

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-14/0043**  
**of 19 March 2014**

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Interchar 963

Product family  
to which the construction product belongs

Reactive Coatings for fire protection of steel elements

Manufacturer

International Paint Ltd  
Stoneygate Lane  
FELLING, GATESHEAD NE10 0JY  
GROSSBRITANNIEN

Manufacturing plant

International Paint  
Holmedalen 3  
Aspereds Industriomrade  
42457 Angered  
Sweden

This European Technical Assessment  
contains

37 pages including 1 annex which form an integral part of  
this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

Guideline for European technical approval of "Fire  
Protective Products", ETAG 018 Part 2: "Reactive  
Coatings for Fire Protection of Steel Elements",  
used as European Assessment Document (EAD)  
according to Article 66 Paragraph 3 of Regulation (EU)  
No 305/2011.

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## Specific part

### 1 Technical description of the product

This European technical assessment (ETA) applies to the reactive coating for fire protection "Interchar 963". "Interchar 963" is a spray applied or, for small areas, brush applied solvent based reactive coating system. The reactive coating system for fire protection consists of the primer, the reactive coating and, depending on the use category of the top coat, where appropriate. In the case of fire reactive coatings for fire protection act by temperature stress and thus develop a heat-insulating effect. The reactive component, on which the mode of operation of the reactive coating for fire protection is based, is an intumescent material.

In conformity with ETAG 018-2 the ETA is issued for the product under end use conditions (Option 3).

### 2 Specification of the intended use in accordance with the applicable European assessment Document

#### 2.1 Field of application

"Interchar 963" serves for the use as reactive coating system (sheathing) necessary on beams and columns made of structural steel (marking 'S') in accordance with EN 10025<sup>1</sup>, excluding S185 to achieve a fire resistance duration in accordance with EN 13501-2<sup>2</sup>.

"Interchar 963" may be applied in accordance with Annex 1 to the following fields.

– Fire resistance:

Open sections (H and I): R 15-IncSlow, R 30-IncSlow, R 45-IncSlow, R 60-IncSlow  
R 75-IncSlow, R 90-IncSlow

Circular hollow sections: R 15-IncSlow, R 30-IncSlow, R 45-IncSlow, R 60-IncSlow

A/V factor and/or V/A factor: 48 m<sup>-1</sup> up to 475 m<sup>-1</sup> / 0.0208 m up to 0.0021 m

– Design temperatures: 350 °C up to 750 °C

The application of "Interchar 963" on steel tension members is not regulated by this ETA.

<sup>1</sup> EN 10025:part 1 to 6: 2004-2009 Hot rolled products of structural steels

<sup>2</sup> EN 13501-2:2008-01 Fire classification of construction products and building elements Part 2: Classification using data from fire resistance tests, excluding ventilation services implemented

## 2.2 Use category

Depending on the use category in accordance with ETAG 018-2, section 2.2.2 the following types have been approved.

Primer - irrespective of the use category		Reactive coating	Top coat - depending on the use category
Two components epoxy primers	"Intercure 200" "Intergard 269" "Intergard 251" "Interseal 670HS" "Interplus 256" "Interplus 356"	"Interchar 963"	<u>Type X</u> (Y, Z <sub>1</sub> , Z <sub>2</sub> included) "Intersheen 579" <sup>3</sup> or "Interthane 990" <sup>3</sup> "Interthane 990SG" <sup>3</sup> "Interthane 870" <sup>3</sup> "Interthane 1070" <sup>3</sup>
			<u>Typ Z<sub>1</sub></u> (Z <sub>2</sub> included) without top coat or alternatively also with "Intersheen 579" <sup>3</sup>
Alkyd resin primers	"Interprime 306" "Interprime 198"		<u>Type Z<sub>2</sub></u> without top coat or alternatively also with "Intersheen 54" <sup>3</sup> or "Intersheen 579" <sup>3</sup>

For the carrying out with primer "Intergard 269" the applicability of the reactive coating system has been verified on zinc coated substrates with a thickness of the zinc coating of up to 200 µm.

The performances given in Section 3 are only valid if the reactive coating for fire protection "Interchar 963" is used in compliance with the specifications and conditions given in Annex 1. The European technical assessment is issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

## 2.3 Working life

The verifications and assessment methods on which this European Technical Assessment is based lead the assumption of working life of the reactive coating for fire protection "Interchar 963" of 10 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

<sup>3</sup>

For all shades of this top coat

### 3 Performance of the product and references to the methods used for its assessment

#### 3.1 Mechanical resistance and stability (BWR 1)

Not applicable

#### 3.2 Safety in case of fire (BWR 2)

	Performance
Reaction to fire	<p>In the assembly with primer "Intergard 251", reactive coating "Interchar 963" and topcoat "Intersheen 579" the reactive coating system corresponds to the reaction-to-fire class C-s1,d0 according to EN 13501-1<sup>4</sup>.</p> <p>In the assembly with primer "Intercure 200", reactive coating "Interchar 963" and topcoat "Interthane 990" the reactive coating system corresponds to the reaction-to-fire class C-s2,d0 according to EN 13501-1<sup>4</sup>.</p> <p>All other assemblies with or without topcoat correspond to the reaction-to-fire class D-s2,d0 according to EN 13501-1<sup>4</sup>.</p>
Fire resistance	The fire resistance classes were determined according to EN 13501-2 <sup>2</sup> corresponding to ENV 13381-8 <sup>5</sup> and shall be gathered from Annex 1.
Smouldering fire exposure	The verification under exposure to the smouldering fire curve according to ENV 13381-4 <sup>6</sup> has been furnished in the context of the approval tests.

#### 3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Air and/or water permeability	not applicable
Release of dangerous substances.	<p>The product does not contain/release dangerous substances specified in TR 034, dated march 2012, except:</p> <p>Volatile organic compounds (VOC): The content of volatile organic compounds was assessed on the basis of the chemical formulation. The release of volatile organic compounds to indoor air is not verified with this ETA.</p>
Resistance to chemicals	No performance determined

<sup>4</sup> EN 13501-1:2010-01 Fire classification of construction products and building elements Part 1: Classification using data from reaction to fire tests implemented

<sup>5</sup> EN 13381-8:2010-09 Test methods for determining the contribution to the fire resistance of structural members – Part 8: Applied reactive protection to steel members

<sup>6</sup> EN 13381-4:2002-07 Test methods for determining the contribution to the fire resistance of structural members – Part 4: Applied protection to steel members

**3.4 Safety and accessibility (BWR 4)**

Not applicable

**3.5 Protection against noise (BWR 5)**

Not applicable

**3.6 Energy economy and heat retention (BWR 6)**

Not applicable

**3.7 Sustainable use of natural resources (BWR 7)**

For the sustainable use of natural resources no performance was investigated for this product.

**3.8 General aspects**

The verification of durability is part of testing the essential characteristics. Durability is only ensured if the specifications of intended use according to Annex 1 are taken into account.

**4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base**

According to Decision of the Commission of 22 June 1999 (1999/454/EC, ABl. L 178 of 14.07.1999), as amended by Decision of the Commission of 8 January 2001 (2001/596/EG, ABl. L 209/33 of 02.08.2001), the system 1 of assessment and verification of constancy of performance (see Annex V and Article 65 Paragraph 2 to Regulation (EU) No 305/2011).

Additionally according to the Decision 2001/596/EC of the European Commission system 1, 3 or 4 in accordance of the class of attestation of conformity is to be used in relation to the reaction-to-fire performance given in the following table applies.

Product	Intended use(s)	Level or class (reaction to fire)	System
Fire protective products (including coatings)	For uses subject to regulations on reaction to fire	A1*, A2*, B*, C*	1
	...	A1**, A2**, B**, C**, D, E	3
	...	(A1-E)***, F	4

\* Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)

\*\* Products/materials not covered by footnote (\*)

\*\*\* Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of class A1 according to Commission Decision 96/603/EC (ABL 178 of 14 July 1999), as amended

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 19. March 2014 by Deutsches Institut für Bautechnik

Prof. Gunter Hoppe  
Head of Department

*beglaubigt:*  
Stopp

**Annex 1****Handling, Application**

The manufacturer shall provide an installation guide for his product.

The installation guide shall give information about.

- List of suitable substrates
- Preparation of the surface of the construction (e.g. cleanliness, required preparation grade of the surface, e.g. Sa 2 ½ )
- Method of application (e.g. the temperature and humidity conditions before, during and after application)
- Necessary application wet film thickness in relation to the dry film thickness
- Required minimum dry film thickness of the reactive coating
- Period of time between the application of each component, taking account of exposure conditions
- Curing time of the system
- Approved top coats
- Equipment parameters
- Provisions to protect coatings intended for internal use, if temporarily exposed on site.

This ETA is issued on the assumption that the application of "Interchar 963" occurs in accordance with the manufacturer's instructions.

**Primer**

A two component epoxy primer or alkyd resin primer as specified by the manufacturer shall be used, see clause 2.2 of this ETA.

The primer shall be applied on surface prepared steel. The surface of the steel shall be free of dust, grease and other pollutants. The preparation grade of surface shall be in accordance with the technical data sheets. The primer shall cover the surface of the steel completely. The required dry film thickness according to the manufacturer's declaration shall be respected.

Primer applied on the steel sections at the factory, where relevant, which does not comply with the requirements of the ETA holder shall be removed before.

**Reactive coating**

The reactive coating shall be compatible with the top coat.

The dry film thickness of the reactive coating "Interchar 963" (without primer and top coat) shall have at least the tabular values required in Annex 1.

**Topcoat**

The top coat shall be compatible with the reactive coating. During the tests carried out for the approval procedure the top coats have been found to be compatible according to section 2.2 of this ETA.

The required dry film thickness according to the manufacturer's declaration shall be respected, it is approx. 40 µm - 100 µm.

**Structural references**

The steel members coated with "Interchar 963" should not have claddings or other sheathings which could prevent the reactive coating from foaming.



**Packaging, transport and storage**

In the accompanying document or on the tanks the manufacturer shall give information as to transport and storage.

At least the following shall be indicated: storage temperature, type of storage (container, tank, etc.), required data related to minimum and maximum temperature for transport and storage. In case of combustible components or other potentially dangerous substances the instructions shall contain indications about limitations and/or conditions for handling, transport and storage.

**Use, maintenance, 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.

The top coat shall protect the reactive coating from moisture and other environmental influences. Therefore it shall always be kept in a proper state. In case of an execution without top coat the control shall refer to the reactive coating. If the maintenance work related to the reactive coating or the top coating is necessary, the manufacturer's instructions shall be respected.

**Fire resistance**

1. This Annex relates to the use of "Interchar 963" for safety in case of fire of open sections (H and I) and circular hollow sections for steel columns. The proper field of application is given in Tables 1 to 28 which show the minimum dry thickness of the layer (without primer and top coat) required for achieving the classification "R" in case of different design temperatures and profile factors. The tables are applicable to assemblies with or without topcoat.
2. The product has been approved on the basis of:
  - a) The approval test on the basis of ENV 13381-4<sup>6</sup>, EN 13381-8<sup>5</sup> and ETAG 018, Parts 1 and 2
  - b) The design of the minimum dry film thickness of the layer according of EN 13381-8<sup>5</sup>
3. The data for beams are related to a three-sided fire exposure. A four-sided fire exposure for beams has to be calculated from the column tables, but limited to the maximum thickness for beams.
4. The data for columns are related to a four-sided fire exposure. A three-sided exposure for columns has to be calculated from the column table but the V/A has to be corrected based on the area of fire exposure.
5. The layer thicknesses given are applicable to steel sections with a surface prepared according to section 4.2.2 of this ETA.
6. The thicknesses given for open H- and I-sections also apply to steel sections of other shapes, e.g. U-, L- and T-sections under consideration of the same A/V value.

