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## CERTIFICATE OF APPROVAL

### No CF 821

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This is to certify that, in accordance with  
TS00 General Requirements for Certification of Fire Protection Products  
The undermentioned products of

## SIKA DEUTSCHLAND GMBH

Kornwestheimer Strasse 103-107, D-70439 Stuttgart, Germany

Tel: 0049 7042 109 259 Fax: 0049 7042 109 261  
[www.protectivecoatings.de](http://www.protectivecoatings.de)

Have been assessed against the requirements of the Technical Schedule(s)  
denoted below and are approved for use subject to the conditions  
appended hereto:

#### CERTIFIED PRODUCT

Sika® Unitherm® Platinum

#### TECHNICAL SCHEDULE

TS15 Intumescent  
Coatings for Steelwork

Signed and sealed for and on behalf of Warringtonfire Testing and Certification Limited

Paul Duggan  
Certification Manager



Issued: 9<sup>th</sup> December 2010  
Reissued: 25<sup>th</sup> July 2019  
Valid to: 24<sup>th</sup> July 2024

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

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#### Sika® Unitherm® Platinum

1. This approval relates to the use of Sika® Unitherm® Platinum for the fire protection of I/H beams, I/H columns, rectangular/square hollow beams, circular and rectangular/square hollow columns. The precise scope is given in Tables 1 to 29 which show the total dry film thickness of Sika® Unitherm® Platinum (excluding primer and top sealer) required to provide fire resistance periods in accordance with BS476: Part 21: 1987 of up to 75 minutes for I/H beams and columns, up to 60 minutes for circular and rectangular/square hollow columns, and up to 45 minutes for rectangular/square hollow beams for differing section factors.
2. The products are approved on the basis of:
  - i) Initial type testing
  - ii) A design appraisal against TS15
  - iii) Certification of quality management system to ISO 9001: 2015
  - iv) Inspection and surveillance of factory production control
  - v) Audit testing
3. The data shown is applicable to steel sections galvanised or blast cleaned to ISO 8501-1 Sa2.5 or equivalent and primed with a suitable and compatible primer. The data shown is also applicable to steel sections blast cleaned to ISO 8501-1 Sa2.5 or equivalent followed by direct application of Sika® Unitherm® Platinum. Specifications of surface preparations, primers and top sealers is available from Sika Deutschland GmbH whose responsibility is to ensure that Sika® Unitherm® Platinum is compatible for use in respect of both ambient and fire conditions. The total dry film thickness of primer and top sealer should not exceed that tested.
4. The data shown is applicable to Sika® Unitherm® Platinum applied by spray to horizontal, vertical, flexural and compression members supporting loads up to the maximum design loads specified in BS449: Part 2. For other design temperatures it should be confirmed it is acceptable to utilise these temperatures prior to using the data for approval purposes.
5. The approval relates to on going production. Product and/or its immediate packaging is identified with the manufacturers' name, the product name or number, the CERTIFIRE name or name and mark, together with the CERTIFIRE certificate number and application where appropriate.
6. The data shown in the tables is based on assessments which comply with the criteria for acceptability now incorporated within the CERTIFIRE scheme.
7. This certification is provided to the client for their own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 1 I/H Beams: 15 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
55	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
65	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
70	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
75	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
80	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
85	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
90	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
95	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
100	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
105	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
110	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
115	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
120	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
125	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
130	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
135	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
140	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
145	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
150	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
155	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
160	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
165	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
170	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
175	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
180	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
185	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
190	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
195	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
200	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
205	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
210	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
215	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
220	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
225	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
230	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
235	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
240	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
245	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
250	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
255	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
260	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
265	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
270	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
275	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
280	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
285	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
290	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
295	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
300	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
305	0.454	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
310	0.477	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
315	0.501	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
320	0.524	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
325	0.547	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
330	0.570	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
335	0.593	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
340	0.616	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
345	0.639	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
350	0.662	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
355	0.686	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
360	0.709	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
365	0.732	0.461	0.438	0.438	0.438	0.438	0.438	0.438	0.438
370	0.755	0.484	0.438	0.438	0.438	0.438	0.438	0.438	0.438
375	0.778	0.508	0.438	0.438	0.438	0.438	0.438	0.438	0.438

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 2 I/H Beams: 15 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
55	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
65	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
70	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
75	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
80	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
85	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
90	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
95	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
100	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
105	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
110	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
115	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
120	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
125	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
130	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
135	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
140	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
145	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
150	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
155	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
160	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
165	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
170	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
175	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
180	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
185	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
190	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
195	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
200	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
205	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
210	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
215	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
220	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
225	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
230	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
235	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
240	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
245	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
250	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
255	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
260	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
265	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
270	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
275	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
280	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
285	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
290	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
295	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
300	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
305	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
310	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
315	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
320	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
325	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
330	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
335	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
340	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
345	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
350	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
355	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
360	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
365	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
370	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
375	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.

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C/012

Issued: 9<sup>th</sup> December 2010  
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Valid to: 24<sup>th</sup> July 2024



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 3 I/H Beams: 30 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
55	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
65	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
70	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
75	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
80	0.477	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
85	0.518	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
90	0.558	0.447	0.438	0.438	0.438	0.438	0.438	0.438	0.438
95	0.599	0.480	0.438	0.438	0.438	0.438	0.438	0.438	0.438
100	0.639	0.513	0.438	0.438	0.438	0.438	0.438	0.438	0.438
105	0.679	0.547	0.440	0.438	0.438	0.438	0.438	0.438	0.438
110	0.720	0.580	0.471	0.438	0.438	0.438	0.438	0.438	0.438
115	0.760	0.614	0.501	0.438	0.438	0.438	0.438	0.438	0.438
120	0.801	0.647	0.532	0.438	0.438	0.438	0.438	0.438	0.438
125	0.841	0.680	0.562	0.447	0.438	0.438	0.438	0.438	0.438
130	0.881	0.714	0.593	0.477	0.438	0.438	0.438	0.438	0.438
135	0.922	0.747	0.623	0.507	0.438	0.438	0.438	0.438	0.438
140	0.962	0.781	0.653	0.536	0.438	0.438	0.438	0.438	0.438
145	1.002	0.814	0.684	0.566	0.438	0.438	0.438	0.438	0.438
150	1.043	0.848	0.714	0.596	0.462	0.438	0.438	0.438	0.438
155	1.083	0.881	0.745	0.626	0.492	0.438	0.438	0.438	0.438
160	1.124	0.914	0.775	0.656	0.521	0.438	0.438	0.438	0.438
165	1.164	0.948	0.806	0.685	0.551	0.438	0.438	0.438	0.438
170	1.204	0.981	0.836	0.715	0.581	0.438	0.438	0.438	0.438
175	1.245	1.015	0.866	0.745	0.610	0.454	0.438	0.438	0.438
180	1.285	1.048	0.897	0.775	0.640	0.484	0.438	0.438	0.438
185	1.325	1.082	0.927	0.805	0.670	0.514	0.438	0.438	0.438
190	1.366	1.115	0.958	0.834	0.699	0.544	0.438	0.438	0.438
195	1.406	1.148	0.988	0.864	0.729	0.574	0.438	0.438	0.438
200	1.447	1.182	1.019	0.894	0.759	0.604	0.452	0.438	0.438
205	1.487	1.215	1.049	0.924	0.788	0.634	0.482	0.438	0.438
210	1.527	1.249	1.079	0.953	0.818	0.664	0.513	0.438	0.438
215	1.568	1.282	1.110	0.983	0.847	0.694	0.543	0.438	0.438
220	1.608	1.315	1.140	1.013	0.877	0.724	0.573	0.438	0.438
225	1.649	1.349	1.171	1.043	0.907	0.754	0.603	0.467	0.438
230	1.689	1.382	1.201	1.073	0.936	0.784	0.633	0.497	0.438
235	1.729	1.416	1.232	1.102	0.966	0.814	0.663	0.527	0.438
240	1.770	1.449	1.262	1.132	0.996	0.843	0.693	0.557	0.438
245	1.810	1.483	1.292	1.162	1.025	0.873	0.723	0.587	0.455
250	1.850	1.516	1.323	1.192	1.055	0.903	0.753	0.616	0.485
255	1.891	1.549	1.353	1.222	1.085	0.933	0.784	0.646	0.514
260	1.972	1.583	1.384	1.251	1.114	0.963	0.814	0.676	0.544
265	2.070	1.616	1.414	1.281	1.144	0.993	0.844	0.706	0.573
270	2.168	1.650	1.445	1.311	1.174	1.023	0.874	0.736	0.603
275	2.266	1.683	1.475	1.341	1.203	1.053	0.904	0.765	0.633
280	2.364	1.717	1.505	1.371	1.233	1.083	0.934	0.795	0.662
285	2.462	1.750	1.536	1.400	1.263	1.113	0.964	0.825	0.692
290	2.560	1.783	1.566	1.430	1.292	1.143	0.994	0.855	0.722
295	2.658	1.817	1.597	1.460	1.322	1.173	1.025	0.884	0.751
300	2.757	1.850	1.627	1.490	1.351	1.203	1.055	0.914	0.781
305	2.855	1.884	1.658	1.519	1.381	1.233	1.085	0.944	0.811
310	2.953	1.917	1.688	1.549	1.411	1.262	1.115	0.974	0.840
315	3.051	1.950	1.718	1.579	1.440	1.292	1.145	1.004	0.870
320	3.149	1.984	1.749	1.609	1.470	1.322	1.175	1.033	0.900
325	3.247	2.017	1.779	1.639	1.500	1.352	1.205	1.063	0.929
330	3.345	2.051	1.810	1.668	1.529	1.382	1.235	1.093	0.959
335	-	-	1.840	1.698	1.559	1.412	1.265	1.123	0.989
340	-	-	1.871	1.728	1.589	1.442	1.296	1.152	1.018
345	-	-	1.901	1.758	1.618	1.472	1.326	1.182	1.048
350	-	-	1.931	1.788	1.648	1.502	1.356	1.212	1.078
355	-	-	1.962	1.817	1.678	1.532	1.386	1.242	1.107
360	-	-	1.992	1.847	1.707	1.562	1.416	1.272	1.137
365	-	-	2.023	1.877	1.737	1.592	1.446	1.301	1.167
370	-	-	2.053	1.907	1.766	1.622	1.476	1.331	1.196
375	-	-	2.084	1.937	1.796	1.652	1.506	1.361	1.226

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 4 I/H Beams: 30 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
55	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
65	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
70	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
75	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
80	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
85	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
90	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
95	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
100	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
105	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
110	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
115	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
120	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
125	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
130	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
135	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
140	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
145	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
150	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
155	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
160	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
165	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
170	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
175	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
180	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
185	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
190	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
195	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
200	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
205	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
210	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
215	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
220	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
225	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
230	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
235	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
240	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
245	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
250	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
255	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
260	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
265	0.451	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
270	0.481	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
275	0.511	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
280	0.542	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
285	0.572	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
290	0.602	0.457	0.438	0.438	0.438	0.438	0.438	0.438	0.438
295	0.632	0.487	0.438	0.438	0.438	0.438	0.438	0.438	0.438
300	0.663	0.517	0.438	0.438	0.438	0.438	0.438	0.438	0.438
305	0.693	0.547	0.438	0.438	0.438	0.438	0.438	0.438	0.438
310	0.723	0.577	0.438	0.438	0.438	0.438	0.438	0.438	0.438
315	0.753	0.608	0.456	0.438	0.438	0.438	0.438	0.438	0.438
320	0.783	0.638	0.487	0.443	0.438	0.438	0.438	0.438	0.438
325	0.814	0.668	0.517	0.474	0.438	0.438	0.438	0.438	0.438
330	0.844	0.698	0.548	0.504	0.438	0.438	0.438	0.438	0.438
335	0.874	0.729	0.578	0.535	0.438	0.438	0.438	0.438	0.438
340	0.904	0.759	0.609	0.566	0.438	0.438	0.438	0.438	0.438
345	0.934	0.789	0.639	0.596	0.438	0.438	0.438	0.438	0.438
350	0.965	0.819	0.670	0.627	0.461	0.438	0.438	0.438	0.438
355	0.995	0.849	0.700	0.658	0.491	0.438	0.438	0.438	0.438
360	1.025	0.880	0.731	0.688	0.520	0.438	0.438	0.438	0.438
365	1.055	0.910	0.761	0.719	0.549	0.438	0.438	0.438	0.438
370	1.085	0.940	0.792	0.749	0.578	0.438	0.438	0.438	0.438
375	1.116	0.970	0.822	0.780	0.608	0.458	0.438	0.438	0.438

