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Designated according to Article 29 of Regulation (EU) No 305/2011

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European Technical Assessment

ETA-20/1261
of 19/01/2021

General Part

Technical Assessment Body Issuing the European Technical Assessment:	**Element Materials Technology Rotterdam B.V.**
Trade Name of the Construction Product:	**FIRETEX FX6002**
Product Family to Which the Construction Product Belongs:	35. Fire Protective Products Reactive Coating for the Fire Protection of Steel Elements
Manufacturer:	**Sherwin-Williams Protective and Marine Coatings** Tower Works Kestor Street Bolton BL2 2AL UK
Manufacturing Plant(s):	**Sherwin-Williams Protective and Marine Coatings** Tower Works Kestor Street Bolton BL2 2AL UK
This European Technical Assessment Contains:	55 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 20/1261, issued on 2020-12-17

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1. Technical Description of the Product

FIRETEX FX6002 is a spray applied intumescent paint. The intumescent paint systems work with primer, and with or without topcoat where appropriate to suit the environmental conditions.

In accordance with EAD 350402-00-1106, FIRETEX FX6002 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 Directive 67/548/EEC and Regulation (EC) No 1272/2008 and SGDS "Indicative list on dangerous substances", that that it does not contain such dangerous 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 FIRETEX FX6002 is to fire protect up to 120 minutes for I/H-section beams, Circular hollow columns, Rectangular hollow columns and beams, and up to 150 minutes for H-section columns, and steel temperatures in the range of 350ºC to 750ºC. The precise scope is given in Tables of Results which show the total dry film thickness of FIRETEX FX6002 (excluding primer and top coat) required to provide classifications of R15-IncSlow to R120-IncSlow for sections for various design temperatures and section factors. FIRETEX FX6002 also showed its ability to fire protect structural steel 'I' and 'H' shape columns sections up to 150 minutes. Therefore, tables with results for additional fire resistance periods form part of this classification report.

The provisions made in this ETA are based on an assumed working life of the applied coating for the intended use of 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.

The results of the analysis of the test data for FIRETEX FX6002 has been assessed as being compatible with the primers and top coats as specified below:

Primer Reference[2]	Primer Type[2]	Tested Nominal Primer DFT (mm)	Permitted Primer Thickness Range (mm)	
			Minimum[1]	Maximum
FIRETEX C69	A two pack epoxy blast primer	0.075	0.075	0.113
Kem-Kromik M155	Alkyd	0.100	0.050	0.150
Macropoxy 400	A multi-functional epoxy zinc phosphate coating	0.125	0.063	0.188
Macropoxy 400	A multi-functional epoxy zinc phosphate coating	0.285	0.143	0.428
Pro-Cryl 7000	Water based blast primer	0.035	0.018	0.053
Zinc-Clad IV EU	A two pack zinc rich epoxy primer	0.085	0.043	0.128
Zinc-Clad IV EU/Macropoxy M330	A two pack zinc rich epoxy primer /A two pack epoxy sealercoat	0.085/0.05	0.045/0.025	0.130/0.075
Mordant Wash L703 /Macropoxy K267 (galvanised steel)[3]	Blue mordant solutiuon/A high solids two-pack epoxy, pigmented with micaceous oxide	0.100	0.05	0.150
Macropoxy K267 (galvanised steel, sweep blasted before primer application)[3]	A high solids two-pack epoxy	0.100	0.050	0.15
Dura-Plate 301W	Two component epoxy	0.200	0.100	0.300
Macropoxy 400/Acrolon 7300	A multifunctional epoxy zince phosphate primer/A fast drying acrylic urethane gloss finish	0.100/0.080	0.050/0.040	0.150/0.120
Fast-Clad 7220	Two component epoxy	0.100	0.050	0.150

[1] Any thickness below that tested is shall be acceptable provided the lower thickness is not less than that recommended by the manufacturer.

[2] Results applicable to other primers from the same generic group

[3] Results applicable to the specific primer only, for galvanised substrate

Top Coat Reference[1]	Top Coat Description[1]	Tested Nominal Top Coat DFT (mm)	Permitted Top Coat Thickness Range (mm)	
			Minimum	Maximum
N/A	N/A	0.000	0.000	0.000
Acrolon C137V2	Acrylic/Urethane	0.080	0.080	0.120
Acrolon C237	Acrylic/Urethane	0.100	0.100	0.150
Acrolon 7300	Acrylic/Urethane	0.100	0.100	0.150
FIRETEX M71V2	Acrylic	0.030	0.030	0.450
Sher-Cryl M770	Acrylic	0.065	0.065	0.098

[1] Results applicable to the specific topcoat only

FIRETEX FX6002 has been assessed as having passed requirements for durability with the following top coats:

Top Coat Reference[1]	Top Coat Description[1]	Approved Top Coat Colours	Durability Approvals Based On The Carried Out Testing			
			Type Z_2	Type Z_1	Type Y	Type X
N/A	N/A	All Colours	✓	✓	✓	✓
Acrolon C137V2	Acrylic/Urethane	All Colours	✓	✓	✓	✓
Acrolon C237	Acrylic/Urethane	All Colours	✓	✓	✓	✓
Acrolon 7300	Acrylic/Urethane	All Colours	✓	✓	✓	✓
FIRETEX M71V2	Acrylic	All Colours	✓	✓		
Sher-Cryl M770	Acrylic	All Colours	✓	✓		

[1] Results applicable to the specific topcoat only

FIRETEX FX6002 was subjected to the identification testing in accordance with the methods of identification defined in Table 4 of EAD 350402-00-1106. Test for technical characterisation has been done as described in Annex E (Thermo analytical analyses (TG) and Infrared spectroscopy analyses (IR)).

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 D-s1, d0 (with the Firetex C69 primer and FIRETEX M71V2 black top coat)
EN 13501-2	Fire resistance	(R15 – R120) – IncSlow* (exact scope see Annex A)
BASIC WORKS REQUIREMENT 3: HYGIENE, HEALTH AND THE ENVIRONMENT		
Manufacturer's declaration and EN 16516	Content, emission and or release of dangerous substances	It does not contain such dangerous substances according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and SGDS "Indicative list on dangerous substances". Use categories: IA1 and S/W2 VOC emission test results after 28 days: VOC<0.022mg/m3, R value of 2.37 according to AgBB 2015
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	• Primer and top coat compatibility • Type X durability • Type Y durability • Type Z_1 durability • Type Z_2 durability
EAD 350402-00-1106 Clause 2.3.5	Identification	Thermo analytical analyses (TG) and Infrared spectroscopy analyses (IR)

*A reactive coating system known FIRETEX FX6002 has ability to fire protect structural steel 'I' and 'H' shape columns sections up to 150 minutes. Therefore, tables with results for additional fire resistance periods also form part of this classification report.

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 2021/01/19

By

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Deputy TAB Manager

Annex A - Product Performance: Fire Resistance

1 This Annex relates to the use of FIRETEX FX6002 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 46 which show the total dry film thickness of FIRETEX FX6002 (excluding primer and top coat) required to fire protect up to 120 minutes for I/H-section beams, Circular hollow columns, Rectangular/Square hollow columns and beams, and up to 150 minutes for H-section columns, and steel temperatures in the range of 350ºC to 750ºC for various design temperatures and section factors.

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 principles 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). Column results also apply to beams with four side fire exposure, as specified in the results.

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. FIRETEX FX6002 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.

Tables of Results

Table 1 I-Section Beams 15 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
50	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
55	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
60	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
65	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
70	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
75	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
80	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
85	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
90	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
95	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
100	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
105	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
110	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
115	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
120	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
125	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
130	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
135	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
140	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
145	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
150	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
155	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
160	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
165	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
170	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
175	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
180	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
185	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
190	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
195	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
200	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
205	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
210	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
215	0.375	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
220	0.388	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
225	0.401	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
230	0.414	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
235	0.426	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
240	0.439	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
245	0.452	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
250	0.464	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
255	0.477	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
260	0.490	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
265	0.503	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
270	0.515	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
275	0.528	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
280	0.541	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
285	0.554	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
290	0.566	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
295	0.579	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
300	0.592	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
305	0.605	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
310	0.617	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
315	0.630	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
320	0.643	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
325	0.656	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
330	0.668	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
335	0.681	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
340	0.694	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
345	0.706	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
350	0.719	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
355	0.732	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
360	0.745	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
365	0.757	0.378	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
370	0.770	0.389	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
375	0.783	0.400	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
380	0.796	0.411	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
385	0.808	0.422	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
390	0.821	0.433	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
395	0.834	0.444	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
400	0.847	0.455	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 2 I-Section Beams 20 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
50	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
55	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
60	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
65	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
70	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
75	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
80	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
85	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
90	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
95	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
100	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
105	0.372	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
110	0.387	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
115	0.402	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
120	0.417	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
125	0.432	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
130	0.447	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
135	0.462	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
140	0.477	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
145	0.492	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
150	0.506	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
155	0.521	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
160	0.536	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
165	0.551	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
170	0.566	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
175	0.581	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
180	0.596	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
185	0.611	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
190	0.626	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
195	0.641	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
200	0.656	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
205	0.670	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
210	0.685	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
215	0.700	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
220	0.715	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
225	0.730	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
230	0.745	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
235	0.760	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
240	0.775	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
245	0.790	0.369	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
250	0.805	0.384	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
255	0.820	0.398	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
260	0.835	0.413	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
265	0.849	0.427	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
270	0.864	0.441	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
275	0.879	0.456	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
280	0.894	0.470	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
285	0.909	0.484	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
290	0.924	0.499	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
295	0.939	0.513	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
300	0.954	0.527	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
305	0.969	0.542	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
310	0.984	0.556	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
315	0.999	0.571	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
320	1.013	0.585	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
325	1.028	0.599	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
330	1.043	0.614	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
335	1.058	0.628	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
340	1.073	0.642	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
345	1.088	0.657	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
350	1.103	0.671	0.370	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
355	1.118	0.685	0.383	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
360	1.133	0.700	0.396	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
365	1.148	0.714	0.408	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
370	1.163	0.729	0.421	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
375	1.178	0.743	0.434	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
380	1.192	0.757	0.447	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
385	1.207	0.772	0.459	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
390	1.222	0.786	0.472	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
395	1.237	0.800	0.485	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
400	1.252	0.815	0.498	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 3 I-Section Beams 30 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
50	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
55	0.380	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
60	0.410	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
65	0.440	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
70	0.470	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
75	0.500	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
80	0.530	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
85	0.560	0.368	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
90	0.590	0.385	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
95	0.620	0.402	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
100	0.650	0.420	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
105	0.680	0.437	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
110	0.710	0.454	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
115	0.740	0.471	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
120	0.770	0.488	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
125	0.800	0.506	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
130	0.830	0.523	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
135	0.860	0.540	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
140	0.890	0.557	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
145	0.920	0.574	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
150	0.950	0.592	0.368	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
155	0.980	0.609	0.384	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
160	1.010	0.626	0.400	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
165	1.040	0.643	0.415	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
170	1.070	0.660	0.431	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
175	1.100	0.678	0.447	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
180	1.130	0.695	0.463	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
185	1.160	0.712	0.478	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
190	1.190	0.729	0.494	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
195	1.220	0.746	0.510	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
200	1.250	0.764	0.526	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
205	1.280	0.781	0.542	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
210	1.310	0.798	0.557	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
215	1.340	0.815	0.573	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
220	1.370	0.833	0.589	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
225	1.400	0.850	0.605	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
230	1.430	0.867	0.620	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
235	1.460	0.884	0.636	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
240	1.490	0.901	0.652	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
245	1.517	0.919	0.668	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
250	1.536	0.936	0.684	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
255	1.554	0.953	0.699	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
260	1.573	0.970	0.715	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
265	1.592	0.987	0.731	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
270	1.610	1.005	0.747	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
275	1.629	1.022	0.763	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
280	1.648	1.039	0.778	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
285	1.666	1.056	0.794	0.374	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
290	1.685	1.073	0.810	0.392	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
295	1.703	1.091	0.826	0.410	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
300	1.722	1.108	0.841	0.428	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
305	1.741	1.125	0.857	0.446	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
310	1.759	1.142	0.873	0.465	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
315	1.778	1.159	0.889	0.483	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
320	1.797	1.177	0.905	0.501	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
325	1.815	1.194	0.920	0.519	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
330	1.834	1.211	0.936	0.537	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
335	1.853	1.228	0.952	0.555	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
340	1.871	1.245	0.968	0.574	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
345	1.890	1.263	0.983	0.592	0.374	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
350	1.908	1.280	0.999	0.610	0.391	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
355	1.927	1.297	1.015	0.628	0.408	0.378	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
360	1.946	1.314	1.031	0.646	0.425	0.394	0.380	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
365	1.964	1.331	1.047	0.665	0.442	0.411	0.396	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
370	1.983	1.349	1.062	0.683	0.459	0.427	0.413	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
375	2.002	1.366	1.078	0.701	0.475	0.444	0.429	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
380	2.020	1.383	1.094	0.719	0.492	0.461	0.446	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
385	2.039	1.400	1.110	0.737	0.509	0.477	0.462	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
390	2.058	1.418	1.125	0.755	0.526	0.494	0.479	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
395	2.076	1.435	1.141	0.774	0.543	0.510	0.495	0.377	0.372	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
400	2.095	1.452	1.157	0.792	0.559	0.527	0.512	0.393	0.388	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 4 I-Section Beams 45 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
50	0.744	0.420	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
55	0.819	0.467	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
60	0.893	0.514	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
65	0.968	0.560	0.374	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
70	1.042	0.607	0.401	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
75	1.116	0.654	0.429	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
80	1.191	0.701	0.456	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
85	1.265	0.747	0.483	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
90	1.340	0.794	0.510	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
95	1.414	0.841	0.537	0.386	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
100	1.488	0.888	0.564	0.405	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
105	1.528	0.935	0.591	0.425	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
110	1.550	0.981	0.618	0.444	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
115	1.572	1.028	0.645	0.463	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
120	1.594	1.075	0.673	0.483	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
125	1.617	1.122	0.700	0.502	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
130	1.639	1.168	0.727	0.522	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
135	1.661	1.215	0.754	0.541	0.381	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
140	1.683	1.262	0.781	0.561	0.400	0.371	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
145	1.705	1.309	0.808	0.580	0.419	0.390	0.375	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
150	1.727	1.356	0.835	0.600	0.438	0.409	0.394	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
155	1.750	1.402	0.862	0.619	0.457	0.428	0.413	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
160	1.772	1.449	0.890	0.638	0.476	0.447	0.432	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
165	1.794	1.496	0.917	0.658	0.495	0.466	0.451	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
170	1.816	1.526	0.944	0.677	0.514	0.485	0.470	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
175	1.838	1.546	0.971	0.697	0.533	0.504	0.489	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
180	1.860	1.567	0.998	0.716	0.551	0.523	0.508	0.368	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
185	1.883	1.587	1.025	0.736	0.570	0.542	0.527	0.388	0.380	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
190	1.905	1.608	1.052	0.755	0.589	0.561	0.546	0.408	0.400	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
195	1.927	1.628	1.079	0.775	0.608	0.580	0.565	0.428	0.420	0.387	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
200	1.949	1.649	1.106	0.794	0.627	0.599	0.584	0.448	0.440	0.407	0.381	0.367	0.367	0.367	0.367	0.367	0.367	0.367
205	1.971	1.669	1.134	0.813	0.646	0.618	0.603	0.468	0.460	0.428	0.401	0.367	0.367	0.367	0.367	0.367	0.367	0.367
210	1.993	1.690	1.161	0.833	0.665	0.637	0.622	0.488	0.480	0.448	0.421	0.367	0.367	0.367	0.367	0.367	0.367	0.367
215	2.016	1.710	1.188	0.852	0.684	0.656	0.641	0.508	0.500	0.468	0.442	0.367	0.367	0.367	0.367	0.367	0.367	0.367
220	2.038	1.731	1.215	0.872	0.703	0.675	0.660	0.527	0.520	0.488	0.462	0.367	0.367	0.367	0.367	0.367	0.367	0.367
225	2.060	1.751	1.242	0.891	0.722	0.694	0.679	0.547	0.540	0.508	0.483	0.367	0.367	0.367	0.367	0.367	0.367	0.367
230	2.082	1.771	1.269	0.911	0.741	0.713	0.698	0.567	0.560	0.528	0.503	0.367	0.367	0.367	0.367	0.367	0.367	0.367
235	2.104	1.792	1.296	0.930	0.760	0.731	0.717	0.587	0.580	0.548	0.523	0.367	0.367	0.367	0.367	0.367	0.367	0.367
240	2.126	1.812	1.323	0.950	0.779	0.750	0.736	0.607	0.600	0.569	0.544	0.367	0.367	0.367	0.367	0.367	0.367	0.367
245	2.149	1.833	1.350	0.969	0.798	0.769	0.755	0.627	0.620	0.589	0.564	0.374	0.367	0.367	0.367	0.367	0.367	0.367
250	2.171	1.853	1.378	0.988	0.817	0.788	0.774	0.647	0.639	0.609	0.584	0.397	0.367	0.367	0.367	0.367	0.367	0.367
255	2.193	1.874	1.405	1.008	0.836	0.807	0.793	0.667	0.659	0.629	0.605	0.420	0.378	0.367	0.367	0.367	0.367	0.367
260	2.215	1.894	1.432	1.027	0.855	0.826	0.812	0.686	0.679	0.649	0.625	0.443	0.402	0.367	0.367	0.367	0.367	0.367
265	2.237	1.915	1.459	1.047	0.874	0.845	0.831	0.706	0.699	0.669	0.645	0.466	0.425	0.367	0.367	0.367	0.367	0.367
270	2.259	1.935	1.486	1.066	0.893	0.864	0.850	0.726	0.719	0.690	0.666	0.489	0.449	0.367	0.367	0.367	0.367	0.367
275	2.282	1.956	1.513	1.086	0.912	0.883	0.869	0.746	0.739	0.710	0.686	0.512	0.472	0.367	0.367	0.367	0.367	0.367
280	2.304	1.976	1.536	1.105	0.931	0.902	0.888	0.766	0.759	0.730	0.707	0.535	0.496	0.370	0.367	0.367	0.367	0.367
285	2.326	1.997	1.559	1.125	0.950	0.921	0.907	0.786	0.779	0.750	0.727	0.558	0.519	0.396	0.367	0.367	0.367	0.367
290	2.348	2.017	1.582	1.144	0.969	0.940	0.926	0.806	0.799	0.770	0.747	0.581	0.543	0.421	0.373	0.367	0.367	0.367
295	2.370	2.037	1.605	1.163	0.988	0.959	0.945	0.826	0.819	0.790	0.768	0.604	0.566	0.447	0.398	0.367	0.367	0.367
300	2.392	2.058	1.628	1.183	1.007	0.978	0.964	0.845	0.839	0.810	0.788	0.626	0.590	0.473	0.423	0.367	0.367	0.367
305	2.415	2.078	1.651	1.202	1.026	0.997	0.983	0.865	0.859	0.831	0.808	0.649	0.613	0.499	0.449	0.367	0.367	0.367
310	2.437	2.099	1.674	1.222	1.045	1.016	1.002	0.885	0.879	0.851	0.829	0.672	0.637	0.524	0.474	0.367	0.367	0.367
315	2.459	2.119	1.697	1.241	1.064	1.035	1.021	0.905	0.899	0.871	0.849	0.695	0.661	0.550	0.499	0.367	0.367	0.367
320	2.481	2.140	1.720	1.261	1.083	1.054	1.040	0.925	0.918	0.891	0.869	0.718	0.684	0.576	0.525	0.377	0.367	0.367
325	2.503	2.160	1.742	1.280	1.102	1.073	1.059	0.945	0.938	0.911	0.890	0.741	0.708	0.602	0.550	0.402	0.367	0.367
330	2.525	2.181	1.765	1.300	1.121	1.092	1.078	0.965	0.958	0.931	0.910	0.764	0.731	0.628	0.576	0.428	0.367	0.367
335	2.548	2.201	1.788	1.319	1.140	1.111	1.097	0.985	0.978	0.952	0.930	0.787	0.755	0.653	0.601	0.454	0.367	0.367
340	2.570	2.222	1.811	1.338	1.158	1.130	1.116	1.005	0.998	0.972	0.951	0.810	0.778	0.679	0.626	0.480	0.367	0.367
345	2.592	2.242	1.834	1.358	1.177	1.149	1.135	1.024	1.018	0.992	0.971	0.833	0.802	0.705	0.652	0.506	0.367	0.367
350	2.614	2.262	1.857	1.377	1.196	1.168	1.154	1.044	1.038	1.012	0.992	0.856	0.825	0.731	0.677	0.531	0.367	0.367
355	2.636	2.283	1.880	1.397	1.215	1.187	1.173	1.064	1.058	1.032	1.012	0.879	0.849	0.756	0.702	0.557	0.367	0.367
360	2.658	2.303	1.903	1.416	1.234	1.206	1.191	1.084	1.078	1.052	1.032	0.902	0.873	0.782	0.728	0.583	0.367	0.367
365	2.681	2.324	1.926	1.436	1.253	1.225	1.210	1.104	1.098	1.072	1.053	0.924	0.896	0.808	0.753	0.609	0.367	0.367
370	2.703	2.344	1.949	1.455	1.272	1.244	1.229	1.124	1.118	1.093	1.073	0.947	0.920	0.834	0.779	0.635	0.372	0.367
375	2.725	2.365	1.972	1.475	1.291	1.263	1.248	1.144	1.138	1.113	1.093	0.970	0.943	0.859	0.804	0.661	0.396	0.367
380	2.771	2.385	1.995	1.494	1.310	1.282	1.267	1.164	1.158	1.133	1.114	0.993	0.967	0.885	0.829	0.686	0.420	0.367
385	2.819	2.406	2.018	1.514	1.329	1.301	1.286	1.183	1.178	1.153	1.134	1.016	0.990	0.911	0.855	0.712	0.444	0.367
390	2.866	2.426	2.041	1.540	1.348	1.320	1.305	1.203	1.197	1.173	1.154	1.039	1.014	0.937	0.880	0.738	0.468	0.367
395	2.913	2.447	2.064	1.566	1.367	1.339	1.324	1.223	1.217	1.193	1.175	1.062	1.037	0.962	0.905	0.764	0.492	0.367
400	2.961	2.467	2.087	1.592	1.386	1.358	1.343	1.243	1.237	1.214	1.195	1.085	1.061	0.988	0.931	0.790	0.516	0.367

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 5 I-Section Beams 60 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
50	1.178	0.773	0.500	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
55	1.296	0.855	0.555	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
60	1.414	0.937	0.614	0.403	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
65	1.523	1.019	0.674	0.448	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
70	1.588	1.102	0.734	0.493	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
75	1.652	1.184	0.793	0.538	0.397	0.381	0.374	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
80	1.717	1.266	0.853	0.583	0.430	0.413	0.405	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
85	1.782	1.348	0.912	0.628	0.464	0.445	0.436	0.375	0.372	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
90	1.846	1.430	0.972	0.673	0.497	0.477	0.468	0.402	0.399	0.389	0.381	0.367	0.367	0.367	0.367	0.367	0.367	0.367
95	1.911	1.512	1.032	0.718	0.531	0.509	0.499	0.429	0.426	0.415	0.406	0.367	0.367	0.367	0.367	0.367	0.367	0.367
100	1.975	1.543	1.091	0.763	0.564	0.541	0.530	0.457	0.453	0.441	0.432	0.382	0.374	0.367	0.367	0.367	0.367	0.367
105	2.040	1.574	1.151	0.808	0.598	0.573	0.561	0.484	0.480	0.467	0.457	0.405	0.397	0.374	0.367	0.367	0.367	0.367
110	2.105	1.605	1.210	0.852	0.631	0.605	0.592	0.511	0.507	0.493	0.483	0.429	0.420	0.396	0.367	0.367	0.367	0.367
115	2.169	1.636	1.270	0.897	0.665	0.637	0.624	0.538	0.534	0.519	0.508	0.452	0.444	0.419	0.387	0.367	0.367	0.367
120	2.234	1.667	1.330	0.942	0.698	0.669	0.655	0.565	0.561	0.545	0.534	0.476	0.467	0.441	0.409	0.367	0.367	0.367
125	2.298	1.697	1.389	0.987	0.732	0.701	0.686	0.592	0.588	0.571	0.559	0.499	0.490	0.464	0.431	0.367	0.367	0.367
130	2.363	1.728	1.449	1.032	0.765	0.733	0.717	0.620	0.615	0.597	0.585	0.523	0.513	0.487	0.454	0.367	0.367	0.367
135	2.428	1.759	1.509	1.077	0.799	0.765	0.749	0.647	0.642	0.623	0.610	0.546	0.536	0.509	0.476	0.367	0.367	0.367
140	2.492	1.790	1.534	1.122	0.832	0.797	0.780	0.674	0.669	0.649	0.635	0.570	0.559	0.532	0.498	0.386	0.367	0.367
145	2.557	1.820	1.557	1.167	0.866	0.829	0.811	0.701	0.696	0.676	0.661	0.593	0.583	0.554	0.520	0.410	0.367	0.367
150	2.621	1.851	1.580	1.212	0.899	0.861	0.842	0.728	0.723	0.702	0.686	0.617	0.606	0.577	0.542	0.433	0.367	0.367
155	2.686	1.882	1.603	1.257	0.933	0.893	0.873	0.756	0.750	0.728	0.712	0.640	0.629	0.599	0.564	0.456	0.367	0.367
160	2.740	1.913	1.626	1.301	0.966	0.925	0.905	0.783	0.777	0.754	0.737	0.664	0.652	0.622	0.586	0.479	0.367	0.367
165	2.778	1.943	1.649	1.346	1.000	0.957	0.936	0.810	0.804	0.780	0.763	0.687	0.675	0.645	0.608	0.502	0.367	0.367
170	2.816	1.974	1.672	1.391	1.033	0.988	0.967	0.837	0.831	0.806	0.788	0.711	0.698	0.667	0.630	0.525	0.367	0.367
175	2.854	2.005	1.695	1.436	1.067	1.020	0.998	0.864	0.858	0.832	0.814	0.734	0.721	0.690	0.652	0.548	0.367	0.367
180	2.892	2.036	1.718	1.481	1.100	1.052	1.029	0.892	0.885	0.858	0.839	0.758	0.745	0.712	0.674	0.571	0.367	0.367
185	2.930	2.066	1.741	1.519	1.134	1.084	1.061	0.919	0.912	0.884	0.865	0.781	0.768	0.735	0.697	0.595	0.367	0.367
190	2.968	2.097	1.764	1.542	1.167	1.116	1.092	0.946	0.939	0.910	0.890	0.804	0.791	0.757	0.719	0.618	0.367	0.367
195	3.006	2.128	1.787	1.564	1.201	1.148	1.123	0.973	0.966	0.937	0.916	0.828	0.814	0.780	0.741	0.641	0.367	0.367
200	3.044	2.159	1.810	1.587	1.234	1.180	1.154	1.000	0.993	0.963	0.941	0.851	0.837	0.803	0.763	0.664	0.393	0.367
205	3.082	2.189	1.833	1.609	1.268	1.212	1.186	1.028	1.020	0.989	0.967	0.875	0.860	0.825	0.785	0.687	0.418	0.367
210	3.120	2.220	1.855	1.631	1.301	1.244	1.217	1.055	1.047	1.015	0.992	0.898	0.884	0.848	0.807	0.710	0.444	0.367
215	3.158	2.251	1.878	1.654	1.335	1.276	1.248	1.082	1.074	1.041	1.018	0.922	0.907	0.870	0.829	0.733	0.469	0.367
220	3.196	2.282	1.901	1.676	1.368	1.308	1.279	1.109	1.101	1.067	1.043	0.945	0.930	0.893	0.851	0.757	0.495	0.367
225	3.234	2.312	1.924	1.698	1.402	1.340	1.310	1.136	1.128	1.093	1.069	0.969	0.953	0.915	0.873	0.780	0.520	0.367
230	3.272	2.343	1.947	1.721	1.436	1.372	1.342	1.164	1.155	1.119	1.094	0.992	0.976	0.938	0.895	0.803	0.545	0.367
235	3.310	2.374	1.970	1.743	1.469	1.404	1.373	1.191	1.182	1.145	1.119	1.016	0.999	0.961	0.918	0.826	0.571	0.367
240	3.348	2.405	1.993	1.765	1.503	1.436	1.404	1.218	1.209	1.171	1.145	1.039	1.023	0.983	0.940	0.849	0.596	0.367
245	3.386	2.436	2.016	1.788	1.529	1.468	1.435	1.245	1.236	1.197	1.170	1.063	1.046	1.006	0.962	0.872	0.622	0.367
250	3.423	2.466	2.039	1.810	1.552	1.500	1.467	1.272	1.262	1.224	1.196	1.086	1.069	1.028	0.984	0.895	0.647	0.367
255	3.461	2.497	2.062	1.833	1.575	1.527	1.498	1.300	1.289	1.250	1.221	1.110	1.092	1.051	1.006	0.918	0.673	0.367
260	3.499	2.528	2.085	1.855	1.598	1.550	1.525	1.327	1.316	1.276	1.247	1.133	1.115	1.073	1.028	0.942	0.698	0.367
265	3.536	2.559	2.108	1.877	1.621	1.573	1.548	1.354	1.343	1.302	1.272	1.157	1.138	1.096	1.050	0.965	0.724	0.367
270	3.569	2.589	2.131	1.900	1.644	1.596	1.572	1.381	1.370	1.328	1.298	1.180	1.162	1.119	1.072	0.988	0.749	0.367
275	3.603	2.620	2.154	1.922	1.666	1.620	1.595	1.408	1.397	1.354	1.323	1.204	1.185	1.141	1.094	1.011	0.775	0.367
280	3.636	2.651	2.177	1.944	1.689	1.643	1.619	1.436	1.424	1.380	1.349	1.227	1.208	1.164	1.116	1.034	0.800	0.367
285	3.670	2.682	2.200	1.967	1.712	1.666	1.642	1.463	1.451	1.406	1.374	1.251	1.231	1.186	1.138	1.057	0.826	0.389
290	3.703	2.712	2.223	1.989	1.735	1.689	1.666	1.490	1.478	1.432	1.400	1.274	1.254	1.209	1.161	1.080	0.851	0.419
295	3.737	2.744	2.246	2.011	1.758	1.713	1.689	1.517	1.505	1.458	1.425	1.298	1.277	1.231	1.183	1.103	0.877	0.449
300	3.771	2.777	2.268	2.034	1.781	1.736	1.712	1.541	1.530	1.485	1.451	1.321	1.301	1.254	1.205	1.127	0.902	0.479
305	3.804	2.810	2.291	2.056	1.804	1.759	1.736	1.565	1.555	1.511	1.476	1.344	1.324	1.277	1.227	1.150	0.928	0.509
310	3.838	2.843	2.314	2.079	1.827	1.782	1.759	1.590	1.579	1.536	1.502	1.368	1.347	1.299	1.249	1.173	0.953	0.539
315	3.871	2.877	2.337	2.101	1.850	1.806	1.783	1.614	1.604	1.561	1.527	1.391	1.370	1.322	1.271	1.196	0.979	0.569
320	3.905	2.910	2.360	2.123	1.873	1.829	1.806	1.639	1.628	1.585	1.552	1.415	1.393	1.344	1.293	1.219	1.004	0.598
325	3.938	2.943	2.383	2.146	1.896	1.852	1.829	1.663	1.653	1.610	1.577	1.438	1.416	1.367	1.315	1.242	1.030	0.628
330	3.972	2.976	2.406	2.168	1.919	1.875	1.853	1.687	1.677	1.635	1.603	1.462	1.440	1.389	1.337	1.265	1.055	0.658
335	4.005	3.009	2.429	2.190	1.942	1.899	1.876	1.712	1.702	1.660	1.628	1.485	1.463	1.412	1.359	1.288	1.081	0.688
340	4.039	3.042	2.452	2.213	1.965	1.922	1.900	1.736	1.726	1.685	1.653	1.509	1.486	1.435	1.381	1.312	1.106	0.718
345	4.072	3.075	2.475	2.235	1.988	1.945	1.923	1.760	1.751	1.710	1.678	1.534	1.509	1.457	1.404	1.335	1.132	0.748
350	4.106	3.108	2.498	2.257	2.011	1.968	1.946	1.785	1.775	1.735	1.704	1.561	1.535	1.480	1.426	1.358	1.157	0.778
355	4.139	3.141	2.521	2.280	2.034	1.992	1.970	1.809	1.800	1.760	1.729	1.587	1.561	1.502	1.448	1.381	1.183	0.808
360	4.173	3.174	2.544	2.302	2.057	2.015	1.993	1.834	1.824	1.785	1.754	1.613	1.587	1.527	1.470	1.404	1.208	0.838
365	4.206	3.207	2.567	2.325	2.079	2.038	2.017	1.858	1.849	1.810	1.779	1.639	1.614	1.554	1.492	1.427	1.234	0.868
370	4.240	3.240	2.590	2.347	2.102	2.061	2.040	1.882	1.873	1.834	1.804	1.665	1.640	1.580	1.514	1.450	1.259	0.898
375	4.274	3.273	2.613	2.369	2.125	2.085	2.064	1.907	1.898	1.859	1.830	1.691	1.666	1.607	1.541	1.473	1.285	0.928
380	4.307	3.306	2.636	2.392	2.148	2.108	2.087	1.931	1.922	1.884	1.855	1.717	1.692	1.633	1.567	1.497	1.310	0.957
385	4.341	3.339	2.659	2.414	2.171	2.131	2.110	1.956	1.947	1.909	1.880	1.743	1.719	1.660	1.594	1.520	1.336	0.987
390	4.374	3.372	2.681	2.436	2.194	2.154	2.134	1.980	1.971	1.934	1.905	1.769	1.745	1.686	1.620	1.544	1.361	1.017
395	4.408	3.405	2.704	2.459	2.217	2.178	2.157	2.004	1.996	1.959	1.931	1.795	1.771	1.713	1.647	1.568	1.387	1.047
400	4.441	3.438	2.730	2.481	2.240	2.201	2.181	2.029	2.020	1.984	1.956	1.822	1.797	1.739	1.673	1.592	1.412	1.077

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 6 I-Section Beams 75 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
50	1.660	1.126	0.799	0.566	0.398	0.377	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
55	1.773	1.244	0.887	0.628	0.441	0.419	0.410	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367	0.367
60	1.886	1.361	0.977	0.702	0.503	0.479	0.469	0.404	0.401	0.390	0.382	0.367	0.367	0.367	0.367	0.367	0.367	0.367
65	1.998	1.479	1.067	0.775	0.565	0.539	0.529	0.458	0.455	0.443	0.434	0.385	0.377	0.367	0.367	0.367	0.367	0.367
70	2.111	1.566	1.157	0.848	0.627	0.599	0.588	0.513	0.509	0.496	0.486	0.434	0.426	0.403	0.375	0.367	0.367	0.367
75	2.224	1.640	1.247	0.922	0.689	0.660	0.647	0.567	0.563	0.549	0.538	0.484	0.475	0.451	0.421	0.367	0.367	0.367
80	2.336	1.714	1.337	0.995	0.751	0.720	0.707	0.621	0.617	0.602	0.591	0.533	0.524	0.499	0.467	0.379	0.367	0.367
85	2.449	1.789	1.427	1.069	0.813	0.780	0.766	0.675	0.671	0.655	0.643	0.583	0.573	0.548	0.513	0.422	0.367	0.367
90	2.562	1.863	1.515	1.142	0.875	0.841	0.825	0.730	0.725	0.708	0.695	0.633	0.623	0.596	0.559	0.465	0.367	0.367
95	2.674	1.937	1.561	1.215	0.937	0.901	0.885	0.784	0.779	0.760	0.747	0.682	0.672	0.644	0.605	0.508	0.367	0.367
100	2.826	2.012	1.607	1.289	0.999	0.961	0.944	0.838	0.833	0.813	0.799	0.732	0.721	0.692	0.650	0.550	0.390	0.367
105	3.012	2.086	1.652	1.362	1.060	1.021	1.004	0.893	0.887	0.866	0.851	0.781	0.770	0.741	0.696	0.593	0.426	0.367
110	3.198	2.161	1.698	1.436	1.122	1.082	1.063	0.947	0.941	0.919	0.903	0.831	0.819	0.789	0.742	0.636	0.461	0.367
115	3.384	2.235	1.744	1.509	1.184	1.142	1.122	1.001	0.995	0.972	0.955	0.880	0.868	0.837	0.788	0.679	0.496	0.367
120	3.532	2.309	1.790	1.537	1.246	1.202	1.182	1.055	1.049	1.025	1.008	0.930	0.917	0.885	0.834	0.722	0.532	0.367
125	3.563	2.384	1.836	1.563	1.308	1.262	1.241	1.110	1.103	1.078	1.060	0.979	0.966	0.934	0.879	0.764	0.567	0.389
130	3.594	2.458	1.882	1.589	1.370	1.323	1.300	1.164	1.157	1.131	1.112	1.029	1.015	0.982	0.925	0.807	0.603	0.416
135	3.625	2.532	1.927	1.615	1.432	1.383	1.360	1.218	1.211	1.184	1.164	1.078	1.064	1.030	0.971	0.850	0.638	0.443
140	3.656	2.607	1.973	1.641	1.494	1.443	1.419	1.273	1.265	1.237	1.216	1.128	1.113	1.078	1.017	0.893	0.673	0.470
145	3.687	2.681	2.019	1.667	1.529	1.504	1.478	1.327	1.319	1.290	1.268	1.177	1.162	1.127	1.063	0.936	0.709	0.497
150	3.718	2.747	2.065	1.693	1.553	1.533	1.523	1.381	1.373	1.343	1.320	1.227	1.211	1.175	1.109	0.978	0.744	0.524
155	3.749	2.801	2.111	1.719	1.576	1.556	1.546	1.435	1.427	1.395	1.372	1.277	1.260	1.223	1.154	1.021	0.780	0.551
160	3.780	2.856	2.157	1.744	1.600	1.580	1.570	1.490	1.481	1.448	1.425	1.326	1.309	1.271	1.200	1.064	0.815	0.578
165	3.811	2.910	2.202	1.770	1.623	1.603	1.593	1.526	1.522	1.501	1.477	1.376	1.359	1.320	1.246	1.107	0.850	0.605
170	3.842	2.964	2.248	1.796	1.647	1.627	1.616	1.549	1.545	1.531	1.520	1.425	1.408	1.368	1.292	1.150	0.886	0.632
175	3.874	3.018	2.294	1.822	1.671	1.650	1.640	1.572	1.568	1.554	1.543	1.475	1.457	1.416	1.338	1.192	0.921	0.659
180	3.905	3.072	2.340	1.848	1.694	1.674	1.663	1.595	1.591	1.577	1.566	1.518	1.506	1.464	1.383	1.235	0.956	0.686
185	3.936	3.126	2.386	1.874	1.718	1.697	1.687	1.618	1.614	1.599	1.589	1.541	1.532	1.513	1.429	1.278	0.992	0.713
190	3.967	3.181	2.431	1.900	1.741	1.720	1.710	1.641	1.637	1.622	1.611	1.563	1.554	1.535	1.475	1.321	1.027	0.740
195	3.998	3.235	2.477	1.926	1.765	1.744	1.733	1.664	1.660	1.645	1.634	1.585	1.577	1.557	1.517	1.364	1.063	0.767
200	4.029	3.289	2.523	1.951	1.788	1.767	1.757	1.687	1.683	1.668	1.657	1.608	1.599	1.580	1.539	1.406	1.098	0.794
205	4.060	3.343	2.569	1.977	1.812	1.791	1.780	1.709	1.706	1.691	1.680	1.630	1.622	1.602	1.561	1.449	1.133	0.821
210	4.091	3.397	2.615	2.003	1.836	1.814	1.804	1.732	1.729	1.714	1.703	1.653	1.644	1.624	1.584	1.492	1.169	0.848
215	4.122	3.451	2.661	2.029	1.859	1.838	1.827	1.755	1.752	1.737	1.726	1.675	1.666	1.646	1.606	1.524	1.204	0.875
220	4.153	3.506	2.706	2.055	1.883	1.861	1.851	1.778	1.775	1.760	1.749	1.698	1.689	1.668	1.628	1.546	1.240	0.902
225	4.184	3.543	2.741	2.081	1.906	1.885	1.874	1.801	1.797	1.783	1.771	1.720	1.711	1.691	1.650	1.567	1.275	0.929
230	4.215	3.572	2.768	2.107	1.930	1.908	1.897	1.824	1.820	1.805	1.794	1.743	1.734	1.713	1.672	1.589	1.310	0.956
235	4.246	3.601	2.795	2.132	1.953	1.932	1.921	1.847	1.843	1.828	1.817	1.765	1.756	1.735	1.695	1.611	1.346	0.983
240	4.277	3.630	2.822	2.158	1.977	1.955	1.944	1.870	1.866	1.851	1.840	1.788	1.778	1.757	1.717	1.633	1.381	1.010
245	4.309	3.659	2.848	2.184	2.000	1.979	1.968	1.893	1.889	1.874	1.863	1.810	1.801	1.780	1.739	1.654	1.417	1.037
250	4.340	3.688	2.875	2.210	2.024	2.002	1.991	1.916	1.912	1.897	1.886	1.833	1.823	1.802	1.761	1.676	1.452	1.064
255	4.371	3.717	2.902	2.236	2.048	2.025	2.014	1.939	1.935	1.920	1.909	1.855	1.846	1.824	1.784	1.698	1.487	1.091
260	4.402	3.746	2.929	2.262	2.071	2.049	2.038	1.962	1.958	1.943	1.931	1.878	1.868	1.846	1.806	1.719	1.519	1.118
265	4.433	3.775	2.955	2.288	2.095	2.072	2.061	1.985	1.981	1.966	1.954	1.900	1.890	1.869	1.828	1.741	1.542	1.145
270	4.464	3.805	2.982	2.314	2.118	2.096	2.085	2.007	2.004	1.989	1.977	1.922	1.913	1.891	1.850	1.763	1.564	1.172
275	4.497	3.834	3.009	2.339	2.142	2.119	2.108	2.030	2.027	2.011	2.000	1.945	1.935	1.913	1.873	1.784	1.587	1.199
280	4.556	3.863	3.036	2.365	2.165	2.143	2.132	2.053	2.050	2.034	2.023	1.967	1.958	1.935	1.895	1.806	1.609	1.226
285	4.615	3.892	3.063	2.391	2.189	2.166	2.155	2.076	2.072	2.057	2.046	1.990	1.980	1.957	1.917	1.828	1.632	1.253
290	4.674	3.921	3.089	2.417	2.212	2.190	2.178	2.099	2.095	2.080	2.069	2.012	2.002	1.980	1.939	1.850	1.654	1.280
295	4.733	3.950	3.116	2.443	2.236	2.213	2.202	2.122	2.118	2.103	2.091	2.035	2.025	2.002	1.962	1.871	1.677	1.307
300	4.792	3.979	3.143	2.469	2.260	2.237	2.225	2.145	2.141	2.126	2.114	2.057	2.047	2.024	1.984	1.893	1.699	1.334
305	4.851	4.008	3.170	2.495	2.283	2.260	2.249	2.168	2.164	2.149	2.137	2.080	2.070	2.046	2.006	1.915	1.721	1.361
310	4.910	4.037	3.196	2.521	2.307	2.283	2.272	2.191	2.187	2.172	2.160	2.102	2.092	2.069	2.028	1.936	1.744	1.388
315	4.969	4.066	3.223	2.546	2.330	2.307	2.295	2.214	2.210	2.194	2.183	2.125	2.114	2.091	2.050	1.958	1.766	1.415
320	5.028	4.095	3.250	2.572	2.354	2.330	2.319	2.237	2.233	2.217	2.206	2.147	2.137	2.113	2.073	1.980	1.789	1.442
325	5.087	4.124	3.277	2.598	2.377	2.354	2.342	2.260	2.256	2.240	2.229	2.170	2.159	2.135	2.095	2.002	1.811	1.469
330	5.146	4.153	3.303	2.624	2.401	2.377	2.366	2.283	2.279	2.263	2.251	2.192	2.182	2.158	2.117	2.023	1.834	1.496
335	5.205	4.182	3.330	2.650	2.424	2.401	2.389	2.305	2.302	2.286	2.274	2.215	2.204	2.180	2.139	2.045	1.856	1.523
340	5.264	4.211	3.357	2.676	2.448	2.424	2.412	2.328	2.325	2.309	2.297	2.237	2.226	2.202	2.162	2.067	1.879	1.550
345	5.323	4.240	3.384	2.702	2.472	2.448	2.436	2.351	2.347	2.332	2.320	2.259	2.249	2.224	2.184	2.088	1.901	1.577
350	5.382	4.269	3.411	2.730	2.495	2.471	2.459	2.374	2.370	2.355	2.343	2.282	2.271	2.247	2.206	2.110	1.924	1.604
355	5.441	4.298	3.437	2.794	2.519	2.495	2.483	2.397	2.393	2.378	2.366	2.304	2.294	2.269	2.228	2.132	1.946	1.631
360	5.500	4.327	3.464	2.859	2.542	2.518	2.506	2.420	2.416	2.400	2.389	2.327	2.316	2.291	2.251	2.153	1.969	1.658
365	5.559	4.356	3.491	2.924	2.566	2.542	2.530	2.443	2.439	2.423	2.411	2.349	2.338	2.313	2.273	2.175	1.991	1.685
370	5.618	4.385	3.518	2.988	2.589	2.565	2.553	2.466	2.462	2.446	2.434	2.372	2.361	2.335	2.295	2.197	2.014	1.711
375	5.677	4.414	3.577	3.053	2.613	2.588	2.576	2.489	2.485	2.469	2.457	2.394	2.383	2.358	2.317	2.219	2.036	1.738
380	5.736	4.443	3.647	3.117	2.636	2.612	2.600	2.512	2.508	2.492	2.480	2.417	2.406	2.380	2.340	2.240	2.059	1.765
385	-	4.472	3.716	3.182	2.660	2.635	2.623	2.535	2.531	2.515	2.503	2.439	2.428	2.402	2.362	2.262	2.081	1.792
390	-	4.524	3.786	3.246	2.684	2.659	2.647	2.558	2.554	2.538	2.526	2.462	2.450	2.424	2.384	2.284	2.104	1.819
395	-	4.631	3.856	3.311	2.707	2.682	2.670	2.581	2.577	2.561	2.549	2.484	2.473	2.447	2.406	2.305	2.126	1.846
400	-	4.738	3.925	3.376	2.742	2.706	2.693	2.603	2.600	2.584	2.571	2.507	2.495	2.469	2.428	2.327	2.148	1.873