Annex 1, Table 1: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 15 minutes									
		Design Temperature $\theta_D$ in °C									
A/V m <sup>-1</sup>	V/A m	350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
95	0,0105	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
100	0,0100	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
105	0,0095	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
110	0,0091	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
115	0,0087	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
120	0,0083	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
125	0,0080	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
130	0,0077	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
135	0,0074	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
140	0,0071	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
145	0,0069	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
150	0,0067	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
155	0,0065	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
160	0,0063	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
165	0,0061	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
170	0,0059	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
175	0,0057	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
180	0,0056	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
185	0,0054	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
190	0,0053	0,287	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
195	0,0051	0,307	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
200	0,0050	0,327	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
205	0,0049	0,347	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
210	0,0048	0,367	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
215	0,0047	0,386	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
220	0,0045	0,406	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
225	0,0044	0,425	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
230	0,0043	0,445	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
235	0,0043	0,464	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
240	0,0042	0,483	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
245	0,0041	0,503	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
250	0,0040	0,522	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
255	0,0039	0,541	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
260	0,0038	0,560	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
265	0,0038	0,579	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
270	0,0037	0,598	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
275	0,0036	0,616	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
280	0,0036	0,635	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
285	0,0035	0,654	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
290	0,0034	0,672	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
295	0,0034	0,691	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
300	0,0033	0,709	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272

Annex 1, Table 1: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 15 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033	0,728	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
310	0,0032	0,746	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
315	0,0032	0,764	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
320	0,0031	0,782	0,276	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
325	0,0031	0,800	0,289	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
330	0,0030	0,819	0,301	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
335	0,0030	0,836	0,313	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
340	0,0029	0,854	0,325	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
345	0,0029	0,872	0,338	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
350	0,0029	0,890	0,350	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
355	0,0028	0,908	0,362	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
360	0,0028	0,925	0,375	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
365	0,0027	0,943	0,387	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
370	0,0027	0,960	0,399	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
375	0,0027	0,978	0,412	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
380	0,0026	0,995	0,424	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
385	0,0026	1,013	0,437	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
390	0,0026	1,030	0,449	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
395	0,0025	1,047	0,462	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
400	0,0025	1,064	0,474	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
405	0,0025	1,081	0,487	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
410	0,0024	1,098	0,499	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
415	0,0024	1,115	0,512	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
420	0,0024	1,132	0,524	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
425	0,0024	1,149	0,537	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
430	0,0023	1,166	0,550	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
435	0,0023	1,182	0,562	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
440	0,0023	1,199	0,575	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
445	0,0022	1,216	0,588	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
450	0,0022	1,232	0,600	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
455	0,0022	1,249	0,613	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
460	0,0022	1,265	0,626	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272

Annex 1, Table 2: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 30 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	0,397	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
95	0,0105	0,447	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
100	0,0100	0,497	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
105	0,0095	0,546	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
110	0,0091	0,595	0,288	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
115	0,0087	0,644	0,322	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
120	0,0083	0,693	0,357	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
125	0,0080	0,741	0,392	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
130	0,0077	0,790	0,427	0,272	0,272	0,272	0,272	0,272	0,272	0,272	0,272
135	0,0074	0,838	0,462	0,276	0,274	0,272	0,272	0,272	0,272	0,272	0,272
140	0,0071	0,886	0,497	0,303	0,291	0,272	0,272	0,272	0,272	0,272	0,272
145	0,0069	0,933	0,532	0,331	0,308	0,272	0,272	0,272	0,272	0,272	0,272
150	0,0067	0,981	0,568	0,360	0,324	0,272	0,272	0,272	0,272	0,272	0,272
155	0,0065	1,028	0,603	0,388	0,341	0,272	0,272	0,272	0,272	0,272	0,272
160	0,0063	1,076	0,638	0,416	0,358	0,272	0,272	0,272	0,272	0,272	0,272
165	0,0061	1,123	0,673	0,445	0,376	0,272	0,272	0,272	0,272	0,272	0,272
170	0,0059	1,170	0,709	0,474	0,396	0,279	0,272	0,272	0,272	0,272	0,272
175	0,0057	1,216	0,744	0,503	0,422	0,302	0,272	0,272	0,272	0,272	0,272
180	0,0056	1,263	0,780	0,532	0,449	0,325	0,272	0,272	0,272	0,272	0,272
185	0,0054	1,309	0,815	0,561	0,476	0,348	0,272	0,272	0,272	0,272	0,272
190	0,0053	1,355	0,851	0,591	0,503	0,372	0,272	0,272	0,272	0,272	0,272
195	0,0051	1,401	0,887	0,620	0,530	0,395	0,272	0,272	0,272	0,272	0,272
200	0,0050	1,447	0,923	0,650	0,558	0,419	0,272	0,272	0,272	0,272	0,272
205	0,0049	1,492	0,958	0,680	0,586	0,443	0,272	0,272	0,272	0,272	0,272
210	0,0048	1,538	0,994	0,710	0,613	0,468	0,272	0,272	0,272	0,272	0,272
215	0,0047	1,583	1,030	0,741	0,641	0,492	0,272	0,272	0,272	0,272	0,272
220	0,0045	1,628	1,066	0,771	0,670	0,517	0,272	0,272	0,272	0,272	0,272
225	0,0044	1,673	1,102	0,802	0,698	0,542	0,289	0,272	0,272	0,272	0,272
230	0,0043	1,718	1,138	0,833	0,727	0,568	0,308	0,272	0,272	0,272	0,272
235	0,0043	1,762	1,175	0,864	0,756	0,593	0,327	0,272	0,272	0,272	0,272
240	0,0042	1,807	1,211	0,896	0,785	0,619	0,346	0,272	0,272	0,272	0,272
245	0,0041	1,851	1,247	0,927	0,814	0,645	0,366	0,272	0,272	0,272	0,272
250	0,0040	1,895	1,284	0,959	0,844	0,672	0,386	0,272	0,272	0,272	0,272
255	0,0039	1,939	1,320	0,991	0,874	0,698	0,406	0,272	0,272	0,272	0,272
260	0,0038	1,983	1,357	1,023	0,904	0,725	0,426	0,272	0,272	0,272	0,272
265	0,0038	2,026	1,393	1,055	0,934	0,752	0,447	0,272	0,272	0,272	0,272
270	0,0037	2,070	1,430	1,088	0,965	0,780	0,468	0,272	0,272	0,272	0,272
275	0,0036	2,113	1,466	1,121	0,996	0,808	0,489	0,272	0,272	0,272	0,272
280	0,0036		1,503	1,154	1,027	0,836	0,511	0,272	0,272	0,272	0,272
285	0,0035		1,540	1,187	1,058	0,864	0,533	0,272	0,272	0,272	0,272
290	0,0034		1,577	1,220	1,089	0,893	0,555	0,272	0,272	0,272	0,272
295	0,0034		1,614	1,254	1,121	0,922	0,577	0,272	0,272	0,272	0,272
300	0,0033		1,651	1,288	1,153	0,951	0,600	0,286	0,272	0,272	0,272

Annex 1, Table 2: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 30 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033	1,688	1,322	1,185	0,981	0,623	0,302	0,272	0,272	0,272	0,272
310	0,0032	1,725	1,356	1,218	1,011	0,647	0,319	0,272	0,272	0,272	0,272
315	0,0032	1,762	1,390	1,251	1,041	0,671	0,335	0,272	0,272	0,272	0,272
320	0,0031	1,799	1,425	1,284	1,071	0,695	0,353	0,272	0,272	0,272	0,272
325	0,0031	1,836	1,460	1,317	1,102	0,720	0,370	0,272	0,272	0,272	0,272
330	0,0030	1,874	1,495	1,351	1,134	0,745	0,388	0,272	0,272	0,272	0,272
335	0,0030	1,911	1,531	1,384	1,165	0,770	0,406	0,272	0,272	0,272	0,272
340	0,0029	1,949	1,566	1,419	1,197	0,796	0,425	0,272	0,272	0,272	0,272
345	0,0029	1,986	1,602	1,453	1,229	0,822	0,444	0,272	0,272	0,272	0,272
350	0,0029	2,024	1,638	1,488	1,262	0,848	0,463	0,272	0,272	0,272	0,272
355	0,0028	2,061	1,675	1,523	1,295	0,875	0,483	0,272	0,272	0,272	0,272
360	0,0028	2,099	1,711	1,558	1,329	0,903	0,503	0,272	0,272	0,272	0,272
365	0,0027		1,748	1,594	1,362	0,931	0,523	0,272	0,272	0,272	0,272
370	0,0027		1,785	1,630	1,397	0,959	0,544	0,272	0,272	0,272	0,272
375	0,0027		1,822	1,666	1,431	0,988	0,565	0,272	0,272	0,272	0,272
380	0,0026		1,860	1,702	1,466	1,017	0,587	0,272	0,272	0,272	0,272
385	0,0026		1,898	1,739	1,502	1,047	0,609	0,272	0,272	0,272	0,272
390	0,0026		1,936	1,777	1,537	1,077	0,632	0,272	0,272	0,272	0,272
395	0,0025		1,974	1,814	1,574	1,108	0,655	0,272	0,272	0,272	0,272
400	0,0025		2,013	1,852	1,610	1,139	0,679	0,272	0,272	0,272	0,272
405	0,0025		2,052	1,890	1,648	1,171	0,703	0,272	0,272	0,272	0,272
410	0,0024		2,091	1,929	1,685	1,203	0,728	0,272	0,272	0,272	0,272
415	0,0024				1,723	1,236	0,754	0,272	0,272	0,272	0,272
420	0,0024				1,762	1,269	0,779	0,272	0,272	0,272	0,272
425	0,0024				1,801	1,303	0,806	0,281	0,272	0,272	0,272
430	0,0023				1,840	1,338	0,833	0,297	0,272	0,272	0,272
435	0,0023				1,880	1,373	0,861	0,314	0,272	0,272	0,272
440	0,0023				1,921	1,409	0,889	0,331	0,272	0,272	0,272
445	0,0022				1,962	1,446	0,919	0,348	0,272	0,272	0,272
450	0,0022				2,003	1,483	0,949	0,367	0,272	0,272	0,272
455	0,0022				2,045	1,521	0,979	0,385	0,272	0,272	0,272
460	0,0022				2,088	1,560	1,011	0,405	0,272	0,272	0,272

