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

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European Technical Assessment

ETA 13/0356 of 15/5/14

General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: Warrington Certification Limited	
Trade name of the construction product	PROMAPAINT® SC3
Product family to which the construction product belongs	35. Fire Protective Products Reactive Coating for the Fire Protection of Steel Elements
Manufacturer	**Promat International NV** **Bormstraat 24,** **2830 Tisselt,** **Belgium**
Manufacturing plant(s)	Promat manufacturing plant No. 12 and plant No. 33
This European Technical Assessment contains	25 pages including Annex A which form an integral part of this assessment.
	Annex B Contains confidential information and is not included in the European Technical Assessment when that assessment is publicly available.
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	ETAG 018-1 edition April 2013 and ETAG 018-2 edition November 2011 used as European Assessment Document (EAD)
This version replaces:	The previous ETA with the same number issued on 7th May 2013

TERVEZÉSI SEGÉDLET

General Comments

1. This European Technical Assessment is issued by Warrington Certification Limited on the basis ETAG 018 Fire Protective Products Part 1: General and Part 2: Reactive Coatings For Fire Protection of Steel Elements, Used as European Assessment Document.

2. This European Technical Assessment 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.

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SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical Description of the Product

(Detailed information and data are given in Annexes)

PROMAPAINT® SC3 is a spray or brush applied water borne intumescent paint formulated for the fire protection of structural steel elements installed in the following environmental conditions:

Internal conditions – ETAG 018-2 Type Z2

Internal conditions with high humidity – ETAG 018-2 Type Z1

Internal and semi-exposed conditions – ETAG 018-2 Type Y.

All conditions – ETAG 018-2 Type X.

In accordance with ETAG 018-2 (foreword), PROMAPAINT® SC3 may be considered as a reactive coating (Option 3), a "final assembly" but some generic primers and some specific topcoats are also identified.

2 Specification Of The Intended Use In Accordance With The Relevant EAD

PROMAPAINT® SC3 is used as reactive coating system to fire protect various sizes of structural steel 'H' or 'I' section beams and columns for up to a fire resistance classification of R180IncSlow and for design temperatures in the range of 350°C to 750°C.

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

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3 Performance Of The Product And References To The Methods Used For Its Assessment

The assessment of the PROMAPAINT® SC3 for the intended use considering the Basic Requirements for Construction Works 2 and 3 (BWR2 and BWR3) was performed following the ETAG 018 for Fire Protective Products, Part 1 General (April 2013) and Part 2: Reactive coatings for fire protection of steel elements (November 2011), used as EAD.

ETAG Clause No.	Characteristic	Assessment of characteristic
5.1	**Mechanical resistance and stability**	Not relevant
5.2	**Safety in case of fire**	
5.2.1	Resistance to fire	EN 13501-2
5.2.2	Reaction to fire	EN 13501-1
5.3	**Hygiene, Health and the Environment**	
5.3.2	- Release of dangerous substances	No 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	**Related aspects of serviceability**	
5.7.2.2	- Primer and top coat compatibility - Type Z_2 Durability - Type Z_1 Durability - Type Y Durability - Type X Durability	
5.7.3 and Annex E	- Identification	

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3.1 Reaction to fire

The fire protection coating in conjunction with an alkyd primer such as Interprime 306 and without topcoats has a performance determined for a reaction to fire classification in accordance with EN 13501-1 of Class E.

3.2 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). The test data was analysed according to EN 13381-8: 2010. Annex A summarises the results of the analysis.

3.3 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.

In addition to the specific clauses relating to dangerous substances contained in this European technical assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

3.4 Durability and serviceability

PROMAPAINT® SC3 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 primers and topcoats families:

Primers	
Name	**Type**
Interprime 306	Alkyd Primer
Interguard 269	Two component epoxy
Interzinc 72	Zinc rich epoxy
Interzinc 297	Zinc silicate

Top Coats	
Name	**Type**
Interthane 990	Two component polyurethane
Interlac 665	Alkyd

The Interguard 269 system together with PROMAPAINT® SC3 has been tested in accordance with the test procedures defined in ETAG 018-2 (used as European Assessment Document, EAD) Clause 5.7.2.1 on galvanised steel substrates and passed the performance requirements for compatibility.

PROMAPAINT® SC3 has been assessed as having passed the requirements for Type Z1, Type Z2, Type Y and Type X environmental conditions defined in ETAG 018-2 (used as European Assessment Document, EAD) as listed below:

Top Coats	
Name	**Type of exposure**
Interthane 990	X (also applies to exposure conditions Y, Z_1, Z_2)
Interlac 665	Z_1 (also applies to exposure conditions Z_2)
None	Z_2

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4 Assessment And Verification Of Constancy Of Performance (Hereinafter AVCP) System Applied, With References To Its Legal base

According to the decision 1999/454/EC of the European Commission the system of assessment and verification of constancy of performance (see Annex V to the Regulation (EU) No 305/2011) given in the following table apply:

Products	Intended uses	Level or Class	System
Fire protective products (including coatings)	For fire compartmentation and / or fire protection or fire performance	Any	System 1

4.1 Attestation of Conformity system

According to the decision 1999/454/EC of the European Commission the system 1 of attestation of conformity applies.

This system of attestation of conformity is defined as follows:

System 1: Certification of the conformity of the product by a notified certification body on the basis of:

(a) Tasks for the manufacturer:

(1) factory production control;

(2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;

(b) Tasks for the notified body

(1) initial type-testing of the product;

(2) initial inspection of factory and of factory production control;

(3) continued surveillance, assessment and approval of factory production control.

5 Technical Details Necessary For The Implementation Of The AVCP System, As Provided For In The Applicable EAD.

The manufacturer shall exercise internal control of production in accordance with the provisions laid down in the "Control Plan".

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

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical assessment.

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

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As an example the following table is derived from ETAG 018-2 specify properties that should be controlled and minimum frequencies of control.

The exact test method and threshold have been laid down in the factory production control plan, operated by the manufacturer and deposited at Warrington Certification Limited (as annex B of this ETA).

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	EN ISO 3219		Every batch
Raw materials(3)		Check specification	Every delivery
Pigment dispersion	EN ISO 3219		Every batch
Non- volatile content	ISO 3251		Every batch

According Table 8.1of ETAG 018-2

(1) agreed with Approvals bodies 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.

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Signatories

Responsible Officer

J. Yuan* - Principal Certification Engineer

Approved

A. Kearns* - Technical Manager

* For and on behalf of Warrington Certification Limited.

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Annex A - Product Performance: Fire Resistance

1 This Annex relates to the use of PROMAPAINT® SC3 for the fire protection of 'H' or 'I' shaped beams and columns. The precise scope is given in Tables 1 to 18 which show the total dry film thickness of PROMAPAINT® SC3 (excluding primer and top coat) required to provide classifications of R15 to R180 for various design temperatures and section factors. A summary of the salient features of the testing and assessment are shown in A1 of this Annex.