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 7 I-Section Beams 90 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
50	2.094	1.528	1.100	0.836	0.651	0.629	0.617	0.540	0.537	0.523	0.513	0.458	0.449	0.425	0.395	0.367	0.367	0.367
55	2.250	1.650	1.220	0.928	0.723	0.698	0.685	0.599	0.596	0.580	0.569	0.508	0.499	0.471	0.439	0.367	0.367	0.367
60	2.406	1.772	1.341	1.029	0.811	0.784	0.770	0.680	0.676	0.659	0.647	0.584	0.574	0.546	0.511	0.427	0.367	0.367
65	2.562	1.893	1.461	1.130	0.898	0.869	0.855	0.760	0.756	0.738	0.725	0.660	0.649	0.621	0.582	0.494	0.367	0.367
70	2.718	2.015	1.563	1.231	0.986	0.955	0.940	0.840	0.836	0.817	0.804	0.736	0.725	0.695	0.654	0.562	0.422	0.367
75	3.315	2.137	1.651	1.331	1.073	1.041	1.025	0.921	0.916	0.896	0.882	0.812	0.800	0.770	0.726	0.629	0.480	0.367
80	3.574	2.259	1.739	1.432	1.161	1.127	1.110	1.001	0.996	0.975	0.960	0.887	0.875	0.844	0.798	0.697	0.538	0.381
85	3.649	2.381	1.827	1.525	1.249	1.212	1.194	1.081	1.076	1.054	1.038	0.963	0.951	0.919	0.870	0.764	0.596	0.429
90	3.724	2.503	1.916	1.584	1.336	1.298	1.279	1.161	1.156	1.133	1.116	1.039	1.026	0.993	0.942	0.832	0.654	0.477
95	3.800	2.625	2.004	1.644	1.424	1.384	1.364	1.242	1.236	1.212	1.195	1.115	1.101	1.068	1.013	0.899	0.712	0.525
100	3.875	2.758	2.092	1.703	1.511	1.469	1.449	1.322	1.316	1.291	1.273	1.191	1.177	1.143	1.085	0.967	0.770	0.573
105	3.950	2.939	2.180	1.762	1.552	1.532	1.522	1.402	1.396	1.370	1.351	1.267	1.252	1.217	1.157	1.034	0.828	0.621
110	4.025	3.121	2.268	1.822	1.593	1.570	1.559	1.482	1.476	1.449	1.429	1.342	1.327	1.292	1.229	1.102	0.886	0.669
115	4.100	3.302	2.356	1.881	1.633	1.608	1.596	1.531	1.529	1.518	1.507	1.418	1.403	1.366	1.301	1.169	0.944	0.717
120	4.175	3.484	2.445	1.941	1.673	1.646	1.633	1.561	1.558	1.546	1.538	1.494	1.478	1.441	1.372	1.237	1.002	0.765
125	4.251	3.551	2.533	2.000	1.713	1.684	1.670	1.590	1.587	1.575	1.566	1.531	1.526	1.514	1.444	1.305	1.060	0.813
130	4.326	3.585	2.621	2.060	1.753	1.722	1.707	1.620	1.617	1.603	1.593	1.556	1.550	1.538	1.514	1.372	1.118	0.861
135	4.401	3.620	2.709	2.119	1.793	1.760	1.744	1.650	1.646	1.631	1.620	1.580	1.575	1.562	1.538	1.440	1.176	0.909
140	4.476	3.654	2.799	2.179	1.834	1.798	1.781	1.679	1.675	1.659	1.648	1.605	1.599	1.586	1.562	1.507	1.234	0.957
145	4.538	3.689	2.888	2.238	1.874	1.836	1.818	1.709	1.704	1.687	1.675	1.629	1.624	1.610	1.586	1.534	1.292	1.005
150	4.597	3.723	2.978	2.298	1.914	1.874	1.855	1.738	1.734	1.715	1.702	1.654	1.648	1.635	1.610	1.557	1.350	1.052
155	4.655	3.757	3.068	2.357	1.954	1.912	1.892	1.768	1.763	1.743	1.729	1.678	1.672	1.659	1.634	1.581	1.408	1.100
160	4.713	3.792	3.158	2.416	1.994	1.950	1.929	1.798	1.792	1.772	1.757	1.703	1.697	1.683	1.658	1.604	1.466	1.148
165	4.772	3.826	3.248	2.476	2.034	1.988	1.966	1.827	1.822	1.800	1.784	1.727	1.721	1.707	1.682	1.627	1.517	1.196
170	4.830	3.861	3.338	2.535	2.075	2.026	2.003	1.857	1.851	1.828	1.811	1.752	1.746	1.731	1.706	1.650	1.540	1.244
175	4.889	3.895	3.428	2.595	2.115	2.064	2.040	1.886	1.880	1.856	1.839	1.776	1.770	1.755	1.730	1.674	1.563	1.292
180	4.947	3.930	3.517	2.654	2.155	2.102	2.077	1.916	1.910	1.884	1.866	1.801	1.794	1.780	1.754	1.697	1.586	1.340
185	5.005	3.964	3.548	2.714	2.195	2.140	2.114	1.946	1.939	1.912	1.893	1.825	1.819	1.804	1.778	1.720	1.609	1.388
190	5.064	3.998	3.574	2.764	2.235	2.178	2.150	1.975	1.968	1.940	1.920	1.850	1.843	1.828	1.802	1.743	1.632	1.436
195	5.122	4.033	3.601	2.813	2.275	2.216	2.187	2.005	1.997	1.969	1.948	1.874	1.868	1.852	1.826	1.766	1.655	1.484
200	5.181	4.067	3.627	2.862	2.316	2.254	2.224	2.034	2.027	1.997	1.975	1.899	1.892	1.876	1.850	1.790	1.678	1.523
205	5.239	4.102	3.653	2.910	2.356	2.292	2.261	2.064	2.056	2.025	2.002	1.923	1.916	1.900	1.874	1.813	1.701	1.547
210	5.297	4.136	3.679	2.959	2.396	2.330	2.298	2.093	2.085	2.053	2.030	1.948	1.941	1.925	1.898	1.836	1.725	1.572
215	5.356	4.171	3.705	3.007	2.436	2.368	2.335	2.123	2.115	2.081	2.057	1.972	1.965	1.949	1.922	1.859	1.748	1.597
220	5.414	4.205	3.731	3.056	2.476	2.406	2.372	2.153	2.144	2.109	2.084	1.997	1.990	1.973	1.946	1.882	1.771	1.621
225	5.472	4.240	3.758	3.104	2.516	2.444	2.409	2.182	2.173	2.138	2.112	2.021	2.014	1.997	1.969	1.906	1.794	1.646
230	5.531	4.274	3.784	3.153	2.557	2.482	2.446	2.212	2.203	2.166	2.139	2.046	2.038	2.021	1.993	1.929	1.817	1.670
235	5.589	4.308	3.810	3.201	2.597	2.520	2.483	2.241	2.232	2.194	2.166	2.070	2.063	2.045	2.017	1.952	1.840	1.695
240	5.648	4.343	3.836	3.250	2.637	2.558	2.520	2.271	2.261	2.222	2.193	2.095	2.087	2.070	2.041	1.975	1.863	1.719
245	5.706	4.377	3.862	3.298	2.677	2.596	2.557	2.301	2.290	2.250	2.221	2.119	2.112	2.094	2.065	1.999	1.886	1.744
250	5.764	4.412	3.888	3.347	2.717	2.634	2.594	2.330	2.320	2.278	2.248	2.144	2.136	2.118	2.089	2.022	1.909	1.769
255	-	4.446	3.914	3.395	2.752	2.672	2.631	2.360	2.349	2.306	2.275	2.168	2.160	2.142	2.113	2.045	1.932	1.793
260	-	4.481	3.941	3.444	2.786	2.710	2.668	2.389	2.378	2.335	2.303	2.193	2.185	2.166	2.137	2.068	1.955	1.818
265	-	4.532	3.967	3.492	2.820	2.747	2.705	2.419	2.408	2.363	2.330	2.217	2.209	2.190	2.161	2.091	1.978	1.842
270	-	4.594	3.993	3.536	2.853	2.782	2.742	2.449	2.437	2.391	2.357	2.242	2.234	2.215	2.185	2.115	2.001	1.867
275	-	4.655	4.019	3.569	2.887	2.818	2.779	2.478	2.466	2.419	2.384	2.266	2.258	2.239	2.209	2.138	2.024	1.891
280	-	4.716	4.045	3.603	2.920	2.854	2.816	2.508	2.496	2.447	2.412	2.291	2.282	2.263	2.233	2.161	2.047	1.916
285	-	4.778	4.071	3.637	2.954	2.889	2.853	2.537	2.525	2.475	2.439	2.315	2.307	2.287	2.257	2.184	2.070	1.941
290	-	4.839	4.098	3.670	2.988	2.925	2.890	2.567	2.554	2.503	2.466	2.340	2.331	2.311	2.281	2.208	2.093	1.965
295	-	4.900	4.124	3.704	3.021	2.961	2.927	2.596	2.583	2.532	2.494	2.364	2.356	2.335	2.305	2.231	2.116	1.990
300	-	4.962	4.150	3.738	3.055	2.997	2.964	2.626	2.613	2.560	2.521	2.389	2.380	2.360	2.329	2.254	2.139	2.014
305	-	5.023	4.176	3.771	3.089	3.032	3.000	2.656	2.642	2.588	2.548	2.413	2.404	2.384	2.353	2.277	2.162	2.039
310	-	5.084	4.202	3.805	3.122	3.068	3.037	2.685	2.671	2.616	2.576	2.438	2.429	2.408	2.377	2.300	2.185	2.063
315	-	5.146	4.228	3.839	3.156	3.104	3.074	2.715	2.701	2.644	2.603	2.462	2.453	2.432	2.401	2.324	2.208	2.088
320	-	5.207	4.255	3.872	3.189	3.139	3.111	2.760	2.734	2.672	2.630	2.487	2.478	2.456	2.425	2.347	2.231	2.113
325	-	5.269	4.281	3.906	3.223	3.175	3.148	2.815	2.790	2.701	2.657	2.511	2.502	2.480	2.449	2.370	2.254	2.137
330	-	5.330	4.307	3.939	3.257	3.211	3.185	2.869	2.846	2.732	2.685	2.536	2.526	2.505	2.473	2.393	2.277	2.162
335	-	5.391	4.333	3.973	3.290	3.247	3.222	2.924	2.902	2.795	2.712	2.560	2.551	2.529	2.497	2.416	2.300	2.186
340	-	5.453	4.359	4.007	3.324	3.282	3.259	2.978	2.957	2.857	2.760	2.585	2.575	2.553	2.521	2.440	2.323	2.211
345	-	5.514	4.385	4.040	3.357	3.318	3.296	3.033	3.013	2.920	2.829	2.609	2.600	2.577	2.545	2.463	2.346	2.235
350	-	5.575	4.412	4.074	3.391	3.354	3.333	3.088	3.069	2.983	2.899	2.634	2.624	2.601	2.569	2.486	2.369	2.260
355	-	5.637	4.438	4.108	3.425	3.389	3.370	3.142	3.125	3.045	2.968	2.658	2.648	2.625	2.593	2.509	2.392	2.285
360	-	5.698	4.464	4.141	3.458	3.425	3.407	3.197	3.181	3.108	3.037	2.683	2.673	2.650	2.617	2.533	2.415	2.309
365	-	5.759	4.490	4.175	3.492	3.461	3.444	3.251	3.237	3.171	3.107	2.707	2.697	2.674	2.641	2.556	2.439	2.334
370	-	-	4.617	4.209	3.527	3.497	3.481	3.306	3.293	3.233	3.176	2.752	2.722	2.698	2.665	2.579	2.462	2.358
375	-	-	4.758	4.242	3.585	3.537	3.518	3.360	3.349	3.296	3.245	2.860	2.815	2.722	2.689	2.602	2.485	2.383
380	-	-	4.898	4.276	3.642	3.594	3.571	3.415	3.405	3.359	3.315	2.969	2.924	2.818	2.713	2.625	2.508	2.407
385	-	-	5.038	4.310	3.700	3.652	3.628	3.470	3.461	3.421	3.384	3.077	3.033	2.929	2.776	2.649	2.531	2.432
390	-	-	5.178	4.343	3.758	3.709	3.685	3.524	3.517	3.484	3.453	3.186	3.142	3.039	2.888	2.672	2.554	2.457
395	-	-	5.318	4.377	3.816	3.766	3.741	3.580	3.572	3.544	3.523	3.294	3.251	3.149	3.001	2.695	2.577	2.481
400	-	-	5.458	4.410	3.874	3.823	3.798	3.635	3.628	3.599	3.578	3.402	3.360	3.259	3.114	2.718	2.600	2.506

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 8 I-Section Beams 105 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
50	2.457	1.931	1.428	1.106	0.905	0.880	0.868	0.786	0.782	0.767	0.757	0.700	0.690	0.665	0.631	0.544	0.418	0.367
55	2.730	2.093	1.564	1.229	1.005	0.978	0.964	0.873	0.869	0.852	0.840	0.777	0.766	0.738	0.701	0.604	0.464	0.367
60	3.610	2.255	1.699	1.357	1.118	1.089	1.074	0.978	0.974	0.956	0.943	0.877	0.866	0.837	0.796	0.695	0.544	0.393
65	3.736	2.417	1.834	1.485	1.232	1.200	1.184	1.083	1.078	1.060	1.046	0.977	0.966	0.936	0.892	0.786	0.625	0.462
70	3.862	2.580	1.969	1.591	1.345	1.311	1.294	1.188	1.183	1.163	1.149	1.078	1.065	1.035	0.987	0.877	0.705	0.531
75	3.989	2.771	2.105	1.691	1.458	1.422	1.405	1.293	1.288	1.267	1.252	1.178	1.165	1.134	1.083	0.968	0.786	0.601
80	4.115	3.224	2.240	1.791	1.551	1.526	1.514	1.399	1.393	1.371	1.354	1.278	1.265	1.233	1.179	1.060	0.866	0.670
85	4.242	3.551	2.375	1.891	1.625	1.597	1.584	1.504	1.498	1.474	1.457	1.379	1.364	1.331	1.274	1.151	0.947	0.739
90	4.368	3.630	2.511	1.991	1.700	1.669	1.654	1.567	1.564	1.549	1.539	1.479	1.464	1.430	1.370	1.242	1.027	0.808
95	4.494	3.709	2.646	2.091	1.774	1.740	1.724	1.627	1.623	1.607	1.595	1.546	1.538	1.521	1.466	1.333	1.108	0.878
100	4.612	3.788	2.819	2.191	1.848	1.811	1.793	1.686	1.682	1.664	1.652	1.595	1.586	1.567	1.535	1.424	1.188	0.947
105	4.729	3.867	3.045	2.291	1.922	1.882	1.863	1.746	1.741	1.722	1.708	1.645	1.635	1.613	1.578	1.514	1.269	1.016
110	4.847	3.946	3.272	2.391	1.996	1.954	1.933	1.806	1.800	1.779	1.764	1.695	1.683	1.659	1.621	1.549	1.349	1.086
115	4.964	4.025	3.499	2.491	2.071	2.025	2.003	1.865	1.859	1.837	1.821	1.744	1.732	1.705	1.664	1.584	1.430	1.155
120	5.082	4.104	3.564	2.591	2.145	2.096	2.073	1.925	1.919	1.894	1.877	1.794	1.781	1.751	1.706	1.619	1.510	1.224
125	5.199	4.183	3.608	2.691	2.219	2.167	2.143	1.984	1.978	1.952	1.933	1.844	1.829	1.797	1.749	1.654	1.539	1.293
130	5.317	4.263	3.653	2.814	2.293	2.239	2.213	2.044	2.037	2.009	1.990	1.893	1.878	1.843	1.792	1.689	1.566	1.363
135	5.434	4.342	3.697	2.947	2.368	2.310	2.282	2.103	2.096	2.067	2.046	1.943	1.926	1.889	1.835	1.724	1.593	1.432
140	5.552	4.421	3.742	3.081	2.442	2.381	2.352	2.163	2.155	2.124	2.102	1.993	1.975	1.935	1.878	1.759	1.620	1.501
145	5.670	4.499	3.786	3.215	2.516	2.453	2.422	2.222	2.214	2.182	2.159	2.042	2.024	1.981	1.921	1.794	1.647	1.535
150	-	4.571	3.831	3.349	2.590	2.524	2.492	2.282	2.273	2.240	2.215	2.092	2.072	2.027	1.964	1.829	1.674	1.561
155	-	4.643	3.875	3.483	2.664	2.595	2.562	2.341	2.333	2.297	2.271	2.142	2.121	2.073	2.007	1.864	1.701	1.588
160	-	4.714	3.920	3.541	2.741	2.666	2.632	2.401	2.392	2.355	2.328	2.191	2.169	2.119	2.050	1.899	1.728	1.614
165	-	4.786	3.964	3.566	2.830	2.740	2.701	2.461	2.451	2.412	2.384	2.241	2.218	2.166	2.093	1.934	1.755	1.641
170	-	4.858	4.009	3.591	2.919	2.824	2.779	2.520	2.510	2.470	2.440	2.291	2.266	2.212	2.136	1.969	1.782	1.668
175	-	4.930	4.053	3.616	3.008	2.908	2.861	2.580	2.569	2.527	2.497	2.340	2.315	2.258	2.179	2.004	1.809	1.694
180	-	5.001	4.098	3.640	3.097	2.992	2.942	2.639	2.628	2.585	2.553	2.390	2.364	2.304	2.222	2.039	1.836	1.721
185	-	5.073	4.142	3.665	3.186	3.076	3.024	2.699	2.687	2.642	2.609	2.440	2.412	2.350	2.265	2.074	1.863	1.747
190	-	5.145	4.187	3.690	3.275	3.160	3.105	2.763	2.750	2.700	2.666	2.489	2.461	2.396	2.308	2.109	1.889	1.774
195	-	5.217	4.232	3.715	3.364	3.244	3.187	2.832	2.818	2.762	2.722	2.539	2.509	2.442	2.350	2.144	1.916	1.800
200	-	5.288	4.276	3.740	3.453	3.328	3.268	2.900	2.886	2.828	2.786	2.589	2.558	2.488	2.393	2.179	1.943	1.827
205	-	5.360	4.321	3.765	3.529	3.412	3.350	2.969	2.954	2.894	2.850	2.638	2.606	2.534	2.436	2.214	1.970	1.853
210	-	5.432	4.365	3.789	3.556	3.496	3.432	3.038	3.022	2.959	2.914	2.688	2.655	2.580	2.479	2.249	1.997	1.880
215	-	5.503	4.410	3.814	3.583	3.542	3.513	3.106	3.090	3.025	2.979	2.739	2.704	2.626	2.522	2.284	2.024	1.906
220	-	5.575	4.454	3.839	3.609	3.569	3.548	3.175	3.158	3.091	3.043	2.796	2.756	2.672	2.565	2.319	2.051	1.933
225	-	5.647	4.500	3.864	3.636	3.596	3.575	3.244	3.226	3.157	3.107	2.852	2.811	2.718	2.608	2.354	2.078	1.959
230	-	5.719	4.554	3.889	3.662	3.623	3.603	3.312	3.294	3.223	3.172	2.909	2.866	2.769	2.651	2.389	2.105	1.986
235	-	-	4.609	3.914	3.689	3.650	3.630	3.381	3.362	3.289	3.236	2.965	2.921	2.821	2.694	2.424	2.132	2.012
240	-	-	4.663	3.938	3.716	3.678	3.657	3.449	3.430	3.354	3.300	3.022	2.976	2.873	2.738	2.459	2.159	2.039
245	-	-	4.718	3.963	3.742	3.705	3.685	3.518	3.498	3.420	3.365	3.078	3.031	2.925	2.786	2.494	2.186	2.065
250	-	-	4.772	3.988	3.769	3.732	3.712	3.552	3.543	3.486	3.429	3.134	3.086	2.976	2.834	2.529	2.213	2.092
255	-	-	4.826	4.013	3.795	3.759	3.740	3.582	3.573	3.537	3.493	3.191	3.141	3.028	2.881	2.565	2.240	2.118
260	-	-	4.881	4.038	3.822	3.786	3.767	3.612	3.604	3.568	3.541	3.247	3.196	3.080	2.929	2.600	2.267	2.145
265	-	-	4.935	4.063	3.849	3.813	3.794	3.642	3.634	3.599	3.572	3.304	3.251	3.132	2.977	2.635	2.294	2.171
270	-	-	4.990	4.087	3.875	3.840	3.822	3.672	3.664	3.630	3.603	3.360	3.306	3.183	3.024	2.670	2.321	2.198
275	-	-	5.044	4.112	3.902	3.867	3.849	3.702	3.695	3.661	3.635	3.417	3.361	3.235	3.072	2.705	2.348	2.224
280	-	-	5.098	4.137	3.928	3.894	3.877	3.733	3.725	3.692	3.666	3.473	3.416	3.287	3.120	2.743	2.375	2.251
285	-	-	5.153	4.162	3.955	3.922	3.904	3.763	3.755	3.723	3.698	3.527	3.471	3.339	3.168	2.787	2.402	2.277
290	-	-	5.207	4.187	3.982	3.949	3.931	3.793	3.785	3.754	3.729	3.563	3.525	3.390	3.215	2.830	2.429	2.304
295	-	-	5.262	4.212	4.008	3.976	3.959	3.823	3.816	3.785	3.761	3.598	3.562	3.442	3.263	2.874	2.456	2.330
300	-	-	5.316	4.236	4.035	4.003	3.986	3.853	3.846	3.816	3.792	3.634	3.598	3.494	3.311	2.917	2.482	2.357
305	-	-	5.370	4.261	4.061	4.030	4.014	3.883	3.876	3.847	3.824	3.669	3.634	3.540	3.358	2.961	2.509	2.383
310	-	-	5.425	4.286	4.088	4.057	4.041	3.914	3.907	3.878	3.855	3.705	3.671	3.580	3.406	3.005	2.536	2.410
315	-	-	5.479	4.311	4.115	4.084	4.068	3.944	3.937	3.909	3.887	3.740	3.707	3.619	3.454	3.048	2.563	2.436
320	-	-	5.533	4.336	4.141	4.111	4.096	3.974	3.967	3.940	3.918	3.776	3.743	3.659	3.502	3.092	2.590	2.463
325	-	-	5.588	4.361	4.168	4.139	4.123	4.004	3.998	3.971	3.950	3.811	3.780	3.698	3.548	3.136	2.617	2.489
330	-	-	5.642	4.385	4.194	4.166	4.151	4.034	4.028	4.002	3.981	3.847	3.816	3.738	3.594	3.179	2.644	2.516
335	-	-	5.697	4.410	4.221	4.193	4.178	4.065	4.058	4.033	4.013	3.882	3.852	3.777	3.639	3.223	2.671	2.542
340	-	-	5.751	4.435	4.248	4.220	4.205	4.095	4.089	4.064	4.044	3.918	3.889	3.817	3.685	3.266	2.698	2.569
345	-	-	-	4.460	4.274	4.247	4.233	4.125	4.119	4.095	4.076	3.953	3.925	3.856	3.731	3.310	2.725	2.595
350	-	-	-	4.485	4.301	4.274	4.260	4.155	4.149	4.126	4.107	3.989	3.962	3.895	3.776	3.354	2.811	2.622
355	-	-	-	4.641	4.327	4.301	4.288	4.185	4.180	4.157	4.139	4.024	3.998	3.935	3.822	3.397	2.900	2.648
360	-	-	-	4.863	4.354	4.328	4.315	4.215	4.210	4.188	4.170	4.059	4.034	3.974	3.868	3.441	2.988	2.675
365	-	-	-	5.084	4.381	4.355	4.342	4.246	4.240	4.219	4.202	4.095	4.071	4.014	3.913	3.485	3.077	2.701
370	-	-	-	5.306	4.407	4.383	4.370	4.276	4.271	4.250	4.233	4.130	4.107	4.053	3.959	3.531	3.165	2.733
375	-	-	-	5.528	4.434	4.410	4.397	4.306	4.301	4.281	4.265	4.166	4.143	4.093	4.005	3.601	3.254	2.846
380	-	-	-	5.750	4.460	4.437	4.425	4.336	4.331	4.312	4.296	4.201	4.180	4.132	4.050	3.672	3.343	2.958
385	-	-	-	-	4.487	4.464	4.452	4.366	4.362	4.343	4.327	4.237	4.216	4.172	4.096	3.743	3.431	3.070
390	-	-	-	-	4.708	4.491	4.479	4.397	4.392	4.374	4.359	4.272	4.252	4.211	4.142	3.813	3.520	3.183
395	-	-	-	-	4.987	4.759	4.639	4.427	4.422	4.405	4.390	4.308	4.289	4.250	4.187	3.884	3.598	3.295
400	-	-	-	-	5.267	5.045	4.930	4.457	4.453	4.436	4.422	4.343	4.325	4.290	4.233	3.954	3.677	3.407

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 9 I-Section Beams 120 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
50	3.765	2.334	1.806	1.389	1.159	1.132	1.118	1.032	1.028	1.012	1.001	0.941	0.931	0.905	0.867	0.772	0.631	0.482
55	3.934	2.536	1.980	1.534	1.287	1.257	1.242	1.146	1.142	1.124	1.111	1.046	1.034	1.005	0.962	0.858	0.701	0.535
60	4.103	2.792	2.153	1.679	1.426	1.394	1.378	1.276	1.272	1.253	1.239	1.170	1.158	1.128	1.082	0.972	0.803	0.625
65	4.272	3.564	2.326	1.824	1.555	1.527	1.513	1.407	1.401	1.381	1.366	1.295	1.282	1.251	1.201	1.086	0.905	0.715
70	4.441	3.697	2.499	1.969	1.669	1.637	1.621	1.530	1.526	1.510	1.494	1.420	1.406	1.375	1.321	1.200	1.007	0.805
75	4.620	3.831	2.672	2.114	1.783	1.747	1.730	1.625	1.621	1.603	1.590	1.534	1.524	1.498	1.440	1.314	1.109	0.895
80	4.803	3.964	3.051	2.259	1.896	1.857	1.838	1.720	1.715	1.695	1.681	1.616	1.605	1.581	1.542	1.429	1.211	0.985
85	4.986	4.097	3.523	2.404	2.010	1.967	1.946	1.815	1.810	1.788	1.772	1.698	1.686	1.659	1.615	1.530	1.313	1.075
90	5.169	4.230	3.616	2.549	2.124	2.077	2.054	1.910	1.904	1.880	1.863	1.781	1.767	1.736	1.689	1.593	1.415	1.165
95	5.353	4.364	3.708	2.694	2.237	2.187	2.162	2.005	1.999	1.973	1.954	1.863	1.848	1.814	1.763	1.657	1.515	1.255
100	5.536	4.497	3.800	2.942	2.351	2.297	2.270	2.100	2.093	2.065	2.045	1.945	1.928	1.891	1.836	1.720	1.568	1.345
105	5.719	4.626	3.891	3.219	2.465	2.407	2.379	2.195	2.188	2.158	2.136	2.027	2.009	1.969	1.910	1.784	1.621	1.435
110	-	4.756	3.983	3.495	2.578	2.516	2.487	2.290	2.282	2.250	2.227	2.109	2.090	2.047	1.984	1.848	1.674	1.520
115	-	4.886	4.075	3.571	2.692	2.626	2.595	2.385	2.377	2.343	2.318	2.192	2.171	2.124	2.057	1.911	1.726	1.569
120	-	5.015	4.167	3.623	2.861	2.743	2.703	2.480	2.471	2.435	2.409	2.274	2.252	2.202	2.131	1.975	1.779	1.619
125	-	5.145	4.259	3.676	3.053	2.926	2.867	2.575	2.566	2.527	2.499	2.356	2.333	2.279	2.205	2.038	1.832	1.669
130	-	5.275	4.351	3.728	3.245	3.110	3.046	2.670	2.660	2.620	2.590	2.438	2.413	2.357	2.278	2.102	1.885	1.718
135	-	5.404	4.443	3.780	3.437	3.293	3.224	2.792	2.774	2.712	2.681	2.521	2.494	2.435	2.352	2.165	1.937	1.768
140	-	5.534	4.538	3.832	3.538	3.476	3.403	2.950	2.931	2.857	2.803	2.603	2.575	2.512	2.426	2.229	1.990	1.818
145	-	5.664	4.637	3.885	3.565	3.542	3.532	3.108	3.089	3.012	2.955	2.685	2.656	2.590	2.499	2.293	2.043	1.867
150	-	-	4.735	3.937	3.591	3.566	3.556	3.266	3.246	3.166	3.107	2.797	2.744	2.667	2.573	2.356	2.096	1.917
155	-	-	4.834	3.989	3.617	3.591	3.581	3.425	3.404	3.320	3.259	2.937	2.883	2.759	2.647	2.420	2.148	1.966
160	-	-	4.933	4.042	3.643	3.615	3.605	3.533	3.530	3.474	3.411	3.078	3.022	2.892	2.720	2.483	2.201	2.016
165	-	-	5.031	4.094	3.670	3.640	3.630	3.558	3.555	3.541	3.530	3.219	3.160	3.026	2.843	2.547	2.254	2.066
170	-	-	5.130	4.146	3.696	3.664	3.654	3.583	3.580	3.566	3.555	3.359	3.299	3.159	2.971	2.610	2.307	2.115
175	-	-	5.229	4.199	3.722	3.688	3.679	3.608	3.604	3.591	3.580	3.500	3.438	3.293	3.098	2.674	2.359	2.165
180	-	-	5.327	4.251	3.748	3.713	3.703	3.633	3.629	3.616	3.605	3.545	3.534	3.427	3.226	2.745	2.412	2.215
185	-	-	5.426	4.303	3.775	3.737	3.727	3.658	3.654	3.641	3.630	3.571	3.559	3.531	3.353	2.848	2.465	2.264
190	-	-	5.524	4.356	3.801	3.762	3.752	3.682	3.679	3.666	3.655	3.597	3.585	3.557	3.481	2.950	2.517	2.314
195	-	-	5.623	4.408	3.827	3.786	3.776	3.707	3.704	3.691	3.680	3.622	3.611	3.584	3.542	3.053	2.570	2.363
200	-	-	5.722	4.460	3.853	3.810	3.801	3.732	3.729	3.715	3.705	3.648	3.637	3.610	3.569	3.156	2.623	2.413
205	-	-	-	4.527	3.880	3.835	3.825	3.757	3.754	3.740	3.730	3.674	3.663	3.636	3.596	3.259	2.676	2.463
210	-	-	-	4.617	3.906	3.859	3.850	3.782	3.779	3.765	3.755	3.699	3.688	3.662	3.623	3.361	2.730	2.512
215	-	-	-	4.708	3.932	3.884	3.874	3.807	3.803	3.790	3.780	3.725	3.714	3.689	3.650	3.464	2.804	2.562
220	-	-	-	4.798	3.959	3.908	3.899	3.832	3.828	3.815	3.805	3.751	3.740	3.715	3.678	3.537	2.879	2.612
225	-	-	-	4.889	3.985	3.933	3.923	3.856	3.853	3.840	3.830	3.776	3.766	3.741	3.705	3.567	2.953	2.661
230	-	-	-	4.979	4.011	3.957	3.947	3.881	3.878	3.865	3.855	3.802	3.791	3.767	3.732	3.597	3.028	2.711
235	-	-	-	5.069	4.037	3.981	3.972	3.906	3.903	3.890	3.880	3.828	3.817	3.794	3.759	3.628	3.102	2.766
240	-	-	-	5.160	4.064	4.006	3.996	3.931	3.928	3.915	3.905	3.853	3.843	3.820	3.786	3.658	3.177	2.824
245	-	-	-	5.250	4.090	4.030	4.021	3.956	3.953	3.940	3.930	3.879	3.869	3.846	3.813	3.688	3.251	2.882
250	-	-	-	5.341	4.116	4.055	4.045	3.981	3.978	3.965	3.955	3.905	3.894	3.872	3.840	3.719	3.326	2.940
255	-	-	-	5.431	4.142	4.079	4.070	4.006	4.002	3.990	3.980	3.930	3.920	3.899	3.868	3.749	3.401	2.998
260	-	-	-	5.522	4.169	4.103	4.094	4.030	4.027	4.015	4.005	3.956	3.946	3.925	3.895	3.779	3.475	3.056
265	-	-	-	5.612	4.195	4.128	4.119	4.055	4.052	4.040	4.030	3.982	3.972	3.951	3.922	3.810	3.537	3.114
270	-	-	-	5.703	4.221	4.152	4.143	4.080	4.077	4.065	4.055	4.007	3.997	3.977	3.949	3.840	3.576	3.172
275	-	-	-	-	4.247	4.177	4.167	4.105	4.102	4.090	4.080	4.033	4.023	4.004	3.976	3.870	3.615	3.230
280	-	-	-	-	4.274	4.201	4.192	4.130	4.127	4.115	4.105	4.059	4.049	4.030	4.003	3.901	3.654	3.288
285	-	-	-	-	4.300	4.225	4.216	4.155	4.152	4.140	4.130	4.085	4.075	4.056	4.030	3.931	3.692	3.346
290	-	-	-	-	4.326	4.250	4.241	4.180	4.177	4.165	4.155	4.110	4.101	4.082	4.058	3.961	3.731	3.403
295	-	-	-	-	4.352	4.274	4.265	4.204	4.201	4.189	4.180	4.136	4.126	4.109	4.085	3.992	3.770	3.461
300	-	-	-	-	4.379	4.299	4.290	4.229	4.226	4.214	4.205	4.162	4.152	4.135	4.112	4.022	3.809	3.519
305	-	-	-	-	4.405	4.323	4.314	4.254	4.251	4.239	4.230	4.187	4.178	4.161	4.139	4.052	3.847	3.558
310	-	-	-	-	4.431	4.347	4.338	4.279	4.276	4.264	4.255	4.213	4.204	4.187	4.166	4.083	3.886	3.596
315	-	-	-	-	4.457	4.372	4.363	4.304	4.301	4.289	4.280	4.239	4.229	4.214	4.193	4.113	3.925	3.633
320	-	-	-	-	4.484	4.396	4.387	4.329	4.326	4.314	4.305	4.264	4.255	4.240	4.220	4.143	3.964	3.671
325	-	-	-	-	4.619	4.421	4.412	4.354	4.351	4.339	4.330	4.290	4.281	4.266	4.247	4.174	4.002	3.708
330	-	-	-	-	4.813	4.445	4.436	4.378	4.376	4.364	4.355	4.316	4.307	4.292	4.275	4.204	4.041	3.746
335	-	-	-	-	5.008	4.470	4.461	4.403	4.400	4.389	4.380	4.341	4.332	4.319	4.302	4.234	4.080	3.783
340	-	-	-	-	5.203	4.506	4.485	4.428	4.425	4.414	4.405	4.367	4.358	4.345	4.329	4.265	4.119	3.821
345	-	-	-	-	5.397	4.834	4.719	4.453	4.450	4.439	4.430	4.393	4.384	4.371	4.356	4.295	4.158	3.858
350	-	-	-	-	5.592	5.163	5.052	4.478	4.475	4.464	4.455	4.418	4.410	4.397	4.383	4.325	4.196	3.896
355	-	-	-	-	-	5.492	5.386	4.617	4.581	4.489	4.480	4.444	4.436	4.424	4.410	4.356	4.235	3.933
360	-	-	-	-	-	-	5.719	4.934	4.900	4.760	4.653	4.470	4.461	4.450	4.437	4.386	4.274	3.971
365	-	-	-	-	-	-	-	5.252	5.218	5.081	4.977	4.495	4.487	4.476	4.465	4.416	4.313	4.008
370	-	-	-	-	-	-	-	5.569	5.536	5.402	5.301	4.653	4.544	4.502	4.492	4.447	4.351	4.046
375	-	-	-	-	-	-	-	-	-	5.723	5.625	4.985	4.858	4.720	4.593	4.477	4.390	4.083
380	-	-	-	-	-	-	-	-	-	-	-	5.317	5.171	5.017	4.846	4.507	4.429	4.121
385	-	-	-	-	-	-	-	-	-	-	-	5.650	5.484	5.315	5.100	4.685	4.468	4.158
390	-	-	-	-	-	-	-	-	-	-	-	-	-	5.612	5.353	4.877	4.506	4.196
395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.607	5.068	4.645	4.233
400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.259	4.794	4.270

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 10 I-Section Columns 15 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
55	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
60	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
65	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
70	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
75	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
80	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
85	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
90	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
95	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
100	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
105	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
110	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
115	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
120	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
125	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
130	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
135	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
140	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
145	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
150	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
155	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
160	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
165	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
170	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
175	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
180	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
185	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
190	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
195	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
200	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
205	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
210	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
215	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
220	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
225	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
230	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
235	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
240	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
245	0.487	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
250	0.510	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
255	0.533	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
260	0.556	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
265	0.579	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
270	0.602	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
275	0.625	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
280	0.649	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
285	0.672	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
290	0.695	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
295	0.718	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
300	0.741	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
305	0.764	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
310	0.787	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
315	0.810	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
320	0.833	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
325	0.856	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
330	0.879	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
335	0.902	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
340	0.925	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
345	0.948	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
350	0.971	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
355	0.994	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
360	1.017	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
365	1.040	0.488	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
370	1.063	0.505	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
375	1.086	0.523	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
380	1.109	0.540	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
385	1.132	0.558	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
390	1.155	0.575	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
395	1.178	0.592	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
400	1.201	0.610	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
405	1.224	0.627	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
410	1.247	0.645	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
415	1.270	0.662	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
420	1.293	0.680	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
425	1.316	0.697	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
430	1.339	0.714	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
435	1.362	0.732	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
440	1.385	0.749	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
445	1.408	0.767	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
450	1.431	0.784	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
455	1.454	0.801	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
460	1.477	0.819	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
465	1.500	0.836	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
470	1.523	0.854	0.476	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
475	1.542	0.871	0.489	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472

Thickness is intumescent only. Results also apply to I/H-section beams exposed on all four sides limited to a maximum protection thickness of 5.770mm.