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 5 I/H Beams: 45 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
55	0.790	0.543	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.905	0.641	0.511	0.438	0.438	0.438	0.438	0.438	0.438
65	1.020	0.740	0.587	0.491	0.438	0.438	0.438	0.438	0.438
70	1.134	0.838	0.663	0.547	0.477	0.438	0.438	0.438	0.438
75	1.249	0.937	0.740	0.603	0.519	0.466	0.438	0.438	0.438
80	1.364	1.035	0.816	0.659	0.562	0.505	0.458	0.438	0.438
85	1.479	1.133	0.892	0.715	0.604	0.544	0.494	0.450	0.438
90	1.594	1.232	0.968	0.771	0.646	0.583	0.530	0.484	0.444
95	1.708	1.330	1.045	0.827	0.689	0.621	0.566	0.518	0.476
100	1.823	1.429	1.121	0.883	0.731	0.660	0.602	0.552	0.509
105	1.918	1.527	1.197	0.939	0.773	0.699	0.638	0.586	0.542
110	1.968	1.625	1.273	0.995	0.815	0.737	0.674	0.620	0.575
115	2.018	1.724	1.349	1.050	0.858	0.776	0.710	0.654	0.608
120	2.068	1.822	1.426	1.106	0.900	0.815	0.746	0.688	0.640
125	2.118	1.912	1.502	1.162	0.942	0.853	0.782	0.722	0.673
130	2.168	1.964	1.578	1.218	0.984	0.892	0.818	0.756	0.706
135	2.218	2.015	1.654	1.274	1.027	0.931	0.854	0.790	0.739
140	2.268	2.066	1.731	1.330	1.069	0.969	0.890	0.824	0.771
145	2.318	2.117	1.807	1.386	1.111	1.008	0.926	0.858	0.804
150	2.368	2.169	1.883	1.442	1.153	1.047	0.962	0.892	0.837
155	2.418	2.220	1.945	1.498	1.196	1.085	0.998	0.926	0.870
160	2.468	2.271	2.001	1.554	1.238	1.124	1.034	0.960	0.902
165	2.518	2.323	2.058	1.610	1.280	1.163	1.070	0.994	0.935
170	2.568	2.374	2.114	1.666	1.322	1.201	1.106	1.028	0.968
175	2.618	2.425	2.170	1.722	1.365	1.240	1.142	1.062	1.001
180	2.668	2.477	2.227	1.778	1.407	1.279	1.178	1.096	1.034
185	2.718	2.528	2.283	1.834	1.449	1.317	1.214	1.130	1.066
190	2.768	2.579	2.340	1.890	1.492	1.356	1.250	1.164	1.099
195	2.818	2.630	2.396	1.959	1.534	1.395	1.286	1.198	1.132
200	2.868	2.682	2.452	2.031	1.576	1.433	1.322	1.232	1.165
205	2.919	2.733	2.509	2.104	1.618	1.472	1.358	1.266	1.197
210	2.969	2.784	2.565	2.176	1.661	1.511	1.394	1.300	1.230
215	3.019	2.836	2.621	2.249	1.703	1.549	1.430	1.334	1.263
220	3.069	2.887	2.678	2.322	1.745	1.588	1.466	1.368	1.296
225	3.119	2.938	2.734	2.394	1.787	1.627	1.502	1.402	1.328
230	3.169	2.990	2.791	2.467	1.830	1.665	1.538	1.436	1.361
235	3.219	3.041	2.847	2.539	1.872	1.704	1.574	1.470	1.394
240	3.269	3.092	2.903	2.612	1.935	1.743	1.610	1.504	1.427
245	3.319	3.144	2.960	2.685	2.054	1.781	1.646	1.538	1.460
250	3.369	3.195	3.016	2.757	2.173	1.820	1.682	1.572	1.492
255	3.419	3.246	3.073	2.830	2.293	1.859	1.718	1.606	1.525
260	-	3.297	3.129	2.902	2.412	1.898	1.754	1.640	1.558
265	-	3.349	3.185	2.975	2.531	2.031	1.790	1.674	1.591
270	-	3.400	3.242	3.048	2.651	2.181	1.826	1.708	1.623
275	-	3.451	3.298	3.120	2.770	2.331	1.862	1.742	1.656
280	-	-	3.355	3.193	2.890	2.480	1.898	1.776	1.689
285	-	-	3.411	3.265	3.009	2.630	2.074	1.810	1.722
290	-	-	3.467	3.338	3.128	2.780	2.272	1.844	1.754
295	-	-	-	3.410	3.248	2.929	2.471	1.878	1.787
300	-	-	-	3.483	3.367	3.079	2.670	1.976	1.820
305	-	-	-	-	-	3.229	2.869	2.253	1.853
310	-	-	-	-	-	3.378	3.068	2.530	1.886
315	-	-	-	-	-	-	3.266	2.808	2.084
320	-	-	-	-	-	-	-	3.085	2.473
325	-	-	-	-	-	-	-	3.362	2.862
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.





## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 6 I/H Beams: 45 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
55	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
65	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
70	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
75	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
80	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
85	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
90	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
95	0.440	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
100	0.472	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
105	0.505	0.460	0.438	0.438	0.438	0.438	0.438	0.438	0.438
110	0.537	0.492	0.442	0.438	0.438	0.438	0.438	0.438	0.438
115	0.570	0.524	0.474	0.460	0.438	0.438	0.438	0.438	0.438
120	0.602	0.556	0.507	0.493	0.438	0.438	0.438	0.438	0.438
125	0.635	0.588	0.539	0.525	0.447	0.438	0.438	0.438	0.438
130	0.667	0.620	0.571	0.557	0.479	0.438	0.438	0.438	0.438
135	0.700	0.652	0.603	0.590	0.511	0.438	0.438	0.438	0.438
140	0.732	0.685	0.635	0.622	0.542	0.447	0.438	0.438	0.438
145	0.765	0.717	0.668	0.654	0.574	0.479	0.438	0.438	0.438
150	0.797	0.749	0.700	0.687	0.606	0.512	0.438	0.438	0.438
155	0.830	0.781	0.732	0.719	0.638	0.544	0.438	0.438	0.438
160	0.862	0.813	0.764	0.751	0.670	0.576	0.441	0.438	0.438
165	0.895	0.845	0.797	0.784	0.702	0.609	0.475	0.438	0.438
170	0.927	0.878	0.829	0.816	0.734	0.641	0.509	0.438	0.438
175	0.960	0.910	0.861	0.848	0.766	0.673	0.543	0.438	0.438
180	0.992	0.942	0.893	0.880	0.798	0.706	0.576	0.438	0.438
185	1.025	0.974	0.926	0.913	0.830	0.738	0.610	0.438	0.438
190	1.057	1.006	0.958	0.945	0.862	0.770	0.644	0.448	0.438
195	1.090	1.038	0.990	0.977	0.894	0.802	0.678	0.484	0.438
200	1.122	1.071	1.022	1.010	0.926	0.835	0.711	0.521	0.438
205	1.155	1.103	1.055	1.042	0.958	0.867	0.745	0.557	0.438
210	1.187	1.135	1.087	1.074	0.990	0.899	0.779	0.593	0.438
215	1.220	1.167	1.119	1.107	1.022	0.932	0.813	0.629	0.474
220	1.252	1.199	1.151	1.139	1.054	0.964	0.847	0.666	0.510
225	1.285	1.231	1.184	1.171	1.086	0.996	0.880	0.702	0.546
230	1.317	1.264	1.216	1.204	1.117	1.029	0.914	0.738	0.582
235	1.350	1.296	1.248	1.236	1.149	1.061	0.948	0.774	0.619
240	1.382	1.328	1.280	1.268	1.181	1.093	0.982	0.810	0.655
245	1.415	1.360	1.313	1.300	1.213	1.126	1.015	0.847	0.691
250	1.447	1.392	1.345	1.333	1.245	1.158	1.049	0.883	0.727
255	1.480	1.424	1.377	1.365	1.277	1.190	1.083	0.919	0.763
260	1.512	1.456	1.409	1.397	1.309	1.222	1.117	0.955	0.799
265	1.545	1.489	1.442	1.430	1.341	1.255	1.151	0.992	0.835
270	1.577	1.521	1.474	1.462	1.373	1.287	1.184	1.028	0.871
275	1.610	1.553	1.506	1.494	1.405	1.319	1.218	1.064	0.908
280	1.642	1.585	1.538	1.527	1.437	1.352	1.252	1.100	0.944
285	1.675	1.617	1.571	1.559	1.469	1.384	1.286	1.136	0.980
290	1.707	1.649	1.603	1.591	1.501	1.416	1.319	1.173	1.016
295	1.740	1.682	1.635	1.624	1.533	1.449	1.353	1.209	1.052
300	1.772	1.714	1.667	1.656	1.565	1.481	1.387	1.245	1.088
305	1.805	1.746	1.700	1.688	1.597	1.513	1.421	1.281	1.124
310	1.837	1.778	1.732	1.720	1.629	1.546	1.455	1.317	1.160
315	1.870	1.810	1.764	1.753	1.661	1.578	1.488	1.354	1.196
320	1.902	1.842	1.796	1.785	1.693	1.610	1.522	1.390	1.233
325	2.452	1.875	1.828	1.817	1.724	1.642	1.556	1.426	1.269
330	3.014	1.907	1.861	1.850	1.756	1.675	1.590	1.462	1.305
335	-	1.939	1.893	1.882	1.788	1.707	1.623	1.499	1.341
340	-	1.971	1.925	1.914	1.820	1.739	1.657	1.535	1.377
345	-	2.003	1.957	1.947	1.852	1.772	1.691	1.571	1.413
350	-	2.035	1.990	1.979	1.884	1.804	1.725	1.607	1.449
355	-	-	2.022	2.011	1.916	1.836	1.759	1.643	1.485
360	-	-	2.054	2.044	1.948	1.869	1.792	1.680	1.522
365	-	-	-	-	1.980	1.901	1.826	1.716	1.558
370	-	-	-	-	2.012	1.933	1.860	1.752	1.594
375	-	-	-	-	2.044	1.966	1.894	1.788	1.630

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.





## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 7 I/H Beams: 60 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
55	1.570	1.327	1.118	0.941	0.789	0.583	0.521	0.438	0.438
60	1.756	1.491	1.262	1.064	0.894	0.675	0.592	0.536	0.507
65	2.097	1.655	1.405	1.188	0.998	0.768	0.663	0.587	0.547
70	3.034	1.819	1.549	1.311	1.103	0.860	0.735	0.639	0.587
75	-	2.070	1.692	1.434	1.207	0.953	0.806	0.690	0.626
80	-	2.412	1.835	1.558	1.312	1.046	0.878	0.741	0.666
85	-	2.754	1.977	1.681	1.416	1.138	0.949	0.792	0.706
90	-	3.095	2.117	1.804	1.520	1.231	1.020	0.844	0.746
95	-	-	2.257	1.913	1.625	1.323	1.092	0.895	0.785
100	-	-	2.398	1.962	1.729	1.416	1.163	0.946	0.825
105	-	-	2.538	2.011	1.834	1.508	1.235	0.997	0.865
110	-	-	2.678	2.060	1.919	1.601	1.306	1.049	0.905
115	-	-	2.818	2.108	1.968	1.693	1.377	1.100	0.944
120	-	-	2.958	2.157	2.017	1.786	1.449	1.151	0.984
125	-	-	3.098	2.206	2.065	1.878	1.520	1.203	1.024
130	-	-	3.238	2.255	2.114	1.940	1.592	1.254	1.064
135	-	-	3.379	2.304	2.163	1.991	1.663	1.305	1.103
140	-	-	-	2.353	2.211	2.042	1.734	1.356	1.143
145	-	-	-	2.402	2.260	2.093	1.806	1.408	1.183
150	-	-	-	2.451	2.309	2.144	1.877	1.459	1.222
155	-	-	-	2.500	2.357	2.195	1.940	1.510	1.262
160	-	-	-	2.549	2.406	2.246	1.998	1.561	1.302
165	-	-	-	2.598	2.455	2.298	2.056	1.613	1.342
170	-	-	-	2.647	2.503	2.349	2.114	1.664	1.381
175	-	-	-	2.696	2.552	2.400	2.171	1.715	1.421
180	-	-	-	2.745	2.601	2.451	2.229	1.766	1.461
185	-	-	-	2.794	2.649	2.502	2.287	1.818	1.501
190	-	-	-	2.842	2.698	2.553	2.345	1.869	1.540
195	-	-	-	2.891	2.747	2.604	2.403	1.930	1.580
200	-	-	-	2.940	2.795	2.655	2.461	2.011	1.620
205	-	-	-	2.989	2.844	2.706	2.519	2.091	1.659
210	-	-	-	3.038	2.893	2.757	2.577	2.172	1.699
215	-	-	-	3.087	2.941	2.808	2.634	2.252	1.739
220	-	-	-	3.136	2.990	2.859	2.692	2.333	1.779
225	-	-	-	3.185	3.039	2.910	2.750	2.414	1.818
230	-	-	-	3.234	3.087	2.961	2.808	2.494	1.858
235	-	-	-	3.283	3.136	3.012	2.866	2.575	1.898
240	-	-	-	3.332	3.185	3.063	2.924	2.655	2.024
245	-	-	-	3.381	3.233	3.114	2.982	2.736	2.163
250	-	-	-	3.430	3.282	3.165	3.040	2.817	2.302
255	-	-	-	-	3.331	3.216	3.098	2.897	2.441
260	-	-	-	-	3.379	3.267	3.155	2.978	2.580
265	-	-	-	-	3.428	3.318	3.213	3.059	2.719
270	-	-	-	-	-	3.369	3.271	3.139	2.858
275	-	-	-	-	-	3.420	3.329	3.220	2.997
280	-	-	-	-	-	3.471	3.387	3.300	3.136
285	-	-	-	-	-	-	3.445	3.381	3.275
290	-	-	-	-	-	-	-	-	3.414
295	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 8 I/H Beams: 60 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
55	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.489	0.469	0.447	0.441	0.438	0.438	0.438	0.438	0.438
65	0.527	0.505	0.483	0.477	0.446	0.438	0.438	0.438	0.438
70	0.566	0.542	0.518	0.512	0.480	0.447	0.438	0.438	0.438
75	0.604	0.579	0.554	0.547	0.514	0.481	0.438	0.438	0.438
80	0.642	0.615	0.589	0.583	0.549	0.514	0.468	0.438	0.438
85	0.680	0.652	0.625	0.618	0.583	0.548	0.502	0.438	0.438
90	0.719	0.688	0.660	0.653	0.617	0.582	0.535	0.472	0.438
95	0.757	0.725	0.696	0.689	0.651	0.615	0.569	0.507	0.443
100	0.795	0.762	0.732	0.724	0.686	0.649	0.603	0.541	0.478
105	0.833	0.798	0.767	0.759	0.720	0.683	0.636	0.575	0.512
110	0.871	0.835	0.803	0.795	0.754	0.716	0.670	0.609	0.547
115	0.910	0.871	0.838	0.830	0.789	0.750	0.703	0.643	0.582
120	0.948	0.908	0.874	0.865	0.823	0.784	0.737	0.677	0.616
125	0.986	0.945	0.909	0.901	0.857	0.817	0.771	0.711	0.651
130	1.024	0.981	0.945	0.936	0.892	0.851	0.804	0.746	0.685
135	1.062	1.018	0.980	0.971	0.926	0.885	0.838	0.780	0.720
140	1.101	1.054	1.016	1.007	0.960	0.918	0.872	0.814	0.755
145	1.139	1.091	1.051	1.042	0.994	0.952	0.905	0.848	0.789
150	1.177	1.128	1.087	1.077	1.029	0.986	0.939	0.882	0.824
155	1.215	1.164	1.122	1.113	1.063	1.019	0.972	0.916	0.859
160	1.253	1.201	1.158	1.148	1.097	1.053	1.006	0.950	0.893
165	1.292	1.238	1.194	1.183	1.132	1.087	1.040	0.985	0.928
170	1.330	1.274	1.229	1.219	1.166	1.120	1.073	1.019	0.962
175	1.368	1.311	1.265	1.254	1.200	1.154	1.107	1.053	0.997
180	1.406	1.347	1.300	1.289	1.234	1.188	1.140	1.087	1.032
185	1.445	1.384	1.336	1.325	1.269	1.221	1.174	1.121	1.066
190	1.483	1.421	1.371	1.360	1.303	1.255	1.208	1.155	1.101
195	1.521	1.457	1.407	1.395	1.337	1.289	1.241	1.189	1.136
200	1.559	1.494	1.442	1.431	1.372	1.322	1.275	1.223	1.170
205	1.597	1.530	1.478	1.466	1.406	1.356	1.309	1.258	1.205
210	1.636	1.567	1.513	1.501	1.440	1.390	1.342	1.292	1.239
215	1.674	1.604	1.549	1.537	1.475	1.423	1.376	1.326	1.274
220	1.712	1.640	1.585	1.572	1.509	1.457	1.409	1.360	1.309
225	1.750	1.677	1.620	1.607	1.543	1.491	1.443	1.394	1.343
230	1.788	1.713	1.656	1.642	1.577	1.524	1.477	1.428	1.378
235	1.827	1.750	1.691	1.678	1.612	1.558	1.510	1.462	1.413
240	1.865	1.787	1.727	1.713	1.646	1.592	1.544	1.497	1.447
245	1.903	1.823	1.762	1.748	1.680	1.626	1.577	1.531	1.482
250	2.061	1.860	1.798	1.784	1.715	1.659	1.611	1.565	1.516
255	2.218	1.897	1.833	1.819	1.749	1.693	1.645	1.599	1.551
260	2.375	2.048	1.869	1.854	1.783	1.727	1.678	1.633	1.586
265	2.533	2.225	1.911	1.890	1.818	1.760	1.712	1.667	1.620
270	2.690	2.401	2.109	2.030	1.852	1.794	1.746	1.701	1.655
275	2.847	2.578	2.307	2.233	1.886	1.828	1.779	1.736	1.690
280	3.005	2.755	2.505	2.437	2.025	1.861	1.813	1.770	1.724
285	3.162	2.931	2.703	2.640	2.266	1.895	1.846	1.804	1.759
290	3.319	3.108	2.901	2.843	2.507	2.129	1.880	1.838	1.793
295	3.477	3.284	3.099	3.047	2.747	2.427	2.015	1.872	1.828
300	-	-	3.296	3.250	2.988	2.724	2.369	1.943	1.863
305	-	-	-	-	3.229	3.022	2.722	2.352	1.897
310	-	-	-	-	-	3.319	3.075	2.762	2.331
315	-	-	-	-	-	-	-	3.172	2.843
320	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 9 I/H Beams: 75 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
55	-	-	1.837	1.631	1.460	1.314	1.199	1.106	1.034
60	-	-	2.004	1.817	1.625	1.460	1.325	1.214	1.124
65	-	-	-	3.027	1.790	1.606	1.451	1.322	1.215
70	-	-	-	-	2.057	1.751	1.578	1.430	1.306
75	-	-	-	-	2.543	1.897	1.704	1.538	1.396
80	-	-	-	-	3.029	2.062	1.831	1.645	1.487
85	-	-	-	-	-	2.227	1.924	1.753	1.577
90	-	-	-	-	-	2.392	1.974	1.861	1.668
95	-	-	-	-	-	2.558	2.024	1.930	1.759
100	-	-	-	-	-	2.723	2.074	1.974	1.849
105	-	-	-	-	-	2.888	2.124	2.019	1.921
110	-	-	-	-	-	3.054	2.174	2.063	1.966
115	-	-	-	-	-	3.219	2.224	2.107	2.011
120	-	-	-	-	-	-	2.274	2.152	2.056
125	-	-	-	-	-	-	2.324	2.196	2.101
130	-	-	-	-	-	-	2.373	2.240	2.146
135	-	-	-	-	-	-	2.423	2.285	2.191
140	-	-	-	-	-	-	2.473	2.329	2.236
145	-	-	-	-	-	-	2.523	2.373	2.280
150	-	-	-	-	-	-	2.573	2.418	2.325
155	-	-	-	-	-	-	2.623	2.462	2.370
160	-	-	-	-	-	-	2.673	2.506	2.415
165	-	-	-	-	-	-	2.723	2.551	2.460
170	-	-	-	-	-	-	2.773	2.595	2.505
175	-	-	-	-	-	-	2.822	2.639	2.550
180	-	-	-	-	-	-	2.872	2.684	2.595
185	-	-	-	-	-	-	2.922	2.728	2.640
190	-	-	-	-	-	-	2.972	2.772	2.685
195	-	-	-	-	-	-	3.022	2.817	2.730
200	-	-	-	-	-	-	3.072	2.861	2.774
205	-	-	-	-	-	-	3.122	2.905	2.819
210	-	-	-	-	-	-	3.172	2.950	2.864
215	-	-	-	-	-	-	3.222	2.994	2.909
220	-	-	-	-	-	-	3.272	3.038	2.954
225	-	-	-	-	-	-	3.321	3.083	2.999
230	-	-	-	-	-	-	3.371	3.127	3.044
235	-	-	-	-	-	-	3.421	3.171	3.089
240	-	-	-	-	-	-	-	3.216	3.134
245	-	-	-	-	-	-	-	3.260	3.179
250	-	-	-	-	-	-	-	3.304	3.223
255	-	-	-	-	-	-	-	3.349	3.268
260	-	-	-	-	-	-	-	3.393	3.313
265	-	-	-	-	-	-	-	-	3.358
270	-	-	-	-	-	-	-	-	3.403
275	-	-	-	-	-	-	-	-	3.448
280	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.

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C/012

Issued: 9<sup>th</sup> December 2010  
Reissued: 25<sup>th</sup> July 2019  
Valid to: 24<sup>th</sup> July 2024



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 10 I/H Beams: 75 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
55	0.991	0.929	0.859	0.837	0.537	0.516	0.438	0.438	0.438
60	1.071	0.995	0.911	0.885	0.576	0.553	0.524	0.487	0.453
65	1.151	1.061	0.964	0.934	0.615	0.590	0.561	0.524	0.489
70	1.232	1.126	1.016	0.983	0.653	0.628	0.597	0.560	0.524
75	1.312	1.192	1.068	1.031	0.692	0.665	0.634	0.596	0.560
80	1.392	1.258	1.120	1.080	0.731	0.703	0.670	0.632	0.596
85	1.473	1.323	1.172	1.129	0.770	0.740	0.706	0.668	0.632
90	1.553	1.389	1.224	1.177	0.809	0.777	0.743	0.704	0.668
95	1.633	1.455	1.276	1.226	0.848	0.815	0.779	0.740	0.704
100	1.714	1.520	1.329	1.275	0.886	0.852	0.816	0.776	0.740
105	1.794	1.586	1.381	1.324	0.925	0.890	0.852	0.812	0.776
110	1.874	1.652	1.433	1.372	0.964	0.927	0.889	0.849	0.811
115	1.933	1.717	1.485	1.421	1.003	0.964	0.925	0.885	0.847
120	1.979	1.783	1.537	1.470	1.042	1.002	0.962	0.921	0.883
125	2.025	1.849	1.589	1.518	1.080	1.039	0.998	0.957	0.919
130	2.071	1.912	1.641	1.567	1.119	1.076	1.034	0.993	0.955
135	2.118	1.962	1.694	1.616	1.158	1.114	1.071	1.029	0.991
140	2.164	2.012	1.746	1.664	1.197	1.151	1.107	1.065	1.027
145	2.210	2.062	1.798	1.713	1.236	1.189	1.144	1.101	1.063
150	2.256	2.112	1.850	1.762	1.275	1.226	1.180	1.137	1.099
155	2.302	2.162	1.902	1.810	1.313	1.263	1.217	1.174	1.134
160	2.349	2.211	1.961	1.859	1.352	1.301	1.253	1.210	1.170
165	2.395	2.261	2.021	1.909	1.391	1.338	1.289	1.246	1.206
170	2.441	2.311	2.080	1.973	1.430	1.376	1.326	1.282	1.242
175	2.487	2.361	2.140	2.038	1.469	1.413	1.362	1.318	1.278
180	2.534	2.411	2.199	2.102	1.507	1.450	1.399	1.354	1.314
185	2.580	2.461	2.259	2.166	1.546	1.488	1.435	1.390	1.350
190	2.626	2.511	2.318	2.230	1.585	1.525	1.472	1.426	1.386
195	2.672	2.561	2.377	2.294	1.624	1.562	1.508	1.462	1.421
200	2.718	2.611	2.437	2.359	1.663	1.600	1.544	1.499	1.457
205	2.765	2.661	2.496	2.423	1.701	1.637	1.581	1.535	1.493
210	2.811	2.711	2.556	2.487	1.740	1.675	1.617	1.571	1.529
215	2.857	2.761	2.615	2.551	1.779	1.712	1.654	1.607	1.565
220	2.903	2.811	2.675	2.616	1.818	1.749	1.690	1.643	1.601
225	2.949	2.861	2.734	2.680	1.857	1.787	1.727	1.679	1.637
230	2.996	2.911	2.793	2.744	1.896	1.824	1.763	1.715	1.673
235	3.042	2.961	2.853	2.808	2.033	1.862	1.800	1.751	1.709
240	3.088	3.011	2.912	2.873	2.194	1.899	1.836	1.787	1.744
245	3.134	3.060	2.972	2.937	2.355	2.075	1.872	1.824	1.780
250	3.181	3.110	3.031	3.001	2.516	2.267	1.940	1.860	1.816
255	3.227	3.160	3.091	3.065	2.677	2.460	2.174	1.896	1.852
260	3.273	3.210	3.150	3.130	2.838	2.653	2.408	2.120	1.888
265	3.319	3.260	3.209	3.194	2.999	2.845	2.641	2.392	2.087
270	3.365	3.310	3.269	3.258	3.160	3.038	2.875	2.664	2.403
275	3.412	3.360	3.328	3.322	3.321	3.231	3.108	2.936	2.719
280	-	-	-	-	-	-	3.342	3.208	3.035
285	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results apply to I/H section beams with concrete slabs with 3 sided fire exposure.

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C/012

Issued: 9<sup>th</sup> December 2010  
Reissued: 25<sup>th</sup> July 2019  
Valid to: 24<sup>th</sup> July 2024



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 11 I/H Columns: 15 minutes										
Required Thickness (mm) for a Design Temperature (°C)										
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550	575
55	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
65	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
70	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
75	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
80	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
85	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
90	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
95	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
100	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
105	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
110	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
115	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
120	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
125	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
130	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
135	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
140	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
145	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
150	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
155	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
160	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
165	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
170	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
175	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
180	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
185	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
190	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
195	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
200	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
205	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
210	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
215	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
220	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
225	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
230	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
235	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
240	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
245	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
250	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
255	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
260	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
265	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
270	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
275	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
280	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
285	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
290	0.454	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
295	0.475	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
300	0.496	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
305	0.517	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
310	0.538	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
315	0.559	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
320	0.580	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
325	0.601	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
330	0.621	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
335	0.642	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
340	0.663	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
345	0.684	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
350	0.705	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
355	0.726	0.440	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
360	0.747	0.461	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
365	0.768	0.482	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
370	0.789	0.504	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
375	0.810	0.525	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438

Thickness is intumescent only.