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 regression analysis defined in Annex E of EN 13381-8:2010.

3. The data presented in the tables in this Annex refers to both beams (three-sided fire exposure) and columns (four sided exposure).

4. The data shown is applicable to steel sections blast cleaned to ISO 8501-1 SA21/2 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 0.20 mm.

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

6. PROMAPAINT® SC3 has been exposed to the slow heating regime defined in Annex A of EN 13381-8: 2010 and has satisfied the requirements.

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A1 Tables of Results

Table 1: I Section Beams 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
66	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
70	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
75	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
80	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
85	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
90	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
95	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
100	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
105	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
110	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
115	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
120	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
125	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
130	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
135	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
140	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
145	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
150	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
155	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
160	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
165	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
170	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
175	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
180	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
185	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
190	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
195	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
200	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
205	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
210	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
215	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
220	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
225	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
230	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
235	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
240	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
245	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
250	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
255	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
260	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
265	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
270	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
275	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
280	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
285	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
290	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
295	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
300	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
305	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
310	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
315	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
320	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
325	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
330	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
335	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
340	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
342	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845

Thickness is intumescent only.

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Table 2: I Section Beams 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
66	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
70	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
75	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
80	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
85	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
90	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
95	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
100	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
105	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
110	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
115	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
120	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
125	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
130	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
135	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
140	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
145	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
150	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
155	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
160	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
165	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
170	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
175	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
180	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
185	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
190	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
195	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
200	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
205	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
210	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
215	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
220	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
225	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
230	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
235	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
240	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
245	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
250	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
255	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
260	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
265	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
270	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
275	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
280	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
285	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
290	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
295	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
300	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
305	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
310	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
315	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
320	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
325	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
330	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
335	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
340	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
342	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845

Thickness is intumescent only.

TERVEKO SPECIMEN

Table 3: I Section Beams 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
66	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
70	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
75	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
80	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
85	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
90	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
95	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
100	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
105	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
110	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
115	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
120	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
125	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
130	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
135	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
140	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
145	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
150	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
155	1.860	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
160	1.883	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
165	1.905	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
170	1.927	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
175	1.947	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
180	1.967	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
185	1.987	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
190	2.006	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
195	2.024	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
200	2.042	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
205	2.059	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
210	2.076	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
215	2.092	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
220	2.108	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
225	2.123	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
230	2.138	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
235	2.153	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
240	2.167	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
245	2.181	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
250	2.194	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
255	2.208	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
260	2.220	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
265	2.233	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
270	2.245	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
275	2.257	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
280	2.269	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
285	2.280	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
290	2.291	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
295	2.302	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
300	2.313	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
305	2.323	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
310	2.333	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
315	2.343	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
320	2.353	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
325	2.362	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
330	2.372	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
335	2.381	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
340	2.390	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
342	2.393	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845

Thickness is intumescent only.

TERVEKO SPECIMEN

Table 4: I Section Beams 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
66	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
70	1.904	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
75	1.977	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
80	2.046	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
85	2.111	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
90	2.175	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
95	2.235	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
100	2.293	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
105	2.349	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
110	2.402	1.845	1.845	1.845	1.845	1.845	1.845	1.845	1.845
115	2.454	1.849	1.845	1.845	1.845	1.845	1.845	1.845	1.845
120	2.503	1.890	1.845	1.845	1.845	1.845	1.845	1.845	1.845
125	2.551	1.930	1.845	1.845	1.845	1.845	1.845	1.845	1.845
130	2.596	1.968	1.845	1.845	1.845	1.845	1.845	1.845	1.845
135	2.641	2.005	1.845	1.845	1.845	1.845	1.845	1.845	1.845
140	2.683	2.041	1.845	1.845	1.845	1.845	1.845	1.845	1.845
145	2.724	2.076	1.845	1.845	1.845	1.845	1.845	1.845	1.845
150	2.764	2.109	1.845	1.845	1.845	1.845	1.845	1.845	1.845
155	2.803	2.142	1.845	1.845	1.845	1.845	1.845	1.845	1.845
160	2.840	2.173	1.845	1.845	1.845	1.845	1.845	1.845	1.845
165	2.876	2.204	1.845	1.845	1.845	1.845	1.845	1.845	1.845
170	2.910	2.233	1.845	1.845	1.845	1.845	1.845	1.845	1.845
175	2.944	2.262	1.845	1.845	1.845	1.845	1.845	1.845	1.845
180	2.977	2.290	1.845	1.845	1.845	1.845	1.845	1.845	1.845
185	3.009	2.317	1.845	1.845	1.845	1.845	1.845	1.845	1.845
190	3.039	2.343	1.845	1.845	1.845	1.845	1.845	1.845	1.845
195	3.069	2.369	1.845	1.845	1.845	1.845	1.845	1.845	1.845
200	3.098	2.394	1.845	1.845	1.845	1.845	1.845	1.845	1.845
205	3.126	2.418	1.845	1.845	1.845	1.845	1.845	1.845	1.845
210	3.153	2.441	1.845	1.845	1.845	1.845	1.845	1.845	1.845
215	3.180	2.464	1.845	1.845	1.845	1.845	1.845	1.845	1.845
220	3.206	2.487	1.845	1.845	1.845	1.845	1.845	1.845	1.845
225	3.231	2.508	1.845	1.845	1.845	1.845	1.845	1.845	1.845
230	3.255	2.530	1.845	1.845	1.845	1.845	1.845	1.845	1.845
235	3.279	2.550	1.845	1.845	1.845	1.845	1.845	1.845	1.845
240	3.302	2.570	1.845	1.845	1.845	1.845	1.845	1.845	1.845
245	3.325	2.590	1.845	1.845	1.845	1.845	1.845	1.845	1.845
250	3.347	2.609	1.845	1.845	1.845	1.845	1.845	1.845	1.845
255	3.368	2.628	1.845	1.845	1.845	1.845	1.845	1.845	1.845
260	3.389	2.646	1.858	1.845	1.845	1.845	1.845	1.845	1.845
265	3.410	2.664	1.872	1.845	1.845	1.845	1.845	1.845	1.845
270	3.430	2.682	1.886	1.845	1.845	1.845	1.845	1.845	1.845
275	3.449	2.699	1.900	1.845	1.845	1.845	1.845	1.845	1.845
280	3.468	2.715	1.913	1.845	1.845	1.845	1.845	1.845	1.845
285	3.486	2.731	1.926	1.845	1.845	1.845	1.845	1.845	1.845
290	3.505	2.747	1.939	1.845	1.845	1.845	1.845	1.845	1.845
295	3.522	2.763	1.951	1.845	1.845	1.845	1.845	1.845	1.845
300	3.540	2.778	1.963	1.845	1.845	1.845	1.845	1.845	1.845
305	3.556	2.793	1.975	1.845	1.845	1.845	1.845	1.845	1.845
310	3.573	2.808	1.987	1.845	1.845	1.845	1.845	1.845	1.845
315	3.589	2.822	1.998	1.845	1.845	1.845	1.845	1.845	1.845
320	3.605	2.836	2.010	1.845	1.845	1.845	1.845	1.845	1.845
325	3.620	2.850	2.021	1.845	1.845	1.845	1.845	1.845	1.845
330	3.636	2.863	2.031	1.845	1.845	1.845	1.845	1.845	1.845
335	3.650	2.876	2.042	1.845	1.845	1.845	1.845	1.845	1.845
340	3.665	2.889	2.052	1.845	1.845	1.845	1.845	1.845	1.845
342	3.670	2.894	2.056	1.845	1.845	1.845	1.845	1.845	1.845

Thickness is intumescent only.

