Warrington Certification Limited,
Holmesfield Road,
Warrington, WA1 2DS
Tel. +44 (0) 1925-646777
Fax +44 (0) 1925-646667

Member of EOTA
Authorised and notified according to Article 10 of the Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products.

European Organisation for Technical Approvals

EUROPEAN TECHNICAL APPROVAL ETA -13/0113

Trade name:	**FIRETEX FX5120**
Holder of the approval:	**Sherwin-Williams** **Protective & Marine Coatings** Tower Works Kestor Street Bolton BL2 2AL United Kingdom Tel: 0044 (0) 1204 521771 Fax: 0044 (0) 1204 382115 Internet: www.sherwin-williams.com/protective
Generic type and use of construction product(s):	Reactive Coating for the Fire Protection of Structural Steel
Validity from:	**30 June 2013**
to:	**12 February 2018**
Manufacturing plant(s):	**Sherwin-Williams** **Protective & Marine Coatings** Tower Works Kestor Street Bolton BL2 2AL United Kingdom
This European Technical Approval contains:	10 pages and 1 Annex, 43 pages in total.

I LEGAL BASES AND GENERAL CONDITIONS

1 This European Technical Approval is issued by Warrington Certification Limited in accordance with:

The Council Directive (89/106/EEC)[1] of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products as amended by Council Directive 93/68/EEC of 22 July 1993[2].

UK implementation of CPD Statutory Instruments 1991, No 1620 Building and Buildings The Construction Products Regulations 1991- made 15 July 1991, laid before Parliament 22 July 1991, coming into force 27 December 1991, and amended by The Construction Products (Amendment) Regulations 1994 (Statutory Instruments 1994, No 3051).

Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex to Commission Decision 94/23/EC[3]

European Technical Approval Guideline 018 Fire Protective Products Part 1: General and Part 2: Reactive Coatings For Fire Protection of Steel Elements.

2 Warrington Certification Limited is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant(s). Nevertheless, the responsibility for the conformity of the products with the European Technical Approval and for their fitness for their intended use remains with the holder of the European Technical Approval.

3 This European Technical Approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1.

4 This European Technical Approval may be withdrawn by Warrington Certification Limited pursuant to Article 5.1 of the Council Directive 89/106/EEC.

5 Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Warrington Certification Limited. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6 The European Technical Approval is issued by the approval body in its official language of English. This version should correspond fully to the version used by EOTA for circulation. Translations in other languages have to be designated as such.

[1] Official Journal of the European Communities N° L40, 11 Feb 1989, p 12
[2] Official Journal of the European Communities N° L220, 30 Aug 1993, p 1.
[3] Official Journal of the European Communities N° L17, 20 Jan 1994, p 34.

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 General

FIRETEX FX5120 is a spray or brush/roller applied intumescent paint formulated for the fire protection of structural steel elements installed in the following environmental conditions:

Internal use – ETAG 018-2 Type Z_2
Internal use with high humidity – ETAG 018-2 Type Z_1

1.2 Intended Use

The intended use of FIRETEX FX5120 and is to fire protect various sizes of structural steel 'H' or 'I' section beams and columns and hollow columns (circular and rectangular) for up to a fire resistance classification of R120IncSlow and for design temperatures in the range of 350°C to 750°C.

1.3 Working life

The provisions made in this ETA are based on an assumed intended working life of the applied coating for the intended use of 10 years, provided that it is subject to appropriate use and maintenance.

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.

2 Characteristics of the product and methods of verification

The assessment of fitness for use has been made in accordance with ETAG 018-2.

ETAG Clause No.	ETA Clause No.	Characteristic	Assessment of characteristic
5.1		**Mechanical resistance and stability**	Not relevant
5.2	2.1	**Safety in case of fire**	
5.2.1	2.1.1	Resistance to fire	
5.2.2	2.1.2	Reaction to fire	

5.3		**Hygiene, Health and the Environment**	
5.3.2	2.2	- Release of dangerous substances	
5.4	-	**Safety in use**	Not relevant
5.5	-	**Protection against noise**	Not relevant
5.6	-	**Energy, Economy and Heat Retention**	Not relevant
5.7	2.3	**Related aspects of serviceability**	
5.7.2.2	2.3.1 2.3.2	- Primer and top coat compatibility - Type Z_2 and Type Z_1 Durability	
5.7.3 and Annex E	2.3.3	- Identification	

2.1 Safety in case of fire

2.1.1 Resistance to Fire

The resistance to fire performance according to EN 13501-2 determined in accordance with test principles defined in EN 13381-8: 2010 including Annex A (slow heating curve as defined in EN 1363-2, "IncSlow" according to EN 13501-2). The test data was analysed adopting the graphical method defined in Annex E of EN 13381-8: 2013. Annex A summarises the results of the analysis.

In accordance with ETAG 018-2 (foreword), FIRETEX FX5120 and may be considered as a reactive coating kit that includes one or more primers and/or topcoats (Option 2).

Until the withdrawal of relevant national test and classification standards, CE Marking will cover a finite number of variations in coating thickness subjected to a fire resistance assessment. As time progresses, the performance declaration for fire resistance covered by CE Marking may change and the ETA holder may incorporate the changes in this ETA by amendment or revision.

In the meantime, and taking into account the transitional arrangements for test and classification standards and the corresponding national legislation (see EC Guidance paper J), the ETA holder shall be permitted to maintain and be able to use - on a national basis – the test data for this characteristic, based on relevant national standards, next to the performance declaration covered by the CE Marking based on this ETA.

2.1.2 Reaction to Fire

The fire protection coating in conjunction with FIRETEX C69 primer has a performance determined for a reaction to fire classification in accordance with EN 13501-1 of Class b-s1, d0.

2.2 Dangerous substances

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

2.3 Related Aspects of Serviceability

2.3.1 FIRETEX FX5120 and has been assessed as being compatible, in accordance with the test procedures defined in ETAG 018-2 Clause 5.7.2.1 with the following generic primer types:

Generic Primer Types
Two pack epoxy blast primer
Single pack alkyd primer
Two pack epoxy primer
Two pack zinc rich epoxy primer with two pack epoxy sealer coat

2.3.2 The reactive coating has been assessed as having passed the requirements for use in conditions defined in ETAG 018-2 for Type Z_2 and Type Z_1 environmental conditions and can be used with and without the following top coats:

Top Coats	
Type	**Name**
Acrylic urethane	Resistex C137V2
Acrylic urethane	Resistex C237
Acrylic	FIRETEX M71V3
Acrylic	Envirogard M770

2.3.3 FIRETEX FX5120 and the primers and topcoats mentioned in this document have been identified according to Table 5.3 of ETAG 018-2. Each product container is identified with the name FIRETEX FX5120 and is CE marked.

3 Evaluation of Conformity and CE marking

3.1 Attestation of Conformity system

The system of attestation of conformity specified by the European Commission Decision 99/454/EC for fire protective products is system 1 and is detailed as follows:

Certification of the conformity of the product by an approved certification body on the basis of:

(a) Tasks for the manufacturer

- factory production control
- testing of samples taken at the factory in accordance with a prescribed test plan

(b) Tasks for the Notified body

- initial type-testing of the product;
- initial inspection of factory and of factory production control
- continuous surveillance, assessment and approval of factory production control

3.2 Responsibilities

3.2.1 Tasks for the Manufacturer -

3.2.1.1 Factory production control

The manufacturer of FIRETEX FX5120 and covered by this European Technical Approval shall document, operate and maintain an adequate factory production control system to enable the achievement of the required product characteristics, hence conformity of the product to this ETA, and the effective operation of the production control system to be checked.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control that applies. The manufacturer's documentation and procedures shall be appropriate to the product and manufacturing process. The factory production control system shall achieve an appropriate level of confidence in the conformity of the product. This involves:

a) the preparation of documented procedures and instructions relating to factory production control operations ;

b) the effective implementation of these procedures and instructions.

c) the recording of these procedures and their results.

d) the use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of non-conformity and, if necessary, revise the factory production control to rectify the cause of non-conformity.

e) a procedure to ensure that both the Notified Body and the Certification Body are advised before any significant change to the product, its components or manufacturing process, is made.

f) a procedure to ensure that personnel involved in the production processes and the quality control procedures are qualified and adequately trained to carry out their required tasks.

g) that all testing and measuring equipment is maintained and up to date calibration records are documented.

h) maintenance of records to ensure every container of coating material produced is clearly labeled with the batch number, which allows traceability to its production to be identified.

3.2.1.2 Other tasks for the manufacturer

The following tables derived from ETAG 018-2 specify properties that should be controlled and minimum frequencies of control. The test method and threshold have been laid down in the factory production control plan.

Reactive Coating

Property	Property Paragraph (ETAG)	Threshold	Minimum frequency of tests
Char depth	Annex G or similar	Manufacturer's declaration, minimum value	Every batch
Insulating efficiency	Annex A or alternative(1)	Manufacturer's declaration (2)	Every 10th batch or at least once per month
Sag resistance		Manufacturer's declaration	Every batch
Viscosity	BS EN ISO 2884	Manufacturer's declaration	Every batch
Raw materials(3)		Check specification	Every delivery
Pigment dispersion		Manufacturer's declaration	Every batch

(1) agreed with ETA issuing body and manufacturer.
(2) if result of char depth is not sufficient an insulating efficiency test should be carried out.
(3) check test results according to specification.

Primers

Property	Property Paragraph (ETAG)	Threshold	Minimum frequency of tests
Raw materials(1)		Check specification	Every delivery
Viscosity	BS EN ISO 2884	Manufacturer's declaration	Every batch
Non-volatile content	ISO 3251	Manufacturer's declaration	Every batch
Colour		Manufacturer's declaration	Every batch
Fineness of grind		Manufacturer's declaration	Every batch

(1) check test results according to specification.

Top Coats

Property	Property Paragraph (ETAG)	Threshold	Minimum frequency of tests
Raw materials(1)		Check specification	Every delivery
Viscosity	EN ISO 3219	Manufacturer's declaration	Every batch
Non-volatile content	ISO 3251	Manufacturer's declaration	Every batch
Colour		Manufacturer's declaration	Every batch

(1) check test results according to specification.

3.2.2 Tasks of Notified Bodies

3.2.2.1. Initial type testing

The approval tests have been conducted on behalf the notified body in accordance ETAG 018, Parts 1 or 2, as relevant, and the notified ETA issuing body has assessed the results of these tests in accordance with the ETAG, as part of the ETA issuing procedure.

These tests shall be used by the certification body for Certificate of Conformity purposes.

3.2.2.2. Assessment of the factory production control system - initial inspection and continuous surveillance

Assessment of the factory production control system is the responsibility of the ETA issuing body.

An initial inspection shall be carried out of the production unit specified in this ETA to demonstrate that the factory production control is in conformity with the ETA.

Subsequently continuous surveillance of factory production control is necessary to ensure continuing conformity with the ETA. It is recommended that surveillance inspections be conducted at least twice a year.

The results of certification of conformity and of the continuous surveillance shall be made available to Warrington Certification Limited. Where the provisions of the ETA are no longer fulfilled, the certificate of conformity shall be withdrawn by the certification body.

3.3 CE marking

The CE conformity marking symbol consists exclusively of the letters “CE” in accordance with Directive 93/68/EEC.

NOTE: The manufacturer, or his authorised representative established in the EEA, is responsible for the affixing of the CE marking symbol.

The CE marking symbol shall be accompanied by the following information:

a) Identification number of the ETA issuing body;

b) The name or identifying mark of the producer;

c) Registered address of the producer;

d) The last two digits of the year in which the marking was first applied;

e) The number of the ETA;

f) Reference to ETAG 018, Parts 1 and 2;

g) Indication of intended use;

The CE marking symbol and items a) to g) above shall accompany the product and shall be included with the application instructions.

Additionally, at least the CE marking symbol and item a) of all this information shall be affixed to the supply containers and optionally on its packaging.

4. Assumptions under which the fitness for use of the product for intended use will be assessed

4.1 Manufacturing, transport and storage

FIRETEX FX5120 and is manufactured in accordance with the provisions of the ETA using the manufacturing process as identified during the inspection of the factory by Warrington Certification Limited and laid down in the technical documentation.

It is assumed that the manufacture of FIRETEX FX5120 and fulfils the criteria for stable industrial production. The samples taken in connection with the evaluation of properties shall be representative of the whole production.

4.2 Application

The ETA is issued under the assumption that the application of FIRETEX FX5120 and shall be in accordance with the manufacturer's technical literature.

4.3 Maintenance and repair

The assessment of the fitness for use is based on the assumption that necessary maintenance and repair if required is carried out in accordance with the manufacturer's instructions during the assumed intended working life.

ANNEX A - Product Performance: Fire Resistance

1 This Annex relates to the use of FIRETEX FX5120 for the fire protection of 'H' or 'I' shaped beams and columns and circular and rectangular hollow columns.

The precise scope is given in Tables 1 - 32 which show the total dry film thickness of FIRETEX FX5120 (excluding primer and top coat) required to provide classifications of R15 to R120 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 13381-8:2010.
ii) A design appraisal against this ETA adopting the graphical analysis defined in Annex E of EN 13381-8:2013.

3. The data presented in the tables in this Annex refers to both beams (3-sided and 4-sided fire exposure) and columns (4-sided fire exposure). In the case of beams exposed on 4 sides the maximum protection thickness is 5.635mm.

4. The data shown is applicable to steel sections blast cleaned to ISO 8501-1 SA$2^{1}/_{2}$ or equivalent and primed with the compatible primers and top coats listed in this ETA. Based on the test data the total dry film thickness of primer and top coat together should not exceed 0.20mm.

5. The data for the 'H' and 'I' shaped beams and columns applies also to other shaped steel sections that have re-entrant details such as channels, angles and tees.

6. The reactive coating has been exposed to the slowing heating regime defined in Annex A of EN 13381-8: 2010 (slow heating curve as defined in EN 1363-2, "IncSlow" according to EN 13501-2) and has satisfied the requirements.

Beams with open profile and 3-sided fire exposure

Table 1: Beams with open profile and 3-sided fire exposure: Fire Resistance Period: 15 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
49	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
50	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
55	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
60	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
65	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
70	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
75	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
80	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
85	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
90	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
95	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
100	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
105	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
110	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
115	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
120	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
125	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
130	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
135	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
140	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
145	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
150	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
155	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
160	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
165	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
170	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
175	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
180	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
185	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
190	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
195	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
200	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
205	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
210	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
215	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
220	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
225	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
230	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
235	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
240	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
245	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
250	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
255	0.493	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
260	0.509	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
265	0.525	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
270	0.541	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
275	0.557	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
280	0.573	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
285	0.589	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
290	0.606	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
295	0.622	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
300	0.638	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
305	0.654	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
310	0.670	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
315	0.686	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
320	0.702	0.484	0.477	0.477	0.477	0.477	0.477	0.477	0.477
325	0.719	0.498	0.477	0.477	0.477	0.477	0.477	0.477	0.477
330	0.735	0.511	0.477	0.477	0.477	0.477	0.477	0.477	0.477
335	0.751	0.524	0.477	0.477	0.477	0.477	0.477	0.477	0.477
340	0.767	0.537	0.477	0.477	0.477	0.477	0.477	0.477	0.477

Thickness is intumescent only.

Table 2: Beams with open profile and 3-sided fire exposure: Fire Resistance Period: 30 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
49	0.508	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
50	0.513	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
55	0.539	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
60	0.564	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
65	0.590	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
70	0.616	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
75	0.641	0.490	0.477	0.477	0.477	0.477	0.477	0.477	0.477
80	0.667	0.505	0.477	0.477	0.477	0.477	0.477	0.477	0.477
85	0.693	0.519	0.477	0.477	0.477	0.477	0.477	0.477	0.477
90	0.718	0.534	0.477	0.477	0.477	0.477	0.477	0.477	0.477
95	0.744	0.548	0.477	0.477	0.477	0.477	0.477	0.477	0.477
100	0.770	0.563	0.477	0.477	0.477	0.477	0.477	0.477	0.477
105	0.795	0.577	0.477	0.477	0.477	0.477	0.477	0.477	0.477
110	0.821	0.592	0.477	0.477	0.477	0.477	0.477	0.477	0.477
115	0.847	0.606	0.481	0.477	0.477	0.477	0.477	0.477	0.477
120	0.872	0.621	0.495	0.477	0.477	0.477	0.477	0.477	0.477
125	0.898	0.635	0.509	0.477	0.477	0.477	0.477	0.477	0.477
130	0.924	0.650	0.524	0.477	0.477	0.477	0.477	0.477	0.477
135	0.949	0.664	0.538	0.477	0.477	0.477	0.477	0.477	0.477
140	0.979	0.679	0.552	0.477	0.477	0.477	0.477	0.477	0.477
145	1.014	0.693	0.567	0.477	0.477	0.477	0.477	0.477	0.477
150	1.049	0.708	0.581	0.477	0.477	0.477	0.477	0.477	0.477
155	1.083	0.722	0.595	0.477	0.477	0.477	0.477	0.477	0.477
160	1.118	0.737	0.610	0.477	0.477	0.477	0.477	0.477	0.477
165	1.153	0.751	0.624	0.477	0.477	0.477	0.477	0.477	0.477
170	1.188	0.766	0.638	0.477	0.477	0.477	0.477	0.477	0.477
175	1.223	0.780	0.653	0.477	0.477	0.477	0.477	0.477	0.477
180	1.258	0.795	0.667	0.477	0.477	0.477	0.477	0.477	0.477
185	1.293	0.809	0.681	0.477	0.477	0.477	0.477	0.477	0.477
190	1.328	0.824	0.696	0.477	0.477	0.477	0.477	0.477	0.477
195	1.363	0.838	0.710	0.477	0.477	0.477	0.477	0.477	0.477
200	1.397	0.853	0.724	0.477	0.477	0.477	0.477	0.477	0.477
205	1.432	0.867	0.739	0.491	0.477	0.477	0.477	0.477	0.477
210	1.467	0.882	0.753	0.509	0.477	0.477	0.477	0.477	0.477
215	1.502	0.896	0.767	0.528	0.477	0.477	0.477	0.477	0.477
220	1.537	0.911	0.782	0.546	0.477	0.477	0.477	0.477	0.477
225	1.572	0.925	0.796	0.565	0.477	0.477	0.477	0.477	0.477
230	1.607	0.940	0.811	0.583	0.477	0.477	0.477	0.477	0.477
235	1.642	0.954	0.825	0.602	0.477	0.477	0.477	0.477	0.477
240	1.677	0.977	0.839	0.620	0.477	0.477	0.477	0.477	0.477
245	1.711	1.016	0.854	0.639	0.477	0.477	0.477	0.477	0.477
250	1.746	1.054	0.868	0.657	0.478	0.477	0.477	0.477	0.477
255	1.781	1.093	0.882	0.676	0.495	0.477	0.477	0.477	0.477
260	1.816	1.131	0.897	0.694	0.513	0.477	0.477	0.477	0.477
265	1.851	1.170	0.911	0.713	0.531	0.477	0.477	0.477	0.477
270	1.886	1.208	0.925	0.732	0.549	0.477	0.477	0.477	0.477
275	1.921	1.247	0.940	0.750	0.567	0.477	0.477	0.477	0.477
280	1.956	1.285	0.954	0.769	0.584	0.477	0.477	0.477	0.477
285	1.991	1.324	0.974	0.787	0.602	0.477	0.477	0.477	0.477
290	2.026	1.362	1.006	0.806	0.620	0.477	0.477	0.477	0.477
295	2.060	1.400	1.037	0.824	0.638	0.481	0.477	0.477	0.477
300	2.095	1.439	1.069	0.843	0.656	0.496	0.477	0.477	0.477
305	2.130	1.477	1.101	0.861	0.674	0.512	0.477	0.477	0.477
310	2.165	1.516	1.133	0.880	0.691	0.527	0.477	0.477	0.477
315	2.200	1.554	1.165	0.898	0.709	0.542	0.477	0.477	0.477
320	2.235	1.593	1.197	0.917	0.727	0.557	0.477	0.477	0.477
325	2.270	1.631	1.229	0.935	0.745	0.572	0.477	0.477	0.477
330	2.305	1.670	1.261	0.954	0.763	0.588	0.477	0.477	0.477
335	2.340	1.708	1.293	0.976	0.781	0.603	0.477	0.477	0.477
340	2.374	1.747	1.325	1.004	0.798	0.618	0.477	0.477	0.477

Thickness is intumescent only.

