	3.151	2.611
120	-	-	6.058	5.454	5.224	4.896	4.668	4.432	4.206	3.869	3.269	2.717
125	-	-	6.207	5.598	5.366	5.035	4.805	4.567	4.338	3.996	3.384	2.822
130	-	-	6.351	5.738	5.504	5.170	4.938	4.699	4.467	4.120	3.498	2.925
135	-	-	-	5.874	5.639	5.302	5.067	4.827	4.593	4.242	3.609	3.026
140	-	-	-	6.006	5.769	5.430	5.194	4.953	4.716	4.360	3.718	3.125
145	-	-	-	6.134	5.896	5.556	5.317	5.076	4.836	4.477	3.826	3.223
150	-	-	-	6.259	6.020	5.677	5.437	5.196	4.954	4.591	3.931	3.320
155	-	-	-	-	6.141	5.796	5.554	5.313	5.069	4.702	4.034	3.414
160	-	-	-	-	6.258	5.912	5.669	5.427	5.182	4.812	4.136	3.508
165	-	-	-	-	-	6.026	5.781	5.539	5.292	4.919	4.236	3.600
170	-	-	-	-	-	6.136	5.890	5.649	5.400	5.024	4.334	3.690
175	-	-	-	-	-	6.244	5.997	5.756	5.506	5.127	4.430	3.779
180	-	-	-	-	-	6.349	6.101	5.861	5.609	5.228	4.524	3.867
185	-	-	-	-	-	-	6.203	5.964	5.711	5.327	4.617	3.953
190	-	-	-	-	-	-	6.303	6.064	5.810	5.424	4.709	4.038
195	-	-	-	-	-	-	-	6.163	5.907	5.520	4.799	4.122
200	-	-	-	-	-	-	-	6.259	6.003	5.613	4.887	4.205
205	-	-	-	-	-	-	-	6.353	6.096	5.705	4.974	4.286
210	-	-	-	-	-	-	-	-	6.188	5.795	5.059	4.367
215	-	-	-	-	-	-	-	-	6.278	5.884	5.143	4.446
220	-	-	-	-	-	-	-	-	6.366	5.971	5.226	4.523
225	-	-	-	-	-	-	-	-	-	6.056	5.307	4.600
230	-	-	-	-	-	-	-	-	-	6.140	5.387	4.676
235	-	-	-	-	-	-	-	-	-	6.222	5.466	4.751
240	-	-	-	-	-	-	-	-	-	6.303	5.543	4.824
245	-	-	-	-	-	-	-	-	-	-	5.620	4.897
250	-	-	-	-	-	-	-	-	-	-	5.695	4.968
255	-	-	-	-	-	-	-	-	-	-	5.769	5.039
260	-	-	-	-	-	-	-	-	-	-	5.842	5.109
265	-	-	-	-	-	-	-	-	-	-	5.913	5.177
270	-	-	-	-	-	-	-	-	-	-	5.984	5.245
275	-	-	-	-	-	-	-	-	-	-	6.054	5.312
280	-	-	-	-	-	-	-	-	-	-	6.122	5.378
285	-	-	-	-	-	-	-	-	-	-	6.190	5.443
290	-	-	-	-	-	-	-	-	-	-	6.256	5.508
295	-	-	-	-	-	-	-	-	-	-	6.322	5.571
300	-	-	-	-	-	-	-	-	-	-	-	5.634
305	-	-	-	-	-	-	-	-	-	-	-	5.695
310	-	-	-	-	-	-	-	-	-	-	-	5.757
315	-	-	-	-	-	-	-	-	-	-	-	5.817
320	-	-	-	-	-	-	-	-	-	-	-	5.876
325	-	-	-	-	-	-	-	-	-	-	-	5.935
330	-	-	-	-	-	-	-	-	-	-	-	5.993
335	-	-	-	-	-	-	-	-	-	-	-	6.050
340	-	-	-	-	-	-	-	-	-	-	-	6.107
342	-	-	-	-	-	-	-	-	-	-	-	6.127

Thickness is intumescent only.

Table 8: I Section Columns 15 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
95	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
100	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
105	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
110	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
115	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
120	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
125	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
130	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
135	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
140	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
145	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
150	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
155	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
160	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
165	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
170	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
175	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
180	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
185	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
190	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
195	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
200	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
205	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
210	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
215	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
220	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
225	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
230	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
235	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
240	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
245	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
250	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
255	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
260	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
265	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
270	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
275	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
280	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
285	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
290	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
295	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
300	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
305	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
310	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
315	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
320	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
325	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
330	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
335	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
340	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
345	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
346	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951

Thickness is intumescent only.

Results also apply to I/H-section beams exposed on all four sides up to the maximum dry film thickness of 6.368mm.

Table 9: I Section Columns 30 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
95	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
100	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
105	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
110	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
115	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
120	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
125	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
130	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
135	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
140	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
145	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
150	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
155	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
160	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
165	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
170	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
175	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
180	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
185	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
190	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
195	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
200	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
205	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
210	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
215	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
220	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
225	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
230	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
235	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
240	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
245	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
250	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
255	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
260	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
265	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
270	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
275	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
280	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
285	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
290	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
295	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
300	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
305	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
310	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
315	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
320	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
325	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
330	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
335	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
340	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
345	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
346	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951

Thickness is intumescent only.

Results also apply to I/H-section beams exposed on all four sides up to the maximum dry film thickness of 6.368mm.

Table 10: I Section Columns 45 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
95	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
100	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
105	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
110	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
115	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
120	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
125	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
130	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
135	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
140	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
145	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
150	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
155	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
160	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
165	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
170	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
175	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
180	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
185	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
190	1.974	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
195	2.009	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
200	2.044	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
205	2.076	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
210	2.108	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
215	2.138	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
220	2.167	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
225	2.196	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
230	2.223	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
235	2.249	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
240	2.274	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
245	2.299	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
250	2.323	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
255	2.346	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
260	2.368	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
265	2.389	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
270	2.410	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
275	2.430	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
280	2.450	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
285	2.469	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
290	2.488	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
295	2.505	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
300	2.523	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
305	2.540	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
310	2.556	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
315	2.572	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
320	2.588	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
325	2.603	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
330	2.618	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
335	2.632	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
340	2.646	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
345	2.660	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
346	2.664	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951

Thickness is intumescent only.

Results also apply to I/H-section beams exposed on all four sides up to the maximum dry film thickness of 6.368mm.