TERVEKO SHEET

Table 5: I Section Beams 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
66	2.987	2.456	1.937	1.845	1.845	1.845	1.845	1.845	1.845
70	3.095	2.552	2.020	1.845	1.845	1.845	1.845	1.845	1.845
75	3.223	2.666	2.120	1.845	1.845	1.845	1.845	1.845	1.845
80	3.345	2.776	2.215	1.845	1.845	1.845	1.845	1.845	1.845
85	3.462	2.882	2.307	1.845	1.845	1.845	1.845	1.845	1.845
90	3.574	2.983	2.396	1.874	1.845	1.845	1.845	1.845	1.845
95	3.681	3.081	2.481	1.948	1.845	1.845	1.845	1.845	1.845
100	3.784	3.174	2.564	2.020	1.845	1.845	1.845	1.845	1.845
105	3.883	3.264	2.643	2.090	1.845	1.845	1.845	1.845	1.845
110	3.977	3.351	2.720	2.157	1.845	1.845	1.845	1.845	1.845
115	4.068	3.435	2.795	2.222	1.845	1.845	1.845	1.845	1.845
120	4.156	3.516	2.867	2.285	1.845	1.845	1.845	1.845	1.845
125	4.240	3.594	2.936	2.347	1.845	1.845	1.845	1.845	1.845
130	4.322	3.669	3.004	2.406	1.845	1.845	1.845	1.845	1.845
135	4.400	3.742	3.069	2.464	1.891	1.845	1.845	1.845	1.845
140	4.475	3.812	3.133	2.520	1.939	1.845	1.845	1.845	1.845
145	4.548	3.880	3.194	2.575	1.986	1.845	1.845	1.845	1.845
150	4.619	3.946	3.254	2.628	2.032	1.845	1.845	1.845	1.845
155	4.687	4.010	3.311	2.680	2.077	1.845	1.845	1.845	1.845
160	4.753	4.072	3.368	2.730	2.120	1.845	1.845	1.845	1.845
165	4.817	4.132	3.422	2.779	2.163	1.845	1.845	1.845	1.845
170	4.878	4.190	3.475	2.827	2.205	1.845	1.845	1.845	1.845
175	4.938	4.247	3.527	2.873	2.245	1.845	1.845	1.845	1.845
180	4.996	4.301	3.577	2.918	2.285	1.845	1.845	1.845	1.845
185	5.052	4.355	3.626	2.962	2.323	1.845	1.845	1.845	1.845
190	5.106	4.406	3.673	3.005	2.361	1.845	1.845	1.845	1.845
195	5.159	4.457	3.719	3.047	2.398	1.845	1.845	1.845	1.845
200	5.211	4.505	3.764	3.088	2.434	1.845	1.845	1.845	1.845
205	5.260	4.553	3.808	3.128	2.470	1.845	1.845	1.845	1.845
210	5.309	4.599	3.851	3.167	2.504	1.873	1.845	1.845	1.845
215	5.356	4.644	3.893	3.205	2.538	1.902	1.845	1.845	1.845
220	5.402	4.688	3.933	3.242	2.571	1.930	1.845	1.845	1.845
225	5.446	4.731	3.973	3.279	2.603	1.958	1.845	1.845	1.845
230	5.489	4.773	4.012	3.314	2.635	1.985	1.845	1.845	1.845
235	5.532	4.813	4.050	3.349	2.666	2.012	1.845	1.845	1.845
240	5.573	4.853	4.087	3.383	2.696	2.038	1.845	1.845	1.845
245	5.613	4.892	4.123	3.416	2.726	2.063	1.845	1.845	1.845
250	5.652	4.929	4.158	3.449	2.755	2.088	1.845	1.845	1.845
255	5.690	4.966	4.192	3.480	2.783	2.113	1.845	1.845	1.845
260	5.727	5.002	4.226	3.512	2.811	2.137	1.845	1.845	1.845
265	5.763	5.037	4.259	3.542	2.839	2.161	1.845	1.845	1.845
270	5.798	5.071	4.291	3.572	2.866	2.185	1.845	1.845	1.845
275	5.833	5.105	4.323	3.601	2.892	2.207	1.845	1.845	1.845
280	5.866	5.138	4.353	3.630	2.918	2.230	1.845	1.845	1.845
285	5.899	5.170	4.384	3.658	2.943	2.252	1.845	1.845	1.845
290	5.931	5.201	4.413	3.685	2.968	2.274	1.845	1.845	1.845
295	5.963	5.231	4.442	3.712	2.992	2.295	1.845	1.845	1.845
300	5.993	5.261	4.470	3.739	3.016	2.316	1.845	1.845	1.845
305	6.023	5.291	4.498	3.765	3.040	2.337	1.845	1.845	1.845
310	6.053	5.319	4.525	3.790	3.063	2.357	1.845	1.845	1.845
315	6.081	5.347	4.552	3.815	3.086	2.377	1.845	1.845	1.845
320	6.109	5.375	4.578	3.840	3.108	2.397	1.845	1.845	1.845
325	6.137	5.402	4.604	3.864	3.130	2.416	1.845	1.845	1.845
330	6.164	5.428	4.629	3.887	3.151	2.435	1.845	1.845	1.845
335	6.190	5.454	4.653	3.910	3.173	2.454	1.845	1.845	1.845
340	6.216	5.480	4.677	3.933	3.193	2.472	1.845	1.845	1.845
342	6.225	5.488	4.686	3.941	3.201	2.478	1.845	1.845	1.845

Thickness is intumescent only.