Table 3: Beams with open profile and 3-sided fire exposure: Fire Resistance Period: 45 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
49	0.961	0.717	0.541	0.477	0.477	0.477	0.477	0.477	0.477
50	0.934	0.717	0.541	0.477	0.477	0.477	0.477	0.477	0.477
55	1.010	0.758	0.573	0.477	0.477	0.477	0.477	0.477	0.477
60	1.086	0.805	0.605	0.479	0.477	0.477	0.477	0.477	0.477
65	1.162	0.852	0.637	0.497	0.477	0.477	0.477	0.477	0.477
70	1.238	0.899	0.669	0.516	0.477	0.477	0.477	0.477	0.477
75	1.314	0.946	0.701	0.534	0.477	0.477	0.477	0.477	0.477
80	1.390	0.986	0.733	0.552	0.477	0.477	0.477	0.477	0.477
85	1.466	1.022	0.765	0.570	0.488	0.477	0.477	0.477	0.477
90	1.542	1.058	0.797	0.588	0.503	0.477	0.477	0.477	0.477
95	1.618	1.094	0.829	0.606	0.518	0.477	0.477	0.477	0.477
100	1.694	1.130	0.861	0.624	0.533	0.477	0.477	0.477	0.477
105	1.770	1.166	0.893	0.642	0.548	0.477	0.477	0.477	0.477
110	1.846	1.202	0.925	0.660	0.563	0.477	0.477	0.477	0.477
115	1.922	1.238	0.957	0.678	0.578	0.477	0.477	0.477	0.477
120	1.998	1.274	0.991	0.696	0.593	0.487	0.477	0.477	0.477
125	2.074	1.310	1.024	0.714	0.608	0.502	0.477	0.477	0.477
130	2.150	1.346	1.058	0.732	0.623	0.517	0.477	0.477	0.477
135	2.226	1.382	1.092	0.750	0.637	0.532	0.477	0.477	0.477
140	2.302	1.419	1.126	0.768	0.652	0.547	0.477	0.477	0.477
145	2.378	1.455	1.159	0.786	0.667	0.562	0.477	0.477	0.477
150	2.448	1.491	1.193	0.804	0.682	0.576	0.477	0.477	0.477
155	2.478	1.527	1.227	0.822	0.697	0.591	0.477	0.477	0.477
160	2.509	1.563	1.261	0.840	0.712	0.606	0.477	0.477	0.477
165	2.539	1.599	1.294	0.858	0.727	0.621	0.477	0.477	0.477
170	2.569	1.635	1.328	0.876	0.742	0.636	0.477	0.477	0.477
175	2.599	1.671	1.362	0.894	0.757	0.651	0.477	0.477	0.477
180	2.630	1.707	1.396	0.912	0.772	0.666	0.477	0.477	0.477
185	2.660	1.743	1.430	0.930	0.786	0.681	0.477	0.477	0.477
190	2.690	1.779	1.463	0.948	0.801	0.696	0.486	0.477	0.477
195	2.721	1.815	1.497	0.969	0.816	0.711	0.503	0.477	0.477
200	2.751	1.851	1.531	1.007	0.831	0.726	0.521	0.477	0.477
205	2.781	1.887	1.565	1.045	0.846	0.741	0.538	0.477	0.477
210	2.811	1.923	1.598	1.083	0.861	0.756	0.555	0.477	0.477
215	2.842	1.959	1.632	1.121	0.876	0.770	0.573	0.477	0.477
220	2.872	1.995	1.666	1.159	0.891	0.785	0.590	0.477	0.477
225	2.902	2.031	1.700	1.197	0.906	0.800	0.608	0.477	0.477
230	2.932	2.067	1.733	1.235	0.921	0.815	0.625	0.477	0.477
235	2.963	2.103	1.767	1.273	0.936	0.830	0.642	0.477	0.477
240	2.993	2.139	1.801	1.312	0.950	0.845	0.660	0.477	0.477
245	3.023	2.175	1.835	1.350	0.967	0.860	0.677	0.477	0.477
250	3.054	2.211	1.868	1.388	1.003	0.875	0.695	0.485	0.477
255	3.084	2.247	1.902	1.426	1.039	0.890	0.712	0.502	0.477
260	3.114	2.283	1.936	1.464	1.075	0.905	0.729	0.519	0.477
265	3.144	2.319	1.970	1.502	1.111	0.920	0.747	0.536	0.477
270	3.175	2.355	2.003	1.540	1.147	0.935	0.764	0.553	0.477
275	3.205	2.391	2.037	1.578	1.182	0.949	0.782	0.570	0.477
280	3.235	2.427	2.071	1.616	1.218	0.965	0.799	0.587	0.477
285	3.265	2.473	2.105	1.654	1.254	0.995	0.816	0.603	0.477
290	3.296	2.527	2.138	1.693	1.290	1.025	0.834	0.620	0.477
295	3.326	2.581	2.172	1.731	1.326	1.055	0.851	0.637	0.480
300	3.356	2.635	2.206	1.769	1.362	1.085	0.869	0.654	0.492
305	3.387	2.688	2.240	1.807	1.398	1.115	0.886	0.671	0.505
310	3.417	2.742	2.273	1.845	1.433	1.145	0.903	0.688	0.517
315	3.447	2.796	2.307	1.883	1.469	1.175	0.921	0.705	0.529
320	3.477	2.850	2.341	1.921	1.505	1.205	0.938	0.721	0.541
325	3.511	2.903	2.375	1.959	1.541	1.235	0.955	0.738	0.553
330	3.557	2.957	2.408	1.997	1.577	1.265	0.977	0.755	0.566
335	3.603	3.011	2.442	2.035	1.613	1.295	1.003	0.772	0.578
340	3.649	3.065	2.494	2.074	1.649	1.325	1.029	0.789	0.590

Thickness is intumescent only.

Table 4: Beams with open profile and 3-sided fire exposure: Fire Resistance Period: 60 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
49	1.714	1.240	0.916	0.713	0.555	0.477	0.477	0.477	0.477
50	1.653	1.240	0.916	0.713	0.555	0.477	0.477	0.477	0.477
55	1.801	1.303	0.939	0.754	0.589	0.477	0.477	0.477	0.477
60	1.949	1.404	1.002	0.804	0.627	0.490	0.477	0.477	0.477
65	2.097	1.505	1.064	0.855	0.666	0.515	0.477	0.477	0.477
70	2.245	1.605	1.127	0.905	0.704	0.540	0.477	0.477	0.477
75	2.393	1.706	1.189	0.955	0.743	0.566	0.481	0.477	0.477
80	2.473	1.807	1.251	0.993	0.781	0.591	0.496	0.477	0.477
85	2.518	1.908	1.314	1.028	0.820	0.616	0.511	0.477	0.477
90	2.563	2.009	1.376	1.063	0.859	0.641	0.527	0.477	0.477
95	2.608	2.109	1.438	1.098	0.897	0.666	0.542	0.477	0.477
100	2.653	2.210	1.501	1.134	0.936	0.691	0.557	0.477	0.477
105	2.698	2.311	1.563	1.169	0.973	0.717	0.573	0.481	0.477
110	2.743	2.412	1.626	1.204	1.005	0.742	0.588	0.495	0.477
115	2.787	2.465	1.688	1.239	1.038	0.767	0.603	0.510	0.477
120	2.832	2.497	1.750	1.274	1.071	0.792	0.619	0.525	0.477
125	2.877	2.528	1.813	1.309	1.103	0.817	0.634	0.539	0.477
130	2.922	2.560	1.875	1.344	1.136	0.842	0.649	0.554	0.477
135	2.967	2.591	1.938	1.380	1.169	0.868	0.665	0.568	0.477
140	3.012	2.623	2.000	1.415	1.202	0.893	0.680	0.583	0.477
145	3.057	2.654	2.062	1.450	1.234	0.918	0.695	0.598	0.477
150	3.101	2.686	2.125	1.485	1.267	0.943	0.711	0.612	0.477
155	3.146	2.717	2.187	1.520	1.300	0.969	0.726	0.627	0.486
160	3.191	2.749	2.249	1.555	1.333	1.002	0.741	0.641	0.500
165	3.236	2.780	2.312	1.590	1.365	1.035	0.757	0.656	0.514
170	3.281	2.812	2.374	1.626	1.398	1.067	0.772	0.670	0.529
175	3.326	2.843	2.437	1.661	1.431	1.100	0.787	0.685	0.543
180	3.371	2.874	2.476	1.696	1.463	1.133	0.803	0.700	0.557
185	3.415	2.906	2.512	1.731	1.496	1.165	0.818	0.714	0.571
190	3.460	2.937	2.548	1.766	1.529	1.198	0.833	0.729	0.585
195	3.505	2.969	2.584	1.801	1.562	1.231	0.849	0.743	0.599
200	3.551	3.000	2.620	1.836	1.594	1.264	0.864	0.758	0.613
205	3.596	3.032	2.656	1.872	1.627	1.296	0.880	0.773	0.627
210	3.641	3.063	2.692	1.907	1.660	1.329	0.895	0.787	0.641
215	3.687	3.095	2.728	1.942	1.693	1.362	0.910	0.802	0.655
220	3.732	3.126	2.764	1.977	1.725	1.394	0.926	0.816	0.669
225	3.778	3.158	2.800	2.012	1.758	1.427	0.941	0.831	0.684
230	3.823	3.189	2.836	2.047	1.791	1.460	0.956	0.846	0.698
235	3.868	3.221	2.872	2.082	1.823	1.492	0.982	0.860	0.712
240	3.914	3.252	2.908	2.118	1.856	1.525	1.019	0.875	0.726
245	3.959	3.284	2.944	2.153	1.889	1.558	1.055	0.889	0.740
250	4.005	3.315	2.980	2.188	1.922	1.590	1.092	0.904	0.754
255	4.050	3.346	3.016	2.223	1.954	1.623	1.129	0.918	0.768
260	4.096	3.378	3.052	2.258	1.987	1.656	1.166	0.933	0.782
265	4.141	3.409	3.088	2.293	2.020	1.688	1.202	0.948	0.796
270	4.186	3.441	3.124	2.328	2.053	1.721	1.239	0.962	0.810
275	4.232	3.472	3.160	2.364	2.085	1.754	1.276	0.992	0.824
280	4.277	3.506	3.196	2.399	2.118	1.786	1.312	1.025	0.838
285	4.323	3.559	3.232	2.434	2.151	1.819	1.349	1.057	0.853
290	4.368	3.613	3.268	2.493	2.183	1.852	1.386	1.089	0.867
295	4.413	3.667	3.304	2.561	2.216	1.884	1.423	1.122	0.881
300	4.459	3.720	3.340	2.629	2.249	1.917	1.459	1.154	0.895
305	4.504	3.774	3.376	2.697	2.282	1.950	1.496	1.186	0.909
310	4.550	3.827	3.412	2.765	2.314	1.983	1.533	1.218	0.923
315	4.595	3.881	3.448	2.834	2.347	2.015	1.569	1.251	0.937
320	4.640	3.935	3.484	2.902	2.380	2.048	1.606	1.283	0.951
325	4.686	3.988	3.527	2.970	2.413	2.081	1.643	1.315	0.967
330	4.731	4.042	3.576	3.038	2.447	2.113	1.679	1.348	0.997
335	4.777	4.096	3.626	3.106	2.515	2.146	1.716	1.380	1.027
340	4.822	4.149	3.675	3.175	2.584	2.179	1.753	1.412	1.057

Thickness is intumescent only.

Table 5: Beams with open profile and 3-sided fire exposure: Fire Resistance Period: 75 Minutes									
Section Factor up to m^{-1}	**Thickness (mm) Required for a Design Temperature of**								
	350°C	**400°C**	**450°C**	**500°C**	**550°C**	**600°C**	**650°C**	**700°C**	**750°C**
49	2.543	1.905	1.481	1.120	0.866	0.698	0.536	0.477	0.477
50	2.557	1.905	1.481	1.120	0.866	0.698	0.536	0.477	0.477
55	2.628	2.002	1.557	1.177	0.912	0.739	0.569	0.477	0.477
60	2.698	2.166	1.678	1.261	0.975	0.794	0.611	0.479	0.477
65	2.769	2.331	1.799	1.346	1.026	0.848	0.652	0.503	0.477
70	2.839	2.460	1.920	1.430	1.077	0.903	0.693	0.526	0.477
75	2.910	2.513	2.041	1.514	1.127	0.958	0.735	0.550	0.477
80	2.980	2.565	2.162	1.598	1.178	0.994	0.776	0.573	0.486
85	3.050	2.618	2.283	1.682	1.229	1.027	0.817	0.597	0.501
90	3.121	2.670	2.404	1.766	1.279	1.060	0.859	0.620	0.516
95	3.191	2.723	2.472	1.850	1.330	1.094	0.900	0.644	0.531
100	3.262	2.775	2.513	1.934	1.381	1.127	0.941	0.667	0.545
105	3.332	2.828	2.554	2.018	1.432	1.160	0.978	0.691	0.560
110	3.403	2.881	2.596	2.102	1.482	1.193	1.010	0.714	0.575
115	3.473	2.933	2.637	2.186	1.533	1.227	1.042	0.738	0.590
120	3.544	2.986	2.678	2.271	1.584	1.260	1.073	0.761	0.604
125	3.614	3.038	2.720	2.355	1.635	1.293	1.105	0.785	0.619
130	3.685	3.091	2.761	2.439	1.685	1.326	1.136	0.808	0.634
135	3.755	3.143	2.802	2.475	1.736	1.360	1.168	0.832	0.649
140	3.826	3.196	2.843	2.509	1.787	1.393	1.200	0.855	0.663
145	3.896	3.248	2.885	2.542	1.837	1.426	1.231	0.879	0.678
150	3.966	3.301	2.926	2.576	1.888	1.459	1.263	0.902	0.693
155	4.037	3.353	2.967	2.609	1.939	1.493	1.295	0.926	0.708
160	4.107	3.406	3.009	2.643	1.990	1.526	1.326	0.949	0.723
165	4.178	3.458	3.050	2.676	2.040	1.559	1.358	0.977	0.737
170	4.248	3.510	3.091	2.710	2.091	1.592	1.390	1.010	0.752
175	4.319	3.556	3.133	2.743	2.142	1.626	1.421	1.044	0.767
180	4.389	3.603	3.174	2.777	2.193	1.659	1.453	1.078	0.782
185	4.460	3.649	3.215	2.810	2.243	1.692	1.485	1.112	0.796
190	4.530	3.696	3.256	2.844	2.294	1.725	1.516	1.146	0.811
195	4.601	3.742	3.298	2.877	2.345	1.759	1.548	1.180	0.826
200	4.671	3.789	3.339	2.911	2.395	1.792	1.580	1.214	0.841
205	4.741	3.835	3.380	2.944	2.446	1.825	1.611	1.248	0.855
210	4.812	3.882	3.422	2.978	2.491	1.858	1.643	1.281	0.870
215	4.882	3.928	3.463	3.011	2.537	1.892	1.674	1.315	0.885
220	4.953	3.975	3.505	3.045	2.583	1.925	1.706	1.349	0.900
225	5.023	4.021	3.553	3.078	2.628	1.958	1.738	1.383	0.914
230	5.094	4.068	3.602	3.112	2.674	1.991	1.769	1.417	0.929
235	5.164	4.114	3.650	3.145	2.719	2.025	1.801	1.451	0.944
240	5.235	4.161	3.699	3.178	2.765	2.058	1.833	1.485	0.959
245	5.305	4.207	3.747	3.212	2.810	2.091	1.864	1.519	0.989
250	5.376	4.254	3.796	3.245	2.856	2.124	1.896	1.552	1.030
255	5.446	4.300	3.844	3.279	2.901	2.158	1.928	1.586	1.070
260	5.516	4.347	3.893	3.312	2.947	2.191	1.959	1.620	1.110
265	5.587	4.393	3.941	3.346	2.993	2.224	1.991	1.654	1.151
270		4.440	3.990	3.379	3.038	2.257	2.023	1.688	1.191
275		4.486	4.038	3.413	3.084	2.291	2.054	1.722	1.231
280		4.533	4.087	3.446	3.129	2.324	2.086	1.756	1.271
285		4.579	4.135	3.480	3.175	2.357	2.118	1.789	1.312
290		4.626	4.184	3.523	3.220	2.390	2.149	1.823	1.352
295		4.672	4.232	3.584	3.266	2.424	2.181	1.857	1.392
300		4.719	4.280	3.645	3.311	2.479	2.212	1.891	1.433
305		4.765	4.329	3.705	3.357	2.570	2.244	1.925	1.473
310		4.812	4.377	3.766	3.403	2.661	2.276	1.959	1.513
315		4.858	4.426	3.827	3.448	2.752	2.307	1.993	1.553
320		4.905	4.474	3.887	3.494	2.842	2.339	2.027	1.594
325		4.951	4.523	3.948	3.550	2.933	2.371	2.060	1.634
330		4.998	4.571	4.009	3.609	3.024	2.402	2.094	1.674
335		5.044	4.620	4.069	3.668	3.115	2.434	2.128	1.714
340		5.091	4.668	4.130	3.726	3.205	2.506	2.162	1.755

Thickness is intumescent only.