Table 11 I-Section Columns 20 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
55	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
60	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
65	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
70	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
75	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
80	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
85	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
90	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
95	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
100	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
105	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
110	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
115	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
120	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
125	0.477	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
130	0.501	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
135	0.524	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
140	0.548	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
145	0.572	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
150	0.596	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
155	0.619	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
160	0.643	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
165	0.667	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
170	0.690	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
175	0.714	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
180	0.738	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
185	0.761	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
190	0.785	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
195	0.809	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
200	0.833	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
205	0.856	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
210	0.880	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
215	0.904	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
220	0.927	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
225	0.951	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
230	0.975	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
235	0.998	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
240	1.022	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
245	1.046	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
250	1.070	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
255	1.093	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
260	1.117	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
265	1.141	0.480	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
270	1.164	0.504	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
275	1.188	0.528	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
280	1.212	0.552	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
285	1.235	0.576	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
290	1.259	0.600	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
295	1.283	0.623	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
300	1.307	0.647	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
305	1.330	0.671	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
310	1.354	0.695	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
315	1.378	0.719	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
320	1.401	0.743	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
325	1.425	0.766	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
330	1.449	0.790	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
335	1.472	0.814	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
340	1.496	0.838	0.480	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
345	1.520	0.862	0.499	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
350	1.542	0.886	0.518	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
355	1.562	0.909	0.537	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
360	1.581	0.933	0.555	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
365	1.601	0.957	0.574	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
370	1.621	0.981	0.593	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
375	1.640	1.005	0.612	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
380	1.660	1.029	0.631	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
385	1.680	1.052	0.650	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
390	1.700	1.076	0.669	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
395	1.719	1.100	0.688	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
400	1.739	1.124	0.707	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
405	1.759	1.148	0.726	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
410	1.778	1.172	0.745	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
415	1.798	1.195	0.763	0.477	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
420	1.818	1.219	0.782	0.492	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
425	1.837	1.243	0.801	0.508	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
430	1.857	1.267	0.820	0.524	0.473	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
435	1.877	1.291	0.839	0.539	0.488	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
440	1.897	1.315	0.858	0.555	0.503	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
445	1.916	1.338	0.877	0.571	0.518	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
450	1.936	1.362	0.896	0.587	0.533	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
455	1.956	1.386	0.915	0.602	0.548	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
460	1.975	1.410	0.934	0.618	0.564	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
465	1.995	1.434	0.952	0.634	0.579	0.477	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
470	2.015	1.458	0.971	0.649	0.594	0.491	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
475	2.034	1.481	0.990	0.665	0.609	0.505	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472

Thickness is intumescent only. Results also apply to I/H-section beams exposed on all four sides limited to a maximum protection thickness of 5.770mm.

Table 12 I-Section Columns 30 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
55	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
60	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
65	0.500	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
70	0.549	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
75	0.598	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
80	0.647	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
85	0.696	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
90	0.746	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
95	0.795	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
100	0.844	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
105	0.893	0.486	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
110	0.942	0.513	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
115	0.992	0.540	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
120	1.041	0.567	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
125	1.090	0.594	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
130	1.139	0.621	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
135	1.188	0.648	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
140	1.238	0.675	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
145	1.287	0.702	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
150	1.336	0.729	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
155	1.385	0.756	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
160	1.434	0.783	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
165	1.484	0.810	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
170	1.533	0.837	0.493	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
175	1.557	0.864	0.516	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
180	1.581	0.891	0.539	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
185	1.604	0.918	0.562	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
190	1.628	0.945	0.585	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
195	1.651	0.972	0.608	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
200	1.675	0.999	0.630	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
205	1.699	1.026	0.653	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
210	1.722	1.053	0.676	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
215	1.746	1.080	0.699	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
220	1.769	1.107	0.722	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
225	1.793	1.134	0.745	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
230	1.817	1.160	0.768	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
235	1.840	1.187	0.791	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
240	1.864	1.214	0.814	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
245	1.887	1.241	0.837	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
250	1.911	1.268	0.860	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
255	1.935	1.295	0.882	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
260	1.958	1.322	0.905	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
265	1.982	1.349	0.928	0.494	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
270	2.005	1.376	0.951	0.519	0.474	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
275	2.029	1.403	0.974	0.544	0.498	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
280	2.053	1.430	0.997	0.568	0.522	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
285	2.076	1.457	1.020	0.593	0.546	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
290	2.100	1.484	1.043	0.618	0.570	0.483	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
295	2.123	1.511	1.066	0.643	0.594	0.505	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
300	2.147	1.537	1.089	0.668	0.618	0.528	0.490	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
305	2.170	1.561	1.112	0.693	0.643	0.550	0.512	0.492	0.476	0.472	0.472	0.472	0.472	0.472	0.472
310	2.194	1.585	1.135	0.718	0.667	0.572	0.533	0.513	0.497	0.472	0.472	0.472	0.472	0.472	0.472
315	2.218	1.608	1.157	0.743	0.691	0.594	0.555	0.534	0.517	0.477	0.472	0.472	0.472	0.472	0.472
320	2.241	1.632	1.180	0.768	0.715	0.617	0.576	0.555	0.537	0.496	0.472	0.472	0.472	0.472	0.472
325	2.265	1.655	1.203	0.793	0.739	0.639	0.597	0.575	0.558	0.515	0.472	0.472	0.472	0.472	0.472
330	2.288	1.679	1.226	0.818	0.763	0.661	0.619	0.596	0.578	0.534	0.484	0.472	0.472	0.472	0.472
335	2.312	1.702	1.249	0.843	0.787	0.683	0.640	0.617	0.598	0.553	0.501	0.472	0.472	0.472	0.472
340	2.336	1.726	1.272	0.868	0.811	0.706	0.662	0.638	0.619	0.572	0.519	0.472	0.472	0.472	0.472
345	2.359	1.749	1.295	0.893	0.835	0.728	0.683	0.659	0.639	0.592	0.536	0.479	0.472	0.472	0.472
350	2.383	1.773	1.318	0.918	0.859	0.750	0.705	0.680	0.659	0.611	0.554	0.495	0.472	0.472	0.472
355	2.406	1.796	1.341	0.943	0.883	0.772	0.726	0.701	0.680	0.630	0.572	0.510	0.472	0.472	0.472
360	2.430	1.820	1.364	0.968	0.907	0.795	0.748	0.721	0.700	0.649	0.589	0.526	0.472	0.472	0.472
365	2.454	1.843	1.387	0.993	0.931	0.817	0.769	0.742	0.721	0.668	0.607	0.542	0.472	0.472	0.472
370	2.477	1.867	1.410	1.017	0.955	0.839	0.791	0.763	0.741	0.687	0.624	0.558	0.472	0.472	0.472
375	2.501	1.890	1.432	1.042	0.979	0.861	0.812	0.784	0.761	0.706	0.642	0.574	0.472	0.472	0.472
380	2.524	1.914	1.455	1.067	1.003	0.884	0.834	0.805	0.782	0.725	0.659	0.590	0.472	0.472	0.472
385	2.548	1.937	1.478	1.092	1.027	0.906	0.855	0.826	0.802	0.745	0.677	0.606	0.472	0.472	0.472
390	2.572	1.961	1.501	1.117	1.051	0.928	0.876	0.847	0.822	0.764	0.695	0.622	0.472	0.472	0.472
395	2.595	1.984	1.524	1.142	1.075	0.950	0.898	0.867	0.843	0.783	0.712	0.638	0.481	0.472	0.472
400	2.619	2.008	1.547	1.167	1.099	0.973	0.919	0.888	0.863	0.802	0.730	0.654	0.493	0.472	0.472
405	2.642	2.031	1.570	1.192	1.123	0.995	0.941	0.909	0.883	0.821	0.747	0.669	0.505	0.472	0.472
410	2.666	2.055	1.594	1.217	1.147	1.017	0.962	0.930	0.904	0.840	0.765	0.685	0.517	0.472	0.472
415	2.690	2.078	1.617	1.242	1.171	1.039	0.984	0.951	0.924	0.859	0.783	0.701	0.530	0.472	0.472
420	2.713	2.102	1.640	1.267	1.195	1.062	1.005	0.972	0.944	0.878	0.800	0.717	0.542	0.472	0.472
425	2.737	2.125	1.663	1.292	1.219	1.084	1.027	0.992	0.965	0.897	0.818	0.733	0.554	0.472	0.472
430	2.760	2.149	1.687	1.317	1.244	1.106	1.048	1.013	0.985	0.917	0.835	0.749	0.566	0.472	0.472
435	2.784	2.173	1.710	1.342	1.268	1.128	1.070	1.034	1.006	0.936	0.853	0.765	0.579	0.472	0.472
440	2.811	2.196	1.733	1.367	1.292	1.151	1.091	1.055	1.026	0.955	0.870	0.781	0.591	0.472	0.472
445	2.846	2.220	1.756	1.392	1.316	1.173	1.112	1.076	1.046	0.974	0.888	0.797	0.603	0.472	0.472
450	2.882	2.243	1.780	1.417	1.340	1.195	1.134	1.097	1.067	0.993	0.906	0.812	0.615	0.472	0.472
455	2.917	2.267	1.803	1.442	1.364	1.217	1.155	1.118	1.087	1.012	0.923	0.828	0.628	0.472	0.472
460	2.952	2.290	1.826	1.466	1.388	1.240	1.177	1.138	1.107	1.031	0.941	0.844	0.640	0.472	0.472
465	2.988	2.314	1.850	1.491	1.412	1.262	1.198	1.159	1.128	1.050	0.958	0.860	0.652	0.472	0.472
470	3.023	2.337	1.873	1.516	1.436	1.284	1.220	1.180	1.148	1.070	0.976	0.876	0.664	0.482	0.472
475	3.058	2.361	1.896	1.540	1.460	1.306	1.241	1.201	1.168	1.089	0.993	0.892	0.677	0.491	0.472

Thickness is intumescent only. Results also apply to I/H-section beams exposed on all four sides limited to a maximum protection thickness of 5.770mm.

Table 13 I-Section Columns 45 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	0.755	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
55	0.838	0.514	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
60	0.928	0.576	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
65	1.017	0.637	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
70	1.107	0.698	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
75	1.196	0.760	0.483	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
80	1.286	0.821	0.525	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
85	1.376	0.883	0.568	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
90	1.465	0.944	0.611	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
95	1.544	1.005	0.654	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
100	1.589	1.067	0.697	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
105	1.633	1.128	0.739	0.493	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
110	1.678	1.189	0.782	0.523	0.483	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
115	1.722	1.251	0.825	0.554	0.511	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
120	1.767	1.312	0.868	0.585	0.540	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
125	1.811	1.373	0.910	0.615	0.568	0.488	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
130	1.856	1.435	0.953	0.646	0.596	0.512	0.480	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
135	1.901	1.496	0.996	0.676	0.625	0.537	0.505	0.486	0.472	0.472	0.472	0.472	0.472	0.472	0.472
140	1.945	1.544	1.039	0.707	0.653	0.562	0.529	0.511	0.495	0.472	0.472	0.472	0.472	0.472	0.472
145	1.990	1.571	1.082	0.737	0.681	0.587	0.554	0.535	0.519	0.480	0.472	0.472	0.472	0.472	0.472
150	2.034	1.598	1.124	0.768	0.709	0.612	0.578	0.559	0.543	0.503	0.472	0.472	0.472	0.472	0.472
155	2.079	1.625	1.167	0.799	0.738	0.637	0.603	0.583	0.567	0.526	0.475	0.472	0.472	0.472	0.472
160	2.123	1.652	1.210	0.829	0.766	0.662	0.627	0.607	0.591	0.549	0.497	0.472	0.472	0.472	0.472
165	2.168	1.679	1.253	0.860	0.794	0.687	0.652	0.631	0.615	0.572	0.519	0.472	0.472	0.472	0.472
170	2.212	1.706	1.296	0.890	0.823	0.711	0.676	0.656	0.639	0.596	0.542	0.480	0.472	0.472	0.472
175	2.257	1.733	1.338	0.921	0.851	0.736	0.701	0.680	0.663	0.619	0.564	0.502	0.472	0.472	0.472
180	2.301	1.760	1.381	0.951	0.879	0.761	0.725	0.704	0.687	0.642	0.586	0.523	0.472	0.472	0.472
185	2.346	1.787	1.424	0.982	0.908	0.786	0.750	0.728	0.710	0.665	0.609	0.544	0.472	0.472	0.472
190	2.390	1.814	1.467	1.013	0.936	0.811	0.774	0.752	0.734	0.689	0.631	0.566	0.472	0.472	0.472
195	2.435	1.841	1.510	1.043	0.964	0.836	0.799	0.776	0.758	0.712	0.653	0.587	0.472	0.472	0.472
200	2.480	1.868	1.545	1.074	0.993	0.861	0.823	0.801	0.782	0.735	0.675	0.608	0.472	0.472	0.472
205	2.524	1.895	1.572	1.104	1.021	0.886	0.848	0.825	0.806	0.758	0.698	0.629	0.472	0.472	0.472
210	2.569	1.922	1.599	1.135	1.049	0.910	0.872	0.849	0.830	0.781	0.720	0.651	0.488	0.472	0.472
215	2.613	1.949	1.625	1.166	1.077	0.935	0.897	0.873	0.854	0.805	0.742	0.672	0.506	0.472	0.472
220	2.658	1.976	1.652	1.196	1.106	0.960	0.921	0.897	0.878	0.828	0.765	0.693	0.525	0.472	0.472
225	2.702	2.003	1.679	1.227	1.134	0.985	0.946	0.921	0.902	0.851	0.787	0.715	0.544	0.472	0.472
230	2.747	2.030	1.705	1.257	1.162	1.010	0.970	0.946	0.926	0.874	0.809	0.736	0.563	0.472	0.472
235	2.791	2.057	1.732	1.288	1.191	1.035	0.995	0.970	0.949	0.897	0.832	0.757	0.582	0.472	0.472
240	2.833	2.084	1.759	1.318	1.219	1.060	1.019	0.994	0.973	0.921	0.854	0.778	0.600	0.472	0.472
245	2.874	2.111	1.785	1.349	1.247	1.085	1.044	1.018	0.997	0.944	0.876	0.800	0.619	0.472	0.472
250	2.915	2.138	1.812	1.380	1.276	1.109	1.068	1.042	1.021	0.967	0.899	0.821	0.638	0.472	0.472
255	2.955	2.165	1.839	1.410	1.304	1.134	1.093	1.066	1.045	0.990	0.921	0.842	0.657	0.476	0.472
260	2.996	2.192	1.865	1.441	1.332	1.159	1.117	1.091	1.069	1.014	0.943	0.864	0.676	0.492	0.472
265	3.037	2.219	1.892	1.471	1.360	1.184	1.142	1.115	1.093	1.037	0.966	0.885	0.694	0.509	0.472
270	3.078	2.246	1.919	1.502	1.389	1.209	1.166	1.139	1.117	1.060	0.988	0.906	0.713	0.526	0.472
275	3.119	2.273	1.945	1.532	1.417	1.234	1.191	1.163	1.141	1.083	1.010	0.927	0.732	0.542	0.472
280	3.160	2.300	1.972	1.561	1.445	1.259	1.215	1.187	1.165	1.106	1.033	0.949	0.751	0.559	0.472
285	3.201	2.327	1.998	1.590	1.474	1.283	1.240	1.211	1.188	1.130	1.055	0.970	0.770	0.576	0.472
290	3.241	2.354	2.025	1.618	1.502	1.308	1.264	1.236	1.212	1.153	1.077	0.991	0.788	0.592	0.472
295	3.282	2.381	2.052	1.647	1.530	1.333	1.289	1.260	1.236	1.176	1.100	1.013	0.807	0.609	0.472
300	3.323	2.408	2.078	1.676	1.560	1.358	1.313	1.284	1.260	1.199	1.122	1.034	0.826	0.626	0.484
305	3.364	2.435	2.105	1.704	1.589	1.383	1.338	1.308	1.284	1.223	1.144	1.055	0.845	0.642	0.498
310	3.405	2.462	2.132	1.733	1.619	1.408	1.362	1.332	1.308	1.246	1.167	1.077	0.864	0.659	0.511
315	3.446	2.489	2.158	1.762	1.649	1.433	1.386	1.357	1.332	1.269	1.189	1.098	0.882	0.675	0.525
320	3.486	2.516	2.185	1.790	1.678	1.458	1.411	1.381	1.356	1.292	1.211	1.119	0.901	0.692	0.539
325	3.527	2.543	2.212	1.819	1.708	1.482	1.435	1.405	1.380	1.315	1.234	1.140	0.920	0.709	0.552
330	3.568	2.570	2.238	1.848	1.738	1.507	1.460	1.429	1.403	1.339	1.256	1.162	0.939	0.725	0.566
335	3.609	2.597	2.265	1.876	1.767	1.532	1.484	1.453	1.427	1.362	1.278	1.183	0.958	0.742	0.579
340	3.650	2.624	2.292	1.905	1.797	1.563	1.509	1.477	1.451	1.385	1.301	1.204	0.976	0.759	0.593
345	3.691	2.651	2.318	1.934	1.827	1.595	1.533	1.502	1.475	1.408	1.323	1.226	0.995	0.775	0.606
350	3.732	2.678	2.345	1.962	1.856	1.626	1.564	1.526	1.499	1.431	1.345	1.247	1.014	0.792	0.620
355	3.772	2.705	2.372	1.991	1.886	1.658	1.596	1.554	1.523	1.455	1.368	1.268	1.033	0.809	0.634
360	3.813	2.732	2.398	2.020	1.916	1.689	1.627	1.585	1.550	1.478	1.390	1.289	1.052	0.825	0.647
365	3.854	2.759	2.425	2.048	1.945	1.721	1.658	1.616	1.581	1.501	1.412	1.311	1.070	0.842	0.661
370	3.895	2.786	2.452	2.077	1.975	1.753	1.689	1.647	1.612	1.524	1.435	1.332	1.089	0.859	0.674
375	3.936	2.828	2.478	2.106	2.005	1.784	1.720	1.677	1.642	1.551	1.457	1.353	1.108	0.875	0.688
380	3.977	2.889	2.505	2.134	2.034	1.816	1.751	1.708	1.673	1.581	1.479	1.375	1.127	0.892	0.701
385	4.017	2.949	2.531	2.163	2.064	1.847	1.782	1.739	1.703	1.611	1.502	1.396	1.146	0.908	0.715
390	4.058	3.010	2.558	2.192	2.094	1.879	1.813	1.770	1.734	1.641	1.524	1.417	1.164	0.925	0.728
395	4.099	3.070	2.585	2.220	2.123	1.910	1.844	1.801	1.764	1.671	1.550	1.438	1.183	0.942	0.742
400	4.140	3.131	2.611	2.249	2.153	1.942	1.875	1.832	1.795	1.701	1.579	1.460	1.202	0.958	0.756
405	4.181	3.191	2.638	2.278	2.183	1.973	1.907	1.862	1.826	1.731	1.608	1.481	1.221	0.975	0.769
410	4.222	3.252	2.665	2.306	2.212	2.005	1.938	1.893	1.856	1.761	1.637	1.502	1.240	0.992	0.783
415	4.263	3.312	2.691	2.335	2.242	2.036	1.969	1.924	1.887	1.791	1.666	1.524	1.258	1.008	0.796
420	4.303	3.373	2.718	2.364	2.272	2.068	2.000	1.955	1.917	1.821	1.695	1.548	1.277	1.025	0.810
425	4.344	3.433	2.745	2.392	2.301	2.099	2.031	1.986	1.948	1.850	1.724	1.576	1.296	1.042	0.823
430	4.385	3.494	2.771	2.421	2.331	2.131	2.062	2.016	1.978	1.880	1.753	1.604	1.315	1.058	0.837
435	4.426	3.554	2.798	2.450	2.361	2.163	2.093	2.047	2.009	1.910	1.782	1.632	1.334	1.075	0.851
440	4.467	3.615	2.868	2.478	2.390	2.194	2.124	2.078	2.039	1.940	1.811	1.660	1.352	1.091	0.864
445	4.508	3.675	2.944	2.507	2.420	2.226	2.155	2.109	2.070	1.970	1.840	1.688	1.371	1.108	0.878
450	4.548	3.736	3.020	2.536	2.450	2.257	2.187	2.140	2.101	2.000	1.869	1.715	1.390	1.125	0.891
455	4.589	3.796	3.095	2.564	2.479	2.289	2.218	2.171	2.131	2.030	1.898	1.743	1.409	1.141	0.905
460	4.698	3.857	3.171	2.593	2.509	2.320	2.249	2.201	2.162	2.060	1.927	1.771	1.428	1.158	0.918
465	4.877	3.917	3.247	2.622	2.539	2.352	2.280	2.232	2.192	2.090	1.956	1.799	1.446	1.175	0.932
470	5.056	3.978	3.322	2.650	2.568	2.383	2.311	2.263	2.223	2.119	1.985	1.827	1.465	1.191	0.946
475	5.235	4.038	3.398	2.679	2.598	2.415	2.342	2.294	2.253	2.149	2.014	1.855	1.484	1.208	0.959

Thickness is intumescent only. Results also apply to I/H-section beams exposed on all four sides limited to a maximum protection thickness of 5.770mm.

Table 14 I-Section Columns 60 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	1.152	0.790	0.537	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
55	1.280	0.878	0.596	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
60	1.410	0.972	0.668	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
65	1.538	1.067	0.740	0.505	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
70	1.635	1.161	0.812	0.562	0.522	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
75	1.733	1.255	0.884	0.620	0.577	0.498	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
80	1.830	1.350	0.956	0.677	0.632	0.547	0.513	0.494	0.480	0.472	0.472	0.472	0.472	0.472	0.472
85	1.927	1.444	1.028	0.735	0.686	0.597	0.560	0.540	0.524	0.485	0.472	0.472	0.472	0.472	0.472
90	2.025	1.537	1.100	0.792	0.741	0.646	0.607	0.585	0.568	0.526	0.478	0.472	0.472	0.472	0.472
95	2.122	1.590	1.173	0.850	0.796	0.695	0.654	0.630	0.612	0.566	0.514	0.472	0.472	0.472	0.472
100	2.219	1.643	1.245	0.907	0.850	0.745	0.701	0.676	0.656	0.607	0.551	0.497	0.472	0.472	0.472
105	2.317	1.697	1.317	0.965	0.905	0.794	0.748	0.721	0.700	0.647	0.587	0.528	0.472	0.472	0.472
110	2.414	1.750	1.389	1.022	0.960	0.844	0.796	0.767	0.744	0.688	0.623	0.559	0.472	0.472	0.472
115	2.511	1.804	1.461	1.080	1.014	0.893	0.843	0.812	0.788	0.728	0.659	0.590	0.475	0.472	0.472
120	2.609	1.857	1.533	1.137	1.069	0.942	0.890	0.857	0.832	0.769	0.695	0.621	0.498	0.472	0.472
125	2.706	1.910	1.566	1.194	1.124	0.992	0.937	0.903	0.876	0.810	0.732	0.653	0.521	0.472	0.472
130	2.802	1.964	1.599	1.252	1.179	1.041	0.984	0.948	0.920	0.850	0.768	0.684	0.544	0.472	0.472
135	2.860	2.017	1.631	1.309	1.233	1.090	1.031	0.993	0.964	0.891	0.804	0.715	0.567	0.473	0.472
140	2.917	2.071	1.664	1.367	1.288	1.140	1.078	1.039	1.008	0.931	0.840	0.746	0.590	0.494	0.472
145	2.974	2.124	1.697	1.424	1.343	1.189	1.125	1.084	1.052	0.972	0.876	0.778	0.612	0.514	0.472
150	3.031	2.177	1.729	1.482	1.397	1.239	1.172	1.130	1.096	1.012	0.913	0.809	0.635	0.534	0.472
155	3.089	2.231	1.762	1.537	1.452	1.288	1.219	1.175	1.140	1.053	0.949	0.840	0.658	0.555	0.472
160	3.146	2.284	1.795	1.567	1.507	1.337	1.266	1.220	1.184	1.094	0.985	0.871	0.681	0.575	0.472
165	3.203	2.338	1.827	1.597	1.549	1.387	1.313	1.266	1.228	1.134	1.021	0.902	0.704	0.596	0.479
170	3.260	2.391	1.860	1.627	1.579	1.436	1.360	1.311	1.272	1.175	1.057	0.934	0.727	0.616	0.497
175	3.318	2.444	1.892	1.657	1.609	1.485	1.407	1.357	1.316	1.215	1.094	0.965	0.749	0.636	0.515
180	3.375	2.498	1.925	1.687	1.639	1.535	1.454	1.402	1.360	1.256	1.130	0.996	0.772	0.657	0.534
185	3.432	2.551	1.958	1.717	1.668	1.564	1.501	1.447	1.404	1.296	1.166	1.027	0.795	0.677	0.552
190	3.489	2.605	1.990	1.747	1.698	1.594	1.543	1.493	1.448	1.337	1.202	1.058	0.818	0.697	0.571
195	3.547	2.658	2.023	1.777	1.728	1.623	1.573	1.537	1.492	1.378	1.238	1.090	0.841	0.718	0.589
200	3.604	2.711	2.056	1.807	1.758	1.653	1.602	1.566	1.535	1.418	1.275	1.121	0.864	0.738	0.607
205	3.661	2.765	2.088	1.837	1.788	1.683	1.632	1.596	1.565	1.459	1.311	1.152	0.886	0.758	0.626
210	3.718	2.818	2.121	1.867	1.818	1.712	1.662	1.626	1.595	1.499	1.347	1.183	0.909	0.779	0.644
215	3.776	2.870	2.154	1.897	1.847	1.742	1.691	1.655	1.624	1.538	1.383	1.214	0.932	0.799	0.663
220	3.833	2.922	2.186	1.927	1.877	1.772	1.721	1.685	1.654	1.568	1.419	1.246	0.955	0.819	0.681
225	3.890	2.974	2.219	1.957	1.907	1.801	1.751	1.715	1.684	1.598	1.456	1.277	0.978	0.840	0.700
230	3.947	3.025	2.251	1.987	1.937	1.831	1.780	1.744	1.714	1.628	1.492	1.308	1.001	0.860	0.718
235	4.005	3.077	2.284	2.017	1.967	1.861	1.810	1.774	1.743	1.658	1.528	1.339	1.024	0.881	0.736
240	4.062	3.129	2.317	2.047	1.997	1.890	1.839	1.804	1.773	1.688	1.559	1.371	1.046	0.901	0.755
245	4.119	3.181	2.349	2.076	2.026	1.920	1.869	1.834	1.803	1.718	1.590	1.402	1.069	0.921	0.773
250	4.176	3.233	2.382	2.106	2.056	1.950	1.899	1.863	1.833	1.748	1.620	1.433	1.092	0.942	0.792
255	4.234	3.285	2.415	2.136	2.086	1.979	1.928	1.893	1.862	1.778	1.651	1.464	1.115	0.962	0.810
260	4.291	3.337	2.447	2.166	2.116	2.009	1.958	1.923	1.892	1.808	1.681	1.495	1.138	0.982	0.828
265	4.348	3.389	2.480	2.196	2.146	2.039	1.988	1.952	1.922	1.838	1.712	1.527	1.161	1.003	0.847
270	4.405	3.441	2.512	2.226	2.175	2.068	2.017	1.982	1.951	1.867	1.742	1.558	1.183	1.023	0.865
275	4.463	3.493	2.545	2.256	2.205	2.098	2.047	2.012	1.981	1.897	1.773	1.590	1.206	1.043	0.884
280	4.520	3.545	2.578	2.286	2.235	2.128	2.077	2.041	2.011	1.927	1.803	1.621	1.229	1.064	0.902
285	4.577	3.597	2.610	2.316	2.265	2.157	2.106	2.071	2.041	1.957	1.834	1.653	1.252	1.084	0.920
290	4.631	3.649	2.643	2.346	2.295	2.187	2.136	2.101	2.070	1.987	1.864	1.685	1.275	1.104	0.939
295	4.681	3.701	2.676	2.376	2.325	2.217	2.166	2.130	2.100	2.017	1.894	1.717	1.298	1.125	0.957
300	4.731	3.753	2.708	2.406	2.354	2.246	2.195	2.160	2.130	2.047	1.925	1.748	1.320	1.145	0.976
305	4.780	3.805	2.741	2.436	2.384	2.276	2.225	2.190	2.160	2.077	1.955	1.780	1.343	1.165	0.994
310	4.830	3.857	2.774	2.466	2.414	2.306	2.255	2.219	2.189	2.107	1.986	1.812	1.366	1.186	1.013
315	4.880	3.909	2.816	2.496	2.444	2.335	2.284	2.249	2.219	2.137	2.016	1.843	1.389	1.206	1.031
320	4.929	3.961	2.907	2.526	2.474	2.365	2.314	2.279	2.249	2.167	2.047	1.875	1.412	1.227	1.049
325	4.979	4.013	2.999	2.556	2.504	2.395	2.344	2.309	2.278	2.197	2.077	1.907	1.435	1.247	1.068
330	5.029	4.065	3.090	2.586	2.533	2.424	2.373	2.338	2.308	2.227	2.108	1.938	1.457	1.267	1.086
335	5.078	4.117	3.182	2.616	2.563	2.454	2.403	2.368	2.338	2.256	2.138	1.970	1.480	1.288	1.105
340	5.128	4.169	3.273	2.646	2.593	2.484	2.433	2.398	2.368	2.286	2.169	2.002	1.503	1.308	1.123
345	5.178	4.221	3.365	2.676	2.623	2.513	2.462	2.427	2.397	2.316	2.199	2.033	1.526	1.328	1.141
350	5.227	4.272	3.457	2.706	2.653	2.543	2.492	2.457	2.427	2.346	2.229	2.065	1.602	1.349	1.160
355	5.277	4.324	3.548	2.736	2.683	2.573	2.521	2.487	2.457	2.376	2.260	2.097	1.707	1.369	1.178
360	5.327	4.376	3.640	2.766	2.712	2.602	2.551	2.516	2.487	2.406	2.290	2.128	1.812	1.389	1.197
365	5.377	4.428	3.731	2.796	2.742	2.632	2.581	2.546	2.516	2.436	2.321	2.160	1.917	1.410	1.215
370	5.426	4.480	3.823	2.920	2.772	2.662	2.610	2.576	2.546	2.466	2.351	2.192	2.022	1.430	1.234
375	5.476	4.532	3.914	3.062	2.806	2.691	2.640	2.605	2.576	2.496	2.382	2.224	2.128	1.450	1.252
380	5.527	4.584	4.006	3.204	2.962	2.721	2.670	2.635	2.605	2.526	2.412	2.255	2.233	1.471	1.270
385	5.578	4.667	4.098	3.346	3.118	2.751	2.699	2.665	2.635	2.556	2.443	2.338	2.338	1.491	1.289
390	5.628	4.779	4.189	3.488	3.273	2.780	2.729	2.694	2.665	2.586	2.473	2.443	2.443	1.512	1.307
395	5.679	4.891	4.281	3.630	3.429	2.859	2.759	2.724	2.695	2.616	2.548	2.548	2.548	1.532	1.326
400	5.730	5.004	4.372	3.772	3.585	3.054	2.788	2.754	2.724	2.653	2.653	2.653	2.653	1.639	1.344
405	5.781	5.116	4.464	3.913	3.741	3.249	2.927	2.784	2.758	2.758	2.758	2.758	2.758	1.756	1.362
410	5.832	5.229	4.555	4.055	3.897	3.444	3.147	2.900	2.863	2.863	2.863	2.863	2.863	1.873	1.381
415	5.883	5.341	4.649	4.197	4.052	3.639	3.368	3.141	2.968	2.968	2.968	2.968	2.968	1.990	1.399
420	5.934	5.453	4.745	4.339	4.208	3.834	3.588	3.382	3.174	3.073	3.073	3.073	3.073	2.107	1.418
425	5.985	5.514	4.841	4.481	4.364	4.029	3.808	3.623	3.436	3.178	3.178	3.178	3.178	2.224	1.436
430	6.035	5.558	4.938	4.616	4.520	4.225	4.028	3.864	3.698	3.283	3.283	3.283	3.283	2.342	1.454
435	6.086	5.603	5.034	4.687	4.638	4.420	4.248	4.105	3.960	3.416	3.388	3.388	3.388	2.459	1.473
440	6.137	5.647	5.130	4.757	4.705	4.611	4.468	4.346	4.222	3.758	3.493	3.493	3.493	2.576	1.491
445	6.188	5.691	5.227	4.828	4.772	4.672	4.631	4.587	4.484	4.099	3.598	3.598	3.598	2.693	1.510
450	6.239	5.735	5.323	4.898	4.839	4.732	4.689	4.661	4.639	4.441	3.703	3.703	3.703	2.810	1.528
455	6.290	5.779	5.419	4.969	4.905	4.793	4.747	4.718	4.694	4.636	4.121	3.808	3.808	2.927	1.619
460	6.341	5.823	5.496	5.039	4.972	4.853	4.805	4.774	4.749	4.688	4.618	3.913	3.913	3.044	1.743
465	6.391	5.867	5.538	5.110	5.039	4.914	4.863	4.831	4.804	4.740	4.666	4.018	4.018	3.162	1.867
470	6.442	5.912	5.579	5.180	5.106	4.974	4.921	4.887	4.860	4.792	4.715	4.124	4.124	3.279	1.991
475	6.493	5.956	5.621	5.251	5.173	5.034	4.979	4.943	4.915	4.844	4.763	4.229	4.229	3.396	2.115

Thickness is intumescent only. Results also apply to I/H-section beams exposed on all four sides limited to a maximum protection thickness of 5.770mm.