TENSOSHEET

Table 6: I Section Beams 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
66	4.131	3.560	3.002	2.521	2.085	1.845	1.845	1.845	1.845
70	4.285	3.704	3.132	2.639	2.192	1.845	1.845	1.845	1.845
75	4.469	3.875	3.288	2.782	2.320	1.909	1.845	1.845	1.845
80	4.645	4.039	3.438	2.919	2.445	2.022	1.845	1.845	1.845
85	4.812	4.196	3.582	3.052	2.566	2.132	1.845	1.845	1.845
90	4.973	4.347	3.721	3.180	2.684	2.239	1.845	1.845	1.845
95	5.127	4.492	3.856	3.304	2.798	2.343	1.857	1.845	1.845
100	5.275	4.632	3.985	3.424	2.908	2.444	1.946	1.845	1.845
105	5.416	4.766	4.110	3.541	3.016	2.543	2.033	1.845	1.845
110	5.552	4.896	4.231	3.653	3.120	2.639	2.119	1.845	1.845
115	5.683	5.021	4.348	3.763	3.221	2.732	2.202	1.845	1.845
120	5.809	5.141	4.461	3.869	3.320	2.824	2.283	1.845	1.845
125	5.930	5.258	4.570	3.971	3.416	2.913	2.363	1.845	1.845
130	6.047	5.370	4.676	4.071	3.509	3.000	2.441	1.845	1.845
135	6.159	5.479	4.778	4.168	3.600	3.085	2.517	1.888	1.845
140	6.268	5.583	4.878	4.262	3.689	3.168	2.592	1.951	1.845
145	-	5.685	4.974	4.354	3.775	3.249	2.665	2.013	1.845
150	-	5.783	5.068	4.443	3.859	3.328	2.736	2.074	1.845
155	-	5.879	5.158	4.530	3.941	3.405	2.806	2.134	1.845
160	-	5.971	5.247	4.614	4.021	3.480	2.875	2.192	1.845
165	-	6.060	5.332	4.696	4.099	3.554	2.942	2.250	1.845
170	-	6.147	5.415	4.776	4.175	3.626	3.008	2.306	1.845
175	-	6.231	5.496	4.854	4.249	3.697	3.072	2.362	1.845
180	-	6.313	5.575	4.929	4.322	3.766	3.135	2.416	1.845
185	-	-	5.652	5.003	4.393	3.833	3.197	2.470	1.845
190	-	-	5.726	5.075	4.462	3.899	3.258	2.523	1.845
195	-	-	5.799	5.146	4.529	3.964	3.317	2.574	1.845
200	-	-	5.869	5.214	4.595	4.027	3.376	2.625	1.862
205	-	-	5.938	5.281	4.660	4.089	3.433	2.675	1.904
210	-	-	6.005	5.347	4.723	4.150	3.490	2.724	1.944
215	-	-	6.071	5.410	4.785	4.210	3.545	2.773	1.984
220	-	-	6.135	5.473	4.845	4.268	3.599	2.820	2.023
225	-	-	6.197	5.534	4.904	4.325	3.652	2.867	2.062
230	-	-	6.258	5.593	4.962	4.381	3.704	2.913	2.100
235	-	-	6.317	5.651	5.019	4.436	3.756	2.958	2.138
240	-	-	-	5.708	5.075	4.490	3.806	3.002	2.175
245	-	-	-	5.764	5.129	4.543	3.856	3.046	2.211
250	-	-	-	5.819	5.182	4.595	3.904	3.089	2.247
255	-	-	-	5.872	5.234	4.646	3.952	3.132	2.283
260	-	-	-	5.924	5.286	4.696	3.999	3.173	2.318
265	-	-	-	5.975	5.336	4.745	4.046	3.214	2.352
270	-	-	-	6.025	5.385	4.793	4.091	3.255	2.386
275	-	-	-	6.074	5.433	4.840	4.136	3.295	2.420
280	-	-	-	6.122	5.480	4.887	4.180	3.334	2.453
285	-	-	-	6.169	5.527	4.932	4.223	3.373	2.486
290	-	-	-	6.215	5.572	4.977	4.265	3.411	2.518
295	-	-	-	6.260	5.617	5.021	4.307	3.448	2.550
300	-	-	-	6.305	5.661	5.065	4.348	3.485	2.581
305	-	-	-	6.348	5.704	5.107	4.389	3.522	2.612
310	-	-	-	-	5.746	5.149	4.429	3.558	2.642
315	-	-	-	-	5.788	5.190	4.468	3.593	2.673
320	-	-	-	-	5.829	5.231	4.507	3.628	2.702
325	-	-	-	-	5.869	5.270	4.545	3.662	2.732
330	-	-	-	-	5.908	5.309	4.582	3.696	2.761
335	-	-	-	-	5.947	5.348	4.619	3.730	2.789
340	-	-	-	-	5.985	5.386	4.656	3.763	2.818
342	-	-	-	-	5.998	5.399	4.668	3.774	2.828

Thickness is intumescent only.

TERVEKO SPECIMEN

Table 7: I Section Beams 150 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
66	5.274	4.665	4.067	3.561	3.107	2.710	2.290	1.845	1.845
70	5.476	4.856	4.244	3.727	3.262	2.855	2.423	1.960	1.845
75	5.715	5.083	4.456	3.926	3.450	3.031	2.585	2.104	1.845
80	5.944	5.301	4.661	4.119	3.631	3.202	2.743	2.245	1.845
85	6.163	5.510	4.857	4.305	3.807	3.369	2.896	2.382	1.887
90	-	5.711	5.047	4.486	3.978	3.531	3.047	2.517	2.006
95	-	5.904	5.230	4.660	4.143	3.689	3.193	2.649	2.122
100	-	6.090	5.406	4.828	4.304	3.842	3.336	2.778	2.236
105	-	6.269	5.577	4.992	4.460	3.992	3.476	2.904	2.348
110	-	-	5.741	5.150	4.612	4.137	3.613	3.028	2.458
115	-	-	5.901	5.303	4.759	4.279	3.746	3.150	2.566
120	-	-	6.055	5.452	4.903	4.418	3.877	3.269	2.673
125	-	-	6.204	5.596	5.042	4.553	4.004	3.385	2.777
130	-	-	6.348	5.736	5.178	4.685	4.129	3.500	2.880
135	-	-	-	5.872	5.310	4.813	4.251	3.612	2.981
140	-	-	-	6.005	5.439	4.939	4.371	3.722	3.080
145	-	-	-	6.133	5.564	5.061	4.488	3.830	3.177
150	-	-	-	6.258	5.686	5.181	4.602	3.936	3.273
155	-	-	-	-	5.805	5.298	4.714	4.039	3.368
160	-	-	-	-	5.922	5.412	4.824	4.141	3.461
165	-	-	-	-	6.035	5.524	4.932	4.242	3.552
170	-	-	-	-	6.146	5.633	5.037	4.340	3.642
175	-	-	-	-	6.253	5.740	5.140	4.436	3.730
180	-	-	-	-	6.359	5.845	5.241	4.531	3.817
185	-	-	-	-	-	5.947	5.341	4.624	3.903
190	-	-	-	-	-	6.047	5.438	4.716	3.987
195	-	-	-	-	-	6.145	5.533	4.806	4.070
200	-	-	-	-	-	6.241	5.627	4.894	4.152
205	-	-	-	-	-	6.335	5.719	4.981	4.233
210	-	-	-	-	-	-	5.809	5.067	4.312
215	-	-	-	-	-	-	5.898	5.150	4.390
220	-	-	-	-	-	-	5.984	5.233	4.467
225	-	-	-	-	-	-	6.070	5.314	4.543
230	-	-	-	-	-	-	6.153	5.394	4.618
235	-	-	-	-	-	-	6.236	5.473	4.691
240	-	-	-	-	-	-	6.316	5.550	4.764
245	-	-	-	-	-	-	-	5.626	4.835
250	-	-	-	-	-	-	-	5.701	4.906
255	-	-	-	-	-	-	-	5.775	4.976
260	-	-	-	-	-	-	-	5.847	5.044
265	-	-	-	-	-	-	-	5.919	5.112
270	-	-	-	-	-	-	-	5.989	5.178
275	-	-	-	-	-	-	-	6.058	5.244
280	-	-	-	-	-	-	-	6.127	5.309
285	-	-	-	-	-	-	-	6.194	5.373
290	-	-	-	-	-	-	-	6.260	5.436
295	-	-	-	-	-	-	-	6.325	5.498
300	-	-	-	-	-	-	-	-	5.560
305	-	-	-	-	-	-	-	-	5.621
310	-	-	-	-	-	-	-	-	5.680
315	-	-	-	-	-	-	-	-	5.740
320	-	-	-	-	-	-	-	-	5.798
325	-	-	-	-	-	-	-	-	5.855
330	-	-	-	-	-	-	-	-	5.912
335	-	-	-	-	-	-	-	-	5.968
340	-	-	-	-	-	-	-	-	6.024
342	-	-	-	-	-	-	-	-	6.043