Table 6: Beams with open profile and 3-sided fire exposure: Fire Resistance Period: 90 Minutes									
Section Factor up to m^{-1}	**Thickness (mm) Required for a Design Temperature of**								
	350°C	**400°C**	**450°C**	**500°C**	**550°C**	**600°C**	**650°C**	**700°C**	**750°C**
49	3.411	2.654	2.087	1.657	1.325	1.038	0.828	0.648	0.477
50	3.420	2.672	2.087	1.657	1.325	1.038	0.828	0.648	0.477
55	3.575	2.763	2.087	1.741	1.393	1.092	0.873	0.687	0.489
60	3.730	2.854	2.197	1.877	1.492	1.157	0.941	0.740	0.525
65	3.885	2.945	2.480	2.012	1.590	1.223	0.988	0.793	0.561
70	4.040	3.036	2.540	2.147	1.689	1.288	1.025	0.847	0.596
75	4.195	3.126	2.600	2.282	1.788	1.354	1.061	0.900	0.632
80	4.350	3.217	2.660	2.418	1.886	1.419	1.098	0.953	0.668
85	4.505	3.308	2.720	2.485	1.985	1.485	1.135	0.990	0.704
90	4.660	3.399	2.781	2.536	2.083	1.551	1.171	1.023	0.739
95	4.815	3.490	2.841	2.587	2.182	1.616	1.208	1.055	0.775
100	4.970	3.580	2.901	2.637	2.281	1.682	1.245	1.088	0.811
105	5.125	3.671	2.961	2.688	2.379	1.747	1.281	1.120	0.846
110	5.280	3.762	3.021	2.739	2.458	1.813	1.318	1.153	0.882
115	5.435	3.853	3.081	2.790	2.501	1.878	1.355	1.185	0.918
120	5.590	3.944	3.141	2.841	2.543	1.944	1.391	1.218	0.953
125		4.034	3.201	2.892	2.585	2.009	1.428	1.250	0.988
130		4.125	3.261	2.943	2.627	2.075	1.465	1.283	1.022
135		4.216	3.321	2.993	2.669	2.140	1.501	1.315	1.056
140		4.307	3.381	3.044	2.711	2.206	1.538	1.348	1.090
145		4.397	3.441	3.095	2.753	2.272	1.575	1.380	1.124
150		4.488	3.501	3.146	2.795	2.337	1.611	1.413	1.158
155		4.579	3.549	3.197	2.837	2.403	1.648	1.445	1.192
160		4.670	3.596	3.248	2.879	2.458	1.684	1.478	1.226
165		4.761	3.643	3.298	2.921	2.498	1.721	1.510	1.260
170		4.851	3.691	3.349	2.963	2.537	1.758	1.543	1.294
175		4.942	3.738	3.400	3.005	2.576	1.794	1.575	1.328
180		5.033	3.785	3.451	3.047	2.616	1.831	1.608	1.362
185		5.124	3.833	3.502	3.089	2.655	1.868	1.640	1.396
190		5.215	3.880	3.551	3.131	2.694	1.904	1.673	1.430
195		5.305	3.927	3.600	3.173	2.733	1.941	1.705	1.464
200		5.396	3.975	3.649	3.215	2.773	1.978	1.738	1.498
205		5.487	4.022	3.699	3.257	2.812	2.014	1.770	1.532
210		5.578	4.070	3.748	3.299	2.851	2.051	1.803	1.566
215			4.117	3.797	3.341	2.890	2.088	1.835	1.600
220			4.164	3.846	3.383	2.930	2.124	1.868	1.634
225			4.212	3.896	3.425	2.969	2.161	1.900	1.668
230			4.259	3.945	3.467	3.008	2.198	1.933	1.702
235			4.306	3.994	3.512	3.047	2.234	1.965	1.736
240			4.354	4.043	3.568	3.087	2.271	1.998	1.770
245			4.401	4.092	3.624	3.126	2.307	2.030	1.804
250			4.448	4.142	3.680	3.165	2.344	2.063	1.838
255			4.496	4.191	3.735	3.204	2.381	2.095	1.872
260			4.543	4.240	3.791	3.244	2.417	2.128	1.906
265			4.590	4.289	3.847	3.283	2.469	2.160	1.940
270			4.638	4.339	3.903	3.322	2.558	2.193	1.974
275			4.685	4.388	3.959	3.361	2.648	2.225	2.008
280			4.733	4.437	4.015	3.401	2.737	2.258	2.042
285			4.780	4.486	4.071	3.440	2.827	2.290	2.076
290			4.827	4.535	4.127	3.479	2.916	2.323	2.110
295			4.875	4.585	4.182	3.529	3.006	2.355	2.144
300			4.922	4.634	4.238	3.593	3.095	2.388	2.178
305			4.969	4.683	4.294	3.657	3.185	2.420	2.212
310			5.017	4.732	4.350	3.721	3.274	2.475	2.246
315			5.064	4.782	4.406	3.785	3.364	2.588	2.280
320			5.111	4.831	4.462	3.849	3.454	2.702	2.314
325			5.159	4.880	4.518	3.913	3.528	2.816	2.348
330			5.206	4.929	4.573	3.977	3.587	2.930	2.382
335			5.253	4.979	4.629	4.041	3.645	3.043	2.416
340			5.301	5.028	4.685	4.104	3.704	3.157	2.462

Thickness is intumescent only.

Table 7: Beams with open profile and 3-sided fire exposure: Fire Resistance Period: 105 Minutes									
Section Factor up to m^{-1}	**Thickness (mm) Required for a Design Temperature of**								
	350°C	**400°C**	**450°C**	**500°C**	**550°C**	**600°C**	**650°C**	**700°C**	**750°C**
49	4.323	3.449	2.765	2.193	1.812	1.487	1.214	0.942	0.732
50	4.273	3.449	2.786	2.193	1.812	1.487	1.214	0.942	0.732
55	4.511	3.614	2.894	2.308	1.904	1.563	1.276	0.991	0.773
60	4.750	3.781	3.001	2.462	2.049	1.671	1.356	1.043	0.836
65	4.988	3.947	3.109	2.535	2.195	1.780	1.435	1.095	0.898
70	5.227	4.114	3.217	2.607	2.340	1.888	1.514	1.146	0.961
75	5.465	4.281	3.325	2.680	2.461	1.997	1.594	1.198	0.997
80		4.447	3.433	2.753	2.520	2.105	1.673	1.250	1.032
85		4.614	3.541	2.825	2.578	2.214	1.752	1.302	1.067
90		4.780	3.649	2.898	2.637	2.322	1.832	1.354	1.102
95		4.947	3.757	2.970	2.696	2.431	1.911	1.406	1.137
100		5.113	3.865	3.043	2.755	2.488	1.990	1.457	1.172
105		5.280	3.973	3.115	2.814	2.539	2.070	1.509	1.207
110		5.446	4.081	3.188	2.873	2.589	2.149	1.561	1.242
115		5.613	4.188	3.260	2.932	2.640	2.228	1.613	1.277
120			4.296	3.333	2.991	2.690	2.308	1.665	1.312
125			4.404	3.405	3.050	2.741	2.387	1.717	1.347
130			4.512	3.478	3.108	2.791	2.456	1.768	1.382
135			4.620	3.550	3.167	2.842	2.499	1.820	1.417
140			4.728	3.623	3.226	2.892	2.541	1.872	1.452
145			4.836	3.696	3.285	2.943	2.584	1.924	1.487
150			4.944	3.768	3.344	2.993	2.627	1.976	1.522
155			5.052	3.841	3.403	3.044	2.670	2.027	1.557
160			5.160	3.913	3.462	3.094	2.713	2.079	1.592
165			5.268	3.986	3.518	3.145	2.755	2.131	1.627
170			5.375	4.058	3.569	3.195	2.798	2.183	1.661
175			5.483	4.131	3.619	3.246	2.841	2.235	1.696
180			5.591	4.203	3.670	3.296	2.884	2.287	1.731
185				4.276	3.721	3.347	2.926	2.338	1.766
190				4.348	3.772	3.397	2.969	2.390	1.801
195				4.421	3.822	3.448	3.012	2.442	1.836
200				4.493	3.873	3.498	3.055	2.493	1.871
205				4.566	3.924	3.550	3.097	2.545	1.906
210				4.638	3.975	3.602	3.140	2.596	1.941
215				4.711	4.025	3.654	3.183	2.647	1.976
220				4.784	4.076	3.706	3.226	2.699	2.011
225				4.856	4.127	3.758	3.268	2.750	2.046
230				4.929	4.178	3.809	3.311	2.802	2.081
235				5.001	4.228	3.861	3.354	2.853	2.116
240				5.074	4.279	3.913	3.397	2.904	2.151
245				5.146	4.330	3.965	3.440	2.956	2.186
250				5.219	4.381	4.017	3.482	3.007	2.221
255				5.291	4.431	4.069	3.534	3.058	2.256
260				5.364	4.482	4.121	3.593	3.110	2.291
265				5.436	4.533	4.172	3.652	3.161	2.326
270				5.509	4.584	4.224	3.710	3.212	2.361
275				5.581	4.634	4.276	3.769	3.264	2.396
280					4.685	4.328	3.828	3.315	2.431
285					4.736	4.380	3.887	3.366	2.524
290					4.787	4.432	3.945	3.418	2.652
295					4.837	4.484	4.004	3.469	2.780
300					4.888	4.535	4.063	3.524	2.908
305					4.939	4.587	4.122	3.585	3.036
310					4.990	4.639	4.180	3.647	3.164
315					5.040	4.691	4.239	3.708	3.292
320					5.091	4.743	4.298	3.769	3.420
325					5.142	4.795	4.357	3.831	3.522
330					5.193	4.846	4.415	3.892	3.579
335					5.243	4.898	4.474	3.953	3.636
340					5.294	4.950	4.533	4.015	3.693

Thickness is intumescent only.

Table 8: Beams with open profile and 3-sided fire exposure: Fire Resistance Period: 120 Minutes									
Section Factor up to m^{-1}	**Thickness (mm) Required for a Design Temperature of**								
	350°C	**400°C**	**450°C**	**500°C**	**550°C**	**600°C**	**650°C**	**700°C**	**750°C**
49		4.271	3.460	2.809	2.322	1.936	1.640	1.338	1.047
50		4.271	3.460	2.815	2.332	1.936	1.640	1.338	1.047
55		4.458	3.625	2.950	2.430	2.035	1.724	1.406	1.101
60		4.699	3.798	3.085	2.527	2.186	1.844	1.496	1.171
65		4.941	3.971	3.220	2.625	2.337	1.964	1.585	1.242
70		5.182	4.144	3.354	2.723	2.464	2.084	1.675	1.313
75		5.424	4.317	3.489	2.820	2.530	2.204	1.765	1.384
80			4.490	3.624	2.918	2.596	2.324	1.854	1.454
85			4.663	3.759	3.015	2.663	2.444	1.944	1.525
90			4.836	3.894	3.113	2.729	2.500	2.033	1.596
95			5.009	4.029	3.210	2.795	2.557	2.123	1.667
100			5.182	4.164	3.308	2.862	2.613	2.213	1.738
105			5.355	4.299	3.405	2.928	2.669	2.302	1.808
110			5.528	4.434	3.503	2.995	2.726	2.392	1.879
115				4.569	3.601	3.061	2.782	2.465	1.950
120				4.704	3.698	3.127	2.838	2.516	2.021
125				4.839	3.796	3.194	2.895	2.567	2.091
130				4.974	3.893	3.260	2.951	2.617	2.162
135				5.109	3.991	3.327	3.007	2.668	2.233
140				5.244	4.088	3.393	3.063	2.719	2.304
145				5.379	4.186	3.459	3.120	2.769	2.374
150				5.513	4.284	3.520	3.176	2.820	2.445
155				5.635	4.381	3.571	3.232	2.871	2.492
160					4.479	3.622	3.289	2.922	2.540
165					4.576	3.673	3.345	2.972	2.587
170					4.674	3.724	3.401	3.023	2.634
175					4.771	3.775	3.458	3.074	2.682
180					4.869	3.826	3.513	3.125	2.729
185					4.966	3.877	3.564	3.175	2.777
190					5.064	3.928	3.614	3.226	2.824
195					5.162	3.979	3.665	3.277	2.872
200					5.259	4.030	3.716	3.327	2.919
205					5.357	4.080	3.767	3.378	2.966
210					5.454	4.131	3.818	3.429	3.014
215					5.552	4.182	3.869	3.480	3.061
220						4.233	3.920	3.531	3.109
225						4.284	3.971	3.584	3.156
230						4.335	4.022	3.637	3.204
235						4.386	4.072	3.689	3.251
240						4.437	4.123	3.742	3.298
245						4.488	4.174	3.795	3.346
250						4.539	4.225	3.847	3.393
255						4.590	4.276	3.900	3.441
260						4.641	4.327	3.952	3.488
265						4.692	4.378	4.005	3.544
270						4.743	4.429	4.058	3.603
275						4.794	4.480	4.110	3.663
280						4.845	4.530	4.163	3.722
285						4.896	4.581	4.216	3.781
290						4.947	4.632	4.268	3.841
295						4.998	4.683	4.321	3.900
300						5.049	4.734	4.373	3.959
305						5.100	4.785	4.426	4.019
310						5.151	4.836	4.479	4.078
315						5.202	4.887	4.531	4.137
320						5.252	4.938	4.584	4.196
325						5.303	4.988	4.637	4.256
330						5.354	5.039	4.689	4.315
335						5.405	5.090	4.742	4.374
340						5.456	5.141	4.795	4.434

Thickness is intumescent only.

Beams and columns with open profile and 4-sided exposure

Table 9: Beams and columns with open profile and 4-sided exposure: Fire Resistance Period: 15 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
50	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
55	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
60	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
65	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
70	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
75	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
80	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
85	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
90	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
95	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
100	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
105	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
110	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
115	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
120	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
125	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
130	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
135	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
140	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
145	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
150	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
155	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
160	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
165	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
170	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
175	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
180	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
185	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
190	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
195	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
200	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
205	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
210	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
215	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
220	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
225	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
230	0.501	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
235	0.522	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
240	0.543	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
245	0.565	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
250	0.586	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
255	0.607	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
260	0.629	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
265	0.650	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
270	0.671	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
275	0.693	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
280	0.714	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
285	0.736	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
290	0.757	0.499	0.489	0.489	0.489	0.489	0.489	0.489	0.489
295	0.778	0.514	0.489	0.489	0.489	0.489	0.489	0.489	0.489
300	0.800	0.529	0.489	0.489	0.489	0.489	0.489	0.489	0.489
305	0.821	0.544	0.489	0.489	0.489	0.489	0.489	0.489	0.489
310	0.842	0.559	0.489	0.489	0.489	0.489	0.489	0.489	0.489
315	0.864	0.574	0.489	0.489	0.489	0.489	0.489	0.489	0.489
320	0.885	0.589	0.489	0.489	0.489	0.489	0.489	0.489	0.489
325	0.906	0.604	0.489	0.489	0.489	0.489	0.489	0.489	0.489
330	0.928	0.619	0.489	0.489	0.489	0.489	0.489	0.489	0.489
335	0.949	0.634	0.489	0.489	0.489	0.489	0.489	0.489	0.489

Thickness is intumescent only.

Table 10: Beams and columns with open profile and 4-sided exposure: Fire Resistance Period: 30 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	0.523	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
50	0.523	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
55	0.558	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
60	0.607	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
65	0.656	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
70	0.705	0.501	0.489	0.489	0.489	0.489	0.489	0.489	0.489
75	0.754	0.535	0.489	0.489	0.489	0.489	0.489	0.489	0.489
80	0.803	0.570	0.489	0.489	0.489	0.489	0.489	0.489	0.489
85	0.852	0.604	0.489	0.489	0.489	0.489	0.489	0.489	0.489
90	0.901	0.638	0.489	0.489	0.489	0.489	0.489	0.489	0.489
95	0.950	0.672	0.489	0.489	0.489	0.489	0.489	0.489	0.489
100	0.999	0.707	0.489	0.489	0.489	0.489	0.489	0.489	0.489
105	1.030	0.741	0.493	0.489	0.489	0.489	0.489	0.489	0.489
110	1.059	0.775	0.519	0.489	0.489	0.489	0.489	0.489	0.489
115	1.089	0.809	0.545	0.489	0.489	0.489	0.489	0.489	0.489
120	1.119	0.843	0.571	0.489	0.489	0.489	0.489	0.489	0.489
125	1.148	0.878	0.598	0.489	0.489	0.489	0.489	0.489	0.489
130	1.178	0.912	0.624	0.489	0.489	0.489	0.489	0.489	0.489
135	1.207	0.946	0.650	0.489	0.489	0.489	0.489	0.489	0.489
140	1.237	0.980	0.676	0.489	0.489	0.489	0.489	0.489	0.489
145	1.266	1.012	0.702	0.489	0.489	0.489	0.489	0.489	0.489
150	1.296	1.037	0.729	0.489	0.489	0.489	0.489	0.489	0.489
155	1.325	1.063	0.755	0.489	0.489	0.489	0.489	0.489	0.489
160	1.355	1.089	0.781	0.489	0.489	0.489	0.489	0.489	0.489
165	1.384	1.115	0.807	0.489	0.489	0.489	0.489	0.489	0.489
170	1.414	1.141	0.833	0.496	0.489	0.489	0.489	0.489	0.489
175	1.444	1.167	0.860	0.514	0.489	0.489	0.489	0.489	0.489
180	1.473	1.192	0.886	0.532	0.489	0.489	0.489	0.489	0.489
185	1.503	1.218	0.912	0.550	0.489	0.489	0.489	0.489	0.489
190	1.532	1.244	0.938	0.568	0.489	0.489	0.489	0.489	0.489
195	1.562	1.270	0.964	0.586	0.489	0.489	0.489	0.489	0.489
200	1.591	1.296	0.991	0.604	0.489	0.489	0.489	0.489	0.489
205	1.621	1.322	1.016	0.622	0.489	0.489	0.489	0.489	0.489
210	1.650	1.348	1.040	0.640	0.489	0.489	0.489	0.489	0.489
215	1.680	1.373	1.065	0.658	0.489	0.489	0.489	0.489	0.489
220	1.709	1.399	1.089	0.676	0.489	0.489	0.489	0.489	0.489
225	1.739	1.425	1.114	0.695	0.489	0.489	0.489	0.489	0.489
230	1.769	1.451	1.138	0.713	0.489	0.489	0.489	0.489	0.489
235	1.798	1.477	1.162	0.731	0.502	0.489	0.489	0.489	0.489
240	1.828	1.503	1.187	0.749	0.521	0.489	0.489	0.489	0.489
245	1.857	1.529	1.211	0.767	0.541	0.489	0.489	0.489	0.489
250	1.887	1.554	1.236	0.785	0.560	0.489	0.489	0.489	0.489
255	1.916	1.580	1.260	0.803	0.580	0.489	0.489	0.489	0.489
260	1.946	1.606	1.285	0.821	0.599	0.489	0.489	0.489	0.489
265	1.975	1.632	1.309	0.839	0.618	0.489	0.489	0.489	0.489
270	2.005	1.658	1.334	0.857	0.638	0.493	0.489	0.489	0.489
275	2.034	1.684	1.358	0.875	0.657	0.509	0.489	0.489	0.489
280	2.064	1.709	1.383	0.894	0.677	0.526	0.489	0.489	0.489
285	2.093	1.735	1.407	0.912	0.696	0.542	0.489	0.489	0.489
290	2.123	1.761	1.431	0.930	0.716	0.558	0.489	0.489	0.489
295	2.153	1.787	1.456	0.948	0.735	0.575	0.489	0.489	0.489
300	2.182	1.813	1.480	0.966	0.755	0.591	0.489	0.489	0.489
305	2.212	1.839	1.505	0.984	0.774	0.608	0.489	0.489	0.489
310	2.241	1.865	1.529	1.002	0.793	0.624	0.489	0.489	0.489
315	2.271	1.890	1.554	1.029	0.813	0.641	0.489	0.489	0.489
320	2.300	1.916	1.578	1.056	0.832	0.657	0.489	0.489	0.489
325	2.330	1.942	1.603	1.083	0.852	0.673	0.489	0.489	0.489
330	2.359	1.968	1.627	1.110	0.871	0.690	0.498	0.489	0.489
335	2.389	1.994	1.651	1.137	0.891	0.706	0.512	0.489	0.489

Thickness is intumescent only.