Results also apply to I-section beams exposed on all four sides.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 12 I/H Columns: 30 minutes										
Required Thickness (mm) for a Design Temperature (°C)										
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550	575
55	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
65	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
70	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
75	0.461	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
80	0.497	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
85	0.533	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
90	0.570	0.462	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
95	0.606	0.492	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
100	0.642	0.522	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
105	0.679	0.552	0.445	0.438	0.438	0.438	0.438	0.438	0.438	0.438
110	0.715	0.582	0.474	0.438	0.438	0.438	0.438	0.438	0.438	0.438
115	0.752	0.612	0.502	0.438	0.438	0.438	0.438	0.438	0.438	0.438
120	0.788	0.642	0.531	0.438	0.438	0.438	0.438	0.438	0.438	0.438
125	0.824	0.672	0.559	0.450	0.438	0.438	0.438	0.438	0.438	0.438
130	0.861	0.702	0.588	0.477	0.438	0.438	0.438	0.438	0.438	0.438
135	0.897	0.732	0.616	0.505	0.438	0.438	0.438	0.438	0.438	0.438
140	0.933	0.762	0.645	0.533	0.438	0.438	0.438	0.438	0.438	0.438
145	0.970	0.792	0.673	0.561	0.438	0.438	0.438	0.438	0.438	0.438
150	1.006	0.822	0.702	0.589	0.464	0.438	0.438	0.438	0.438	0.438
155	1.042	0.852	0.730	0.617	0.491	0.438	0.438	0.438	0.438	0.438
160	1.079	0.882	0.759	0.645	0.519	0.438	0.438	0.438	0.438	0.438
165	1.115	0.913	0.787	0.673	0.547	0.438	0.438	0.438	0.438	0.438
170	1.152	0.943	0.816	0.701	0.575	0.438	0.438	0.438	0.438	0.438
175	1.188	0.973	0.844	0.729	0.603	0.456	0.438	0.438	0.438	0.438
180	1.224	1.003	0.873	0.757	0.631	0.484	0.438	0.438	0.438	0.438
185	1.261	1.033	0.901	0.785	0.659	0.512	0.438	0.438	0.438	0.438
190	1.297	1.063	0.930	0.813	0.686	0.541	0.438	0.438	0.438	0.438
195	1.333	1.093	0.958	0.841	0.714	0.569	0.438	0.438	0.438	0.438
200	1.370	1.123	0.987	0.869	0.742	0.597	0.454	0.438	0.438	0.438
205	1.406	1.153	1.015	0.897	0.770	0.625	0.483	0.438	0.438	0.438
210	1.443	1.183	1.044	0.925	0.798	0.653	0.511	0.438	0.438	0.438
215	1.479	1.213	1.072	0.953	0.826	0.681	0.539	0.438	0.438	0.438
220	1.515	1.243	1.101	0.981	0.854	0.710	0.568	0.441	0.438	0.438
225	1.552	1.273	1.129	1.008	0.881	0.738	0.596	0.469	0.438	0.438
230	1.588	1.303	1.158	1.036	0.909	0.766	0.624	0.497	0.438	0.438
235	1.624	1.333	1.186	1.064	0.937	0.794	0.653	0.525	0.438	0.438
240	1.661	1.363	1.215	1.092	0.965	0.822	0.681	0.553	0.438	0.438
245	1.697	1.393	1.243	1.120	0.993	0.850	0.709	0.581	0.439	0.438
250	1.733	1.423	1.272	1.148	1.021	0.879	0.738	0.609	0.467	0.438
255	1.770	1.453	1.300	1.176	1.049	0.907	0.766	0.637	0.495	0.438
260	1.806	1.483	1.329	1.204	1.076	0.935	0.794	0.665	0.523	0.438
265	1.843	1.513	1.357	1.232	1.104	0.963	0.823	0.694	0.551	0.438
270	1.879	1.544	1.386	1.260	1.132	0.991	0.851	0.722	0.579	0.438
275	1.915	1.574	1.414	1.288	1.160	1.019	0.879	0.750	0.608	0.447
280	1.952	1.604	1.443	1.316	1.188	1.048	0.908	0.778	0.636	0.476
285	1.988	1.634	1.471	1.344	1.216	1.076	0.936	0.806	0.664	0.504
290	2.024	1.664	1.500	1.372	1.244	1.104	0.964	0.834	0.692	0.532
295	2.061	1.694	1.528	1.400	1.271	1.132	0.993	0.862	0.720	0.561
300	-	1.724	1.557	1.428	1.299	1.160	1.021	0.890	0.749	0.589
305	-	1.754	1.585	1.456	1.327	1.188	1.049	0.918	0.777	0.617
310	-	1.784	1.614	1.484	1.355	1.217	1.078	0.947	0.805	0.646
315	-	1.814	1.642	1.512	1.383	1.245	1.106	0.975	0.833	0.674
320	-	1.844	1.671	1.540	1.411	1.273	1.134	1.003	0.861	0.702
325	-	1.874	1.699	1.567	1.439	1.301	1.163	1.031	0.890	0.731
330	-	1.904	1.728	1.595	1.466	1.329	1.191	1.059	0.918	0.759
335	-	1.934	1.756	1.623	1.494	1.358	1.219	1.087	0.946	0.787
340	-	1.964	1.785	1.651	1.522	1.386	1.247	1.115	0.974	0.816
345	-	1.994	1.813	1.679	1.550	1.414	1.276	1.143	1.002	0.844
350	-	2.024	1.842	1.707	1.578	1.442	1.304	1.171	1.031	0.872
355	-	2.054	1.870	1.735	1.606	1.470	1.332	1.200	1.059	0.901
360	-	-	1.899	1.763	1.634	1.498	1.361	1.228	1.087	0.929
365	-	-	1.927	1.791	1.661	1.527	1.389	1.256	1.115	0.957
370	-	-	1.956	1.819	1.689	1.555	1.417	1.284	1.143	0.986
375	-	-	1.984	1.847	1.717	1.583	1.446	1.312	1.172	1.014

Thickness is intumescent only.

Results also apply to I-section beams exposed on all four sides.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 13 I/H Columns: 45 minutes										
Required Thickness (mm) for a Design Temperature (°C)										
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550	575
55	0.804	0.550	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438
60	0.906	0.636	0.509	0.445	0.438	0.438	0.438	0.438	0.438	0.438
65	1.009	0.721	0.573	0.491	0.439	0.438	0.438	0.438	0.438	0.438
70	1.111	0.807	0.637	0.537	0.478	0.438	0.438	0.438	0.438	0.438
75	1.213	0.893	0.701	0.583	0.518	0.468	0.438	0.438	0.438	0.438
80	1.315	0.979	0.765	0.629	0.557	0.504	0.459	0.438	0.438	0.438
85	1.418	1.065	0.829	0.675	0.597	0.541	0.494	0.451	0.438	0.438
90	1.520	1.151	0.893	0.721	0.636	0.577	0.528	0.484	0.438	0.438
95	1.622	1.236	0.957	0.767	0.676	0.614	0.562	0.517	0.470	0.438
100	1.724	1.322	1.020	0.813	0.715	0.650	0.596	0.549	0.501	0.450
105	1.827	1.408	1.084	0.859	0.755	0.687	0.631	0.582	0.533	0.481
110	1.920	1.494	1.148	0.904	0.794	0.723	0.665	0.614	0.565	0.512
115	1.985	1.580	1.212	0.950	0.834	0.760	0.699	0.647	0.596	0.543
120	2.051	1.665	1.276	0.996	0.873	0.796	0.733	0.680	0.628	0.574
125	2.117	1.751	1.340	1.042	0.913	0.833	0.768	0.712	0.660	0.605
130	2.183	1.837	1.404	1.088	0.952	0.869	0.802	0.745	0.691	0.636
135	2.249	1.919	1.468	1.134	0.992	0.906	0.836	0.778	0.723	0.667
140	2.315	1.988	1.532	1.180	1.031	0.942	0.870	0.810	0.755	0.698
145	2.381	2.057	1.596	1.226	1.070	0.979	0.904	0.843	0.786	0.729
150	2.447	2.126	1.659	1.272	1.110	1.016	0.939	0.875	0.818	0.761
155	2.513	2.195	1.723	1.318	1.149	1.052	0.973	0.908	0.849	0.792
160	2.578	2.264	1.787	1.363	1.189	1.089	1.007	0.941	0.881	0.823
165	2.644	2.333	1.851	1.409	1.228	1.125	1.041	0.973	0.913	0.854
170	2.710	2.402	1.918	1.455	1.268	1.162	1.076	1.006	0.944	0.885
175	2.776	2.471	2.000	1.501	1.307	1.198	1.110	1.038	0.976	0.916
180	2.842	2.540	2.082	1.547	1.347	1.235	1.144	1.071	1.008	0.947
185	2.908	2.609	2.163	1.593	1.386	1.271	1.178	1.104	1.039	0.978
190	2.974	2.678	2.245	1.639	1.426	1.308	1.213	1.136	1.071	1.009
195	3.040	2.747	2.327	1.685	1.465	1.344	1.247	1.169	1.103	1.040
200	3.106	2.816	2.409	1.731	1.505	1.381	1.281	1.202	1.134	1.071
205	3.172	2.885	2.490	1.777	1.544	1.417	1.315	1.234	1.166	1.103
210	3.237	2.954	2.572	1.822	1.584	1.454	1.350	1.267	1.198	1.134
215	3.303	3.023	2.654	1.868	1.623	1.490	1.384	1.299	1.229	1.165
220	3.369	3.092	2.735	1.936	1.663	1.527	1.418	1.332	1.261	1.196
225	3.435	3.161	2.817	2.022	1.702	1.563	1.452	1.365	1.292	1.227
230	-	3.230	2.899	2.208	1.742	1.600	1.486	1.397	1.324	1.258
235	-	3.299	2.981	2.344	1.781	1.636	1.521	1.430	1.356	1.289
240	-	3.368	3.062	2.480	1.821	1.673	1.555	1.462	1.387	1.320
245	-	3.437	3.144	2.616	1.860	1.709	1.589	1.495	1.419	1.351
250	-	-	3.226	2.752	1.900	1.746	1.623	1.528	1.451	1.382
255	-	-	3.307	2.888	2.084	1.782	1.658	1.560	1.482	1.413
260	-	-	3.389	3.024	2.281	1.819	1.692	1.593	1.514	1.444
265	-	-	-	3.160	2.479	1.855	1.726	1.625	1.546	1.476
270	-	-	-	3.296	2.676	1.892	1.760	1.658	1.577	1.507
275	-	-	-	3.432	2.873	2.067	1.795	1.691	1.609	1.538
280	-	-	-	-	3.070	2.303	1.829	1.723	1.640	1.569
285	-	-	-	-	3.267	2.539	1.863	1.756	1.672	1.600
290	-	-	-	-	-	2.775	1.897	1.789	1.704	1.631
295	-	-	-	-	-	3.011	2.138	1.821	1.735	1.662
300	-	-	-	-	-	3.247	2.421	1.854	1.767	1.693
305	-	-	-	-	-	-	2.704	1.886	1.799	1.724
310	-	-	-	-	-	-	2.987	2.061	1.830	1.755
315	-	-	-	-	-	-	3.269	2.383	1.862	1.786
320	-	-	-	-	-	-	-	2.705	1.894	1.817
325	-	-	-	-	-	-	-	3.027	1.925	1.849
330	-	-	-	-	-	-	-	-	1.957	1.880
335	-	-	-	-	-	-	-	-	1.989	1.911
340	-	-	-	-	-	-	-	-	2.020	1.942
345	-	-	-	-	-	-	-	-	2.052	1.973
350	-	-	-	-	-	-	-	-	-	2.004
355	-	-	-	-	-	-	-	-	-	2.035
360	-	-	-	-	-	-	-	-	-	2.066
365	-	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results also apply to I-section beams exposed on all four sides.





## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 14 I/H Columns: 60 minutes										
Required Thickness (mm) for a Design Temperature (°C)										
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550	575
55	1.523	1.278	1.065	0.903	0.766	0.571	0.517	0.438	0.438	0.438
60	1.691	1.423	1.189	1.010	0.856	0.650	0.577	0.529	0.503	0.477
65	1.858	1.569	1.314	1.117	0.946	0.730	0.638	0.572	0.541	0.513
70	2.168	1.714	1.439	1.224	1.037	0.810	0.699	0.615	0.579	0.550
75	2.529	1.859	1.564	1.331	1.127	0.890	0.759	0.657	0.618	0.586
80	2.890	2.052	1.689	1.438	1.218	0.969	0.820	0.700	0.656	0.623
85	-	2.265	1.813	1.545	1.308	1.049	0.880	0.742	0.694	0.659
90	-	2.478	1.938	1.652	1.398	1.129	0.941	0.785	0.733	0.695
95	-	2.691	2.064	1.759	1.489	1.209	1.002	0.828	0.771	0.732
100	-	2.905	2.189	1.866	1.579	1.289	1.062	0.870	0.809	0.768
105	-	3.118	2.315	1.950	1.670	1.368	1.123	0.913	0.848	0.805
110	-	3.331	2.440	2.023	1.760	1.448	1.184	0.956	0.886	0.841
115	-	-	2.566	2.095	1.850	1.528	1.244	0.998	0.925	0.877
120	-	-	2.691	2.168	1.934	1.608	1.305	1.041	0.963	0.914
125	-	-	2.816	2.240	2.009	1.687	1.365	1.084	1.001	0.950
130	-	-	2.942	2.312	2.084	1.767	1.426	1.126	1.040	0.986
135	-	-	3.067	2.385	2.159	1.847	1.487	1.169	1.078	1.023
140	-	-	3.193	2.457	2.233	1.928	1.547	1.212	1.116	1.059
145	-	-	3.318	2.530	2.308	2.010	1.608	1.254	1.155	1.096
150	-	-	3.444	2.602	2.383	2.092	1.669	1.297	1.193	1.132
155	-	-	-	2.674	2.458	2.175	1.729	1.340	1.231	1.168
160	-	-	-	2.747	2.532	2.257	1.790	1.382	1.270	1.205
165	-	-	-	2.819	2.607	2.339	1.850	1.425	1.308	1.241
170	-	-	-	2.892	2.682	2.422	1.917	1.468	1.346	1.278
175	-	-	-	2.964	2.757	2.504	2.026	1.510	1.385	1.314
180	-	-	-	3.036	2.831	2.586	2.134	1.553	1.423	1.350
185	-	-	-	3.109	2.906	2.669	2.242	1.596	1.461	1.387
190	-	-	-	3.181	2.981	2.751	2.350	1.638	1.500	1.423
195	-	-	-	3.254	3.056	2.833	2.458	1.681	1.538	1.459
200	-	-	-	3.326	3.130	2.916	2.566	1.723	1.576	1.496
205	-	-	-	3.398	3.205	2.998	2.674	1.766	1.615	1.532
210	-	-	-	3.471	3.280	3.080	2.782	1.809	1.653	1.569
215	-	-	-	-	3.355	3.163	2.890	1.851	1.692	1.605
220	-	-	-	-	3.429	3.245	2.999	1.894	1.730	1.641
225	-	-	-	-	-	3.327	3.107	2.181	1.768	1.678
230	-	-	-	-	-	3.410	3.215	2.532	1.807	1.714
235	-	-	-	-	-	-	3.323	2.884	1.845	1.751
240	-	-	-	-	-	-	-	1.883	1.787	1.787
245	-	-	-	-	-	-	-	2.423	1.823	1.823
250	-	-	-	-	-	-	-	-	1.860	1.860
255	-	-	-	-	-	-	-	-	1.896	1.896
260	-	-	-	-	-	-	-	-	1.932	1.932
265	-	-	-	-	-	-	-	-	1.969	1.969
270	-	-	-	-	-	-	-	-	2.005	2.005
275	-	-	-	-	-	-	-	-	2.042	2.042
280	-	-	-	-	-	-	-	-	-	2.078
285	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results also apply to I-section beams exposed on all four sides.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 15 I/H Columns: 75 minutes										
Required Thickness (mm) for a Design Temperature (°C)										
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550	575
55	-	2.330	1.718	1.533	1.382	1.254	1.149	1.068	0.989	0.908
60	-	2.542	1.902	1.697	1.528	1.383	1.261	1.163	1.068	0.972
65	-	-	2.712	1.861	1.674	1.513	1.373	1.259	1.148	1.035
70	-	-	-	2.295	1.821	1.642	1.485	1.354	1.227	1.099
75	-	-	-	2.820	2.053	1.771	1.597	1.450	1.307	1.163
80	-	-	-	-	2.395	1.901	1.709	1.546	1.386	1.226
85	-	-	-	-	2.738	2.116	1.821	1.641	1.465	1.290
90	-	-	-	-	3.081	2.332	1.938	1.737	1.545	1.354
95	-	-	-	-	-	2.548	2.069	1.832	1.624	1.418
100	-	-	-	-	-	2.764	2.200	1.925	1.704	1.481
105	-	-	-	-	-	2.981	2.331	2.008	1.783	1.545
110	-	-	-	-	-	3.197	2.462	2.091	1.863	1.609
115	-	-	-	-	-	3.413	2.593	2.174	1.942	1.673
120	-	-	-	-	-	-	2.724	2.257	2.020	1.736
125	-	-	-	-	-	-	2.855	2.340	2.098	1.800
130	-	-	-	-	-	-	2.985	2.422	2.176	1.864
135	-	-	-	-	-	-	3.116	2.505	2.254	1.939
140	-	-	-	-	-	-	3.247	2.588	2.332	2.032
145	-	-	-	-	-	-	3.378	2.671	2.410	2.126
150	-	-	-	-	-	-	-	2.754	2.488	2.219
155	-	-	-	-	-	-	-	2.837	2.566	2.313
160	-	-	-	-	-	-	-	2.920	2.645	2.406
165	-	-	-	-	-	-	-	3.003	2.723	2.500
170	-	-	-	-	-	-	-	3.086	2.801	2.593
175	-	-	-	-	-	-	-	3.169	2.879	2.687
180	-	-	-	-	-	-	-	3.252	2.957	2.780
185	-	-	-	-	-	-	-	3.335	3.035	2.874
190	-	-	-	-	-	-	-	3.418	3.113	2.967
195	-	-	-	-	-	-	-	-	3.191	3.061
200	-	-	-	-	-	-	-	-	3.269	3.155
205	-	-	-	-	-	-	-	-	3.348	3.248
210	-	-	-	-	-	-	-	-	3.426	3.342
215	-	-	-	-	-	-	-	-	3.504	3.435
220	-	-	-	-	-	-	-	-	-	-
225	-	-	-	-	-	-	-	-	-	-
230	-	-	-	-	-	-	-	-	-	-
235	-	-	-	-	-	-	-	-	-	-
240	-	-	-	-	-	-	-	-	-	-
245	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results also apply to I-section beams exposed on all four sides.



## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 16 Rectangular/Square Hollow Beams: 15 minutes Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
60	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
70	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
75	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
80	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
85	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
90	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
95	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
100	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
105	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
110	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
115	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
120	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
125	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
130	0.439	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
135	0.481	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
140	0.524	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
145	0.566	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
150	0.609	0.418	0.411	0.411	0.411	0.411	0.411	0.411	0.411
155	0.651	0.463	0.411	0.411	0.411	0.411	0.411	0.411	0.411
160	0.694	0.507	0.411	0.411	0.411	0.411	0.411	0.411	0.411
165	0.736	0.552	0.411	0.411	0.411	0.411	0.411	0.411	0.411
170	0.779	0.596	0.411	0.411	0.411	0.411	0.411	0.411	0.411
175	0.821	0.640	0.414	0.411	0.411	0.411	0.411	0.411	0.411
180	0.864	0.685	0.463	0.411	0.411	0.411	0.411	0.411	0.411
185	0.906	0.729	0.511	0.411	0.411	0.411	0.411	0.411	0.411
190	0.949	0.774	0.560	0.411	0.411	0.411	0.411	0.411	0.411
195	0.991	0.818	0.608	0.411	0.411	0.411	0.411	0.411	0.411
200	1.033	0.862	0.657	0.411	0.411	0.411	0.411	0.411	0.411
205	1.076	0.907	0.706	0.426	0.411	0.411	0.411	0.411	0.411
210	1.118	0.951	0.754	0.480	0.411	0.411	0.411	0.411	0.411
215	1.161	0.996	0.803	0.533	0.411	0.411	0.411	0.411	0.411
220	1.203	1.040	0.852	0.587	0.411	0.411	0.411	0.411	0.411
225	1.246	1.084	0.900	0.641	0.411	0.411	0.411	0.411	0.411
230	1.288	1.129	0.949	0.694	0.430	0.411	0.411	0.411	0.411
235	1.331	1.173	0.997	0.748	0.485	0.411	0.411	0.411	0.411
240	1.373	1.218	1.046	0.801	0.540	0.411	0.411	0.411	0.411
245	1.416	1.262	1.095	0.855	0.595	0.411	0.411	0.411	0.411
250	1.458	1.307	1.143	0.908	0.651	0.411	0.411	0.411	0.411
255	1.501	1.351	1.192	0.962	0.706	0.411	0.411	0.411	0.411
260	1.543	1.395	1.241	1.015	0.761	0.443	0.411	0.411	0.411
265	1.586	1.440	1.289	1.069	0.816	0.499	0.411	0.411	0.411
270	1.628	1.484	1.338	1.122	0.871	0.556	0.411	0.411	0.411
275	1.670	1.529	1.386	1.176	0.926	0.612	0.411	0.411	0.411
280	1.713	1.573	1.435	1.229	0.981	0.668	0.411	0.411	0.411
285	1.754	1.617	1.484	1.283	1.036	0.724	0.411	0.411	0.411
290	1.794	1.662	1.532	1.336	1.092	0.781	0.411	0.411	0.411
295	1.833	1.706	1.581	1.390	1.147	0.837	0.441	0.411	0.411
300	1.872	1.749	1.630	1.444	1.202	0.893	0.499	0.411	0.411
305	1.912	1.786	1.678	1.497	1.257	0.950	0.557	0.411	0.411
310	1.951	1.824	1.727	1.551	1.312	1.006	0.614	0.411	0.411
315	1.991	1.862	1.765	1.604	1.367	1.062	0.672	0.411	0.411
320	2.030	1.899	1.800	1.658	1.422	1.118	0.730	0.411	0.411
325	2.069	1.937	1.836	1.711	1.477	1.175	0.787	0.411	0.411
330	2.109	1.975	1.871	1.755	1.533	1.231	0.845	0.416	0.411
335	2.148	2.012	1.906	1.788	1.588	1.287	0.903	0.473	0.411
340	2.188	2.050	1.941	1.821	1.643	1.344	0.960	0.531	0.411

Thickness is intumescent only.

Results apply to rectangular hollow section beams with concrete slabs with 3 sided fire exposure.

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 17 Rectangular/Square Hollow Beams: 15 minutes Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
60	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
70	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
75	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
80	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
85	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
90	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
95	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
100	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
105	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
110	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
115	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
120	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
125	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
130	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
135	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
140	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
145	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
150	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
155	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
160	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
165	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
170	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
175	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
180	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
185	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
190	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
195	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
200	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
205	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
210	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
215	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
220	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
225	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
230	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
235	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
240	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
245	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
250	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
255	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
260	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
265	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
270	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
275	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
280	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
285	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
290	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
295	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
300	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
305	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
310	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
315	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
320	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
325	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
330	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
335	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
340	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411

Thickness is intumescent only.

Results apply to rectangular hollow section beams with concrete slabs with 3 sided fire exposure.

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 18 Rectangular/Square Hollow Beams: 30 minutes Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
60	0.868	0.508	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.998	0.654	0.485	0.411	0.411	0.411	0.411	0.411	0.411
70	1.150	0.800	0.608	0.464	0.411	0.411	0.411	0.411	0.411
75	1.302	0.947	0.730	0.566	0.450	0.411	0.411	0.411	0.411
80	1.454	1.093	0.853	0.667	0.532	0.429	0.411	0.411	0.411
85	1.606	1.239	0.976	0.768	0.614	0.491	0.411	0.411	0.411
90	1.752	1.386	1.098	0.869	0.695	0.554	0.461	0.411	0.411
95	1.854	1.532	1.221	0.970	0.777	0.617	0.513	0.434	0.411
100	1.956	1.678	1.343	1.072	0.859	0.679	0.564	0.484	0.412
105	2.059	1.796	1.466	1.173	0.941	0.742	0.616	0.534	0.460
110	2.161	1.895	1.589	1.274	1.023	0.804	0.667	0.584	0.509
115	2.263	1.993	1.711	1.375	1.105	0.867	0.719	0.635	0.558
120	2.365	2.091	1.813	1.476	1.187	0.930	0.771	0.685	0.607
125	2.467	2.190	1.909	1.578	1.269	0.992	0.822	0.735	0.656
130	2.570	2.288	2.005	1.679	1.351	1.055	0.874	0.785	0.705
135	2.672	2.386	2.101	1.777	1.433	1.118	0.925	0.835	0.754
140	2.774	2.485	2.197	1.873	1.515	1.180	0.977	0.885	0.803
145	2.876	2.583	2.293	1.968	1.597	1.243	1.028	0.935	0.852
150	2.978	2.681	2.389	2.063	1.679	1.306	1.080	0.985	0.900
155	3.081	2.780	2.485	2.158	1.765	1.368	1.132	1.035	0.949
160	3.163	2.878	2.581	2.254	1.861	1.431	1.183	1.085	0.998
165	3.243	2.976	2.677	2.349	1.957	1.494	1.235	1.135	1.047
170	3.324	3.075	2.773	2.444	2.053	1.556	1.286	1.186	1.096
175	3.404	3.160	2.869	2.539	2.149	1.619	1.338	1.236	1.145
180	3.484	3.242	2.965	2.635	2.245	1.682	1.390	1.286	1.194
185	3.564	3.324	3.061	2.730	2.341	1.749	1.441	1.336	1.243
190	3.644	3.406	3.150	2.825	2.437	1.854	1.493	1.386	1.292
195	3.724	3.489	3.236	2.920	2.533	1.959	1.544	1.436	1.340
200	3.805	3.571	3.323	3.015	2.629	2.065	1.596	1.486	1.389
205	3.885	3.653	3.409	3.110	2.725	2.170	1.647	1.536	1.438
210	3.965	3.735	3.495	3.201	2.821	2.276	1.699	1.586	1.487
215	4.045	3.818	3.581	3.292	2.917	2.381	1.764	1.636	1.536
220	4.125	3.900	3.667	3.383	3.013	2.487	1.870	1.686	1.585
225	4.205	3.982	3.753	3.474	3.110	2.592	1.976	1.737	1.634
230	4.286	4.064	3.839	3.565	3.209	2.698	2.082	1.815	1.683
235	4.366	4.146	3.925	3.656	3.309	2.803	2.188	1.893	1.731
240	4.446	4.229	4.011	3.747	3.408	2.909	2.294	1.972	1.800
245	-	4.311	4.098	3.838	3.507	3.014	2.400	2.051	1.871
250	-	4.393	4.184	3.929	3.607	3.121	2.506	2.130	1.942
255	-	-	4.270	4.020	3.706	3.231	2.611	2.208	2.014
260	-	-	4.356	4.111	3.806	3.342	2.717	2.287	2.085
265	-	-	4.442	4.202	3.905	3.453	2.823	2.366	2.156
270	-	-	-	4.293	4.004	3.563	2.929	2.445	2.227
275	-	-	-	4.384	4.104	3.674	3.035	2.524	2.299
280	-	-	-	-	4.203	3.784	3.156	2.602	2.370
285	-	-	-	-	4.303	3.895	3.293	2.681	2.441
290	-	-	-	-	4.402	4.005	3.430	2.760	2.513
295	-	-	-	-	-	4.116	3.567	2.839	2.584
300	-	-	-	-	-	4.226	3.704	2.917	2.655
305	-	-	-	-	-	4.337	3.841	2.996	2.726
310	-	-	-	-	-	4.448	3.978	3.075	2.798
315	-	-	-	-	-	-	4.115	3.246	2.869
320	-	-	-	-	-	-	4.252	3.443	2.940
325	-	-	-	-	-	-	4.389	3.640	3.012
330	-	-	-	-	-	-	-	3.836	3.083
335	-	-	-	-	-	-	-	4.033	3.258
340	-	-	-	-	-	-	-	4.230	3.448

Thickness is intumescent only.

Results apply to rectangular hollow section beams with concrete slabs with 3 sided fire exposure.