Thickness is intumescent only.

TERVEZÉSI SEGÉDLET

Table 8: I Section Beams 180 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
66	-	5.770	5.131	4.601	4.129	3.723	3.287	2.815	2.366
70	-	6.008	5.356	4.814	4.333	3.918	3.470	2.983	2.519
75	-	6.291	5.625	5.071	4.579	4.154	3.693	3.188	2.705
80	-	-	5.883	5.319	4.817	4.383	3.910	3.388	2.888
85	-	-	6.133	5.559	5.048	4.606	4.121	3.584	3.068
90	-	-	-	5.791	5.272	4.823	4.328	3.776	3.244
95	-	-	-	6.015	5.489	5.035	4.530	3.964	3.418
100	-	-	-	6.232	5.700	5.240	4.727	4.148	3.588
105	-	-	-	-	5.905	5.441	4.919	4.328	3.754
110	-	-	-	-	6.104	5.636	5.107	4.505	3.918
115	-	-	-	-	6.297	5.826	5.291	4.678	4.080
120	-	-	-	-	-	6.012	5.470	4.847	4.238
125	-	-	-	-	-	6.193	5.646	5.013	4.394
130	-	-	-	-	-	-	5.817	5.176	4.546
135	-	-	-	-	-	-	5.985	5.336	4.697
140	-	-	-	-	-	-	6.150	5.493	4.845
145	-	-	-	-	-	-	6.311	5.647	4.990
150	-	-	-	-	-	-	-	5.797	5.133
155	-	-	-	-	-	-	-	5.945	5.273
160	-	-	-	-	-	-	-	6.091	5.412
165	-	-	-	-	-	-	-	6.233	5.548
170	-	-	-	-	-	-	-	-	5.682
175	-	-	-	-	-	-	-	-	5.813
180	-	-	-	-	-	-	-	-	5.943
185	-	-	-	-	-	-	-	-	6.071
190	-	-	-	-	-	-	-	-	6.196
195	-	-	-	-	-	-	-	-	6.320

Thickness is intumescent only.

TERVEZÉSI SEGÉDLET

Table 9: I Section Columns 15 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
95	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
100	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
105	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
110	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
115	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
120	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
125	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
130	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
135	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
140	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
145	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
150	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
155	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
160	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
165	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
170	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
175	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
180	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
185	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
190	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
195	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
200	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
205	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
210	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
215	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
220	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
225	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
230	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
235	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
240	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
245	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
250	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
255	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
260	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
265	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
270	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
275	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
280	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
285	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
290	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
295	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
300	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
305	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
310	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
315	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
320	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
325	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
330	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
335	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
340	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
345	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
346	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951

Thickness is intumescent only.

TERVEZÉSI SEGÉDLET

Table 10: I Section Columns 30 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
95	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
100	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
105	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
110	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
115	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
120	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
125	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
130	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
135	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
140	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
145	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
150	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
155	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
160	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
165	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
170	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
175	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
180	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
185	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
190	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
195	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
200	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
205	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
210	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
215	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
220	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
225	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
230	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
235	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
240	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
245	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
250	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
255	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
260	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
265	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
270	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
275	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
280	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
285	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
290	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
295	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
300	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
305	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
310	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
315	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
320	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
325	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
330	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
335	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
340	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
345	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
346	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951

Thickness is intumescent only.

TERVEZÉSI SEGÉDLET

Table 11: I Section Columns 45 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
95	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
100	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
105	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
110	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
115	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
120	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
125	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
130	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
135	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
140	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
145	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
150	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
155	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
160	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
165	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
170	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
175	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
180	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
185	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
190	1.974	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
195	2.009	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
200	2.044	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
205	2.076	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
210	2.108	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
215	2.138	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
220	2.167	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
225	2.196	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
230	2.223	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
235	2.249	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
240	2.274	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
245	2.299	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
250	2.323	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
255	2.346	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
260	2.368	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
265	2.389	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
270	2.410	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
275	2.430	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
280	2.450	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
285	2.469	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
290	2.488	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
295	2.505	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
300	2.523	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
305	2.540	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
310	2.556	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
315	2.572	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
320	2.588	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
325	2.603	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
330	2.618	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
335	2.632	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
340	2.646	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
345	2.660	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
346	2.664	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951

Thickness is intumescent only.