Table 11: Beams and columns with open profile and 4-sided exposure: Fire Resistance Period: 45 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	0.952	0.721	0.560	0.489	0.489	0.489	0.489	0.489	0.489
50	0.952	0.721	0.560	0.489	0.489	0.489	0.489	0.489	0.489
55	0.968	0.759	0.589	0.489	0.489	0.489	0.489	0.489	0.489
60	1.067	0.829	0.651	0.497	0.489	0.489	0.489	0.489	0.489
65	1.166	0.895	0.706	0.542	0.489	0.489	0.489	0.489	0.489
70	1.265	0.961	0.762	0.587	0.489	0.489	0.489	0.489	0.489
75	1.364	1.022	0.817	0.632	0.489	0.489	0.489	0.489	0.489
80	1.463	1.073	0.872	0.678	0.506	0.489	0.489	0.489	0.489
85	1.562	1.124	0.927	0.723	0.542	0.489	0.489	0.489	0.489
90	1.661	1.175	0.982	0.768	0.578	0.489	0.489	0.489	0.489
95	1.760	1.226	1.022	0.813	0.615	0.489	0.489	0.489	0.489
100	1.859	1.278	1.053	0.859	0.651	0.489	0.489	0.489	0.489
105	1.958	1.329	1.084	0.904	0.687	0.498	0.489	0.489	0.489
110	2.057	1.380	1.115	0.949	0.723	0.526	0.489	0.489	0.489
115	2.156	1.431	1.147	0.994	0.759	0.553	0.489	0.489	0.489
120	2.255	1.482	1.178	1.026	0.796	0.581	0.489	0.489	0.489
125	2.354	1.534	1.209	1.054	0.832	0.608	0.489	0.489	0.489
130	2.453	1.585	1.240	1.082	0.868	0.636	0.489	0.489	0.489
135	2.486	1.636	1.271	1.111	0.904	0.663	0.489	0.489	0.489
140	2.515	1.687	1.303	1.139	0.940	0.691	0.489	0.489	0.489
145	2.543	1.738	1.334	1.167	0.977	0.718	0.489	0.489	0.489
150	2.572	1.790	1.365	1.196	1.010	0.746	0.489	0.489	0.489
155	2.600	1.841	1.396	1.224	1.037	0.773	0.489	0.489	0.489
160	2.629	1.892	1.427	1.252	1.064	0.801	0.505	0.489	0.489
165	2.657	1.943	1.458	1.281	1.091	0.828	0.525	0.489	0.489
170	2.686	1.994	1.490	1.309	1.118	0.856	0.545	0.489	0.489
175	2.714	2.046	1.521	1.338	1.146	0.883	0.565	0.489	0.489
180	2.743	2.097	1.552	1.366	1.173	0.911	0.585	0.489	0.489
185	2.771	2.148	1.583	1.394	1.200	0.938	0.605	0.489	0.489
190	2.799	2.199	1.614	1.423	1.227	0.966	0.625	0.489	0.489
195	2.828	2.250	1.646	1.451	1.254	0.993	0.645	0.489	0.489
200	2.856	2.302	1.677	1.479	1.281	1.020	0.665	0.489	0.489
205	2.885	2.353	1.708	1.508	1.308	1.047	0.685	0.489	0.489
210	2.913	2.404	1.739	1.536	1.335	1.074	0.705	0.489	0.489
215	2.942	2.455	1.770	1.565	1.362	1.100	0.725	0.489	0.489
220	2.970	2.489	1.801	1.593	1.389	1.127	0.745	0.489	0.489
225	2.999	2.520	1.833	1.621	1.416	1.153	0.765	0.489	0.489
230	3.027	2.552	1.864	1.650	1.443	1.180	0.785	0.489	0.489
235	3.055	2.583	1.895	1.678	1.471	1.207	0.805	0.507	0.489
240	3.084	2.615	1.926	1.706	1.498	1.233	0.825	0.528	0.489
245	3.112	2.647	1.957	1.735	1.525	1.260	0.845	0.550	0.489
250	3.141	2.678	1.989	1.763	1.552	1.287	0.865	0.571	0.489
255	3.169	2.710	2.020	1.791	1.579	1.313	0.885	0.593	0.489
260	3.198	2.741	2.051	1.820	1.606	1.340	0.905	0.614	0.489
265	3.226	2.773	2.082	1.848	1.633	1.366	0.925	0.636	0.489
270	3.255	2.805	2.113	1.877	1.660	1.393	0.945	0.658	0.489
275	3.283	2.836	2.144	1.905	1.687	1.420	0.965	0.679	0.489
280	3.311	2.868	2.176	1.933	1.714	1.446	0.985	0.701	0.489
285	3.340	2.899	2.207	1.962	1.741	1.473	1.006	0.722	0.489
290	3.368	2.931	2.238	1.990	1.768	1.500	1.034	0.744	0.489
295	3.397	2.963	2.269	2.018	1.796	1.526	1.063	0.765	0.498
300	3.425	2.994	2.300	2.047	1.823	1.553	1.091	0.787	0.516
305	3.454	3.026	2.331	2.075	1.850	1.579	1.119	0.808	0.535
310	3.482	3.057	2.363	2.104	1.877	1.606	1.147	0.830	0.554
315	3.530	3.089	2.394	2.132	1.904	1.633	1.176	0.851	0.573
320	3.579	3.121	2.425	2.160	1.931	1.659	1.204	0.873	0.592
325	3.629	3.152	2.456	2.189	1.958	1.686	1.232	0.894	0.611
330	3.679	3.184	2.508	2.217	1.985	1.713	1.261	0.916	0.630
335	3.729	3.215	2.563	2.245	2.012	1.739	1.289	0.937	0.649

Thickness is intumescent only.

Table 12: Beams and columns with open profile and 4-sided exposure: Fire Resistance Period: 60 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	1.703	1.186	0.882	0.725	0.588	0.489	0.489	0.489	0.489
50	1.703	1.186	0.882	0.725	0.588	0.489	0.489	0.489	0.489
55	1.793	1.248	0.928	0.763	0.619	0.500	0.489	0.489	0.489
60	1.967	1.373	1.013	0.841	0.690	0.554	0.489	0.489	0.489
65	2.145	1.501	1.101	0.914	0.753	0.607	0.489	0.489	0.489
70	2.322	1.628	1.189	0.987	0.816	0.661	0.499	0.489	0.489
75	2.481	1.756	1.276	1.046	0.879	0.715	0.544	0.489	0.489
80	2.574	1.884	1.364	1.101	0.942	0.769	0.589	0.489	0.489
85	2.668	2.011	1.452	1.156	1.004	0.822	0.634	0.489	0.489
90	2.761	2.139	1.540	1.211	1.038	0.876	0.679	0.489	0.489
95	2.855	2.267	1.628	1.267	1.072	0.930	0.724	0.499	0.489
100	2.948	2.394	1.716	1.322	1.106	0.984	0.769	0.535	0.489
105	3.042	2.482	1.803	1.377	1.140	1.022	0.813	0.571	0.489
110	3.135	2.528	1.891	1.432	1.174	1.053	0.858	0.607	0.489
115	3.229	2.574	1.979	1.487	1.208	1.083	0.903	0.643	0.489
120	3.322	2.620	2.067	1.542	1.242	1.114	0.948	0.679	0.489
125	3.416	2.666	2.155	1.597	1.277	1.144	0.993	0.714	0.489
130	3.493	2.712	2.243	1.653	1.311	1.175	1.024	0.750	0.489
135	3.525	2.758	2.330	1.708	1.345	1.206	1.053	0.786	0.489
140	3.556	2.804	2.418	1.763	1.379	1.236	1.081	0.822	0.489
145	3.588	2.850	2.476	1.818	1.413	1.267	1.109	0.858	0.489
150	3.619	2.896	2.507	1.873	1.447	1.297	1.137	0.894	0.489
155	3.651	2.942	2.537	1.928	1.481	1.328	1.165	0.930	0.502
160	3.682	2.988	2.568	1.984	1.515	1.358	1.193	0.966	0.531
165	3.713	3.034	2.598	2.039	1.549	1.389	1.222	1.001	0.561
170	3.745	3.080	2.629	2.094	1.584	1.420	1.250	1.028	0.591
175	3.776	3.126	2.659	2.149	1.618	1.450	1.278	1.054	0.620
180	3.808	3.172	2.690	2.204	1.652	1.481	1.306	1.080	0.650
185	3.839	3.218	2.720	2.259	1.686	1.511	1.334	1.106	0.680
190	3.871	3.264	2.751	2.314	1.720	1.542	1.362	1.132	0.710
195	3.902	3.310	2.781	2.370	1.754	1.573	1.390	1.158	0.739
200	3.934	3.356	2.812	2.425	1.788	1.603	1.419	1.184	0.769
205	3.965	3.402	2.842	2.473	1.822	1.634	1.447	1.210	0.799
210	3.997	3.448	2.873	2.510	1.856	1.664	1.475	1.236	0.828
215	4.028	3.493	2.903	2.547	1.891	1.695	1.503	1.262	0.858
220	4.060	3.531	2.934	2.583	1.925	1.725	1.531	1.288	0.888
225	4.091	3.568	2.964	2.620	1.959	1.756	1.559	1.314	0.917
230	4.123	3.606	2.995	2.657	1.993	1.787	1.587	1.340	0.947
235	4.154	3.644	3.025	2.694	2.027	1.817	1.616	1.366	0.977
240	4.185	3.682	3.056	2.730	2.061	1.848	1.644	1.392	1.006
245	4.217	3.720	3.086	2.767	2.095	1.878	1.672	1.418	1.031
250	4.248	3.757	3.117	2.804	2.129	1.909	1.700	1.444	1.057
255	4.280	3.795	3.147	2.840	2.163	1.940	1.728	1.471	1.082
260	4.311	3.833	3.178	2.877	2.197	1.970	1.756	1.497	1.107
265	4.343	3.871	3.208	2.914	2.232	2.001	1.784	1.523	1.133
270	4.374	3.909	3.239	2.951	2.266	2.031	1.813	1.549	1.158
275	4.406	3.946	3.269	2.987	2.300	2.062	1.841	1.575	1.183
280	4.437	3.984	3.300	3.024	2.334	2.092	1.869	1.601	1.209
285	4.469	4.022	3.330	3.061	2.368	2.123	1.897	1.627	4.710
290	4.500	4.060	3.361	3.098	2.402	2.154	1.925	1.653	1.260
295	4.532	4.098	3.391	3.134	2.436	2.184	1.953	1.679	1.285
300	4.563	4.135	3.422	3.171	2.482	2.215	1.982	1.705	1.310
305	4.594	4.173	3.452	3.208	2.556	2.245	2.010	1.731	1.336
310	4.626	4.211	3.483	3.244	2.629	2.276	2.038	1.757	1.361
315	4.657	4.249	3.539	3.281	2.702	2.307	2.066	1.783	1.386
320	4.689	4.287	3.596	3.318	2.776	2.337	2.094	1.809	1.412
325	4.737	4.324	3.654	3.355	2.849	2.368	2.122	1.835	1.437
330	4.820	4.362	3.712	3.391	2.923	2.398	2.150	1.861	1.462
335	4.902	4.400	3.769	3.428	2.996	2.429	2.179	1.887	1.488

Thickness is intumescent only.

Table 13: Beams and columns with open profile and 4-sided exposure: Fire Resistance Period: 75 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	2.466	1.888	1.453	1.093	0.879	0.744	0.601	0.489	0.489
50	2.466	1.888	1.453	1.093	0.879	0.744	0.601	0.489	0.489
55	2.596	1.987	1.511	1.150	0.925	0.783	0.633	0.489	0.489
60	2.775	2.178	1.659	1.265	1.015	0.866	0.710	0.547	0.489
65	2.947	2.373	1.810	1.382	1.104	0.945	0.779	0.606	0.489
70	3.120	2.522	1.961	1.500	1.194	1.020	0.849	0.664	0.489
75	3.292	2.636	2.112	1.617	1.284	1.083	0.918	0.722	0.511
80	3.464	2.749	2.263	1.734	1.373	1.146	0.987	0.781	0.559
85	3.585	2.862	2.414	1.851	1.463	1.209	1.032	0.839	0.607
90	3.699	2.976	2.519	1.969	1.553	1.272	1.071	0.898	0.654
95	3.812	3.089	2.603	2.086	1.642	1.335	1.109	0.956	0.702
100	3.926	3.202	2.687	2.203	1.732	1.398	1.147	1.008	0.750
105	4.040	3.316	2.772	2.321	1.822	1.461	1.186	1.039	0.797
110	4.153	3.429	2.856	2.438	1.911	1.524	1.224	1.069	0.845
115	4.267	3.506	2.940	2.509	2.001	1.587	1.263	1.099	0.893
120	4.381	3.548	3.024	2.569	2.091	1.650	1.301	1.129	0.940
125	4.494	3.589	3.109	2.629	2.180	1.713	1.339	1.160	0.988
130	4.608	3.631	3.193	2.689	2.270	1.776	1.378	1.190	1.021
135	4.715	3.672	3.277	2.749	2.360	1.840	1.416	1.220	1.049
140	4.763	3.714	3.362	2.809	2.449	1.903	1.454	1.251	1.076
145	4.810	3.755	3.446	2.869	2.502	1.966	1.493	1.281	1.104
150	4.858	3.797	3.503	2.929	2.550	2.029	1.531	1.311	1.131
155	4.906	3.839	3.536	2.989	2.598	2.092	1.570	1.341	1.158
160	4.953	3.880	3.570	3.049	2.645	2.155	1.608	1.372	1.186
165	5.001	3.922	3.603	3.109	2.693	2.218	1.646	1.402	1.213
170	5.049	3.963	3.636	3.169	2.741	2.281	1.685	1.432	1.241
175	5.097	4.005	3.670	3.229	2.789	2.344	1.723	1.463	1.268
180	5.144	4.046	3.703	3.289	2.836	2.407	1.761	1.493	1.295
185	5.192	4.088	3.736	3.349	2.884	2.466	1.800	1.523	1.323
190	5.240	4.129	3.770	3.409	2.932	2.505	1.838	1.553	1.350
195	5.287	4.171	3.803	3.468	2.980	2.544	1.877	1.584	1.378
200	5.335	4.213	3.837	3.512	3.027	2.583	1.915	1.614	1.405
205	5.383	4.254	3.870	3.548	3.075	2.622	1.953	1.644	1.433
210	5.431	4.296	3.903	3.585	3.123	2.661	1.992	1.675	1.460
215	5.478	4.337	3.937	3.622	3.171	2.700	2.030	1.705	1.487
220	5.526	4.379	3.970	3.659	3.219	2.739	2.068	1.735	1.515
225	5.574	4.420	4.003	3.696	3.266	2.778	2.107	1.765	1.542
230	5.622	4.462	4.037	3.733	3.314	2.817	2.145	1.796	1.570
235	5.669	4.503	4.070	3.769	3.362	2.856	2.184	1.826	1.597
240	5.717	4.545	4.103	3.806	3.410	2.895	2.222	1.856	1.624
245	5.765	4.587	4.137	3.843	3.457	2.934	2.260	1.886	1.652
250	5.812	4.628	4.170	3.880	3.503	2.973	2.299	1.917	1.679
255	5.860	4.670	4.204	3.917	3.546	3.012	2.337	1.947	1.707
260	5.908	4.712	4.237	3.953	3.589	3.051	2.375	1.977	4.710
265	5.956	4.782	4.270	3.990	3.631	3.090	2.414	2.008	1.762
270	6.003	4.852	4.304	4.027	3.674	3.129	2.452	2.038	1.789
275	6.051	4.922	4.337	4.064	3.717	3.168	2.516	2.068	1.816
280	6.099	4.991	4.370	4.101	3.760	3.207	2.587	2.098	1.844
285	6.146	5.061	4.404	4.137	3.802	3.246	2.658	2.129	1.871
290	6.194	5.131	4.437	4.174	3.845	3.285	2.729	2.159	1.899
295	6.242	5.201	4.470	4.211	3.888	3.324	2.800	2.189	1.926
300	6.290	5.271	4.504	4.248	3.931	3.363	2.872	2.220	1.953
305	6.337	5.341	4.537	4.285	3.974	3.402	2.943	2.250	1.981
310	6.385	5.410	4.571	4.321	4.016	3.441	3.014	2.280	2.008
315	6.433	5.480	4.604	4.358	4.059	3.479	3.085	2.310	2.036
320	6.481	5.550	4.637	4.395	4.102	3.534	3.156	2.341	2.063
325	6.528	5.620	4.671	4.432	4.145	3.591	3.227	2.371	2.090
330	6.576	5.690	4.704	4.469	4.187	3.648	3.298	2.401	2.118
335	6.624	5.760	4.785	4.505	4.230	3.705	3.369	2.431	2.145

Thickness is intumescent only. In the case of beams exposed on 4 sides the maximum protection thickness is 5.635mm.