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 19 Rectangular/Square Hollow Beams: 30 minutes Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
60	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
70	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
75	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
80	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
85	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
90	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
95	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
100	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
105	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
110	0.436	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
115	0.484	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
120	0.532	0.454	0.411	0.411	0.411	0.411	0.411	0.411	0.411
125	0.580	0.501	0.433	0.415	0.411	0.411	0.411	0.411	0.411
130	0.628	0.548	0.480	0.461	0.411	0.411	0.411	0.411	0.411
135	0.676	0.595	0.527	0.508	0.411	0.411	0.411	0.411	0.411
140	0.723	0.642	0.573	0.555	0.448	0.411	0.411	0.411	0.411
145	0.771	0.689	0.620	0.601	0.495	0.411	0.411	0.411	0.411
150	0.819	0.736	0.667	0.648	0.542	0.411	0.411	0.411	0.411
155	0.867	0.783	0.714	0.695	0.589	0.456	0.411	0.411	0.411
160	0.915	0.830	0.760	0.742	0.636	0.503	0.411	0.411	0.411
165	0.963	0.877	0.807	0.788	0.683	0.549	0.411	0.411	0.411
170	1.011	0.924	0.854	0.835	0.729	0.595	0.416	0.411	0.411
175	1.058	0.972	0.900	0.882	0.776	0.642	0.462	0.411	0.411
180	1.106	1.019	0.947	0.928	0.823	0.688	0.508	0.411	0.411
185	1.154	1.066	0.994	0.975	0.870	0.734	0.555	0.411	0.411
190	1.202	1.113	1.041	1.022	0.917	0.781	0.601	0.411	0.411
195	1.250	1.160	1.087	1.069	0.964	0.827	0.647	0.411	0.411
200	1.298	1.207	1.134	1.115	1.011	0.874	0.693	0.426	0.411
205	1.346	1.254	1.181	1.162	1.058	0.920	0.740	0.468	0.411
210	1.394	1.301	1.228	1.209	1.104	0.966	0.786	0.510	0.411
215	1.441	1.348	1.274	1.256	1.151	1.013	0.832	0.552	0.411
220	1.489	1.395	1.321	1.302	1.198	1.059	0.879	0.594	0.411
225	1.537	1.442	1.368	1.349	1.245	1.105	0.925	0.636	0.411
230	1.585	1.489	1.415	1.396	1.292	1.152	0.971	0.678	0.411
235	1.633	1.536	1.461	1.442	1.339	1.198	1.017	0.720	0.411
240	1.681	1.584	1.508	1.489	1.386	1.244	1.064	0.763	0.411
245	1.729	1.631	1.555	1.536	1.432	1.291	1.110	0.805	0.443
250	1.790	1.678	1.602	1.583	1.479	1.337	1.156	0.847	0.480
255	1.854	1.725	1.648	1.629	1.526	1.384	1.202	0.889	0.517
260	1.918	1.780	1.695	1.676	1.573	1.430	1.249	0.931	0.554
265	1.982	1.837	1.742	1.723	1.620	1.476	1.295	0.973	0.591
270	2.046	1.895	1.795	1.773	1.667	1.523	1.341	1.015	0.628
275	2.110	1.953	1.848	1.824	1.714	1.569	1.387	1.057	0.665
280	2.175	2.011	1.900	1.876	1.760	1.615	1.434	1.099	0.702
285	2.239	2.069	1.953	1.927	1.805	1.662	1.480	1.141	0.739
290	2.303	2.127	2.006	1.979	1.850	1.708	1.526	1.183	0.776
295	2.367	2.184	2.058	2.030	1.895	1.752	1.572	1.225	0.813
300	2.431	2.242	2.111	2.081	1.941	1.792	1.619	1.267	0.850
305	2.495	2.300	2.164	2.133	1.986	1.832	1.665	1.310	0.887
310	2.559	2.358	2.216	2.184	2.031	1.872	1.711	1.352	0.924
315	2.624	2.416	2.269	2.236	2.076	1.912	1.753	1.394	0.961
320	2.688	2.474	2.322	2.287	2.122	1.952	1.787	1.436	0.998
325	2.752	2.532	2.374	2.339	2.167	1.992	1.822	1.478	1.035
330	2.816	2.589	2.427	2.390	2.212	2.032	1.856	1.520	1.072
335	2.880	2.647	2.480	2.442	2.257	2.072	1.891	1.562	1.109
340	2.944	2.705	2.532	2.493	2.303	2.112	1.926	1.604	1.146

Thickness is intumescent only.

Results apply to rectangular hollow section beams with concrete slabs with 3 sided fire exposure.

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 20 Rectangular/Square Hollow Beams: 45 minutes Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
60	2.125	1.951	1.817	1.666	1.417	1.227	1.049	0.884	0.561
65	2.296	2.113	1.970	1.814	1.620	1.406	1.205	1.019	0.739
70	2.467	2.275	2.123	1.961	1.803	1.606	1.390	1.190	0.917
75	2.638	2.437	2.276	2.109	1.947	1.785	1.576	1.361	1.095
80	2.809	2.599	2.429	2.257	2.092	1.923	1.755	1.532	1.273
85	2.980	2.761	2.582	2.404	2.236	2.061	1.886	1.703	1.451
90	3.269	2.924	2.735	2.552	2.380	2.200	2.017	1.837	1.629
95	3.782	3.086	2.887	2.700	2.525	2.338	2.148	1.961	1.782
100	4.294	3.500	3.040	2.848	2.669	2.477	2.280	2.085	1.897
105	-	3.924	3.329	2.995	2.813	2.615	2.411	2.209	2.011
110	-	4.348	3.688	3.195	2.958	2.753	2.542	2.332	2.126
115	-	-	4.046	3.492	3.109	2.892	2.673	2.456	2.240
120	-	-	4.405	3.789	3.351	3.030	2.805	2.580	2.355
125	-	-	-	4.086	3.592	3.195	2.936	2.704	2.469
130	-	-	-	4.383	3.834	3.380	3.067	2.828	2.584
135	-	-	-	-	4.075	3.566	3.206	2.952	2.698
140	-	-	-	-	4.316	3.751	3.347	3.076	2.813
145	-	-	-	-	-	3.937	3.488	3.187	2.927
150	-	-	-	-	-	4.123	3.629	3.296	3.042
155	-	-	-	-	-	4.308	3.770	3.404	3.149
160	-	-	-	-	-	-	3.910	3.513	3.250
165	-	-	-	-	-	-	4.051	3.622	3.352
170	-	-	-	-	-	-	4.192	3.731	3.453
175	-	-	-	-	-	-	4.333	3.839	3.555
180	-	-	-	-	-	-	4.474	3.948	3.656
185	-	-	-	-	-	-	-	4.057	3.758
190	-	-	-	-	-	-	-	4.166	3.859
195	-	-	-	-	-	-	-	4.274	3.961
200	-	-	-	-	-	-	-	4.383	4.062
205	-	-	-	-	-	-	-	-	4.164
210	-	-	-	-	-	-	-	-	4.265
215	-	-	-	-	-	-	-	-	4.367
220	-	-	-	-	-	-	-	-	4.468
225	-	-	-	-	-	-	-	-	-
230	-	-	-	-	-	-	-	-	-
235	-	-	-	-	-	-	-	-	-
240	-	-	-	-	-	-	-	-	-
245	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results apply to rectangular hollow section beams with concrete slabs with 3 sided fire exposure.

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C/012

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 21 Rectangular/Square Hollow Beams: 45 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
60	0.472	0.422	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.627	0.530	0.469	0.455	0.411	0.411	0.411	0.411	0.411
70	0.783	0.662	0.583	0.564	0.481	0.414	0.411	0.411	0.411
75	0.939	0.795	0.697	0.674	0.571	0.485	0.422	0.411	0.411
80	1.095	0.927	0.811	0.784	0.661	0.557	0.477	0.411	0.411
85	1.250	1.059	0.925	0.894	0.750	0.629	0.532	0.457	0.411
90	1.406	1.192	1.039	1.004	0.840	0.701	0.587	0.507	0.421
95	1.562	1.324	1.153	1.114	0.929	0.773	0.642	0.556	0.470
100	1.718	1.456	1.267	1.223	1.019	0.845	0.697	0.605	0.519
105	1.828	1.589	1.381	1.333	1.109	0.917	0.751	0.655	0.568
110	1.932	1.721	1.495	1.443	1.198	0.989	0.806	0.704	0.617
115	2.036	1.820	1.609	1.553	1.288	1.060	0.861	0.754	0.665
120	2.140	1.913	1.723	1.663	1.378	1.132	0.916	0.803	0.714
125	2.244	2.007	1.813	1.765	1.467	1.204	0.971	0.853	0.763
130	2.348	2.101	1.899	1.849	1.557	1.276	1.026	0.902	0.812
135	2.452	2.195	1.985	1.934	1.646	1.348	1.081	0.951	0.861
140	2.556	2.288	2.071	2.019	1.736	1.420	1.135	1.001	0.910
145	2.660	2.382	2.157	2.103	1.823	1.492	1.190	1.050	0.959
150	2.764	2.476	2.243	2.188	1.910	1.564	1.245	1.100	1.008
155	2.868	2.570	2.330	2.273	1.996	1.635	1.300	1.149	1.056
160	2.972	2.663	2.416	2.357	2.083	1.707	1.355	1.198	1.105
165	3.075	2.757	2.502	2.442	2.170	1.791	1.410	1.248	1.154
170	3.179	2.851	2.588	2.527	2.256	1.885	1.465	1.297	1.203
175	3.283	2.944	2.674	2.611	2.343	1.978	1.520	1.347	1.252
180	3.386	3.038	2.760	2.696	2.430	2.071	1.574	1.396	1.301
185	3.490	3.139	2.846	2.781	2.516	2.164	1.629	1.446	1.350
190	3.594	3.248	2.932	2.865	2.603	2.257	1.684	1.495	1.398
195	3.697	3.357	3.019	2.950	2.690	2.350	1.740	1.544	1.447
200	3.801	3.467	3.109	3.035	2.777	2.443	1.852	1.594	1.496
205	3.905	3.576	3.228	3.131	2.863	2.537	1.964	1.643	1.545
210	4.008	3.686	3.347	3.252	2.950	2.630	2.076	1.693	1.594
215	4.112	3.795	3.465	3.372	3.037	2.723	2.189	1.746	1.643
220	4.216	3.905	3.584	3.493	3.133	2.816	2.301	1.839	1.692
225	4.319	4.014	3.702	3.613	3.248	2.909	2.413	1.933	1.742
230	4.423	4.123	3.821	3.734	3.362	3.002	2.525	2.026	1.814
235	-	4.233	3.939	3.855	3.476	3.096	2.637	2.119	1.887
240	-	4.342	4.058	3.975	3.591	3.202	2.749	2.213	1.959
245	-	4.452	4.176	4.096	3.705	3.308	2.862	2.306	2.031
250	-	-	4.295	4.217	3.819	3.414	2.974	2.400	2.104
255	-	-	4.413	4.337	3.934	3.520	3.086	2.493	2.176
260	-	-	-	4.458	4.048	3.626	3.186	2.587	2.249
265	-	-	-	-	4.162	3.733	3.286	2.680	2.321
270	-	-	-	-	4.276	3.839	3.385	2.774	2.393
275	-	-	-	-	4.391	3.945	3.485	2.867	2.466
280	-	-	-	-	-	4.051	3.585	2.960	2.538
285	-	-	-	-	-	4.157	3.684	3.054	2.611
290	-	-	-	-	-	4.263	3.784	3.156	2.683
295	-	-	-	-	-	4.369	3.884	3.264	2.755
300	-	-	-	-	-	-	3.983	3.373	2.828
305	-	-	-	-	-	-	4.083	3.481	2.900
310	-	-	-	-	-	-	4.182	3.589	2.973
315	-	-	-	-	-	-	4.282	3.698	3.045
320	-	-	-	-	-	-	4.382	3.806	3.131
325	-	-	-	-	-	-	-	3.914	3.241
330	-	-	-	-	-	-	-	4.022	3.351
335	-	-	-	-	-	-	-	4.131	3.461
340	-	-	-	-	-	-	-	4.239	3.571

Thickness is intumescent only.

Results apply to rectangular hollow section beams with concrete slabs with 3 sided fire exposure.

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C/012

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 22 Circular and Rectangular/Square Hollow Columns: 15 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
60	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
70	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
75	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
80	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
85	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
90	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
95	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
100	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
105	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
110	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
115	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
120	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
125	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
130	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
135	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
140	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
145	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
150	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
155	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
160	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
165	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
170	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
175	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
180	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
185	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
190	0.441	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
195	0.479	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
200	0.518	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
205	0.556	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
210	0.595	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
215	0.633	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
220	0.672	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
225	0.710	0.414	0.411	0.411	0.411	0.411	0.411	0.411	0.411
230	0.749	0.456	0.411	0.411	0.411	0.411	0.411	0.411	0.411
235	0.787	0.498	0.411	0.411	0.411	0.411	0.411	0.411	0.411
240	0.826	0.540	0.411	0.411	0.411	0.411	0.411	0.411	0.411
245	0.865	0.582	0.411	0.411	0.411	0.411	0.411	0.411	0.411
250	0.903	0.624	0.411	0.411	0.411	0.411	0.411	0.411	0.411
255	0.942	0.665	0.411	0.411	0.411	0.411	0.411	0.411	0.411
260	0.980	0.707	0.411	0.411	0.411	0.411	0.411	0.411	0.411
265	1.019	0.749	0.424	0.411	0.411	0.411	0.411	0.411	0.411
270	1.057	0.791	0.470	0.411	0.411	0.411	0.411	0.411	0.411
275	1.096	0.833	0.516	0.411	0.411	0.411	0.411	0.411	0.411
280	1.134	0.875	0.561	0.411	0.411	0.411	0.411	0.411	0.411
285	1.173	0.917	0.607	0.411	0.411	0.411	0.411	0.411	0.411
290	1.211	0.958	0.652	0.411	0.411	0.411	0.411	0.411	0.411
295	1.250	1.000	0.698	0.411	0.411	0.411	0.411	0.411	0.411
300	1.288	1.042	0.744	0.411	0.411	0.411	0.411	0.411	0.411
305	1.327	1.084	0.789	0.428	0.411	0.411	0.411	0.411	0.411
310	1.365	1.126	0.835	0.477	0.411	0.411	0.411	0.411	0.411
315	1.404	1.168	0.880	0.527	0.411	0.411	0.411	0.411	0.411
320	1.442	1.210	0.926	0.576	0.411	0.411	0.411	0.411	0.411
325	1.481	1.252	0.972	0.626	0.411	0.411	0.411	0.411	0.411
330	1.519	1.293	1.017	0.675	0.411	0.411	0.411	0.411	0.411
335	1.558	1.335	1.063	0.725	0.411	0.411	0.411	0.411	0.411
340	1.596	1.377	1.108	0.774	0.456	0.411	0.411	0.411	0.411

Thickness is intumescent only.