TERVEZÉSI SEGÉDLET

Table 12: I Section Columns 60 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
95	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
100	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
105	1.990	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
110	2.088	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
115	2.180	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
120	2.266	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
125	2.348	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
130	2.426	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
135	2.499	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
140	2.569	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
145	2.635	1.951	1.951	1.951	1.951	1.951	1.951	1.951	1.951
150	2.698	1.955	1.951	1.951	1.951	1.951	1.951	1.951	1.951
155	2.757	2.014	1.951	1.951	1.951	1.951	1.951	1.951	1.951
160	2.814	2.070	1.951	1.951	1.951	1.951	1.951	1.951	1.951
165	2.869	2.124	1.951	1.951	1.951	1.951	1.951	1.951	1.951
170	2.921	2.175	1.951	1.951	1.951	1.951	1.951	1.951	1.951
175	2.970	2.224	1.951	1.951	1.951	1.951	1.951	1.951	1.951
180	3.018	2.271	1.951	1.951	1.951	1.951	1.951	1.951	1.951
185	3.063	2.317	1.951	1.951	1.951	1.951	1.951	1.951	1.951
190	3.107	2.360	1.951	1.951	1.951	1.951	1.951	1.951	1.951
195	3.149	2.402	1.951	1.951	1.951	1.951	1.951	1.951	1.951
200	3.189	2.443	1.951	1.951	1.951	1.951	1.951	1.951	1.951
205	3.228	2.482	1.951	1.951	1.951	1.951	1.951	1.951	1.951
210	3.265	2.519	1.951	1.951	1.951	1.951	1.951	1.951	1.951
215	3.301	2.555	1.951	1.951	1.951	1.951	1.951	1.951	1.951
220	3.335	2.590	1.951	1.951	1.951	1.951	1.951	1.951	1.951
225	3.369	2.624	1.951	1.951	1.951	1.951	1.951	1.951	1.951
230	3.401	2.657	1.958	1.951	1.951	1.951	1.951	1.951	1.951
235	3.432	2.688	1.989	1.951	1.951	1.951	1.951	1.951	1.951
240	3.462	2.719	2.019	1.951	1.951	1.951	1.951	1.951	1.951
245	3.491	2.748	2.049	1.951	1.951	1.951	1.951	1.951	1.951
250	3.519	2.777	2.077	1.951	1.951	1.951	1.951	1.951	1.951
255	3.546	2.804	2.104	1.951	1.951	1.951	1.951	1.951	1.951
260	3.572	2.831	2.131	1.951	1.951	1.951	1.951	1.951	1.951
265	3.597	2.857	2.157	1.951	1.951	1.951	1.951	1.951	1.951
270	3.622	2.883	2.182	1.951	1.951	1.951	1.951	1.951	1.951
275	3.646	2.907	2.206	1.951	1.951	1.951	1.951	1.951	1.951
280	3.669	2.931	2.230	1.951	1.951	1.951	1.951	1.951	1.951
285	3.691	2.954	2.253	1.951	1.951	1.951	1.951	1.951	1.951
290	3.713	2.976	2.276	1.951	1.951	1.951	1.951	1.951	1.951
295	3.734	2.998	2.298	1.951	1.951	1.951	1.951	1.951	1.951
300	3.755	3.020	2.319	1.951	1.951	1.951	1.951	1.951	1.951
305	3.775	3.040	2.340	1.951	1.951	1.951	1.951	1.951	1.951
310	3.794	3.060	2.360	1.951	1.951	1.951	1.951	1.951	1.951
315	3.813	3.080	2.380	1.951	1.951	1.951	1.951	1.951	1.951
320	3.832	3.099	2.399	1.951	1.951	1.951	1.951	1.951	1.951
325	3.850	3.118	2.418	1.951	1.951	1.951	1.951	1.951	1.951
330	3.867	3.136	2.436	1.951	1.951	1.951	1.951	1.951	1.951
335	3.884	3.154	2.454	1.951	1.951	1.951	1.951	1.951	1.951
340	3.901	3.171	2.471	1.951	1.951	1.951	1.951	1.951	1.951
345	3.917	3.188	2.488	1.951	1.951	1.951	1.951	1.951	1.951
346	3.921	3.192	2.493	1.951	1.951	1.951	1.951	1.951	1.951

Thickness is intumescent only.

TERVEZETT

Table 13: I Section Columns 90 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	2.757	2.003	1.951	1.951	1.951	1.951	1.951	1.951	1.951
75	2.938	2.174	1.951	1.951	1.951	1.951	1.951	1.951	1.951
80	3.131	2.358	1.951	1.951	1.951	1.951	1.951	1.951	1.951
85	3.310	2.529	1.951	1.951	1.951	1.951	1.951	1.951	1.951
90	3.477	2.690	2.016	1.951	1.951	1.951	1.951	1.951	1.951
95	3.633	2.841	2.160	1.951	1.951	1.951	1.951	1.951	1.951
100	3.778	2.983	2.295	1.951	1.951	1.951	1.951	1.951	1.951
105	3.914	3.116	2.424	1.951	1.951	1.951	1.951	1.951	1.951
110	4.042	3.242	2.545	1.951	1.951	1.951	1.951	1.951	1.951
115	4.162	3.361	2.661	1.998	1.951	1.951	1.951	1.951	1.951
120	4.275	3.474	2.771	2.103	1.951	1.951	1.951	1.951	1.951
125	4.382	3.581	2.875	2.202	1.951	1.951	1.951	1.951	1.951
130	4.484	3.682	2.975	2.297	1.951	1.951	1.951	1.951	1.951
135	4.579	3.779	3.070	2.389	1.951	1.951	1.951	1.951	1.951
140	4.670	3.870	3.160	2.476	1.951	1.951	1.951	1.951	1.951
145	4.756	3.958	3.247	2.560	1.951	1.951	1.951	1.951	1.951
150	4.838	4.041	3.330	2.640	1.996	1.951	1.951	1.951	1.951
155	4.916	4.121	3.410	2.718	2.070	1.951	1.951	1.951	1.951
160	4.991	4.197	3.486	2.792	2.141	1.951	1.951	1.951	1.951
165	5.062	4.270	3.559	2.863	2.209	1.951	1.951	1.951	1.951
170	5.130	4.340	3.629	2.932	2.275	1.951	1.951	1.951	1.951
175	5.194	4.407	3.697	2.998	2.339	1.951	1.951	1.951	1.951
180	5.257	4.471	3.762	3.062	2.400	1.951	1.951	1.951	1.951
185	5.316	4.533	3.824	3.124	2.460	1.951	1.951	1.951	1.951
190	5.373	4.592	3.884	3.183	2.517	1.951	1.951	1.951	1.951
195	5.428	4.649	3.942	3.241	2.573	1.951	1.951	1.951	1.951
200	5.480	4.704	3.998	3.296	2.627	1.983	1.951	1.951	1.951
205	5.531	4.757	4.052	3.350	2.679	2.033	1.951	1.951	1.951
210	5.579	4.808	4.104	3.402	2.730	2.081	1.951	1.951	1.951
215	5.626	4.857	4.155	3.452	2.779	2.128	1.951	1.951	1.951
220	5.671	4.904	4.204	3.501	2.827	2.174	1.951	1.951	1.951
225	5.715	4.950	4.251	3.548	2.873	2.218	1.951	1.951	1.951
230	5.757	4.994	4.296	3.594	2.918	2.261	1.951	1.951	1.951
235	5.797	5.037	4.341	3.639	2.962	2.303	1.951	1.951	1.951
240	5.836	5.078	4.383	3.682	3.004	2.344	1.951	1.951	1.951
245	5.874	5.118	4.425	3.724	3.046	2.384	1.951	1.951	1.951
250	5.911	5.157	4.465	3.764	3.086	2.423	1.951	1.951	1.951
255	5.946	5.195	4.504	3.804	3.125	2.461	1.951	1.951	1.951
260	5.980	5.231	4.542	3.842	3.163	2.498	1.951	1.951	1.951
265	6.013	5.267	4.579	3.880	3.200	2.534	1.951	1.951	1.951
270	6.045	5.301	4.615	3.916	3.236	2.569	1.951	1.951	1.951
275	6.077	5.334	4.650	3.951	3.271	2.603	1.951	1.951	1.951
280	6.107	5.367	4.684	3.986	3.306	2.636	1.951	1.951	1.951
285	6.136	5.398	4.716	4.019	3.339	2.669	1.955	1.951	1.951
290	6.165	5.429	4.748	4.052	3.372	2.701	1.985	1.951	1.951
295	6.192	5.458	4.780	4.084	3.403	2.732	2.014	1.951	1.951
300	6.219	5.487	4.810	4.115	3.435	2.762	2.043	1.951	1.951
305	6.245	5.515	4.840	4.145	3.465	2.792	2.071	1.951	1.951
310	6.271	5.543	4.868	4.175	3.494	2.821	2.098	1.951	1.951
315	6.295	5.570	4.897	4.203	3.523	2.849	2.125	1.951	1.951
320	6.319	5.595	4.924	4.232	3.552	2.877	2.152	1.951	1.951
325	6.343	5.621	4.951	4.259	3.579	2.904	2.177	1.951	1.951
330	6.366	5.645	4.977	4.286	3.606	2.931	2.203	1.951	1.951
335	6.388	5.670	5.002	4.312	3.633	2.957	2.227	1.951	1.951
340	6.410	5.693	5.027	4.338	3.658	2.982	2.252	1.951	1.951
345	6.431	5.716	5.051	4.363	3.684	3.007	2.275	1.951	1.951
346	6.436	5.722	5.058	4.370	3.691	3.014	2.282	1.951	1.951