Table 14: Beams and columns with open profile and 4-sided exposure: Fire Resistance Period: 90 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	3.072	2.540	2.056	1.648	1.337	1.071	0.867	0.705	0.546
50	3.072	2.540	2.056	1.648	1.337	1.071	0.867	0.705	0.546
55	3.234	2.674	2.164	1.735	1.407	1.127	0.913	0.742	0.575
60	3.564	2.874	2.395	1.902	1.547	1.242	1.007	0.829	0.651
65	3.863	3.062	2.547	2.072	1.689	1.359	1.094	0.910	0.719
70	4.162	3.249	2.699	2.243	1.832	1.477	1.182	0.991	0.786
75	4.460	3.436	2.851	2.413	1.974	1.594	1.269	1.051	0.854
80	4.718	3.589	3.003	2.546	2.117	1.712	1.356	1.108	0.921
85	4.767	3.729	3.155	2.664	2.260	1.829	1.444	1.164	0.988
90	4.816	3.870	3.307	2.782	2.402	1.947	1.531	1.221	1.028
95	4.865	4.010	3.459	2.901	2.519	2.064	1.619	1.277	1.060
100	4.914	4.151	3.548	3.019	2.619	2.181	1.706	1.334	1.092
105	4.963	4.291	3.625	3.137	2.718	2.299	1.794	1.390	1.124
110	5.012	4.431	3.701	3.255	2.818	2.416	1.881	1.447	1.156
115	5.061	4.572	3.777	3.374	2.917	2.509	1.969	1.503	1.188
120	5.110	4.711	3.853	3.487	3.017	2.587	2.056	1.560	1.221
125	5.159	4.759	3.930	3.528	3.117	2.665	2.144	1.617	1.253
130	5.208	4.807	4.006	3.569	3.216	2.743	2.231	1.673	1.285
135	5.257	4.856	4.082	3.610	3.316	2.821	2.318	1.730	1.317
140	5.306	4.904	4.158	3.651	3.415	2.899	2.406	1.786	1.349
145	5.355	4.953	4.235	3.692	3.495	2.977	2.484	1.843	1.381
150	5.404	5.001	4.311	3.733	3.529	3.055	2.547	1.899	1.414
155	5.453	5.049	4.387	3.774	3.564	3.133	2.610	1.956	1.446
160	5.502	5.098	4.463	3.815	3.598	3.211	2.673	2.012	1.478
165	5.551	5.146	4.540	3.855	3.632	3.289	2.736	2.069	1.510
170	5.600	5.194	4.616	3.896	3.666	3.367	2.799	2.125	1.542
175	5.649	5.243	4.692	3.937	3.700	3.445	2.862	2.182	1.574
180	5.698	5.291	4.752	3.978	3.734	3.502	2.925	2.238	1.607
185	5.747	5.339	4.808	4.019	3.769	3.539	2.988	2.295	1.639
190	5.796	5.388	4.863	4.060	3.803	3.575	3.051	2.351	1.671
195	5.845	5.436	4.919	4.101	3.837	3.611	3.114	2.408	1.703
200	5.894	5.484	4.974	4.142	3.871	3.647	3.177	2.464	1.735
205	5.943	5.533	5.030	4.183	3.905	3.683	3.240	2.513	1.767
210	5.992	5.581	5.085	4.223	3.939	3.719	3.303	2.563	1.799
215	6.041	5.630	5.140	4.264	3.974	3.755	3.366	2.612	1.832
220	6.090	5.678	5.196	4.305	4.008	3.791	3.429	2.661	1.864
225	6.139	5.726	5.251	4.346	4.042	3.827	3.489	2.711	1.896
230	6.188	5.775	5.307	4.387	4.076	3.863	3.529	2.760	1.928
235	6.237	5.823	5.362	4.428	4.110	3.899	3.569	2.809	1.960
240	6.286	5.871	5.417	4.469	4.144	3.935	3.608	2.859	4.710
245	6.335	5.920	5.473	4.510	4.179	3.971	3.648	2.908	2.025
250	6.384	5.968	5.528	4.551	4.213	4.007	3.688	2.957	2.057
255	6.433	6.016	5.584	4.591	4.247	4.043	3.727	3.007	2.089
260	6.482	6.065	5.639	4.632	4.281	4.079	3.767	3.056	2.121
265	6.531	6.113	5.694	4.673	4.315	4.115	3.807	3.105	2.153
270	6.580	6.161	5.750	4.719	4.349	4.151	3.846	3.155	2.185
275	6.629	6.210	5.805	4.805	4.384	4.187	3.886	3.204	2.218
280	6.678	6.258	5.861	4.892	4.418	4.223	3.926	3.253	2.250
285	6.727	6.307	5.916	4.979	4.452	4.259	3.965	3.303	2.282
290	6.776	6.355	5.972	5.066	4.486	4.295	4.005	3.352	2.314
295	6.825	6.403	6.027	5.153	4.520	4.331	4.045	3.401	2.346
300	6.874	6.452	6.082	5.239	4.555	4.367	4.084	3.451	2.378
305	6.923	6.500	6.138	5.326	4.589	4.403	4.124	3.501	2.410
310	6.972	6.548	6.193	5.413	4.623	4.439	4.164	3.555	2.443
315	7.021	6.597	6.249	5.500	4.657	4.475	4.203	3.608	2.578
320	7.070	6.645	6.304	5.586	4.691	4.511	4.243	3.662	2.834
325	7.119	6.693	6.359	5.673	4.763	4.547	4.283	3.715	3.090
330	7.168	6.742	6.415	5.760	4.880	4.583	4.322	3.769	3.347
335	7.217	6.790	6.470	5.847	4.997	4.620	4.362	3.823	3.504

Thickness is intumescent only. In the case of beams exposed on 4 sides the maximum protection thickness is 5.635mm.

Table 15: Beams and columns with open profile and 4-sided exposure: Fire Resistance Period: 105 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48		3.311	2.623	2.204	1.853	1.553	1.261	0.958	0.778
50		3.311	2.623	2.204	1.853	1.553	1.261	0.958	0.778
55		3.320	2.761	2.320	1.950	1.635	1.327	1.008	0.819
60		3.623	3.003	2.525	2.138	1.795	1.459	1.113	0.911
65		3.925	3.222	2.709	2.330	1.958	1.594	1.221	0.999
70		4.228	3.440	2.892	2.510	2.122	1.729	1.328	1.071
75		4.531	3.626	3.076	2.668	2.285	1.864	1.435	1.143
80		4.731	3.804	3.260	2.826	2.449	1.998	1.543	1.214
85		4.781	3.981	3.444	2.983	2.580	2.133	1.650	1.285
90		4.831	4.159	3.568	3.141	2.709	2.268	1.757	1.357
95		4.881	4.337	3.676	3.299	2.837	2.403	1.865	1.428
100		4.931	4.514	3.783	3.456	2.966	2.523	1.972	1.500
105		4.981	4.692	3.891	3.541	3.095	2.632	2.079	1.571
110		5.031	4.756	3.998	3.609	3.224	2.742	2.187	1.643
115		5.082	4.807	4.105	3.678	3.353	2.851	2.294	1.714
120		5.132	4.858	4.213	3.746	3.481	2.960	2.401	1.786
125		5.182	4.910	4.320	3.815	3.530	3.070	2.501	1.857
130		5.232	4.961	4.428	3.883	3.576	3.179	2.591	1.928
135		5.282	5.012	4.535	3.952	3.622	3.288	2.681	2.000
140		5.332	5.063	4.642	4.020	3.669	3.397	2.771	2.071
145		5.383	5.114	4.731	4.089	3.715	3.492	2.861	2.143
150		5.433	5.165	4.787	4.157	3.761	3.527	2.951	2.214
155		5.483	5.217	4.843	4.226	3.808	3.561	3.041	2.286
160		5.533	5.268	4.900	4.294	3.854	3.596	3.131	2.357
165		5.583	5.319	4.956	4.363	3.900	3.631	3.222	2.429
170		5.633	5.370	5.012	4.431	3.946	3.666	3.312	2.511
175		5.684	5.421	5.068	4.500	3.993	3.701	3.402	2.601
180		5.734	5.472	5.125	4.568	4.039	3.735	3.488	2.691
185		5.784	5.524	5.181	4.636	4.085	3.770	3.523	2.781
190		5.834	5.575	5.237	4.705	4.131	3.805	3.559	2.871
195		5.884	5.626	5.293	4.772	4.178	3.840	3.595	2.962
200		5.934	5.677	5.350	4.838	4.224	3.875	3.631	3.052
205		5.984	5.728	5.406	4.905	4.270	3.909	3.667	3.142
210		6.035	5.780	5.462	4.972	4.317	3.944	3.702	3.232
215		6.085	5.831	5.518	5.038	4.363	3.979	3.738	3.322
220		6.135	5.882	5.575	5.105	4.409	4.014	3.774	3.413
225		6.185	5.933	5.631	5.172	4.455	4.048	3.810	4.710
230		6.235	5.984	5.687	5.238	4.502	4.083	3.845	3.527
235		6.285	6.035	5.743	5.305	4.548	4.118	3.881	3.563
240		6.336	6.087	5.800	5.372	4.594	4.153	3.917	3.598
245		6.386	6.138	5.856	5.438	4.640	4.188	3.953	3.633
250		6.436	6.189	5.912	5.505	4.687	4.222	3.989	3.669
255		6.486	6.240	5.968	5.572	4.755	4.257	4.024	3.704
260		6.536	6.291	6.025	5.638	4.845	4.292	4.060	3.739
265		6.586	6.342	6.081	5.705	4.934	4.327	4.096	3.775
270		6.637	6.394	6.137	5.772	5.024	4.361	4.132	3.810
275		6.687	6.445	6.193	5.838	5.114	4.396	4.167	3.845
280		6.737	6.496	6.249	5.905	5.204	4.431	4.203	3.881
285		6.787	6.547	6.306	5.972	5.294	4.466	4.239	3.916
290		6.837	6.598	6.362	6.038	5.384	4.501	4.275	3.951
295		6.887	6.650	6.418	6.105	5.474	4.535	4.311	3.987
300		6.937	6.701	6.474	6.172	5.564	4.570	4.346	4.022
305		6.988	6.752	6.531	6.238	5.654	4.605	4.382	4.057
310		7.038	6.803	6.587	6.305	5.744	4.640	4.418	4.093
315		7.088	6.854	6.643	6.372	5.834	4.674	4.454	4.128
320		7.138	6.905	6.699	6.438	5.924	4.709	4.489	4.163
325		7.188	6.957	6.756	6.505	6.014	4.893	4.525	4.199
330		7.238	7.008	6.812	6.572	6.104	5.079	4.561	4.234
335		7.289	7.059	6.868	6.638	6.194	5.266	4.597	4.269

Thickness is intumescent only. In the case of beams exposed on 4 sides the maximum protection thickness is 5.635mm.

Table 16: Beams and columns with open profile and 4-sided exposure: Fire Resistance Period: 120 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48			3.311	2.709	2.365	2.035	1.714	1.390	1.054
50			3.311	2.709	2.365	2.035	1.714	1.390	1.054
55			3.485	2.852	2.489	2.142	1.804	1.463	1.109
60			3.718	3.131	2.706	2.362	1.979	1.609	1.226
65			4.043	3.375	2.924	2.544	2.157	1.757	1.345
70			4.368	3.596	3.143	2.727	2.335	1.906	1.463
75			4.693	3.798	3.362	2.910	2.507	2.054	1.582
80			4.781	4.000	3.542	3.093	2.664	2.203	1.701
85			4.856	4.202	3.674	3.276	2.822	2.351	1.820
90			4.932	4.404	3.805	3.459	2.979	2.496	1.939
95			5.007	4.606	3.937	3.569	3.136	2.628	2.058
100			5.082	4.737	4.068	3.668	3.293	2.760	2.177
105			5.157	4.794	4.200	3.766	3.450	2.892	2.296
110			5.233	4.850	4.331	3.864	3.536	3.024	2.415
115			5.308	4.907	4.463	3.963	3.601	3.156	2.536
120			5.383	4.963	4.595	4.061	3.666	3.288	2.657
125			5.458	5.020	4.717	4.160	3.731	3.420	2.778
130			5.534	5.077	4.777	4.258	3.795	3.505	2.900
135			5.609	5.133	4.836	4.357	3.860	3.544	3.021
140			5.684	5.190	4.895	4.455	3.925	3.583	3.142
145			5.759	5.246	4.955	4.553	3.990	3.622	3.264
150			5.834	5.303	5.014	4.652	4.055	3.661	3.385
155			5.910	5.359	5.073	4.736	4.120	3.700	3.491
160			5.985	5.416	5.133	4.799	4.185	3.739	3.524
165			6.060	5.472	5.192	4.863	4.250	3.778	3.557
170			6.135	5.529	5.252	4.927	4.315	3.818	3.590
175			6.211	5.585	5.311	4.990	4.380	3.857	3.623
180			6.286	5.642	5.370	5.054	4.445	3.896	3.656
185			6.361	5.698	5.430	5.117	4.510	3.935	3.688
190			6.436	5.755	5.489	5.181	4.575	3.974	3.721
195			6.511	5.812	5.548	5.244	4.640	4.013	3.754
200			6.587	5.868	5.608	5.308	4.705	4.052	3.787
205			6.662	5.925	5.667	5.371	4.789	4.091	4.710
210			6.737	5.981	5.727	5.435	4.875	4.130	3.853
215			6.812	6.038	5.786	5.499	4.960	4.169	3.886
220			6.888	6.094	5.845	5.562	5.046	4.208	3.919
225			6.963	6.151	5.905	5.626	5.132	4.247	3.952
230			7.038	6.207	5.964	5.689	5.217	4.286	3.985
235			7.113	6.264	6.023	5.753	5.303	4.326	4.018
240			7.188	6.320	6.083	5.816	5.389	4.365	4.051
245			7.264	6.377	6.142	5.880	5.474	4.404	4.084
250				6.433	6.201	5.943	5.560	4.443	4.117
255				6.490	6.261	6.007	5.646	4.482	4.150
260				6.547	6.320	6.070	5.731	4.521	4.183
265				6.603	6.380	6.134	5.817	4.560	4.216
270				6.660	6.439	6.198	5.903	4.599	4.249
275				6.716	6.498	6.261	5.988	4.638	4.282
280				6.773	6.558	6.325	6.074	4.677	4.315
285				6.829	6.617	6.388	6.160	4.826	4.348
290				6.886	6.676	6.452	6.245	5.539	4.380
295				6.942	6.736	6.515	6.331	6.252	4.413
300				6.999	6.795	6.579	6.417	6.964	4.446
305				7.055	6.855	6.642	6.502	0.000	4.479
310				7.112	6.914	6.706	6.588	0.000	4.512
315				7.169	6.973	6.769	6.674	0.000	4.545
320				7.225	7.033	6.833	6.759	0.000	4.578
325				7.282	7.092	6.897	6.845	0.000	4.611
330					7.151	6.960	6.931	0.000	4.644
335					7.211	7.024	7.016	0.000	4.677

Thickness is intumescent only. In the case of beams exposed on 4 sides the maximum protection thickness is 5.635mm

Rectangular Hollow Columns with closed profile and 4-sided exposure

Section Factor up to m^{-1}	Table 17: Rectangular Hollow Columns: Fire Resistance Period: 15 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
47	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
50	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
55	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
60	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
65	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
70	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
75	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
80	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
85	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
90	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
95	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
100	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
105	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
110	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
115	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
120	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
125	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
130	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
135	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
140	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
145	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
150	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
155	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
160	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
165	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
170	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
175	0.962	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
180	0.985	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
185	1.008	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
190	1.031	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
195	1.054	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
200	1.077	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
205	1.100	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
210	1.123	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
215	1.146	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
220	1.169	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
225	1.192	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
230	1.216	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
235	1.239	0.949	0.944	0.944	0.944	0.944	0.944	0.944	0.944
240	1.262	0.970	0.944	0.944	0.944	0.944	0.944	0.944	0.944
245	1.285	0.991	0.944	0.944	0.944	0.944	0.944	0.944	0.944
250	1.308	1.012	0.944	0.944	0.944	0.944	0.944	0.944	0.944
255	1.331	1.033	0.944	0.944	0.944	0.944	0.944	0.944	0.944
260	1.354	1.054	0.944	0.944	0.944	0.944	0.944	0.944	0.944
265	1.377	1.075	0.944	0.944	0.944	0.944	0.944	0.944	0.944
270	1.400	1.096	0.944	0.944	0.944	0.944	0.944	0.944	0.944
275	1.423	1.117	0.944	0.944	0.944	0.944	0.944	0.944	0.944
280	1.446	1.138	0.944	0.944	0.944	0.944	0.944	0.944	0.944
285	1.469	1.159	0.944	0.944	0.944	0.944	0.944	0.944	0.944
290	1.492	1.180	0.944	0.944	0.944	0.944	0.944	0.944	0.944
295	1.515	1.201	0.944	0.944	0.944	0.944	0.944	0.944	0.944
300	1.538	1.222	0.944	0.944	0.944	0.944	0.944	0.944	0.944
305	1.561	1.243	0.944	0.944	0.944	0.944	0.944	0.944	0.944
310	1.585	1.264	0.965	0.944	0.944	0.944	0.944	0.944	0.944
315	1.608	1.285	0.984	0.944	0.944	0.944	0.944	0.944	0.944
320	1.631	1.306	1.003	0.944	0.944	0.944	0.944	0.944	0.944
325	1.654	1.327	1.021	0.944	0.944	0.944	0.944	0.944	0.944

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 18: Rectangular Hollow Columns: Fire Resistance Period: 30 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
47	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
50	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
55	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
60	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
65	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
70	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
75	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
80	0.984	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
85	1.051	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
90	1.118	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
95	1.185	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
100	1.252	0.982	0.944	0.944	0.944	0.944	0.944	0.944	0.944
105	1.319	1.034	0.944	0.944	0.944	0.944	0.944	0.944	0.944
110	1.386	1.085	0.944	0.944	0.944	0.944	0.944	0.944	0.944
115	1.453	1.136	0.944	0.944	0.944	0.944	0.944	0.944	0.944
120	1.520	1.187	0.970	0.944	0.944	0.944	0.944	0.944	0.944
125	1.587	1.238	1.008	0.944	0.944	0.944	0.944	0.944	0.944
130	1.654	1.289	1.047	0.944	0.944	0.944	0.944	0.944	0.944
135	1.721	1.341	1.085	0.944	0.944	0.944	0.944	0.944	0.944
140	1.788	1.392	1.124	0.944	0.944	0.944	0.944	0.944	0.944
145	1.855	1.443	1.162	0.975	0.944	0.944	0.944	0.944	0.944
150	1.922	1.494	1.200	1.005	0.944	0.944	0.944	0.944	0.944
155	1.991	1.545	1.239	1.035	0.944	0.944	0.944	0.944	0.944
160	2.060	1.596	1.277	1.066	0.944	0.944	0.944	0.944	0.944
165	2.129	1.647	1.316	1.096	0.944	0.944	0.944	0.944	0.944
170	2.199	1.699	1.354	1.126	0.944	0.944	0.944	0.944	0.944
175	2.268	1.750	1.393	1.156	0.957	0.944	0.944	0.944	0.944
180	2.337	1.801	1.431	1.187	0.985	0.944	0.944	0.944	0.944
185	2.407	1.852	1.470	1.217	1.013	0.944	0.944	0.944	0.944
190	2.476	1.903	1.508	1.247	1.041	0.944	0.944	0.944	0.944
195	2.545	1.950	1.547	1.277	1.069	0.944	0.944	0.944	0.944
200	2.615	1.992	1.585	1.307	1.098	0.944	0.944	0.944	0.944
205	2.684	2.034	1.623	1.338	1.126	0.944	0.944	0.944	0.944
210	2.754	2.077	1.662	1.368	1.154	0.944	0.944	0.944	0.944
215	2.823	2.119	1.700	1.398	1.182	0.944	0.944	0.944	0.944
220	2.887	2.161	1.739	1.428	1.210	0.972	0.944	0.944	0.944
225	2.947	2.203	1.777	1.459	1.238	0.998	0.944	0.944	0.944
230	3.007	2.246	1.816	1.489	1.266	1.024	0.944	0.944	0.944
235	3.066	2.288	1.854	1.519	1.294	1.050	0.944	0.944	0.944
240	3.126	2.330	1.893	1.549	1.322	1.077	0.944	0.944	0.944
245	3.185	2.372	1.931	1.580	1.351	1.103	0.944	0.944	0.944
250	3.245	2.415	1.976	1.610	1.379	1.129	0.944	0.944	0.944
255	3.304	2.457	2.021	1.640	1.407	1.155	0.944	0.944	0.944
260	3.364	2.499	2.066	1.670	1.435	1.181	0.944	0.944	0.944
265	3.423	2.541	2.111	1.700	1.463	1.207	0.944	0.944	0.944
270	3.483	2.583	2.156	1.731	1.491	1.233	0.944	0.944	0.944
275	3.543	2.626	2.200	1.761	1.519	1.259	0.944	0.944	0.944
280	3.602	2.668	2.245	1.791	1.547	1.286	0.944	0.944	0.944
285	3.662	2.710	2.290	1.821	1.575	1.312	0.969	0.944	0.944
290	3.723	2.752	2.335	1.852	1.603	1.338	0.994	0.944	0.944
295	3.835	2.795	2.380	1.882	1.632	1.364	1.019	0.944	0.944
300	3.946	2.837	2.424	1.912	1.660	1.390	1.044	0.944	0.944
305	4.058	2.922	2.469	1.951	1.688	1.416	1.069	0.944	0.944
310	4.169	3.052	2.514	2.000	1.716	1.442	1.094	0.944	0.944
315	4.281	3.181	2.559	2.049	1.744	1.468	1.119	0.944	0.944
320	4.392	3.310	2.604	2.098	1.772	1.495	1.144	0.944	0.944
325	4.503	3.439	2.649	2.147	1.800	1.521	1.169	0.944	0.944

