CERTIFICATE OF APPROVAL
No CF 5644

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

SHERWIN WILLIAMS

Kestor street, Tower works, Bolton BL2 2AL
TEL: 01204521771

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	TECHNICAL SCHEDULE
FIRETEX FX6002	TS 15

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

Paul Duggan
Certification Manager

Issued:	13th September 2018
Revised:	29th November 2019
Valid to:	12th September 2023

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FIRETEX FX6002

1. 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.

2. This approval relates to the use of FIRETEX FX6002 for the fire protection of I/H-shaped and hollow steel sections. The precise scope is given in tables below which show the total dry film thickness of FIRETEX FX6002 (excluding primer and top sealer) required to provide fire resistance periods in accordance with BS476: Part 21: 1987 of up to 120 minutes for I-section beams, rectangular hollow columns, circular hollow columns and rectangular hollow beams, 150 minutes for I-section columns.

3. The products are approved on the basis of:
   i) Initial type testing.
   ii) A design appraisal against TS15.
   iii) Certification of Quality Management systems to ISO 9001: 2015.
   iv) Inspection and surveillance of factory production control.
   v) Audit testing.

4. The data referring to three-sided fire exposure of beams relates to beams supporting concrete floor slabs. Separate consideration is required where this is not the case.

5. The data shown are applicable to steel sections blast cleaned to ISO 8501-1 SA2.5 or equivalent and primed with a suitable and compatible primer. Specifications of surface preparations, primers and top sealers is available from Sherwin-Williams Protective and Marine Coatings whose responsibility is to ensure that FIRETEX FX6002 is compatible for use in respect of both ambient and fire conditions. The total dry film thickness of primer should not exceed that tested.

6. The data shown is applicable to FIRETEX FX6002 applied by spray to horizontal, vertical, flexural and compression members supporting loads up to the maximum design loads specified in BS449: Part 2. Specifications for other steel design temperatures are available from Sherwin-Williams Protective and Marine Coatings.

7. 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.

8. The data shown in the tables are based on assessments which comply with the criteria for acceptability now incorporated within the CERTIFIRE scheme.

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FIRETEX FX6002

Table 1 I-Section Columns 15 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
35	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
40	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
45	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
50	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
55	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
60	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
65	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
70	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
75	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
80	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
85	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
90	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
95	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
100	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
105	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
110	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
115	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
120	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
125	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
130	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
135	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
140	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
145	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
150	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
155	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
160	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
165	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
170	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
175	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
180	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
185	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
190	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
195	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
200	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
205	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
210	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
215	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
220	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
225	0.362	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
230	0.373	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
235	0.384	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
240	0.395	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
245	0.407	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
250	0.418	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
255	0.429	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
260	0.440	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
265	0.452	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
270	0.463	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
275	0.474	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
280	0.485	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
285	0.496	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
290	0.508	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
295	0.519	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
300	0.530	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
305	0.541	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
310	0.552	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
315	0.564	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
320	0.575	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
325	0.586	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
330	0.597	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
335	0.608	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
340	0.620	0.355	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
345	0.631	0.365	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
350	0.642	0.375	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
355	0.653	0.385	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
360	0.665	0.395	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
365	0.676	0.405	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
370	0.687	0.415	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
375	0.698	0.425	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
380	0.709	0.435	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
385	0.721	0.445	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354

Thickness is intumescent only. Results also apply to I-section beams exposed on all four sides limited to a maximum protection thickness of 6.0445mm.