Table 15 I-Section Columns 75 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	1.602	1.117	0.817	0.595	0.556	0.481	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
55	1.754	1.241	0.908	0.660	0.617	0.534	0.499	0.478	0.472	0.472	0.472	0.472	0.472	0.472	0.472
60	1.905	1.369	1.008	0.744	0.697	0.609	0.571	0.549	0.531	0.490	0.472	0.472	0.472	0.472	0.472
65	2.057	1.496	1.108	0.827	0.778	0.684	0.644	0.620	0.601	0.556	0.505	0.472	0.472	0.472	0.472
70	2.208	1.605	1.209	0.910	0.858	0.759	0.716	0.691	0.670	0.622	0.566	0.508	0.472	0.472	0.472
75	2.360	1.706	1.309	0.994	0.939	0.834	0.789	0.761	0.740	0.688	0.627	0.564	0.472	0.472	0.472
80	2.511	1.807	1.410	1.077	1.019	0.909	0.862	0.832	0.809	0.753	0.687	0.619	0.488	0.472	0.472
85	2.663	1.907	1.510	1.160	1.099	0.983	0.934	0.903	0.879	0.819	0.748	0.674	0.530	0.472	0.472
90	2.810	2.008	1.588	1.244	1.180	1.058	1.007	0.974	0.948	0.885	0.809	0.730	0.572	0.472	0.472
95	2.909	2.109	1.659	1.327	1.260	1.133	1.080	1.045	1.018	0.951	0.870	0.785	0.614	0.496	0.472
100	3.009	2.210	1.730	1.410	1.341	1.208	1.152	1.116	1.087	1.016	0.931	0.840	0.656	0.526	0.472
105	3.108	2.310	1.800	1.494	1.421	1.283	1.225	1.187	1.157	1.082	0.992	0.895	0.698	0.557	0.472
110	3.208	2.411	1.871	1.560	1.502	1.358	1.297	1.258	1.226	1.148	1.053	0.951	0.740	0.588	0.479
115	3.307	2.512	1.942	1.610	1.562	1.433	1.370	1.329	1.296	1.214	1.114	1.006	0.782	0.619	0.502
120	3.407	2.613	2.013	1.660	1.608	1.508	1.443	1.400	1.365	1.280	1.174	1.061	0.824	0.650	0.526
125	3.506	2.713	2.084	1.710	1.654	1.560	1.515	1.471	1.435	1.345	1.235	1.116	0.866	0.680	0.549
130	3.606	2.810	2.155	1.759	1.701	1.599	1.561	1.538	1.504	1.411	1.296	1.172	0.908	0.711	0.572
135	3.706	2.880	2.226	1.809	1.747	1.639	1.598	1.573	1.553	1.477	1.357	1.227	0.950	0.742	0.596
140	3.805	2.951	2.297	1.859	1.793	1.679	1.634	1.607	1.586	1.538	1.418	1.282	0.992	0.773	0.619
145	3.905	3.021	2.367	1.909	1.840	1.718	1.671	1.642	1.620	1.571	1.479	1.338	1.034	0.803	0.642
150	4.004	3.092	2.438	1.959	1.886	1.758	1.708	1.677	1.653	1.603	1.537	1.393	1.076	0.834	0.665
155	4.104	3.162	2.509	2.009	1.932	1.797	1.744	1.712	1.686	1.635	1.569	1.448	1.118	0.865	0.689
160	4.203	3.232	2.580	2.059	1.979	1.837	1.781	1.747	1.719	1.668	1.601	1.503	1.160	0.896	0.712
165	4.303	3.303	2.651	2.109	2.025	1.876	1.818	1.781	1.753	1.700	1.633	1.548	1.202	0.926	0.735
170	4.403	3.373	2.722	2.159	2.071	1.916	1.854	1.816	1.786	1.732	1.664	1.579	1.244	0.957	0.759
175	4.502	3.443	2.793	2.209	2.118	1.955	1.891	1.851	1.819	1.765	1.696	1.611	1.286	0.988	0.782
180	4.602	3.514	2.851	2.259	2.164	1.995	1.928	1.886	1.853	1.797	1.728	1.642	1.328	1.019	0.805
185	4.648	3.584	2.908	2.309	2.210	2.034	1.964	1.921	1.886	1.829	1.760	1.673	1.370	1.049	0.829
190	4.689	3.654	2.965	2.359	2.257	2.074	2.001	1.955	1.919	1.862	1.792	1.705	1.412	1.080	0.852
195	4.730	3.725	3.021	2.409	2.303	2.114	2.037	1.990	1.953	1.894	1.823	1.736	1.454	1.111	0.875
200	4.771	3.795	3.078	2.459	2.350	2.153	2.074	2.025	1.986	1.926	1.855	1.767	1.496	1.142	0.898
205	4.812	3.865	3.135	2.509	2.396	2.193	2.111	2.060	2.019	1.959	1.887	1.799	1.540	1.172	0.922
210	4.853	3.936	3.192	2.559	2.442	2.232	2.147	2.095	2.052	1.991	1.919	1.830	1.616	1.203	0.945
215	4.895	4.006	3.248	2.609	2.489	2.272	2.184	2.129	2.086	2.023	1.951	1.861	1.692	1.234	0.968
220	4.936	4.076	3.305	2.658	2.535	2.311	2.221	2.164	2.119	2.056	1.983	1.893	1.769	1.265	0.992
225	4.977	4.147	3.362	2.708	2.581	2.351	2.257	2.199	2.152	2.088	2.014	1.924	1.845	1.295	1.015
230	5.018	4.217	3.418	2.758	2.628	2.390	2.294	2.234	2.186	2.120	2.046	1.955	1.921	1.326	1.038
235	5.059	4.287	3.475	2.812	2.674	2.430	2.331	2.269	2.219	2.153	2.078	1.997	1.997	1.357	1.062
240	5.100	4.358	3.532	2.884	2.720	2.469	2.367	2.303	2.252	2.185	2.110	2.073	2.073	1.388	1.085
245	5.141	4.428	3.589	2.956	2.767	2.509	2.404	2.338	2.285	2.217	2.149	2.149	2.149	1.418	1.108
250	5.182	4.498	3.645	3.028	2.821	2.549	2.440	2.373	2.319	2.250	2.225	2.225	2.225	1.449	1.131
255	5.224	4.569	3.702	3.100	2.900	2.588	2.477	2.408	2.352	2.301	2.301	2.301	2.301	1.480	1.155
260	5.265	4.628	3.759	3.171	2.978	2.628	2.514	2.443	2.385	2.377	2.377	2.377	2.377	1.511	1.178
265	5.306	4.671	3.816	3.243	3.057	2.667	2.550	2.477	2.453	2.453	2.453	2.453	2.453	1.558	1.201
270	5.347	4.715	3.872	3.315	3.135	2.707	2.587	2.529	2.529	2.529	2.529	2.529	2.529	1.658	1.225
275	5.388	4.758	3.929	3.387	3.213	2.746	2.624	2.605	2.605	2.605	2.605	2.605	2.605	1.758	1.248
280	5.429	4.801	3.986	3.459	3.292	2.786	2.681	2.681	2.681	2.681	2.681	2.681	2.681	1.858	1.271
285	5.470	4.845	4.043	3.531	3.370	2.863	2.757	2.757	2.757	2.757	2.757	2.757	2.757	1.958	1.295
290	5.525	4.888	4.099	3.603	3.449	2.964	2.833	2.833	2.833	2.833	2.833	2.833	2.833	2.057	1.318
295	5.583	4.931	4.156	3.675	3.527	3.064	2.909	2.909	2.909	2.909	2.909	2.909	2.909	2.157	1.341
300	5.642	4.974	4.213	3.747	3.605	3.165	2.986	2.986	2.986	2.986	2.986	2.986	2.986	2.257	1.364
305	5.701	5.018	4.270	3.819	3.684	3.266	3.062	3.062	3.062	3.062	3.062	3.062	3.062	2.357	1.388
310	5.760	5.061	4.326	3.891	3.762	3.366	3.138	3.138	3.138	3.138	3.138	3.138	3.138	2.456	1.411
315	5.818	5.104	4.383	3.963	3.841	3.467	3.214	3.214	3.214	3.214	3.214	3.214	3.214	2.556	1.434
320	5.877	5.148	4.440	4.035	3.919	3.568	3.297	3.290	3.290	3.290	3.290	3.290	3.290	2.656	1.458
325	5.936	5.191	4.497	4.107	3.997	3.668	3.416	3.366	3.366	3.366	3.366	3.366	3.366	2.756	1.481
330	5.995	5.234	4.553	4.179	4.076	3.769	3.535	3.442	3.442	3.442	3.442	3.442	3.442	2.855	1.504
335	6.054	5.278	4.610	4.251	4.154	3.870	3.655	3.518	3.518	3.518	3.518	3.518	3.518	2.955	1.528
340	6.112	5.321	4.697	4.323	4.233	3.970	3.774	3.594	3.594	3.594	3.594	3.594	3.594	3.055	1.654
345	6.171	5.364	4.783	4.395	4.311	4.071	3.893	3.724	3.670	3.670	3.670	3.670	3.670	3.155	1.821
350	6.230	5.408	4.870	4.467	4.390	4.172	4.013	3.862	3.746	3.746	3.746	3.746	3.746	3.255	1.987
355	6.289	5.451	4.957	4.539	4.468	4.272	4.132	4.000	3.845	3.822	3.822	3.822	3.822	3.354	2.154
360	6.347	5.501	5.043	4.612	4.546	4.373	4.251	4.138	4.006	3.898	3.898	3.898	3.898	3.454	2.321
365	6.406	5.564	5.130	4.712	4.629	4.474	4.370	4.275	4.166	3.974	3.974	3.974	3.974	3.554	2.487
370	6.465	5.628	5.217	4.812	4.732	4.574	4.490	4.413	4.326	4.113	4.050	4.050	4.050	3.654	2.654
375	6.524	5.692	5.303	4.913	4.834	4.678	4.609	4.551	4.486	4.302	4.126	4.126	4.126	3.753	2.820
380	6.582	5.756	5.390	5.013	4.937	4.785	4.717	4.672	4.635	4.491	4.231	4.202	4.202	3.853	2.987
385	6.641	5.820	5.476	5.113	5.039	4.891	4.824	4.780	4.744	4.651	4.459	4.279	4.279	3.953	3.154
390	6.700	5.884	5.537	5.214	5.142	4.997	4.932	4.889	4.853	4.761	4.644	4.361	4.355	4.053	3.320
395	6.759	5.948	5.596	5.314	5.244	5.103	5.040	4.997	4.962	4.872	4.744	4.628	4.431	4.152	3.487
400	6.818	6.011	5.655	5.414	5.346	5.209	5.147	5.106	5.072	4.982	4.845	4.716	4.507	4.252	3.654
405	6.876	6.075	5.714	5.499	5.449	5.315	5.255	5.214	5.181	5.093	4.946	4.804	4.583	4.352	3.820
410	6.935	6.139	5.773	5.553	5.517	5.421	5.362	5.323	5.290	5.203	5.047	4.893	4.650	4.452	3.987
415	6.994	6.203	5.832	5.607	5.570	5.503	5.470	5.431	5.399	5.314	5.147	4.981	4.713	4.552	4.153
420	7.053	6.267	5.891	5.661	5.623	5.554	5.526	5.508	5.493	5.424	5.248	5.069	4.775	4.628	4.320
425	7.111	6.331	5.950	5.715	5.676	5.605	5.576	5.557	5.542	5.504	5.349	5.157	4.838	4.670	4.487
430	7.170	6.395	6.010	5.769	5.729	5.656	5.626	5.607	5.591	5.551	5.450	5.246	4.900	4.713	4.618
435	7.229	6.458	6.069	5.823	5.782	5.707	5.676	5.656	5.640	5.599	5.513	5.334	4.963	4.756	4.647
440	7.288	6.522	6.128	5.877	5.835	5.758	5.726	5.705	5.688	5.646	5.560	5.422	5.025	4.799	4.676
445	7.346	6.586	6.187	5.931	5.888	5.809	5.776	5.755	5.737	5.694	5.606	5.496	5.088	4.841	4.705
450	7.405	6.650	6.246	5.985	5.941	5.860	5.826	5.804	5.786	5.741	5.652	5.542	5.150	4.884	4.734
455	7.464	6.714	6.305	6.039	5.994	5.911	5.876	5.853	5.835	5.789	5.699	5.587	5.213	4.927	4.763
460	-	6.778	6.364	6.093	6.047	5.962	5.926	5.903	5.884	5.836	5.745	5.633	5.275	4.969	4.793
465	-	6.842	6.423	6.147	6.100	6.013	5.976	5.952	5.932	5.884	5.792	5.679	5.338	5.012	4.822
470	-	6.905	6.482	6.201	6.153	6.064	6.026	6.002	5.981	5.931	5.838	5.724	5.400	5.055	4.851
475	-	6.969	6.541	6.255	6.206	6.115	6.076	6.051	6.030	5.978	5.885	5.770	5.463	5.097	4.880

Thickness is intumescent only. Results also apply to I/H-section beams exposed on all four sides limited to a maximum protection thickness of 5.770mm.

Table 16 I-Section Columns 90 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	2.072	1.472	1.097	0.846	0.803	0.721	0.686	0.665	0.649	0.606	0.554	0.495	0.472	0.472	0.472
55	2.271	1.624	1.219	0.940	0.892	0.800	0.762	0.739	0.720	0.673	0.614	0.550	0.472	0.472	0.472
60	2.469	1.775	1.348	1.048	0.997	0.899	0.859	0.833	0.813	0.762	0.699	0.629	0.481	0.472	0.472
65	2.668	1.927	1.477	1.157	1.102	0.999	0.955	0.928	0.906	0.852	0.783	0.708	0.547	0.472	0.472
70	2.836	2.079	1.598	1.266	1.208	1.098	1.052	1.023	0.999	0.941	0.868	0.787	0.613	0.489	0.472
75	2.944	2.231	1.714	1.375	1.313	1.197	1.148	1.117	1.092	1.030	0.952	0.866	0.679	0.543	0.472
80	3.051	2.383	1.830	1.483	1.419	1.296	1.245	1.212	1.186	1.119	1.037	0.945	0.745	0.596	0.472
85	3.159	2.534	1.946	1.581	1.524	1.395	1.342	1.307	1.279	1.209	1.121	1.024	0.811	0.649	0.513
90	3.266	2.686	2.062	1.669	1.609	1.495	1.438	1.401	1.372	1.298	1.205	1.103	0.877	0.702	0.556
95	3.374	2.826	2.178	1.757	1.692	1.579	1.535	1.496	1.465	1.387	1.290	1.182	0.943	0.755	0.598
100	3.481	2.931	2.294	1.845	1.775	1.652	1.604	1.574	1.551	1.476	1.374	1.262	1.009	0.808	0.641
105	3.589	3.035	2.410	1.933	1.858	1.726	1.674	1.641	1.615	1.555	1.459	1.341	1.075	0.862	0.683
110	3.696	3.139	2.526	2.021	1.942	1.800	1.743	1.708	1.680	1.614	1.540	1.420	1.141	0.915	0.726
115	3.804	3.243	2.642	2.108	2.025	1.874	1.813	1.775	1.745	1.674	1.593	1.499	1.207	0.968	0.768
120	3.911	3.347	2.758	2.196	2.108	1.948	1.882	1.842	1.810	1.734	1.646	1.559	1.273	1.021	0.811
125	4.019	3.451	2.854	2.284	2.191	2.022	1.952	1.909	1.875	1.793	1.699	1.605	1.339	1.074	0.853
130	4.126	3.556	2.938	2.372	2.274	2.096	2.022	1.976	1.940	1.853	1.752	1.651	1.405	1.127	0.896
135	4.234	3.660	3.021	2.460	2.357	2.170	2.091	2.043	2.005	1.912	1.805	1.697	1.471	1.181	0.939
140	4.342	3.764	3.105	2.548	2.440	2.244	2.161	2.110	2.070	1.972	1.858	1.742	1.535	1.234	0.981
145	4.449	3.868	3.189	2.636	2.523	2.318	2.230	2.177	2.134	2.031	1.911	1.788	1.568	1.287	1.024
150	4.557	3.972	3.273	2.724	2.606	2.391	2.300	2.244	2.199	2.091	1.964	1.834	1.601	1.340	1.066
155	4.711	4.076	3.356	2.810	2.689	2.465	2.370	2.311	2.264	2.151	2.017	1.880	1.633	1.393	1.109
160	4.913	4.181	3.440	2.880	2.772	2.539	2.439	2.378	2.329	2.210	2.070	1.925	1.666	1.446	1.151
165	5.114	4.285	3.524	2.950	2.846	2.613	2.509	2.445	2.394	2.270	2.123	1.971	1.698	1.500	1.194
170	5.316	4.389	3.608	3.020	2.913	2.687	2.578	2.512	2.459	2.329	2.176	2.017	1.731	1.545	1.237
175	5.495	4.493	3.691	3.090	2.981	2.761	2.648	2.579	2.524	2.389	2.229	2.062	1.763	1.576	1.279
180	5.570	4.597	3.775	3.160	3.049	2.830	2.717	2.646	2.589	2.448	2.282	2.108	1.796	1.607	1.322
185	5.645	4.650	3.859	3.231	3.117	2.894	2.787	2.713	2.653	2.508	2.335	2.154	1.828	1.638	1.364
190	5.721	4.696	3.943	3.301	3.185	2.958	2.852	2.780	2.718	2.567	2.388	2.200	1.861	1.668	1.407
195	5.796	4.742	4.026	3.371	3.253	3.022	2.915	2.846	2.783	2.627	2.441	2.245	1.894	1.699	1.449
200	5.871	4.788	4.110	3.441	3.321	3.086	2.979	2.910	2.849	2.687	2.494	2.291	1.926	1.730	1.492
205	5.947	4.834	4.194	3.511	3.389	3.150	3.043	2.975	2.915	2.746	2.547	2.337	1.959	1.761	1.535
210	6.022	4.879	4.278	3.582	3.457	3.213	3.106	3.040	2.982	2.807	2.600	2.383	1.991	1.792	1.615
215	6.098	4.925	4.361	3.652	3.525	3.277	3.170	3.105	3.048	2.877	2.653	2.428	2.024	1.823	1.696
220	6.173	4.971	4.445	3.722	3.592	3.341	3.233	3.170	3.114	2.947	2.706	2.474	2.056	1.854	1.776
225	6.248	5.017	4.529	3.792	3.660	3.405	3.297	3.235	3.180	3.017	2.759	2.520	2.089	1.885	1.856
230	6.324	5.063	4.611	3.862	3.728	3.469	3.360	3.300	3.246	3.088	2.817	2.566	2.121	1.937	1.937
235	6.399	5.108	4.651	3.932	3.796	3.533	3.424	3.365	3.313	3.158	2.895	2.611	2.154	2.017	2.017
240	6.474	5.154	4.690	4.003	3.864	3.597	3.488	3.430	3.379	3.228	2.973	2.657	2.187	2.098	2.098
245	6.550	5.200	4.729	4.073	3.932	3.660	3.551	3.495	3.445	3.299	3.051	2.703	2.219	2.178	2.178
250	6.625	5.246	4.769	4.143	4.000	3.724	3.615	3.560	3.511	3.369	3.129	2.748	2.259	2.259	2.259
255	6.700	5.292	4.808	4.213	4.068	3.788	3.678	3.625	3.578	3.439	3.207	2.794	2.339	2.339	2.339
260	6.776	5.338	4.848	4.283	4.136	3.852	3.742	3.690	3.644	3.509	3.285	2.881	2.419	2.419	2.419
265	6.851	5.383	4.887	4.354	4.204	3.916	3.806	3.755	3.710	3.580	3.363	2.975	2.500	2.500	2.500
270	6.927	5.429	4.926	4.424	4.271	3.980	3.869	3.820	3.776	3.650	3.442	3.069	2.580	2.580	2.580
275	7.002	5.475	4.966	4.494	4.339	4.044	3.933	3.885	3.843	3.720	3.520	3.162	2.661	2.661	2.661
280	7.077	5.545	5.005	4.564	4.407	4.107	3.996	3.950	3.909	3.791	3.598	3.256	2.741	2.741	2.741
285	7.153	5.618	5.044	4.630	4.475	4.171	4.060	4.015	3.975	3.861	3.676	3.350	2.822	2.822	2.822
290	7.228	5.692	5.084	4.687	4.543	4.235	4.124	4.080	4.041	3.931	3.754	3.444	2.902	2.902	2.902
295	7.303	5.765	5.123	4.744	4.611	4.299	4.187	4.144	4.107	4.001	3.832	3.538	2.982	2.982	2.982
300	7.379	5.839	5.163	4.801	4.675	4.363	4.251	4.209	4.174	4.072	3.910	3.631	3.063	3.063	3.063
305	7.454	5.912	5.202	4.858	4.738	4.427	4.314	4.274	4.240	4.142	3.988	3.725	3.143	3.143	3.143
310	-	5.986	5.241	4.915	4.802	4.491	4.378	4.339	4.306	4.212	4.066	3.819	3.224	3.224	3.224
315	-	6.059	5.281	4.971	4.866	4.555	4.441	4.404	4.372	4.283	4.144	3.913	3.304	3.304	3.304
320	-	6.133	5.320	5.028	4.930	4.621	4.505	4.469	4.439	4.353	4.222	4.007	3.385	3.385	3.385
325	-	6.206	5.359	5.085	4.993	4.707	4.569	4.534	4.505	4.423	4.300	4.100	3.465	3.465	3.465
330	-	6.280	5.399	5.142	5.057	4.793	4.644	4.599	4.571	4.494	4.378	4.194	3.545	3.545	3.545
335	-	6.353	5.438	5.199	5.121	4.879	4.741	4.692	4.651	4.564	4.456	4.288	3.626	3.626	3.626
340	-	6.427	5.478	5.256	5.185	4.965	4.839	4.791	4.751	4.645	4.534	4.382	3.706	3.706	3.706
345	-	6.500	5.558	5.313	5.248	5.051	4.936	4.890	4.851	4.748	4.613	4.476	3.787	3.787	3.787
350	-	6.574	5.642	5.370	5.312	5.137	5.033	4.988	4.951	4.851	4.719	4.570	3.867	3.867	3.867
355	-	6.647	5.726	5.427	5.376	5.223	5.131	5.087	5.051	4.953	4.825	4.672	3.948	3.948	3.948
360	-	6.721	5.810	5.485	5.440	5.308	5.228	5.186	5.150	5.056	4.931	4.781	4.159	4.028	4.028
365	-	6.794	5.894	5.564	5.508	5.394	5.325	5.285	5.250	5.159	5.037	4.890	4.423	4.108	4.108
370	-	6.868	5.978	5.643	5.586	5.480	5.423	5.383	5.350	5.261	5.142	4.999	4.643	4.189	4.189
375	-	6.941	6.062	5.722	5.664	5.556	5.511	5.482	5.450	5.364	5.248	5.108	4.757	4.269	4.269
380	-	7.015	6.146	5.801	5.742	5.631	5.585	5.555	5.531	5.467	5.354	5.217	4.870	4.350	4.350
385	-	7.088	6.230	5.880	5.820	5.707	5.659	5.629	5.604	5.542	5.460	5.326	4.984	4.656	4.430
390	-	7.161	6.314	5.959	5.897	5.782	5.734	5.703	5.677	5.613	5.536	5.436	5.097	4.767	4.510
395	-	7.235	6.398	6.038	5.975	5.858	5.808	5.776	5.750	5.684	5.605	5.519	5.211	4.879	4.591
400	-	7.308	6.482	6.117	6.053	5.933	5.882	5.850	5.823	5.755	5.673	5.585	5.324	4.990	4.662
405	-	7.382	6.567	6.196	6.131	6.009	5.957	5.923	5.895	5.827	5.742	5.651	5.438	5.101	4.729
410	-	7.455	6.651	6.275	6.209	6.084	6.031	5.997	5.968	5.898	5.811	5.717	5.517	5.213	4.797
415	-	-	6.735	6.354	6.286	6.159	6.105	6.070	6.041	5.969	5.879	5.783	5.575	5.324	4.865
420	-	-	6.819	6.433	6.364	6.235	6.180	6.144	6.114	6.040	5.948	5.849	5.633	5.436	4.932
425	-	-	6.903	6.512	6.442	6.310	6.254	6.217	6.187	6.111	6.017	5.914	5.690	5.510	5.000
430	-	-	6.987	6.591	6.520	6.386	6.328	6.291	6.260	6.182	6.085	5.980	5.748	5.559	5.068
435	-	-	7.071	6.670	6.598	6.461	6.403	6.364	6.332	6.253	6.154	6.046	5.806	5.608	5.135
440	-	-	7.155	6.749	6.675	6.537	6.477	6.438	6.405	6.324	6.222	6.112	5.864	5.657	5.203
445	-	-	7.239	6.828	6.753	6.612	6.551	6.512	6.478	6.395	6.291	6.178	5.922	5.706	5.271
450	-	-	7.323	6.907	6.831	6.688	6.626	6.585	6.551	6.466	6.360	6.244	5.980	5.754	5.339
455	-	-	7.407	6.985	6.909	6.763	6.700	6.659	6.624	6.537	6.428	6.310	6.038	5.803	5.406
460	-	-	7.491	7.064	6.987	6.839	6.774	6.732	6.697	6.608	6.497	6.375	6.096	5.852	5.474
465	-	-	-	7.143	7.064	6.914	6.849	6.806	6.769	6.680	6.566	6.441	6.154	5.901	5.519
470	-	-	-	7.222	7.142	6.990	6.923	6.879	6.842	6.751	6.634	6.507	6.212	5.950	5.562
475	-	-	-	7.301	7.220	7.065	6.997	6.953	6.915	6.822	6.703	6.573	6.269	5.999	5.605

Thickness is intumescent only. Results also apply to I/H-section beams exposed on all four sides limited to a maximum protection thickness of 5.770mm.

Table 17 I-Section Columns 105 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	2.542	1.889	1.378	1.097	1.050	0.961	0.923	0.900	0.882	0.835	0.777	0.714	0.572	0.472	0.472
55	2.788	2.083	1.531	1.219	1.166	1.067	1.026	1.000	0.979	0.927	0.863	0.793	0.635	0.484	0.472
60	2.907	2.276	1.697	1.353	1.297	1.190	1.146	1.118	1.096	1.040	0.970	0.894	0.723	0.561	0.472
65	3.019	2.470	1.862	1.487	1.427	1.314	1.267	1.236	1.212	1.152	1.077	0.996	0.811	0.637	0.490
70	3.131	2.664	2.028	1.619	1.557	1.437	1.387	1.355	1.329	1.264	1.184	1.097	0.899	0.714	0.555
75	3.243	2.834	2.194	1.750	1.681	1.559	1.508	1.473	1.446	1.377	1.291	1.198	0.986	0.790	0.620
80	3.355	2.946	2.360	1.881	1.806	1.672	1.618	1.585	1.558	1.489	1.398	1.299	1.074	0.867	0.685
85	3.467	3.058	2.526	2.012	1.931	1.785	1.726	1.689	1.660	1.591	1.505	1.400	1.162	0.944	0.750
90	3.579	3.171	2.692	2.143	2.056	1.899	1.834	1.793	1.762	1.686	1.597	1.502	1.250	1.020	0.816
95	3.691	3.283	2.840	2.274	2.181	2.012	1.941	1.898	1.863	1.780	1.683	1.586	1.338	1.097	0.881
100	3.802	3.396	2.954	2.405	2.306	2.126	2.049	2.002	1.965	1.875	1.770	1.663	1.426	1.174	0.946
105	3.914	3.508	3.067	2.536	2.431	2.239	2.156	2.106	2.066	1.970	1.856	1.740	1.514	1.250	1.011
110	4.026	3.621	3.181	2.667	2.556	2.353	2.264	2.210	2.168	2.064	1.942	1.817	1.577	1.327	1.076
115	4.138	3.733	3.295	2.797	2.681	2.466	2.372	2.315	2.269	2.159	2.029	1.894	1.634	1.404	1.142
120	4.250	3.846	3.408	2.894	2.805	2.580	2.479	2.419	2.371	2.254	2.115	1.971	1.690	1.480	1.207
125	4.362	3.958	3.522	2.990	2.897	2.693	2.587	2.523	2.472	2.348	2.201	2.047	1.747	1.546	1.272
130	4.474	4.070	3.636	3.085	2.989	2.805	2.694	2.627	2.574	2.443	2.287	2.124	1.803	1.584	1.337
135	4.586	4.183	3.749	3.181	3.082	2.892	2.802	2.732	2.676	2.538	2.374	2.201	1.859	1.623	1.402
140	5.129	4.295	3.863	3.277	3.174	2.979	2.887	2.829	2.777	2.632	2.460	2.278	1.916	1.662	1.468
145	5.540	4.408	3.977	3.372	3.267	3.066	2.971	2.912	2.864	2.727	2.546	2.355	1.972	1.701	1.533
150	5.667	4.520	4.090	3.468	3.359	3.152	3.056	2.995	2.946	2.818	2.632	2.432	2.029	1.740	1.566
155	5.794	4.645	4.204	3.563	3.452	3.239	3.141	3.079	3.028	2.897	2.719	2.509	2.085	1.778	1.599
160	5.921	4.821	4.318	3.659	3.544	3.326	3.225	3.162	3.110	2.976	2.804	2.585	2.142	1.817	1.631
165	6.048	4.996	4.431	3.755	3.637	3.413	3.310	3.245	3.192	3.055	2.880	2.662	2.198	1.856	1.664
170	6.175	5.171	4.545	3.850	3.729	3.499	3.395	3.328	3.274	3.134	2.955	2.739	2.254	1.895	1.696
175	6.302	5.346	4.633	3.946	3.822	3.586	3.479	3.411	3.356	3.213	3.030	2.815	2.311	1.934	1.729
180	6.429	5.504	4.686	4.042	3.914	3.673	3.564	3.495	3.438	3.292	3.105	2.886	2.367	1.972	1.762
185	6.556	5.604	4.739	4.137	4.007	3.760	3.649	3.578	3.520	3.371	3.180	2.957	2.424	2.011	1.794
190	6.683	5.704	4.793	4.233	4.099	3.847	3.733	3.661	3.602	3.450	3.255	3.028	2.480	2.050	1.827
195	6.810	5.803	4.846	4.328	4.192	3.933	3.818	3.744	3.684	3.529	3.330	3.099	2.536	2.089	1.860
200	6.937	5.903	4.899	4.424	4.284	4.020	3.903	3.827	3.766	3.607	3.405	3.170	2.593	2.128	1.892
205	7.064	6.003	4.953	4.520	4.377	4.107	3.987	3.911	3.848	3.686	3.480	3.242	2.649	2.167	1.925
210	7.190	6.102	5.006	4.612	4.469	4.194	4.072	3.994	3.930	3.765	3.556	3.313	2.706	2.205	1.957
215	7.317	6.202	5.059	4.656	4.562	4.280	4.157	4.077	4.012	3.844	3.631	3.384	2.762	2.244	1.990
220	7.444	6.302	5.112	4.700	4.630	4.367	4.242	4.160	4.094	3.923	3.706	3.455	2.825	2.283	2.023
225	-	6.401	5.166	4.745	4.673	4.454	4.326	4.243	4.175	4.002	3.781	3.526	2.901	2.322	2.055
230	-	6.501	5.219	4.789	4.716	4.541	4.411	4.327	4.257	4.081	3.856	3.597	2.978	2.361	2.088
235	-	6.601	5.272	4.833	4.759	4.619	4.496	4.410	4.339	4.160	3.931	3.668	3.054	2.399	2.120
240	-	6.700	5.326	4.877	4.802	4.662	4.580	4.493	4.421	4.239	4.006	3.739	3.130	2.438	2.153
245	-	6.800	5.379	4.921	4.844	4.705	4.639	4.576	4.503	4.318	4.081	3.811	3.207	2.477	2.186
250	-	6.900	5.432	4.965	4.887	4.748	4.684	4.638	4.585	4.396	4.156	3.882	3.283	2.516	2.259
255	-	6.999	5.491	5.009	4.930	4.791	4.729	4.684	4.644	4.475	4.232	3.953	3.360	2.555	2.339
260	-	7.099	5.602	5.053	4.973	4.834	4.774	4.731	4.692	4.554	4.307	4.024	3.436	2.593	2.419
265	-	7.199	5.714	5.097	5.015	4.877	4.820	4.778	4.740	4.625	4.382	4.095	3.512	2.632	2.500
270	-	7.299	5.826	5.141	5.058	4.920	4.865	4.824	4.788	4.678	4.457	4.166	3.589	2.671	2.580
275	-	7.398	5.938	5.185	5.101	4.963	4.910	4.871	4.836	4.731	4.532	4.237	3.665	2.710	2.661
280	-	7.498	6.050	5.229	5.144	5.006	4.955	4.918	4.884	4.783	4.607	4.308	3.742	2.749	2.741
285	-	-	6.162	5.273	5.187	5.049	5.000	4.964	4.932	4.836	4.668	4.379	3.818	2.822	2.822
290	-	-	6.274	5.317	5.229	5.092	5.045	5.011	4.980	4.888	4.729	4.451	3.894	2.902	2.902
295	-	-	6.385	5.361	5.272	5.135	5.090	5.057	5.028	4.941	4.790	4.522	3.971	3.025	2.982
300	-	-	6.497	5.405	5.315	5.178	5.135	5.104	5.076	4.993	4.851	4.593	4.047	3.161	3.063
305	-	-	6.609	5.449	5.358	5.221	5.180	5.151	5.124	5.046	4.911	4.668	4.124	3.297	3.143
310	-	-	6.721	5.512	5.401	5.264	5.225	5.197	5.173	5.099	4.972	4.744	4.200	3.433	3.224
315	-	-	6.833	5.625	5.443	5.307	5.270	5.244	5.221	5.151	5.033	4.820	4.276	3.569	3.304
320	-	-	6.945	5.739	5.495	5.349	5.315	5.291	5.269	5.204	5.093	4.896	4.353	3.704	3.385
325	-	-	7.056	5.852	5.611	5.392	5.360	5.337	5.317	5.256	5.154	4.973	4.429	3.840	3.465
330	-	-	7.168	5.966	5.726	5.435	5.405	5.384	5.365	5.309	5.215	5.049	4.506	3.976	3.545
335	-	-	7.280	6.079	5.842	5.478	5.451	5.431	5.413	5.361	5.276	5.125	4.582	4.112	3.626
340	-	-	7.392	6.193	5.958	5.589	5.517	5.477	5.461	5.414	5.336	5.201	4.684	4.247	3.706
345	-	-	7.504	6.306	6.074	5.704	5.626	5.579	5.543	5.467	5.397	5.278	4.800	4.383	3.787
350	-	-	-	6.420	6.190	5.819	5.736	5.686	5.648	5.556	5.458	5.354	4.917	4.519	3.867
355	-	-	-	6.533	6.305	5.933	5.846	5.792	5.754	5.660	5.543	5.430	5.034	4.649	3.948
360	-	-	-	6.647	6.421	6.048	5.955	5.899	5.859	5.763	5.644	5.513	5.150	4.767	4.074
365	-	-	-	6.760	6.537	6.163	6.065	6.005	5.965	5.867	5.745	5.611	5.267	4.885	4.382
370	-	-	-	6.874	6.653	6.278	6.175	6.112	6.070	5.970	5.845	5.708	5.384	5.003	4.640
375	-	-	-	6.987	6.768	6.393	6.284	6.219	6.176	6.074	5.946	5.806	5.495	5.122	4.756
380	-	-	-	7.101	6.884	6.508	6.394	6.325	6.281	6.177	6.047	5.903	5.582	5.240	4.873
385	-	-	-	7.214	7.000	6.622	6.504	6.432	6.387	6.281	6.147	6.000	5.670	5.358	4.989
390	-	-	-	7.328	7.116	6.737	6.614	6.539	6.492	6.385	6.248	6.098	5.757	5.476	5.106
395	-	-	-	7.442	7.232	6.852	6.723	6.645	6.598	6.488	6.349	6.195	5.844	5.552	5.222
400	-	-	-	-	7.347	6.967	6.833	6.752	6.703	6.592	6.449	6.293	5.931	5.626	5.339
405	-	-	-	-	7.463	7.082	6.943	6.858	6.809	6.695	6.550	6.390	6.018	5.701	5.455
410	-	-	-	-	-	7.196	7.052	6.965	6.914	6.799	6.651	6.487	6.105	5.775	5.527
415	-	-	-	-	-	7.311	7.162	7.072	7.020	6.903	6.752	6.585	6.192	5.849	5.586
420	-	-	-	-	-	7.426	7.272	7.178	7.125	7.006	6.852	6.682	6.279	5.923	5.645
425	-	-	-	-	-	-	7.381	7.285	7.231	7.110	6.953	6.780	6.366	5.997	5.704
430	-	-	-	-	-	-	7.491	7.391	7.336	7.213	7.054	6.877	6.453	6.071	5.763
435	-	-	-	-	-	-	-	7.498	7.442	7.317	7.154	6.975	6.541	6.146	5.822
440	-	-	-	-	-	-	-	-	-	7.420	7.255	7.072	6.628	6.220	5.881
445	-	-	-	-	-	-	-	-	-	-	7.356	7.169	6.715	6.294	5.940
450	-	-	-	-	-	-	-	-	-	-	7.456	7.267	6.802	6.368	6.000
455	-	-	-	-	-	-	-	-	-	-	-	7.364	6.889	6.442	6.059
460	-	-	-	-	-	-	-	-	-	-	-	7.462	6.976	6.516	6.118
465	-	-	-	-	-	-	-	-	-	-	-	-	7.063	6.591	6.177
470	-	-	-	-	-	-	-	-	-	-	-	-	7.150	6.665	6.236
475	-	-	-	-	-	-	-	-	-	-	-	-	7.237	6.739	6.295

Thickness is intumescent only. Results also apply to I/H-section beams exposed on all four sides limited to a maximum protection thickness of 5.770mm.

Table 18 I-Section Columns 120 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	3.308	2.307	1.762	1.349	1.297	1.200	1.161	1.135	1.114	1.064	1.001	0.933	0.781	0.638	0.478
55	3.455	2.542	1.958	1.499	1.441	1.333	1.289	1.261	1.238	1.182	1.112	1.036	0.867	0.708	0.530
60	3.602	2.777	2.163	1.672	1.603	1.481	1.434	1.403	1.378	1.317	1.242	1.160	0.976	0.805	0.618
65	3.749	2.906	2.368	1.850	1.773	1.635	1.580	1.545	1.518	1.453	1.371	1.283	1.085	0.902	0.705
70	3.896	3.023	2.573	2.027	1.943	1.792	1.729	1.690	1.660	1.587	1.501	1.407	1.194	0.999	0.793
75	4.043	3.140	2.778	2.205	2.114	1.948	1.879	1.836	1.802	1.721	1.626	1.530	1.303	1.096	0.881
80	4.190	3.257	2.906	2.382	2.284	2.105	2.028	1.981	1.944	1.854	1.749	1.642	1.413	1.193	0.968
85	4.337	3.374	3.024	2.560	2.455	2.262	2.177	2.126	2.086	1.988	1.872	1.754	1.522	1.290	1.056
90	4.484	3.491	3.142	2.737	2.625	2.419	2.327	2.271	2.228	2.121	1.995	1.865	1.611	1.387	1.143
95	4.658	3.607	3.260	2.877	2.796	2.576	2.476	2.417	2.369	2.255	2.119	1.977	1.698	1.484	1.231
100	4.991	3.724	3.378	2.996	2.914	2.733	2.625	2.562	2.511	2.388	2.242	2.089	1.785	1.566	1.319
105	5.325	3.841	3.496	3.115	3.031	2.863	2.775	2.707	2.653	2.522	2.365	2.200	1.872	1.631	1.406
110	5.592	3.958	3.614	3.234	3.147	2.972	2.889	2.838	2.795	2.655	2.488	2.312	1.959	1.697	1.494
115	5.802	4.075	3.732	3.353	3.264	3.081	2.995	2.942	2.900	2.789	2.611	2.424	2.046	1.762	1.562
120	6.011	4.192	3.850	3.472	3.380	3.190	3.102	3.047	3.003	2.891	2.735	2.536	2.133	1.827	1.615
125	6.221	4.309	3.969	3.591	3.497	3.300	3.208	3.152	3.106	2.990	2.844	2.647	2.219	1.893	1.667
130	6.430	4.426	4.087	3.710	3.613	3.409	3.315	3.256	3.209	3.089	2.938	2.759	2.306	1.958	1.719
135	6.639	4.542	4.205	3.829	3.730	3.518	3.421	3.361	3.312	3.188	3.032	2.856	2.393	2.024	1.771
140	6.849	4.963	4.323	3.948	3.846	3.627	3.528	3.465	3.414	3.287	3.126	2.945	2.480	2.089	1.824
145	7.058	5.536	4.441	4.067	3.963	3.737	3.634	3.570	3.517	3.385	3.220	3.034	2.567	2.154	1.876
150	7.267	5.681	4.559	4.186	4.079	3.846	3.741	3.674	3.620	3.484	3.314	3.122	2.654	2.220	1.928
155	7.477	5.827	4.739	4.305	4.196	3.955	3.847	3.779	3.723	3.583	3.408	3.211	2.741	2.285	1.980
160	-	5.972	4.965	4.424	4.313	4.064	3.954	3.883	3.826	3.682	3.502	3.299	2.825	2.351	2.033
165	-	6.117	5.191	4.543	4.429	4.174	4.060	3.988	3.929	3.781	3.596	3.388	2.901	2.416	2.085
170	-	6.262	5.417	4.641	4.546	4.283	4.167	4.093	4.032	3.880	3.690	3.477	2.977	2.481	2.137
175	-	6.408	5.579	4.713	4.638	4.392	4.273	4.197	4.135	3.979	3.784	3.565	3.054	2.547	2.189
180	-	6.553	5.716	4.785	4.700	4.501	4.380	4.302	4.238	4.078	3.878	3.654	3.130	2.612	2.242
185	-	6.698	5.852	4.856	4.762	4.610	4.486	4.406	4.341	4.177	3.972	3.743	3.206	2.678	2.294
190	-	6.843	5.989	4.928	4.824	4.666	4.593	4.511	4.444	4.276	4.066	3.831	3.283	2.743	2.346
195	-	6.988	6.126	5.000	4.886	4.722	4.656	4.613	4.547	4.375	4.160	3.920	3.359	2.809	2.398
200	-	7.134	6.263	5.071	4.948	4.778	4.710	4.667	4.631	4.474	4.254	4.009	3.435	2.876	2.451
205	-	7.279	6.400	5.143	5.011	4.834	4.765	4.720	4.684	4.573	4.348	4.097	3.512	2.944	2.503
210	-	7.424	6.536	5.215	5.073	4.889	4.820	4.774	4.737	4.642	4.442	4.186	3.588	3.012	2.555
215	-	-	6.673	5.287	5.135	4.945	4.874	4.828	4.790	4.694	4.536	4.275	3.665	3.079	2.608
220	-	-	6.810	5.358	5.197	5.001	4.929	4.882	4.843	4.745	4.621	4.363	3.741	3.147	2.660
225	-	-	6.947	5.430	5.259	5.057	4.984	4.936	4.897	4.797	4.670	4.452	3.817	3.215	2.712
230	-	-	7.083	5.534	5.321	5.113	5.038	4.989	4.950	4.849	4.720	4.540	3.894	3.283	2.764
235	-	-	7.220	5.717	5.383	5.169	5.093	5.043	5.003	4.900	4.770	4.620	3.970	3.350	2.825
240	-	-	7.357	5.899	5.445	5.224	5.147	5.097	5.056	4.952	4.820	4.668	4.046	3.418	2.907
245	-	-	7.494	6.081	5.559	5.280	5.202	5.151	5.109	5.004	4.870	4.716	4.123	3.486	2.988
250	-	-	-	6.264	5.742	5.336	5.257	5.205	5.162	5.055	4.919	4.764	4.199	3.553	3.069
255	-	-	-	6.446	5.924	5.392	5.311	5.259	5.216	5.107	4.969	4.812	4.275	3.621	3.150
260	-	-	-	6.629	6.107	5.448	5.366	5.312	5.269	5.158	5.019	4.860	4.352	3.689	3.232
265	-	-	-	6.811	6.290	5.538	5.420	5.366	5.322	5.210	5.069	4.907	4.428	3.757	3.313
270	-	-	-	6.994	6.473	5.680	5.475	5.420	5.375	5.262	5.119	4.955	4.504	3.824	3.394
275	-	-	-	7.176	6.656	5.821	5.603	5.474	5.428	5.313	5.168	5.003	4.581	3.892	3.475
280	-	-	-	7.359	6.838	5.963	5.740	5.601	5.483	5.365	5.218	5.051	4.649	3.960	3.557
285	-	-	-	-	7.021	6.104	5.877	5.739	5.622	5.417	5.268	5.099	4.711	4.027	3.638
290	-	-	-	-	7.204	6.246	6.013	5.877	5.761	5.468	5.318	5.147	4.774	4.095	3.719
295	-	-	-	-	7.387	6.387	6.150	6.015	5.900	5.589	5.368	5.194	4.837	4.163	3.800
300	-	-	-	-	-	6.529	6.287	6.153	6.040	5.732	5.417	5.242	4.900	4.231	3.882
305	-	-	-	-	-	6.670	6.424	6.291	6.179	5.876	5.467	5.290	4.962	4.298	3.963
310	-	-	-	-	-	6.812	6.561	6.429	6.318	6.019	5.590	5.338	5.025	4.366	4.044
315	-	-	-	-	-	6.953	6.698	6.567	6.457	6.162	5.740	5.386	5.088	4.434	4.126
320	-	-	-	-	-	7.095	6.835	6.705	6.596	6.305	5.891	5.434	5.151	4.501	4.207
325	-	-	-	-	-	7.236	6.971	6.843	6.736	6.449	6.041	5.483	5.213	4.569	4.288
330	-	-	-	-	-	7.378	7.108	6.981	6.875	6.592	6.192	5.646	5.276	4.660	4.369
335	-	-	-	-	-	7.519	7.245	7.119	7.014	6.735	6.342	5.809	5.339	4.785	4.451
340	-	-	-	-	-	-	7.382	7.257	7.153	6.879	6.492	5.972	5.402	4.910	4.532
345	-	-	-	-	-	-	7.519	7.395	7.292	7.022	6.643	6.136	5.464	5.035	4.615
350	-	-	-	-	-	-	-	-	7.432	7.165	6.793	6.299	5.582	5.160	4.742
355	-	-	-	-	-	-	-	-	-	7.308	6.944	6.462	5.719	5.285	4.869
360	-	-	-	-	-	-	-	-	-	7.452	7.094	6.625	5.856	5.410	4.996
365	-	-	-	-	-	-	-	-	-	-	7.245	6.788	5.993	5.530	5.123
370	-	-	-	-	-	-	-	-	-	-	7.395	6.951	6.130	5.642	5.251
375	-	-	-	-	-	-	-	-	-	-	-	7.115	6.267	5.755	5.378
380	-	-	-	-	-	-	-	-	-	-	-	7.278	6.404	5.867	5.498
385	-	-	-	-	-	-	-	-	-	-	-	7.441	6.542	5.980	5.587
390	-	-	-	-	-	-	-	-	-	-	-	-	6.679	6.092	5.676
395	-	-	-	-	-	-	-	-	-	-	-	-	6.816	6.205	5.765
400	-	-	-	-	-	-	-	-	-	-	-	-	6.953	6.317	5.854
405	-	-	-	-	-	-	-	-	-	-	-	-	7.090	6.430	5.943
410	-	-	-	-	-	-	-	-	-	-	-	-	7.227	6.542	6.032
415	-	-	-	-	-	-	-	-	-	-	-	-	7.364	6.655	6.121
420	-	-	-	-	-	-	-	-	-	-	-	-	7.501	6.768	6.210
425	-	-	-	-	-	-	-	-	-	-	-	-	-	6.880	6.299
430	-	-	-	-	-	-	-	-	-	-	-	-	-	6.993	6.388
435	-	-	-	-	-	-	-	-	-	-	-	-	-	7.105	6.477
440	-	-	-	-	-	-	-	-	-	-	-	-	-	7.218	6.565
445	-	-	-	-	-	-	-	-	-	-	-	-	-	7.330	6.654
450	-	-	-	-	-	-	-	-	-	-	-	-	-	7.443	6.743
455	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.832
460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.921
465	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.010
470	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.099
475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.188

Thickness is intumescent only. Results also apply to I/H-section beams exposed on all four sides limited to a maximum protection thickness of 5.770mm.