Annex 1, Table 3: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 45 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	0,924	0,561	0,394	0,345	0,272	0,272	0,272	0,272	0,272	0,272
95	0,0105	1,001	0,619	0,442	0,386	0,302	0,272	0,272	0,272	0,272	0,272
100	0,0100	1,079	0,677	0,490	0,431	0,342	0,272	0,272	0,272	0,272	0,272
105	0,0095	1,156	0,735	0,538	0,475	0,382	0,272	0,272	0,272	0,272	0,272
110	0,0091	1,233	0,793	0,586	0,520	0,422	0,272	0,272	0,272	0,272	0,272
115	0,0087	1,310	0,851	0,635	0,566	0,462	0,304	0,272	0,272	0,272	0,272
120	0,0083	1,386	0,910	0,684	0,612	0,503	0,337	0,272	0,272	0,272	0,272
125	0,0080	1,462	0,968	0,733	0,658	0,544	0,370	0,272	0,272	0,272	0,272
130	0,0077	1,538	1,027	0,783	0,704	0,586	0,404	0,272	0,272	0,272	0,272
135	0,0074	1,613	1,085	0,832	0,751	0,628	0,438	0,283	0,272	0,272	0,272
140	0,0071	1,688	1,144	0,882	0,798	0,670	0,472	0,311	0,272	0,272	0,272
145	0,0069	1,763	1,203	0,933	0,845	0,713	0,507	0,339	0,272	0,272	0,272
150	0,0067	1,837	1,261	0,984	0,893	0,756	0,542	0,367	0,272	0,272	0,272
155	0,0065	1,912	1,320	1,035	0,941	0,800	0,578	0,396	0,272	0,272	0,272
160	0,0063	1,985	1,380	1,086	0,989	0,844	0,614	0,426	0,272	0,272	0,272
165	0,0061	2,059	1,439	1,137	1,038	0,888	0,651	0,455	0,283	0,272	0,272
170	0,0059		1,498	1,189	1,087	0,933	0,688	0,486	0,306	0,272	0,272
175	0,0057		1,557	1,242	1,136	0,978	0,725	0,516	0,330	0,272	0,272
180	0,0056		1,617	1,294	1,186	1,024	0,763	0,547	0,355	0,272	0,272
185	0,0054		1,676	1,347	1,236	1,070	0,802	0,579	0,380	0,272	0,272
190	0,0053		1,736	1,400	1,286	1,116	0,841	0,611	0,405	0,272	0,272
195	0,0051		1,796	1,454	1,337	1,163	0,880	0,643	0,431	0,272	0,272
200	0,0050		1,856	1,507	1,389	1,210	0,920	0,676	0,457	0,291	0,272
205	0,0049		1,915	1,561	1,440	1,258	0,961	0,710	0,484	0,312	0,272
210	0,0048		1,975	1,616	1,492	1,307	1,002	0,744	0,511	0,334	0,272
215	0,0047		2,036	1,671	1,545	1,355	1,043	0,779	0,539	0,356	0,272
220	0,0045		2,096	1,726	1,597	1,405	1,085	0,814	0,567	0,379	0,272
225	0,0044			1,781	1,651	1,454	1,128	0,849	0,596	0,402	0,272
230	0,0043			1,837	1,704	1,505	1,171	0,886	0,625	0,425	0,272
235	0,0043			1,893	1,758	1,556	1,215	0,922	0,655	0,449	0,272
240	0,0042			1,950	1,813	1,607	1,259	0,960	0,685	0,474	0,272
245	0,0041			2,007	1,867	1,659	1,304	0,998	0,716	0,499	0,272
250	0,0040			2,064	1,923	1,711	1,349	1,036	0,747	0,524	0,284
255	0,0039			2,121	1,978	1,764	1,395	1,076	0,780	0,550	0,303
260	0,0038					1,817	1,442	1,116	0,812	0,577	0,322
265	0,0038					1,871	1,490	1,156	0,846	0,604	0,342
270	0,0037					1,926	1,538	1,198	0,880	0,632	0,363
275	0,0036					1,981	1,586	1,240	0,914	0,661	0,384
280	0,0036					2,036	1,636	1,282	0,950	0,690	0,405
285	0,0035					2,093	1,686	1,326	0,986	0,720	0,427
290	0,0034						1,737	1,370	1,023	0,750	0,449
295	0,0034						1,788	1,415	1,061	0,781	0,473
300	0,0033						1,841	1,461	1,099	0,813	0,496

Annex 1, Table 3: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 45 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033						1,894	1,508	1,138	0,846	0,521
310	0,0032						1,948	1,556	1,178	0,880	0,546
315	0,0032						2,002	1,604	1,219	0,914	0,571
320	0,0031						2,058	1,653	1,261	0,949	0,598
325	0,0031						2,114	1,704	1,304	0,985	0,625
330	0,0030							1,755	1,348	1,023	0,653
335	0,0030							1,807	1,393	1,061	0,682
340	0,0029							1,860	1,439	1,100	0,711
345	0,0029							1,915	1,486	1,140	0,742
350	0,0029							1,970	1,534	1,181	0,774
355	0,0028							2,027	1,583	1,223	0,806
360	0,0028							2,084	1,633	1,267	0,840
365	0,0027								1,685	1,312	0,874
370	0,0027								1,738	1,358	0,910
375	0,0027								1,792	1,405	0,947
380	0,0026								1,847	1,454	0,985
385	0,0026								1,904	1,505	1,024
390	0,0026								1,963	1,556	1,065
395	0,0025								2,023	1,610	1,108
400	0,0025								2,085	1,665	1,152
405	0,0025									1,722	1,197
410	0,0024									1,781	1,244
415	0,0024									1,842	1,293
420	0,0024									1,904	1,344
425	0,0024									1,969	1,397
430	0,0023									2,037	1,452
435	0,0023									2,106	1,510
440	0,0023										1,569
445	0,0022										1,632
450	0,0022										1,697
455	0,0022										1,765
460	0,0022										1,837

Annex 1, Table 4: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 60 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	1,450	0,974	0,756	0,688	0,585	0,430	0,306	0,272	0,272	0,272
95	0,0105	1,556	1,055	0,825	0,752	0,644	0,478	0,346	0,272	0,272	0,272
100	0,0100	1,661	1,136	0,894	0,817	0,703	0,527	0,387	0,272	0,272	0,272
105	0,0095	1,766	1,217	0,963	0,883	0,762	0,577	0,429	0,301	0,272	0,272
110	0,0091	1,871	1,299	1,033	0,949	0,822	0,628	0,471	0,336	0,272	0,272
115	0,0087	1,975	1,380	1,104	1,015	0,883	0,678	0,514	0,371	0,272	0,272
120	0,0083	2,079	1,462	1,174	1,082	0,944	0,730	0,557	0,407	0,297	0,272
125	0,0080		1,544	1,245	1,149	1,005	0,782	0,601	0,444	0,328	0,272
130	0,0077		1,626	1,317	1,217	1,068	0,835	0,646	0,481	0,360	0,272
135	0,0074		1,708	1,389	1,286	1,130	0,888	0,691	0,519	0,392	0,272
140	0,0071		1,791	1,461	1,354	1,194	0,942	0,737	0,557	0,425	0,287
145	0,0069		1,873	1,534	1,424	1,258	0,996	0,783	0,596	0,458	0,313
150	0,0067		1,955	1,607	1,493	1,322	1,052	0,830	0,635	0,491	0,341
155	0,0065		2,038	1,681	1,564	1,387	1,107	0,878	0,676	0,526	0,369
160	0,0063		2,121	1,755	1,634	1,453	1,164	0,926	0,716	0,561	0,397
165	0,0061			1,830	1,706	1,519	1,221	0,976	0,758	0,596	0,426
170	0,0059			1,905	1,777	1,586	1,279	1,025	0,800	0,632	0,456
175	0,0057			1,980	1,850	1,654	1,338	1,076	0,843	0,669	0,486
180	0,0056			2,056	1,923	1,722	1,397	1,127	0,887	0,707	0,517
185	0,0054					1,791	1,457	1,180	0,931	0,745	0,549
190	0,0053					1,861	1,518	1,232	0,976	0,784	0,581
195	0,0051					1,931	1,580	1,286	1,022	0,824	0,613
200	0,0050					2,002	1,642	1,341	1,069	0,865	0,647
205	0,0049					2,073	1,705	1,396	1,116	0,906	0,681
210	0,0048						1,770	1,452	1,164	0,948	0,716
215	0,0047						1,834	1,509	1,214	0,991	0,752
220	0,0045						1,900	1,567	1,264	1,035	0,788
225	0,0044						1,967	1,626	1,315	1,080	0,825
230	0,0043						2,034	1,686	1,367	1,125	0,864
235	0,0043						2,102	1,747	1,420	1,172	0,903
240	0,0042							1,809	1,474	1,219	0,942
245	0,0041							1,871	1,529	1,268	0,983
250	0,0040							1,935	1,585	1,318	1,025
255	0,0039							2,000	1,642	1,368	1,068
260	0,0038							2,066	1,700	1,420	1,111
265	0,0038								1,759	1,473	1,156
270	0,0037								1,820	1,527	1,202
275	0,0036								1,881	1,583	1,249
280	0,0036								1,944	1,639	1,298
285	0,0035								2,009	1,697	1,347
290	0,0034								2,074	1,757	1,398
295	0,0034									1,817	1,450
300	0,0033									1,880	1,504



Annex 1, Table 4: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 60 minutes									
		Design Temperature $\theta_D$ in °C									
A/V m <sup>-1</sup>	V/A m	350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033									1,943	1,559
310	0,0032									2,009	1,615
315	0,0032									2,076	1,673
320	0,0031										1,733
325	0,0031										1,794
330	0,0030										1,857
335	0,0030										1,922
340	0,0029										1,989
345	0,0029										2,058
350	0,0029										
355	0,0028										
360	0,0028										
365	0,0027										
370	0,0027										
375	0,0027										
380	0,0026										
385	0,0026										
390	0,0026										
395	0,0025										
400	0,0025										
405	0,0025										
410	0,0024										
415	0,0024										
420	0,0024										
425	0,0024										
430	0,0023										
435	0,0023										
440	0,0023										
445	0,0022										
450	0,0022										
455	0,0022										
460	0,0022										

Annex 1, Table 5: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 75 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	1,976	1,386	1,117	1,033	0,907	0,715	0,562	0,430	0,335	0,272
95	0,0105	2,110	1,490	1,207	1,118	0,985	0,781	0,618	0,478	0,377	0,272
100	0,0100		1,595	1,298	1,204	1,063	0,848	0,676	0,527	0,419	0,307
105	0,0095		1,700	1,389	1,290	1,143	0,916	0,734	0,576	0,462	0,343
110	0,0091		1,804	1,480	1,377	1,222	0,984	0,792	0,626	0,506	0,380
115	0,0087		1,909	1,572	1,465	1,303	1,053	0,852	0,677	0,550	0,418
120	0,0083		2,015	1,665	1,553	1,384	1,123	0,913	0,729	0,595	0,456
125	0,0080		2,120	1,758	1,641	1,467	1,194	0,974	0,782	0,641	0,495
130	0,0077			1,851	1,731	1,549	1,266	1,036	0,835	0,688	0,535
135	0,0074			1,946	1,821	1,633	1,338	1,099	0,889	0,736	0,575
140	0,0071			2,040	1,911	1,717	1,412	1,163	0,944	0,784	0,616
145	0,0069					1,802	1,486	1,227	1,000	0,833	0,658
150	0,0067					1,888	1,561	1,293	1,057	0,883	0,701
155	0,0065					1,975	1,637	1,360	1,115	0,934	0,744
160	0,0063					2,062	1,714	1,427	1,173	0,986	0,789
165	0,0061						1,792	1,496	1,233	1,039	0,834
170	0,0059						1,870	1,565	1,294	1,093	0,880
175	0,0057						1,950	1,636	1,355	1,148	0,927
180	0,0056						2,031	1,707	1,418	1,204	0,975
185	0,0054						2,113	1,780	1,482	1,261	1,024
190	0,0053							1,854	1,547	1,319	1,074
195	0,0051							1,929	1,613	1,378	1,125
200	0,0050							2,005	1,680	1,438	1,177
205	0,0049							2,082	1,748	1,499	1,231
210	0,0048								1,818	1,562	1,285
215	0,0047								1,888	1,626	1,340
220	0,0045								1,960	1,691	1,397
225	0,0044								2,034	1,757	1,455
230	0,0043								2,109	1,825	1,515
235	0,0043									1,894	1,575
240	0,0042									1,965	1,637
245	0,0041									2,037	1,701
250	0,0040									2,111	1,766
255	0,0039										1,832
260	0,0038										1,901
265	0,0038										1,970
270	0,0037										2,042
275	0,0036										2,115
280	0,0036										
285	0,0035										
290	0,0034										
295	0,0034										
300	0,0033										