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Table 2 I-Section Columns 20 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
35	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
40	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
45	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
50	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
55	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
60	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
65	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
70	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
75	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
80	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
85	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
90	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
95	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
100	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
105	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
110	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
115	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
120	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
125	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
130	0.358	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
135	0.372	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
140	0.386	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
145	0.399	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
150	0.413	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
155	0.427	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
160	0.441	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
165	0.455	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
170	0.469	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
175	0.483	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
180	0.497	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
185	0.511	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
190	0.525	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
195	0.539	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
200	0.553	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
205	0.567	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
210	0.581	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
215	0.595	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
220	0.609	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
225	0.623	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
230	0.637	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
235	0.651	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
240	0.665	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
245	0.679	0.361	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
250	0.693	0.374	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
255	0.707	0.388	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
260	0.721	0.401	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
265	0.734	0.415	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
270	0.748	0.428	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
275	0.762	0.442	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
280	0.776	0.455	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
285	0.790	0.469	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
290	0.804	0.482	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
295	0.818	0.496	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
300	0.832	0.509	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
305	0.846	0.523	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
310	0.860	0.536	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
315	0.874	0.550	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
320	0.888	0.563	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
325	0.902	0.577	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
330	0.916	0.590	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
335	0.930	0.604	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
340	0.944	0.617	0.363	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
345	0.958	0.631	0.375	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
350	0.972	0.644	0.388	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
355	0.986	0.658	0.400	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
360	1.000	0.671	0.413	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
365	1.014	0.685	0.425	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
370	1.028	0.698	0.438	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
375	1.042	0.712	0.450	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
380	1.056	0.725	0.463	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
385	1.070	0.739	0.475	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354

Thickness is intumescent only. Results also apply to I-section beams exposed on all four sides limited to a maximum protection thickness of 6.0445mm.

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SHERWIN WILLIAMS

Table 3 I-Section Columns 30 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
35	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
40	0.359	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
45	0.377	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
50	0.395	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
55	0.414	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
60	0.432	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
65	0.450	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
70	0.468	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
75	0.487	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
80	0.505	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
85	0.523	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
90	0.541	0.367	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
95	0.560	0.383	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
100	0.578	0.400	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
105	0.596	0.416	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
110	0.614	0.433	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
115	0.633	0.450	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
120	0.651	0.466	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
125	0.669	0.483	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
130	0.687	0.499	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
135	0.706	0.516	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
140	0.724	0.532	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
145	0.742	0.549	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
150	0.761	0.566	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
155	0.779	0.582	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
160	0.797	0.599	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
165	0.815	0.615	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
170	0.834	0.632	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
175	0.852	0.648	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
180	0.870	0.665	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
185	0.888	0.682	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
190	0.907	0.698	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
195	0.925	0.715	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
200	0.943	0.731	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
205	0.961	0.748	0.365	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
210	0.980	0.764	0.384	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
215	0.998	0.781	0.403	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
220	1.016	0.797	0.421	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
225	1.034	0.814	0.440	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
230	1.053	0.831	0.458	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
235	1.071	0.847	0.477	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
240	1.089	0.864	0.496	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
245	1.107	0.880	0.514	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
250	1.126	0.897	0.533	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
255	1.144	0.913	0.552	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
260	1.162	0.930	0.570	0.358	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
265	1.180	0.947	0.589	0.375	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
270	1.199	0.963	0.608	0.393	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
275	1.217	0.980	0.626	0.411	0.364	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
280	1.235	0.996	0.645	0.429	0.382	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
285	1.254	1.013	0.663	0.446	0.399	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
290	1.272	1.029	0.682	0.464	0.417	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
295	1.290	1.046	0.701	0.482	0.434	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
300	1.308	1.063	0.719	0.500	0.452	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
305	1.327	1.079	0.738	0.517	0.470	0.371	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
310	1.345	1.096	0.757	0.535	0.487	0.388	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
315	1.363	1.112	0.775	0.553	0.505	0.406	0.360	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
320	1.381	1.129	0.794	0.571	0.523	0.423	0.377	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
325	1.400	1.145	0.813	0.588	0.540	0.440	0.395	0.368	0.354	0.354	0.354	0.354	0.354	0.354	0.354
330	1.418	1.162	0.831	0.606	0.558	0.458	0.412	0.385	0.364	0.354	0.354	0.354	0.354	0.354	0.354
335	1.436	1.179	0.850	0.624	0.576	0.475	0.429	0.402	0.381	0.354	0.354	0.354	0.354	0.354	0.354
340	1.454	1.195	0.868	0.642	0.593	0.493	0.446	0.419	0.398	0.354	0.354	0.354	0.354	0.354	0.354
345	1.473	1.212	0.887	0.660	0.611	0.510	0.464	0.436	0.415	0.361	0.354	0.354	0.354	0.354	0.354
350	1.491	1.228	0.906	0.677	0.629	0.527	0.481	0.454	0.432	0.378	0.354	0.354	0.354	0.354	0.354
355	1.509	1.245	0.924	0.695	0.646	0.545	0.498	0.471	0.449	0.394	0.354	0.354	0.354	0.354	0.354
360	1.537	1.261	0.943	0.713	0.664	0.562	0.515	0.488	0.466	0.411	0.354	0.354	0.354	0.354	0.354
365	1.577	1.278	0.962	0.731	0.681	0.579	0.533	0.505	0.483	0.427	0.356	0.354	0.354	0.354	0.354
370	1.616	1.295	0.980	0.748	0.699	0.597	0.550	0.522	0.500	0.444	0.372	0.354	0.354	0.354	0.354
375	1.655	1.311	0.999	0.766	0.717	0.614	0.567	0.539	0.517	0.460	0.388	0.354	0.354	0.354	0.354
380	1.695	1.328	1.018	0.784	0.734	0.632	0.584	0.556	0.534	0.477	0.404	0.354	0.354	0.354	0.354
385	1.734	1.344	1.036	0.802	0.752	0.649	0.602	0.573	0.551	0.494	0.420	0.354	0.354	0.354	0.354