Table 19 I-Section Columns 150 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
50	4.456	3.576	2.638	2.054	1.971	1.814	1.744	1.700	1.665	1.580	1.477	1.371	1.199	1.041	0.870
55	4.816	3.795	2.823	2.282	2.190	2.016	1.937	1.889	1.850	1.756	1.641	1.523	1.332	1.156	0.966
60	5.177	4.014	3.008	2.534	2.436	2.251	2.165	2.112	2.070	1.968	1.842	1.711	1.484	1.294	1.093
65	5.545	4.233	3.193	2.785	2.682	2.486	2.392	2.335	2.291	2.179	2.044	1.900	1.638	1.432	1.220
70	5.948	4.452	3.378	2.923	2.868	2.721	2.619	2.559	2.511	2.391	2.245	2.089	1.794	1.567	1.347
75	6.352	4.729	3.564	3.052	2.998	2.886	2.827	2.782	2.731	2.603	2.447	2.278	1.950	1.695	1.475
80	6.755	5.155	3.749	3.182	3.127	3.015	2.955	2.919	2.888	2.809	2.648	2.467	2.106	1.823	1.593
85	7.158	5.553	3.934	3.312	3.256	3.143	3.084	3.047	3.017	2.937	2.831	2.656	2.262	1.950	1.704
90	-	5.863	4.119	3.441	3.386	3.272	3.213	3.176	3.145	3.064	2.957	2.829	2.418	2.078	1.815
95	-	6.172	4.304	3.571	3.515	3.401	3.342	3.305	3.273	3.191	3.082	2.951	2.574	2.206	1.926
100	-	6.481	4.489	3.701	3.645	3.530	3.471	3.433	3.402	3.319	3.208	3.073	2.730	2.334	2.037
105	-	6.790	4.912	3.831	3.774	3.658	3.600	3.562	3.530	3.446	3.333	3.195	2.859	2.461	2.148
110	-	7.100	5.561	3.960	3.904	3.787	3.728	3.690	3.658	3.573	3.458	3.317	2.966	2.589	2.258
115	-	7.409	5.790	4.090	4.033	3.916	3.857	3.819	3.787	3.701	3.584	3.439	3.072	2.717	2.369
120	-	-	6.018	4.220	4.163	4.045	3.986	3.948	3.915	3.828	3.709	3.561	3.179	2.832	2.480
125	-	-	6.247	4.349	4.292	4.174	4.115	4.076	4.043	3.955	3.835	3.683	3.285	2.923	2.591
130	-	-	6.476	4.479	4.421	4.302	4.244	4.205	4.172	4.083	3.960	3.805	3.392	3.014	2.702
135	-	-	6.704	4.609	4.551	4.431	4.373	4.334	4.300	4.210	4.086	3.927	3.498	3.105	2.809
140	-	-	6.933	5.533	5.111	4.560	4.501	4.462	4.428	4.337	4.211	4.049	3.605	3.196	2.882
145	-	-	7.162	5.707	5.584	4.935	4.677	4.591	4.557	4.465	4.337	4.171	3.711	3.287	2.955
150	-	-	7.390	5.882	5.756	5.469	5.103	4.924	4.804	4.592	4.462	4.293	3.818	3.378	3.028
155	-	-	-	6.056	5.928	5.649	5.501	5.292	5.136	4.816	4.587	4.415	3.924	3.470	3.102
160	-	-	-	6.230	6.100	5.821	5.676	5.567	5.468	5.056	4.745	4.537	4.031	3.561	3.175
165	-	-	-	6.404	6.271	5.994	5.851	5.745	5.654	5.295	4.911	4.657	4.137	3.652	3.248
170	-	-	-	6.578	6.443	6.166	6.025	5.922	5.834	5.524	5.076	4.774	4.244	3.743	3.321
175	-	-	-	6.752	6.615	6.338	6.200	6.100	6.014	5.718	5.241	4.891	4.350	3.834	3.394
180	-	-	-	6.927	6.787	6.510	6.375	6.277	6.194	5.912	5.406	5.008	4.457	3.925	3.468
185	-	-	-	7.101	6.959	6.683	6.550	6.455	6.374	6.105	5.605	5.125	4.563	4.016	3.541
190	-	-	-	7.275	7.131	6.855	6.724	6.632	6.553	6.299	5.832	5.242	4.736	4.107	3.614
195	-	-	-	7.449	7.302	7.027	6.899	6.810	6.733	6.493	6.059	5.359	4.960	4.198	3.687
200	-	-	-	-	7.474	7.199	7.074	6.987	6.913	6.686	6.286	5.476	5.184	4.289	3.760
205	-	-	-	-	-	7.372	7.249	7.165	7.093	6.880	6.513	5.772	5.407	4.380	3.834
210	-	-	-	-	-	-	7.424	7.342	7.273	7.074	6.740	6.076	5.631	4.471	3.907
215	-	-	-	-	-	-	-	7.520	7.453	7.267	6.967	6.380	5.855	4.562	3.980
220	-	-	-	-	-	-	-	-	-	7.461	7.195	6.684	6.079	4.637	4.053
225	-	-	-	-	-	-	-	-	-	-	7.422	6.988	6.302	4.695	4.126
230	-	-	-	-	-	-	-	-	-	-	-	7.292	6.526	4.753	4.200
235	-	-	-	-	-	-	-	-	-	-	-	-	6.750	4.811	4.273
240	-	-	-	-	-	-	-	-	-	-	-	-	6.974	4.869	4.346
245	-	-	-	-	-	-	-	-	-	-	-	-	7.198	4.926	4.419
250	-	-	-	-	-	-	-	-	-	-	-	-	7.421	4.984	4.492
255	-	-	-	-	-	-	-	-	-	-	-	-	-	5.042	4.566
260	-	-	-	-	-	-	-	-	-	-	-	-	-	5.100	4.632
265	-	-	-	-	-	-	-	-	-	-	-	-	-	5.158	4.689
270	-	-	-	-	-	-	-	-	-	-	-	-	-	5.215	4.746
275	-	-	-	-	-	-	-	-	-	-	-	-	-	5.273	4.803
280	-	-	-	-	-	-	-	-	-	-	-	-	-	5.331	4.860
285	-	-	-	-	-	-	-	-	-	-	-	-	-	5.389	4.917
290	-	-	-	-	-	-	-	-	-	-	-	-	-	5.446	4.974
295	-	-	-	-	-	-	-	-	-	-	-	-	-	5.568	5.031
300	-	-	-	-	-	-	-	-	-	-	-	-	-	5.784	5.088
305	-	-	-	-	-	-	-	-	-	-	-	-	-	6.001	5.145
310	-	-	-	-	-	-	-	-	-	-	-	-	-	6.218	5.202
315	-	-	-	-	-	-	-	-	-	-	-	-	-	6.434	5.259
320	-	-	-	-	-	-	-	-	-	-	-	-	-	6.651	5.316
325	-	-	-	-	-	-	-	-	-	-	-	-	-	6.867	5.373
330	-	-	-	-	-	-	-	-	-	-	-	-	-	7.084	5.430
335	-	-	-	-	-	-	-	-	-	-	-	-	-	7.301	5.509
340	-	-	-	-	-	-	-	-	-	-	-	-	-	7.517	5.795
345	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.081
350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.368
355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.654
360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.940
365	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.227
370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.513
375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
390	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
405	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
415	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
435	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
445	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
455	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
465	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
470	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results only apply to I/H-section columns exposed on all four sides.

Table 20 Circular Hollow Columns 15 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
55	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
60	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
65	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
70	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
75	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
80	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
85	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
90	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
95	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
100	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
105	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
110	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
115	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
120	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
125	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
130	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
135	0.387	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
140	0.413	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
145	0.439	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
150	0.464	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
155	0.490	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
160	0.516	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
165	0.541	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
170	0.567	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
175	0.593	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
180	0.619	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
185	0.644	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
190	0.670	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
195	0.696	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
200	0.721	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
205	0.747	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
210	0.773	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
215	0.798	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
220	0.824	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
225	0.850	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
230	0.875	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
235	0.901	0.384	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
240	0.927	0.409	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
245	0.953	0.434	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
250	0.978	0.460	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
255	1.004	0.485	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
260	1.030	0.511	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
265	1.055	0.536	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
270	1.081	0.561	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
275	1.107	0.587	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
280	1.132	0.612	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
285	1.158	0.638	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
290	1.184	0.663	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
295	1.209	0.689	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
300	1.235	0.714	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
305	1.261	0.739	0.373	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
310	1.286	0.765	0.396	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
315	1.312	0.790	0.419	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
320	1.338	0.816	0.442	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
325	1.364	0.841	0.465	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
330	1.389	0.866	0.488	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365

Thickness is intumescent only.

Table 21 Circular Hollow Columns 20 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
55	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
60	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
65	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
70	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
75	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
80	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
85	0.383	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
90	0.416	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
95	0.449	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
100	0.481	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
105	0.514	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
110	0.547	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
115	0.580	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
120	0.613	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
125	0.646	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
130	0.679	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
135	0.712	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
140	0.745	0.376	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
145	0.778	0.407	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
150	0.811	0.438	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
155	0.844	0.469	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
160	0.877	0.500	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
165	0.910	0.530	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
170	0.943	0.561	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
175	0.976	0.592	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
180	1.008	0.623	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
185	1.041	0.654	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
190	1.074	0.684	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
195	1.107	0.715	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
200	1.140	0.746	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
205	1.173	0.777	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
210	1.206	0.808	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
215	1.239	0.838	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
220	1.272	0.869	0.373	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
225	1.305	0.900	0.405	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
230	1.338	0.931	0.437	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
235	1.371	0.962	0.469	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
240	1.404	0.992	0.501	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
245	1.437	1.023	0.533	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
250	1.470	1.054	0.565	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
255	1.502	1.085	0.597	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
260	1.535	1.116	0.628	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
265	1.568	1.146	0.660	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
270	1.601	1.177	0.692	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
275	1.634	1.208	0.724	0.420	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
280	1.667	1.239	0.756	0.510	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
285	1.700	1.270	0.788	0.599	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
290	1.733	1.300	0.820	0.688	0.430	0.404	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
295	1.766	1.331	0.852	0.778	0.526	0.502	0.380	0.365	0.365	0.365	0.365	0.365	0.365	0.365
300	1.799	1.362	0.883	0.867	0.621	0.600	0.481	0.456	0.365	0.365	0.365	0.365	0.365	0.365
305	1.832	1.393	0.956	0.956	0.717	0.698	0.582	0.558	0.365	0.365	0.365	0.365	0.365	0.365
310	1.865	1.424	1.046	1.046	0.813	0.796	0.682	0.660	0.365	0.365	0.365	0.365	0.365	0.365
315	1.898	1.454	1.135	1.135	0.909	0.894	0.783	0.761	0.365	0.365	0.365	0.365	0.365	0.365
320	1.931	1.485	1.224	1.224	1.004	0.992	0.884	0.863	0.365	0.365	0.365	0.365	0.365	0.365
325	1.964	1.516	1.314	1.314	1.100	1.090	0.985	0.964	0.365	0.365	0.365	0.365	0.365	0.365
330	1.996	1.547	1.403	1.403	1.196	1.188	1.086	1.066	0.371	0.365	0.365	0.365	0.365	0.365

Thickness is intumescent only.

Table 22 Circular Hollow Columns 30 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	0.388	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
55	0.461	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
60	0.533	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
65	0.605	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
70	0.678	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
75	0.750	0.390	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
80	0.822	0.440	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
85	0.895	0.489	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
90	0.967	0.539	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
95	1.040	0.588	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
100	1.112	0.638	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
105	1.184	0.688	0.394	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
110	1.257	0.737	0.435	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
115	1.329	0.787	0.475	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
120	1.401	0.836	0.515	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
125	1.474	0.886	0.555	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
130	1.546	0.935	0.596	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
135	1.618	0.985	0.636	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
140	1.691	1.034	0.676	0.382	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
145	1.763	1.084	0.716	0.498	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
150	1.835	1.134	0.757	0.614	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
155	1.908	1.183	0.797	0.730	0.484	0.465	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
160	1.980	1.233	0.846	0.846	0.609	0.593	0.473	0.448	0.365	0.365	0.365	0.365	0.365	0.365
165	2.041	1.282	0.962	0.962	0.734	0.721	0.606	0.582	0.365	0.365	0.365	0.365	0.365	0.365
170	2.087	1.332	1.078	1.078	0.860	0.849	0.738	0.715	0.365	0.365	0.365	0.365	0.365	0.365
175	2.132	1.381	1.194	1.194	0.985	0.977	0.871	0.849	0.365	0.365	0.365	0.365	0.365	0.365
180	2.177	1.431	1.310	1.310	1.110	1.105	1.003	0.982	0.365	0.365	0.365	0.365	0.365	0.365
185	2.223	1.480	1.425	1.425	1.235	1.233	1.136	1.116	0.365	0.365	0.365	0.365	0.365	0.365
190	2.268	1.541	1.541	1.541	1.361	1.361	1.269	1.249	0.511	0.383	0.365	0.365	0.365	0.365
195	2.314	1.657	1.657	1.657	1.489	1.489	1.401	1.383	0.676	0.554	0.365	0.365	0.365	0.365
200	2.359	1.773	1.773	1.773	1.617	1.617	1.534	1.516	0.842	0.725	0.365	0.365	0.365	0.365
205	2.404	1.889	1.889	1.889	1.745	1.745	1.666	1.650	1.008	0.895	0.365	0.365	0.365	0.365
210	2.450	2.005	2.005	2.005	1.873	1.873	1.799	1.783	1.173	1.066	0.365	0.365	0.365	0.365
215	2.495	2.121	2.121	2.121	2.001	2.001	1.931	1.917	1.339	1.237	0.365	0.365	0.365	0.365
220	2.541	2.237	2.237	2.237	2.129	2.129	2.064	2.050	1.505	1.407	0.365	0.365	0.365	0.365
225	2.586	2.353	2.353	2.353	2.257	2.257	2.196	2.184	1.670	1.578	0.365	0.365	0.365	0.365
230	2.632	2.469	2.469	2.469	2.385	2.385	2.329	2.318	1.836	1.749	0.365	0.365	0.365	0.365
235	2.677	2.585	2.585	2.585	2.513	2.513	2.462	2.451	2.002	1.920	0.365	0.365	0.365	0.365
240	2.722	2.700	2.700	2.700	2.641	2.641	2.594	2.585	2.167	2.090	0.365	0.365	0.365	0.365
245	2.816	2.816	2.816	2.816	2.769	2.769	2.727	2.718	2.333	2.261	0.613	0.365	0.365	0.365
250	2.932	2.932	2.932	2.932	2.897	2.897	2.859	2.852	2.499	2.432	0.861	0.365	0.365	0.365
255	3.048	3.048	3.048	3.048	3.025	3.025	2.992	2.985	2.664	2.602	1.110	0.365	0.365	0.365
260	3.164	3.164	3.164	3.164	3.153	3.153	3.124	3.119	2.830	2.773	1.358	0.365	0.365	0.365
265	3.281	3.281	3.281	3.281	3.281	3.281	3.257	3.252	2.996	2.944	1.607	0.365	0.365	0.365
270	3.409	3.409	3.409	3.409	3.409	3.409	3.390	3.386	3.161	3.114	1.855	0.365	0.365	0.365
275	3.537	3.537	3.537	3.537	3.537	3.537	3.522	3.519	3.327	3.285	2.104	0.365	0.365	0.365
280	3.665	3.665	3.665	3.665	3.665	3.665	3.655	3.653	3.492	3.456	2.352	0.365	0.365	0.365
285	3.793	3.793	3.793	3.793	3.793	3.793	3.787	3.786	3.658	3.626	2.601	0.377	0.365	0.365
290	3.920	3.920	3.920	3.920	3.920	3.920	3.920	3.920	3.824	3.797	2.850	0.616	0.365	0.365
295	4.053	4.053	4.053	4.053	4.053	4.053	4.053	4.053	3.989	3.968	3.098	0.854	0.365	0.365
300	4.187	4.187	4.187	4.187	4.187	4.187	4.187	4.187	4.155	4.138	3.347	1.093	0.365	0.365
305	4.321	4.321	4.321	4.321	4.321	4.321	4.321	4.321	4.321	4.309	3.595	1.332	0.365	0.365
310	4.455	4.455	4.455	4.455	4.455	4.455	4.455	4.455	4.455	4.454	3.844	1.571	0.365	0.365
315	4.487	4.487	4.487	4.487	4.487	4.487	4.487	4.487	4.487	4.485	4.092	1.809	0.365	0.365
320	4.521	4.521	4.521	4.521	4.521	4.521	4.521	4.521	4.519	4.516	4.341	2.048	0.365	0.365
325	4.557	4.557	4.557	4.557	4.557	4.557	4.557	4.557	4.551	4.548	4.463	2.287	0.365	0.365
330	4.593	4.593	4.593	4.593	4.593	4.593	4.593	4.593	4.582	4.579	4.488	2.526	0.365	0.365

Thickness is intumescent only.

Table 23 Circular Hollow Columns 45 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	1.051	0.560	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
55	1.194	0.675	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
60	1.338	0.790	0.421	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
65	1.481	0.906	0.514	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
70	1.624	1.021	0.607	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
75	1.767	1.137	0.699	0.430	0.375	0.373	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
80	1.911	1.252	0.792	0.502	0.444	0.441	0.419	0.414	0.365	0.365	0.365	0.365	0.365	0.365
85	2.061	1.367	0.885	0.575	0.513	0.510	0.486	0.481	0.367	0.365	0.365	0.365	0.365	0.365
90	2.237	1.483	0.978	0.648	0.581	0.579	0.553	0.548	0.427	0.413	0.365	0.365	0.365	0.365
95	2.412	1.598	1.070	0.720	0.650	0.648	0.620	0.615	0.486	0.472	0.365	0.365	0.365	0.365
100	2.588	1.713	1.163	0.793	0.719	0.716	0.688	0.682	0.546	0.531	0.365	0.365	0.365	0.365
105	2.763	1.829	1.256	0.866	0.787	0.785	0.755	0.749	0.606	0.591	0.365	0.365	0.365	0.365
110	2.939	1.944	1.348	0.939	0.856	0.854	0.822	0.816	0.666	0.650	0.425	0.365	0.365	0.365
115	3.115	2.057	1.441	1.011	0.925	0.922	0.889	0.882	0.726	0.709	0.553	0.365	0.365	0.365
120	3.290	2.164	1.534	1.084	0.993	0.991	0.956	0.949	0.786	0.768	0.682	0.365	0.365	0.365
125	3.466	2.270	1.626	1.157	1.062	1.060	1.023	1.016	0.846	0.827	0.810	0.365	0.365	0.365
130	3.559	2.377	1.719	1.229	1.131	1.129	1.091	1.083	0.939	0.939	0.939	0.365	0.365	0.365
135	3.599	2.484	1.812	1.302	1.199	1.197	1.158	1.150	1.068	1.068	1.068	0.398	0.365	0.365
140	3.639	2.591	1.904	1.375	1.268	1.266	1.225	1.217	1.196	1.196	1.196	0.541	0.365	0.365
145	3.680	2.697	1.997	1.447	1.337	1.335	1.325	1.325	1.325	1.325	1.325	0.684	0.365	0.365
150	3.720	2.804	2.105	1.520	1.453	1.453	1.453	1.453	1.453	1.453	1.453	0.827	0.365	0.365
155	3.760	2.911	2.219	1.593	1.582	1.582	1.582	1.582	1.582	1.582	1.582	0.969	0.365	0.365
160	3.800	3.018	2.333	1.710	1.710	1.710	1.710	1.710	1.710	1.710	1.710	1.112	0.365	0.365
165	3.840	3.125	2.447	1.839	1.839	1.839	1.839	1.839	1.839	1.839	1.839	1.255	0.365	0.365
170	3.880	3.231	2.560	1.967	1.967	1.967	1.967	1.967	1.967	1.967	1.967	1.397	0.419	0.365
175	3.920	3.338	2.674	2.096	2.096	2.096	2.096	2.096	2.096	2.096	2.096	1.540	0.570	0.365
180	3.960	3.445	2.788	2.224	2.224	2.224	2.224	2.224	2.224	2.224	2.224	1.683	0.722	0.365
185	4.000	3.546	2.902	2.353	2.353	2.353	2.353	2.353	2.353	2.353	2.353	1.826	0.874	0.365
190	4.041	3.620	3.016	2.482	2.482	2.482	2.482	2.482	2.482	2.482	2.482	1.968	1.025	0.365
195	4.081	3.694	3.129	2.610	2.610	2.610	2.610	2.610	2.610	2.610	2.610	2.111	1.177	0.365
200	4.121	3.768	3.243	2.739	2.739	2.739	2.739	2.739	2.739	2.739	2.739	2.254	1.329	0.365
205	4.161	3.841	3.357	2.867	2.867	2.867	2.867	2.867	2.867	2.867	2.867	2.397	1.480	0.365
210	4.201	3.915	3.471	2.996	2.996	2.996	2.996	2.996	2.996	2.996	2.996	2.539	1.632	0.365
215	4.241	3.989	3.584	3.124	3.124	3.124	3.124	3.124	3.124	3.124	3.124	2.682	1.784	0.365
220	4.281	4.062	3.698	3.253	3.253	3.253	3.253	3.253	3.253	3.253	3.253	2.825	1.936	0.365
225	4.321	4.136	3.812	3.392	3.381	3.381	3.381	3.381	3.381	3.381	3.381	2.968	2.087	0.365
230	4.361	4.210	3.926	3.561	3.510	3.510	3.510	3.510	3.510	3.510	3.510	3.110	2.239	0.365
235	4.401	4.284	4.040	3.730	3.638	3.638	3.638	3.638	3.638	3.638	3.638	3.253	2.391	0.365
240	4.442	4.357	4.153	3.900	3.797	3.797	3.767	3.767	3.767	3.767	3.767	3.396	2.542	0.398
245	4.647	4.431	4.267	4.069	3.994	3.994	3.946	3.935	3.896	3.896	3.896	3.539	2.694	0.524
250	4.884	4.538	4.381	4.238	4.192	4.192	4.156	4.149	4.024	4.024	4.024	3.681	2.846	0.651
255	5.120	4.655	4.519	4.408	4.389	4.389	4.367	4.363	4.153	4.153	4.153	3.824	2.997	0.777
260	5.357	4.772	4.692	4.531	4.518	4.518	4.507	4.505	4.456	4.450	4.281	3.967	3.149	0.903
265	5.594	4.888	4.865	4.641	4.618	4.618	4.604	4.601	4.539	4.532	4.410	4.109	3.301	1.030
270	5.831	5.039	5.039	4.750	4.718	4.718	4.700	4.697	4.623	4.614	4.493	4.252	3.453	1.156
275	6.060	5.212	5.212	4.859	4.818	4.818	4.797	4.793	4.706	4.696	4.557	4.395	3.604	1.282
280	6.185	5.385	5.385	4.969	4.918	4.918	4.893	4.889	4.790	4.778	4.621	4.479	3.756	1.409
285	6.311	5.558	5.558	5.078	5.018	5.018	4.990	4.984	4.873	4.859	4.684	4.527	3.908	1.535
290	6.437	5.731	5.731	5.188	5.118	5.118	5.086	5.080	4.957	4.941	4.748	4.576	4.059	1.661
295	6.562	5.904	5.904	5.297	5.218	5.218	5.183	5.176	5.040	5.023	4.812	4.625	4.211	1.788
300	6.688	6.061	6.061	5.406	5.318	5.318	5.279	5.272	5.123	5.105	4.876	4.673	4.363	1.914
305	6.813	6.123	6.123	5.516	5.418	5.418	5.376	5.368	5.207	5.187	4.940	4.722	4.464	2.040
310	6.939	6.186	6.186	5.625	5.518	5.518	5.472	5.463	5.290	5.268	5.004	4.771	4.502	2.167
315	7.065	6.248	6.248	5.734	5.618	5.618	5.569	5.559	5.374	5.350	5.068	4.820	4.539	2.293
320	7.190	6.311	6.311	5.844	5.718	5.718	5.665	5.655	5.457	5.432	5.131	4.868	4.577	2.419
325	7.316	6.374	6.374	5.953	5.818	5.818	5.762	5.751	5.540	5.514	5.195	4.917	4.614	2.546
330	7.442	6.436	6.436	6.057	5.918	5.918	5.858	5.847	5.624	5.595	5.259	4.966	4.652	2.672

Thickness is intumescent only.

Table 24 Circular Hollow Columns 60 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	1.741	1.153	0.719	0.444	0.390	0.388	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
55	1.958	1.332	0.868	0.546	0.481	0.479	0.455	0.450	0.365	0.365	0.365	0.365	0.365	0.365
60	2.313	1.511	1.018	0.670	0.600	0.597	0.571	0.566	0.449	0.437	0.365	0.365	0.365	0.365
65	2.727	1.690	1.168	0.793	0.718	0.716	0.687	0.682	0.555	0.541	0.365	0.365	0.365	0.365
70	3.140	1.870	1.317	0.917	0.836	0.834	0.803	0.798	0.661	0.646	0.430	0.365	0.365	0.365
75	3.537	2.067	1.467	1.040	0.954	0.952	0.920	0.913	0.766	0.750	0.519	0.365	0.365	0.365
80	3.578	2.365	1.617	1.164	1.073	1.071	1.036	1.029	0.872	0.855	0.608	0.394	0.365	0.365
85	3.618	2.662	1.766	1.288	1.191	1.189	1.152	1.145	0.978	0.960	0.697	0.469	0.365	0.365
90	3.659	2.960	1.916	1.411	1.309	1.307	1.268	1.261	1.083	1.064	0.786	0.545	0.365	0.365
95	3.700	3.258	2.062	1.535	1.427	1.425	1.384	1.376	1.189	1.169	0.875	0.620	0.399	0.365
100	3.741	3.538	2.197	1.658	1.546	1.544	1.501	1.492	1.295	1.274	0.964	0.696	0.463	0.365
105	3.782	3.583	2.333	1.782	1.664	1.662	1.617	1.608	1.400	1.378	1.053	0.771	0.526	0.365
110	3.822	3.628	2.468	1.906	1.782	1.780	1.733	1.724	1.506	1.483	1.142	0.847	0.589	0.365
115	3.863	3.674	2.604	2.027	1.901	1.899	1.849	1.839	1.612	1.588	1.231	0.923	0.653	0.365
120	3.904	3.719	2.739	2.119	2.019	2.017	1.965	1.955	1.717	1.692	1.320	0.998	0.716	0.365
125	3.945	3.764	2.875	2.210	2.102	2.101	2.063	2.055	1.823	1.797	1.409	1.074	0.779	0.394
130	3.985	3.809	3.010	2.301	2.185	2.184	2.142	2.134	1.928	1.901	1.498	1.149	0.843	0.448
135	4.026	3.854	3.146	2.392	2.268	2.267	2.222	2.213	2.037	2.006	1.587	1.225	0.906	0.502
140	4.067	3.899	3.281	2.484	2.350	2.350	2.302	2.292	2.170	2.136	1.676	1.301	0.969	0.557
145	4.108	3.945	3.417	2.575	2.433	2.433	2.381	2.371	2.302	2.269	1.765	1.376	1.033	0.611
150	4.149	3.990	3.545	2.666	2.516	2.516	2.461	2.450	2.435	2.403	1.854	1.452	1.096	0.665
155	4.189	4.035	3.618	2.757	2.599	2.599	2.568	2.568	2.568	2.537	1.943	1.527	1.159	0.719
160	4.230	4.080	3.691	2.849	2.700	2.700	2.700	2.700	2.700	2.671	2.039	1.603	1.223	0.773
165	4.271	4.125	3.765	2.940	2.833	2.833	2.833	2.833	2.833	2.805	2.200	1.678	1.286	0.827
170	4.312	4.170	3.838	3.031	2.966	2.966	2.966	2.966	2.966	2.939	2.361	1.754	1.349	0.881
175	4.353	4.216	3.911	3.122	3.098	3.098	3.098	3.098	3.098	3.073	2.522	1.830	1.413	0.936
180	4.393	4.261	3.985	3.231	3.231	3.231	3.231	3.231	3.231	3.206	2.683	1.905	1.476	0.990
185	4.434	4.306	4.058	3.363	3.363	3.363	3.363	3.363	3.363	3.340	2.844	1.981	1.539	1.044
190	4.647	4.351	4.131	3.496	3.496	3.496	3.496	3.496	3.496	3.474	3.004	2.117	1.603	1.098
195	4.950	4.396	4.205	3.629	3.629	3.629	3.629	3.629	3.629	3.608	3.165	2.328	1.666	1.152
200	5.252	4.442	4.278	3.761	3.761	3.761	3.761	3.761	3.761	3.742	3.326	2.538	1.729	1.206
205	5.555	4.624	4.352	3.894	3.894	3.894	3.894	3.894	3.894	3.876	3.487	2.748	1.793	1.261
210	5.858	4.830	4.425	4.052	4.027	4.027	4.027	4.027	4.027	4.010	3.648	2.958	1.856	1.315
215	6.126	5.036	4.691	4.260	4.159	4.159	4.159	4.159	4.159	4.143	3.809	3.168	1.919	1.369
220	6.333	5.242	5.044	4.474	4.359	4.359	4.292	4.292	4.292	4.277	3.970	3.378	1.983	1.423
225	6.541	5.448	5.398	4.737	4.649	4.649	4.607	4.599	4.424	4.411	4.130	3.588	2.128	1.477
230	6.748	5.751	5.751	5.000	4.895	4.895	4.847	4.838	4.630	4.606	4.291	3.798	2.406	1.531
235	6.956	6.065	6.065	5.264	5.142	5.142	5.088	5.077	4.851	4.825	4.452	4.008	2.684	1.585
240	7.163	6.160	6.160	5.527	5.388	5.388	5.328	5.317	5.073	5.043	4.617	4.218	2.963	1.640
245	7.371	6.255	6.255	5.790	5.635	5.635	5.569	5.556	5.294	5.262	4.783	4.428	3.241	1.694
250	7.578	6.360	6.350	6.052	5.882	5.882	5.809	5.795	5.516	5.480	4.948	4.555	3.520	1.748
255	7.786	6.509	6.444	6.135	6.076	6.076	6.050	6.035	5.737	5.699	5.113	4.673	3.798	1.802
260	7.993	6.658	6.539	6.218	6.157	6.157	6.131	6.125	5.959	5.917	5.278	4.791	4.076	1.856
265	8.201	6.806	6.634	6.302	6.238	6.238	6.210	6.205	6.094	6.080	5.444	4.908	4.355	1.910
270	8.408	6.955	6.729	6.385	6.319	6.319	6.290	6.285	6.169	6.154	5.609	5.026	4.507	1.965
275	-	7.104	6.823	6.469	6.400	6.400	6.370	6.364	6.244	6.228	5.774	5.144	4.596	2.019
280	-	7.253	6.918	6.552	6.481	6.481	6.450	6.444	6.318	6.301	5.939	5.262	4.685	2.869
285	-	7.402	7.013	6.635	6.562	6.562	6.530	6.524	6.393	6.375	6.072	5.380	4.774	3.771
290	-	7.551	7.108	6.719	6.643	6.643	6.610	6.604	6.467	6.449	6.138	5.498	4.863	4.464
295	-	7.700	7.202	6.802	6.724	6.724	6.690	6.683	6.542	6.523	6.204	5.616	4.952	4.528
300	-	7.849	7.297	6.886	6.805	6.805	6.770	6.763	6.616	6.597	6.270	5.733	5.041	4.592
305	-	7.998	7.392	6.969	6.886	6.886	6.850	6.843	6.691	6.671	6.336	5.851	5.130	4.656
310	-	8.146	7.487	7.052	6.967	6.967	6.930	6.922	6.765	6.745	6.402	5.969	5.218	4.720
315	-	8.295	7.581	7.136	7.048	7.048	7.010	7.002	6.840	6.819	6.468	6.070	5.307	4.784
320	-	8.444	7.676	7.219	7.129	7.129	7.090	7.082	6.914	6.893	6.534	6.132	5.396	4.847
325	-	-	7.771	7.303	7.210	7.210	7.169	7.161	6.989	6.966	6.600	6.193	5.485	4.911
330	-	-	7.866	7.386	7.291	7.291	7.249	7.241	7.064	7.040	6.666	6.255	5.574	4.975

Thickness is intumescent only.