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 19: Rectangular Hollow Columns: Fire Resistance Period: 45 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
47	1.004	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
50	1.004	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
55	1.081	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
60	1.203	0.944	0.944	0.944	0.944	0.944	0.944	0.944	0.944
65	1.325	1.023	0.944	0.944	0.944	0.944	0.944	0.944	0.944
70	1.446	1.121	0.944	0.944	0.944	0.944	0.944	0.944	0.944
75	1.568	1.220	0.988	0.944	0.944	0.944	0.944	0.944	0.944
80	1.689	1.318	1.066	0.944	0.944	0.944	0.944	0.944	0.944
85	1.811	1.416	1.145	0.944	0.944	0.944	0.944	0.944	0.944
90	1.940	1.514	1.223	1.017	0.944	0.944	0.944	0.944	0.944
95	2.300	1.613	1.302	1.083	0.944	0.944	0.944	0.944	0.944
100	2.660	1.711	1.380	1.149	0.955	0.944	0.944	0.944	0.944
105	2.900	1.809	1.459	1.216	1.011	0.944	0.944	0.944	0.944
110	2.994	1.907	1.537	1.282	1.066	0.944	0.944	0.944	0.944
115	3.087	2.077	1.615	1.349	1.122	0.944	0.944	0.944	0.944
120	3.181	2.267	1.694	1.415	1.178	0.985	0.944	0.944	0.944
125	3.274	2.457	1.772	1.482	1.234	1.031	0.944	0.944	0.944
130	3.368	2.646	1.851	1.548	1.289	1.077	0.944	0.944	0.944
135	3.461	2.836	1.929	1.614	1.345	1.122	0.944	0.944	0.944
140	3.554	2.939	2.052	1.681	1.401	1.168	0.970	0.944	0.944
145	3.648	3.031	2.174	1.747	1.456	1.213	1.005	0.944	0.944
150	3.743	3.122	2.297	1.814	1.512	1.259	1.041	0.944	0.944
155	3.845	3.214	2.419	1.880	1.568	1.305	1.077	0.944	0.944
160	3.946	3.305	2.542	1.950	1.624	1.350	1.113	0.944	0.944
165	4.047	3.397	2.664	2.028	1.679	1.396	1.149	0.944	0.944
170	4.149	3.488	2.786	2.106	1.735	1.442	1.185	0.944	0.944
175	4.250	3.580	2.900	2.185	1.791	1.487	1.221	0.961	0.944
180	4.351	3.671	3.002	2.263	1.846	1.533	1.257	0.994	0.944
185	4.453	3.761	3.104	2.341	1.902	1.578	1.292	1.028	0.944
190	4.554	3.849	3.206	2.420	1.954	1.624	1.328	1.061	0.944
195	4.656	3.938	3.308	2.498	2.002	1.670	1.364	1.095	0.944
200	4.757	4.026	3.409	2.577	2.050	1.715	1.400	1.128	0.944
205	4.858	4.115	3.511	2.655	2.098	1.761	1.436	1.162	0.944
210	4.960	4.203	3.613	2.733	2.146	1.806	1.472	1.195	0.944
215	5.061	4.291	3.715	2.812	2.194	1.852	1.508	1.229	0.944
220	5.162	4.380	3.799	2.897	2.242	1.898	1.544	1.262	0.944
225	5.264	4.468	3.882	2.993	2.290	1.943	1.579	1.296	0.944
230	5.365	4.557	3.966	3.090	2.337	1.986	1.615	1.329	0.944
235	5.466	4.645	4.049	3.186	2.385	2.030	1.651	1.363	0.944
240	5.568	4.733	4.132	3.282	2.433	2.073	1.687	1.396	0.944
245	5.669	4.822	4.216	3.378	2.481	2.117	1.723	1.430	0.944
250	5.771	4.910	4.299	3.474	2.529	2.161	1.759	1.463	0.944
255	5.870	4.999	4.382	3.570	2.577	2.204	1.795	1.497	0.966
260	5.962	5.087	4.466	3.666	2.625	2.248	1.831	1.530	1.003
265	6.054	5.175	4.549	3.760	2.673	2.292	1.866	1.564	1.041
270	6.146	5.264	4.632	3.850	2.721	2.335	1.902	1.597	1.079
275	6.238	5.352	4.716	3.941	2.769	2.379	1.940	1.631	1.116
280	6.330	5.440	4.799	4.031	2.817	2.422	1.982	1.664	1.154
285	6.423	5.529	4.882	4.122	2.879	2.466	2.023	1.698	1.192
290	6.515	5.617	4.966	4.212	3.024	2.510	2.065	1.731	1.230
295	6.607	5.706	5.049	4.303	3.168	2.553	2.107	1.765	1.267
300	6.699	5.794	5.132	4.393	3.313	2.597	2.149	1.798	1.305
305	6.791	5.886	5.216	4.484	3.458	2.640	2.191	1.832	1.343
310	6.883	5.983	5.299	4.574	3.602	2.684	2.233	1.865	1.380
315	6.976	6.080	5.382	4.665	3.738	2.728	2.275	1.899	1.418
320	7.068	6.176	5.466	4.755	3.835	2.771	2.317	1.932	1.456
325	7.160	6.273	5.549	4.846	3.932	2.815	2.358	1.965	1.493

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 20: Rectangular Hollow Columns: Fire Resistance Period: 60 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
47	1.508	1.177	0.944	0.944	0.944	0.944	0.944	0.944	0.944
50	1.508	1.177	0.944	0.944	0.944	0.944	0.944	0.944	0.944
55	1.621	1.268	1.012	0.944	0.944	0.944	0.944	0.944	0.944
60	1.792	1.411	1.132	0.944	0.944	0.944	0.944	0.944	0.944
65	1.929	1.554	1.252	1.038	0.944	0.944	0.944	0.944	0.944
70	2.930	1.698	1.372	1.144	0.944	0.944	0.944	0.944	0.944
75	3.061	1.841	1.493	1.250	1.044	0.944	0.944	0.944	0.944
80	3.192	2.132	1.613	1.356	1.137	0.954	0.944	0.944	0.944
85	3.324	2.660	1.733	1.462	1.229	1.034	0.944	0.944	0.944
90	3.455	2.938	1.853	1.568	1.321	1.113	0.944	0.944	0.944
95	3.586	3.066	2.052	1.674	1.414	1.193	1.000	0.944	0.944
100	3.718	3.195	2.385	1.780	1.506	1.272	1.067	0.944	0.944
105	3.866	3.323	2.717	1.885	1.598	1.351	1.134	0.944	0.944
110	4.014	3.451	2.933	2.049	1.691	1.431	1.201	0.975	0.944
115	4.162	3.579	3.062	2.253	1.783	1.510	1.267	1.035	0.944
120	4.310	3.708	3.191	2.457	1.875	1.590	1.334	1.095	0.944
125	4.459	3.811	3.320	2.660	1.988	1.669	1.401	1.155	0.944
130	4.607	3.913	3.449	2.862	2.128	1.748	1.468	1.215	0.944
135	4.755	4.014	3.578	2.981	2.268	1.828	1.535	1.276	0.944
140	4.903	4.116	3.707	3.100	2.408	1.907	1.601	1.336	0.950
145	5.051	4.217	3.804	3.219	2.548	1.998	1.668	1.396	1.003
150	5.200	4.318	3.898	3.338	2.689	2.093	1.735	1.456	1.055
155	5.348	4.420	3.991	3.457	2.829	2.188	1.802	1.516	1.108
160	5.496	4.521	4.085	3.576	2.941	2.283	1.869	1.577	1.161
165	5.644	4.623	4.179	3.695	3.047	2.378	1.934	1.637	1.213
170	5.792	4.724	4.272	3.793	3.152	2.473	1.991	1.697	1.266
175	5.924	4.825	4.366	3.886	3.257	2.568	2.048	1.757	1.319
180	6.045	4.927	4.459	3.979	3.363	2.663	2.104	1.817	1.371
185	6.166	5.028	4.553	4.072	3.468	2.758	2.161	1.878	1.424
190	6.287	5.130	4.647	4.165	3.573	2.854	2.217	1.934	1.476
195	6.408	5.231	4.740	4.258	3.679	2.946	2.274	1.971	1.529
200	6.529	5.333	4.834	4.352	3.777	3.039	2.331	2.007	1.582
205	6.650	5.434	4.927	4.445	3.871	3.131	2.387	2.043	1.634
210	6.771	5.535	5.021	4.538	3.966	3.224	2.444	2.080	1.687
215	6.892	5.637	5.115	4.631	4.060	3.316	2.501	2.116	1.740
220	7.013	5.738	5.208	4.724	4.154	3.409	2.557	2.153	1.792
225	7.134	5.840	5.302	4.817	4.248	3.501	2.614	2.189	1.845
230	7.255	5.968	5.395	4.910	4.343	3.594	2.670	2.225	1.898
235	7.376	6.098	5.489	5.003	4.437	3.686	2.727	2.262	1.941
240	7.497	6.228	5.583	5.096	4.531	3.783	2.784	2.298	1.971
245	7.618	6.358	5.676	5.189	4.625	3.884	2.840	2.335	2.001
250	7.740	6.489	5.770	5.283	4.720	3.984	2.920	2.371	2.031
255	7.861	6.619	5.867	5.376	4.814	4.084	3.010	2.407	2.061
260	7.982	6.749	5.984	5.469	4.908	4.185	3.100	2.444	2.091
265	8.103	6.879	6.101	5.562	5.003	4.285	3.191	2.480	2.121
270	8.224	7.010	6.218	5.655	5.097	4.385	3.281	2.516	2.152
275	8.345	7.140	6.335	5.748	5.191	4.485	3.371	2.553	2.182
280		7.270	6.452	5.841	5.285	4.586	3.461	2.589	2.212
285		7.400	6.569	5.947	5.380	4.686	3.552	2.626	2.242
290		7.531	6.686	6.054	5.474	4.786	3.642	2.662	2.272
295		7.661	6.803	6.161	5.568	4.887	3.736	2.698	2.302
300		7.791	6.920	6.268	5.662	4.987	3.854	2.735	2.332
305		7.921	7.036	6.375	5.757	5.087	3.971	2.771	2.362
310		8.052	7.153	6.482	5.851	5.187	4.088	2.808	2.392
315		8.182	7.270	6.589	5.950	5.288	4.205	2.844	2.422
320		8.312	7.387	6.696	6.048	5.388	4.323	3.001	2.452
325			7.504	6.803	6.147	5.488	4.440	3.235	2.482

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 21: Rectangular Hollow Columns: Fire Resistance Period: 75 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
47	2.804	1.614	1.321	1.101	0.944	0.944	0.944	0.944	0.944
50	2.852	1.614	1.321	1.101	0.944	0.944	0.944	0.944	0.944
55	3.023	1.736	1.421	1.188	0.980	0.944	0.944	0.944	0.944
60	3.194	1.929	1.579	1.332	1.110	0.944	0.944	0.944	0.944
65	3.365	2.894	1.736	1.475	1.240	1.049	0.944	0.944	0.944
70	3.536	3.060	1.894	1.619	1.371	1.164	0.983	0.944	0.944
75	3.707	3.226	1.929	1.763	1.501	1.278	1.083	0.944	0.944
80	3.906	3.392	2.935	1.907	1.631	1.393	1.182	0.979	0.944
85	4.108	3.558	3.096	2.260	1.762	1.507	1.282	1.070	0.944
90	4.309	3.724	3.258	2.653	1.892	1.622	1.381	1.161	0.944
95	4.511	3.895	3.419	2.929	2.136	1.736	1.481	1.253	0.944
100	4.713	4.066	3.581	3.079	2.425	1.851	1.580	1.344	1.000
105	4.914	4.237	3.738	3.229	2.714	1.993	1.680	1.436	1.082
110	5.116	4.407	3.869	3.379	2.923	2.195	1.779	1.527	1.163
115	5.318	4.578	3.999	3.529	3.052	2.397	1.879	1.618	1.244
120	5.519	4.749	4.130	3.679	3.181	2.599	1.993	1.710	1.326
125	5.721	4.920	4.261	3.796	3.310	2.801	2.123	1.801	1.407
130	5.922	5.091	4.392	3.902	3.439	2.939	2.254	1.893	1.488
135	6.124	5.262	4.522	4.008	3.568	3.053	2.384	1.974	1.570
140	6.326	5.433	4.653	4.114	3.698	3.167	2.514	2.050	1.651
145	6.527	5.603	4.784	4.219	3.805	3.281	2.644	2.126	1.732
150	6.729	5.774	4.915	4.325	3.908	3.395	2.774	2.201	1.814
155	6.931	5.953	5.046	4.431	4.011	3.509	2.895	2.277	1.895
160	7.132	6.139	5.176	4.537	4.114	3.623	2.999	2.353	1.952
165	7.334	6.325	5.307	4.642	4.217	3.735	3.102	2.428	1.990
170	7.536	6.510	5.438	4.748	4.320	3.837	3.206	2.504	2.029
175	7.737	6.696	5.569	4.854	4.422	3.939	3.309	2.579	2.067
180	7.939	6.881	5.699	4.960	4.525	4.041	3.412	2.655	2.106
185	8.140	7.067	5.830	5.065	4.628	4.143	3.516	2.731	2.144
190	8.342	7.252	5.982	5.171	4.731	4.245	3.619	2.806	2.183
195		7.438	6.137	5.277	4.834	4.347	3.723	2.893	2.222
200		7.623	6.292	5.383	4.937	4.449	3.826	3.005	2.260
205		7.809	6.447	5.488	5.040	4.551	3.928	3.117	2.299
210		7.995	6.602	5.594	5.143	4.653	4.031	3.229	2.337
215		8.180	6.757	5.700	5.246	4.755	4.134	3.341	2.376
220		8.366	6.912	5.806	5.349	4.857	4.236	3.453	2.414
225			7.067	5.929	5.452	4.959	4.339	3.565	2.453
230			7.222	6.064	5.555	5.061	4.442	3.677	2.491
235			7.376	6.199	5.658	5.163	4.544	3.783	2.530
240			7.531	6.334	5.761	5.265	4.647	3.886	2.569
245			7.686	6.470	5.867	5.367	4.750	3.989	2.607
250			7.841	6.605	5.992	5.469	4.852	4.092	2.646
255			7.996	6.740	6.117	5.571	4.955	4.195	2.684
260			8.151	6.875	6.242	5.673	5.058	4.298	2.723
265			8.306	7.010	6.367	5.776	5.160	4.400	2.761
270				7.145	6.492	5.881	5.263	4.503	2.800
275				7.280	6.617	5.995	5.366	4.606	2.839
280				7.415	6.742	6.109	5.468	4.709	2.924
285				7.551	6.867	6.223	5.571	4.812	3.057
290				7.686	6.992	6.337	5.674	4.915	3.190
295				7.821	7.117	6.451	5.776	5.018	3.322
300				7.956	7.242	6.565	5.879	5.120	3.455
305				8.091	7.367	6.678	5.984	5.223	3.588
310				8.226	7.492	6.792	6.088	5.326	3.721
315				8.361	7.617	6.906	6.193	5.429	3.863
320					7.742	7.020	6.297	5.532	4.005
325					7.867	7.134	6.402	5.635	4.147

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 22: Rectangular Hollow Columns: Fire Resistance Period: 90 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
47	3.212	2.803	1.833	1.463	1.247	1.056	0.944	0.944	0.944
50	3.271	2.831	1.833	1.463	1.247	1.056	0.944	0.944	0.944
55	3.485	3.036	1.833	1.576	1.346	1.142	0.961	0.944	0.944
60	3.700	3.241	1.929	1.755	1.510	1.290	1.094	0.944	0.944
65	3.967	3.446	3.020	1.948	1.674	1.439	1.227	1.034	0.944
70	4.239	3.651	3.215	2.600	1.838	1.587	1.360	1.157	0.944
75	4.511	3.887	3.410	2.968	2.153	1.736	1.492	1.280	0.970
80	4.783	4.137	3.605	3.150	2.660	1.884	1.625	1.403	1.080
85	5.055	4.387	3.803	3.332	2.953	2.174	1.758	1.527	1.190
90	5.327	4.638	4.004	3.514	3.108	2.526	1.891	1.650	1.301
95	5.599	4.888	4.205	3.696	3.264	2.866	2.098	1.773	1.411
100	5.870	5.138	4.407	3.862	3.419	3.004	2.334	1.896	1.521
105	6.142	5.389	4.608	4.025	3.575	3.143	2.570	2.033	1.632
110	6.414	5.639	4.809	4.189	3.729	3.282	2.806	2.176	1.742
115	6.686	5.889	5.011	4.352	3.863	3.421	2.955	2.318	1.852
120	6.958	6.140	5.212	4.516	3.997	3.560	3.080	2.461	1.954
125	7.230	6.390	5.413	4.679	4.131	3.699	3.205	2.603	2.036
130	7.502	6.640	5.615	4.843	4.266	3.815	3.330	2.746	2.119
135	7.774	6.891	5.816	5.006	4.400	3.928	3.455	2.885	2.201
140	8.046	7.141	6.034	5.170	4.534	4.041	3.580	3.009	2.284
145	8.318	7.391	6.255	5.333	4.669	4.154	3.705	3.134	2.366
150		7.642	6.476	5.497	4.803	4.267	3.815	3.259	2.449
155		7.892	6.697	5.660	4.937	4.380	3.924	3.383	2.531
160		8.142	6.919	5.824	5.071	4.493	4.032	3.508	2.613
165		8.393	7.140	6.018	5.206	4.606	4.141	3.633	2.696
170			7.361	6.218	5.340	4.719	4.249	3.751	2.778
175			7.582	6.418	5.474	4.832	4.357	3.854	2.861
180			7.803	6.618	5.609	4.945	4.466	3.958	2.966
185			8.024	6.818	5.743	5.058	4.574	4.062	3.070
190			8.246	7.018	5.885	5.171	4.683	4.165	3.174
195				7.218	6.058	5.284	4.791	4.269	3.278
200				7.418	6.231	5.397	4.900	4.372	3.383
205				7.618	6.404	5.510	5.008	4.476	3.487
210				7.818	6.577	5.623	5.117	4.579	3.591
215				8.018	6.750	5.736	5.225	4.683	3.695
220				8.218	6.922	5.849	5.333	4.787	3.810
225					7.095	5.987	5.442	4.890	3.927
230					7.268	6.124	5.550	4.994	4.045
235					7.441	6.261	5.659	5.097	4.162
240					7.614	6.399	5.767	5.201	4.279
245					7.787	6.536	5.881	5.304	4.397
250					7.959	6.673	6.009	5.408	4.514
255					8.132	6.810	6.136	5.512	4.632
260					8.305	6.948	6.264	5.615	4.749
265						7.085	6.392	5.719	4.867
270						7.222	6.520	5.822	4.984
275						7.360	6.648	5.935	5.102
280						7.497	6.776	6.051	5.219
285						7.634	6.904	6.167	5.337
290						7.772	7.032	6.283	5.454
295						7.909	7.160	6.399	5.571
300						8.046	7.288	6.515	5.689
305						8.184	7.416	6.631	5.806
310						8.321	7.544	6.747	5.917
315							7.672	6.863	6.024
320							7.800	6.979	6.131
325							7.927	7.095	6.238

Thickness is intumescent only.