Annex 1, Table 6: Beams, open sections (H and I Profile)

Interchar 963		Fire Resistance 90 minutes									
		Design Temperature $\theta_D$ in °C									
A/V m <sup>-1</sup>	V/A m	350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111		1,798	1,479	1,379	1,229	1,000	0,818	0,661	0,548	0,430
95	0,0105		1,926	1,590	1,485	1,326	1,084	0,890	0,723	0,603	0,478
100	0,0100		2,054	1,702	1,591	1,424	1,168	0,964	0,787	0,659	0,526
105	0,0095			1,814	1,698	1,523	1,254	1,038	0,852	0,716	0,575
110	0,0091			1,927	1,806	1,623	1,340	1,114	0,917	0,774	0,626
115	0,0087			2,041	1,914	1,723	1,428	1,190	0,983	0,833	0,677
120	0,0083					1,825	1,516	1,268	1,051	0,893	0,728
125	0,0080					1,928	1,606	1,346	1,120	0,954	0,781
130	0,0077					2,031	1,697	1,426	1,189	1,016	0,835
135	0,0074						1,788	1,507	1,260	1,079	0,890
140	0,0071						1,881	1,589	1,332	1,144	0,946
145	0,0069						1,975	1,672	1,405	1,209	1,003
150	0,0067						2,070	1,756	1,479	1,275	1,061
155	0,0065							1,841	1,554	1,343	1,120
160	0,0063							1,928	1,631	1,412	1,180
165	0,0061							2,016	1,708	1,482	1,241
170	0,0059							2,105	1,787	1,554	1,304
175	0,0057								1,868	1,626	1,368
180	0,0056								1,950	1,700	1,433
185	0,0054								2,033	1,776	1,500
190	0,0053								2,117	1,853	1,568
195	0,0051									1,931	1,637
200	0,0050									2,011	1,708
205	0,0049									2,093	1,780
210	0,0048										1,854
215	0,0047										1,929
220	0,0045										2,006
225	0,0044										2,085
230	0,0043										
235	0,0043										
240	0,0042										
245	0,0041										
250	0,0040										
255	0,0039										
260	0,0038										
265	0,0038										
270	0,0037										
275	0,0036										
280	0,0036										
285	0,0035										
290	0,0034										
295	0,0034										
300	0,0033										

Annex 1, Table 7: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 15 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
95	0,0105	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
100	0,0100	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
105	0,0095	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
110	0,0091	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
115	0,0087	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
120	0,0083	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
125	0,0080	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
130	0,0077	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
135	0,0074	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
140	0,0071	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
145	0,0069	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
150	0,0067	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
155	0,0065	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
160	0,0063	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
165	0,0061	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
170	0,0059	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
175	0,0057	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
180	0,0056	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
185	0,0054	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
190	0,0053	0,287	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
195	0,0051	0,307	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
200	0,0050	0,327	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
205	0,0049	0,347	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
210	0,0048	0,367	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
215	0,0047	0,386	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
220	0,0045	0,406	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
225	0,0044	0,425	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
230	0,0043	0,445	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
235	0,0043	0,464	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
240	0,0042	0,483	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
245	0,0041	0,503	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
250	0,0040	0,522	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
255	0,0039	0,541	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
260	0,0038	0,560	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
265	0,0038	0,579	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
270	0,0037	0,598	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
275	0,0036	0,616	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
280	0,0036	0,635	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
285	0,0035	0,654	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
290	0,0034	0,672	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
295	0,0034	0,691	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
300	0,0033	0,709	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286

Annex 1, Table 7: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 15 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033	0,728	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
310	0,0032	0,746	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
315	0,0032	0,764	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
320	0,0031	0,782	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
325	0,0031	0,800	0,289	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
330	0,0030	0,819	0,301	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
335	0,0030	0,836	0,313	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
340	0,0029	0,854	0,325	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
345	0,0029	0,872	0,338	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
350	0,0029	0,890	0,350	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
355	0,0028	0,908	0,362	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
360	0,0028	0,925	0,375	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
365	0,0027	0,943	0,387	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
370	0,0027	0,960	0,399	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
375	0,0027	0,978	0,412	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
380	0,0026	0,995	0,424	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
385	0,0026	1,013	0,437	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
390	0,0026	1,030	0,449	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
395	0,0025	1,047	0,462	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
400	0,0025	1,064	0,474	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
405	0,0025	1,081	0,487	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
410	0,0024	1,098	0,499	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
415	0,0024	1,115	0,512	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
420	0,0024	1,132	0,524	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
425	0,0024	1,149	0,537	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
430	0,0023	1,166	0,550	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
435	0,0023	1,182	0,562	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
440	0,0023	1,199	0,575	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
445	0,0022	1,216	0,588	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
450	0,0022	1,232	0,600	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
455	0,0022	1,249	0,613	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
460	0,0022	1,265	0,626	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286

Annex 1, Table 8: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 30 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	0,397	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
95	0,0105	0,447	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
100	0,0100	0,497	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
105	0,0095	0,546	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
110	0,0091	0,595	0,288	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
115	0,0087	0,644	0,322	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
120	0,0083	0,693	0,357	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
125	0,0080	0,741	0,392	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
130	0,0077	0,790	0,427	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
135	0,0074	0,838	0,462	0,286	0,286	0,286	0,286	0,286	0,286	0,286	0,286
140	0,0071	0,886	0,497	0,303	0,296	0,286	0,286	0,286	0,286	0,286	0,286
145	0,0069	0,933	0,532	0,331	0,313	0,286	0,286	0,286	0,286	0,286	0,286
150	0,0067	0,981	0,568	0,360	0,330	0,286	0,286	0,286	0,286	0,286	0,286
155	0,0065	1,028	0,603	0,388	0,347	0,286	0,286	0,286	0,286	0,286	0,286
160	0,0063	1,076	0,638	0,416	0,364	0,286	0,286	0,286	0,286	0,286	0,286
165	0,0061	1,123	0,673	0,445	0,381	0,286	0,286	0,286	0,286	0,286	0,286
170	0,0059	1,170	0,709	0,474	0,399	0,286	0,286	0,286	0,286	0,286	0,286
175	0,0057	1,216	0,744	0,503	0,422	0,302	0,286	0,286	0,286	0,286	0,286
180	0,0056	1,263	0,780	0,532	0,449	0,325	0,286	0,286	0,286	0,286	0,286
185	0,0054	1,309	0,815	0,561	0,476	0,348	0,286	0,286	0,286	0,286	0,286
190	0,0053	1,355	0,851	0,591	0,503	0,372	0,286	0,286	0,286	0,286	0,286
195	0,0051	1,401	0,887	0,620	0,530	0,395	0,286	0,286	0,286	0,286	0,286
200	0,0050	1,447	0,923	0,650	0,558	0,419	0,286	0,286	0,286	0,286	0,286
205	0,0049	1,492	0,958	0,680	0,586	0,443	0,286	0,286	0,286	0,286	0,286
210	0,0048	1,538	0,994	0,710	0,613	0,468	0,286	0,286	0,286	0,286	0,286
215	0,0047	1,583	1,030	0,741	0,641	0,492	0,286	0,286	0,286	0,286	0,286
220	0,0045	1,628	1,066	0,771	0,670	0,517	0,286	0,286	0,286	0,286	0,286
225	0,0044	1,673	1,102	0,802	0,698	0,542	0,289	0,286	0,286	0,286	0,286
230	0,0043	1,718	1,138	0,833	0,727	0,568	0,308	0,286	0,286	0,286	0,286
235	0,0043	1,762	1,175	0,864	0,756	0,593	0,327	0,286	0,286	0,286	0,286
240	0,0042	1,807	1,211	0,896	0,785	0,619	0,346	0,286	0,286	0,286	0,286
245	0,0041	1,851	1,247	0,927	0,814	0,645	0,366	0,286	0,286	0,286	0,286
250	0,0040	1,895	1,284	0,959	0,844	0,672	0,386	0,286	0,286	0,286	0,286
255	0,0039	1,939	1,320	0,991	0,874	0,698	0,406	0,286	0,286	0,286	0,286
260	0,0038	1,983	1,357	1,023	0,904	0,725	0,426	0,286	0,286	0,286	0,286
265	0,0038	2,026	1,393	1,055	0,934	0,752	0,447	0,286	0,286	0,286	0,286
270	0,0037	2,070	1,430	1,088	0,965	0,780	0,468	0,286	0,286	0,286	0,286
275	0,0036	2,113	1,466	1,121	0,996	0,808	0,489	0,286	0,286	0,286	0,286
280	0,0036	2,156	1,503	1,154	1,027	0,836	0,511	0,286	0,286	0,286	0,286
285	0,0035	2,199	1,540	1,187	1,058	0,864	0,533	0,286	0,286	0,286	0,286
290	0,0034	2,242	1,577	1,220	1,089	0,893	0,555	0,286	0,286	0,286	0,286
295	0,0034	2,284	1,614	1,254	1,121	0,922	0,577	0,286	0,286	0,286	0,286
300	0,0033	2,327	1,651	1,288	1,153	0,951	0,600	0,286	0,286	0,286	0,286

Annex 1, Table 8: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 30 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033	2,369	1,688	1,322	1,185	0,981	0,623	0,302	0,286	0,286	0,286
310	0,0032	2,411	1,725	1,356	1,218	1,011	0,647	0,319	0,286	0,286	0,286
315	0,0032	2,453	1,762	1,390	1,251	1,041	0,671	0,335	0,286	0,286	0,286
320	0,0031	2,495	1,799	1,425	1,284	1,071	0,695	0,353	0,286	0,286	0,286
325	0,0031		1,836	1,460	1,317	1,102	0,720	0,370	0,286	0,286	0,286
330	0,0030		1,874	1,495	1,351	1,134	0,745	0,388	0,286	0,286	0,286
335	0,0030		1,911	1,531	1,384	1,165	0,770	0,406	0,286	0,286	0,286
340	0,0029		1,949	1,566	1,419	1,197	0,796	0,425	0,286	0,286	0,286
345	0,0029		1,986	1,602	1,453	1,229	0,822	0,444	0,286	0,286	0,286
350	0,0029		2,024	1,638	1,488	1,262	0,848	0,463	0,286	0,286	0,286
355	0,0028		2,061	1,675	1,523	1,295	0,875	0,483	0,286	0,286	0,286
360	0,0028		2,099	1,711	1,558	1,329	0,903	0,503	0,286	0,286	0,286
365	0,0027		2,137	1,748	1,594	1,362	0,931	0,523	0,286	0,286	0,286
370	0,0027		2,175	1,785	1,630	1,397	0,959	0,544	0,286	0,286	0,286
375	0,0027		2,213	1,822	1,666	1,431	0,988	0,565	0,286	0,286	0,286
380	0,0026		2,251	1,860	1,702	1,466	1,017	0,587	0,286	0,286	0,286
385	0,0026		2,289	1,898	1,739	1,502	1,047	0,609	0,286	0,286	0,286
390	0,0026		2,327	1,936	1,777	1,537	1,077	0,632	0,286	0,286	0,286
395	0,0025		2,365	1,974	1,814	1,574	1,108	0,655	0,286	0,286	0,286
400	0,0025		2,403	2,013	1,852	1,610	1,139	0,679	0,286	0,286	0,286
405	0,0025		2,442	2,052	1,890	1,648	1,171	0,703	0,286	0,286	0,286
410	0,0024		2,480	2,091	1,929	1,685	1,203	0,728	0,286	0,286	0,286
415	0,0024		2,518	2,130	1,968	1,723	1,236	0,754	0,286	0,286	0,286
420	0,0024			2,170	2,007	1,762	1,269	0,779	0,286	0,286	0,286
425	0,0024			2,210	2,046	1,801	1,303	0,806	0,286	0,286	0,286
430	0,0023			2,250	2,086	1,840	1,338	0,833	0,297	0,286	0,286
435	0,0023			2,291	2,127	1,880	1,373	0,861	0,314	0,286	0,286
440	0,0023			2,332	2,167	1,921	1,409	0,889	0,331	0,286	0,286
445	0,0022			2,373	2,208	1,962	1,446	0,919	0,348	0,286	0,286
450	0,0022			2,414	2,250	2,003	1,483	0,949	0,367	0,286	0,286
455	0,0022			2,456	2,292	2,045	1,521	0,979	0,385	0,286	0,286
460	0,0022			2,498	2,334	2,088	1,560	1,011	0,405	0,286	0,286