Table 11: I Section Columns 60 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
95	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
100	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
105	1.990	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
110	2.088	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
115	2.180	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
120	2.266	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
125	2.348	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
130	2.426	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
135	2.499	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
140	2.569	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
145	2.635	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
150	2.698	1.955	1.951	1.951	1.951	1.951	1.951	1.951	1.951
155	2.757	2.014	1.951	1.951	1.951	1.951	1.951	1.951	1.951
160	2.814	2.070	1.951	1.951	1.951	1.951	1.951	1.951	1.951
165	2.869	2.124	1.951	1.951	1.951	1.951	1.951	1.951	1.951
170	2.921	2.175	1.951	1.951	1.951	1.951	1.951	1.951	1.951
175	2.970	2.224	1.951	1.951	1.951	1.951	1.951	1.951	1.951
180	3.018	2.271	1.951	1.951	1.951	1.951	1.951	1.951	1.951
185	3.063	2.317	1.951	1.951	1.951	1.951	1.951	1.951	1.951
190	3.107	2.360	1.951	1.951	1.951	1.951	1.951	1.951	1.951
195	3.149	2.402	1.951	1.951	1.951	1.951	1.951	1.951	1.951
200	3.189	2.443	1.951	1.951	1.951	1.951	1.951	1.951	1.951
205	3.228	2.482	1.951	1.951	1.951	1.951	1.951	1.951	1.951
210	3.265	2.519	1.951	1.951	1.951	1.951	1.951	1.951	1.951
215	3.301	2.555	1.951	1.951	1.951	1.951	1.951	1.951	1.951
220	3.335	2.590	1.951	1.951	1.951	1.951	1.951	1.951	1.951
225	3.369	2.624	1.951	1.951	1.951	1.951	1.951	1.951	1.951
230	3.401	2.657	1.958	1.951	1.951	1.951	1.951	1.951	1.951
235	3.432	2.688	1.989	1.951	1.951	1.951	1.951	1.951	1.951
240	3.462	2.719	2.019	1.951	1.951	1.951	1.951	1.951	1.951
245	3.491	2.748	2.049	1.951	1.951	1.951	1.951	1.951	1.951
250	3.519	2.777	2.077	1.951	1.951	1.951	1.951	1.951	1.951
255	3.546	2.804	2.104	1.951	1.951	1.951	1.951	1.951	1.951
260	3.572	2.831	2.131	1.951	1.951	1.951	1.951	1.951	1.951
265	3.597	2.857	2.157	1.951	1.951	1.951	1.951	1.951	1.951
270	3.622	2.883	2.182	1.951	1.951	1.951	1.951	1.951	1.951
275	3.646	2.907	2.206	1.951	1.951	1.951	1.951	1.951	1.951
280	3.669	2.931	2.230	1.951	1.951	1.951	1.951	1.951	1.951
285	3.691	2.954	2.253	1.951	1.951	1.951	1.951	1.951	1.951
290	3.713	2.976	2.276	1.951	1.951	1.951	1.951	1.951	1.951
295	3.734	2.998	2.298	1.951	1.951	1.951	1.951	1.951	1.951
300	3.755	3.020	2.319	1.951	1.951	1.951	1.951	1.951	1.951
305	3.775	3.040	2.340	1.951	1.951	1.951	1.951	1.951	1.951
310	3.794	3.060	2.360	1.951	1.951	1.951	1.951	1.951	1.951
315	3.813	3.080	2.380	1.951	1.951	1.951	1.951	1.951	1.951
320	3.832	3.099	2.399	1.951	1.951	1.951	1.951	1.951	1.951
325	3.850	3.118	2.418	1.951	1.951	1.951	1.951	1.951	1.951
330	3.867	3.136	2.436	1.951	1.951	1.951	1.951	1.951	1.951
335	3.884	3.154	2.454	1.951	1.951	1.951	1.951	1.951	1.951
340	3.901	3.171	2.471	1.951	1.951	1.951	1.951	1.951	1.951
345	3.917	3.188	2.488	1.951	1.951	1.951	1.951	1.951	1.951
346	3.921	3.192	2.493	1.951	1.951	1.951	1.951	1.951	1.951

Thickness is intumescent only.

Results also apply to I/H-section beams exposed on all four sides up to the maximum dry film thickness of 6.368mm.

Table 12: I Section Columns 90 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	2.757	2.003	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	2.938	2.174	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	3.131	2.358	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	3.310	2.529	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	3.477	2.690	2.016	1.951	1.951	1.951	1.951	1.951	1.951
95	3.633	2.841	2.160	1.951	1.951	1.951	1.951	1.951	1.951
100	3.778	2.983	2.295	1.951	1.951	1.951	1.951	1.951	1.951
105	3.914	3.116	2.424	1.951	1.951	1.951	1.951	1.951	1.951
110	4.042	3.242	2.545	1.951	1.951	1.951	1.951	1.951	1.951
115	4.162	3.361	2.661	1.998	1.951	1.951	1.951	1.951	1.951
120	4.275	3.474	2.771	2.103	1.951	1.951	1.951	1.951	1.951
125	4.382	3.581	2.875	2.202	1.951	1.951	1.951	1.951	1.951
130	4.484	3.682	2.975	2.297	1.951	1.951	1.951	1.951	1.951
135	4.579	3.779	3.070	2.389	1.951	1.951	1.951	1.951	1.951
140	4.670	3.870	3.160	2.476	1.951	1.951	1.951	1.951	1.951
145	4.756	3.958	3.247	2.560	1.951	1.951	1.951	1.951	1.951
150	4.838	4.041	3.330	2.640	1.996	1.951	1.951	1.951	1.951
155	4.916	4.121	3.410	2.718	2.070	1.951	1.951	1.951	1.951
160	4.991	4.197	3.486	2.792	2.141	1.951	1.951	1.951	1.951
165	5.062	4.270	3.559	2.863	2.209	1.951	1.951	1.951	1.951
170	5.130	4.340	3.629	2.932	2.275	1.951	1.951	1.951	1.951
175	5.194	4.407	3.697	2.998	2.339	1.951	1.951	1.951	1.951
180	5.257	4.471	3.762	3.062	2.400	1.951	1.951	1.951	1.951
185	5.316	4.533	3.824	3.124	2.460	1.951	1.951	1.951	1.951
190	5.373	4.592	3.884	3.183	2.517	1.951	1.951	1.951	1.951
195	5.428	4.649	3.942	3.241	2.573	1.951	1.951	1.951	1.951
200	5.480	4.704	3.998	3.296	2.627	1.983	1.951	1.951	1.951
205	5.531	4.757	4.052	3.350	2.679	2.033	1.951	1.951	1.951
210	5.579	4.808	4.104	3.402	2.730	2.081	1.951	1.951	1.951
215	5.626	4.857	4.155	3.452	2.779	2.128	1.951	1.951	1.951
220	5.671	4.904	4.204	3.501	2.827	2.174	1.951	1.951	1.951
225	5.715	4.950	4.251	3.548	2.873	2.218	1.951	1.951	1.951
230	5.757	4.994	4.296	3.594	2.918	2.261	1.951	1.951	1.951
235	5.797	5.037	4.341	3.639	2.962	2.303	1.951	1.951	1.951
240	5.836	5.078	4.383	3.682	3.004	2.344	1.951	1.951	1.951
245	5.874	5.118	4.425	3.724	3.046	2.384	1.951	1.951	1.951
250	5.911	5.157	4.465	3.764	3.086	2.423	1.951	1.951	1.951
255	5.946	5.195	4.504	3.804	3.125	2.461	1.951	1.951	1.951
260	5.980	5.231	4.542	3.842	3.163	2.498	1.951	1.951	1.951
265	6.013	5.267	4.579	3.880	3.200	2.534	1.951	1.951	1.951
270	6.045	5.301	4.615	3.916	3.236	2.569	1.951	1.951	1.951
275	6.077	5.334	4.650	3.951	3.271	2.603	1.951	1.951	1.951
280	6.107	5.367	4.684	3.986	3.306	2.636	1.951	1.951	1.951
285	6.136	5.398	4.716	4.019	3.339	2.669	1.955	1.951	1.951
290	6.165	5.429	4.748	4.052	3.372	2.701	1.985	1.951	1.951
295	6.192	5.458	4.780	4.084	3.403	2.732	2.014	1.951	1.951
300	6.219	5.487	4.810	4.115	3.435	2.762	2.043	1.951	1.951
305	6.245	5.515	4.840	4.145	3.465	2.792	2.071	1.951	1.951
310	6.271	5.543	4.868	4.175	3.494	2.821	2.098	1.951	1.951
315	6.295	5.570	4.897	4.203	3.523	2.849	2.125	1.951	1.951
320	6.319	5.595	4.924	4.232	3.552	2.877	2.152	1.951	1.951
325	6.343	5.621	4.951	4.259	3.579	2.904	2.177	1.951	1.951
330	6.366	5.645	4.977	4.286	3.606	2.931	2.203	1.951	1.951
335	6.388	5.670	5.002	4.312	3.633	2.957	2.227	1.951	1.951
340	6.410	5.693	5.027	4.338	3.658	2.982	2.252	1.951	1.951
345	6.431	5.716	5.051	4.363	3.684	3.007	2.275	1.951	1.951
346	6.436	5.722	5.058	4.370	3.691	3.014	2.282	1.951	1.951

Thickness is intumescent only.