Thickness is intumescent only. Results also apply to I-section beams exposed on all four sides limited to a maximum protection thickness of 6.0445mm.

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Table 4 I-Section Columns 45 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	0.521	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
35	0.555	0.392	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
40	0.588	0.416	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
45	0.622	0.441	0.355	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
50	0.655	0.466	0.375	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
55	0.689	0.490	0.395	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
60	0.723	0.515	0.415	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
65	0.756	0.540	0.436	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
70	0.790	0.565	0.456	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
75	0.823	0.589	0.476	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
80	0.857	0.614	0.496	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
85	0.891	0.639	0.516	0.367	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
90	0.924	0.664	0.536	0.387	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
95	0.958	0.688	0.556	0.407	0.360	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
100	0.991	0.713	0.576	0.426	0.380	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
105	1.025	0.738	0.596	0.446	0.399	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
110	1.059	0.763	0.616	0.466	0.419	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
115	1.092	0.787	0.636	0.485	0.439	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
120	1.126	0.812	0.656	0.505	0.459	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
125	1.159	0.837	0.677	0.525	0.479	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
130	1.193	0.861	0.697	0.544	0.499	0.365	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
135	1.227	0.886	0.717	0.564	0.519	0.386	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
140	1.260	0.911	0.737	0.584	0.539	0.407	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
145	1.294	0.936	0.757	0.604	0.559	0.428	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
150	1.327	0.960	0.777	0.623	0.578	0.449	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
155	1.361	0.985	0.797	0.643	0.598	0.470	0.375	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
160	1.395	1.010	0.817	0.663	0.618	0.491	0.397	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
165	1.428	1.035	0.837	0.682	0.638	0.512	0.419	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
170	1.462	1.059	0.857	0.702	0.658	0.533	0.441	0.366	0.354	0.354	0.354	0.354	0.354	0.354	0.354
175	1.495	1.084	0.877	0.722	0.678	0.554	0.464	0.389	0.354	0.354	0.354	0.354	0.354	0.354	0.354
180	1.531	1.109	0.898	0.741	0.698	0.575	0.486	0.413	0.354	0.354	0.354	0.354	0.354	0.354	0.354
185	1.573	1.134	0.918	0.761	0.718	0.596	0.508	0.436	0.354	0.354	0.354	0.354	0.354	0.354	0.354
190	1.614	1.158	0.938	0.781	0.738	0.617	0.530	0.459	0.376	0.354	0.354	0.354	0.354	0.354	0.354
195	1.655	1.183	0.958	0.800	0.757	0.638	0.552	0.482	0.401	0.355	0.354	0.354	0.354	0.354	0.354
200	1.697	1.208	0.978	0.820	0.777	0.659	0.574	0.505	0.425	0.379	0.354	0.354	0.354	0.354	0.354
205	1.738	1.232	0.998	0.840	0.797	0.680	0.596	0.528	0.449	0.403	0.354	0.354	0.354	0.354	0.354