Results also apply to rectangular/square hollow section beams exposed on all sides limited to a maximum protection thickness of 4.474mm.

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C/012

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 23 Circular and Rectangular/Square Hollow Columns: 15 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
60	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
70	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
75	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
80	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
85	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
90	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
95	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
100	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
105	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
110	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
115	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
120	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
125	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
130	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
135	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
140	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
145	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
150	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
155	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
160	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
165	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
170	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
175	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
180	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
185	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
190	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
195	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
200	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
205	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
210	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
215	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
220	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
225	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
230	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
235	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
240	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
245	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
250	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
255	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
260	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
265	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
270	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
275	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
280	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
285	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
290	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
295	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
300	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
305	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
310	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
315	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
320	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
325	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
330	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
335	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
340	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411

Thickness is intumescent only.

Results also apply to rectangular/square hollow section beams exposed on all sides limited to a maximum protection thickness of 4.474mm.

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C/012

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 24 Circular and Rectangular/Square Hollow Columns: 30 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
60	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
70	0.470	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
75	0.561	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
80	0.652	0.474	0.411	0.411	0.411	0.411	0.411	0.411	0.411
85	0.744	0.544	0.415	0.411	0.411	0.411	0.411	0.411	0.411
90	0.835	0.614	0.468	0.411	0.411	0.411	0.411	0.411	0.411
95	0.927	0.685	0.521	0.411	0.411	0.411	0.411	0.411	0.411
100	1.018	0.755	0.574	0.458	0.411	0.411	0.411	0.411	0.411
105	1.110	0.825	0.627	0.509	0.411	0.411	0.411	0.411	0.411
110	1.201	0.895	0.680	0.561	0.435	0.411	0.411	0.411	0.411
115	1.292	0.966	0.733	0.612	0.486	0.411	0.411	0.411	0.411
120	1.384	1.036	0.786	0.663	0.536	0.411	0.411	0.411	0.411
125	1.475	1.106	0.839	0.714	0.587	0.452	0.411	0.411	0.411
130	1.567	1.176	0.892	0.766	0.637	0.503	0.411	0.411	0.411
135	1.658	1.246	0.945	0.817	0.688	0.553	0.411	0.411	0.411
140	1.747	1.317	0.998	0.868	0.738	0.603	0.461	0.411	0.411
145	1.820	1.387	1.051	0.919	0.789	0.654	0.512	0.411	0.411
150	1.892	1.457	1.104	0.970	0.839	0.704	0.562	0.411	0.411
155	1.964	1.527	1.157	1.022	0.889	0.754	0.613	0.453	0.411
160	2.037	1.598	1.210	1.073	0.940	0.804	0.664	0.505	0.411
165	2.109	1.668	1.263	1.124	0.990	0.855	0.715	0.556	0.411
170	2.181	1.738	1.316	1.175	1.041	0.905	0.765	0.608	0.423
175	2.254	1.805	1.368	1.227	1.091	0.955	0.816	0.660	0.477
180	2.326	1.872	1.421	1.278	1.142	1.005	0.867	0.712	0.530
185	2.398	1.939	1.474	1.329	1.192	1.056	0.918	0.764	0.584
190	2.471	2.006	1.527	1.380	1.243	1.106	0.969	0.816	0.638
195	2.543	2.073	1.580	1.432	1.293	1.156	1.019	0.868	0.692
200	2.615	2.140	1.633	1.483	1.343	1.207	1.070	0.920	0.746
205	2.688	2.207	1.686	1.534	1.394	1.257	1.121	0.972	0.800
210	2.760	2.275	1.739	1.585	1.444	1.307	1.172	1.024	0.854
215	2.832	2.342	1.807	1.637	1.495	1.357	1.222	1.076	0.908
220	2.905	2.409	1.874	1.688	1.545	1.408	1.273	1.128	0.962
225	2.977	2.476	1.941	1.739	1.596	1.458	1.324	1.180	1.016
230	3.049	2.543	2.008	1.804	1.646	1.508	1.375	1.232	1.070
235	3.122	2.610	2.075	1.869	1.697	1.559	1.426	1.284	1.124
240	3.196	2.677	2.142	1.934	1.749	1.609	1.476	1.335	1.178
245	3.270	2.744	2.209	1.999	1.811	1.659	1.527	1.387	1.232
250	3.343	2.811	2.276	2.064	1.872	1.709	1.578	1.439	1.286
255	3.417	2.878	2.343	2.129	1.934	1.763	1.629	1.491	1.340
260	3.491	2.945	2.411	2.194	1.996	1.820	1.679	1.543	1.394
265	3.564	3.012	2.478	2.259	2.057	1.878	1.730	1.595	1.448
270	3.638	3.079	2.545	2.324	2.119	1.936	1.783	1.647	1.502
275	3.712	3.172	2.612	2.389	2.181	1.993	1.836	1.699	1.556
280	3.785	3.270	2.679	2.454	2.242	2.051	1.889	1.750	1.610
285	3.859	3.368	2.746	2.519	2.304	2.109	1.942	1.799	1.664
290	3.933	3.466	2.813	2.584	2.366	2.166	1.995	1.847	1.718
295	4.006	3.564	2.880	2.649	2.427	2.224	2.048	1.896	1.765
300	4.080	3.662	2.948	2.713	2.489	2.282	2.101	1.944	1.809
305	4.154	3.760	3.015	2.778	2.551	2.339	2.154	1.993	1.853
310	4.227	3.858	3.082	2.843	2.612	2.397	2.207	2.041	1.897
315	4.301	3.956	3.219	2.908	2.674	2.455	2.261	2.090	1.941
320	4.375	4.054	3.369	2.973	2.736	2.512	2.314	2.138	1.985
325	4.448	4.152	3.519	3.038	2.797	2.570	2.367	2.187	2.029
330	4.522	4.250	3.669	3.118	2.859	2.627	2.420	2.235	2.073
335	4.596	4.348	3.819	3.268	2.921	2.685	2.473	2.284	2.116
340	4.669	4.446	3.969	3.419	2.982	2.743	2.526	2.332	2.160

Thickness is intumescent only.

Results also apply to rectangular/square hollow section beams exposed on all sides limited to a maximum protection thickness of 4.474mm.

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 25 Circular and Rectangular/Square Hollow Columns: 30 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
60	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
70	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
75	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
80	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
85	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
90	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
95	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
100	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
105	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
110	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
115	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
120	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
125	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
130	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
135	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
140	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
145	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
150	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
155	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
160	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
165	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
170	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
175	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
180	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
185	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
190	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
195	0.442	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
200	0.500	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
205	0.559	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
210	0.617	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
215	0.675	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
220	0.733	0.441	0.411	0.411	0.411	0.411	0.411	0.411	0.411
225	0.791	0.501	0.411	0.411	0.411	0.411	0.411	0.411	0.411
230	0.849	0.561	0.411	0.411	0.411	0.411	0.411	0.411	0.411
235	0.907	0.620	0.411	0.411	0.411	0.411	0.411	0.411	0.411
240	0.965	0.680	0.440	0.411	0.411	0.411	0.411	0.411	0.411
245	1.023	0.740	0.500	0.426	0.411	0.411	0.411	0.411	0.411
250	1.081	0.799	0.560	0.487	0.411	0.411	0.411	0.411	0.411
255	1.140	0.859	0.620	0.548	0.411	0.411	0.411	0.411	0.411
260	1.198	0.919	0.681	0.608	0.411	0.411	0.411	0.411	0.411
265	1.256	0.978	0.741	0.669	0.411	0.411	0.411	0.411	0.411
270	1.314	1.038	0.801	0.729	0.411	0.411	0.411	0.411	0.411
275	1.372	1.098	0.861	0.790	0.411	0.411	0.411	0.411	0.411
280	1.430	1.157	0.921	0.851	0.411	0.411	0.411	0.411	0.411
285	1.488	1.217	0.981	0.911	0.470	0.411	0.411	0.411	0.411
290	1.546	1.277	1.041	0.972	0.533	0.411	0.411	0.411	0.411
295	1.604	1.336	1.102	1.032	0.596	0.411	0.411	0.411	0.411
300	1.662	1.396	1.162	1.093	0.659	0.411	0.411	0.411	0.411
305	1.721	1.456	1.222	1.154	0.723	0.411	0.411	0.411	0.411
310	1.765	1.515	1.282	1.214	0.786	0.411	0.411	0.411	0.411
315	1.804	1.575	1.342	1.275	0.849	0.411	0.411	0.411	0.411
320	1.843	1.635	1.402	1.335	0.912	0.428	0.411	0.411	0.411
325	1.882	1.694	1.463	1.396	0.976	0.485	0.411	0.411	0.411
330	1.921	1.747	1.523	1.457	1.039	0.543	0.411	0.411	0.411
335	1.960	1.783	1.583	1.517	1.102	0.600	0.411	0.411	0.411
340	1.999	1.818	1.643	1.578	1.165	0.657	0.411	0.411	0.411

Thickness is intumescent only.

Results also apply to rectangular/square hollow section beams exposed on all sides limited to a maximum protection thickness of 4.474mm.

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 26 Circular and Rectangular/Square Hollow Columns: 45 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
60	1.477	1.169	0.893	0.525	0.422	0.411	0.411	0.411	0.411
65	1.682	1.339	1.027	0.683	0.509	0.411	0.411	0.411	0.411
70	1.830	1.524	1.193	0.841	0.639	0.493	0.411	0.411	0.411
75	1.957	1.710	1.358	0.999	0.769	0.600	0.485	0.412	0.411
80	2.083	1.839	1.523	1.157	0.898	0.706	0.571	0.479	0.425
85	2.210	1.959	1.689	1.315	1.028	0.813	0.657	0.546	0.475
90	2.336	2.079	1.818	1.473	1.158	0.920	0.743	0.613	0.526
95	2.463	2.198	1.932	1.631	1.288	1.026	0.829	0.680	0.577
100	2.590	2.318	2.046	1.773	1.417	1.133	0.916	0.747	0.628
105	2.716	2.438	2.160	1.883	1.547	1.240	1.002	0.814	0.678
110	2.843	2.557	2.274	1.993	1.677	1.346	1.088	0.881	0.729
115	2.969	2.677	2.388	2.103	1.794	1.453	1.174	0.948	0.780
120	3.098	2.797	2.502	2.213	1.901	1.560	1.260	1.015	0.830
125	3.294	2.916	2.616	2.322	2.007	1.666	1.347	1.082	0.881
130	3.489	3.036	2.730	2.432	2.114	1.772	1.433	1.149	0.932
135	3.685	3.163	2.844	2.542	2.221	1.875	1.519	1.216	0.983
140	3.881	3.297	2.958	2.652	2.327	1.978	1.605	1.283	1.033
145	4.076	3.431	3.073	2.762	2.434	2.081	1.692	1.350	1.084
150	4.272	3.565	3.171	2.872	2.540	2.184	1.785	1.417	1.135
155	4.467	3.699	3.266	2.981	2.647	2.287	1.888	1.484	1.185
160	4.663	3.833	3.361	3.091	2.753	2.390	1.991	1.551	1.236
165	-	3.966	3.456	3.187	2.860	2.493	2.093	1.618	1.287
170	-	4.100	3.551	3.283	2.966	2.596	2.196	1.685	1.338
175	-	4.234	3.646	3.379	3.073	2.699	2.299	1.761	1.388
180	-	4.368	3.741	3.475	3.173	2.802	2.401	1.873	1.439
185	-	4.502	3.836	3.571	3.271	2.905	2.504	1.986	1.490
190	-	4.636	3.931	3.667	3.370	3.008	2.607	2.098	1.540
195	-	-	4.026	3.762	3.468	3.111	2.709	2.210	1.591
200	-	-	4.121	3.858	3.566	3.215	2.812	2.322	1.642
205	-	-	4.216	3.954	3.665	3.319	2.915	2.435	1.693
210	-	-	4.311	4.050	3.763	3.423	3.017	2.547	1.752
215	-	-	4.406	4.146	3.862	3.527	3.123	2.659	1.889
220	-	-	4.501	4.242	3.960	3.631	3.234	2.771	2.026
225	-	-	4.596	4.338	4.059	3.735	3.346	2.884	2.163
230	-	-	4.691	4.433	4.157	3.839	3.458	2.996	2.300
235	-	-	-	4.529	4.256	3.943	3.570	3.109	2.437
240	-	-	-	4.625	4.354	4.047	3.682	3.229	2.574
245	-	-	-	4.721	4.453	4.151	3.794	3.349	2.711
250	-	-	-	-	4.551	4.255	3.906	3.469	2.848
255	-	-	-	-	4.650	4.359	4.018	3.590	2.984
260	-	-	-	-	4.748	4.463	4.130	3.710	3.120
265	-	-	-	-	-	4.567	4.242	3.830	3.251
270	-	-	-	-	-	4.671	4.354	3.950	3.382
275	-	-	-	-	-	-	4.466	4.070	3.513
280	-	-	-	-	-	-	4.578	4.190	3.643
285	-	-	-	-	-	-	4.690	4.310	3.774
290	-	-	-	-	-	-	-	4.430	3.905
295	-	-	-	-	-	-	-	4.550	4.036
300	-	-	-	-	-	-	-	4.670	4.167
305	-	-	-	-	-	-	-	-	4.298
310	-	-	-	-	-	-	-	-	4.429
315	-	-	-	-	-	-	-	-	4.559
320	-	-	-	-	-	-	-	-	4.690
325	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results also apply to rectangular/square hollow section beams exposed on all sides limited to a maximum protection thickness of 4.474mm.