Results also apply to I/H-section beams exposed on all four sides up to the maximum dry film thickness of 6.368mm.

Table 13: I Section Columns 120 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	4.411	3.552	2.839	2.196	1.951	1.951	1.951	1.951	1.951
75	4.634	3.767	3.045	2.388	1.951	1.951	1.951	1.951	1.951
80	4.872	4.000	3.268	2.599	2.007	1.951	1.951	1.951	1.951
85	5.093	4.216	3.477	2.797	2.193	1.951	1.951	1.951	1.951
90	5.299	4.420	3.675	2.985	2.371	1.951	1.951	1.951	1.951
95	5.491	4.610	3.861	3.164	2.539	1.973	1.951	1.951	1.951
100	5.670	4.789	4.037	3.333	2.700	2.124	1.951	1.951	1.951
105	5.838	4.958	4.204	3.494	2.854	2.269	1.951	1.951	1.951
110	5.996	5.117	4.362	3.648	3.001	2.408	1.951	1.951	1.951
115	6.145	5.268	4.512	3.794	3.141	2.542	1.951	1.951	1.951
120	6.285	5.410	4.654	3.933	3.276	2.670	2.062	1.951	1.951
125	6.417	5.545	4.790	4.067	3.405	2.793	2.177	1.951	1.951
130	6.541	5.674	4.919	4.194	3.529	2.912	2.288	1.951	1.951
135	6.660	5.795	5.042	4.316	3.648	3.026	2.396	1.951	1.951
140	6.772	5.911	5.160	4.433	3.762	3.136	2.499	1.951	1.951
145	-	6.022	5.273	4.545	3.872	3.242	2.600	1.951	1.951
150	-	6.127	5.380	4.653	3.978	3.345	2.697	2.016	1.951
155	-	6.228	5.483	4.756	4.080	3.444	2.791	2.102	1.951
160	-	6.324	5.582	4.855	4.178	3.539	2.882	2.186	1.951
165	-	6.416	5.677	4.951	4.273	3.632	2.970	2.268	1.951
170	-	6.505	5.768	5.043	4.364	3.721	3.056	2.348	1.951
175	-	6.589	5.856	5.132	4.452	3.808	3.139	2.425	1.951
180	-	6.670	5.940	5.217	4.538	3.892	3.219	2.500	1.951
185	-	6.748	6.021	5.300	4.620	3.973	3.298	2.573	1.951
190	-	6.823	6.100	5.379	4.700	4.052	3.374	2.644	1.951
195	-	-	6.175	5.456	4.777	4.128	3.447	2.713	2.014
200	-	-	6.247	5.530	4.852	4.203	3.519	2.780	2.076
205	-	-	6.318	5.602	4.924	4.274	3.589	2.846	2.136
210	-	-	6.385	5.672	4.995	4.344	3.657	2.910	2.195
215	-	-	6.451	5.739	5.063	4.412	3.723	2.972	2.253
220	-	-	6.514	5.804	5.129	4.478	3.787	3.033	2.310
225	-	-	6.575	5.867	5.193	4.542	3.850	3.093	2.365
230	-	-	6.634	5.929	5.255	4.605	3.911	3.150	2.419
235	-	-	6.692	5.988	5.316	4.666	3.970	3.207	2.471
240	-	-	6.747	6.046	5.375	4.725	4.028	3.262	2.523
245	-	-	6.801	6.102	5.432	4.782	4.085	3.316	2.573
250	-	-	6.854	6.156	5.488	4.838	4.140	3.369	2.622
255	-	-	-	6.209	5.542	4.893	4.194	3.420	2.670
260	-	-	-	6.260	5.595	4.946	4.247	3.470	2.717
265	-	-	-	6.310	5.646	4.998	4.298	3.520	2.764
270	-	-	-	6.359	5.696	5.049	4.348	3.568	2.809
275	-	-	-	6.406	5.745	5.098	4.397	3.615	2.853
280	-	-	-	6.452	5.792	5.147	4.445	3.661	2.897
285	-	-	-	6.497	5.838	5.194	4.492	3.706	2.939
290	-	-	-	6.541	5.884	5.240	4.537	3.750	2.981
295	-	-	-	6.584	5.928	5.285	4.582	3.793	3.021
300	-	-	-	6.625	5.971	5.328	4.626	3.835	3.062
305	-	-	-	6.666	6.013	5.371	4.669	3.877	3.101
310	-	-	-	6.705	6.054	5.413	4.710	3.917	3.139
315	-	-	-	6.744	6.094	5.454	4.751	3.957	3.177
320	-	-	-	6.781	6.133	5.495	4.792	3.996	3.214
325	-	-	-	6.818	6.171	5.534	4.831	4.034	3.250
330	-	-	-	6.854	6.209	5.572	4.869	4.071	3.286
335	-	-	-	-	6.245	5.610	4.907	4.108	3.321
340	-	-	-	-	6.281	5.647	4.944	4.144	3.356
345	-	-	-	-	6.316	5.683	4.980	4.179	3.389
346	-	-	-	-	6.326	5.693	4.990	4.189	3.399

Thickness is intumescent only.

Results also apply to I/H-section beams exposed on all four sides up to the maximum dry film thickness of 6.368mm.