210	1.779	1.257	1.018	0.859	0.817	0.701	0.618	0.551	0.474	0.428	0.366	0.354	0.354	0.354	0.354
215	1.821	1.282	1.038	0.879	0.837	0.722	0.640	0.575	0.498	0.452	0.389	0.354	0.354	0.354	0.354
220	1.862	1.307	1.058	0.899	0.857	0.743	0.662	0.598	0.523	0.476	0.413	0.354	0.354	0.354	0.354
225	1.904	1.331	1.078	0.918	0.877	0.764	0.685	0.621	0.547	0.500	0.437	0.362	0.354	0.354	0.354
230	1.945	1.356	1.098	0.938	0.897	0.785	0.707	0.644	0.572	0.524	0.460	0.385	0.354	0.354	0.354
235	1.986	1.381	1.118	0.958	0.917	0.806	0.729	0.667	0.596	0.548	0.484	0.408	0.354	0.354	0.354
240	2.028	1.406	1.139	0.977	0.937	0.827	0.751	0.690	0.620	0.572	0.507	0.431	0.354	0.354	0.354
245	2.069	1.430	1.159	0.997	0.956	0.848	0.773	0.714	0.645	0.596	0.531	0.454	0.354	0.354	0.354
250	2.110	1.455	1.179	1.017	0.976	0.869	0.795	0.737	0.669	0.620	0.554	0.477	0.354	0.354	0.354
255	2.152	1.480	1.199	1.037	0.996	0.890	0.817	0.760	0.694	0.644	0.578	0.500	0.354	0.354	0.354
260	2.193	1.505	1.219	1.056	1.016	0.911	0.839	0.783	0.718	0.668	0.601	0.523	0.354	0.354	0.354
265	2.235	1.538	1.239	1.076	1.036	0.932	0.861	0.806	0.743	0.692	0.625	0.546	0.354	0.354	0.354
270	2.276	1.583	1.259	1.096	1.056	0.953	0.884	0.829	0.767	0.716	0.649	0.569	0.370	0.354	0.354
275	2.317	1.629	1.279	1.115	1.076	0.974	0.906	0.852	0.791	0.740	0.672	0.591	0.391	0.354	0.354
280	2.359	1.674	1.299	1.135	1.096	0.995	0.928	0.876	0.816	0.764	0.696	0.614	0.413	0.354	0.354
285	2.400	1.720	1.319	1.155	1.116	1.016	0.950	0.899	0.840	0.788	0.719	0.637	0.434	0.354	0.354
290	2.441	1.765	1.339	1.174	1.135	1.037	0.972	0.922	0.865	0.813	0.743	0.660	0.456	0.354	0.354
295	2.483	1.811	1.359	1.194	1.155	1.058	0.994	0.945	0.889	0.837	0.766	0.683	0.477	0.354	0.354
300	2.524	1.856	1.380	1.214	1.175	1.079	1.016	0.968	0.914	0.861	0.790	0.706	0.498	0.354	0.354
305	2.566	1.902	1.400	1.233	1.195	1.100	1.038	0.991	0.938	0.885	0.813	0.729	0.520	0.354	0.354
310	2.607	1.947	1.420	1.253	1.215	1.121	1.060	1.014	0.962	0.909	0.837	0.752	0.541	0.354	0.354
315	2.648	1.993	1.440	1.273	1.235	1.142	1.083	1.038	0.987	0.933	0.861	0.775	0.562	0.355	0.354
320	2.690	2.038	1.460	1.292	1.255	1.163	1.105	1.061	1.011	0.957	0.884	0.798	0.584	0.375	0.354
325	2.731	2.083	1.480	1.312	1.275	1.184	1.127	1.084	1.036	0.981	0.908	0.821	0.605	0.395	0.354
330	2.772	2.129	1.500	1.332	1.295	1.205	1.149	1.107	1.060	1.005	0.931	0.844	0.627	0.415	0.354
335	2.814	2.174	1.522	1.351	1.314	1.226	1.171	1.130	1.085	1.029	0.955	0.867	0.648	0.434	0.354
340	2.855	2.220	1.570	1.371	1.334	1.247	1.193	1.153	1.109	1.053	0.978	0.890	0.669	0.454	0.354
345	2.897	2.265	1.618	1.391	1.354	1.268	1.215	1.177	1.133	1.077	1.002	0.913	0.691	0.474	0.354
350	2.938	2.311	1.666	1.410	1.374	1.289	1.237	1.200	1.158	1.101	1.025	0.936	0.712	0.494	0.354
355	2.979	2.356	1.714	1.430	1.394	1.310	1.259	1.223	1.182	1.125	1.049	0.958	0.733	0.513	0.354
360	3.021	2.402	1.762	1.450	1.414	1.331	1.281	1.246	1.207	1.149	1.073	0.981	0.755	0.533	0.354
365	3.064	2.447	1.810	1.470	1.434	1.352	1.304	1.269	1.231	1.173	1.096	1.004	0.776	0.553	0.354
370	3.126	2.493	1.857	1.489	1.454	1.373	1.326	1.292	1.256	1.198	1.120	1.027	0.797	0.573	0.354
375	3.188	2.538	1.905	1.509	1.474	1.394	1.348	1.315	1.280	1.222	1.143	1.050	0.819	0.593	0.354
380	3.250	2.584	1.953	1.541	1.493	1.415	1.370	1.339	1.304	1.246	1.167	1.073	0.840	0.612	0.354
385	3.312	2.629	2.001	1.586	1.513	1.436	1.392	1.362	1.329	1.270	1.190	1.096	0.862	0.632	0.371