Table 23: Rectangular Hollow Columns: Fire Resistance Period: 105 Minutes								
Thickness (mm) Required for a Design Temperature of								
350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
	3.202	2.833	1.833	1.590	1.378	1.188	1.017	0.944
	3.221	2.848	1.833	1.590	1.378	1.188	1.017	0.944
	3.470	3.079	1.929	1.713	1.487	1.284	1.088	0.944
	3.719	3.310	2.907	1.911	1.667	1.446	1.242	0.944
		3.542	3.121	1.929	1.847	1.609	1.397	1.090
		3.785	3.336	2.996	2.228	1.772	1.551	1.229
		4.068	3.550	3.179	2.777	1.943	1.706	1.369
		4.352	3.772	3.362	2.998	2.320	1.860	1.508
		4.635	4.019	3.545	3.163	2.697	2.057	1.647
		4.919	4.267	3.727	3.328	2.943	2.287	1.787
		5.202	4.514	3.912	3.492	3.091	2.518	1.926
		5.485	4.762	4.097	3.657	3.239	2.748	2.069
		5.769	5.009	4.282	3.814	3.387	2.934	2.211
		6.052	5.256	4.467	3.966	3.535	3.078	2.354
		6.335	5.504	4.651	4.118	3.683	3.222	2.497
		6.619	5.751	4.836	4.269	3.816	3.366	2.640
		6.902	5.998	5.021	4.421	3.945	3.510	2.783
		7.185	6.246	5.206	4.573	4.073	3.654	2.917
		7.469	6.493	5.391	4.725	4.201	3.780	3.040
		7.752	6.741	5.575	4.877	4.329	3.892	3.163
		8.035	6.988	5.760	5.029	4.458	4.003	3.287
		8.319	7.235	5.980	5.181	4.586	4.115	3.410
			7.483	6.232	5.333	4.714	4.226	3.534
			7.730	6.484	5.485	4.842	4.338	3.657
			7.978	6.735	5.637	4.970	4.449	3.776
			8.225	6.987	5.789	5.099	4.561	3.891
				7.239	5.985	5.227	4.672	4.007
				7.490	6.209	5.355	4.784	4.122
				7.742	6.433	5.483	4.896	4.237
				7.994	6.656	5.612	5.007	4.352
				8.246	6.880	5.740	5.119	4.467
					7.104	5.876	5.230	4.582
					7.327	6.055	5.342	4.697
					7.551	6.233	5.453	4.812
					7.775	6.412	5.565	4.927
					7.998	6.590	5.676	5.043
					8.222	6.769	5.788	5.158
						6.947	5.911	5.273
						7.126	6.050	5.388
						7.305	6.188	5.503
						7.483	6.326	5.618
						7.662	6.464	5.733
						7.840	6.602	5.848
						8.019	6.740	5.977
						8.197	6.878	6.106
						8.376	7.016	6.235
							7.154	6.364
							7.293	6.493
							7.431	6.621
							7.569	6.750
							7.707	6.879
							7.845	7.008
							7.983	7.137
							8.121	7.265
							8.258	7.394
							8.395	7.523
								7.652

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 24: Rectangular Hollow Columns: Fire Resistance Period: 120 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
47			3.209	2.855	2.623	1.701	1.492	1.302	1.021
50			3.209	2.861	2.623	1.701	1.492	1.302	1.021
55			3.491	3.111	2.761	1.791	1.609	1.408	1.109
60			3.775	3.360	3.045	1.929	1.802	1.591	1.276
65				3.610	3.256	2.931	2.117	1.775	1.444
70				3.898	3.466	3.122	2.672	1.984	1.612
75				4.215	3.677	3.313	2.972	2.324	1.780
80				4.533	3.941	3.503	3.144	2.664	1.953
85				4.850	4.219	3.694	3.316	2.929	2.174
90				5.168	4.497	3.886	3.488	3.094	2.394
95				5.485	4.775	4.078	3.660	3.260	2.614
100				5.803	5.053	4.270	3.824	3.425	2.834
105				6.120	5.331	4.462	3.983	3.590	2.987
110				6.438	5.609	4.654	4.143	3.749	3.133
115				6.755	5.887	4.846	4.302	3.883	3.278
120				7.073	6.165	5.038	4.462	4.018	3.423
125				7.390	6.443	5.230	4.621	4.153	3.568
130				7.708	6.721	5.422	4.780	4.287	3.713
135				8.025	6.999	5.614	4.940	4.422	3.836
140				8.343	7.276	5.806	5.099	4.556	3.959
145					7.554	6.100	5.258	4.691	4.081
150					7.832	6.422	5.418	4.826	4.203
155					8.110	6.745	5.577	4.960	4.326
160					8.388	7.067	5.736	5.095	4.448
165						7.390	5.931	5.229	4.570
170						7.712	6.209	5.364	4.692
175						8.035	6.487	5.498	4.815
180						8.357	6.765	5.633	4.937
185							7.043	5.768	5.059
190							7.321	5.936	5.182
195							7.599	6.156	5.304
200							7.876	6.375	5.426
205							8.154	6.594	5.548
210								6.814	5.671
215								7.033	5.793
220								7.252	5.938
225								7.472	6.102
230								7.691	6.265
235								7.910	6.429
240								8.130	6.592
245								8.349	6.756
250									6.919
255									7.083
260									7.246
265									7.410
270									7.574
275									7.737
280									7.901
285									8.064
290									8.228
295									8.391

Thickness is intumescent only.

Circular Hollow Columns with closed profile and all round exposure

Section Factor up to m^{-1}	Table 25: Circular Hollow Columns: Fire Resistance Period: 15 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
50	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
55	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
60	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
65	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
70	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
75	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
80	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
85	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
90	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
95	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
100	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
105	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
110	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
115	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
120	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
125	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
130	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
135	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
140	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
145	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
150	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
155	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
160	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
165	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
170	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
175	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
180	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
185	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
190	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
195	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
200	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
205	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
210	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
215	0.961	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
220	0.989	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
225	1.018	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
230	1.046	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
235	1.074	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
240	1.102	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
245	1.130	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
250	1.158	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
255	1.186	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
260	1.215	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
265	1.243	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
270	1.271	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
275	1.299	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
280	1.327	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
285	1.355	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
290	1.384	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
295	1.412	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
300	1.440	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
305	1.468	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
310	1.496	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
315	1.524	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
320	1.552	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
325	1.581	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
330	1.609	0.952	0.940	0.940	0.940	0.940	0.940	0.940	0.940
335	1.637	0.984	0.940	0.940	0.940	0.940	0.940	0.940	0.940

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 26: Circular Hollow Columns: Fire Resistance Period: 30 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
50	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
55	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
60	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
65	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
70	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
75	0.950	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
80	1.069	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
85	1.189	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
90	1.309	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
95	1.428	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
100	1.548	1.008	0.940	0.940	0.940	0.940	0.940	0.940	0.940
105	1.667	1.082	0.940	0.940	0.940	0.940	0.940	0.940	0.940
110	1.787	1.157	0.940	0.940	0.940	0.940	0.940	0.940	0.940
115	1.907	1.232	0.940	0.940	0.940	0.940	0.940	0.940	0.940
120	1.969	1.306	0.940	0.940	0.940	0.940	0.940	0.940	0.940
125	2.014	1.381	0.966	0.940	0.940	0.940	0.940	0.940	0.940
130	2.058	1.456	1.008	0.940	0.940	0.940	0.940	0.940	0.940
135	2.103	1.530	1.050	0.940	0.940	0.940	0.940	0.940	0.940
140	2.147	1.605	1.092	0.940	0.940	0.940	0.940	0.940	0.940
145	2.192	1.679	1.134	0.940	0.940	0.940	0.940	0.940	0.940
150	2.237	1.754	1.175	0.940	0.940	0.940	0.940	0.940	0.940
155	2.281	1.829	1.217	0.940	0.940	0.940	0.940	0.940	0.940
160	2.326	1.903	1.259	0.940	0.940	0.940	0.940	0.940	0.940
165	2.370	1.956	1.301	0.969	0.940	0.940	0.940	0.940	0.940
170	2.415	1.992	1.343	1.000	0.940	0.940	0.940	0.940	0.940
175	2.460	2.029	1.385	1.031	0.940	0.940	0.940	0.940	0.940
180	2.504	2.065	1.427	1.062	0.940	0.940	0.940	0.940	0.940
185	2.549	2.102	1.469	1.094	0.940	0.940	0.940	0.940	0.940
190	2.593	2.138	1.511	1.125	0.940	0.940	0.940	0.940	0.940
195	2.638	2.175	1.553	1.156	0.940	0.940	0.940	0.940	0.940
200	2.682	2.211	1.595	1.187	0.940	0.940	0.940	0.940	0.940
205	2.727	2.248	1.637	1.218	0.940	0.940	0.940	0.940	0.940
210	2.772	2.284	1.679	1.249	0.940	0.940	0.940	0.940	0.940
215	2.816	2.321	1.721	1.281	0.940	0.940	0.940	0.940	0.940
220	2.861	2.357	1.763	1.312	0.940	0.940	0.940	0.940	0.940
225	2.905	2.393	1.805	1.343	0.971	0.940	0.940	0.940	0.940
230	2.950	2.430	1.846	1.374	1.005	0.940	0.940	0.940	0.940
235	3.002	2.466	1.888	1.405	1.039	0.940	0.940	0.940	0.940
240	3.070	2.503	1.930	1.436	1.072	0.940	0.940	0.940	0.940
245	3.137	2.539	1.980	1.468	1.106	0.940	0.940	0.940	0.940
250	3.204	2.576	2.030	1.499	1.140	0.940	0.940	0.940	0.940
255	3.271	2.612	2.080	1.530	1.174	0.940	0.940	0.940	0.940
260	3.338	2.649	2.131	1.561	1.207	0.940	0.940	0.940	0.940
265	3.406	2.685	2.181	1.592	1.241	0.940	0.940	0.940	0.940
270	3.473	2.721	2.231	1.623	1.275	0.940	0.940	0.940	0.940
275	3.540	2.758	2.281	1.654	1.309	0.940	0.940	0.940	0.940
280	3.607	2.794	2.332	1.686	1.343	0.940	0.940	0.940	0.940
285	3.674	2.831	2.382	1.717	1.376	0.940	0.940	0.940	0.940
290	3.742	2.867	2.432	1.748	1.410	0.940	0.940	0.940	0.940
295	3.809	2.904	2.483	1.779	1.444	0.940	0.940	0.940	0.940
300	3.876	2.940	2.533	1.810	1.478	0.940	0.940	0.940	0.940
305	3.947	2.977	2.583	1.841	1.511	0.940	0.940	0.940	0.940
310	4.026	3.094	2.633	1.873	1.545	0.940	0.940	0.940	0.940
315	4.105	3.217	2.684	1.904	1.579	0.940	0.940	0.940	0.940
320	4.184	3.340	2.734	1.935	1.613	0.986	0.940	0.940	0.940
325	4.262	3.463	2.784	2.013	1.646	1.029	0.940	0.940	0.940
330	4.341	3.586	2.835	2.090	1.680	1.073	0.940	0.940	0.940
335	4.420	3.709	2.885	2.168	1.714	1.117	0.940	0.940	0.940

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 27: Circular Hollow Columns: Fire Resistance Period: 45 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	1.838	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
50	1.838	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
55	1.838	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
60	1.876	1.126	0.940	0.940	0.940	0.940	0.940	0.940	0.940
65	1.962	1.317	0.940	0.940	0.940	0.940	0.940	0.940	0.940
70	2.048	1.508	1.038	0.940	0.940	0.940	0.940	0.940	0.940
75	2.135	1.698	1.166	0.940	0.940	0.940	0.940	0.940	0.940
80	2.221	1.889	1.294	0.940	0.940	0.940	0.940	0.940	0.940
85	2.307	1.990	1.423	1.035	0.940	0.940	0.940	0.940	0.940
90	2.394	2.063	1.551	1.131	0.940	0.940	0.940	0.940	0.940
95	2.480	2.137	1.679	1.226	0.940	0.940	0.940	0.940	0.940
100	2.566	2.210	1.807	1.322	0.976	0.940	0.940	0.940	0.940
105	2.653	2.283	1.935	1.418	1.048	0.940	0.940	0.940	0.940
110	2.739	2.356	2.000	1.513	1.120	0.940	0.940	0.940	0.940
115	2.825	2.429	2.065	1.609	1.192	0.940	0.940	0.940	0.940
120	2.912	2.502	2.130	1.705	1.265	0.940	0.940	0.940	0.940
125	3.003	2.575	2.195	1.800	1.337	0.984	0.940	0.940	0.940
130	3.111	2.648	2.259	1.896	1.409	1.036	0.940	0.940	0.940
135	3.219	2.721	2.324	1.969	1.481	1.088	0.940	0.940	0.940
140	3.327	2.794	2.389	2.027	1.553	1.140	0.940	0.940	0.940
145	3.435	2.867	2.454	2.084	1.625	1.191	0.940	0.940	0.940
150	3.543	2.941	2.519	2.142	1.697	1.243	0.940	0.940	0.940
155	3.651	3.026	2.583	2.200	1.769	1.295	0.940	0.940	0.940
160	3.760	3.125	2.648	2.257	1.841	1.347	0.963	0.940	0.940
165	3.868	3.223	2.713	2.315	1.913	1.398	0.997	0.940	0.940
170	3.962	3.322	2.778	2.372	1.970	1.450	1.030	0.940	0.940
175	4.043	3.421	2.843	2.430	2.022	1.502	1.063	0.940	0.940
180	4.125	3.520	2.907	2.487	2.073	1.554	1.096	0.940	0.940
185	4.206	3.619	2.972	2.545	2.124	1.606	1.129	0.940	0.940
190	4.288	3.718	3.067	2.603	2.175	1.657	1.162	0.940	0.940
195	4.369	3.816	3.165	2.660	2.227	1.709	1.195	0.940	0.940
200	4.451	3.915	3.263	2.718	2.278	1.761	1.229	0.940	0.940
205	4.532	3.999	3.361	2.775	2.329	1.813	1.262	0.940	0.940
210	4.614	4.082	3.459	2.833	2.380	1.864	1.295	0.940	0.940
215	4.695	4.165	3.557	2.890	2.431	1.916	1.328	0.940	0.940
220	4.777	4.248	3.655	2.948	2.483	1.968	1.361	0.940	0.940
225	4.858	4.330	3.753	3.027	2.534	2.019	1.394	0.940	0.940
230	4.940	4.413	3.851	3.131	2.585	2.070	1.428	0.940	0.940
235	5.021	4.496	3.945	3.235	2.636	2.121	1.461	0.940	0.940
240	5.102	4.579	4.029	3.339	2.687	2.173	1.494	0.940	0.940
245	5.184	4.662	4.113	3.443	2.739	2.224	1.527	0.940	0.940
250	5.265	4.745	4.196	3.547	2.790	2.275	1.560	0.940	0.940
255	5.347	4.828	4.280	3.651	2.841	2.326	1.593	0.940	0.940
260	5.428	4.911	4.364	3.755	2.892	2.378	1.627	0.971	0.940
265	5.510	4.994	4.448	3.859	2.944	2.429	1.660	1.018	0.940
270	5.613	5.077	4.531	3.953	3.019	2.480	1.693	1.066	0.940
275	5.791	5.160	4.615	4.035	3.149	2.531	1.726	1.113	0.940
280	5.969	5.242	4.699	4.116	3.278	2.583	1.759	1.160	0.940
285	6.146	5.325	4.783	4.198	3.408	2.634	1.792	1.207	0.940
290	6.324	5.408	4.866	4.279	3.538	2.685	1.826	1.254	0.940
295	6.502	5.491	4.950	4.361	3.668	2.736	1.859	1.302	0.940
300	6.680	5.575	5.034	4.442	3.797	2.788	1.892	1.349	0.940
305	6.857	5.713	5.118	4.524	3.924	2.839	1.925	1.396	0.940
310	7.035	5.850	5.202	4.605	4.000	2.890	1.997	1.443	0.940
315	7.213	5.988	5.285	4.687	4.076	2.941	2.085	1.490	0.940
320	7.391	6.126	5.369	4.768	4.151	3.033	2.173	1.537	0.940
325	7.568	6.263	5.453	4.850	4.227	3.235	2.262	1.585	0.940
330	7.746	6.401	5.537	4.931	4.303	3.437	2.350	1.632	0.940
335	7.924	6.539	5.635	5.013	4.379	3.639	2.438	1.679	0.940