Table 14: I Section Columns 150 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	6.064	5.100	4.306	3.588	2.961	2.407	1.951	1.951	1.951
75	6.330	5.361	4.559	3.829	3.190	2.622	2.071	1.951	1.951
80	6.613	5.641	4.833	4.092	3.440	2.858	2.291	1.951	1.951
85	-	5.904	5.091	4.341	3.678	3.084	2.501	1.951	1.951
90	-	6.149	5.334	4.577	3.905	3.299	2.703	2.097	1.951
95	-	6.379	5.563	4.800	4.120	3.506	2.897	2.275	1.951
100	-	6.596	5.779	5.012	4.326	3.703	3.084	2.448	1.951
105	-	6.800	5.984	5.214	4.523	3.893	3.263	2.614	2.022
110	-	-	6.178	5.406	4.710	4.074	3.436	2.774	2.170
115	-	-	6.362	5.589	4.890	4.249	3.602	2.930	2.313
120	-	-	6.538	5.764	5.062	4.417	3.763	3.080	2.452
125	-	-	6.704	5.931	5.227	4.578	3.917	3.225	2.587
130	-	-	-	6.091	5.385	4.733	4.067	3.366	2.718
135	-	-	-	6.244	5.537	4.883	4.211	3.502	2.845
140	-	-	-	6.390	5.684	5.027	4.351	3.634	2.968
145	-	-	-	6.530	5.824	5.166	4.486	3.762	3.088
150	-	-	-	6.665	5.959	5.300	4.616	3.886	3.205
155	-	-	-	6.794	6.090	5.429	4.743	4.006	3.318
160	-	-	-	-	6.215	5.554	4.865	4.123	3.429
165	-	-	-	-	6.336	5.676	4.984	4.237	3.536
170	-	-	-	-	6.453	5.793	5.099	4.347	3.641
175	-	-	-	-	6.566	5.906	5.210	4.454	3.743
180	-	-	-	-	6.675	6.016	5.318	4.558	3.842
185	-	-	-	-	6.780	6.122	5.424	4.660	3.939
190	-	-	-	-	-	6.225	5.526	4.759	4.033
195	-	-	-	-	-	6.325	5.625	4.855	4.125
200	-	-	-	-	-	6.422	5.721	4.948	4.215
205	-	-	-	-	-	6.516	5.815	5.040	4.303
210	-	-	-	-	-	6.607	5.906	5.129	4.388
215	-	-	-	-	-	6.696	5.995	5.215	4.472
220	-	-	-	-	-	6.783	6.082	5.300	4.553
225	-	-	-	-	-	-	6.166	5.382	4.633
230	-	-	-	-	-	-	6.248	5.463	4.711
235	-	-	-	-	-	-	6.328	5.541	4.787
240	-	-	-	-	-	-	6.406	5.618	4.862
245	-	-	-	-	-	-	6.482	5.693	4.935
250	-	-	-	-	-	-	6.556	5.766	5.006
255	-	-	-	-	-	-	6.628	5.837	5.076
260	-	-	-	-	-	-	6.699	5.907	5.144
265	-	-	-	-	-	-	6.768	5.975	5.211
270	-	-	-	-	-	-	6.835	6.042	5.276
275	-	-	-	-	-	-	-	6.108	5.340
280	-	-	-	-	-	-	-	6.172	5.403
285	-	-	-	-	-	-	-	6.234	5.465
290	-	-	-	-	-	-	-	6.295	5.525
295	-	-	-	-	-	-	-	6.355	5.584
300	-	-	-	-	-	-	-	6.414	5.642
305	-	-	-	-	-	-	-	6.472	5.699
310	-	-	-	-	-	-	-	6.528	5.754
315	-	-	-	-	-	-	-	6.583	5.809
320	-	-	-	-	-	-	-	6.637	5.863
325	-	-	-	-	-	-	-	6.690	5.915
330	-	-	-	-	-	-	-	6.742	5.967
335	-	-	-	-	-	-	-	6.793	6.018
340	-	-	-	-	-	-	-	6.843	6.068
345	-	-	-	-	-	-	-	-	6.117
346	-	-	-	-	-	-	-	-	6.130

Thickness is intumescent only.

Results also apply to I/H-section beams exposed on all four sides up to the maximum dry film thickness of 6.368mm.

Hollow Column and Beam Sections

Table 15: Circular and Rectangular/Square Hollow Column Sections 30 Minutes									
Section Factor up to m ²	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
46	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
50	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
55	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
60	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
65	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
70	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
75	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
80	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
85	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
90	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
95	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
100	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
105	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
110	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
115	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
120	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
125	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
130	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
135	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
140	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
145	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
150	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
155	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
160	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
165	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
170	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
175	2.005	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
180	2.054	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
185	2.100	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
190	2.145	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
195	2.189	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
200	2.230	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
205	2.271	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
210	2.309	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
215	2.347	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
220	2.383	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
225	2.418	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
230	2.452	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
235	2.485	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
240	2.516	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
245	2.547	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
250	2.577	1.993	1.989	1.989	1.989	1.989	1.989	1.989	1.989
255	2.605	2.022	1.989	1.989	1.989	1.989	1.989	1.989	1.989
260	2.633	2.050	1.989	1.989	1.989	1.989	1.989	1.989	1.989
265	2.660	2.078	1.989	1.989	1.989	1.989	1.989	1.989	1.989
270	2.687	2.105	1.989	1.989	1.989	1.989	1.989	1.989	1.989
275	2.712	2.131	1.989	1.989	1.989	1.989	1.989	1.989	1.989
280	2.737	2.156	1.989	1.989	1.989	1.989	1.989	1.989	1.989
285	2.761	2.181	1.989	1.989	1.989	1.989	1.989	1.989	1.989
290	2.785	2.205	1.989	1.989	1.989	1.989	1.989	1.989	1.989
295	2.808	2.228	1.989	1.989	1.989	1.989	1.989	1.989	1.989
300	2.830	2.251	1.989	1.989	1.989	1.989	1.989	1.989	1.989
305	2.852	2.273	1.989	1.989	1.989	1.989	1.989	1.989	1.989
310	2.873	2.295	1.989	1.989	1.989	1.989	1.989	1.989	1.989
315	2.893	2.316	1.989	1.989	1.989	1.989	1.989	1.989	1.989
320	2.913	2.337	1.989	1.989	1.989	1.989	1.989	1.989	1.989
325	2.933	2.357	1.989	1.989	1.989	1.989	1.989	1.989	1.989
330	2.952	2.377	1.989	1.989	1.989	1.989	1.989	1.989	1.989
335	2.971	2.396	1.989	1.989	1.989	1.989	1.989	1.989	1.989
338	2.981	2.407	1.989	1.989	1.989	1.989	1.989	1.989	1.989

Thickness is intumescent only.

Results also apply to rectangular/square hollow beams exposed on all four sides up to the maximum dry film thickness of 6.169mm.