Thickness is intumescent only. Results also apply to I-section beams exposed on all four sides limited to a maximum protection thickness of 6.0445mm.

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 5 I-Section Columns 60 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	0.858	0.624	0.398	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
35	0.948	0.671	0.429	0.368	0.355	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
40	1.038	0.718	0.459	0.394	0.380	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
45	1.128	0.765	0.489	0.419	0.405	0.375	0.359	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
50	1.217	0.812	0.519	0.445	0.430	0.399	0.383	0.373	0.364	0.354	0.354	0.354	0.354	0.354	0.354
55	1.307	0.859	0.549	0.471	0.455	0.423	0.406	0.396	0.387	0.361	0.354	0.354	0.354	0.354	0.354
60	1.397	0.906	0.580	0.497	0.481	0.447	0.430	0.419	0.410	0.383	0.354	0.354	0.354	0.354	0.354
65	1.487	0.953	0.610	0.522	0.506	0.470	0.453	0.443	0.433	0.405	0.364	0.354	0.354	0.354	0.354
70	1.550	1.000	0.640	0.548	0.531	0.494	0.476	0.466	0.455	0.428	0.386	0.354	0.354	0.354	0.354
75	1.598	1.047	0.670	0.574	0.556	0.518	0.500	0.489	0.478	0.450	0.408	0.354	0.354	0.354	0.354
80	1.647	1.094	0.700	0.600	0.581	0.542	0.523	0.512	0.501	0.473	0.430	0.368	0.354	0.354	0.354
85	1.695	1.141	0.731	0.626	0.606	0.566	0.547	0.535	0.524	0.495	0.451	0.390	0.354	0.354	0.354
90	1.744	1.188	0.761	0.651	0.631	0.590	0.570	0.558	0.547	0.517	0.473	0.411	0.354	0.354	0.354
95	1.792	1.235	0.791	0.677	0.656	0.614	0.594	0.582	0.570	0.540	0.495	0.433	0.354	0.354	0.354
100	1.841	1.282	0.821	0.703	0.681	0.638	0.617	0.605	0.593	0.562	0.517	0.455	0.354	0.354	0.354
105	1.889	1.329	0.851	0.729	0.706	0.662	0.640	0.628	0.616	0.585	0.539	0.477	0.354	0.354	0.354
110	1.937	1.376	0.881	0.754	0.732	0.686	0.664	0.651	0.639	0.607	0.560	0.498	0.354	0.354	0.354
115	1.986	1.423	0.912	0.780	0.757	0.710	0.687	0.674	0.662	0.629	0.582	0.520	0.354	0.354	0.354
120	2.034	1.470	0.942	0.806	0.782	0.734	0.711	0.697	0.685	0.652	0.604	0.542	0.354	0.354	0.354
125	2.083	1.517	0.972	0.832	0.807	0.757	0.734	0.721	0.708	0.674	0.626	0.563	0.354	0.354	0.354
130	2.131	1.559	1.002	0.857	0.832	0.781	0.758	0.744	0.731	0.697	0.648	0.585	0.354	0.354	0.354
135	2.180	1.601	1.032	0.883	0.857	0.805	0.781	0.767	0.754	0.719	0.669	0.607	0.354	0.354	0.354