Table 25 Circular Hollow Columns 75 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	3.155	1.767	1.247	0.875	0.801	0.799	0.770	0.765	0.637	0.624	0.435	0.365	0.365	0.365
55	3.610	2.012	1.454	1.048	0.967	0.964	0.934	0.927	0.782	0.766	0.538	0.365	0.365	0.365
60	3.795	2.576	1.661	1.220	1.132	1.130	1.097	1.090	0.933	0.916	0.669	0.458	0.365	0.365
65	3.980	3.153	1.867	1.393	1.298	1.296	1.260	1.253	1.083	1.065	0.800	0.573	0.373	0.365
70	4.165	3.568	2.097	1.566	1.464	1.462	1.423	1.415	1.234	1.215	0.931	0.688	0.473	0.365
75	4.350	3.665	2.392	1.738	1.630	1.628	1.586	1.578	1.385	1.364	1.062	0.803	0.573	0.365
80	4.535	3.762	2.688	1.911	1.796	1.793	1.749	1.741	1.535	1.514	1.193	0.918	0.674	0.365
85	4.720	3.859	2.983	2.098	1.961	1.959	1.912	1.903	1.686	1.663	1.324	1.033	0.774	0.433
90	4.905	3.956	3.279	2.310	2.146	2.144	2.084	2.073	1.836	1.812	1.454	1.148	0.874	0.522
95	5.091	4.053	3.542	2.522	2.342	2.340	2.274	2.261	1.987	1.962	1.585	1.263	0.974	0.611
100	5.276	4.151	3.594	2.735	2.537	2.536	2.463	2.449	2.142	2.113	1.716	1.378	1.075	0.701
105	5.461	4.248	3.646	2.947	2.733	2.732	2.653	2.638	2.298	2.266	1.847	1.493	1.175	0.790
110	5.646	4.345	3.698	3.159	2.928	2.928	2.843	2.826	2.454	2.419	1.978	1.608	1.275	0.879
115	5.831	4.442	3.751	3.371	3.125	3.125	3.032	3.014	2.610	2.572	2.092	1.723	1.375	0.968
120	6.016	4.539	3.803	3.549	3.321	3.321	3.222	3.203	2.767	2.724	2.197	1.838	1.476	1.058
125	6.201	4.636	3.855	3.612	3.517	3.517	3.411	3.391	2.923	2.877	2.303	1.953	1.576	1.147
130	6.386	4.733	3.907	3.674	3.595	3.595	3.559	3.551	3.079	3.030	2.408	2.074	1.676	1.236
135	6.572	4.830	3.959	3.737	3.662	3.662	3.627	3.620	3.235	3.183	2.514	2.205	1.776	1.325
140	6.757	4.927	4.012	3.799	3.729	3.729	3.696	3.689	3.391	3.336	2.619	2.336	1.877	1.414
145	6.942	5.024	4.064	3.861	3.795	3.795	3.764	3.758	3.542	3.489	2.725	2.468	1.977	1.504
150	7.127	5.122	4.116	3.924	3.862	3.862	3.833	3.827	3.624	3.594	2.830	2.599	2.095	1.593
155	7.312	5.219	4.168	3.986	3.928	3.928	3.901	3.895	3.706	3.678	2.936	2.730	2.228	1.682
160	7.497	5.316	4.220	4.049	3.995	3.995	3.969	3.964	3.789	3.763	3.041	2.861	2.362	1.771
165	7.682	5.413	4.272	4.111	4.061	4.061	4.038	4.033	3.871	3.847	3.146	2.992	2.495	1.860
170	7.867	5.510	4.325	4.173	4.128	4.128	4.106	4.102	3.954	3.932	3.252	3.124	2.628	1.950
175	8.053	5.607	4.377	4.236	4.195	4.195	4.175	4.171	4.036	4.016	3.357	3.255	2.762	2.050
180	8.238	5.704	4.429	4.298	4.261	4.261	4.243	4.239	4.119	4.101	3.463	3.386	2.895	2.196
185	8.423	5.801	4.769	4.361	4.328	4.328	4.312	4.308	4.201	4.185	3.589	3.517	3.028	2.342
190	-	5.898	5.275	4.423	4.394	4.394	4.380	4.377	4.284	4.270	3.761	3.648	3.162	2.489
195	-	5.995	5.781	4.691	4.522	4.522	4.450	4.446	4.366	4.354	3.933	3.780	3.295	2.635
200	-	6.224	6.116	5.096	4.904	4.904	4.823	4.807	4.450	4.439	4.105	3.911	3.428	2.781
205	-	6.628	6.255	5.502	5.285	5.285	5.195	5.178	4.792	4.749	4.277	4.042	3.562	2.927
210	-	7.033	6.394	5.907	5.666	5.666	5.568	5.549	5.133	5.086	4.450	4.173	3.695	3.074
215	-	7.437	6.533	6.131	6.048	6.048	5.940	5.919	5.475	5.423	4.744	4.305	3.828	3.220
220	-	7.842	6.672	6.255	6.171	6.171	6.135	6.128	5.817	5.760	5.038	4.436	3.962	3.366
225	-	8.246	6.811	6.378	6.292	6.292	6.255	6.247	6.087	6.066	5.332	4.680	4.095	3.513
230	-	-	6.950	6.502	6.413	6.413	6.374	6.366	6.200	6.178	5.626	4.936	4.228	3.659
235	-	-	7.089	6.626	6.534	6.534	6.493	6.486	6.312	6.290	5.920	5.192	4.362	3.805
240	-	-	7.228	6.750	6.655	6.655	6.613	6.605	6.425	6.402	6.105	5.448	4.530	3.952
245	-	-	7.367	6.874	6.775	6.775	6.732	6.724	6.538	6.514	6.202	5.703	4.765	4.098
250	-	-	7.506	6.997	6.896	6.896	6.852	6.843	6.651	6.626	6.299	5.959	4.999	4.244
255	-	-	7.645	7.121	7.017	7.017	6.971	6.962	6.764	6.738	6.396	6.106	5.233	4.391
260	-	-	7.784	7.245	7.138	7.138	7.091	7.082	6.877	6.850	6.493	6.192	5.468	4.542
265	-	-	7.923	7.369	7.259	7.259	7.210	7.201	6.989	6.962	6.590	6.277	5.702	4.698
270	-	-	8.062	7.493	7.380	7.380	7.330	7.320	7.102	7.074	6.687	6.363	5.937	4.853
275	-	-	8.201	7.616	7.501	7.501	7.449	7.439	7.215	7.186	6.784	6.449	6.091	5.009
280	-	-	8.339	7.740	7.622	7.622	7.569	7.558	7.328	7.298	6.881	6.534	6.168	5.164
285	-	-	8.478	7.864	7.743	7.743	7.688	7.678	7.441	7.410	6.978	6.620	6.246	5.320
290	-	-	-	7.988	7.864	7.864	7.808	7.797	7.554	7.522	7.075	6.706	6.323	5.476
295	-	-	-	8.112	7.985	7.985	7.927	7.916	7.667	7.634	7.172	6.791	6.400	5.631
300	-	-	-	8.235	8.106	8.106	8.047	8.035	7.779	7.746	7.269	6.877	6.478	5.787
305	-	-	-	8.359	8.226	8.226	8.166	8.154	7.892	7.858	7.366	6.962	6.555	5.942
310	-	-	-	8.483	8.347	8.347	8.286	8.274	8.005	7.970	7.463	7.048	6.633	6.074
315	-	-	-	-	8.448	8.468	8.405	8.393	8.118	8.082	7.560	7.134	6.710	6.150
320	-	-	-	-	-	-	-	-	8.231	8.194	7.657	7.219	6.788	6.226
325	-	-	-	-	-	-	-	-	8.344	8.306	7.754	7.305	6.865	6.302
330	-	-	-	-	-	-	-	-	8.457	8.418	7.851	7.391	6.943	6.379

Thickness is intumescent only.

Table 26 Circular Hollow Columns 90 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	-	3.212	1.792	1.340	1.251	1.248	1.214	1.208	1.049	1.032	0.786	0.587	0.411	0.365
55	-	3.662	2.091	1.563	1.465	1.463	1.426	1.418	1.244	1.226	0.958	0.725	0.513	0.365
60	-	3.870	2.609	1.786	1.680	1.677	1.637	1.629	1.440	1.420	1.130	0.879	0.651	0.365
65	-	4.079	3.127	2.009	1.894	1.892	1.848	1.839	1.636	1.615	1.302	1.033	0.788	0.471
70	-	4.287	3.575	2.384	2.166	2.162	2.083	2.068	1.832	1.809	1.474	1.187	0.925	0.595
75	-	4.495	3.763	2.768	2.522	2.520	2.430	2.412	2.030	2.004	1.646	1.341	1.063	0.720
80	-	4.704	3.951	3.152	2.879	2.877	2.776	2.757	2.321	2.280	1.818	1.495	1.200	0.845
85	-	4.912	4.139	3.535	3.235	3.234	3.122	3.101	2.611	2.564	1.990	1.649	1.338	0.969
90	-	5.121	4.327	3.663	3.555	3.555	3.469	3.445	2.901	2.849	2.190	1.803	1.475	1.094
95	-	5.329	4.515	3.790	3.684	3.684	3.640	3.631	3.192	3.134	2.397	1.956	1.613	1.218
100	-	5.537	4.703	3.918	3.813	3.813	3.769	3.761	3.482	3.418	2.604	2.108	1.750	1.343
105	-	5.746	4.891	4.045	3.942	3.942	3.899	3.890	3.645	3.614	2.811	2.259	1.887	1.467
110	-	5.954	5.080	4.173	4.071	4.071	4.028	4.020	3.779	3.749	3.018	2.410	2.024	1.592
115	-	6.162	5.268	4.300	4.200	4.200	4.158	4.150	3.913	3.884	3.224	2.560	2.132	1.717
120	-	6.371	5.456	4.427	4.329	4.329	4.288	4.279	4.047	4.018	3.431	2.711	2.239	1.841
125	-	6.579	5.644	4.555	4.458	4.458	4.417	4.409	4.181	4.153	3.569	2.862	2.347	1.966
130	-	6.788	5.832	4.682	4.587	4.587	4.547	4.538	4.315	4.287	3.637	3.012	2.455	2.086
135	-	6.996	6.020	4.810	4.716	4.716	4.676	4.668	4.449	4.422	3.704	3.163	2.562	2.202
140	-	7.204	6.208	4.937	4.845	4.845	4.806	4.798	4.584	4.557	3.772	3.313	2.670	2.319
145	-	7.413	6.396	5.065	4.974	4.974	4.935	4.927	4.718	4.691	3.840	3.464	2.777	2.435
150	-	7.621	6.584	5.192	5.103	5.103	5.065	5.057	4.852	4.826	3.908	3.581	2.885	2.551
155	-	7.830	6.772	5.319	5.232	5.232	5.194	5.187	4.986	4.960	3.976	3.667	2.993	2.668
160	-	8.038	6.960	5.447	5.361	5.361	5.324	5.316	5.120	5.095	4.043	3.754	3.100	2.784
165	-	8.246	7.148	5.574	5.490	5.490	5.453	5.446	5.254	5.230	4.111	3.841	3.208	2.901
170	-	8.455	7.336	5.702	5.619	5.619	5.583	5.576	5.388	5.364	4.179	3.927	3.315	3.017
175	-	-	7.524	5.829	5.748	5.748	5.713	5.705	5.523	5.499	4.247	4.014	3.423	3.133
180	-	-	7.712	5.957	5.877	5.877	5.842	5.835	5.657	5.633	4.315	4.100	3.531	3.250
185	-	-	7.901	6.123	6.006	6.006	5.972	5.965	5.791	5.768	4.382	4.187	3.660	3.366
190	-	-	8.089	6.402	6.212	6.212	6.142	6.129	5.925	5.903	4.463	4.273	3.790	3.482
195	-	-	8.277	6.681	6.460	6.460	6.377	6.361	6.062	6.037	4.905	4.360	3.920	3.599
200	-	-	8.465	6.960	6.709	6.709	6.612	6.594	6.249	6.214	5.347	4.446	4.050	3.715
205	-	-	-	7.239	6.957	6.957	6.848	6.827	6.436	6.396	5.789	4.817	4.180	3.832
210	-	-	-	7.518	7.205	7.205	7.083	7.060	6.623	6.577	6.108	5.192	4.310	3.948
215	-	-	-	7.797	7.453	7.453	7.318	7.292	6.810	6.759	6.248	5.568	4.440	4.064
220	-	-	-	8.076	7.701	7.701	7.553	7.525	6.997	6.940	6.388	5.943	4.792	4.181
225	-	-	-	8.355	7.950	7.950	7.788	7.758	7.184	7.122	6.528	6.141	5.156	4.297
230	-	-	-	-	8.198	8.198	8.023	7.990	7.371	7.304	6.668	6.268	5.521	4.414
235	-	-	-	-	8.386	8.446	8.258	8.223	7.558	7.485	6.808	6.394	5.886	4.704
240	-	-	-	-	-	-	-	8.456	7.745	7.667	6.949	6.520	6.114	5.069
245	-	-	-	-	-	-	-	-	7.932	7.849	7.089	6.647	6.229	5.433
250	-	-	-	-	-	-	-	-	8.119	8.030	7.229	6.773	6.343	5.797
255	-	-	-	-	-	-	-	-	8.306	8.212	7.369	6.899	6.458	6.082
260	-	-	-	-	-	-	-	-	-	8.393	7.509	7.026	6.573	6.186
265	-	-	-	-	-	-	-	-	-	-	7.649	7.152	6.688	6.289
270	-	-	-	-	-	-	-	-	-	-	7.789	7.279	6.803	6.392
275	-	-	-	-	-	-	-	-	-	-	7.929	7.405	6.918	6.496
280	-	-	-	-	-	-	-	-	-	-	8.069	7.531	7.032	6.599
285	-	-	-	-	-	-	-	-	-	-	8.209	7.658	7.147	6.703
290	-	-	-	-	-	-	-	-	-	-	8.349	7.784	7.262	6.806
295	-	-	-	-	-	-	-	-	-	-	8.489	7.910	7.377	6.909
300	-	-	-	-	-	-	-	-	-	-	-	8.037	7.492	7.013
305	-	-	-	-	-	-	-	-	-	-	-	8.163	7.606	7.116
310	-	-	-	-	-	-	-	-	-	-	-	8.290	7.721	7.220
315	-	-	-	-	-	-	-	-	-	-	-	8.416	7.836	7.323
320	-	-	-	-	-	-	-	-	-	-	-	-	7.951	7.426
325	-	-	-	-	-	-	-	-	-	-	-	-	8.066	7.530
330	-	-	-	-	-	-	-	-	-	-	-	-	8.180	7.633

Thickness is intumescent only.

Table 27 Circular Hollow Columns 105 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	-	-	2.923	1.818	1.712	1.710	1.670	1.662	1.476	1.456	1.173	0.931	0.716	0.453
55	-	-	3.569	2.178	1.977	1.974	1.930	1.922	1.718	1.697	1.387	1.124	0.885	0.572
60	-	-	3.819	2.787	2.492	2.488	2.380	2.359	1.960	1.937	1.601	1.318	1.059	0.732
65	-	-	4.069	3.396	3.059	3.056	2.932	2.908	2.369	2.318	1.815	1.511	1.233	0.892
70	-	-	4.319	3.709	3.571	3.570	3.484	3.457	2.836	2.776	2.034	1.704	1.407	1.053
75	-	-	4.569	3.935	3.791	3.791	3.733	3.722	3.302	3.234	2.375	1.897	1.582	1.213
80	-	-	4.819	4.161	4.012	4.012	3.952	3.940	3.639	3.606	2.717	2.113	1.756	1.373
85	-	-	5.069	4.386	4.233	4.233	4.170	4.158	3.848	3.813	3.059	2.373	1.930	1.533
90	-	-	5.319	4.612	4.454	4.454	4.389	4.376	4.056	4.020	3.401	2.633	2.114	1.693
95	-	-	5.569	4.837	4.675	4.675	4.607	4.594	4.265	4.227	3.617	2.892	2.310	1.853
100	-	-	5.820	5.063	4.896	4.896	4.826	4.812	4.473	4.434	3.752	3.152	2.506	2.013
105	-	-	6.070	5.289	5.117	5.117	5.044	5.030	4.682	4.641	3.887	3.412	2.703	2.155
110	-	-	6.320	5.514	5.338	5.338	5.263	5.248	4.890	4.848	4.022	3.567	2.899	2.295
115	-	-	6.570	5.740	5.559	5.559	5.481	5.466	5.099	5.055	4.157	3.627	3.095	2.436
120	-	-	6.820	5.966	5.780	5.780	5.700	5.684	5.307	5.262	4.292	3.687	3.291	2.577
125	-	-	7.070	6.191	6.001	6.001	5.919	5.902	5.516	5.469	4.427	3.747	3.487	2.717
130	-	-	7.320	6.417	6.222	6.222	6.137	6.120	5.724	5.675	4.562	3.808	3.584	2.858
135	-	-	7.570	6.642	6.443	6.443	6.356	6.338	5.933	5.882	4.697	3.868	3.649	2.999
140	-	-	7.820	6.868	6.664	6.664	6.574	6.556	6.141	6.089	4.832	3.928	3.714	3.139
145	-	-	8.070	7.094	6.885	6.885	6.793	6.774	6.350	6.296	4.967	3.988	3.779	3.280
150	-	-	8.320	7.319	7.106	7.106	7.011	6.992	6.558	6.503	5.102	4.049	3.845	3.421
155	-	-	-	7.545	7.327	7.327	7.230	7.211	6.767	6.710	5.237	4.109	3.910	3.550
160	-	-	-	7.770	7.548	7.548	7.448	7.429	6.975	6.917	5.372	4.169	3.975	3.631
165	-	-	-	7.996	7.769	7.769	7.667	7.647	7.183	7.124	5.507	4.229	4.040	3.712
170	-	-	-	8.222	7.990	7.990	7.885	7.865	7.392	7.331	5.642	4.289	4.105	3.792
175	-	-	-	8.447	8.211	8.211	8.104	8.083	7.600	7.538	5.777	4.350	4.170	3.873
180	-	-	-	-	8.403	8.432	8.322	8.301	7.809	7.745	5.912	4.410	4.235	3.954
185	-	-	-	-	-	-	-	-	8.017	7.952	6.047	4.652	4.300	4.035
190	-	-	-	-	-	-	-	-	8.226	8.159	6.392	5.207	4.365	4.115
195	-	-	-	-	-	-	-	-	8.434	8.366	6.741	5.761	4.430	4.196
200	-	-	-	-	-	-	-	-	-	-	7.091	6.157	4.822	4.277
205	-	-	-	-	-	-	-	-	-	-	7.441	6.377	5.338	4.358
210	-	-	-	-	-	-	-	-	-	-	7.790	6.598	5.853	4.438
215	-	-	-	-	-	-	-	-	-	-	8.140	6.819	6.153	4.921
220	-	-	-	-	-	-	-	-	-	-	8.490	7.040	6.320	5.458
225	-	-	-	-	-	-	-	-	-	-	-	7.260	6.486	5.995
230	-	-	-	-	-	-	-	-	-	-	-	7.481	6.653	6.188
235	-	-	-	-	-	-	-	-	-	-	-	7.702	6.819	6.342
240	-	-	-	-	-	-	-	-	-	-	-	7.923	6.986	6.495
245	-	-	-	-	-	-	-	-	-	-	-	8.144	7.152	6.648
250	-	-	-	-	-	-	-	-	-	-	-	8.364	7.319	6.802
255	-	-	-	-	-	-	-	-	-	-	-	-	7.485	6.955
260	-	-	-	-	-	-	-	-	-	-	-	-	7.652	7.109
265	-	-	-	-	-	-	-	-	-	-	-	-	7.818	7.262
270	-	-	-	-	-	-	-	-	-	-	-	-	7.985	7.415
275	-	-	-	-	-	-	-	-	-	-	-	-	8.151	7.569
280	-	-	-	-	-	-	-	-	-	-	-	-	8.318	7.722
285	-	-	-	-	-	-	-	-	-	-	-	-	8.484	7.876
290	-	-	-	-	-	-	-	-	-	-	-	-	-	8.029
295	-	-	-	-	-	-	-	-	-	-	-	-	-	8.182
300	-	-	-	-	-	-	-	-	-	-	-	-	-	8.336
305	-	-	-	-	-	-	-	-	-	-	-	-	-	8.489
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Table 28 Circular Hollow Columns 120 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	-	-	-	2.878	2.528	2.521	2.385	2.358	1.914	1.892	1.569	1.299	1.054	0.748
55	-	-	-	3.166	3.301	3.297	3.151	3.123	2.451	2.390	1.826	1.532	1.265	0.935
60	-	-	-	-	-	-	3.673	3.662	3.137	3.064	2.144	1.765	1.477	1.131
65	-	-	-	-	-	-	3.949	3.938	3.646	3.614	2.655	1.998	1.688	1.327
70	-	-	-	-	-	-	4.225	4.213	3.910	3.876	3.166	2.380	1.899	1.523
75	-	-	-	-	-	-	4.501	4.489	4.174	4.138	3.601	2.780	2.153	1.718
80	-	-	-	-	-	-	4.777	4.764	4.438	4.401	3.837	3.179	2.465	1.914
85	-	-	-	-	-	-	5.053	5.040	4.702	4.663	4.073	3.558	2.778	2.128
90	-	-	-	-	-	-	5.329	5.315	4.966	4.925	4.309	3.772	3.090	2.363
95	-	-	-	-	-	-	5.605	5.591	5.231	5.188	4.545	3.987	3.403	2.597
100	-	-	-	-	-	-	5.882	5.866	5.495	5.450	4.781	4.201	3.612	2.832
105	-	-	-	-	-	-	6.158	6.142	5.759	5.712	5.018	4.415	3.745	3.067
110	-	-	-	-	-	-	6.434	6.417	6.023	5.975	5.254	4.629	3.878	3.302
115	-	-	-	-	-	-	6.710	6.693	6.287	6.237	5.490	4.843	4.012	3.536
120	-	-	-	-	-	-	6.986	6.968	6.551	6.500	5.726	5.057	4.145	3.594
125	-	-	-	-	-	-	7.262	7.244	6.815	6.762	5.962	5.271	4.278	3.652
130	-	-	-	-	-	-	7.538	7.519	7.080	7.024	6.198	5.485	4.412	3.711
135	-	-	-	-	-	-	7.814	7.795	7.344	7.287	6.435	5.699	4.545	3.769
140	-	-	-	-	-	-	8.090	8.070	7.608	7.549	6.671	5.913	4.678	3.827
145	-	-	-	-	-	-	8.366	8.346	7.872	7.811	6.907	6.128	4.812	3.886
150	-	-	-	-	-	-	-	-	8.136	8.074	7.143	6.342	4.945	3.944
155	-	-	-	-	-	-	-	-	8.400	8.336	7.379	6.556	5.078	4.002
160	-	-	-	-	-	-	-	-	-	-	7.615	6.770	5.212	4.061
165	-	-	-	-	-	-	-	-	-	-	7.852	6.984	5.345	4.119
170	-	-	-	-	-	-	-	-	-	-	8.088	7.198	5.478	4.178
175	-	-	-	-	-	-	-	-	-	-	8.324	7.412	5.612	4.236
180	-	-	-	-	-	-	-	-	-	-	-	7.626	5.745	4.294
185	-	-	-	-	-	-	-	-	-	-	-	7.840	5.878	4.353
190	-	-	-	-	-	-	-	-	-	-	-	8.055	6.012	4.411
195	-	-	-	-	-	-	-	-	-	-	-	8.269	6.397	4.743
200	-	-	-	-	-	-	-	-	-	-	-	8.483	6.888	5.548
205	-	-	-	-	-	-	-	-	-	-	-	-	7.378	6.168
210	-	-	-	-	-	-	-	-	-	-	-	-	7.869	6.478
215	-	-	-	-	-	-	-	-	-	-	-	-	8.360	6.789
220	-	-	-	-	-	-	-	-	-	-	-	-	-	7.099
225	-	-	-	-	-	-	-	-	-	-	-	-	-	7.410
230	-	-	-	-	-	-	-	-	-	-	-	-	-	7.720
235	-	-	-	-	-	-	-	-	-	-	-	-	-	8.031
240	-	-	-	-	-	-	-	-	-	-	-	-	-	8.341
245	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Table 29 Rectangular Hollow Columns 15 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m^{-1})	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
55	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
60	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
65	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
70	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
75	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
80	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
85	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
90	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
95	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
100	0.380	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
105	0.402	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
110	0.423	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
115	0.444	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
120	0.465	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
125	0.486	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
130	0.507	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
135	0.528	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
140	0.549	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
145	0.570	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
150	0.591	0.375	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
155	0.612	0.394	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
160	0.633	0.413	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
165	0.654	0.432	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
170	0.675	0.451	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
175	0.696	0.470	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
180	0.717	0.489	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
185	0.738	0.508	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
190	0.759	0.527	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
195	0.780	0.546	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
200	0.801	0.565	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
205	0.822	0.585	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
210	0.843	0.604	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
215	0.864	0.623	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
220	0.885	0.642	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
225	0.906	0.661	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
230	0.927	0.680	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
235	0.948	0.699	0.376	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
240	0.969	0.718	0.392	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
245	0.990	0.737	0.408	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
250	1.011	0.756	0.423	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
255	1.032	0.775	0.439	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
260	1.053	0.794	0.455	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
265	1.074	0.813	0.470	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
270	1.095	0.832	0.486	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
275	1.116	0.852	0.502	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
280	1.137	0.871	0.517	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
285	1.158	0.890	0.533	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
290	1.179	0.909	0.549	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
295	1.200	0.928	0.564	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
300	1.221	0.947	0.580	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
305	1.242	0.966	0.596	0.394	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
310	1.263	0.985	0.611	0.419	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
315	1.284	1.004	0.627	0.445	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
320	1.305	1.023	0.643	0.471	0.387	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
325	1.326	1.042	0.658	0.496	0.412	0.391	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
330	1.347	1.061	0.674	0.522	0.438	0.416	0.381	0.373	0.369	0.369	0.369	0.369	0.369	0.369
335	1.368	1.080	0.689	0.548	0.463	0.441	0.405	0.398	0.369	0.369	0.369	0.369	0.369	0.369
340	1.389	1.100	0.705	0.573	0.488	0.466	0.430	0.422	0.369	0.369	0.369	0.369	0.369	0.369
345	1.410	1.119	0.721	0.599	0.513	0.491	0.454	0.447	0.369	0.369	0.369	0.369	0.369	0.369
350	1.431	1.138	0.736	0.625	0.538	0.516	0.479	0.472	0.369	0.369	0.369	0.369	0.369	0.369
355	1.452	1.157	0.752	0.650	0.563	0.541	0.504	0.496	0.369	0.369	0.369	0.369	0.369	0.369

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.667mm.

Table 30 Rectangular Hollow Columns 20 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m^{-1})	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
55	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
60	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
65	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
70	0.384	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
75	0.412	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
80	0.440	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
85	0.468	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
90	0.496	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
95	0.524	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
100	0.552	0.385	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
105	0.580	0.411	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
110	0.609	0.436	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
115	0.637	0.461	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
120	0.665	0.486	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
125	0.693	0.511	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
130	0.721	0.537	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
135	0.749	0.562	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
140	0.777	0.587	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
145	0.805	0.612	0.387	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
150	0.833	0.637	0.408	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
155	0.861	0.663	0.428	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
160	0.890	0.688	0.448	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
165	0.918	0.713	0.468	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
170	0.946	0.738	0.489	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
175	0.974	0.763	0.509	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
180	1.002	0.789	0.529	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
185	1.030	0.814	0.550	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
190	1.058	0.839	0.570	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
195	1.086	0.864	0.590	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
200	1.114	0.889	0.610	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
205	1.142	0.914	0.631	0.382	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
210	1.171	0.940	0.651	0.417	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
215	1.199	0.965	0.671	0.453	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
220	1.227	0.990	0.692	0.488	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
225	1.255	1.015	0.712	0.524	0.403	0.371	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
230	1.283	1.040	0.732	0.560	0.438	0.407	0.376	0.370	0.369	0.369	0.369	0.369	0.369	0.369
235	1.311	1.066	0.752	0.595	0.474	0.442	0.411	0.405	0.369	0.369	0.369	0.369	0.369	0.369
240	1.339	1.091	0.773	0.631	0.509	0.478	0.446	0.440	0.369	0.369	0.369	0.369	0.369	0.369
245	1.367	1.116	0.793	0.666	0.545	0.513	0.482	0.475	0.369	0.369	0.369	0.369	0.369	0.369
250	1.395	1.141	0.813	0.702	0.580	0.549	0.517	0.510	0.369	0.369	0.369	0.369	0.369	0.369
255	1.423	1.166	0.833	0.737	0.616	0.584	0.552	0.546	0.373	0.369	0.369	0.369	0.369	0.369
260	1.452	1.192	0.854	0.773	0.652	0.620	0.587	0.581	0.408	0.387	0.369	0.369	0.369	0.369
265	1.480	1.217	0.874	0.809	0.687	0.655	0.623	0.616	0.443	0.422	0.369	0.369	0.369	0.369
270	1.508	1.242	0.894	0.844	0.723	0.691	0.658	0.651	0.478	0.456	0.369	0.369	0.369	0.369
275	1.536	1.267	0.915	0.880	0.758	0.726	0.693	0.686	0.513	0.491	0.369	0.369	0.369	0.369
280	1.564	1.292	0.935	0.915	0.794	0.762	0.728	0.721	0.548	0.526	0.369	0.369	0.369	0.369
285	1.592	1.318	0.955	0.951	0.829	0.797	0.764	0.757	0.582	0.560	0.369	0.369	0.369	0.369
290	1.620	1.343	0.987	0.987	0.865	0.833	0.799	0.792	0.617	0.595	0.369	0.369	0.369	0.369
295	1.648	1.368	1.022	1.022	0.900	0.868	0.834	0.827	0.652	0.630	0.369	0.369	0.369	0.369
300	1.676	1.393	1.058	1.058	0.936	0.904	0.869	0.862	0.687	0.664	0.369	0.369	0.369	0.369
305	1.704	1.418	1.093	1.093	0.972	0.940	0.904	0.897	0.722	0.699	0.369	0.369	0.369	0.369
310	1.733	1.444	1.129	1.129	1.007	0.975	0.940	0.932	0.757	0.734	0.369	0.369	0.369	0.369
315	1.761	1.469	1.164	1.164	1.043	1.011	0.975	0.968	0.792	0.768	0.369	0.369	0.369	0.369
320	1.789	1.494	1.200	1.200	1.078	1.046	1.010	1.003	0.827	0.803	0.376	0.369	0.369	0.369
325	1.817	1.519	1.236	1.236	1.114	1.082	1.045	1.038	0.862	0.838	0.409	0.369	0.369	0.369
330	1.845	1.544	1.271	1.271	1.149	1.117	1.081	1.073	0.897	0.872	0.441	0.369	0.369	0.369
335	1.873	1.569	1.307	1.307	1.185	1.153	1.116	1.108	0.932	0.907	0.473	0.369	0.369	0.369
340	1.901	1.595	1.342	1.342	1.220	1.188	1.151	1.144	0.967	0.942	0.506	0.369	0.369	0.369
345	1.929	1.620	1.378	1.378	1.256	1.224	1.186	1.179	1.002	0.976	0.538	0.369	0.369	0.369
350	1.957	1.645	1.414	1.414	1.291	1.259	1.222	1.214	1.036	1.011	0.571	0.369	0.369	0.369
355	1.985	1.670	1.449	1.449	1.327	1.295	1.257	1.249	1.071	1.046	0.603	0.369	0.369	0.369

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.667mm.

Table 31 Rectangular Hollow Columns 30 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m^{-1})	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	0.507	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
55	0.566	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
60	0.626	0.390	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
65	0.685	0.436	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
70	0.744	0.482	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
75	0.804	0.528	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
80	0.863	0.574	0.396	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
85	0.922	0.620	0.426	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
90	0.981	0.666	0.456	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
95	1.041	0.711	0.485	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
100	1.100	0.757	0.515	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
105	1.159	0.803	0.545	0.412	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
110	1.219	0.849	0.575	0.464	0.401	0.385	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
115	1.278	0.895	0.605	0.515	0.452	0.436	0.408	0.402	0.369	0.369	0.369	0.369	0.369	0.369
120	1.337	0.941	0.635	0.567	0.503	0.486	0.458	0.453	0.369	0.369	0.369	0.369	0.369	0.369
125	1.396	0.987	0.665	0.618	0.554	0.537	0.509	0.503	0.369	0.369	0.369	0.369	0.369	0.369
130	1.456	1.032	0.695	0.669	0.605	0.588	0.560	0.554	0.401	0.382	0.369	0.369	0.369	0.369
135	1.515	1.078	0.725	0.721	0.655	0.639	0.610	0.605	0.452	0.433	0.369	0.369	0.369	0.369
140	1.574	1.124	0.772	0.772	0.706	0.690	0.661	0.655	0.503	0.484	0.369	0.369	0.369	0.369
145	1.634	1.170	0.823	0.823	0.757	0.740	0.711	0.706	0.555	0.535	0.369	0.369	0.369	0.369
150	1.693	1.216	0.875	0.875	0.808	0.791	0.762	0.756	0.606	0.586	0.369	0.369	0.369	0.369
155	1.752	1.262	0.926	0.926	0.859	0.842	0.813	0.807	0.657	0.637	0.369	0.369	0.369	0.369
160	1.812	1.308	0.977	0.977	0.910	0.893	0.863	0.857	0.709	0.689	0.369	0.369	0.369	0.369
165	1.871	1.353	1.029	1.029	0.961	0.944	0.914	0.908	0.760	0.740	0.369	0.369	0.369	0.369
170	1.930	1.399	1.080	1.080	1.012	0.994	0.964	0.958	0.812	0.791	0.406	0.369	0.369	0.369
175	1.989	1.445	1.131	1.131	1.063	1.045	1.015	1.009	0.863	0.842	0.457	0.369	0.369	0.369
180	2.049	1.491	1.183	1.183	1.114	1.096	1.066	1.060	0.914	0.893	0.509	0.369	0.369	0.369
185	2.106	1.537	1.234	1.234	1.165	1.147	1.116	1.110	0.966	0.945	0.561	0.369	0.369	0.369
190	2.164	1.583	1.286	1.286	1.216	1.198	1.167	1.161	1.017	0.996	0.612	0.369	0.369	0.369
195	2.221	1.628	1.337	1.337	1.267	1.248	1.218	1.211	1.068	1.047	0.664	0.369	0.369	0.369
200	2.279	1.674	1.388	1.388	1.317	1.299	1.268	1.262	1.120	1.098	0.715	0.369	0.369	0.369
205	2.336	1.720	1.440	1.440	1.368	1.350	1.319	1.312	1.171	1.149	0.767	0.369	0.369	0.369
210	2.394	1.766	1.491	1.491	1.419	1.401	1.369	1.363	1.222	1.200	0.819	0.369	0.369	0.369
215	2.451	1.812	1.542	1.542	1.470	1.452	1.420	1.413	1.274	1.252	0.870	0.369	0.369	0.369
220	2.509	1.858	1.594	1.594	1.521	1.502	1.471	1.464	1.325	1.303	0.922	0.369	0.369	0.369
225	2.566	1.904	1.645	1.645	1.572	1.553	1.521	1.515	1.376	1.354	0.973	0.407	0.369	0.369
230	2.624	1.949	1.696	1.696	1.623	1.604	1.572	1.565	1.428	1.405	1.025	0.446	0.369	0.369
235	2.681	1.995	1.748	1.748	1.674	1.655	1.622	1.616	1.479	1.456	1.077	0.485	0.369	0.369
240	2.739	2.041	1.799	1.799	1.725	1.706	1.673	1.666	1.530	1.508	1.128	0.525	0.369	0.369
245	2.796	2.099	1.851	1.851	1.776	1.756	1.724	1.717	1.582	1.559	1.180	0.564	0.369	0.369
250	2.854	2.156	1.902	1.902	1.827	1.807	1.774	1.767	1.633	1.610	1.231	0.603	0.369	0.369
255	2.911	2.214	1.953	1.953	1.878	1.858	1.825	1.818	1.684	1.661	1.283	0.642	0.369	0.369
260	2.969	2.272	2.005	2.005	1.929	1.909	1.875	1.868	1.736	1.712	1.335	0.681	0.369	0.369
265	3.026	2.330	2.056	2.056	1.979	1.960	1.926	1.919	1.787	1.763	1.386	0.720	0.369	0.369
270	3.084	2.387	2.107	2.107	2.030	2.010	1.977	1.970	1.839	1.815	1.438	0.759	0.369	0.369
275	3.141	2.445	2.159	2.159	2.081	2.061	2.027	2.020	1.890	1.866	1.489	0.798	0.369	0.369
280	3.199	2.503	2.210	2.210	2.132	2.112	2.078	2.071	1.941	1.917	1.541	0.837	0.397	0.369
285	3.257	2.560	2.261	2.261	2.183	2.163	2.128	2.121	1.993	1.968	1.593	0.876	0.432	0.369
290	3.314	2.618	2.313	2.313	2.234	2.214	2.179	2.172	2.044	2.019	1.644	0.916	0.466	0.369
295	3.372	2.676	2.364	2.364	2.285	2.265	2.230	2.222	2.095	2.071	1.696	0.955	0.500	0.369
300	3.429	2.734	2.415	2.415	2.336	2.315	2.280	2.273	2.147	2.122	1.747	0.994	0.534	0.369
305	3.482	2.791	2.467	2.467	2.387	2.366	2.331	2.323	2.198	2.173	1.799	1.033	0.568	0.369
310	3.519	2.849	2.518	2.518	2.438	2.417	2.381	2.374	2.249	2.224	1.851	1.072	0.602	0.369
315	3.556	2.907	2.570	2.570	2.489	2.468	2.432	2.425	2.301	2.275	1.902	1.111	0.636	0.369
320	3.593	2.964	2.621	2.621	2.540	2.519	2.483	2.475	2.352	2.326	1.954	1.150	0.671	0.369
325	3.630	3.022	2.672	2.672	2.591	2.569	2.533	2.526	2.403	2.378	2.005	1.189	0.705	0.369
330	3.667	3.080	2.724	2.724	2.641	2.620	2.584	2.576	2.455	2.429	2.057	1.228	0.739	0.369
335	3.704	3.138	2.775	2.775	2.692	2.671	2.634	2.627	2.506	2.480	2.109	1.267	0.773	0.369
340	3.741	3.195	2.826	2.826	2.743	2.722	2.685	2.677	2.557	2.531	2.160	1.306	0.807	0.369
345	3.778	3.253	2.878	2.878	2.794	2.773	2.736	2.728	2.609	2.582	2.212	1.346	0.841	0.369
350	3.815	3.311	2.929	2.929	2.845	2.823	2.786	2.778	2.660	2.634	2.263	1.385	0.875	0.369
355	3.852	3.369	2.980	2.980	2.896	2.874	2.837	2.829	2.711	2.685	2.315	1.424	0.909	0.369

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.667mm.

Table 32 Rectangular Hollow Columns 45 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m^{-1})	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	1.030	0.710	0.457	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
55	1.141	0.802	0.523	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
60	1.253	0.895	0.590	0.408	0.378	0.371	0.369	0.369	0.369	0.369	0.369	0.369	0.369	0.369
65	1.364	0.988	0.656	0.461	0.428	0.420	0.407	0.405	0.369	0.369	0.369	0.369	0.369	0.369
70	1.476	1.081	0.723	0.514	0.478	0.470	0.455	0.453	0.376	0.369	0.369	0.369	0.369	0.369
75	1.588	1.173	0.789	0.568	0.528	0.519	0.504	0.501	0.459	0.445	0.369	0.369	0.369	0.369
80	1.699	1.266	0.856	0.621	0.578	0.568	0.552	0.548	0.543	0.528	0.369	0.369	0.369	0.369
85	1.811	1.359	0.922	0.674	0.629	0.626	0.626	0.626	0.626	0.611	0.369	0.369	0.369	0.369
90	1.922	1.452	0.989	0.727	0.709	0.709	0.709	0.709	0.709	0.694	0.441	0.369	0.369	0.369
95	2.034	1.544	1.055	0.792	0.792	0.792	0.792	0.792	0.792	0.776	0.521	0.369	0.369	0.369
100	2.156	1.637	1.122	0.875	0.875	0.875	0.875	0.875	0.875	0.859	0.602	0.369	0.369	0.369
105	2.279	1.730	1.188	0.959	0.959	0.959	0.959	0.959	0.959	0.942	0.682	0.387	0.369	0.369
110	2.403	1.823	1.255	1.042	1.042	1.042	1.042	1.042	1.042	1.025	0.762	0.446	0.369	0.369
115	2.526	1.915	1.321	1.125	1.125	1.125	1.125	1.125	1.125	1.107	0.842	0.505	0.369	0.369
120	2.649	2.008	1.387	1.208	1.208	1.208	1.208	1.208	1.208	1.190	0.922	0.565	0.369	0.369
125	2.772	2.105	1.454	1.292	1.292	1.292	1.292	1.292	1.292	1.273	1.002	0.624	0.369	0.369
130	2.896	2.204	1.520	1.375	1.375	1.375	1.375	1.375	1.375	1.355	1.083	0.683	0.388	0.369
135	3.019	2.303	1.587	1.458	1.458	1.458	1.458	1.458	1.458	1.438	1.163	0.743	0.444	0.369
140	3.142	2.402	1.653	1.541	1.541	1.541	1.541	1.541	1.541	1.521	1.243	0.802	0.501	0.369
145	3.265	2.501	1.720	1.624	1.624	1.624	1.624	1.624	1.624	1.604	1.323	0.861	0.558	0.369
150	3.389	2.600	1.786	1.708	1.708	1.708	1.708	1.708	1.708	1.686	1.403	0.920	0.614	0.369
155	3.487	2.699	1.853	1.791	1.791	1.791	1.791	1.791	1.791	1.769	1.483	0.980	0.671	0.369
160	3.530	2.798	1.919	1.874	1.874	1.874	1.874	1.874	1.874	1.852	1.564	1.039	0.727	0.369
165	3.573	2.898	1.986	1.957	1.957	1.957	1.957	1.957	1.957	1.935	1.644	1.098	0.784	0.369
170	3.616	2.997	2.065	2.041	2.041	2.041	2.041	2.041	2.041	2.017	1.724	1.158	0.840	0.369
175	3.659	3.096	2.217	2.124	2.124	2.124	2.124	2.124	2.124	2.100	1.804	1.217	0.897	0.369
180	3.702	3.195	2.369	2.207	2.207	2.207	2.207	2.207	2.207	2.183	1.884	1.276	0.953	0.417
185	3.745	3.294	2.521	2.290	2.290	2.290	2.290	2.290	2.290	2.266	1.964	1.336	1.010	0.472
190	3.788	3.393	2.673	2.373	2.373	2.373	2.373	2.373	2.373	2.348	2.045	1.395	1.066	0.526
195	3.831	3.480	2.825	2.457	2.457	2.457	2.457	2.457	2.457	2.431	2.125	1.454	1.123	0.581
200	3.874	3.513	2.976	2.540	2.540	2.540	2.540	2.540	2.540	2.514	2.205	1.514	1.180	0.636
205	3.917	3.547	3.128	2.623	2.623	2.623	2.623	2.623	2.623	2.597	2.285	1.573	1.236	0.691
210	3.960	3.580	3.280	2.706	2.706	2.706	2.706	2.706	2.706	2.679	2.365	1.632	1.293	0.746
215	4.003	3.613	3.432	2.790	2.790	2.790	2.790	2.790	2.790	2.762	2.445	1.691	1.349	0.801
220	4.046	3.647	3.496	2.873	2.873	2.873	2.873	2.873	2.873	2.845	2.526	1.751	1.406	0.855
225	4.090	3.680	3.526	2.956	2.956	2.956	2.956	2.956	2.956	2.928	2.606	1.810	1.462	0.910
230	4.133	3.713	3.556	3.075	3.039	3.039	3.039	3.039	3.039	3.010	2.686	1.869	1.519	0.965
235	4.176	3.747	3.586	3.386	3.122	3.122	3.122	3.122	3.122	3.093	2.766	1.929	1.575	1.020
240	4.219	3.780	3.616	3.493	3.213	3.206	3.206	3.206	3.206	3.176	2.846	1.988	1.632	1.075
245	4.262	3.813	3.645	3.520	3.484	3.475	3.289	3.289	3.289	3.259	2.927	2.047	1.689	1.130
250	4.305	3.847	3.675	3.547	3.510	3.501	3.486	3.483	3.372	3.341	3.007	2.107	1.745	1.184
255	4.348	3.880	3.705	3.574	3.536	3.527	3.512	3.509	3.455	3.424	3.087	2.166	1.802	1.239
260	4.391	3.913	3.735	3.600	3.563	3.554	3.538	3.535	3.493	3.483	3.167	2.225	1.858	1.294
265	4.434	3.947	3.765	3.627	3.589	3.580	3.564	3.561	3.517	3.507	3.247	2.285	1.915	1.349
270	4.477	3.980	3.795	3.654	3.615	3.606	3.590	3.586	3.541	3.531	3.327	2.344	1.971	1.404
275	4.520	4.013	3.825	3.681	3.642	3.632	3.616	3.612	3.565	3.555	3.408	2.403	2.028	1.459
280	4.635	4.047	3.855	3.708	3.668	3.658	3.642	3.638	3.589	3.579	3.478	2.462	2.084	1.513
285	4.770	4.080	3.885	3.735	3.694	3.684	3.668	3.664	3.613	3.603	3.498	2.522	2.141	1.568
290	4.906	4.114	3.915	3.761	3.721	3.711	3.694	3.690	3.636	3.627	3.519	2.581	2.197	1.623
295	5.041	4.147	3.945	3.788	3.747	3.737	3.720	3.716	3.660	3.651	3.540	2.640	2.254	1.678
300	5.176	4.180	3.975	3.815	3.773	3.763	3.746	3.742	3.684	3.674	3.561	2.700	2.311	1.733
305	5.312	4.214	4.005	3.842	3.800	3.789	3.772	3.768	3.708	3.698	3.582	2.759	2.367	1.788
310	5.447	4.247	4.035	3.869	3.826	3.815	3.798	3.794	3.732	3.722	3.603	2.818	2.424	1.842
315	5.582	4.280	4.065	3.895	3.852	3.842	3.824	3.820	3.756	3.746	3.623	2.878	2.480	1.897
320	5.717	4.314	4.095	3.922	3.879	3.868	3.850	3.846	3.780	3.770	3.644	2.937	2.537	1.952
325	5.853	4.347	4.125	3.949	3.905	3.894	3.876	3.872	3.804	3.794	3.665	2.996	2.593	2.007
330	5.988	4.380	4.155	3.976	3.931	3.920	3.902	3.898	3.828	3.818	3.686	3.056	2.650	2.062
335	6.098	4.414	4.185	4.003	3.958	3.946	3.928	3.924	3.852	3.841	3.707	3.115	2.706	2.117
340	6.150	4.447	4.215	4.029	3.984	3.973	3.954	3.950	3.876	3.865	3.728	3.174	2.763	2.171
345	6.203	4.480	4.245	4.056	4.010	3.999	3.980	3.976	3.900	3.889	3.748	3.233	2.820	2.226
350	6.256	4.514	4.274	4.083	4.037	4.025	4.006	4.002	3.924	3.913	3.769	3.293	2.876	2.281
355	6.309	4.715	4.304	4.110	4.063	4.051	4.032	4.028	3.948	3.937	3.790	3.352	2.933	2.336

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.667mm.