Annex 1, Table 9: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 45 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	0,924	0,561	0,394	0,351	0,286	0,286	0,286	0,286	0,286	0,286
95	0,0105	1,001	0,619	0,442	0,386	0,302	0,286	0,286	0,286	0,286	0,286
100	0,0100	1,079	0,677	0,490	0,431	0,342	0,286	0,286	0,286	0,286	0,286
105	0,0095	1,156	0,735	0,538	0,475	0,382	0,286	0,286	0,286	0,286	0,286
110	0,0091	1,233	0,793	0,586	0,520	0,422	0,286	0,286	0,286	0,286	0,286
115	0,0087	1,310	0,851	0,635	0,566	0,462	0,304	0,286	0,286	0,286	0,286
120	0,0083	1,386	0,910	0,684	0,612	0,503	0,337	0,286	0,286	0,286	0,286
125	0,0080	1,462	0,968	0,733	0,658	0,544	0,370	0,286	0,286	0,286	0,286
130	0,0077	1,538	1,027	0,783	0,704	0,586	0,404	0,286	0,286	0,286	0,286
135	0,0074	1,613	1,085	0,832	0,751	0,628	0,438	0,286	0,286	0,286	0,286
140	0,0071	1,688	1,144	0,882	0,798	0,670	0,472	0,311	0,286	0,286	0,286
145	0,0069	1,763	1,203	0,933	0,845	0,713	0,507	0,339	0,286	0,286	0,286
150	0,0067	1,837	1,261	0,984	0,893	0,756	0,542	0,367	0,286	0,286	0,286
155	0,0065	1,912	1,320	1,035	0,941	0,800	0,578	0,396	0,286	0,286	0,286
160	0,0063	1,985	1,380	1,086	0,989	0,844	0,614	0,426	0,286	0,286	0,286
165	0,0061	2,059	1,439	1,137	1,038	0,888	0,651	0,455	0,286	0,286	0,286
170	0,0059	2,132	1,498	1,189	1,087	0,933	0,688	0,486	0,306	0,286	0,286
175	0,0057	2,206	1,557	1,242	1,136	0,978	0,725	0,516	0,330	0,286	0,286
180	0,0056	2,278	1,617	1,294	1,186	1,024	0,763	0,547	0,355	0,286	0,286
185	0,0054	2,351	1,676	1,347	1,236	1,070	0,802	0,579	0,380	0,286	0,286
190	0,0053	2,423	1,736	1,400	1,286	1,116	0,841	0,611	0,405	0,286	0,286
195	0,0051	2,495	1,796	1,454	1,337	1,163	0,880	0,643	0,431	0,286	0,286
200	0,0050		1,856	1,507	1,389	1,210	0,920	0,676	0,457	0,291	0,286
205	0,0049		1,915	1,561	1,440	1,258	0,961	0,710	0,484	0,312	0,286
210	0,0048		1,975	1,616	1,492	1,307	1,002	0,744	0,511	0,334	0,286
215	0,0047		2,036	1,671	1,545	1,355	1,043	0,779	0,539	0,356	0,286
220	0,0045		2,096	1,726	1,597	1,405	1,085	0,814	0,567	0,379	0,286
225	0,0044		2,156	1,781	1,651	1,454	1,128	0,849	0,596	0,402	0,286
230	0,0043		2,217	1,837	1,704	1,505	1,171	0,886	0,625	0,425	0,286
235	0,0043		2,277	1,893	1,758	1,556	1,215	0,922	0,655	0,449	0,286
240	0,0042		2,338	1,950	1,813	1,607	1,259	0,960	0,685	0,474	0,286
245	0,0041		2,399	2,007	1,867	1,659	1,304	0,998	0,716	0,499	0,286
250	0,0040		2,459	2,064	1,923	1,711	1,349	1,036	0,747	0,524	0,286
255	0,0039		2,520	2,121	1,978	1,764	1,395	1,076	0,780	0,550	0,303
260	0,0038			2,179	2,034	1,817	1,442	1,116	0,812	0,577	0,322
265	0,0038			2,238	2,091	1,871	1,490	1,156	0,846	0,604	0,342
270	0,0037			2,296	2,148	1,926	1,538	1,198	0,880	0,632	0,363
275	0,0036			2,355	2,205	1,981	1,586	1,240	0,914	0,661	0,384
280	0,0036			2,415	2,263	2,036	1,636	1,282	0,950	0,690	0,405
285	0,0035			2,475	2,322	2,093	1,686	1,326	0,986	0,720	0,427
290	0,0034					2,149	1,737	1,370	1,023	0,750	0,449
295	0,0034					2,207	1,788	1,415	1,061	0,781	0,473
300	0,0033					2,265	1,841	1,461	1,099	0,813	0,496



Annex 1, Table 9: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 45 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033					2,324	1,894	1,508	1,138	0,846	0,521
310	0,0032					2,383	1,948	1,556	1,178	0,880	0,546
315	0,0032					2,443	2,002	1,604	1,219	0,914	0,571
320	0,0031					2,504	2,058	1,653	1,261	0,949	0,598
325	0,0031						2,114	1,704	1,304	0,985	0,625
330	0,0030						2,171	1,755	1,348	1,023	0,653
335	0,0030						2,229	1,807	1,393	1,061	0,682
340	0,0029						2,288	1,860	1,439	1,100	0,711
345	0,0029						2,348	1,915	1,486	1,140	0,742
350	0,0029						2,409	1,970	1,534	1,181	0,774
355	0,0028						2,471	2,027	1,583	1,223	0,806
360	0,0028							2,084	1,633	1,267	0,840
365	0,0027							2,143	1,685	1,312	0,874
370	0,0027							2,203	1,738	1,358	0,910
375	0,0027							2,264	1,792	1,405	0,947
380	0,0026							2,327	1,847	1,454	0,985
385	0,0026							2,391	1,904	1,505	1,024
390	0,0026							2,456	1,963	1,556	1,065
395	0,0025							2,522	2,023	1,610	1,108
400	0,0025								2,085	1,665	1,152
405	0,0025								2,148	1,722	1,197
410	0,0024								2,213	1,781	1,244
415	0,0024								2,280	1,842	1,293
420	0,0024								2,349	1,904	1,344
425	0,0024								2,419	1,969	1,397
430	0,0023								2,492	2,037	1,452
435	0,0023									2,106	1,510
440	0,0023									2,178	1,569
445	0,0022									2,253	1,632
450	0,0022									2,331	1,697
455	0,0022									2,411	1,765
460	0,0022									2,495	1,837

Annex 1, Table 10: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 60 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	1,450	0,974	0,756	0,688	0,585	0,430	0,306	0,286	0,286	0,286
95	0,0105	1,556	1,055	0,825	0,752	0,644	0,478	0,346	0,286	0,286	0,286
100	0,0100	1,661	1,136	0,894	0,817	0,703	0,527	0,387	0,286	0,286	0,286
105	0,0095	1,766	1,217	0,963	0,883	0,762	0,577	0,429	0,301	0,286	0,286
110	0,0091	1,871	1,299	1,033	0,949	0,822	0,628	0,471	0,336	0,286	0,286
115	0,0087	1,975	1,380	1,104	1,015	0,883	0,678	0,514	0,371	0,286	0,286
120	0,0083	2,079	1,462	1,174	1,082	0,944	0,730	0,557	0,407	0,297	0,286
125	0,0080	2,183	1,544	1,245	1,149	1,005	0,782	0,601	0,444	0,328	0,286
130	0,0077	2,286	1,626	1,317	1,217	1,068	0,835	0,646	0,481	0,360	0,286
135	0,0074	2,388	1,708	1,389	1,286	1,130	0,888	0,691	0,519	0,392	0,286
140	0,0071	2,490	1,791	1,461	1,354	1,194	0,942	0,737	0,557	0,425	0,287
145	0,0069		1,873	1,534	1,424	1,258	0,996	0,783	0,596	0,458	0,313
150	0,0067		1,955	1,607	1,493	1,322	1,052	0,830	0,635	0,491	0,341
155	0,0065		2,038	1,681	1,564	1,387	1,107	0,878	0,676	0,526	0,369
160	0,0063		2,121	1,755	1,634	1,453	1,164	0,926	0,716	0,561	0,397
165	0,0061		2,204	1,830	1,706	1,519	1,221	0,976	0,758	0,596	0,426
170	0,0059		2,287	1,905	1,777	1,586	1,279	1,025	0,800	0,632	0,456
175	0,0057		2,370	1,980	1,850	1,654	1,338	1,076	0,843	0,669	0,486
180	0,0056		2,454	2,056	1,923	1,722	1,397	1,127	0,887	0,707	0,517
185	0,0054			2,133	1,996	1,791	1,457	1,180	0,931	0,745	0,549
190	0,0053			2,209	2,070	1,861	1,518	1,232	0,976	0,784	0,581
195	0,0051			2,287	2,144	1,931	1,580	1,286	1,022	0,824	0,613
200	0,0050			2,364	2,219	2,002	1,642	1,341	1,069	0,865	0,647
205	0,0049			2,443	2,295	2,073	1,705	1,396	1,116	0,906	0,681
210	0,0048			2,521	2,371	2,146	1,770	1,452	1,164	0,948	0,716
215	0,0047				2,219	1,834	1,509	1,214	0,991	0,752	
220	0,0045				2,292	1,900	1,567	1,264	1,035	0,788	
225	0,0044				2,367	1,967	1,626	1,315	1,080	0,825	
230	0,0043				2,442	2,034	1,686	1,367	1,125	0,864	
235	0,0043					2,518	2,102	1,747	1,420	1,172	0,903
240	0,0042						2,172	1,809	1,474	1,219	0,942
245	0,0041						2,242	1,871	1,529	1,268	0,983
250	0,0040						2,313	1,935	1,585	1,318	1,025
255	0,0039						2,385	2,000	1,642	1,368	1,068
260	0,0038						2,458	2,066	1,700	1,420	1,111
265	0,0038							2,133	1,759	1,473	1,156
270	0,0037							2,201	1,820	1,527	1,202
275	0,0036							2,271	1,881	1,583	1,249
280	0,0036							2,342	1,944	1,639	1,298
285	0,0035							2,413	2,009	1,697	1,347
290	0,0034							2,487	2,074	1,757	1,398
295	0,0034								2,141	1,817	1,450
300	0,0033								2,210	1,880	1,504