140	2.228	1.643	1.063	0.909	0.882	0.829	0.804	0.790	0.777	0.741	0.691	0.629	0.358	0.354	0.354
145	2.276	1.685	1.093	0.935	0.907	0.853	0.828	0.813	0.799	0.764	0.713	0.650	0.382	0.354	0.354
150	2.325	1.727	1.123	0.961	0.932	0.877	0.851	0.836	0.822	0.786	0.735	0.672	0.406	0.354	0.354
155	2.373	1.769	1.153	0.986	0.957	0.901	0.875	0.860	0.845	0.809	0.757	0.694	0.430	0.354	0.354
160	2.422	1.810	1.183	1.012	0.983	0.925	0.898	0.883	0.868	0.831	0.778	0.716	0.454	0.354	0.354
165	2.470	1.852	1.214	1.038	1.008	0.949	0.922	0.906	0.891	0.853	0.800	0.737	0.478	0.354	0.354
170	2.519	1.894	1.244	1.064	1.033	0.973	0.945	0.929	0.914	0.876	0.822	0.759	0.502	0.354	0.354
175	2.567	1.936	1.274	1.089	1.058	0.997	0.968	0.952	0.937	0.898	0.844	0.781	0.526	0.354	0.354
180	2.615	1.978	1.304	1.115	1.083	1.021	0.992	0.975	0.960	0.921	0.866	0.802	0.550	0.354	0.354
185	2.664	2.020	1.334	1.141	1.108	1.044	1.015	0.999	0.983	0.943	0.888	0.824	0.574	0.354	0.354
190	2.712	2.061	1.364	1.167	1.133	1.068	1.039	1.022	1.006	0.965	0.909	0.846	0.597	0.354	0.354
195	2.761	2.103	1.395	1.192	1.158	1.092	1.062	1.045	1.029	0.988	0.931	0.868	0.621	0.354	0.354
200	2.809	2.145	1.425	1.218	1.183	1.116	1.086	1.068	1.052	1.010	0.953	0.889	0.645	0.356	0.354
205	2.857	2.187	1.455	1.244	1.208	1.140	1.109	1.091	1.075	1.033	0.975	0.911	0.669	0.382	0.354
210	2.906	2.229	1.485	1.270	1.234	1.164	1.132	1.114	1.098	1.055	0.997	0.933	0.693	0.408	0.354
215	2.954	2.271	1.515	1.295	1.259	1.188	1.156	1.138	1.121	1.077	1.018	0.954	0.717	0.435	0.354
220	3.003	2.312	1.564	1.321	1.284	1.212	1.179	1.161	1.144	1.100	1.040	0.976	0.741	0.461	0.354
225	3.051	2.354	1.615	1.347	1.309	1.236	1.203	1.184	1.166	1.122	1.062	0.998	0.765	0.488	0.354
230	3.110	2.396	1.665	1.373	1.334	1.260	1.226	1.207	1.189	1.145	1.084	1.020	0.789	0.514	0.354
235	3.170	2.438	1.716	1.399	1.359	1.284	1.249	1.230	1.212	1.167	1.106	1.041	0.813	0.540	0.354
240	3.230	2.480	1.767	1.424	1.384	1.308	1.273	1.253	1.235	1.189	1.127	1.063	0.837	0.567	0.377
245	3.291	2.522	1.818	1.450	1.409	1.331	1.296	1.277	1.258	1.212	1.149	1.085	0.861	0.593	0.402
250	3.351	2.563	1.869	1.476	1.434	1.355	1.320	1.300	1.281	1.234	1.171	1.107	0.884	0.619	0.426
255	3.411	2.605	1.920	1.502	1.460	1.379	1.343	1.323	1.304	1.257	1.193	1.128	0.908	0.646	0.451
260	3.472	2.647	1.971	1.536	1.485	1.403	1.367	1.346	1.327	1.279	1.215	1.150	0.932	0.672	0.475