Thickness is intumescent only.

TENSILE SHEET

Table 14: I Section Columns 120 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	4.411	3.552	2.839	2.196	1.951	1.951	1.951	1.951	1.951
75	4.634	3.767	3.045	2.388	1.951	1.951	1.951	1.951	1.951
80	4.872	4.000	3.268	2.599	2.007	1.951	1.951	1.951	1.951
85	5.093	4.216	3.477	2.797	2.193	1.951	1.951	1.951	1.951
90	5.299	4.420	3.675	2.985	2.371	1.951	1.951	1.951	1.951
95	5.491	4.610	3.861	3.164	2.539	1.973	1.951	1.951	1.951
100	5.670	4.789	4.037	3.333	2.700	2.124	1.951	1.951	1.951
105	5.838	4.958	4.204	3.494	2.854	2.269	1.951	1.951	1.951
110	5.996	5.117	4.362	3.648	3.001	2.408	1.951	1.951	1.951
115	6.145	5.268	4.512	3.794	3.141	2.542	1.951	1.951	1.951
120	6.285	5.410	4.654	3.933	3.276	2.670	2.062	1.951	1.951
125	6.417	5.545	4.790	4.067	3.405	2.793	2.177	1.951	1.951
130	6.541	5.674	4.919	4.194	3.529	2.912	2.288	1.951	1.951
135	6.660	5.795	5.042	4.316	3.648	3.026	2.396	1.951	1.951
140	6.772	5.911	5.160	4.433	3.762	3.136	2.499	1.951	1.951
145	-	6.022	5.273	4.545	3.872	3.242	2.600	1.951	1.951
150	-	6.127	5.380	4.653	3.978	3.345	2.697	2.016	1.951
155	-	6.228	5.483	4.756	4.080	3.444	2.791	2.102	1.951
160	-	6.324	5.582	4.855	4.178	3.539	2.882	2.186	1.951
165	-	6.416	5.677	4.951	4.273	3.632	2.970	2.268	1.951
170	-	6.505	5.768	5.043	4.364	3.721	3.056	2.348	1.951
175	-	6.589	5.856	5.132	4.452	3.808	3.139	2.425	1.951
180	-	6.670	5.940	5.217	4.538	3.892	3.219	2.500	1.951
185	-	6.748	6.021	5.300	4.620	3.973	3.298	2.573	1.951
190	-	6.823	6.100	5.379	4.700	4.052	3.374	2.644	1.951
195	-	-	6.175	5.456	4.777	4.128	3.447	2.713	2.014
200	-	-	6.247	5.530	4.852	4.203	3.519	2.780	2.076
205	-	-	6.318	5.602	4.924	4.274	3.589	2.846	2.136
210	-	-	6.385	5.672	4.995	4.344	3.657	2.910	2.195
215	-	-	6.451	5.739	5.063	4.412	3.723	2.972	2.253
220	-	-	6.514	5.804	5.129	4.478	3.787	3.033	2.310
225	-	-	6.575	5.867	5.193	4.542	3.850	3.093	2.365
230	-	-	6.634	5.929	5.255	4.605	3.911	3.150	2.419
235	-	-	6.692	5.988	5.316	4.666	3.970	3.207	2.471
240	-	-	6.747	6.046	5.375	4.725	4.028	3.262	2.523
245	-	-	6.801	6.102	5.432	4.782	4.085	3.316	2.573
250	-	-	6.854	6.156	5.488	4.838	4.140	3.369	2.622
255	-	-	-	6.209	5.542	4.893	4.194	3.420	2.670
260	-	-	-	6.260	5.595	4.946	4.247	3.470	2.717
265	-	-	-	6.310	5.646	4.998	4.298	3.520	2.764
270	-	-	-	6.359	5.696	5.049	4.348	3.568	2.809
275	-	-	-	6.406	5.745	5.098	4.397	3.615	2.853
280	-	-	-	6.452	5.792	5.147	4.445	3.661	2.897
285	-	-	-	6.497	5.838	5.194	4.492	3.706	2.939
290	-	-	-	6.541	5.884	5.240	4.537	3.750	2.981
295	-	-	-	6.584	5.928	5.285	4.582	3.793	3.021
300	-	-	-	6.625	5.971	5.328	4.626	3.835	3.062
305	-	-	-	6.666	6.013	5.371	4.669	3.877	3.101
310	-	-	-	6.705	6.054	5.413	4.710	3.917	3.139
315	-	-	-	6.744	6.094	5.454	4.751	3.957	3.177
320	-	-	-	6.781	6.133	5.495	4.792	3.996	3.214
325	-	-	-	6.818	6.171	5.534	4.831	4.034	3.250
330	-	-	-	6.854	6.209	5.572	4.869	4.071	3.286
335	-	-	-	-	6.245	5.610	4.907	4.108	3.321
340	-	-	-	-	6.281	5.647	4.944	4.144	3.356
345	-	-	-	-	6.316	5.683	4.980	4.179	3.389
346	-	-	-	-	6.326	5.693	4.990	4.189	3.399

Thickness is intumescent only.