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 27 Circular and Rectangular/Square Hollow Columns: 45 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
60	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
70	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
75	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
80	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
85	0.417	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
90	0.466	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
95	0.515	0.445	0.411	0.411	0.411	0.411	0.411	0.411	0.411
100	0.564	0.492	0.441	0.426	0.411	0.411	0.411	0.411	0.411
105	0.613	0.540	0.487	0.473	0.411	0.411	0.411	0.411	0.411
110	0.661	0.587	0.534	0.519	0.433	0.411	0.411	0.411	0.411
115	0.710	0.635	0.581	0.566	0.479	0.411	0.411	0.411	0.411
120	0.759	0.682	0.627	0.612	0.525	0.419	0.411	0.411	0.411
125	0.808	0.730	0.674	0.659	0.571	0.465	0.411	0.411	0.411
130	0.857	0.777	0.721	0.705	0.617	0.510	0.411	0.411	0.411
135	0.906	0.825	0.767	0.752	0.663	0.555	0.434	0.411	0.411
140	0.955	0.872	0.814	0.798	0.709	0.600	0.479	0.411	0.411
145	1.004	0.920	0.861	0.845	0.754	0.646	0.523	0.411	0.411
150	1.053	0.967	0.907	0.891	0.800	0.691	0.568	0.411	0.411
155	1.102	1.015	0.954	0.938	0.846	0.736	0.613	0.445	0.411
160	1.151	1.063	1.001	0.984	0.892	0.781	0.657	0.489	0.411
165	1.200	1.110	1.047	1.031	0.938	0.826	0.702	0.533	0.411
170	1.249	1.158	1.094	1.077	0.984	0.872	0.747	0.577	0.411
175	1.298	1.205	1.141	1.124	1.030	0.917	0.791	0.621	0.411
180	1.347	1.253	1.187	1.170	1.076	0.962	0.836	0.666	0.444
185	1.396	1.300	1.234	1.217	1.122	1.007	0.880	0.710	0.486
190	1.445	1.348	1.281	1.263	1.168	1.052	0.925	0.754	0.528
195	1.494	1.395	1.327	1.310	1.214	1.098	0.970	0.798	0.570
200	1.543	1.443	1.374	1.356	1.260	1.143	1.014	0.842	0.612
205	1.592	1.490	1.421	1.403	1.306	1.188	1.059	0.886	0.654
210	1.641	1.538	1.467	1.449	1.352	1.233	1.104	0.930	0.696
215	1.690	1.585	1.514	1.496	1.398	1.279	1.148	0.974	0.738
220	1.740	1.633	1.561	1.542	1.444	1.324	1.193	1.019	0.780
225	1.836	1.680	1.607	1.589	1.490	1.369	1.237	1.063	0.822
230	1.932	1.728	1.654	1.635	1.536	1.414	1.282	1.107	0.864
235	2.027	1.797	1.701	1.682	1.582	1.459	1.327	1.151	0.906
240	2.123	1.873	1.752	1.728	1.628	1.505	1.371	1.195	0.948
245	2.219	1.949	1.822	1.792	1.674	1.550	1.416	1.239	0.990
250	2.315	2.024	1.891	1.860	1.720	1.595	1.461	1.283	1.032
255	2.411	2.100	1.961	1.929	1.775	1.640	1.505	1.327	1.074
260	2.506	2.175	2.031	1.997	1.836	1.685	1.550	1.372	1.116
265	2.602	2.251	2.100	2.065	1.897	1.731	1.594	1.416	1.158
270	2.698	2.327	2.170	2.134	1.957	1.784	1.639	1.460	1.200
275	2.794	2.402	2.240	2.202	2.018	1.839	1.684	1.504	1.242
280	2.890	2.478	2.310	2.270	2.079	1.894	1.728	1.548	1.283
285	2.985	2.554	2.379	2.338	2.140	1.948	1.777	1.592	1.325
290	3.081	2.629	2.449	2.407	2.201	2.003	1.827	1.636	1.367
295	3.241	2.705	2.519	2.475	2.262	2.058	1.877	1.680	1.409
300	3.408	2.781	2.589	2.543	2.323	2.113	1.926	1.725	1.451
305	3.576	2.856	2.658	2.612	2.383	2.168	1.976	1.769	1.493
310	3.744	2.932	2.728	2.680	2.444	2.223	2.026	1.813	1.535
315	3.911	3.007	2.798	2.748	2.505	2.277	2.076	1.858	1.577
320	4.079	3.083	2.867	2.817	2.566	2.332	2.125	1.902	1.619
325	4.247	3.270	2.937	2.885	2.627	2.387	2.175	1.947	1.661
330	4.414	3.472	3.007	2.953	2.688	2.442	2.225	1.991	1.703
335	4.582	3.673	3.077	3.022	2.749	2.497	2.275	2.036	1.745
340	-	3.875	3.239	3.090	2.809	2.552	2.324	2.080	1.788

Thickness is intumescent only.

Results also apply to rectangular/square hollow section beams exposed on all sides limited to a maximum protection thickness of 4.474mm.

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### SIKA DEUTSCHLAND GMBH

Table 28 Circular and Rectangular/Square Hollow Columns: 60 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	350	375	400	425	450	475	500	525	550
60	2.292	2.084	1.894	1.742	1.490	1.298	1.136	0.986	0.639
65	2.477	2.258	2.057	1.894	1.702	1.486	1.304	1.134	0.834
70	2.662	2.431	2.220	2.047	1.862	1.692	1.497	1.314	1.029
75	2.847	2.604	2.383	2.199	2.009	1.848	1.690	1.493	1.225
80	3.032	2.778	2.546	2.352	2.156	1.989	1.839	1.673	1.420
85	3.826	2.951	2.709	2.504	2.304	2.130	1.974	1.820	1.615
90	-	3.253	2.873	2.656	2.451	2.271	2.108	1.947	1.782
95	-	4.121	3.036	2.809	2.599	2.412	2.243	2.075	1.900
100	-	-	3.550	2.961	2.746	2.554	2.377	2.202	2.018
105	-	-	4.251	3.170	2.893	2.695	2.512	2.330	2.136
110	-	-	-	3.725	3.041	2.836	2.647	2.458	2.254
115	-	-	-	4.281	3.372	2.977	2.781	2.585	2.372
120	-	-	-	-	3.802	3.153	2.916	2.713	2.490
125	-	-	-	-	4.232	3.481	3.050	2.841	2.608
130	-	-	-	-	-	3.810	3.267	2.968	2.726
135	-	-	-	-	-	4.138	3.521	3.097	2.844
140	-	-	-	-	-	4.466	3.774	3.278	2.962
145	-	-	-	-	-	-	4.028	3.459	3.080
150	-	-	-	-	-	-	4.282	3.639	3.183
155	-	-	-	-	-	-	4.535	3.820	3.284
160	-	-	-	-	-	-	-	4.000	3.385
165	-	-	-	-	-	-	-	4.181	3.486
170	-	-	-	-	-	-	-	4.362	3.588
175	-	-	-	-	-	-	-	4.542	3.689
180	-	-	-	-	-	-	-	4.723	3.790
185	-	-	-	-	-	-	-	-	3.891
190	-	-	-	-	-	-	-	-	3.993
195	-	-	-	-	-	-	-	-	4.094
200	-	-	-	-	-	-	-	-	4.195
205	-	-	-	-	-	-	-	-	4.296
210	-	-	-	-	-	-	-	-	4.398
215	-	-	-	-	-	-	-	-	4.499
220	-	-	-	-	-	-	-	-	4.600
225	-	-	-	-	-	-	-	-	4.701
230	-	-	-	-	-	-	-	-	-
235	-	-	-	-	-	-	-	-	-
240	-	-	-	-	-	-	-	-	-
245	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Results also apply to rectangular/square hollow section beams exposed on all sides limited to a maximum protection thickness of 4.474mm.

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## CERTIFICATE No CF 821

### SIKA DEUTSCHLAND GMBH

Table 29 Circular and Rectangular/Square Hollow Columns: 60 minutes									
Required Thickness (mm) for a Design Temperature (°C)									
Section Factor (m <sup>-1</sup> )	575	600	620	625	650	675	700	725	750
60	0.516	0.422	0.411	0.411	0.411	0.411	0.411	0.411	0.411
65	0.684	0.546	0.474	0.457	0.411	0.411	0.411	0.411	0.411
70	0.851	0.682	0.590	0.567	0.469	0.411	0.411	0.411	0.411
75	1.019	0.818	0.705	0.678	0.555	0.463	0.411	0.411	0.411
80	1.187	0.954	0.821	0.788	0.641	0.528	0.457	0.411	0.411
85	1.354	1.091	0.936	0.899	0.727	0.593	0.507	0.436	0.411
90	1.522	1.227	1.052	1.010	0.813	0.658	0.556	0.485	0.411
95	1.689	1.363	1.167	1.120	0.898	0.722	0.606	0.534	0.445
100	1.814	1.500	1.283	1.231	0.984	0.787	0.655	0.583	0.493
105	1.920	1.636	1.399	1.341	1.070	0.852	0.705	0.632	0.542
110	2.026	1.762	1.514	1.452	1.156	0.916	0.754	0.680	0.590
115	2.132	1.856	1.630	1.562	1.242	0.981	0.804	0.729	0.638
120	2.239	1.951	1.743	1.673	1.328	1.046	0.853	0.778	0.687
125	2.345	2.045	1.830	1.773	1.413	1.111	0.903	0.827	0.735
130	2.451	2.140	1.916	1.858	1.499	1.175	0.952	0.876	0.783
135	2.558	2.234	2.003	1.942	1.585	1.240	1.001	0.925	0.832
140	2.664	2.329	2.089	2.027	1.671	1.305	1.051	0.974	0.880
145	2.770	2.423	2.176	2.112	1.757	1.369	1.100	1.023	0.928
150	2.876	2.518	2.262	2.197	1.845	1.434	1.150	1.072	0.977
155	2.983	2.612	2.349	2.282	1.933	1.499	1.199	1.121	1.025
160	3.089	2.707	2.435	2.367	2.021	1.564	1.249	1.170	1.073
165	3.192	2.801	2.521	2.451	2.109	1.628	1.298	1.219	1.122
170	3.295	2.896	2.608	2.536	2.197	1.693	1.348	1.268	1.170
175	3.398	2.990	2.694	2.621	2.285	1.768	1.397	1.317	1.218
180	3.501	3.085	2.781	2.706	2.373	1.868	1.447	1.366	1.267
185	3.604	3.193	2.867	2.791	2.461	1.967	1.496	1.415	1.315
190	3.707	3.303	2.954	2.875	2.549	2.066	1.545	1.464	1.363
195	3.810	3.412	3.040	2.960	2.637	2.166	1.595	1.513	1.412
200	3.912	3.522	3.140	3.045	2.724	2.265	1.644	1.561	1.460
205	4.015	3.631	3.259	3.147	2.812	2.365	1.694	1.610	1.508
210	4.118	3.740	3.379	3.269	2.900	2.464	1.751	1.659	1.557
215	4.221	3.850	3.498	3.391	2.988	2.564	1.875	1.708	1.605
220	4.324	3.959	3.618	3.513	3.076	2.663	1.998	1.771	1.653
225	4.427	4.069	3.737	3.635	3.218	2.762	2.121	1.854	1.702
230	4.530	4.178	3.857	3.758	3.370	2.862	2.245	1.936	1.756
235	4.633	4.288	3.976	3.880	3.523	2.961	2.368	2.019	1.827
240	4.736	4.397	4.096	4.002	3.676	3.061	2.491	2.102	1.898
245	-	4.507	4.215	4.124	3.829	3.172	2.615	2.185	1.969
250	-	4.616	4.335	4.246	3.982	3.290	2.738	2.268	2.041
255	-	-	4.454	4.369	4.135	3.408	2.861	2.351	2.112
260	-	-	4.574	4.491	4.288	3.525	2.985	2.434	2.183
265	-	-	4.693	4.613	4.441	3.643	3.106	2.517	2.255
270	-	-	-	4.735	4.594	3.760	3.214	2.600	2.326
275	-	-	-	-	-	3.878	3.321	2.683	2.397
280	-	-	-	-	-	3.995	3.429	2.766	2.468
285	-	-	-	-	-	4.113	3.537	2.849	2.540
290	-	-	-	-	-	4.230	3.645	2.932	2.611
295	-	-	-	-	-	4.348	3.752	3.015	2.682
300	-	-	-	-	-	4.466	3.860	3.101	2.753
305	-	-	-	-	-	4.583	3.968	3.233	2.825
310	-	-	-	-	-	4.701	4.075	3.366	2.896
315	-	-	-	-	-	-	4.183	3.498	2.967
320	-	-	-	-	-	-	4.291	3.630	3.039
325	-	-	-	-	-	-	4.399	3.763	3.124
330	-	-	-	-	-	-	4.506	3.895	3.251
335	-	-	-	-	-	-	4.614	4.027	3.378
340	-	-	-	-	-	-	-	4.160	3.505

Thickness is intumescent only.

Results also apply to rectangular/square hollow section beams exposed on all sides limited to a maximum protection thickness of 4.474mm.

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