265	3.532	2.689	2.021	1.589	1.510	1.427	1.390	1.369	1.350	1.301	1.236	1.172	0.956	0.699	0.500
270	3.592	2.731	2.072	1.642	1.553	1.451	1.413	1.392	1.373	1.324	1.258	1.193	0.980	0.725	0.524
275	3.653	2.773	2.123	1.695	1.606	1.475	1.437	1.416	1.396	1.346	1.280	1.215	1.004	0.751	0.548
280	3.713	2.814	2.174	1.748	1.660	1.499	1.460	1.439	1.419	1.369	1.302	1.237	1.028	0.778	0.573
285	3.773	2.856	2.225	1.801	1.713	1.528	1.484	1.462	1.442	1.391	1.324	1.259	1.052	0.804	0.597
290	3.834	2.898	2.276	1.854	1.767	1.582	1.507	1.485	1.465	1.413	1.346	1.280	1.076	0.831	0.622
295	3.894	2.940	2.327	1.907	1.820	1.636	1.546	1.508	1.488	1.436	1.367	1.302	1.100	0.857	0.646
300	3.955	2.982	2.377	1.960	1.874	1.691	1.601	1.549	1.511	1.458	1.389	1.324	1.124	0.883	0.671
305	4.015	3.024	2.428	2.013	1.927	1.745	1.656	1.604	1.554	1.481	1.411	1.345	1.148	0.910	0.695
310	4.075	3.069	2.479	2.067	1.980	1.800	1.711	1.659	1.609	1.503	1.433	1.367	1.171	0.936	0.720
315	4.136	3.139	2.530	2.120	2.034	1.854	1.765	1.714	1.665	1.535	1.455	1.389	1.195	0.962	0.744
320	4.196	3.208	2.581	2.173	2.087	1.908	1.820	1.769	1.720	1.591	1.476	1.411	1.219	0.989	0.769
325	4.256	3.277	2.632	2.226	2.141	1.963	1.875	1.824	1.776	1.647	1.498	1.432	1.243	1.015	0.793
330	4.317	3.346	2.682	2.279	2.194	2.017	1.930	1.880	1.831	1.703	1.522	1.454	1.267	1.042	0.818
335	4.377	3.415	2.733	2.332	2.248	2.072	1.985	1.935	1.887	1.760	1.579	1.476	1.291	1.068	0.842
340	4.437	3.485	2.784	2.385	2.301	2.126	2.040	1.990	1.942	1.816	1.636	1.498	1.315	1.094	0.867
345	4.498	3.554	2.835	2.438	2.355	2.180	2.094	2.045	1.997	1.872	1.693	1.520	1.339	1.121	0.891
350	4.558	3.623	2.886	2.491	2.408	2.235	2.149	2.100	2.053	1.928	1.751	1.576	1.363	1.147	0.916
355	4.618	3.692	2.937	2.544	2.462	2.289	2.204	2.155	2.108	1.984	1.808	1.633	1.387	1.174	0.940
360	4.679	3.761	2.988	2.597	2.515	2.343	2.259	2.211	2.164	2.040	1.865	1.690	1.411	1.200	0.965
365	4.739	3.831	3.038	2.650	2.569	2.398	2.314	2.266	2.219	2.096	1.922	1.747	1.435	1.226	0.989
370	4.799	3.900	3.102	2.703	2.622	2.452	2.368	2.321	2.275	2.153	1.980	1.804	1.458	1.253	1.014
375	4.860	3.969	3.175	2.756	2.676	2.507	2.423	2.376	2.330	2.209	2.037	1.860	1.482	1.279	1.038
380	4.920	4.038	3.247	2.809	2.729	2.561	2.478	2.431	2.385	2.265	2.094	1.917	1.506	1.305	1.063
385	4.980	4.107	3.320	2.862	2.782	2.615	2.533	2.486	2.441	2.321	2.152	1.974	1.545	1.332	1.087