Table 33 Rectangular Hollow Columns 60 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m^{-1})	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	1.552	1.166	0.843	0.616	0.567	0.555	0.535	0.531	0.438	0.428	0.369	0.369	0.369	0.369
55	1.716	1.305	0.948	0.705	0.653	0.640	0.619	0.615	0.511	0.500	0.369	0.369	0.369	0.369
60	1.880	1.443	1.053	0.794	0.739	0.725	0.703	0.698	0.588	0.576	0.415	0.369	0.369	0.369
65	2.044	1.582	1.158	0.883	0.824	0.810	0.786	0.782	0.665	0.652	0.480	0.369	0.369	0.369
70	2.234	1.720	1.263	0.972	0.910	0.895	0.870	0.865	0.742	0.728	0.546	0.406	0.369	0.369
75	2.424	1.859	1.368	1.061	0.996	0.980	0.953	0.948	0.818	0.804	0.612	0.461	0.369	0.369
80	2.614	1.997	1.473	1.151	1.082	1.065	1.037	1.032	0.895	0.880	0.677	0.515	0.369	0.369
85	2.804	2.148	1.578	1.240	1.168	1.150	1.121	1.115	0.972	0.956	0.743	0.570	0.444	0.369
90	2.994	2.305	1.684	1.329	1.253	1.235	1.204	1.198	1.049	1.032	0.809	0.625	0.528	0.369
95	3.184	2.461	1.789	1.418	1.339	1.320	1.288	1.282	1.125	1.108	0.874	0.680	0.613	0.369
100	3.373	2.618	1.894	1.507	1.425	1.405	1.372	1.365	1.202	1.184	0.940	0.735	0.697	0.369
105	3.531	2.775	1.999	1.596	1.511	1.490	1.455	1.448	1.279	1.260	1.005	0.790	0.782	0.444
110	3.652	2.932	2.156	1.686	1.596	1.575	1.539	1.532	1.355	1.336	1.071	0.866	0.866	0.524
115	3.774	3.088	2.349	1.775	1.682	1.660	1.622	1.615	1.432	1.412	1.137	0.951	0.951	0.604
120	3.895	3.245	2.542	1.864	1.768	1.745	1.706	1.698	1.509	1.488	1.202	1.035	1.035	0.684
125	4.016	3.402	2.735	1.953	1.854	1.830	1.790	1.782	1.586	1.564	1.268	1.120	1.120	0.764
130	4.138	3.518	2.928	2.043	1.939	1.914	1.873	1.865	1.662	1.640	1.334	1.204	1.204	0.844
135	4.259	3.598	3.121	2.286	2.025	1.999	1.957	1.949	1.739	1.716	1.399	1.289	1.289	0.924
140	4.380	3.679	3.314	2.529	2.248	2.172	2.041	2.032	1.816	1.792	1.465	1.374	1.374	1.004
145	4.502	3.759	3.482	2.772	2.505	2.433	2.305	2.278	1.893	1.868	1.531	1.458	1.458	1.084
150	4.651	3.840	3.527	3.015	2.761	2.693	2.572	2.547	1.969	1.944	1.596	1.543	1.543	1.164
155	4.808	3.920	3.572	3.258	3.017	2.954	2.840	2.816	2.063	2.020	1.662	1.627	1.627	1.244
160	4.965	4.001	3.617	3.478	3.274	3.215	3.107	3.085	2.447	2.323	1.728	1.712	1.712	1.324
165	5.122	4.082	3.662	3.511	3.481	3.474	3.375	3.354	2.832	2.720	1.796	1.796	1.796	1.404
170	5.279	4.162	3.707	3.544	3.514	3.506	3.494	3.492	3.216	3.117	1.881	1.881	1.881	1.484
175	5.436	4.243	3.752	3.577	3.546	3.539	3.526	3.524	3.484	3.477	1.965	1.965	1.965	1.564
180	5.594	4.323	3.797	3.610	3.578	3.571	3.558	3.556	3.514	3.507	2.050	2.050	2.050	1.644
185	5.751	4.404	3.842	3.643	3.611	3.603	3.590	3.588	3.544	3.537	2.366	2.134	2.134	1.724
190	5.908	4.484	3.887	3.676	3.643	3.636	3.623	3.620	3.574	3.567	3.481	2.219	2.219	1.804
195	6.065	4.581	3.932	3.709	3.676	3.668	3.655	3.652	3.604	3.597	3.508	2.303	2.303	1.884
200	6.125	4.696	3.977	3.742	3.708	3.700	3.687	3.684	3.635	3.627	3.535	2.388	2.388	1.964
205	6.174	4.811	4.022	3.775	3.741	3.733	3.719	3.716	3.665	3.657	3.562	2.473	2.473	2.044
210	6.224	4.926	4.067	3.808	3.773	3.765	3.751	3.748	3.695	3.687	3.589	2.557	2.557	2.124
215	6.273	5.042	4.112	3.841	3.806	3.797	3.783	3.780	3.725	3.717	3.616	2.642	2.642	2.203
220	6.322	5.157	4.157	3.874	3.838	3.830	3.815	3.812	3.755	3.747	3.643	2.726	2.726	2.283
225	6.371	5.272	4.202	3.907	3.871	3.862	3.847	3.844	3.785	3.777	3.670	2.811	2.811	2.363
230	6.420	5.388	4.247	3.940	3.903	3.894	3.879	3.876	3.815	3.807	3.696	2.895	2.895	2.443
235	6.469	5.503	4.292	3.973	3.936	3.927	3.911	3.908	3.846	3.837	3.723	3.225	2.980	2.523
240	6.519	5.618	4.337	4.006	3.968	3.959	3.943	3.940	3.876	3.867	3.750	3.488	3.064	2.603
245	6.568	5.734	4.382	4.039	4.001	3.991	3.975	3.972	3.906	3.897	3.777	3.531	3.149	2.683
250	6.617	5.849	4.427	4.072	4.033	4.024	4.008	4.004	3.936	3.927	3.804	3.573	3.233	2.763
255	6.666	5.964	4.472	4.105	4.065	4.056	4.040	4.036	3.966	3.957	3.831	3.616	3.318	2.843
260	6.715	6.080	4.517	4.138	4.098	4.088	4.072	4.068	3.996	3.987	3.858	3.659	3.402	2.923
265	6.765	6.136	4.652	4.171	4.130	4.120	4.104	4.101	4.026	4.017	3.885	3.702	3.480	3.003
270	6.814	6.192	4.821	4.204	4.163	4.153	4.136	4.133	4.057	4.047	3.912	3.744	3.517	3.083
275	6.863	6.248	4.990	4.237	4.195	4.185	4.168	4.165	4.087	4.077	3.938	3.787	3.555	3.163
280	6.912	6.305	5.159	4.270	4.228	4.217	4.200	4.197	4.117	4.107	3.965	3.830	3.593	3.243
285	6.961	6.361	5.328	4.303	4.260	4.250	4.232	4.229	4.147	4.137	3.992	3.873	3.631	3.323
290	7.010	6.417	5.497	4.336	4.293	4.282	4.264	4.261	4.177	4.167	4.019	3.915	3.668	3.403
295	7.060	6.473	5.666	4.369	4.325	4.314	4.296	4.293	4.207	4.197	4.046	3.958	3.706	3.478
300	7.109	6.529	5.835	4.402	4.358	4.347	4.328	4.325	4.237	4.227	4.073	4.001	3.744	3.510
305	7.158	6.585	6.004	4.435	4.390	4.379	4.361	4.357	4.268	4.257	4.100	4.044	3.781	3.543
310	7.207	6.641	6.121	4.468	4.423	4.411	4.393	4.389	4.298	4.287	4.127	4.086	3.819	3.575
315	7.256	6.697	6.194	4.501	4.455	4.444	4.425	4.421	4.328	4.317	4.153	4.129	3.857	3.608
320	7.306	6.753	6.267	4.621	4.488	4.476	4.457	4.453	4.358	4.347	4.180	4.172	3.894	3.640
325	7.355	6.809	6.340	5.245	4.520	4.508	4.489	4.485	4.388	4.377	4.215	4.215	3.932	3.673
330	7.404	6.865	6.413	5.869	4.962	4.741	4.521	4.517	4.418	4.407	4.257	4.257	3.970	3.706
335	7.453	6.921	6.486	6.135	5.559	5.335	5.076	4.986	4.448	4.437	4.300	4.300	4.007	3.738
340	7.502	6.977	6.560	6.217	6.092	5.929	5.806	5.715	4.479	4.467	4.343	4.343	4.045	3.771
345	7.551	7.033	6.633	6.299	6.176	6.143	6.132	6.121	4.509	4.497	4.386	4.386	4.083	3.803
350	7.601	7.089	6.706	6.381	6.259	6.227	6.213	6.203	4.838	4.527	4.428	4.428	4.120	3.836
355	7.650	7.146	6.779	6.463	6.343	6.311	6.294	6.284	5.787	5.416	4.471	4.471	4.158	3.869

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.667mm.

Table 34 Rectangular Hollow Columns 75 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m^{-1})	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	2.089	1.623	1.229	0.964	0.909	0.895	0.873	0.868	0.759	0.747	0.567	0.398	0.369	0.369
55	2.345	1.807	1.373	1.088	1.029	1.014	0.990	0.985	0.868	0.855	0.661	0.472	0.369	0.369
60	2.600	1.991	1.516	1.212	1.148	1.133	1.107	1.102	0.977	0.964	0.760	0.562	0.399	0.369
65	2.855	2.198	1.660	1.336	1.268	1.252	1.225	1.219	1.087	1.072	0.858	0.653	0.479	0.369
70	3.111	2.413	1.804	1.460	1.388	1.371	1.342	1.336	1.196	1.180	0.957	0.744	0.559	0.378
75	3.366	2.627	1.947	1.584	1.508	1.490	1.459	1.453	1.305	1.289	1.055	0.835	0.639	0.447
80	3.611	2.842	2.124	1.708	1.628	1.609	1.577	1.570	1.414	1.397	1.154	0.926	0.719	0.517
85	3.848	3.057	2.364	1.832	1.748	1.728	1.694	1.687	1.523	1.505	1.252	1.016	0.799	0.587
90	4.085	3.272	2.605	1.956	1.868	1.847	1.811	1.804	1.633	1.614	1.351	1.107	0.879	0.656
95	4.322	3.489	2.845	2.125	1.988	1.965	1.929	1.921	1.742	1.722	1.449	1.198	0.959	0.726
100	4.571	3.741	3.086	2.391	2.191	2.139	2.051	2.038	1.851	1.830	1.548	1.289	1.039	0.796
105	4.895	3.992	3.326	2.658	2.463	2.413	2.327	2.310	1.960	1.939	1.646	1.380	1.119	0.865
110	5.219	4.244	3.526	2.925	2.734	2.686	2.603	2.586	2.123	2.057	1.744	1.470	1.199	0.935
115	5.544	4.496	3.660	3.192	3.006	2.960	2.879	2.863	2.444	2.381	1.843	1.561	1.279	1.004
120	5.868	4.709	3.794	3.458	3.277	3.233	3.155	3.139	2.766	2.706	1.941	1.652	1.359	1.074
125	6.101	4.917	3.928	3.552	3.495	3.483	3.431	3.416	3.087	3.030	2.040	1.743	1.439	1.144
130	6.159	5.125	4.062	3.635	3.570	3.556	3.533	3.529	3.409	3.355	2.446	1.834	1.519	1.213
135	6.217	5.333	4.196	3.718	3.645	3.630	3.604	3.599	3.518	3.508	2.859	1.925	1.599	1.283
140	6.274	5.541	4.331	3.802	3.721	3.703	3.675	3.669	3.573	3.562	3.272	2.015	1.679	1.353
145	6.332	5.748	4.465	3.885	3.796	3.777	3.745	3.739	3.629	3.616	3.492	2.206	1.759	1.422
150	6.390	5.956	4.628	3.968	3.871	3.850	3.816	3.809	3.684	3.670	3.527	2.439	1.839	1.492
155	6.448	6.100	4.817	4.051	3.947	3.924	3.886	3.879	3.740	3.724	3.562	2.672	1.919	1.562
160	6.506	6.149	5.006	4.134	4.022	3.997	3.957	3.949	3.795	3.779	3.597	2.905	1.999	1.631
165	6.563	6.198	5.196	4.217	4.097	4.071	4.027	4.019	3.850	3.833	3.632	3.138	2.171	1.701
170	6.621	6.247	5.385	4.300	4.173	4.144	4.098	4.089	3.906	3.887	3.668	3.371	2.450	1.770
175	6.679	6.296	5.574	4.383	4.248	4.218	4.169	4.159	3.961	3.941	3.703	3.513	2.730	1.840
180	6.737	6.344	5.763	4.467	4.323	4.291	4.239	4.229	4.016	3.995	3.738	3.583	3.010	1.910
185	6.795	6.393	5.953	4.575	4.399	4.365	4.310	4.299	4.072	4.049	3.773	3.653	3.289	1.979
190	6.853	6.442	6.100	4.763	4.474	4.438	4.380	4.369	4.127	4.103	3.808	3.723	3.489	2.096
195	6.910	6.491	6.157	4.950	4.576	4.512	4.451	4.439	4.182	4.157	3.843	3.793	3.533	2.643
200	6.968	6.540	6.215	5.137	4.753	4.662	4.521	4.509	4.238	4.211	3.878	3.863	3.577	3.189
205	7.026	6.588	6.272	5.324	4.929	4.835	4.696	4.663	4.293	4.265	3.933	3.933	3.620	3.492
210	7.084	6.637	6.330	5.511	5.105	5.009	4.883	4.849	4.349	4.319	4.003	4.003	3.664	3.531
215	7.142	6.686	6.388	5.698	5.281	5.182	5.070	5.035	4.404	4.373	4.073	4.073	3.708	3.569
220	7.200	6.735	6.445	5.885	5.457	5.355	5.257	5.221	4.459	4.427	4.143	4.143	3.752	3.608
225	7.257	6.783	6.503	6.072	5.634	5.529	5.444	5.407	4.515	4.481	4.213	4.213	3.796	3.646
230	7.315	6.832	6.560	6.149	5.810	5.702	5.631	5.593	4.667	4.551	4.283	4.283	3.840	3.684
235	7.373	6.881	6.618	6.220	5.986	5.876	5.818	5.779	4.854	4.735	4.353	4.353	3.883	3.723
240	7.431	6.930	6.676	6.291	6.116	6.049	6.005	5.965	5.040	4.919	4.423	4.423	3.927	3.761
245	7.489	6.979	6.733	6.363	6.193	6.145	6.126	6.110	5.227	5.103	4.494	4.494	3.971	3.800
250	7.546	7.027	6.791	6.434	6.270	6.223	6.203	6.187	5.413	5.287	4.574	4.574	4.015	3.838
255	7.604	7.076	6.849	6.505	6.347	6.301	6.280	6.265	5.600	5.472	4.665	4.665	4.059	3.876
260	7.662	7.125	6.906	6.576	6.424	6.378	6.357	6.342	5.786	5.656	4.756	4.756	4.103	3.915
265	7.720	7.174	6.964	6.648	6.500	6.456	6.434	6.419	5.973	5.840	4.846	4.846	4.146	3.953
270	7.778	7.223	7.021	6.719	6.577	6.534	6.511	6.496	6.117	6.024	4.937	4.937	4.190	3.992
275	7.836	7.271	7.079	6.790	6.654	6.612	6.587	6.573	6.204	6.142	5.028	5.028	4.234	4.030
280	7.893	7.320	7.137	6.862	6.731	6.690	6.664	6.651	6.291	6.231	5.119	5.119	4.278	4.069
285	7.951	7.369	7.194	6.933	6.808	6.768	6.741	6.728	6.378	6.319	5.210	5.210	4.322	4.107
290	8.009	7.418	7.252	7.004	6.884	6.846	6.818	6.805	6.465	6.408	5.301	5.301	4.366	4.145
295	8.067	7.466	7.309	7.076	6.961	6.924	6.895	6.882	6.551	6.496	5.391	5.391	4.409	4.184
300	8.125	7.515	7.367	7.147	7.038	7.002	6.971	6.959	6.638	6.585	5.482	5.482	4.453	4.222
305	-	7.564	7.425	7.218	7.115	7.080	7.048	7.036	6.725	6.673	6.084	5.573	4.497	4.261
310	-	7.613	7.482	7.289	7.192	7.158	7.125	7.114	6.812	6.762	6.176	5.664	4.565	4.299
315	-	7.662	7.540	7.361	7.268	7.236	7.202	7.191	6.899	6.850	6.268	5.755	4.696	4.337
320	-	7.710	7.597	7.432	7.345	7.313	7.279	7.268	6.985	6.939	6.360	5.846	4.828	4.376
325	-	7.759	7.655	7.503	7.422	7.391	7.356	7.345	7.072	7.027	6.452	5.936	4.959	4.414
330	-	7.808	7.713	7.575	7.499	7.469	7.432	7.422	7.159	7.116	6.544	6.027	5.091	4.453
335	-	7.857	7.770	7.646	7.575	7.547	7.509	7.499	7.246	7.205	6.636	6.135	5.223	4.491
340	-	7.906	7.828	7.717	7.652	7.625	7.586	7.577	7.333	7.293	6.728	6.268	5.354	4.530
345	-	7.954	7.886	7.788	7.729	7.703	7.663	7.654	7.419	7.382	6.820	6.401	5.486	4.641
350	-	8.003	7.943	7.860	7.806	7.781	7.740	7.731	7.506	7.470	6.912	6.533	5.617	4.751
355	-	8.052	8.001	7.931	7.883	7.859	7.817	7.808	7.593	7.559	7.004	6.666	5.749	4.861

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.667mm.

Table 35 Rectangular Hollow Columns 90 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m^{-1})	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	2.728	2.095	1.615	1.313	1.250	1.235	1.210	1.205	1.084	1.070	0.878	0.707	0.534	0.369
55	3.045	2.366	1.797	1.472	1.404	1.388	1.361	1.356	1.225	1.211	1.008	0.825	0.631	0.397
60	3.363	2.638	1.980	1.630	1.558	1.541	1.512	1.506	1.367	1.351	1.138	0.948	0.747	0.510
65	3.727	2.909	2.232	1.789	1.712	1.694	1.663	1.657	1.509	1.492	1.268	1.071	0.864	0.622
70	4.118	3.181	2.522	1.948	1.866	1.847	1.814	1.808	1.650	1.633	1.398	1.194	0.980	0.735
75	4.508	3.452	2.811	2.166	2.020	1.999	1.965	1.958	1.792	1.773	1.528	1.317	1.097	0.848
80	5.027	4.148	3.101	2.469	2.304	2.262	2.192	2.178	1.933	1.914	1.658	1.440	1.213	0.960
85	5.553	4.673	3.390	2.772	2.608	2.568	2.498	2.485	2.120	2.072	1.787	1.563	1.330	1.073
90	6.079	4.974	3.706	3.075	2.912	2.873	2.804	2.791	2.453	2.407	1.917	1.685	1.447	1.185
95	6.194	5.275	4.032	3.379	3.216	3.178	3.110	3.097	2.787	2.742	2.057	1.808	1.563	1.298
100	6.307	5.576	4.358	3.605	3.500	3.479	3.416	3.404	3.120	3.077	2.422	1.931	1.680	1.410
105	6.421	5.877	4.668	3.796	3.673	3.648	3.606	3.598	3.454	3.412	2.786	2.066	1.796	1.523
110	6.534	6.107	4.961	3.987	3.846	3.817	3.768	3.759	3.593	3.575	3.151	2.302	1.913	1.635
115	6.648	6.186	5.253	4.178	4.019	3.986	3.930	3.920	3.721	3.700	3.484	2.538	2.029	1.748
120	6.761	6.266	5.545	4.370	4.192	4.155	4.092	4.081	3.848	3.824	3.567	2.774	2.250	1.860
125	6.875	6.345	5.837	4.578	4.365	4.323	4.254	4.242	3.975	3.948	3.651	3.011	2.483	1.973
130	6.988	6.425	6.094	4.876	4.544	4.492	4.417	4.403	4.102	4.073	3.735	3.247	2.716	2.146
135	7.101	6.504	6.175	5.173	4.831	4.751	4.621	4.593	4.229	4.197	3.818	3.481	2.949	2.418
140	7.215	6.584	6.256	5.471	5.117	5.034	4.920	4.891	4.356	4.322	3.902	3.647	3.182	2.690
145	7.328	6.663	6.337	5.769	5.404	5.318	5.219	5.190	4.484	4.446	3.986	3.813	3.415	2.961
150	7.442	6.743	6.417	6.066	5.691	5.601	5.519	5.488	4.720	4.627	4.070	3.979	3.558	3.233
155	7.555	6.822	6.498	6.160	5.977	5.884	5.818	5.786	5.018	4.922	4.153	4.145	3.672	3.482
160	7.669	6.902	6.579	6.243	6.133	6.106	6.090	6.082	5.315	5.216	4.311	4.311	3.785	3.556
165	7.782	6.981	6.660	6.326	6.216	6.187	6.168	6.159	5.613	5.511	4.477	4.477	3.898	3.629
170	7.895	7.061	6.741	6.409	6.298	6.268	6.246	6.237	5.910	5.805	4.596	4.596	4.011	3.703
175	8.009	7.140	6.821	6.492	6.380	6.349	6.324	6.314	6.110	6.085	4.693	4.693	4.124	3.776
180	8.122	7.220	6.902	6.575	6.462	6.430	6.402	6.391	6.180	6.153	4.789	4.789	4.238	3.850
185	8.236	7.299	6.983	6.658	6.545	6.511	6.479	6.469	6.249	6.221	4.967	4.886	4.351	3.924
190	-	7.379	7.064	6.741	6.627	6.592	6.557	6.546	6.318	6.289	5.256	4.983	4.464	3.997
195	-	7.458	7.144	6.824	6.709	6.673	6.635	6.624	6.387	6.357	5.546	5.080	4.561	4.071
200	-	7.538	7.225	6.908	6.791	6.754	6.713	6.701	6.456	6.425	5.835	5.177	4.635	4.144
205	-	7.617	7.306	6.991	6.873	6.835	6.790	6.778	6.525	6.493	6.091	5.274	4.709	4.218
210	-	7.697	7.387	7.074	6.956	6.916	6.868	6.856	6.594	6.561	6.161	5.370	4.784	4.291
215	-	7.776	7.468	7.157	7.038	6.998	6.946	6.933	6.663	6.629	6.231	5.467	4.858	4.365
220	-	7.856	7.548	7.240	7.120	7.079	7.024	7.011	6.732	6.697	6.301	5.564	4.932	4.439
225	-	7.935	7.629	7.323	7.202	7.160	7.102	7.088	6.801	6.765	6.371	5.661	5.006	4.512
230	-	8.015	7.710	7.406	7.284	7.241	7.179	7.165	6.870	6.833	6.441	5.758	5.081	4.588
235	-	8.094	7.791	7.489	7.367	7.322	7.257	7.243	6.939	6.901	6.510	5.855	5.155	4.665
240	-	8.174	7.871	7.572	7.449	7.403	7.335	7.320	7.008	6.969	6.580	5.951	5.229	4.742
245	-	-	7.952	7.655	7.531	7.484	7.413	7.398	7.077	7.037	6.650	6.048	5.304	4.819
250	-	-	8.033	7.738	7.613	7.565	7.491	7.475	7.146	7.104	6.720	6.156	5.378	4.896
255	-	-	8.114	7.821	7.696	7.646	7.568	7.552	7.215	7.172	6.790	6.269	5.452	4.973
260	-	-	8.195	7.904	7.778	7.727	7.646	7.630	7.284	7.240	6.859	6.382	5.526	5.050
265	-	-	-	7.987	7.860	7.808	7.724	7.707	7.353	7.308	6.929	6.495	5.601	5.127
270	-	-	-	8.071	7.942	7.889	7.802	7.785	7.422	7.376	6.999	6.608	5.675	5.204
275	-	-	-	8.154	8.024	7.970	7.880	7.862	7.491	7.444	7.069	6.721	5.749	5.281
280	-	-	-	8.237	8.107	8.051	7.957	7.939	7.560	7.512	7.139	6.834	5.824	5.358
285	-	-	-	-	8.189	8.132	8.035	8.017	7.629	7.580	7.208	6.947	5.898	5.435
290	-	-	-	-	8.271	8.214	8.113	8.094	7.698	7.648	7.278	7.060	5.972	5.512
295	-	-	-	-	-	-	8.191	8.171	7.767	7.716	7.348	7.173	6.046	5.589
300	-	-	-	-	-	-	-	8.249	7.837	7.784	7.418	7.286	6.151	5.666
305	-	-	-	-	-	-	-	-	7.906	7.852	7.488	7.399	6.283	5.743
310	-	-	-	-	-	-	-	-	7.975	7.920	7.558	7.512	6.414	5.820
315	-	-	-	-	-	-	-	-	8.044	7.988	7.627	7.625	6.546	5.897
320	-	-	-	-	-	-	-	-	8.113	8.056	7.738	7.738	6.677	5.974
325	-	-	-	-	-	-	-	-	8.182	8.124	7.851	7.851	6.809	6.051
330	-	-	-	-	-	-	-	-	8.251	8.192	7.964	7.964	6.940	6.147
335	-	-	-	-	-	-	-	-	-	8.260	8.077	8.077	7.072	6.256
340	-	-	-	-	-	-	-	-	-	-	8.190	8.190	7.203	6.365
345	-	-	-	-	-	-	-	-	-	-	8.303	8.303	7.335	6.474
350	-	-	-	-	-	-	-	-	-	-	8.416	8.416	7.466	6.583
355	-	-	-	-	-	-	-	-	-	-	-	-	7.598	6.691

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.667mm.

Table 36 Rectangular Hollow Columns 105 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m^{-1})	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	3.350	2.651	1.988	1.661	1.592	1.575	1.547	1.542	1.408	1.393	1.193	1.023	0.859	0.664
55	3.907	2.977	2.314	1.855	1.780	1.762	1.732	1.726	1.582	1.566	1.354	1.178	1.002	0.786
60	4.464	3.302	2.654	2.054	1.968	1.948	1.917	1.910	1.756	1.739	1.516	1.333	1.153	0.937
65	5.194	4.589	2.995	2.397	2.250	2.213	2.152	2.140	1.930	1.912	1.677	1.488	1.303	1.087
70	5.946	4.983	3.336	2.741	2.592	2.556	2.495	2.483	2.172	2.132	1.839	1.644	1.453	1.238
75	6.227	5.378	3.944	3.084	2.934	2.899	2.837	2.825	2.533	2.494	2.000	1.799	1.604	1.388
80	6.405	5.772	4.632	3.428	3.277	3.242	3.180	3.168	2.894	2.856	2.316	1.954	1.754	1.539
85	6.582	6.110	5.028	3.823	3.626	3.587	3.521	3.510	3.256	3.218	2.687	2.152	1.904	1.689
90	6.760	6.245	5.424	4.226	3.986	3.938	3.857	3.843	3.575	3.547	3.057	2.409	2.062	1.840
95	6.938	6.379	5.821	4.630	4.346	4.288	4.192	4.175	3.831	3.798	3.428	2.666	2.301	1.990
100	7.116	6.514	6.128	5.040	4.725	4.653	4.528	4.508	4.088	4.048	3.620	2.922	2.539	2.209
105	7.294	6.648	6.265	5.449	5.124	5.048	4.940	4.915	4.344	4.299	3.786	3.179	2.778	2.464
110	7.471	6.783	6.401	5.858	5.523	5.444	5.353	5.326	4.642	4.562	3.952	3.436	3.017	2.720
115	7.649	6.917	6.538	6.145	5.922	5.839	5.765	5.738	5.051	4.967	4.119	3.710	3.255	2.975
120	7.827	7.052	6.675	6.285	6.164	6.134	6.112	6.103	5.460	5.372	4.285	3.987	3.491	3.230
125	8.005	7.186	6.811	6.425	6.303	6.272	6.245	6.235	5.868	5.777	4.452	4.264	3.692	3.481
130	8.182	7.321	6.948	6.564	6.442	6.409	6.378	6.367	6.139	6.111	4.741	4.538	3.892	3.633
135	-	7.455	7.085	6.704	6.581	6.547	6.511	6.500	6.260	6.230	5.137	4.728	4.093	3.784
140	-	7.590	7.222	6.844	6.720	6.684	6.643	6.632	6.381	6.350	5.532	4.919	4.294	3.936
145	-	7.724	7.358	6.984	6.859	6.822	6.776	6.764	6.502	6.470	5.928	5.109	4.494	4.088
150	-	7.859	7.495	7.124	6.998	6.959	6.909	6.896	6.623	6.589	6.139	5.300	4.643	4.240
155	-	7.993	7.632	7.264	7.137	7.096	7.042	7.029	6.744	6.709	6.235	5.490	4.781	4.391
160	-	8.128	7.769	7.404	7.276	7.234	7.174	7.161	6.866	6.829	6.330	5.681	4.919	4.537
165	-	8.263	7.905	7.543	7.414	7.371	7.307	7.293	6.987	6.948	6.425	5.871	5.057	4.628
170	-	-	8.042	7.683	7.553	7.509	7.440	7.425	7.108	7.068	6.520	6.062	5.195	4.718
175	-	-	8.179	7.823	7.692	7.646	7.573	7.558	7.229	7.188	6.615	6.162	5.333	4.808
180	-	-	8.315	7.963	7.831	7.784	7.706	7.690	7.350	7.307	6.711	6.253	5.471	4.898
185	-	-	-	8.103	7.970	7.921	7.838	7.822	7.471	7.427	6.806	6.343	5.609	4.988
190	-	-	-	8.243	8.109	8.059	7.971	7.954	7.592	7.547	6.901	6.434	5.747	5.078
195	-	-	-	-	8.248	8.196	8.104	8.087	7.713	7.666	6.996	6.524	5.885	5.168
200	-	-	-	-	-	8.334	8.237	8.219	7.834	7.786	7.091	6.615	6.023	5.258
205	-	-	-	-	-	-	-	-	7.955	7.906	7.187	6.705	6.132	5.348
210	-	-	-	-	-	-	-	-	8.076	8.025	7.282	6.796	6.219	5.438
215	-	-	-	-	-	-	-	-	8.197	8.145	7.377	6.886	6.306	5.528
220	-	-	-	-	-	-	-	-	8.318	8.265	7.472	6.977	6.393	5.619
225	-	-	-	-	-	-	-	-	-	8.384	7.567	7.067	6.481	5.709
230	-	-	-	-	-	-	-	-	-	-	7.663	7.158	6.568	5.799
235	-	-	-	-	-	-	-	-	-	-	7.758	7.248	6.655	5.889
240	-	-	-	-	-	-	-	-	-	-	7.853	7.338	6.742	5.979
245	-	-	-	-	-	-	-	-	-	-	7.948	7.429	6.829	6.069
250	-	-	-	-	-	-	-	-	-	-	8.043	7.519	6.917	6.164
255	-	-	-	-	-	-	-	-	-	-	8.138	7.610	7.004	6.260
260	-	-	-	-	-	-	-	-	-	-	8.234	7.700	7.091	6.356
265	-	-	-	-	-	-	-	-	-	-	-	7.791	7.178	6.452
270	-	-	-	-	-	-	-	-	-	-	-	7.881	7.265	6.548
275	-	-	-	-	-	-	-	-	-	-	-	7.972	7.353	6.644
280	-	-	-	-	-	-	-	-	-	-	-	8.062	7.440	6.740
285	-	-	-	-	-	-	-	-	-	-	-	8.153	7.527	6.836
290	-	-	-	-	-	-	-	-	-	-	-	8.243	7.614	6.931
295	-	-	-	-	-	-	-	-	-	-	-	8.334	7.701	7.027
300	-	-	-	-	-	-	-	-	-	-	-	8.424	7.789	7.123
305	-	-	-	-	-	-	-	-	-	-	-	-	7.876	7.219
310	-	-	-	-	-	-	-	-	-	-	-	-	7.963	7.315
315	-	-	-	-	-	-	-	-	-	-	-	-	8.050	7.411
320	-	-	-	-	-	-	-	-	-	-	-	-	8.137	7.507
325	-	-	-	-	-	-	-	-	-	-	-	-	8.225	7.603
330	-	-	-	-	-	-	-	-	-	-	-	-	8.312	7.699
335	-	-	-	-	-	-	-	-	-	-	-	-	8.399	7.795
340	-	-	-	-	-	-	-	-	-	-	-	-	-	7.890
345	-	-	-	-	-	-	-	-	-	-	-	-	-	7.986
350	-	-	-	-	-	-	-	-	-	-	-	-	-	8.082
355	-	-	-	-	-	-	-	-	-	-	-	-	-	8.178

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.667mm.

Table 37 Rectangular Hollow Columns 120 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m^{-1})	350	400	450	500	512	515	520	521	547	550	600	650	700	750
50	4.429	4.279	2.545	2.020	1.901	1.884	1.884	1.878	1.733	1.717	1.508	1.345	1.190	1.018
55	5.404	4.767	2.941	2.363	2.233	2.201	2.148	2.137	1.939	1.922	1.701	1.532	1.374	1.191
60	6.157	5.255	3.337	2.753	2.617	2.585	2.530	2.519	2.240	2.206	1.894	1.719	1.558	1.379
65	6.405	5.744	4.646	3.142	3.001	2.969	2.912	2.901	2.635	2.601	2.132	1.906	1.742	1.566
70	6.653	6.142	5.147	3.602	3.385	3.352	3.294	3.283	3.030	2.996	2.524	2.119	1.926	1.753
75	6.901	6.338	5.648	4.473	4.054	3.973	3.840	3.817	3.425	3.391	2.916	2.402	2.137	1.941
80	7.150	6.535	6.108	5.017	4.719	4.651	4.532	4.503	3.911	3.858	3.308	2.684	2.393	2.164
85	7.398	6.731	6.307	5.539	5.231	5.159	5.058	5.034	4.409	4.344	3.651	2.967	2.649	2.429
90	7.646	6.928	6.507	6.061	5.743	5.667	5.585	5.559	4.924	4.848	3.958	3.250	2.905	2.695
95	7.894	7.124	6.706	6.276	6.149	6.118	6.092	6.082	5.444	5.364	4.265	3.562	3.161	2.960
100	8.142	7.320	6.905	6.479	6.351	6.318	6.286	6.275	5.964	5.880	4.600	3.990	3.416	3.226
105	-	7.517	7.104	6.681	6.552	6.517	6.480	6.469	6.220	6.189	5.103	4.418	3.717	3.490
110	-	7.713	7.304	6.884	6.754	6.717	6.673	6.662	6.399	6.367	5.606	4.769	4.031	3.733
115	-	7.910	7.503	7.087	6.955	6.917	6.867	6.855	6.578	6.544	6.089	5.092	4.344	3.976
120	-	8.106	7.702	7.289	7.157	7.117	7.061	7.048	6.758	6.722	6.236	5.416	4.630	4.218
125	-	8.303	7.901	7.492	7.358	7.317	7.255	7.241	6.937	6.899	6.383	5.739	4.876	4.461
130	-	-	8.101	7.695	7.559	7.516	7.448	7.434	7.116	7.077	6.530	6.063	5.123	4.648
135	-	-	8.300	7.897	7.761	7.716	7.642	7.627	7.295	7.255	6.677	6.168	5.369	4.814
140	-	-	-	8.100	7.962	7.916	7.836	7.820	7.475	7.432	6.824	6.260	5.615	4.980
145	-	-	-	8.303	8.164	8.116	8.030	8.013	7.654	7.610	6.971	6.352	5.861	5.145
150	-	-	-	-	8.365	8.316	8.224	8.207	7.833	7.787	7.118	6.444	6.090	5.311
155	-	-	-	-	-	-	-	-	8.012	7.965	7.265	6.536	6.176	5.477
160	-	-	-	-	-	-	-	-	8.192	8.142	7.412	6.628	6.261	5.642
165	-	-	-	-	-	-	-	-	8.371	8.320	7.560	6.720	6.347	5.808
170	-	-	-	-	-	-	-	-	-	-	7.707	6.812	6.432	5.973
175	-	-	-	-	-	-	-	-	-	-	7.854	6.903	6.517	6.109
180	-	-	-	-	-	-	-	-	-	-	8.001	6.995	6.603	6.189
185	-	-	-	-	-	-	-	-	-	-	8.148	7.087	6.688	6.269
190	-	-	-	-	-	-	-	-	-	-	8.295	7.179	6.774	6.348
195	-	-	-	-	-	-	-	-	-	-	-	7.271	6.859	6.428
200	-	-	-	-	-	-	-	-	-	-	-	7.363	6.945	6.508
205	-	-	-	-	-	-	-	-	-	-	-	7.455	7.030	6.588
210	-	-	-	-	-	-	-	-	-	-	-	7.547	7.115	6.667
215	-	-	-	-	-	-	-	-	-	-	-	7.639	7.201	6.747
220	-	-	-	-	-	-	-	-	-	-	-	7.731	7.286	6.827
225	-	-	-	-	-	-	-	-	-	-	-	7.823	7.372	6.907
230	-	-	-	-	-	-	-	-	-	-	-	7.915	7.457	6.987
235	-	-	-	-	-	-	-	-	-	-	-	8.007	7.543	7.066
240	-	-	-	-	-	-	-	-	-	-	-	8.099	7.628	7.146
245	-	-	-	-	-	-	-	-	-	-	-	8.191	7.713	7.226
250	-	-	-	-	-	-	-	-	-	-	-	8.283	7.799	7.306
255	-	-	-	-	-	-	-	-	-	-	-	8.375	7.884	7.385
260	-	-	-	-	-	-	-	-	-	-	-	-	7.970	7.465
265	-	-	-	-	-	-	-	-	-	-	-	-	8.055	7.545
270	-	-	-	-	-	-	-	-	-	-	-	-	8.141	7.625
275	-	-	-	-	-	-	-	-	-	-	-	-	8.226	7.705
280	-	-	-	-	-	-	-	-	-	-	-	-	8.312	7.784
285	-	-	-	-	-	-	-	-	-	-	-	-	8.397	7.864
290	-	-	-	-	-	-	-	-	-	-	-	-	-	7.944
295	-	-	-	-	-	-	-	-	-	-	-	-	-	8.024
300	-	-	-	-	-	-	-	-	-	-	-	-	-	8.103
305	-	-	-	-	-	-	-	-	-	-	-	-	-	8.183
310	-	-	-	-	-	-	-	-	-	-	-	-	-	8.263
315	-	-	-	-	-	-	-	-	-	-	-	-	-	8.343
320	-	-	-	-	-	-	-	-	-	-	-	-	-	8.423
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.667mm.