Annex 1, Table 10: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 60 minutes									
		Design Temperature $\theta_D$ in °C									
A/V	350	350	400	450	470	500	550	600	650	700	750
m <sup>-1</sup>	m	Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033								2,280	1,943	1,559
310	0,0032								2,351	2,009	1,615
315	0,0032								2,424	2,076	1,673
320	0,0031								2,498	2,144	1,733
325	0,0031									2,214	1,794
330	0,0030									2,287	1,857
335	0,0030									2,361	1,922
340	0,0029									2,437	1,989
345	0,0029									2,515	2,058
350	0,0029										2,129
355	0,0028										2,203
360	0,0028										2,278
365	0,0027										2,356
370	0,0027										2,437
375	0,0027										2,520
380	0,0026										
385	0,0026										
390	0,0026										
395	0,0025										
400	0,0025										
405	0,0025										
410	0,0024										
415	0,0024										
420	0,0024										
425	0,0024										
430	0,0023										
435	0,0023										
440	0,0023										
445	0,0022										
450	0,0022										
455	0,0022										
460	0,0022										

Annex 1, Table 11: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 75 minutes									
A/V m <sup>-1</sup>	350 m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	1,976	1,386	1,117	1,033	0,907	0,715	0,562	0,430	0,335	0,286
95	0,0105	2,110	1,490	1,207	1,118	0,985	0,781	0,618	0,478	0,377	0,286
100	0,0100	2,243	1,595	1,298	1,204	1,063	0,848	0,676	0,527	0,419	0,307
105	0,0095	2,376	1,700	1,389	1,290	1,143	0,916	0,734	0,576	0,462	0,343
110	0,0091	2,509	1,804	1,480	1,377	1,222	0,984	0,792	0,626	0,506	0,380
115	0,0087		1,909	1,572	1,465	1,303	1,053	0,852	0,677	0,550	0,418
120	0,0083		2,015	1,665	1,553	1,384	1,123	0,913	0,729	0,595	0,456
125	0,0080		2,120	1,758	1,641	1,467	1,194	0,974	0,782	0,641	0,495
130	0,0077		2,226	1,851	1,731	1,549	1,266	1,036	0,835	0,688	0,535
135	0,0074		2,331	1,946	1,821	1,633	1,338	1,099	0,889	0,736	0,575
140	0,0071		2,437	2,040	1,911	1,717	1,412	1,163	0,944	0,784	0,616
145	0,0069			2,136	2,002	1,802	1,486	1,227	1,000	0,833	0,658
150	0,0067			2,231	2,094	1,888	1,561	1,293	1,057	0,883	0,701
155	0,0065			2,328	2,187	1,975	1,637	1,360	1,115	0,934	0,744
160	0,0063			2,425	2,280	2,062	1,714	1,427	1,173	0,986	0,789
165	0,0061			2,522	2,374	2,151	1,792	1,496	1,233	1,039	0,834
170	0,0059					2,240	1,870	1,565	1,294	1,093	0,880
175	0,0057					2,330	1,950	1,636	1,355	1,148	0,927
180	0,0056					2,421	2,031	1,707	1,418	1,204	0,975
185	0,0054					2,512	2,113	1,780	1,482	1,261	1,024
190	0,0053						2,196	1,854	1,547	1,319	1,074
195	0,0051						2,279	1,929	1,613	1,378	1,125
200	0,0050						2,364	2,005	1,680	1,438	1,177
205	0,0049						2,450	2,082	1,748	1,499	1,231
210	0,0048							2,160	1,818	1,562	1,285
215	0,0047							2,240	1,888	1,626	1,340
220	0,0045							2,321	1,960	1,691	1,397
225	0,0044							2,403	2,034	1,757	1,455
230	0,0043							2,486	2,109	1,825	1,515
235	0,0043								2,185	1,894	1,575
240	0,0042								2,262	1,965	1,637
245	0,0041								2,341	2,037	1,701
250	0,0040								2,422	2,111	1,766
255	0,0039								2,504	2,187	1,832
260	0,0038									2,264	1,901
265	0,0038									2,342	1,970
270	0,0037									2,423	2,042
275	0,0036									2,505	2,115
280	0,0036										2,190
285	0,0035										2,267
290	0,0034										2,347
295	0,0034										2,428
300	0,0033										2,511

Annex 1, Table 12: columns, open sections (H and I Profile)

Interchar 963		Fire Resistance 90 minutes									
A/V m <sup>-1</sup>	350 m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
90	0,0111	2,502	1,798	1,479	1,379	1,229	1,000	0,818	0,661	0,548	0,430
95	0,0105		1,926	1,590	1,485	1,326	1,084	0,890	0,723	0,603	0,478
100	0,0100		2,054	1,702	1,591	1,424	1,168	0,964	0,787	0,659	0,526
105	0,0095		2,182	1,814	1,698	1,523	1,254	1,038	0,852	0,716	0,575
110	0,0091		2,310	1,927	1,806	1,623	1,340	1,114	0,917	0,774	0,626
115	0,0087		2,439	2,041	1,914	1,723	1,428	1,190	0,983	0,833	0,677
120	0,0083			2,155	2,023	1,825	1,516	1,268	1,051	0,893	0,728
125	0,0080			2,270	2,133	1,928	1,606	1,346	1,120	0,954	0,781
130	0,0077			2,386	2,244	2,031	1,697	1,426	1,189	1,016	0,835
135	0,0074			2,502	2,356	2,135	1,788	1,507	1,260	1,079	0,890
140	0,0071					2,241	1,881	1,589	1,332	1,144	0,946
145	0,0069					2,347	1,975	1,672	1,405	1,209	1,003
150	0,0067					2,454	2,070	1,756	1,479	1,275	1,061
155	0,0065						2,166	1,841	1,554	1,343	1,120
160	0,0063						2,264	1,928	1,631	1,412	1,180
165	0,0061						2,362	2,016	1,708	1,482	1,241
170	0,0059						2,462	2,105	1,787	1,554	1,304
175	0,0057							2,196	1,868	1,626	1,368
180	0,0056							2,288	1,950	1,700	1,433
185	0,0054							2,381	2,033	1,776	1,500
190	0,0053							2,475	2,117	1,853	1,568
195	0,0051								2,204	1,931	1,637
200	0,0050								2,291	2,011	1,708
205	0,0049								2,380	2,093	1,780
210	0,0048								2,471	2,176	1,854
215	0,0047									2,261	1,929
220	0,0045									2,347	2,006
225	0,0044									2,435	2,085
230	0,0043										2,166
235	0,0043										2,248
240	0,0042										2,332
245	0,0041										2,418
250	0,0040										2,507
255	0,0039										
260	0,0038										
265	0,0038										
270	0,0037										
275	0,0036										
280	0,0036										
285	0,0035										
290	0,0034										
295	0,0034										
300	0,0033										

Annex 1, Table 13: columns, circular hollow sections

Interchar 963		Fire Resistance 15 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
80	0,0125	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
85	0,0118	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
90	0,0111	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
95	0,0105	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
100	0,0100	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
105	0,0095	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
110	0,0091	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
115	0,0087	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
120	0,0083	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
125	0,0080	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
130	0,0077	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
135	0,0074	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
140	0,0071	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
145	0,0069	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
150	0,0067	0,571	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
155	0,0065	0,637	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
160	0,0063	0,700	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
165	0,0061	0,761	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
170	0,0059	0,819	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
175	0,0057	0,874	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
180	0,0056	0,927	0,561	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
185	0,0054	0,978	0,614	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
190	0,0053	1,027	0,665	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
195	0,0051	1,074	0,714	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
200	0,0050	1,119	0,761	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
205	0,0049	1,163	0,807	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
210	0,0048	1,205	0,851	0,579	0,570	0,556	0,556	0,556	0,556	0,556	0,556
215	0,0047	1,245	0,893	0,623	0,596	0,556	0,556	0,556	0,556	0,556	0,556
220	0,0045	1,284	0,934	0,666	0,622	0,556	0,556	0,556	0,556	0,556	0,556
225	0,0044	1,322	0,974	0,707	0,647	0,556	0,556	0,556	0,556	0,556	0,556
230	0,0043	1,359	1,012	0,747	0,671	0,556	0,556	0,556	0,556	0,556	0,556
235	0,0043	1,394	1,049	0,786	0,694	0,556	0,556	0,556	0,556	0,556	0,556
240	0,0042	1,428	1,085	0,823	0,727	0,582	0,556	0,556	0,556	0,556	0,556
245	0,0041	1,461	1,120	0,860	0,764	0,620	0,556	0,556	0,556	0,556	0,556
250	0,0040	1,492	1,153	0,895	0,800	0,656	0,556	0,556	0,556	0,556	0,556
255	0,0039	1,523	1,186	0,929	0,834	0,692	0,556	0,556	0,556	0,556	0,556
260	0,0038	1,553	1,217	0,962	0,868	0,726	0,556	0,556	0,556	0,556	0,556
265	0,0038	1,582	1,248	0,995	0,901	0,760	0,556	0,556	0,556	0,556	0,556
270	0,0037	1,610	1,278	1,026	0,933	0,793	0,559	0,556	0,556	0,556	0,556
275	0,0036	1,638	1,307	1,057	0,964	0,824	0,592	0,556	0,556	0,556	0,556
280	0,0036	1,664	1,335	1,086	0,994	0,855	0,623	0,556	0,556	0,556	0,556
285	0,0035	1,690	1,362	1,115	1,023	0,885	0,654	0,556	0,556	0,556	0,556
290	0,0034	1,715	1,389	1,143	1,051	0,914	0,684	0,556	0,556	0,556	0,556
295	0,0034	1,739	1,415	1,170	1,079	0,943	0,714	0,556	0,556	0,556	0,556
300	0,0033	1,763	1,440	1,197	1,106	0,970	0,742	0,556	0,556	0,556	0,556