TERVEKO SPECIMEN

Table 15: I Section Columns 150 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	6.064	5.100	4.306	3.588	2.961	2.407	1.951	1.951	1.951
75	6.330	5.361	4.559	3.829	3.190	2.622	2.071	1.951	1.951
80	6.613	5.641	4.833	4.092	3.440	2.858	2.291	1.951	1.951
85	-	5.904	5.091	4.341	3.678	3.084	2.501	1.951	1.951
90	-	6.149	5.334	4.577	3.905	3.299	2.703	2.097	1.951
95	-	6.379	5.563	4.800	4.120	3.506	2.897	2.275	1.951
100	-	6.596	5.779	5.012	4.326	3.703	3.084	2.448	1.951
105	-	6.800	5.984	5.214	4.523	3.893	3.263	2.614	2.022
110	-	-	6.178	5.406	4.710	4.074	3.436	2.774	2.170
115	-	-	6.362	5.589	4.890	4.249	3.602	2.930	2.313
120	-	-	6.538	5.764	5.062	4.417	3.763	3.080	2.452
125	-	-	6.704	5.931	5.227	4.578	3.917	3.225	2.587
130	-	-	-	6.091	5.385	4.733	4.067	3.366	2.718
135	-	-	-	6.244	5.537	4.883	4.211	3.502	2.845
140	-	-	-	6.390	5.684	5.027	4.351	3.634	2.968
145	-	-	-	6.530	5.824	5.166	4.486	3.762	3.088
150	-	-	-	6.665	5.959	5.300	4.616	3.886	3.205
155	-	-	-	6.794	6.090	5.429	4.743	4.006	3.318
160	-	-	-	-	6.215	5.554	4.865	4.123	3.429
165	-	-	-	-	6.336	5.676	4.984	4.237	3.536
170	-	-	-	-	6.453	5.793	5.099	4.347	3.641
175	-	-	-	-	6.566	5.906	5.210	4.454	3.743
180	-	-	-	-	6.675	6.016	5.318	4.558	3.842
185	-	-	-	-	6.780	6.122	5.424	4.660	3.939
190	-	-	-	-	-	6.225	5.526	4.759	4.033
195	-	-	-	-	-	6.325	5.625	4.855	4.125
200	-	-	-	-	-	6.422	5.721	4.948	4.215
205	-	-	-	-	-	6.516	5.815	5.040	4.303
210	-	-	-	-	-	6.607	5.906	5.129	4.388
215	-	-	-	-	-	6.696	5.995	5.215	4.472
220	-	-	-	-	-	6.783	6.082	5.300	4.553
225	-	-	-	-	-	-	6.166	5.382	4.633
230	-	-	-	-	-	-	6.248	5.463	4.711
235	-	-	-	-	-	-	6.328	5.541	4.787
240	-	-	-	-	-	-	6.406	5.618	4.862
245	-	-	-	-	-	-	6.482	5.693	4.935
250	-	-	-	-	-	-	6.556	5.766	5.006
255	-	-	-	-	-	-	6.628	5.837	5.076
260	-	-	-	-	-	-	6.699	5.907	5.144
265	-	-	-	-	-	-	6.768	5.975	5.211
270	-	-	-	-	-	-	6.835	6.042	5.276
275	-	-	-	-	-	-	-	6.108	5.340
280	-	-	-	-	-	-	-	6.172	5.403
285	-	-	-	-	-	-	-	6.234	5.465
290	-	-	-	-	-	-	-	6.295	5.525
295	-	-	-	-	-	-	-	6.355	5.584
300	-	-	-	-	-	-	-	6.414	5.642
305	-	-	-	-	-	-	-	6.472	5.699
310	-	-	-	-	-	-	-	6.528	5.754
315	-	-	-	-	-	-	-	6.583	5.809
320	-	-	-	-	-	-	-	6.637	5.863
325	-	-	-	-	-	-	-	6.690	5.915
330	-	-	-	-	-	-	-	6.742	5.967
335	-	-	-	-	-	-	-	6.793	6.018
340	-	-	-	-	-	-	-	6.843	6.068
345	-	-	-	-	-	-	-	-	6.117
346	-	-	-	-	-	-	-	-	6.130

Thickness is intumescent only.

TERVEZÉSI SEGÉDLET

Table 16: I Section Columns 180 Minutes									
Section Factor up to m^{-1}	Thickness (mm) Required for a Design Temperature of								
	350°C	400°C	450°C	500°C	550°C	600°C	650°C	700°C	750°C
71	-	6.648	5.773	4.980	4.290	3.681	3.089	2.496	1.968
75	-	-	6.073	5.270	4.568	3.946	3.339	2.726	2.180
80	-	-	6.399	5.586	4.873	4.238	3.615	2.982	2.416
85	-	-	6.704	5.885	5.163	4.517	3.879	3.228	2.644
90	-	-	-	6.168	5.439	4.783	4.133	3.465	2.864
95	-	-	-	6.437	5.701	5.038	4.376	3.694	3.077
100	-	-	-	6.692	5.952	5.282	4.611	3.914	3.283
105	-	-	-	-	6.191	5.516	4.836	4.127	3.483
110	-	-	-	-	6.420	5.741	5.053	4.333	3.677
115	-	-	-	-	6.639	5.956	5.262	4.532	3.864
120	-	-	-	-	6.848	6.163	5.463	4.724	4.046
125	-	-	-	-	-	6.363	5.658	4.910	4.222
130	-	-	-	-	-	6.555	5.846	5.090	4.394
135	-	-	-	-	-	6.739	6.027	5.264	4.560
140	-	-	-	-	-	-	6.202	5.433	4.722
145	-	-	-	-	-	-	6.372	5.597	4.879
150	-	-	-	-	-	-	6.535	5.756	5.032
155	-	-	-	-	-	-	6.694	5.910	5.180
160	-	-	-	-	-	-	6.848	6.060	5.325
165	-	-	-	-	-	-	-	6.205	5.465
170	-	-	-	-	-	-	-	6.346	5.602
175	-	-	-	-	-	-	-	6.484	5.736
180	-	-	-	-	-	-	-	6.617	5.866
185	-	-	-	-	-	-	-	6.747	5.992
190	-	-	-	-	-	-	-	-	6.116
195	-	-	-	-	-	-	-	-	6.237
200	-	-	-	-	-	-	-	-	6.354
205	-	-	-	-	-	-	-	-	6.469
210	-	-	-	-	-	-	-	-	6.581
215	-	-	-	-	-	-	-	-	6.690
220	-	-	-	-	-	-	-	-	6.797
225	-	-	-	-	-	-	-	-	-
230	-	-	-	-	-	-	-	-	-
235	-	-	-	-	-	-	-	-	-
240	-	-	-	-	-	-	-	-	-
245	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-
346	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

TERVEZÉSI SEGÉDLET