Section Factor up to m ²	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
46	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
50	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
55	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
60	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
65	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
70	2.128	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
75	2.340	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
80	2.538	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
85	2.724	2.119	1.989	1.989	1.989	1.989	1.989	1.989	1.989
90	2.898	2.282	1.989	1.989	1.989	1.989	1.989	1.989	1.989
95	3.062	2.438	1.989	1.989	1.989	1.989	1.989	1.989	1.989
100	3.217	2.585	2.050	1.989	1.989	1.989	1.989	1.989	1.989
105	3.363	2.726	2.182	1.989	1.989	1.989	1.989	1.989	1.989
110	3.501	2.859	2.309	1.989	1.989	1.989	1.989	1.989	1.989
115	3.631	2.987	2.430	1.989	1.989	1.989	1.989	1.989	1.989
120	3.755	3.109	2.546	1.989	1.989	1.989	1.989	1.989	1.989
125	3.873	3.225	2.658	2.065	1.989	1.989	1.989	1.989	1.989
130	3.984	3.336	2.766	2.165	1.989	1.989	1.989	1.989	1.989
135	4.091	3.443	2.869	2.262	1.989	1.989	1.989	1.989	1.989
140	4.192	3.545	2.969	2.355	1.989	1.989	1.989	1.989	1.989
145	4.289	3.642	3.065	2.445	1.989	1.989	1.989	1.989	1.989
150	4.381	3.736	3.158	2.533	1.989	1.989	1.989	1.989	1.989
155	4.470	3.827	3.247	2.617	2.051	1.989	1.989	1.989	1.989
160	4.554	3.914	3.333	2.699	2.128	1.989	1.989	1.989	1.989
165	4.635	3.997	3.417	2.779	2.202	1.989	1.989	1.989	1.989
170	4.713	4.078	3.497	2.856	2.274	1.989	1.989	1.989	1.989
175	4.788	4.155	3.575	2.931	2.344	1.989	1.989	1.989	1.989
180	4.859	4.230	3.651	3.003	2.413	1.989	1.989	1.989	1.989
185	4.928	4.302	3.724	3.074	2.479	1.989	1.989	1.989	1.989
190	4.994	4.372	3.794	3.143	2.544	2.032	1.989	1.989	1.989
195	5.058	4.439	3.863	3.209	2.608	2.091	1.989	1.989	1.989
200	5.120	4.504	3.929	3.274	2.669	2.149	1.989	1.989	1.989
205	5.179	4.567	3.994	3.337	2.730	2.206	1.989	1.989	1.989
210	5.236	4.628	4.056	3.399	2.788	2.261	1.989	1.989	1.989
215	5.291	4.687	4.117	3.459	2.846	2.316	1.989	1.989	1.989
220	5.345	4.744	4.176	3.517	2.902	2.369	1.989	1.989	1.989
225	5.396	4.799	4.234	3.573	2.956	2.421	1.989	1.989	1.989
230	5.446	4.853	4.289	3.629	3.010	2.472	1.989	1.989	1.989
235	5.494	4.905	4.344	3.683	3.062	2.522	1.989	1.989	1.989
240	5.541	4.955	4.396	3.735	3.113	2.570	1.989	1.989	1.989
245	5.586	5.004	4.448	3.787	3.163	2.618	1.989	1.989	1.989
250	5.630	5.052	4.498	3.837	3.212	2.665	1.989	1.989	1.989
255	5.672	5.098	4.547	3.885	3.259	2.711	2.019	1.989	1.989
260	5.713	5.143	4.594	3.933	3.306	2.756	2.060	1.989	1.989
265	5.753	5.187	4.640	3.980	3.352	2.800	2.099	1.989	1.989
270	5.792	5.230	4.685	4.025	3.396	2.843	2.139	1.989	1.989
275	5.830	5.271	4.729	4.070	3.440	2.886	2.177	1.989	1.989
280	5.866	5.312	4.772	4.113	3.483	2.927	2.215	1.989	1.989
285	5.902	5.351	4.814	4.156	3.525	2.968	2.252	1.989	1.989
290	5.936	5.389	4.855	4.197	3.566	3.008	2.289	1.989	1.989
295	5.970	5.427	4.895	4.238	3.606	3.048	2.325	1.989	1.989
300	6.003	5.463	4.934	4.278	3.646	3.086	2.361	1.989	1.989
305	6.035	5.499	4.972	4.317	3.685	3.124	2.395	1.989	1.989
310	6.066	5.533	5.009	4.355	3.723	3.161	2.430	1.989	1.989
315	6.096	5.567	5.046	4.392	3.760	3.198	2.463	1.989	1.989
320	6.126	5.600	5.081	4.428	3.796	3.234	2.496	1.989	1.989
325	6.154	5.632	5.116	4.464	3.832	3.269	2.529	1.989	1.989
330	6.182	5.664	5.150	4.499	3.867	3.304	2.561	1.989	1.989
335	6.210	5.695	5.184	4.534	3.902	3.338	2.593	1.989	1.989
338	6.225	5.712	5.202	4.553	3.921	3.357	2.610	1.989	1.989

Thickness is intumescent only.

Results also apply to rectangular/square hollow beams exposed on all four sides up to the maximum dry film thickness of 6.169mm.

Section Factor up to m ¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
46	2.369	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
50	2.709	2.094	1.989	1.989	1.989	1.989	1.989	1.989	1.989
55	3.086	2.434	1.989	1.989	1.989	1.989	1.989	1.989	1.989
60	3.434	2.753	2.215	1.989	1.989	1.989	1.989	1.989	1.989
65	3.757	3.052	2.489	1.989	1.989	1.989	1.989	1.989	1.989
70	4.057	3.333	2.750	2.172	1.989	1.989	1.989	1.989	1.989
75	4.337	3.599	2.997	2.397	1.989	1.989	1.989	1.989	1.989
80	4.599	3.849	3.233	2.612	2.092	1.989	1.989	1.989	1.989
85	4.844	4.087	3.458	2.819	2.280	1.989	1.989	1.989	1.989
90	5.075	4.311	3.673	3.017	2.462	2.021	1.989	1.989	1.989
95	5.291	4.524	3.878	3.208	2.637	2.183	1.989	1.989	1.989
100	5.495	4.727	4.075	3.392	2.807	2.340	1.989	1.989	1.989
105	5.688	4.919	4.263	3.569	2.971	2.492	1.989	1.989	1.989
110	5.870	5.103	4.443	3.739	3.130	2.641	2.059	1.989	1.989
115	6.043	5.278	4.615	3.903	3.284	2.785	2.188	1.989	1.989
120	6.206	5.445	4.781	4.062	3.434	2.925	2.314	1.989	1.989
125	6.362	5.604	4.941	4.215	3.578	3.061	2.437	1.989	1.989
130	6.509	5.757	5.094	4.362	3.719	3.194	2.557	2.002	1.989
135	-	5.903	5.241	4.505	3.855	3.323	2.674	2.108	1.989
140	-	6.043	5.383	4.643	3.987	3.449	2.789	2.211	1.989
145	-	6.177	5.520	4.777	4.115	3.572	2.901	2.312	1.989
150	-	6.306	5.652	4.906	4.240	3.692	3.010	2.411	1.989
155	-	6.430	5.779	5.031	4.361	3.808	3.117	2.508	1.989
160	-	-	5.902	5.153	4.479	3.922	3.222	2.603	1.989
165	-	-	6.021	5.270	4.593	4.033	3.324	2.696	1.989
170	-	-	6.135	5.384	4.705	4.141	3.424	2.788	2.029
175	-	-	6.246	5.495	4.813	4.247	3.523	2.877	2.107
180	-	-	6.354	5.603	4.919	4.350	3.618	2.966	2.183
185	-	-	6.458	5.707	5.022	4.451	3.712	3.052	2.257
190	-	-	-	5.809	5.122	4.550	3.805	3.137	2.331
195	-	-	-	5.908	5.220	4.646	3.895	3.220	2.403
200	-	-	-	6.004	5.316	4.740	3.983	3.302	2.474
205	-	-	-	6.097	5.409	4.832	4.070	3.383	2.544
210	-	-	-	6.188	5.499	4.922	4.155	3.461	2.613
215	-	-	-	6.276	5.588	5.010	4.238	3.539	2.681
220	-	-	-	6.362	5.675	5.096	4.319	3.615	2.748
225	-	-	-	6.446	5.759	5.180	4.399	3.690	2.814
230	-	-	-	6.528	5.841	5.263	4.478	3.764	2.879
235	-	-	-	-	5.922	5.344	4.555	3.836	2.942
240	-	-	-	-	6.001	5.423	4.631	3.907	3.005
245	-	-	-	-	6.078	5.501	4.705	3.977	3.067
250	-	-	-	-	6.153	5.577	4.778	4.046	3.128
255	-	-	-	-	6.227	5.651	4.849	4.114	3.188
260	-	-	-	-	6.299	5.724	4.919	4.180	3.247
265	-	-	-	-	6.370	5.796	4.988	4.246	3.306
270	-	-	-	-	6.439	5.866	5.056	4.310	3.363
275	-	-	-	-	6.506	5.934	5.123	4.374	3.420
280	-	-	-	-	-	6.002	5.188	4.436	3.476
285	-	-	-	-	-	6.068	5.252	4.498	3.531
290	-	-	-	-	-	6.133	5.315	4.558	3.585
295	-	-	-	-	-	6.197	5.378	4.618	3.639
300	-	-	-	-	-	6.260	5.439	4.676	3.692
305	-	-	-	-	-	6.321	5.499	4.734	3.744
310	-	-	-	-	-	6.382	5.558	4.791	3.795
315	-	-	-	-	-	6.441	5.616	4.847	3.846
320	-	-	-	-	-	6.499	5.673	4.902	3.896
325	-	-	-	-	-	-	5.729	4.957	3.945
330	-	-	-	-	-	-	5.785	5.010	3.994
335	-	-	-	-	-	-	5.839	5.063	4.042
338	-	-	-	-	-	-	5.869	5.093	4.069

Thickness is intumescent only.