Annex 1, Table 13: columns, circular hollow sections

Interchar 963		Fire Resistance 15 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033	1,786	1,464	1,223	1,133	0,997	0,770	0,556	0,556	0,556	0,556
310	0,0032	1,808	1,488	1,248	1,158	1,024	0,797	0,556	0,556	0,556	0,556
315	0,0032	1,830	1,511	1,272	1,183	1,049	0,824	0,556	0,556	0,556	0,556
320	0,0031	1,851	1,534	1,296	1,208	1,075	0,850	0,575	0,556	0,556	0,556
325	0,0031	1,872	1,556	1,320	1,231	1,099	0,875	0,601	0,556	0,556	0,556
330	0,0030	1,892	1,578	1,343	1,255	1,123	0,900	0,626	0,556	0,556	0,556
335	0,0030	1,911	1,599	1,365	1,277	1,146	0,924	0,651	0,556	0,556	0,556
340	0,0029	1,930	1,619	1,387	1,300	1,169	0,948	0,675	0,556	0,556	0,556
345	0,0029	1,949	1,639	1,408	1,321	1,191	0,971	0,698	0,556	0,556	0,556
350	0,0029	1,967	1,659	1,428	1,342	1,213	0,993	0,721	0,556	0,556	0,556
355	0,0028	1,985	1,678	1,449	1,363	1,234	1,015	0,744	0,556	0,556	0,556
360	0,0028	2,002	1,696	1,468	1,383	1,255	1,037	0,766	0,556	0,556	0,556
365	0,0027	2,019	1,714	1,488	1,403	1,275	1,058	0,787	0,556	0,556	0,556
370	0,0027	2,036	1,732	1,507	1,422	1,295	1,078	0,808	0,556	0,556	0,556
375	0,0027	2,052	1,750	1,525	1,441	1,315	1,099	0,829	0,564	0,556	0,556
380	0,0026	2,068	1,767	1,543	1,459	1,334	1,118	0,849	0,584	0,556	0,556
385	0,0026	2,083	1,783	1,561	1,478	1,352	1,138	0,869	0,604	0,556	0,556
390	0,0026	2,098	1,799	1,578	1,495	1,370	1,157	0,888	0,624	0,556	0,556
395	0,0025	2,113	1,815	1,595	1,513	1,388	1,175	0,907	0,643	0,556	0,556
400	0,0025	2,128	1,831	1,612	1,529	1,406	1,194	0,926	0,662	0,556	0,556
405	0,0025	2,142	1,846	1,628	1,546	1,423	1,211	0,944	0,681	0,556	0,556
410	0,0024	2,156	1,861	1,644	1,562	1,440	1,229	0,962	0,699	0,556	0,556
415	0,0024	2,169	1,876	1,660	1,578	1,456	1,246	0,980	0,717	0,556	0,556
420	0,0024	2,183	1,890	1,675	1,594	1,472	1,263	0,997	0,734	0,556	0,556
425	0,0024	2,196	1,904	1,690	1,609	1,488	1,279	1,014	0,752	0,556	0,556
430	0,0023	2,208	1,918	1,705	1,624	1,504	1,296	1,030	0,768	0,556	0,556
435	0,0023	2,221	1,931	1,719	1,639	1,519	1,311	1,047	0,785	0,556	0,556
440	0,0023	2,233	1,945	1,733	1,654	1,534	1,327	1,063	0,801	0,556	0,556
445	0,0022	2,245	1,958	1,747	1,668	1,549	1,342	1,078	0,817	0,556	0,556
450	0,0022	2,257	1,970	1,761	1,682	1,563	1,357	1,094	0,833	0,556	0,556
455	0,0022	2,268	1,983	1,774	1,695	1,577	1,372	1,109	0,848	0,559	0,556
460	0,0022	2,280	1,995	1,787	1,709	1,591	1,387	1,124	0,863	0,574	0,556
465	0,0022	2,291	2,007	1,800	1,722	1,605	1,401	1,138	0,878	0,589	0,556
470	0,0021	2,302	2,019	1,813	1,735	1,618	1,415	1,153	0,893	0,604	0,556
475	0,0021	2,312	2,030	1,825	1,748	1,631	1,428	1,167	0,907	0,619	0,556

Annex 1, Table 14: columns, circular hollow sections

Interchar 963		Fire Resistance 30 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
80	0,0125	0,587	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
85	0,0118	0,770	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
90	0,0111	0,942	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
95	0,0105	1,102	0,626	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
100	0,0100	1,253	0,778	0,556	0,556	0,556	0,556	0,556	0,556	0,556	0,556
105	0,0095	1,394	0,921	0,586	0,574	0,556	0,556	0,556	0,556	0,556	0,556
110	0,0091	1,528	1,057	0,723	0,656	0,556	0,556	0,556	0,556	0,556	0,556
115	0,0087	1,654	1,185	0,853	0,735	0,558	0,556	0,556	0,556	0,556	0,556
120	0,0083	1,773	1,306	0,977	0,859	0,683	0,556	0,556	0,556	0,556	0,556
125	0,0080	1,885	1,421	1,095	0,978	0,802	0,556	0,556	0,556	0,556	0,556
130	0,0077	1,992	1,531	1,207	1,091	0,916	0,628	0,556	0,556	0,556	0,556
135	0,0074	2,094	1,635	1,314	1,198	1,025	0,737	0,556	0,556	0,556	0,556
140	0,0071	2,190	1,734	1,416	1,301	1,129	0,842	0,556	0,556	0,556	0,556
145	0,0069	2,282	1,829	1,514	1,400	1,229	0,943	0,584	0,556	0,556	0,556
150	0,0067	2,369	1,919	1,607	1,494	1,324	1,040	0,680	0,556	0,556	0,556
155	0,0065	2,453	2,005	1,696	1,584	1,416	1,133	0,772	0,556	0,556	0,556
160	0,0063	2,532	2,088	1,782	1,671	1,504	1,222	0,861	0,556	0,556	0,556
165	0,0061	2,609	2,167	1,864	1,754	1,588	1,307	0,946	0,597	0,556	0,556
170	0,0059	2,682	2,243	1,943	1,834	1,669	1,390	1,029	0,679	0,556	0,556
175	0,0057	2,751	2,316	2,019	1,910	1,747	1,470	1,108	0,757	0,556	0,556
180	0,0056	2,818	2,386	2,092	1,984	1,823	1,546	1,185	0,833	0,556	0,556
185	0,0054	2,883	2,453	2,162	2,055	1,895	1,620	1,259	0,907	0,556	0,556
190	0,0053	2,944	2,518	2,229	2,124	1,965	1,692	1,330	0,978	0,586	0,556
195	0,0051	3,004	2,580	2,295	2,190	2,032	1,761	1,399	1,047	0,654	0,556
200	0,0050	3,061	2,640	2,357	2,253	2,097	1,827	1,466	1,113	0,719	0,556
205	0,0049	3,116	2,698	2,418	2,315	2,160	1,892	1,531	1,178	0,783	0,556
210	0,0048	3,169	2,754	2,476	2,374	2,221	1,954	1,593	1,240	0,844	0,556
215	0,0047	3,220	2,807	2,533	2,432	2,280	2,014	1,654	1,300	0,904	0,556
220	0,0045	3,269	2,859	2,588	2,487	2,336	2,073	1,713	1,359	0,962	0,556
225	0,0044	3,316	2,909	2,640	2,541	2,391	2,129	1,770	1,416	1,018	0,556
230	0,0043	3,362	2,958	2,692	2,593	2,445	2,184	1,825	1,472	1,072	0,556
235	0,0043	3,406	3,005	2,741	2,643	2,496	2,237	1,879	1,525	1,125	0,605
240	0,0042	3,449	3,050	2,789	2,692	2,547	2,289	1,931	1,577	1,177	0,655
245	0,0041	3,491	3,094	2,836	2,739	2,595	2,339	1,982	1,628	1,227	0,703
250	0,0040	3,531	3,137	2,881	2,785	2,642	2,388	2,031	1,678	1,276	0,750
255	0,0039	3,570	3,178	2,924	2,830	2,688	2,435	2,079	1,726	1,323	0,796
260	0,0038	3,607	3,218	2,967	2,873	2,733	2,481	2,125	1,772	1,370	0,841
265	0,0038	3,644	3,257	3,008	2,915	2,776	2,526	2,170	1,818	1,415	0,884
270	0,0037	3,679	3,295	3,048	2,956	2,818	2,569	2,214	1,862	1,459	0,926
275	0,0036	3,714	3,332	3,087	2,996	2,859	2,612	2,257	1,905	1,501	0,968
280	0,0036	3,747	3,367	3,125	3,034	2,898	2,653	2,299	1,947	1,543	1,008
285	0,0035	3,780	3,402	3,162	3,072	2,937	2,693	2,340	1,988	1,584	1,048
290	0,0034	3,811	3,436	3,198	3,108	2,975	2,732	2,380	2,028	1,624	1,086
295	0,0034	3,842	3,468	3,233	3,144	3,011	2,770	2,418	2,067	1,662	1,123
300	0,0033	3,871	3,500	3,266	3,179	3,047	2,807	2,456	2,105	1,700	1,160



Annex 1, Table 14: columns, circular hollow sections

Interchar 963		Fire Resistance 30 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033	3,900	3,531	3,300	3,213	3,082	2,843	2,493	2,143	1,737	1,196
310	0,0032	3,929	3,561	3,332	3,245	3,116	2,879	2,529	2,179	1,773	1,231
315	0,0032	3,956	3,591	3,363	3,278	3,149	2,913	2,564	2,214	1,808	1,265
320	0,0031	3,983	3,619	3,394	3,309	3,181	2,947	2,598	2,249	1,843	1,298
325	0,0031	4,009	3,647	3,424	3,339	3,213	2,980	2,632	2,283	1,877	1,331
330	0,0030	4,034	3,675	3,453	3,369	3,244	3,012	2,664	2,316	1,909	1,363
335	0,0030	4,059	3,701	3,481	3,398	3,274	3,043	2,696	2,348	1,942	1,394
340	0,0029	4,083	3,727	3,509	3,427	3,303	3,074	2,728	2,380	1,973	1,425
345	0,0029	4,107	3,753	3,536	3,454	3,332	3,104	2,758	2,411	2,004	1,455
350	0,0029	4,130	3,777	3,563	3,482	3,360	3,133	2,788	2,441	2,034	1,484
355	0,0028	4,152	3,801	3,589	3,508	3,387	3,162	2,817	2,470	2,064	1,513
360	0,0028	4,174	3,825	3,614	3,534	3,414	3,190	2,846	2,499	2,093	1,541
365	0,0027	4,195	3,848	3,639	3,559	3,440	3,217	2,874	2,528	2,121	1,569
370	0,0027	4,216	3,871	3,663	3,584	3,466	3,244	2,901	2,556	2,149	1,596
375	0,0027	4,236	3,893	3,686	3,608	3,491	3,270	2,928	2,583	2,176	1,622
380	0,0026	4,256	3,914	3,709	3,632	3,515	3,296	2,954	2,609	2,203	1,648
385	0,0026	4,276	3,935	3,732	3,655	3,539	3,321	2,980	2,636	2,229	1,674
390	0,0026	4,295	3,956	3,754	3,678	3,563	3,345	3,005	2,661	2,254	1,699
395	0,0025	4,314	3,976	3,776	3,700	3,586	3,370	3,030	2,686	2,279	1,723
400	0,0025	4,332	3,996	3,797	3,722	3,609	3,393	3,054	2,711	2,304	1,747
405	0,0025	4,350	4,015	3,818	3,743	3,631	3,416	3,078	2,735	2,328	1,771
410	0,0024	4,367	4,034	3,838	3,764	3,652	3,439	3,101	2,759	2,352	1,794
415	0,0024	4,384	4,052	3,858	3,784	3,674	3,461	3,124	2,782	2,375	1,816
420	0,0024	4,401	4,070	3,878	3,805	3,694	3,483	3,147	2,805	2,398	1,839
425	0,0024	4,417	4,088	3,897	3,824	3,715	3,505	3,169	2,827	2,420	1,861
430	0,0023	4,433	4,106	3,916	3,843	3,735	3,526	3,190	2,849	2,442	1,882
435	0,0023	4,449	4,123	3,934	3,862	3,754	3,546	3,211	2,871	2,464	1,903
440	0,0023	4,465	4,140	3,952	3,881	3,774	3,566	3,232	2,892	2,485	1,924
445	0,0022	4,480	4,156	3,970	3,899	3,793	3,586	3,253	2,912	2,506	1,944
450	0,0022	4,495	4,172	3,988	3,917	3,811	3,606	3,273	2,933	2,527	1,964
455	0,0022	4,509	4,188	4,005	3,935	3,829	3,625	3,292	2,953	2,547	1,984
460	0,0022	4,523	4,203	4,021	3,952	3,847	3,644	3,312	2,973	2,567	2,003
465	0,0022	4,537	4,219	4,038	3,969	3,865	3,662	3,331	2,992	2,586	2,022
470	0,0021	4,551	4,234	4,054	3,985	3,882	3,680	3,349	3,011	2,605	2,041
475	0,0021	4,565	4,248	4,070	4,002	3,899	3,698	3,368	3,030	2,624	2,060