Table 38 Rectangular Hollow Beams 15 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	580	600	603	610	620	650	700	750
40	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
45	0.404	0.404	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
50	0.414	0.414	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
55	0.424	0.424	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
60	0.434	0.434	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
65	0.444	0.444	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
70	0.453	0.453	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
75	0.463	0.463	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
80	0.473	0.473	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
85	0.483	0.483	0.397	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
90	0.493	0.493	0.419	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
95	0.503	0.503	0.441	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
100	0.513	0.513	0.462	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
105	0.523	0.523	0.484	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
110	0.533	0.533	0.506	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
115	0.543	0.543	0.527	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
120	0.552	0.552	0.549	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
125	0.571	0.571	0.571	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
130	0.592	0.592	0.592	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
135	0.614	0.614	0.614	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
140	0.636	0.636	0.636	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
145	0.657	0.657	0.657	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
150	0.679	0.679	0.679	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
155	0.700	0.700	0.700	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
160	0.722	0.722	0.722	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
165	0.744	0.744	0.744	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
170	0.765	0.765	0.765	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
175	0.787	0.787	0.787	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
180	0.809	0.809	0.809	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
185	0.830	0.830	0.830	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
190	0.852	0.852	0.852	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
195	0.874	0.874	0.874	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
200	0.895	0.895	0.895	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
205	0.917	0.917	0.917	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
210	0.939	0.939	0.939	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
215	0.960	0.960	0.960	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
220	0.982	0.982	0.982	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
225	1.004	1.004	1.004	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
230	1.025	1.025	1.025	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
235	1.047	1.047	1.047	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
240	1.068	1.068	1.068	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
245	1.090	1.090	1.090	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
250	1.112	1.112	1.112	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
255	1.133	1.133	1.133	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
260	1.155	1.155	1.155	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
265	1.177	1.177	1.177	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
270	1.198	1.198	1.198	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
275	1.220	1.220	1.220	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
280	1.242	1.242	1.242	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
285	1.263	1.263	1.263	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
290	1.285	1.285	1.285	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
295	1.307	1.307	1.307	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
300	1.328	1.328	1.328	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
305	1.350	1.350	1.350	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
310	1.371	1.371	1.371	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
315	1.393	1.393	1.393	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
320	1.415	1.415	1.415	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
325	1.436	1.436	1.436	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
330	1.458	1.458	1.458	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
335	1.480	1.480	1.480	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
340	1.501	1.501	1.501	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 39 Rectangular Hollow Beams 20 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	580	600	603	610	620	650	700	750
40	0.454	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
45	0.471	0.406	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
50	0.487	0.420	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
55	0.503	0.434	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
60	0.520	0.447	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
65	0.536	0.461	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
70	0.553	0.475	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
75	0.569	0.489	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
80	0.585	0.503	0.416	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
85	0.602	0.516	0.447	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
90	0.618	0.530	0.478	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
95	0.635	0.544	0.509	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
100	0.651	0.558	0.539	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
105	0.667	0.572	0.570	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
110	0.684	0.601	0.601	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
115	0.700	0.632	0.632	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
120	0.716	0.663	0.663	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
125	0.733	0.693	0.693	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
130	0.749	0.724	0.724	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
135	0.766	0.755	0.755	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
140	0.786	0.786	0.786	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
145	0.817	0.817	0.817	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
150	0.847	0.847	0.847	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
155	0.878	0.878	0.878	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
160	0.909	0.909	0.909	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
165	0.940	0.940	0.940	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
170	0.971	0.971	0.971	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
175	1.002	1.002	1.002	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
180	1.032	1.032	1.032	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
185	1.063	1.063	1.063	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
190	1.094	1.094	1.094	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
195	1.125	1.125	1.125	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
200	1.156	1.156	1.156	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
205	1.186	1.186	1.186	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
210	1.217	1.217	1.217	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
215	1.248	1.248	1.248	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
220	1.279	1.279	1.279	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
225	1.310	1.310	1.310	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
230	1.340	1.340	1.340	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
235	1.371	1.371	1.371	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
240	1.402	1.402	1.402	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
245	1.433	1.433	1.433	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
250	1.464	1.464	1.464	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
255	1.494	1.494	1.494	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
260	1.525	1.525	1.525	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
265	1.556	1.556	1.556	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
270	1.587	1.587	1.587	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
275	1.618	1.618	1.618	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
280	1.648	1.648	1.648	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
285	1.679	1.679	1.679	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
290	1.710	1.710	1.710	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
295	1.741	1.741	1.741	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
300	1.772	1.772	1.772	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
305	1.802	1.802	1.802	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
310	1.833	1.833	1.833	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
315	1.864	1.864	1.864	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
320	1.895	1.895	1.895	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
325	1.926	1.926	1.926	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
330	1.956	1.956	1.956	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
335	1.987	1.987	1.987	0.404	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
340	2.018	2.018	2.018	0.452	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 40 Rectangular Hollow Beams 30 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	580	600	603	610	620	650	700	750
40	0.671	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
45	0.693	0.413	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
50	0.716	0.435	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
55	0.738	0.457	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
60	0.761	0.479	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
65	0.783	0.501	0.402	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
70	0.806	0.524	0.452	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
75	0.829	0.546	0.502	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
80	0.851	0.568	0.552	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
85	0.874	0.602	0.602	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
90	0.896	0.652	0.652	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
95	0.919	0.702	0.702	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
100	0.941	0.752	0.752	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
105	0.964	0.802	0.802	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
110	0.986	0.851	0.851	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
115	1.009	0.901	0.901	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
120	1.031	0.951	0.951	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
125	1.054	1.001	1.001	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
130	1.076	1.051	1.051	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
135	1.101	1.101	1.101	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
140	1.151	1.151	1.151	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
145	1.201	1.201	1.201	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
150	1.251	1.251	1.251	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
155	1.301	1.301	1.301	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
160	1.351	1.351	1.351	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
165	1.401	1.401	1.401	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
170	1.451	1.451	1.451	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
175	1.501	1.501	1.501	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
180	1.551	1.551	1.551	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
185	1.601	1.601	1.601	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
190	1.651	1.651	1.651	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
195	1.701	1.701	1.701	0.442	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
200	1.751	1.751	1.751	0.513	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
205	1.801	1.801	1.801	0.584	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
210	1.851	1.851	1.851	0.655	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
215	1.901	1.901	1.901	0.726	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
220	1.951	1.951	1.951	0.797	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
225	2.001	2.001	2.001	0.868	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
230	2.051	2.051	2.051	0.940	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
235	2.101	2.101	2.101	1.011	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
240	2.151	2.151	2.151	1.082	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
245	2.201	2.201	2.201	1.153	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
250	2.251	2.251	2.251	1.224	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
255	2.300	2.300	2.300	1.295	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
260	2.350	2.350	2.350	1.366	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
265	2.400	2.400	2.400	1.437	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
270	2.450	2.450	2.450	1.509	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
275	2.500	2.500	2.500	1.580	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
280	2.550	2.550	2.550	1.651	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
285	2.600	2.600	2.600	1.722	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
290	2.650	2.650	2.650	1.793	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
295	2.700	2.700	2.700	1.864	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
300	2.750	2.750	2.750	1.935	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
305	2.800	2.800	2.800	2.007	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
310	2.850	2.850	2.850	2.078	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
315	2.900	2.900	2.900	2.149	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
320	2.950	2.950	2.950	2.220	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
325	3.000	3.000	3.000	2.291	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
330	3.050	3.050	3.050	2.362	0.431	0.431	0.431	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
335	3.100	3.100	3.100	2.433	0.550	0.550	0.550	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
340	3.150	3.150	3.150	2.504	0.669	0.669	0.669	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 41 Rectangular Hollow Beams 45 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	580	600	603	610	620	650	700	750
40	0.997	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
45	1.055	0.445	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
50	1.113	0.499	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
55	1.171	0.552	0.447	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
60	1.229	0.605	0.527	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
65	1.287	0.658	0.607	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
70	1.345	0.711	0.687	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
75	1.403	0.767	0.767	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
80	1.461	0.847	0.847	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
85	1.519	0.927	0.927	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
90	1.577	1.007	1.007	0.403	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
95	1.635	1.087	1.087	0.494	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
100	1.693	1.167	1.167	0.586	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
105	1.751	1.248	1.248	0.677	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
110	1.809	1.328	1.328	0.769	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
115	1.867	1.408	1.408	0.861	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
120	1.925	1.488	1.488	0.952	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
125	1.983	1.568	1.568	1.044	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
130	2.068	1.648	1.648	1.135	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
135	2.160	1.728	1.728	1.227	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
140	2.251	1.808	1.808	1.319	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
145	2.343	1.888	1.888	1.410	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
150	2.434	1.968	1.968	1.502	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
155	2.526	2.048	2.048	1.594	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
160	2.617	2.129	2.129	1.685	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
165	2.709	2.209	2.209	1.777	0.488	0.488	0.488	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
170	2.800	2.289	2.289	1.868	0.616	0.616	0.616	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
175	2.892	2.369	2.369	1.960	0.744	0.744	0.744	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
180	2.983	2.449	2.449	2.052	0.872	0.872	0.872	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
185	3.057	2.529	2.529	2.143	1.000	1.000	1.000	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
190	3.123	2.609	2.609	2.235	1.128	1.128	1.128	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
195	3.190	2.689	2.689	2.326	1.256	1.256	1.256	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
200	3.256	2.769	2.769	2.418	1.384	1.384	1.384	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
205	3.323	2.849	2.849	2.510	1.512	1.512	1.512	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
210	3.389	2.930	2.930	2.601	1.640	1.640	1.640	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
215	3.456	3.010	3.010	2.693	1.768	1.768	1.768	0.541	0.428	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
220	3.522	3.090	3.090	2.784	1.896	1.896	1.896	0.721	0.613	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
225	3.589	3.170	3.170	2.876	2.024	2.024	2.024	0.901	0.798	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
230	3.656	3.250	3.250	2.968	2.153	2.153	2.153	1.082	0.984	0.485	0.485	0.385	0.385	0.385	0.385	0.385	0.385	0.385
235	3.722	3.330	3.330	3.059	2.281	2.281	2.281	1.262	1.169	0.697	0.697	0.385	0.385	0.385	0.385	0.385	0.385	0.385
240	3.789	3.410	3.410	3.151	2.409	2.409	2.409	1.442	1.355	0.908	0.908	0.385	0.385	0.385	0.385	0.385	0.385	0.385
245	3.855	3.490	3.490	3.243	2.537	2.537	2.537	1.623	1.540	1.119	1.119	0.421	0.385	0.385	0.385	0.385	0.385	0.385
250	3.922	3.570	3.570	3.334	2.665	2.665	2.665	1.803	1.725	1.330	1.330	0.656	0.550	0.385	0.385	0.385	0.385	0.385
255	3.988	3.650	3.650	3.426	2.793	2.793	2.793	1.983	1.911	1.541	1.541	0.891	0.788	0.530	0.385	0.385	0.385	0.385
260	4.055	3.745	3.730	3.517	2.921	2.921	2.921	2.164	2.096	1.753	1.753	1.125	1.026	0.776	0.385	0.385	0.385	0.385
265	4.121	3.872	3.811	3.609	3.049	3.049	3.049	2.344	2.281	1.964	1.964	1.360	1.264	1.023	0.516	0.385	0.385	0.385
270	4.188	3.999	3.891	3.701	3.177	3.177	3.177	2.524	2.467	2.175	2.175	1.594	1.501	1.269	0.801	0.385	0.385	0.385
275	4.254	4.125	3.971	3.792	3.305	3.305	3.305	2.704	2.652	2.386	2.386	1.829	1.739	1.515	1.086	0.385	0.385	0.385
280	4.321	4.252	4.051	3.884	3.433	3.433	3.433	2.885	2.837	2.598	2.598	2.063	1.977	1.762	1.371	0.385	0.385	0.385
285	4.387	4.379	4.131	3.975	3.561	3.561	3.561	3.065	3.023	2.809	2.809	2.298	2.215	2.008	1.656	0.385	0.385	0.385
290	-	-	4.211	4.067	3.689	3.689	3.689	3.245	3.208	3.020	3.020	2.532	2.452	2.254	1.942	0.385	0.385	0.385
295	-	-	4.291	4.159	3.817	3.817	3.817	3.426	3.393	3.231	3.231	2.767	2.690	2.501	2.227	0.588	0.385	0.385
300	-	-	4.371	4.250	3.945	3.945	3.945	3.606	3.579	3.442	3.442	3.002	2.928	2.747	2.512	0.926	0.385	0.385
305	-	-	-	4.342	4.210	4.109	4.073	3.786	3.764	3.654	3.654	3.236	3.166	2.993	2.797	1.264	0.385	0.385
310	-	-	-	-	-	-	4.201	3.967	3.950	3.865	3.865	3.471	3.403	3.240	3.082	1.602	0.385	0.385
315	-	-	-	-	-	-	4.329	4.147	4.135	4.076	4.076	3.705	3.641	3.486	3.367	1.940	0.385	0.385
320	-	-	-	-	-	-	-	4.327	4.320	4.287	4.287	3.940	3.879	3.732	3.652	2.278	0.385	0.385
325	-	-	-	-	-	-	-	-	-	-	-	4.174	4.117	3.979	3.937	2.616	0.385	0.385
330	-	-	-	-	-	-	-	-	-	-	-	-	-	4.225	4.222	2.954	0.385	0.385
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.292	0.385	0.385
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.630	0.385	0.385

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 42 Rectangular Hollow Beams 60 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	580	600	603	610	620	650	700	750
40	1.322	0.547	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
45	1.421	0.667	0.426	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
50	1.520	0.787	0.512	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
55	1.619	0.907	0.597	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
60	1.717	1.026	0.683	0.419	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
65	1.816	1.146	0.769	0.479	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
70	1.915	1.266	0.854	0.540	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
75	2.034	1.386	0.940	0.601	0.410	0.410	0.410	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
80	2.241	1.506	1.025	0.662	0.524	0.524	0.524	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
85	2.449	1.626	1.111	0.723	0.638	0.638	0.638	0.468	0.458	0.415	0.415	0.385	0.385	0.385	0.385	0.385	0.385	0.385
90	2.656	1.745	1.197	0.783	0.752	0.752	0.752	0.583	0.573	0.531	0.531	0.385	0.385	0.385	0.385	0.385	0.385	0.385
95	2.863	1.865	1.282	0.866	0.866	0.866	0.866	0.698	0.688	0.647	0.647	0.397	0.385	0.385	0.385	0.385	0.385	0.385
100	3.030	1.985	1.368	0.980	0.980	0.980	0.980	0.813	0.804	0.763	0.763	0.517	0.473	0.385	0.385	0.385	0.385	0.385
105	3.099	2.122	1.453	1.094	1.094	1.094	1.094	0.928	0.919	0.878	0.878	0.637	0.593	0.481	0.385	0.385	0.385	0.385
110	3.169	2.260	1.539	1.207	1.207	1.207	1.207	1.043	1.034	0.994	0.994	0.757	0.714	0.605	0.385	0.385	0.385	0.385
115	3.238	2.399	1.625	1.321	1.321	1.321	1.321	1.158	1.149	1.110	1.110	0.877	0.835	0.728	0.483	0.385	0.385	0.385
120	3.308	2.537	1.710	1.435	1.435	1.435	1.435	1.274	1.264	1.226	1.226	0.997	0.956	0.851	0.615	0.385	0.385	0.385
125	3.378	2.675	1.796	1.549	1.549	1.549	1.549	1.389	1.379	1.341	1.341	1.117	1.077	0.974	0.746	0.385	0.385	0.385
130	3.447	2.814	1.881	1.663	1.663	1.663	1.663	1.504	1.495	1.457	1.457	1.237	1.198	1.098	0.878	0.385	0.385	0.385
135	3.517	2.952	1.967	1.777	1.777	1.777	1.777	1.619	1.610	1.573	1.573	1.357	1.319	1.221	1.009	0.385	0.385	0.385
140	3.586	3.064	2.065	1.891	1.891	1.891	1.891	1.734	1.725	1.689	1.689	1.477	1.439	1.344	1.141	0.385	0.385	0.385
145	3.656	3.156	2.169	2.005	2.005	2.005	2.005	1.849	1.840	1.804	1.804	1.597	1.560	1.468	1.272	0.385	0.385	0.385
150	3.725	3.249	2.274	2.119	2.119	2.119	2.119	1.964	1.955	1.920	1.920	1.717	1.681	1.591	1.404	0.385	0.385	0.385
155	3.795	3.341	2.378	2.232	2.232	2.232	2.232	2.079	2.071	2.036	2.036	1.837	1.802	1.714	1.535	0.544	0.385	0.385
160	3.865	3.434	2.482	2.346	2.346	2.346	2.346	2.194	2.186	2.152	2.152	1.957	1.923	1.837	1.667	0.711	0.385	0.385
165	3.934	3.526	2.587	2.460	2.460	2.460	2.460	2.309	2.301	2.268	2.268	2.077	2.044	1.961	1.798	0.877	0.385	0.385
170	4.004	3.619	2.691	2.574	2.574	2.574	2.574	2.424	2.416	2.383	2.383	2.197	2.165	2.084	1.930	1.043	0.385	0.385
175	4.073	3.712	2.795	2.688	2.688	2.688	2.688	2.539	2.531	2.499	2.499	2.317	2.285	2.207	2.061	1.210	0.385	0.385
180	4.143	3.804	2.900	2.802	2.802	2.802	2.802	2.654	2.647	2.615	2.615	2.437	2.406	2.330	2.193	1.376	0.385	0.385
185	4.213	3.897	3.004	2.916	2.916	2.916	2.916	2.769	2.762	2.731	2.731	2.557	2.527	2.454	2.324	1.542	0.385	0.385
190	4.282	3.989	3.220	3.030	3.030	3.030	3.030	2.884	2.877	2.846	2.846	2.677	2.648	2.577	2.456	1.709	0.385	0.385
195	4.352	4.082	3.443	3.144	3.144	3.144	3.144	2.999	2.992	2.962	2.962	2.797	2.769	2.700	2.588	1.875	0.385	0.385
200	-	4.175	3.665	3.257	3.257	3.257	3.257	3.114	3.107	3.078	3.078	2.917	2.890	2.823	2.719	2.041	0.385	0.385
205	-	4.267	3.887	3.371	3.371	3.371	3.371	3.230	3.223	3.194	3.194	3.037	3.011	2.947	2.851	2.208	0.385	0.385
210	-	4.360	4.110	3.485	3.485	3.485	3.485	3.345	3.338	3.309	3.309	3.157	3.132	3.070	2.982	2.374	0.385	0.385
215	-	-	-	3.623	3.599	3.599	3.599	3.460	3.453	3.425	3.425	3.277	3.252	3.193	3.114	2.540	0.385	0.385
220	-	-	-	3.944	3.713	3.713	3.713	3.575	3.568	3.541	3.541	3.397	3.373	3.316	3.245	2.707	0.385	0.385
225	-	-	-	4.265	3.827	3.827	3.827	3.690	3.683	3.657	3.657	3.516	3.494	3.440	3.377	2.873	0.385	0.385
230	-	-	-	-	3.941	3.941	3.941	3.805	3.799	3.772	3.772	3.636	3.615	3.563	3.508	3.039	0.385	0.385
235	-	-	-	-	-	4.055	4.055	3.920	3.914	3.888	3.888	3.756	3.736	3.686	3.640	3.206	0.385	0.385
240	-	-	-	-	-	4.169	4.169	4.035	4.029	4.004	4.004	3.876	3.857	3.809	3.771	3.372	0.708	0.675
245	-	-	-	-	-	4.338	4.283	4.150	4.144	4.120	4.120	3.996	3.978	3.933	3.903	3.538	1.210	0.984
250	-	-	-	-	-	-	4.396	4.265	4.259	4.235	4.235	4.116	4.098	4.056	4.034	3.705	1.712	1.293
255	-	-	-	-	-	-	-	4.380	4.374	4.351	4.351	4.236	4.219	4.179	4.166	3.871	2.213	1.602
260	-	-	-	-	-	-	-	-	-	-	-	4.356	4.340	4.302	4.297	4.037	2.715	1.911
265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.204	3.217	2.22
270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.370	3.718	2.529
275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.838
280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.147
285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.456
290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.765
295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.074
300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 43 Rectangular Hollow Beams 75 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	580	600	603	610	620	650	700	750
40	1.648	1.001	0.586	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
45	1.788	1.178	0.734	0.436	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
50	1.927	1.355	0.882	0.553	0.427	0.427	0.427	0.389	0.387	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
55	2.166	1.531	1.031	0.671	0.509	0.509	0.509	0.460	0.457	0.447	0.447	0.395	0.387	0.385	0.385	0.385	0.385	0.385
60	2.500	1.708	1.179	0.789	0.591	0.591	0.591	0.530	0.527	0.515	0.515	0.455	0.446	0.425	0.385	0.385	0.385	0.385
65	2.834	1.885	1.327	0.906	0.711	0.672	0.672	0.601	0.597	0.583	0.583	0.516	0.505	0.492	0.492	0.385	0.385	0.385
70	3.049	2.090	1.475	1.024	0.872	0.793	0.754	0.671	0.667	0.652	0.652	0.617	0.617	0.617	0.617	0.385	0.385	0.385
75	3.132	2.343	1.624	1.141	1.034	0.952	0.836	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.446	0.385	0.385
80	3.215	2.595	1.772	1.259	1.195	1.111	0.918	0.866	0.866	0.866	0.866	0.866	0.866	0.866	0.866	0.573	0.385	0.385
85	3.298	2.848	1.920	1.377	1.357	1.269	1.000	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.701	0.385	0.385
90	3.382	3.040	2.100	1.518	1.518	1.428	1.116	1.116	1.116	1.116	1.116	1.116	1.116	1.116	1.116	0.829	0.385	0.385
95	3.465	3.124	2.310	1.679	1.679	1.586	1.241	1.241	1.241	1.241	1.241	1.241	1.241	1.241	1.241	0.957	0.385	0.385
100	3.548	3.209	2.521	1.841	1.841	1.745	1.365	1.365	1.365	1.365	1.365	1.365	1.365	1.365	1.365	1.085	0.385	0.385
105	3.631	3.294	2.732	2.002	2.002	1.904	1.490	1.490	1.490	1.490	1.490	1.490	1.490	1.490	1.490	1.213	0.498	0.385
110	3.714	3.379	2.943	2.164	2.164	2.062	1.615	1.615	1.615	1.615	1.615	1.615	1.615	1.615	1.615	1.340	0.643	0.385
115	3.798	3.463	3.076	2.325	2.325	2.221	1.740	1.740	1.740	1.740	1.740	1.740	1.740	1.740	1.740	1.468	0.788	0.385
120	3.881	3.548	3.175	2.487	2.487	2.379	1.864	1.864	1.864	1.864	1.864	1.864	1.864	1.864	1.864	1.596	0.933	0.385
125	3.964	3.633	3.273	2.648	2.648	2.538	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.724	1.078	0.385
130	4.047	3.717	3.371	2.810	2.810	2.697	2.114	2.114	2.114	2.114	2.114	2.114	2.114	2.114	2.114	1.852	1.223	0.385
135	4.131	3.802	3.470	2.971	2.971	2.855	2.239	2.239	2.239	2.239	2.239	2.239	2.239	2.239	2.239	1.979	1.369	0.385
140	4.214	3.887	3.568	3.084	3.084	3.012	2.364	2.364	2.364	2.364	2.364	2.364	2.364	2.364	2.364	2.107	1.514	0.385
145	4.297	3.971	3.666	3.182	3.182	3.114	2.488	2.488	2.488	2.488	2.488	2.488	2.488	2.488	2.488	2.235	1.659	0.385
150	-	4.056	3.764	3.280	3.280	3.216	2.613	2.613	2.613	2.613	2.613	2.613	2.613	2.613	2.613	2.363	1.804	0.385
155	-	4.141	3.863	3.391	3.377	3.317	2.738	2.738	2.738	2.738	2.738	2.738	2.738	2.738	2.738	2.491	1.949	0.385
160	-	4.225	3.961	3.532	3.475	3.419	2.863	2.863	2.863	2.863	2.863	2.863	2.863	2.863	2.863	2.618	2.095	0.385
165	-	4.310	4.059	3.674	3.573	3.521	2.987	2.987	2.987	2.987	2.987	2.987	2.987	2.987	2.987	2.746	2.240	0.385
170	-	4.395	4.157	3.815	3.671	3.623	3.112	3.112	3.112	3.112	3.112	3.112	3.112	3.112	3.112	2.874	2.385	0.385
175	-	-	4.256	3.957	3.769	3.725	3.237	3.237	3.237	3.237	3.237	3.237	3.237	3.237	3.237	3.002	2.530	0.385
180	-	-	4.354	4.098	3.867	3.826	3.362	3.362	3.362	3.362	3.362	3.362	3.362	3.362	3.362	3.130	2.675	0.385
185	-	-	-	4.239	3.964	3.928	3.486	3.486	3.486	3.486	3.486	3.486	3.486	3.486	3.486	3.257	2.821	0.385
190	-	-	-	-	4.062	4.030	3.611	3.611	3.611	3.611	3.611	3.611	3.611	3.611	3.611	3.385	2.966	0.385
195	-	-	-	-	-	-	-	3.831	3.811	3.736	3.736	3.736	3.736	3.736	3.736	3.513	3.111	0.385
200	-	-	-	-	-	-	-	4.126	4.112	4.047	4.047	3.861	3.861	3.861	3.861	3.641	3.256	0.578
205	-	-	-	-	-	-	-	-	-	4.371	4.371	4.014	3.985	3.985	3.985	3.769	3.401	0.974
210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.110	3.897	3.546	1.370
215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.235	4.024	3.692	1.766
220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.360	4.152	3.837	2.163
225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.280	3.982	2.559
230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.408	4.127	2.955
235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.272	3.352
240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.748
245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 44 Rectangular Hollow Beams 90 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	580	600	603	610	620	650	700	750
40	1.974	1.456	1.012	0.662	0.536	0.536	0.536	0.492	0.489	0.478	0.478	0.420	0.410	0.385	0.385	0.385	0.385	0.385
45	2.406	1.689	1.214	0.834	0.663	0.663	0.663	0.606	0.603	0.590	0.590	0.523	0.512	0.489	0.454	0.385	0.385	0.385
50	2.872	1.923	1.415	1.006	0.791	0.791	0.791	0.720	0.717	0.702	0.702	0.626	0.614	0.587	0.548	0.429	0.385	0.385
55	-	2.255	1.617	1.178	0.919	0.919	0.919	0.835	0.831	0.814	0.814	0.730	0.716	0.685	0.643	0.513	0.385	0.385
60	-	2.632	1.818	1.350	1.047	1.047	1.047	0.949	0.944	0.926	0.926	0.833	0.819	0.782	0.737	0.596	0.385	0.385
65	-	3.009	2.036	1.522	1.175	1.175	1.175	1.064	1.058	1.038	1.038	0.936	0.921	0.880	0.831	0.680	0.434	0.385
70	-	-	2.364	1.694	1.303	1.303	1.303	1.178	1.172	1.150	1.150	1.039	1.023	0.977	0.926	0.763	0.497	0.385
75	-	-	2.692	1.866	1.443	1.431	1.431	1.292	1.286	1.262	1.262	1.142	1.125	1.075	1.020	0.846	0.560	0.385
80	-	-	3.012	2.064	1.591	1.559	1.559	1.407	1.400	1.374	1.374	1.245	1.227	1.172	1.114	0.930	0.623	0.385
85	-	-	3.105	2.339	1.739	1.687	1.687	1.521	1.514	1.486	1.486	1.349	1.329	1.270	1.209	1.013	0.687	0.385
90	-	-	3.197	2.614	1.887	1.825	1.815	1.635	1.627	1.598	1.598	1.452	1.431	1.367	1.303	1.097	0.750	0.385
95	-	-	3.290	2.890	2.465	1.970	1.943	1.750	1.741	1.710	1.710	1.555	1.533	1.465	1.397	1.180	0.813	0.385
100	-	-	3.383	3.066	3.066	3.032	2.127	1.864	1.855	1.822	1.822	1.658	1.636	1.562	1.492	1.263	0.876	0.497
105	-	-	3.475	3.167	3.149	3.116	2.349	1.979	1.969	1.933	1.933	1.761	1.738	1.660	1.586	1.347	0.939	0.631
110	-	-	3.568	3.267	3.232	3.199	2.571	2.166	2.148	2.082	2.082	1.865	1.840	1.757	1.681	1.430	1.002	0.764
115	-	-	3.660	3.368	3.314	3.283	2.793	2.365	2.346	2.277	2.277	1.968	1.942	1.855	1.775	1.514	1.065	0.898
120	-	-	3.753	3.469	3.397	3.366	3.012	2.564	2.545	2.471	2.471	2.122	2.076	1.952	1.869	1.597	1.129	1.032
125	-	-	3.845	3.570	3.480	3.450	3.135	2.763	2.743	2.665	2.665	2.294	2.245	2.091	1.989	1.724	1.192	1.165
130	-	-	3.938	3.670	3.563	3.534	3.257	2.962	2.941	2.859	2.859	2.466	2.414	2.261	2.114	1.852	1.299	1.299
135	-	-	4.030	3.771	3.645	3.617	3.379	3.117	3.103	3.043	3.043	2.638	2.583	2.431	2.258	1.979	1.432	1.432
140	-	-	4.123	3.872	3.728	3.701	3.502	3.259	3.246	3.190	3.190	2.811	2.753	2.601	2.415	2.107	1.566	1.566
145	-	-	4.216	3.972	3.811	3.784	3.624	3.401	3.388	3.337	3.337	2.983	2.922	2.771	2.573	2.235	1.699	1.699
150	-	-	4.308	4.073	3.894	3.868	3.746	3.542	3.531	3.485	3.485	3.165	3.101	2.941	2.731	2.363	1.833	1.833
155	-	-	-	4.174	3.976	3.951	3.869	3.684	3.674	3.632	3.632	3.348	3.293	3.137	2.888	2.491	1.966	1.966
160	-	-	-	4.275	4.059	4.035	3.991	3.825	3.817	3.779	3.779	3.532	3.484	3.349	3.072	2.618	2.100	2.100
165	-	-	-	4.375	4.142	4.118	4.114	3.967	3.959	3.927	3.927	3.715	3.675	3.562	3.344	2.746	2.240	2.234
170	-	-	-	-	4.236	4.236	4.236	4.109	4.102	4.074	4.074	3.899	3.866	3.774	3.615	2.874	2.385	2.367
175	-	-	-	-	4.307	4.285	4.358	4.250	4.245	4.222	4.222	4.083	4.057	3.987	3.886	3.002	2.530	2.501
180	-	-	-	-	-	-	-	-	-	4.369	4.369	4.266	4.248	4.199	4.157	3.130	2.675	2.634
185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.690	2.821	2.768
190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.966	2.901
195	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.706	3.082
200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.461
205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.840
210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.219
215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 45 Rectangular Hollow Beams 105 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	580	600	603	610	620	650	700	750
40	2.832	1.910	1.439	1.064	0.878	0.878	0.878	0.817	0.813	0.801	0.801	0.734	0.724	0.699	0.658	0.523	0.385	0.385
45	-	2.354	1.693	1.287	1.049	1.049	1.049	0.972	0.968	0.953	0.953	0.877	0.865	0.836	0.792	0.650	0.399	0.385
50	-	2.860	1.948	1.509	1.220	1.220	1.220	1.127	1.122	1.105	1.105	1.019	1.007	0.972	0.927	0.776	0.508	0.385
55	-	-	2.364	1.731	1.391	1.391	1.391	1.282	1.277	1.258	1.258	1.162	1.148	1.109	1.061	0.902	0.616	0.385
60	-	-	2.816	1.953	1.579	1.561	1.561	1.437	1.431	1.410	1.410	1.304	1.290	1.246	1.196	1.029	0.725	0.385
65	-	-	-	2.311	1.775	1.732	1.732	1.592	1.585	1.562	1.562	1.447	1.431	1.383	1.330	1.155	0.833	0.456
70	-	-	-	2.699	1.972	1.918	1.903	1.747	1.740	1.714	1.714	1.589	1.572	1.520	1.465	1.281	0.942	0.677
75	-	-	-	-	3.013	2.728	2.145	1.902	1.894	1.867	1.867	1.732	1.714	1.656	1.599	1.407	1.050	0.897
80	-	-	-	-	3.095	3.073	2.469	2.114	2.098	2.041	2.041	1.874	1.855	1.793	1.734	1.534	1.159	1.118
85	-	-	-	-	3.178	3.155	2.794	2.414	2.397	2.335	2.335	2.036	1.998	1.930	1.868	1.660	1.338	1.338
90	-	-	-	-	3.260	3.238	3.043	2.713	2.696	2.628	2.628	2.307	2.265	2.136	2.010	1.786	1.559	1.559
95	-	-	-	-	3.343	3.320	3.143	3.010	2.994	2.922	2.922	2.579	2.533	2.406	2.265	1.913	1.779	1.779
100	-	-	-	-	3.426	3.403	3.243	3.114	3.107	3.082	3.082	2.850	2.801	2.676	2.520	2.074	2.000	2.000
105	-	-	-	-	3.508	3.486	3.343	3.217	3.211	3.187	3.187	3.054	3.033	2.947	2.776	2.301	2.220	2.220
110	-	-	-	-	3.591	3.568	3.444	3.321	3.315	3.291	3.291	3.163	3.143	3.095	3.019	2.527	2.441	2.441
115	-	-	-	-	3.673	3.651	3.544	3.424	3.419	3.396	3.396	3.272	3.253	3.206	3.135	2.754	2.661	2.661
120	-	-	-	-	3.756	3.734	3.644	3.528	3.522	3.500	3.500	3.381	3.362	3.317	3.252	2.981	2.882	2.882
125	-	-	-	-	3.839	3.816	3.744	3.631	3.626	3.604	3.604	3.489	3.472	3.429	3.368	3.121	3.048	3.048
130	-	-	-	-	3.921	3.899	3.845	3.735	3.730	3.709	3.709	3.598	3.581	3.540	3.484	3.249	3.140	3.140
135	-	-	-	-	4.004	3.982	3.945	3.838	3.833	3.813	3.813	3.707	3.691	3.652	3.600	3.378	3.232	3.232
140	-	-	-	-	4.087	4.064	4.045	3.942	3.937	3.917	3.917	3.816	3.800	3.763	3.717	3.506	3.324	3.324
145	-	-	-	-	4.169	4.147	4.145	4.045	4.041	4.022	4.022	3.924	3.910	3.874	3.833	3.634	3.417	3.417
150	-	-	-	-	4.252	4.246	4.246	4.149	4.144	4.126	4.126	4.033	4.019	3.986	3.949	3.762	3.509	3.509
155	-	-	-	-	4.334	4.312	4.346	4.252	4.248	4.230	4.230	4.142	4.129	4.097	4.065	3.890	3.601	3.601
160	-	-	-	-	-	-	-	4.356	4.352	4.335	4.335	4.251	4.239	4.208	4.182	4.019	3.693	3.693
165	-	-	-	-	-	-	-	-	-	-	-	4.360	4.348	4.320	4.298	4.147	3.814	3.785
170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.275	4.007	3.877
175	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.403	4.201	3.970
180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.394	4.062
185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.154
190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.246
195	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.338
200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.

Table 46 Rectangular Hollow Beams 120 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m^{-1})	350	400	450	500	544	550	553	575	576	580	580	600	603	610	620	650	700	750
40	-	2.691	1.865	1.467	1.221	1.221	1.221	1.142	1.138	1.123	1.123	1.049	1.038	1.011	0.972	0.844	0.578	0.385
45	-	-	2.329	1.739	1.434	1.434	1.434	1.337	1.333	1.316	1.316	1.230	1.219	1.186	1.145	1.010	0.731	0.385
50	-	-	2.908	2.026	1.670	1.648	1.648	1.533	1.528	1.508	1.508	1.412	1.399	1.362	1.319	1.176	0.884	0.547
55	-	-	-	2.531	1.914	1.868	1.862	1.729	1.723	1.701	1.701	1.594	1.580	1.538	1.493	1.343	1.036	0.856
60	-	-	-	-	2.772	2.542	2.157	1.924	1.917	1.894	1.894	1.776	1.760	1.713	1.667	1.509	1.189	1.164
65	-	-	-	-	-	-	2.586	2.252	2.237	2.183	2.183	1.957	1.941	1.889	1.840	1.675	1.472	1.472
70	-	-	-	-	-	-	-	2.655	2.639	2.579	2.579	2.293	2.255	2.144	2.034	1.841	1.781	1.781
75	-	-	-	-	-	-	-	-	-	2.976	2.976	2.668	2.627	2.518	2.392	2.089	2.089	2.089
80	-	-	-	-	-	-	-	-	-	3.098	3.098	3.018	2.998	2.892	2.750	2.397	2.397	2.397
85	-	-	-	-	-	-	-	-	-	3.195	3.195	3.115	3.103	3.076	3.036	2.706	2.706	2.706
90	-	-	-	-	-	-	-	-	-	3.292	3.292	3.212	3.201	3.173	3.135	3.010	3.010	3.010
95	-	-	-	-	-	-	-	-	-	3.389	3.389	3.309	3.298	3.271	3.233	3.108	3.086	3.086
100	-	-	-	-	-	-	-	-	-	3.486	3.486	3.407	3.395	3.368	3.332	3.207	3.163	3.163
105	-	-	-	-	-	-	-	-	-	3.583	3.583	3.504	3.492	3.465	3.430	3.306	3.239	3.239
110	-	-	-	-	-	-	-	-	-	3.680	3.680	3.601	3.589	3.563	3.529	3.405	3.315	3.315
115	-	-	-	-	-	-	-	-	-	3.777	3.777	3.698	3.687	3.660	3.627	3.504	3.391	3.391
120	-	-	-	-	-	-	-	-	-	3.874	3.874	3.795	3.784	3.757	3.726	3.603	3.467	3.467
125	-	-	-	-	-	-	-	-	-	3.971	3.971	3.892	3.881	3.854	3.824	3.702	3.544	3.544
130	-	-	-	-	-	-	-	-	-	4.068	4.068	3.989	3.978	3.952	3.923	3.801	3.620	3.620
135	-	-	-	-	-	-	-	-	-	4.165	4.165	4.087	4.076	4.049	4.022	3.900	3.706	3.696
140	-	-	-	-	-	-	-	-	-	4.262	4.262	4.184	4.173	4.146	4.120	3.999	3.812	3.772
145	-	-	-	-	-	-	-	-	-	4.359	4.359	4.281	4.270	4.244	4.219	4.098	3.917	3.848
150	-	-	-	-	-	-	-	-	-	-	-	4.378	4.367	4.341	4.317	4.197	4.023	3.925
155	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.296	4.128	4.001
160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.234	4.077
165	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.339	4.153
170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.229
175	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.305
180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.382
185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
195	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to beams with concrete slabs with 3 sided fire exposure.