Results also apply to rectangular/square hollow beams exposed on all four sides up to the maximum dry film thickness of 6.169mm.

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
46	3.888	3.137	2.565	2.020	1.989	1.989	1.989	1.989	1.989
50	4.311	3.522	2.914	2.330	1.989	1.989	1.989	1.989	1.989
55	4.778	3.954	3.310	2.685	2.179	1.989	1.989	1.989	1.989
60	5.211	4.359	3.685	3.025	2.486	2.073	1.989	1.989	1.989
65	5.613	4.739	4.041	3.349	2.780	2.343	1.989	1.989	1.989
70	5.986	5.097	4.379	3.659	3.064	2.603	2.070	1.989	1.989
75	6.334	5.434	4.701	3.957	3.337	2.856	2.296	1.989	1.989
80	-	5.753	5.007	4.242	3.601	3.101	2.515	2.022	1.989
85	-	6.054	5.299	4.516	3.856	3.339	2.728	2.213	1.989
90	-	6.340	5.578	4.779	4.102	3.569	2.936	2.400	1.989
95	-	-	5.844	5.031	4.339	3.793	3.139	2.583	1.989
100	-	-	6.099	5.274	4.569	4.010	3.336	2.762	2.100
105	-	-	6.343	5.509	4.791	4.221	3.529	2.937	2.251
110	-	-	-	5.734	5.006	4.427	3.717	3.108	2.400
115	-	-	-	5.952	5.214	4.626	3.900	3.276	2.546
120	-	-	-	6.161	5.416	4.820	4.079	3.440	2.689
125	-	-	-	6.364	5.612	5.009	4.253	3.600	2.830
130	-	-	-	-	5.802	5.192	4.424	3.757	2.968
135	-	-	-	-	5.986	5.371	4.590	3.911	3.104
140	-	-	-	-	6.164	5.545	4.753	4.062	3.237
145	-	-	-	-	6.338	5.715	4.912	4.210	3.368
150	-	-	-	-	6.507	5.881	5.067	4.355	3.497
155	-	-	-	-	-	6.042	5.219	4.497	3.623
160	-	-	-	-	-	6.199	5.368	4.637	3.747
165	-	-	-	-	-	6.353	5.513	4.773	3.870
170	-	-	-	-	-	6.503	5.656	4.907	3.990
175	-	-	-	-	-	-	5.795	5.039	4.108
180	-	-	-	-	-	-	5.931	5.168	4.224
185	-	-	-	-	-	-	6.065	5.295	4.338
190	-	-	-	-	-	-	6.196	5.419	4.451
195	-	-	-	-	-	-	6.324	5.541	4.561
200	-	-	-	-	-	-	6.449	5.661	4.670
205	-	-	-	-	-	-	-	5.779	4.777
210	-	-	-	-	-	-	-	5.894	4.882
215	-	-	-	-	-	-	-	6.008	4.986
220	-	-	-	-	-	-	-	6.120	5.088
225	-	-	-	-	-	-	-	6.229	5.189
230	-	-	-	-	-	-	-	6.337	5.288
235	-	-	-	-	-	-	-	6.443	5.385
240	-	-	-	-	-	-	-	-	5.481
245	-	-	-	-	-	-	-	-	5.576
250	-	-	-	-	-	-	-	-	5.669
255	-	-	-	-	-	-	-	-	5.761
260	-	-	-	-	-	-	-	-	5.851
265	-	-	-	-	-	-	-	-	5.940
270	-	-	-	-	-	-	-	-	6.028
275	-	-	-	-	-	-	-	-	6.115
280	-	-	-	-	-	-	-	-	6.200
285	-	-	-	-	-	-	-	-	6.284
290	-	-	-	-	-	-	-	-	6.367
295	-	-	-	-	-	-	-	-	6.449
300	-	-	-	-	-	-	-	-	6.530
305	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
338	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results also apply to rectangular/square hollow beams exposed on all four sides up to the maximum dry film thickness of 6.169mm.

Table 19: Hollow Beam Sections 15 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
50	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
55	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
60	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
65	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
70	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
75	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
80	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
85	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
90	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
95	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
100	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
105	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
110	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
115	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
120	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
125	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
130	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
135	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
140	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
145	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
150	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
155	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
160	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
165	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
170	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
175	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
180	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
185	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
190	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
195	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
200	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
205	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
210	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
215	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
220	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
225	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
230	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
235	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
240	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
245	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
250	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
255	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
260	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
265	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
270	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
275	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833

Thickness is intumescent only.

Table 20: Hollow Beam Sections 30 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
50	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
55	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
60	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
65	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
70	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
75	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
80	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
85	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
90	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
95	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
100	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
105	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
110	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
115	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
120	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
125	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
130	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
135	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
140	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
145	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
150	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
155	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
160	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
165	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
170	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
175	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
180	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
185	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
190	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
195	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
200	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
205	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
210	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
215	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
220	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
225	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
230	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
235	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
240	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
245	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
250	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
255	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
260	1.846	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
265	1.868	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
270	1.890	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
275	1.910	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833

Thickness is intumescent only.

Table 21: Hollow Beam Sections 45 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
50	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
55	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
60	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
65	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
70	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
75	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
80	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
85	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
90	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
95	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
100	1.849	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
105	1.944	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
110	2.036	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
115	2.124	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
120	2.208	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
125	2.289	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
130	2.367	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
135	2.442	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
140	2.514	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
145	2.584	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
150	2.651	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
155	2.716	1.843	1.833	1.833	1.833	1.833	1.833	1.833	1.833
160	2.779	1.896	1.833	1.833	1.833	1.833	1.833	1.833	1.833
165	2.840	1.948	1.833	1.833	1.833	1.833	1.833	1.833	1.833
170	2.898	1.998	1.833	1.833	1.833	1.833	1.833	1.833	1.833
175	2.955	2.047	1.833	1.833	1.833	1.833	1.833	1.833	1.833
180	3.010	2.094	1.833	1.833	1.833	1.833	1.833	1.833	1.833
185	3.063	2.140	1.833	1.833	1.833	1.833	1.833	1.833	1.833
190	3.114	2.185	1.833	1.833	1.833	1.833	1.833	1.833	1.833
195	3.164	2.228	1.833	1.833	1.833	1.833	1.833	1.833	1.833
200	3.213	2.271	1.833	1.833	1.833	1.833	1.833	1.833	1.833
205	3.260	2.312	1.833	1.833	1.833	1.833	1.833	1.833	1.833
210	3.305	2.352	1.833	1.833	1.833	1.833	1.833	1.833	1.833
215	3.350	2.391	1.833	1.833	1.833	1.833	1.833	1.833	1.833
220	3.393	2.429	1.833	1.833	1.833	1.833	1.833	1.833	1.833
225	3.435	2.466	1.833	1.833	1.833	1.833	1.833	1.833	1.833
230	3.475	2.502	1.833	1.833	1.833	1.833	1.833	1.833	1.833
235	3.515	2.538	1.833	1.833	1.833	1.833	1.833	1.833	1.833
240	3.554	2.572	1.833	1.833	1.833	1.833	1.833	1.833	1.833
245	3.591	2.606	1.833	1.833	1.833	1.833	1.833	1.833	1.833
250	3.628	2.638	1.833	1.833	1.833	1.833	1.833	1.833	1.833
255	3.663	2.670	1.833	1.833	1.833	1.833	1.833	1.833	1.833
260	3.698	2.702	1.833	1.833	1.833	1.833	1.833	1.833	1.833
265	3.732	2.732	1.833	1.833	1.833	1.833	1.833	1.833	1.833
270	3.765	2.762	1.833	1.833	1.833	1.833	1.833	1.833	1.833
275	3.797	2.791	1.833	1.833	1.833	1.833	1.833	1.833	1.833