Annex 1, Table 15: columns, circular hollow sections

Interchar 963		Fire Resistance 45 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
80	0,0125	2,017	1,457	1,080	0,947	0,748	0,556	0,556	0,556	0,556	0,556
85	0,0118	2,238	1,679	1,302	1,169	0,971	0,646	0,556	0,556	0,556	0,556
90	0,0111	2,445	1,886	1,511	1,379	1,181	0,854	0,556	0,556	0,556	0,556
95	0,0105	2,639	2,081	1,709	1,577	1,379	1,052	0,637	0,556	0,556	0,556
100	0,0100	2,820	2,265	1,895	1,764	1,567	1,239	0,821	0,556	0,556	0,556
105	0,0095	2,991	2,438	2,072	1,941	1,745	1,418	0,996	0,593	0,556	0,556
110	0,0091	3,152	2,602	2,239	2,109	1,915	1,588	1,162	0,755	0,556	0,556
115	0,0087	3,304	2,757	2,397	2,269	2,076	1,749	1,321	0,910	0,556	0,556
120	0,0083	3,448	2,904	2,548	2,421	2,229	1,904	1,473	1,059	0,602	0,556
125	0,0080	3,584	3,043	2,692	2,565	2,375	2,051	1,618	1,202	0,739	0,556
130	0,0077	3,713	3,176	2,828	2,703	2,515	2,192	1,758	1,338	0,871	0,556
135	0,0074	3,835	3,302	2,958	2,834	2,648	2,327	1,891	1,469	0,998	0,556
140	0,0071	3,951	3,422	3,083	2,960	2,775	2,456	2,019	1,595	1,120	0,556
145	0,0069	4,062	3,537	3,202	3,080	2,897	2,580	2,142	1,716	1,238	0,617
150	0,0067	4,168	3,646	3,315	3,195	3,014	2,699	2,260	1,832	1,351	0,723
155	0,0065	4,268	3,751	3,424	3,305	3,126	2,813	2,373	1,945	1,460	0,826
160	0,0063	4,364	3,851	3,528	3,411	3,234	2,922	2,483	2,053	1,565	0,926
165	0,0061	4,456	3,947	3,628	3,512	3,337	3,028	2,588	2,157	1,667	1,022
170	0,0059	4,544	4,039	3,725	3,609	3,437	3,129	2,689	2,257	1,765	1,115
175	0,0057	4,629	4,127	3,817	3,703	3,532	3,227	2,787	2,354	1,859	1,204
180	0,0056	4,709	4,211	3,906	3,793	3,624	3,322	2,881	2,448	1,951	1,291
185	0,0054	4,787	4,293	3,991	3,880	3,713	3,413	2,972	2,538	2,039	1,375
190	0,0053	4,862	4,371	4,073	3,963	3,799	3,500	3,060	2,625	2,125	1,457
195	0,0051	4,933	4,446	4,153	4,044	3,881	3,585	3,145	2,710	2,208	1,536
200	0,0050	5,002	4,519	4,229	4,122	3,961	3,667	3,227	2,792	2,288	1,612
205	0,0049		4,589	4,303	4,197	4,038	3,746	3,307	2,871	2,366	1,686
210	0,0048		4,656	4,374	4,269	4,112	3,823	3,384	2,948	2,442	1,758
215	0,0047		4,722	4,443	4,339	4,184	3,897	3,459	3,023	2,515	1,828
220	0,0045		4,784	4,509	4,407	4,254	3,969	3,531	3,095	2,586	1,896
225	0,0044		4,845	4,574	4,473	4,321	4,038	3,601	3,165	2,655	1,962
230	0,0043		4,904	4,636	4,536	4,386	4,106	3,669	3,233	2,722	2,026
235	0,0043		4,961	4,696	4,536	4,450	4,171	3,735	3,300	2,787	2,088
240	0,0042		5,016	4,755	4,536	4,511	4,235	3,800	3,364	2,851	2,149
245	0,0041			4,811	4,536	4,570	4,297	3,862	3,426	2,912	2,208
250	0,0040			4,866	4,536	4,628	4,356	3,923	3,487	2,972	2,265
255	0,0039			4,920	4,536	4,684	4,415	3,981	3,546	3,031	2,321
260	0,0038			4,971	4,536	4,739	4,471	4,039	3,604	3,088	2,376
265	0,0038			5,022	4,536	4,792	4,526	4,095	3,660	3,143	2,429
270	0,0037					4,843	4,580	4,149	3,714	3,197	2,481
275	0,0036					4,893	4,632	4,202	3,768	3,249	2,531
280	0,0036					4,942	4,682	4,253	3,819	3,301	2,580
285	0,0035					4,989	4,732	4,303	3,870	3,351	2,628
290	0,0034						4,780	4,352	3,919	3,400	2,675
295	0,0034						4,827	4,400	3,967	3,447	2,721
300	0,0033						4,872	4,446	4,014	3,494	2,766

Annex 1, Table 15: columns, circular hollow sections

Interchar 963		Fire Resistance 45 minutes									
		Design Temperature $\theta_D$ in °C									
A/V m <sup>-1</sup>	V/A m	350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033						4,917	4,492	4,060	3,539	2,809
310	0,0032						4,960	4,536	4,104	3,583	2,852
315	0,0032						5,003	4,579	4,148	3,627	2,894
320	0,0031							4,621	4,191	3,669	2,935
325	0,0031							4,662	4,232	3,711	2,975
330	0,0030							4,703	4,273	3,751	3,014
335	0,0030							4,742	4,313	3,791	3,052
340	0,0029							4,780	4,352	3,829	3,089
345	0,0029							4,818	4,390	3,867	3,126
350	0,0029							4,855	4,427	3,904	3,162
355	0,0028							4,891	4,463	3,941	3,197
360	0,0028							4,926	4,499	3,976	3,231
365	0,0027							4,960	4,534	4,011	3,265
370	0,0027							4,994	4,568	4,045	3,298
375	0,0027								4,602	4,079	3,330
380	0,0026								4,635	4,111	3,362
385	0,0026								4,667	4,143	3,393
390	0,0026								4,698	4,175	3,423
395	0,0025								4,729	4,206	3,453
400	0,0025								4,759	4,236	3,482
405	0,0025								4,789	4,266	3,511
410	0,0024								4,818	4,295	3,539
415	0,0024								4,847	4,323	3,567
420	0,0024								4,875	4,351	3,594
425	0,0024								4,903	4,379	3,621
430	0,0023								4,930	4,406	3,647
435	0,0023								4,956	4,433	3,673
440	0,0023								4,982	4,459	3,698
445	0,0022								5,008	4,484	3,723
450	0,0022									4,510	3,748
455	0,0022									4,534	3,772
460	0,0022									4,559	3,795
465	0,0022									4,582	3,818
470	0,0021									4,606	3,841
475	0,0021									4,629	3,864

Annex 1, Table 16: columns, circular hollow sections

Interchar 963		Fire Resistance 60 minutes									
A/V m <sup>-1</sup>	V/A m	Design Temperature $\theta_D$ in °C									
		350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
80	0,0125	3,447	2,803	2,388	2,242	2,023	1,659	1,189	0,743	0,556	0,556
85	0,0118	3,706	3,063	2,650	2,504	2,286	1,921	1,443	0,989	0,556	0,556
90	0,0111	3,948	3,307	2,897	2,752	2,534	2,168	1,684	1,222	0,714	0,556
95	0,0105	4,175	3,536	3,130	2,986	2,769	2,403	1,913	1,444	0,926	0,556
100	0,0100	4,388	3,751	3,349	3,206	2,992	2,626	2,131	1,656	1,129	0,556
105	0,0095	4,588	3,955	3,557	3,416	3,203	2,837	2,338	1,858	1,323	0,630
110	0,0091	4,777	4,147	3,755	3,614	3,403	3,039	2,536	2,051	1,508	0,803
115	0,0087	4,954	4,329	3,942	3,802	3,594	3,231	2,725	2,236	1,686	0,968
120	0,0083		4,502	4,119	3,982	3,775	3,414	2,905	2,412	1,856	1,127
125	0,0080		4,665	4,288	4,152	3,948	3,589	3,078	2,582	2,019	1,280
130	0,0077		4,821	4,449	4,315	4,113	3,756	3,243	2,744	2,176	1,426
135	0,0074		4,969	4,603	4,470	4,271	3,916	3,402	2,900	2,327	1,567
140	0,0071			4,749	4,618	4,422	4,070	3,554	3,049	2,472	1,703
145	0,0069			4,889	4,760	4,566	4,217	3,700	3,193	2,611	1,834
150	0,0067					4,704	4,358	3,840	3,331	2,745	1,960
155	0,0065					4,837	4,493	3,974	3,464	2,875	2,082
160	0,0063					4,964	4,623	4,104	3,593	2,999	2,199
165	0,0061						4,748	4,229	3,716	3,120	2,312
170	0,0059						4,869	4,349	3,835	3,236	2,422
175	0,0057						4,985	4,466	3,951	3,348	2,528
180	0,0056							4,578	4,062	3,457	2,630
185	0,0054							4,686	4,169	3,562	2,730
190	0,0053							4,790	4,273	3,663	2,826
195	0,0051							4,891	4,374	3,762	2,919
200	0,0050							4,989	4,471	3,857	3,009
205	0,0049								4,565	3,949	3,097
210	0,0048								4,657	4,039	3,182
215	0,0047								4,745	4,126	3,264
220	0,0045								4,831	4,210	3,344
225	0,0044								4,914	4,292	3,422
230	0,0043								4,995	4,372	3,498
235	0,0043									4,449	3,571
240	0,0042									4,524	3,643
245	0,0041									4,598	3,713
250	0,0040									4,669	3,780
255	0,0039									4,738	3,846
260	0,0038									4,805	3,911
265	0,0038									4,871	3,974
270	0,0037									4,935	4,035
275	0,0036									4,998	4,094
280	0,0036										4,152
285	0,0035										4,209
290	0,0034										4,265
295	0,0034										4,319
300	0,0033										4,371

Annex 1, Table 16: columns, circular hollow sections

Interchar 963		Fire Resistance 60 minutes									
		Design Temperature $\theta_D$ in °C									
A/V m <sup>-1</sup>	V/A m	350	400	450	470	500	550	600	650	700	750
		Minimum thickness required – DFT in mm (without primer and topcoat)									
305	0,0033										4,423
310	0,0032										4,473
315	0,0032										4,523
320	0,0031										4,571
325	0,0031										4,618
330	0,0030										4,664
335	0,0030										4,709
340	0,0029										4,753
345	0,0029										4,796
350	0,0029										4,839
355	0,0028										4,880
360	0,0028										4,921
365	0,0027										4,960
370	0,0027										4,999
375	0,0027										
380	0,0026										
385	0,0026										
390	0,0026										
395	0,0025										
400	0,0025										
405	0,0025										
410	0,0024										
415	0,0024										
420	0,0024										
425	0,0024										
430	0,0023										
435	0,0023										
440	0,0023										
445	0,0022										
450	0,0022										
455	0,0022										
460	0,0022										
465	0,0022										
470	0,0021										
475	0,0021										