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 28: Circular Hollow Columns: Fire Resistance Period: 60 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	2.830	1.838	1.277	0.940	0.940	0.940	0.940	0.940	0.940
50	2.830	1.838	1.277	0.940	0.940	0.940	0.940	0.940	0.940
55	2.830	1.955	1.405	1.000	0.940	0.940	0.940	0.940	0.940
60	2.830	2.078	1.624	1.179	0.940	0.940	0.940	0.940	0.940
65	2.830	2.200	1.842	1.357	1.007	0.940	0.940	0.940	0.940
70	2.830	2.322	1.991	1.536	1.150	0.940	0.940	0.940	0.940
75	2.830	2.445	2.088	1.715	1.294	0.963	0.940	0.940	0.940
80	2.856	2.567	2.185	1.893	1.437	1.078	0.940	0.940	0.940
85	2.970	2.690	2.283	1.997	1.581	1.192	0.940	0.940	0.940
90	3.083	2.812	2.380	2.078	1.724	1.307	0.965	0.940	0.940
95	3.197	2.934	2.477	2.160	1.868	1.422	1.051	0.940	0.940
100	3.311	3.053	2.575	2.241	1.973	1.536	1.138	0.940	0.940
105	3.424	3.169	2.672	2.322	2.044	1.651	1.224	0.940	0.940
110	3.538	3.285	2.769	2.403	2.115	1.765	1.310	0.940	0.940
115	3.651	3.401	2.867	2.484	2.186	1.880	1.396	0.940	0.940
120	3.765	3.517	2.964	2.566	2.258	1.967	1.482	0.989	0.940
125	3.879	3.633	3.081	2.647	2.329	2.030	1.568	1.055	0.940
130	3.992	3.749	3.201	2.728	2.400	2.093	1.655	1.120	0.940
135	4.106	3.865	3.321	2.809	2.471	2.156	1.741	1.185	0.940
140	4.220	3.971	3.441	2.890	2.542	2.219	1.827	1.251	0.940
145	4.333	4.067	3.561	2.972	2.613	2.281	1.913	1.316	0.940
150	4.447	4.164	3.681	3.091	2.685	2.344	1.977	1.382	0.940
155	4.561	4.260	3.801	3.215	2.756	2.407	2.034	1.447	0.940
160	4.674	4.356	3.920	3.339	2.827	2.470	2.090	1.513	0.940
165	4.788	4.453	4.016	3.462	2.898	2.532	2.146	1.578	0.940
170	4.902	4.549	4.112	3.586	2.969	2.595	2.203	1.644	0.960
175	5.015	4.646	4.208	3.709	3.085	2.658	2.259	1.709	0.996
180	5.129	4.742	4.304	3.833	3.208	2.721	2.316	1.775	1.032
185	5.243	4.839	4.400	3.947	3.332	2.783	2.372	1.840	1.068
190	5.356	4.935	4.496	4.041	3.455	2.846	2.429	1.906	1.104
195	5.470	5.031	4.591	4.134	3.578	2.909	2.485	1.963	1.140
200	5.605	5.128	4.687	4.227	3.701	2.972	2.541	2.014	1.175
205	5.954	5.224	4.783	4.320	3.825	3.091	2.598	2.064	1.211
210	6.302	5.321	4.879	4.413	3.940	3.218	2.654	2.115	1.247
215	6.650	5.417	4.975	4.506	4.028	3.344	2.711	2.166	1.283
220	6.999	5.513	5.071	4.599	4.116	3.471	2.767	2.216	1.319
225	7.347	5.654	5.167	4.693	4.204	3.598	2.824	2.267	1.355
230	7.696	5.865	5.263	4.786	4.293	3.724	2.880	2.318	1.391
235	8.044	6.076	5.358	4.879	4.381	3.851	2.936	2.368	1.426
240	8.392	6.287	5.454	4.972	4.469	3.957	3.013	2.419	1.462
245		6.499	5.550	5.065	4.557	4.037	3.152	2.470	1.498
250		6.710	5.685	5.158	4.646	4.118	3.292	2.521	1.534
255		6.921	5.832	5.252	4.734	4.199	3.431	2.571	1.570
260		7.132	5.979	5.345	4.822	4.280	3.570	2.622	1.606
265		7.344	6.126	5.438	4.910	4.361	3.709	2.673	1.641
270		7.555	6.273	5.531	4.999	4.442	3.848	2.723	1.677
275		7.766	6.421	5.645	5.087	4.523	3.954	2.774	1.713
280		7.977	6.568	5.777	5.175	4.604	4.026	2.825	1.749
285		8.189	6.715	5.909	5.263	4.685	4.098	2.875	1.785
290		8.400	6.862	6.040	5.352	4.766	4.170	2.926	1.821
295			7.009	6.172	5.440	4.847	4.242	2.977	1.856
300			7.156	6.304	5.528	4.928	4.314	3.258	1.892
305			7.303	6.436	5.635	5.009	4.386	3.550	1.928
310			7.450	6.567	5.761	5.090	4.458	3.841	2.012
315			7.598	6.699	5.887	5.171	4.530	3.963	2.108
320			7.745	6.831	6.012	5.252	4.602	4.023	2.204
325			7.892	6.962	6.138	5.332	4.674	4.083	2.299
330			8.039	7.094	6.264	5.413	4.746	4.143	2.395
335			8.186	7.226	6.390	5.494	4.818	4.203	2.491

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 29: Circular Hollow Columns: Fire Resistance Period: 75 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	3.880	2.398	1.982	1.585	1.226	0.940	0.940	0.940	0.940
50	3.880	2.440	1.999	1.585	1.226	0.941	0.940	0.940	0.940
55	3.886	2.580	2.144	1.668	1.348	1.003	0.940	0.940	0.940
60	4.055	2.720	2.288	1.969	1.561	1.186	0.940	0.940	0.940
65	4.224	2.859	2.433	2.088	1.774	1.368	1.036	0.940	0.940
70	4.393	3.004	2.577	2.208	1.958	1.551	1.182	0.940	0.940
75	4.562	3.180	2.722	2.328	2.052	1.733	1.329	0.940	0.940
80	4.731	3.357	2.866	2.448	2.145	1.916	1.476	1.051	0.940
85	4.900	3.533	3.006	2.568	2.239	2.008	1.622	1.170	0.940
90	5.069	3.710	3.132	2.688	2.333	2.090	1.769	1.288	0.940
95	5.238	3.886	3.258	2.807	2.427	2.172	1.916	1.407	0.962
100	5.407	4.063	3.384	2.927	2.520	2.254	1.999	1.525	1.041
105	5.576	4.239	3.510	3.051	2.614	2.336	2.072	1.643	1.119
110	5.745	4.415	3.636	3.177	2.708	2.418	2.145	1.762	1.197
115	5.914	4.592	3.761	3.303	2.801	2.500	2.218	1.880	1.276
120	6.083	4.768	3.887	3.429	2.895	2.582	2.292	1.970	1.354
125	6.252	4.945	4.013	3.555	2.993	2.664	2.365	2.035	1.433
130	6.421	5.121	4.139	3.681	3.131	2.745	2.438	2.100	1.511
135	6.590	5.297	4.265	3.806	3.269	2.827	2.512	2.165	1.590
140	6.759	5.474	4.391	3.931	3.406	2.909	2.585	2.230	1.668
145	6.928	5.660	4.516	4.039	3.544	2.999	2.658	2.295	1.747
150	7.097	5.859	4.642	4.148	3.682	3.132	2.732	2.360	1.825
155	7.266	6.058	4.768	4.257	3.820	3.265	2.805	2.425	1.903
160	7.435	6.257	4.894	4.365	3.948	3.398	2.878	2.490	1.969
165	7.604	6.456	5.020	4.474	4.051	3.532	2.951	2.555	2.027
170	7.773	6.655	5.146	4.583	4.155	3.665	3.058	2.620	2.084
175	7.942	6.854	5.271	4.691	4.258	3.798	3.186	2.685	2.141
180	8.111	7.053	5.397	4.800	4.362	3.928	3.313	2.750	2.199
185	8.280	7.252	5.523	4.909	4.465	4.023	3.440	2.815	2.256
190		7.451	5.718	5.017	4.569	4.119	3.567	2.880	2.314
195		7.650	5.958	5.126	4.672	4.214	3.694	2.945	2.371
200		7.848	6.198	5.235	4.776	4.310	3.821	3.045	2.428
205		8.047	6.438	5.343	4.880	4.405	3.939	3.183	2.486
210		8.246	6.678	5.452	4.983	4.501	4.025	3.321	2.543
215			6.918	5.561	5.087	4.596	4.110	3.460	2.601
220			7.158	5.749	5.190	4.692	4.196	3.598	2.658
225			7.398	5.947	5.294	4.787	4.282	3.736	2.715
230			7.638	6.145	5.397	4.883	4.367	3.875	2.773
235			7.878	6.344	5.501	4.978	4.453	3.969	2.830
240			8.118	6.542	5.621	5.074	4.539	4.044	2.888
245			8.358	6.740	5.781	5.169	4.624	4.118	2.945
250				6.938	5.940	5.265	4.710	4.192	3.059
255				7.137	6.100	5.360	4.796	4.267	3.255
260				7.335	6.260	5.456	4.881	4.341	3.451
265				7.533	6.420	5.551	4.967	4.415	3.647
270				7.732	6.579	5.703	5.053	4.490	3.842
275				7.930	6.739	5.871	5.138	4.564	3.956
280				8.128	6.899	6.039	5.224	4.638	4.017
285				8.326	7.058	6.207	5.310	4.713	4.078
290					7.218	6.375	5.395	4.787	4.139
295					7.378	6.543	5.481	4.861	4.199
300					7.537	6.711	5.567	4.936	4.260
305					7.697	6.879	5.729	5.010	4.321
310					7.857	7.047	5.898	5.084	4.382
315					8.017	7.215	6.066	5.158	4.443
320					8.176	7.383	6.235	5.233	4.503
325					8.336	7.551	6.403	5.307	4.564
330						7.719	6.572	5.381	4.625
335						7.887	6.741	5.456	4.686

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 30: Circular Hollow Columns: Fire Resistance Period: 90 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48	6.266	3.736	2.536	2.155	1.838	1.474	1.161	0.940	0.940
50	6.266	3.736	2.572	2.177	1.847	1.474	1.161	0.940	0.940
55	6.266	3.745	2.734	2.329	1.986	1.630	1.275	0.940	0.940
60	6.266	3.947	2.895	2.481	2.126	1.873	1.480	1.090	0.940
65	6.266	4.149	3.080	2.633	2.265	2.019	1.685	1.263	0.940
70	6.266	4.352	3.292	2.785	2.405	2.131	1.891	1.436	1.065
75	6.266	4.554	3.505	2.938	2.544	2.243	2.007	1.609	1.190
80	6.266	4.757	3.717	3.103	2.684	2.356	2.098	1.782	1.314
85	6.404	4.959	3.929	3.273	2.823	2.468	2.189	1.945	1.438
90	6.544	5.162	4.141	3.443	2.963	2.580	2.280	2.026	1.563
95	6.684	5.364	4.353	3.614	3.090	2.693	2.372	2.107	1.687
100	6.824	5.567	4.565	3.784	3.216	2.805	2.463	2.189	1.811
105	6.964	5.769	4.777	3.954	3.343	2.917	2.554	2.270	1.935
110	7.104	5.972	4.989	4.124	3.469	3.037	2.646	2.352	2.009
115	7.244	6.174	5.201	4.295	3.595	3.166	2.737	2.433	2.082
120	7.383	6.376	5.413	4.465	3.721	3.294	2.828	2.514	2.155
125	7.523	6.579	5.625	4.635	3.847	3.423	2.919	2.596	2.229
130	7.663	6.781	5.837	4.805	3.975	3.552	3.026	2.677	2.302
135	7.803	6.984	6.049	4.976	4.104	3.680	3.162	2.759	2.375
140	7.943	7.186	6.261	5.146	4.234	3.809	3.298	2.840	2.449
145	8.083	7.389	6.473	5.316	4.364	3.935	3.434	2.922	2.522
150	8.223	7.591	6.685	5.486	4.493	4.046	3.570	3.018	2.596
155	8.363	7.794	6.897	5.686	4.623	4.157	3.705	3.151	2.669
160		7.996	7.109	5.917	4.752	4.268	3.841	3.283	2.742
165		8.199	7.321	6.148	4.882	4.379	3.962	3.416	2.816
170		8.401	7.533	6.380	5.012	4.491	4.062	3.549	2.889
175			7.745	6.611	5.141	4.602	4.163	3.681	2.962
180			7.957	6.842	5.271	4.713	4.263	3.814	3.075
185			8.169	7.073	5.401	4.824	4.363	3.937	3.200
190			8.381	7.304	5.530	4.935	4.464	4.026	3.324
195				7.535	5.766	5.046	4.564	4.114	3.448
200				7.766	6.055	5.157	4.664	4.203	3.572
205				7.997	6.344	5.269	4.765	4.292	3.697
210				8.228	6.633	5.380	4.865	4.380	3.821
215					6.922	5.491	4.966	4.469	3.935
220					7.211	5.644	5.066	4.557	4.009
225					7.500	5.918	5.166	4.646	4.084
230					7.789	6.192	5.267	4.734	4.158
235					8.078	6.465	5.367	4.823	4.233
240					8.367	6.739	5.467	4.912	4.307
245						7.012	5.568	5.000	4.381
250						7.286	5.771	5.089	4.456
255						7.560	5.980	5.177	4.530
260						7.833	6.189	5.266	4.605
265						8.107	6.398	5.355	4.679
270						8.380	6.607	5.443	4.753
275							6.816	5.532	4.828
280							7.024	5.715	4.902
285							7.233	5.980	4.977
290							7.442	6.246	5.051
295							7.651	6.512	5.126
300							7.860	6.777	5.200
305							8.069	7.043	5.274
310							8.278	7.309	5.349
315								7.574	5.423
320								7.840	5.498
325								8.105	5.572
330								8.371	6.098
335									6.629

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 31: Circular Hollow Columns: Fire Resistance Period: 105 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48		6.973	4.647	2.664	2.313	1.996	1.671	1.310	1.032
50		6.973	4.647	2.664	2.345	2.014	1.671	1.310	1.032
55		6.973	4.647	2.804	2.495	2.159	1.759	1.444	1.125
60		6.973	4.647	3.076	2.644	2.305	2.024	1.669	1.295
65		6.973	4.761	3.315	2.794	2.450	2.152	1.893	1.464
70		6.973	4.961	3.553	2.943	2.595	2.281	2.020	1.634
75		6.973	5.160	3.792	3.129	2.741	2.409	2.124	1.804
80		6.973	5.360	4.031	3.327	2.886	2.537	2.228	1.956
85		6.973	5.559	4.270	3.525	3.034	2.666	2.333	2.046
90		6.973	5.758	4.509	3.723	3.187	2.794	2.437	2.137
95		6.983	5.958	4.747	3.921	3.339	2.922	2.541	2.227
100		7.119	6.157	4.986	4.119	3.492	3.047	2.645	2.318
105		7.254	6.357	5.225	4.317	3.644	3.170	2.749	2.408
110		7.390	6.556	5.464	4.515	3.797	3.292	2.854	2.498
115		7.526	6.755	5.703	4.713	3.949	3.415	2.958	2.589
120		7.661	6.955	5.942	4.911	4.102	3.537	3.082	2.679
125		7.797	7.154	6.180	5.109	4.254	3.659	3.210	2.770
130		7.933	7.353	6.419	5.307	4.407	3.782	3.339	2.860
135		8.068	7.553	6.658	5.505	4.559	3.904	3.468	2.951
140		8.204	7.752	6.897	5.742	4.712	4.020	3.596	3.060
145		8.340	7.952	7.136	5.999	4.864	4.136	3.725	3.178
150			8.151	7.374	6.257	5.017	4.251	3.854	3.296
155			8.350	7.613	6.514	5.169	4.367	3.970	3.414
160				7.852	6.771	5.322	4.482	4.073	3.532
165				8.091	7.028	5.474	4.598	4.176	3.650
170				8.330	7.285	5.685	4.713	4.279	3.768
175					7.542	6.004	4.829	4.382	3.886
180					7.799	6.322	4.944	4.485	3.982
185					8.056	6.640	5.060	4.588	4.070
190					8.313	6.958	5.175	4.691	4.159
195						7.277	5.291	4.794	4.247
200						7.595	5.406	4.897	4.335
205						7.913	5.521	5.000	4.423
210						8.231	5.820	5.103	4.511
215							6.266	5.206	4.600
220							6.712	5.309	4.688
225							7.159	5.412	4.776
230							7.605	5.515	4.864
235							8.051	5.783	4.952
240								6.263	5.041
245								6.744	5.129
250								7.224	5.217
255								7.704	5.305
260								8.185	5.393
265									5.482
270									5.570
275									6.365
280									7.188

Thickness is intumescent only.

Section Factor up to m^{-1}	Table 32: Circular Hollow Columns: Fire Resistance Period: 120 Minutes								
	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
48				5.909	2.830	2.451	2.146	1.838	1.443
50				5.909	2.830	2.498	2.173	1.838	1.443
55				5.909	3.029	2.635	2.317	1.961	1.587
60				5.909	3.286	2.772	2.460	2.102	1.801
65				5.909	3.544	2.909	2.604	2.244	1.979
70				5.909	3.801	3.086	2.748	2.385	2.099
75				5.909	4.058	3.304	2.892	2.527	2.218
80				6.031	4.315	3.523	3.046	2.668	2.338
85				6.208	4.573	3.741	3.214	2.810	2.457
90				6.384	4.830	3.960	3.382	2.951	2.577
95				6.560	5.087	4.178	3.550	3.075	2.696
100				6.737	5.345	4.397	3.719	3.195	2.816
105				6.913	5.602	4.615	3.887	3.314	2.935
110				7.090	5.859	4.834	4.055	3.434	3.048
115				7.266	6.116	5.052	4.223	3.554	3.156
120				7.442	6.374	5.271	4.392	3.673	3.265
125				7.619	6.631	5.489	4.560	3.793	3.373
130				7.795	6.888	5.747	4.728	3.912	3.482
135				7.971	7.145	6.029	4.896	4.031	3.591
140				8.148	7.403	6.311	5.065	4.149	3.699
145				8.324	7.660	6.593	5.233	4.267	3.808
150					7.917	6.875	5.401	4.385	3.916
155					8.174	7.156	5.569	4.503	4.019
160					8.405	7.438	5.900	4.621	4.121
165						7.720	6.233	4.739	4.223
170						8.002	6.567	4.857	4.325
175						8.284	6.901	4.975	4.427
180							7.235	5.093	4.529
185							7.568	5.211	4.631
190							7.902	5.329	4.733
195							8.236	5.447	4.835
200								5.565	4.937
205								6.635	5.039
210								7.769	5.141
215									5.243
220									5.345
225									5.447
230									5.573
235									8.405

Thickness is intumescent only.