Thickness is intumescent only.

Table 22: Hollow Beam Sections 60 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
50	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
55	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
60	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
65	1.965	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
70	2.143	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
75	2.312	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
80	2.474	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
85	2.628	1.882	1.833	1.833	1.833	1.833	1.833	1.833	1.833
90	2.775	2.007	1.833	1.833	1.833	1.833	1.833	1.833	1.833
95	2.916	2.127	1.833	1.833	1.833	1.833	1.833	1.833	1.833
100	3.050	2.242	1.833	1.833	1.833	1.833	1.833	1.833	1.833
105	3.179	2.354	1.833	1.833	1.833	1.833	1.833	1.833	1.833
110	3.303	2.461	1.833	1.833	1.833	1.833	1.833	1.833	1.833
115	3.421	2.565	1.833	1.833	1.833	1.833	1.833	1.833	1.833
120	3.535	2.665	1.895	1.833	1.833	1.833	1.833	1.833	1.833
125	3.645	2.762	1.977	1.833	1.833	1.833	1.833	1.833	1.833
130	3.750	2.855	2.056	1.833	1.833	1.833	1.833	1.833	1.833
135	3.852	2.946	2.133	1.833	1.833	1.833	1.833	1.833	1.833
140	3.950	3.033	2.208	1.833	1.833	1.833	1.833	1.833	1.833
145	4.044	3.118	2.280	1.833	1.833	1.833	1.833	1.833	1.833
150	4.135	3.200	2.351	1.833	1.833	1.833	1.833	1.833	1.833
155	4.223	3.279	2.420	1.833	1.833	1.833	1.833	1.833	1.833
160	4.307	3.357	2.487	1.833	1.833	1.833	1.833	1.833	1.833
165	4.389	3.431	2.552	1.833	1.833	1.833	1.833	1.833	1.833
170	4.469	3.504	2.616	1.833	1.833	1.833	1.833	1.833	1.833
175	4.545	3.575	2.678	1.846	1.833	1.833	1.833	1.833	1.833
180	4.619	3.643	2.738	1.896	1.833	1.833	1.833	1.833	1.833
185	4.691	3.710	2.797	1.945	1.833	1.833	1.833	1.833	1.833
190	4.761	3.775	2.854	1.993	1.833	1.833	1.833	1.833	1.833
195	4.828	3.838	2.910	2.040	1.833	1.833	1.833	1.833	1.833
200	4.894	3.899	2.965	2.085	1.833	1.833	1.833	1.833	1.833
205	4.957	3.959	3.018	2.130	1.833	1.833	1.833	1.833	1.833
210	5.019	4.017	3.070	2.174	1.833	1.833	1.833	1.833	1.833
215	5.079	4.073	3.121	2.217	1.833	1.833	1.833	1.833	1.833
220	5.137	4.128	3.170	2.259	1.833	1.833	1.833	1.833	1.833
225	5.194	4.182	3.219	2.301	1.833	1.833	1.833	1.833	1.833
230	5.249	4.235	3.266	2.341	1.833	1.833	1.833	1.833	1.833
235	5.302	4.286	3.313	2.381	1.833	1.833	1.833	1.833	1.833
240	5.355	4.335	3.358	2.420	1.833	1.833	1.833	1.833	1.833
245	5.405	4.384	3.402	2.458	1.833	1.833	1.833	1.833	1.833
250	5.455	4.432	3.446	2.495	1.833	1.833	1.833	1.833	1.833
255	5.503	4.478	3.488	2.532	1.833	1.833	1.833	1.833	1.833
260	5.550	4.523	3.530	2.568	1.833	1.833	1.833	1.833	1.833
265	5.595	4.568	3.571	2.603	1.833	1.833	1.833	1.833	1.833
270	5.640	4.611	3.610	2.637	1.833	1.833	1.833	1.833	1.833
275	5.684	4.653	3.649	2.671	1.833	1.833	1.833	1.833	1.833

Thickness is intumescent only.

Table 23: Hollow Beam Sections 90 Minutes

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
50	2.902	2.219	1.833	1.833	1.833	1.833	1.833	1.833	1.833
55	3.218	2.489	1.894	1.833	1.833	1.833	1.833	1.833	1.833
60	3.518	2.748	2.114	1.833	1.833	1.833	1.833	1.833	1.833
65	3.803	2.995	2.327	1.833	1.833	1.833	1.833	1.833	1.833
70	4.073	3.233	2.531	1.937	1.833	1.833	1.833	1.833	1.833
75	4.331	3.460	2.729	2.106	1.833	1.833	1.833	1.833	1.833
80	4.576	3.679	2.920	2.270	1.833	1.833	1.833	1.833	1.833
85	4.810	3.889	3.105	2.429	1.841	1.833	1.833	1.833	1.833
90	5.034	4.091	3.284	2.584	1.973	1.833	1.833	1.833	1.833
95	5.248	4.285	3.456	2.735	2.101	1.833	1.833	1.833	1.833
100	5.453	4.473	3.624	2.881	2.226	1.833	1.833	1.833	1.833
105	5.649	4.653	3.786	3.024	2.349	1.833	1.833	1.833	1.833
110	5.837	4.827	3.943	3.162	2.468	1.847	1.833	1.833	1.833
115	6.017	4.995	4.095	3.297	2.585	1.945	1.833	1.833	1.833
120	-	5.157	4.243	3.429	2.699	2.042	1.833	1.833	1.833
125	-	5.314	4.386	3.557	2.811	2.136	1.833	1.833	1.833
130	-	5.465	4.526	3.682	2.920	2.229	1.833	1.833	1.833
135	-	5.611	4.661	3.804	3.027	2.320	1.833	1.833	1.833
140	-	5.753	4.792	3.923	3.132	2.410	1.833	1.833	1.833
145	-	5.890	4.920	4.039	3.234	2.497	1.833	1.833	1.833
150	-	6.023	5.044	4.152	3.334	2.584	1.891	1.833	1.833
155	-	6.152	5.165	4.262	3.433	2.668	1.961	1.833	1.833
160	-	-	5.283	4.370	3.529	2.751	2.031	1.833	1.833
165	-	-	5.397	4.475	3.623	2.833	2.099	1.833	1.833
170	-	-	5.509	4.578	3.715	2.913	2.166	1.833	1.833
175	-	-	5.618	4.679	3.806	2.992	2.232	1.833	1.833
180	-	-	5.724	4.777	3.895	3.070	2.297	1.833	1.833
185	-	-	5.827	4.873	3.982	3.146	2.362	1.833	1.833
190	-	-	5.928	4.967	4.067	3.221	2.425	1.833	1.833
195	-	-	6.026	5.059	4.151	3.295	2.487	1.833	1.833
200	-	-	6.122	5.149	4.233	3.367	2.549	1.833	1.833
205	-	-	-	5.238	4.313	3.439	2.609	1.833	1.833
210	-	-	-	5.324	4.392	3.509	2.669	1.871	1.833
215	-	-	-	5.408	4.470	3.578	2.728	1.918	1.833
220	-	-	-	5.491	4.546	3.646	2.786	1.965	1.833
225	-	-	-	5.572	4.621	3.713	2.844	2.012	1.833
230	-	-	-	5.651	4.695	3.778	2.900	2.058	1.833
235	-	-	-	5.729	4.767	3.843	2.956	2.103	1.833
240	-	-	-	5.806	4.838	3.907	3.011	2.148	1.833
245	-	-	-	5.880	4.907	3.970	3.065	2.193	1.833
250	-	-	-	5.954	4.976	4.031	3.119	2.237	1.833
255	-	-	-	6.026	5.043	4.092	3.172	2.280	1.833
260	-	-	-	6.096	5.109	4.152	3.224	2.323	1.833
265	-	-	-	6.166	5.174	4.211	3.275	2.365	1.833
270	-	-	-	-	5.238	4.269	3.326	2.407	1.833
275	-	-	-	-	5.301	4.327	3.376	2.449	1.833

Thickness is intumescent only.

Section Factor up to m ⁻¹	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
50	4.432	3.587	2.903	2.338	1.864	1.833	1.833	1.833	1.833
55	4.856	3.960	3.230	2.623	2.110	1.833	1.833	1.833	1.833
60	5.258	4.318	3.545	2.898	2.349	1.877	1.833	1.833	1.833
65	5.640	4.661	3.849	3.166	2.582	2.078	1.833	1.833	1.833
70	6.003	4.989	4.142	3.425	2.810	2.276	1.833	1.833	1.833
75	-	5.304	4.425	3.677	3.031	2.469	1.975	1.833	1.833
80	-	5.606	4.698	3.921	3.247	2.658	2.139	1.833	1.833
85	-	5.896	4.963	4.158	3.458	2.844	2.299	1.833	1.833
90	-	-	5.218	4.389	3.664	3.025	2.457	1.950	1.833
95	-	-	5.466	4.614	3.866	3.203	2.613	2.083	1.833
100	-	-	5.705	4.832	4.062	3.378	2.766	2.215	1.833
105	-	-	5.937	5.044	4.254	3.549	2.916	2.345	1.833
110	-	-	6.162	5.251	4.441	3.716	3.064	2.473	1.936
115	-	-	-	5.452	4.625	3.881	3.209	2.600	2.044
120	-	-	-	5.648	4.804	4.042	3.352	2.724	2.150
125	-	-	-	5.840	4.979	4.201	3.493	2.847	2.256
130	-	-	-	6.026	5.150	4.356	3.632	2.969	2.360
135	-	-	-	-	5.318	4.508	3.768	3.089	2.463
140	-	-	-	-	5.482	4.658	3.902	3.207	2.565
145	-	-	-	-	5.643	4.805	4.034	3.324	2.666
150	-	-	-	-	5.800	4.949	4.165	3.439	2.766
155	-	-	-	-	5.954	5.091	4.293	3.553	2.864
160	-	-	-	-	6.105	5.230	4.419	3.665	2.962
165	-	-	-	-	-	5.367	4.543	3.776	3.059
170	-	-	-	-	-	5.501	4.666	3.885	3.154
175	-	-	-	-	-	5.633	4.786	3.993	3.249
180	-	-	-	-	-	5.763	4.905	4.100	3.343
185	-	-	-	-	-	5.890	5.022	4.205	3.435
190	-	-	-	-	-	6.016	5.138	4.309	3.527
195	-	-	-	-	-	6.139	5.251	4.412	3.618
200	-	-	-	-	-	-	5.363	4.514	3.708
205	-	-	-	-	-	-	5.474	4.614	3.797
210	-	-	-	-	-	-	5.583	4.713	3.885
215	-	-	-	-	-	-	5.690	4.811	3.972
220	-	-	-	-	-	-	5.796	4.908	4.059
225	-	-	-	-	-	-	5.901	5.004	4.144
230	-	-	-	-	-	-	6.004	5.098	4.229
235	-	-	-	-	-	-	6.105	5.192	4.313
240	-	-	-	-	-	-	-	5.284	4.396
245	-	-	-	-	-	-	-	5.375	4.478
250	-	-	-	-	-	-	-	5.465	4.559
255	-	-	-	-	-	-	-	5.555	4.640
260	-	-	-	-	-	-	-	5.643	4.720
265	-	-	-	-	-	-	-	5.730	4.799
270	-	-	-	-	-	-	-	5.816	4.877
275	-	-	-	-	-	-	-	5.902	4.955

Thickness is intumescent only.

Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
50	5.961	4.955	4.140	3.468	2.903	2.423	2.008	1.833	1.833
55	-	5.432	4.566	3.846	3.238	2.718	2.268	1.874	1.833
60	-	5.889	4.976	4.212	3.564	3.007	2.522	2.098	1.833
65	-	-	5.371	4.568	3.882	3.289	2.773	2.318	1.915
70	-	-	5.753	4.912	4.191	3.566	3.018	2.535	2.105
75	-	-	6.121	5.247	4.493	3.837	3.260	2.749	2.293
80	-	-	-	5.572	4.788	4.102	3.498	2.960	2.479
85	-	-	-	5.888	5.076	4.362	3.731	3.168	2.663
90	-	-	-	-	5.356	4.617	3.960	3.373	2.845
95	-	-	-	-	5.630	4.867	4.186	3.575	3.025
100	-	-	-	-	5.898	5.111	4.408	3.775	3.202
105	-	-	-	-	6.159	5.351	4.626	3.971	3.378
110	-	-	-	-	-	5.586	4.840	4.165	3.552
115	-	-	-	-	-	5.817	5.051	4.357	3.723
120	-	-	-	-	-	6.043	5.259	4.546	3.893
125	-	-	-	-	-	-	5.463	4.732	4.061
130	-	-	-	-	-	-	5.665	4.916	4.228
135	-	-	-	-	-	-	5.862	5.097	4.392
140	-	-	-	-	-	-	6.057	5.276	4.555
145	-	-	-	-	-	-	-	5.453	4.715
150	-	-	-	-	-	-	-	5.627	4.875
155	-	-	-	-	-	-	-	5.799	5.032
160	-	-	-	-	-	-	-	5.969	5.188
165	-	-	-	-	-	-	-	6.137	5.342
170	-	-	-	-	-	-	-	-	5.495
175	-	-	-	-	-	-	-	-	5.646
180	-	-	-	-	-	-	-	-	5.795
185	-	-	-	-	-	-	-	-	5.943
190	-	-	-	-	-	-	-	-	6.089

Thickness is intumescent only.