Thickness is intumescent only. Results also apply to I-section beams exposed on all four sides limited to a maximum protection thickness of 6.0445mm.

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 6 I-Section Columns 75 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	1.195	0.922	0.698	0.427	0.415	0.396	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354	0.354
35	1.341	1.019	0.760	0.465	0.448	0.427	0.417	0.412	0.406	0.393	0.374	0.354	0.354	0.354	0.354
40	1.487	1.116	0.823	0.504	0.481	0.459	0.448	0.442	0.436	0.422	0.402	0.377	0.354	0.354	0.354
45	1.659	1.212	0.885	0.542	0.515	0.490	0.479	0.472	0.466	0.451	0.429	0.403	0.354	0.354	0.354
50	1.838	1.309	0.948	0.581	0.548	0.522	0.509	0.503	0.496	0.480	0.457	0.430	0.356	0.354	0.354
55	2.017	1.406	1.011	0.619	0.581	0.553	0.540	0.533	0.526	0.509	0.485	0.457	0.381	0.354	0.354
60	2.196	1.502	1.073	0.657	0.614	0.585	0.571	0.563	0.556	0.538	0.513	0.484	0.406	0.354	0.354
65	2.375	1.565	1.136	0.696	0.648	0.616	0.602	0.594	0.586	0.567	0.541	0.511	0.430	0.354	0.354
70	2.553	1.620	1.198	0.734	0.681	0.647	0.632	0.624	0.616	0.596	0.569	0.538	0.455	0.364	0.354
75	2.732	1.675	1.261	0.773	0.714	0.679	0.663	0.654	0.646	0.625	0.597	0.565	0.480	0.387	0.354
80	2.911	1.731	1.324	0.811	0.747	0.710	0.694	0.684	0.676	0.654	0.625	0.592	0.505	0.411	0.354
85	3.067	1.786	1.386	0.850	0.780	0.742	0.724	0.715	0.706	0.683	0.653	0.618	0.529	0.434	0.354
90	3.115	1.841	1.449	0.888	0.814	0.773	0.755	0.745	0.736	0.712	0.681	0.645	0.554	0.458	0.354
95	3.162	1.897	1.511	0.926	0.847	0.805	0.786	0.775	0.766	0.741	0.709	0.672	0.579	0.481	0.354
100	3.210	1.952	1.563	0.965	0.880	0.836	0.817	0.806	0.796	0.770	0.737	0.699	0.604	0.505	0.354
105	3.257	2.007	1.614	1.003	0.913	0.868	0.847	0.836	0.826	0.799	0.765	0.726	0.628	0.528	0.354
110	3.305	2.063	1.664	1.042	0.947	0.899	0.878	0.866	0.856	0.828	0.793	0.753	0.653	0.552	0.362
115	3.353	2.118	1.715	1.080	0.980	0.931	0.909	0.897	0.885	0.857	0.821	0.780	0.678	0.575	0.386
120	3.400	2.173	1.765	1.118	1.013	0.962	0.939	0.927	0.915	0.886	0.849	0.806	0.703	0.598	0.410
125	3.448	2.229	1.816	1.157	1.046	0.994	0.970	0.957	0.945	0.915	0.877	0.833	0.727	0.622	0.434
130	3.495	2.284	1.866	1.195	1.080	1.025	1.001	0.988	0.975	0.945	0.905	0.860	0.752	0.645	0.457
135	3.543	2.339	1.917	1.234	1.113	1.057	1.032	1.018	1.005	0.974	0.933	0.887	0.777	0.669	0.481
140	3.590	2.395	1.967	1.272	1.146	1.088	1.062	1.048	1.035	1.003	0.961	0.914	0.802	0.692	0.505
145	3.638	2.450	2.018	1.310	1.179	1.120	1.093	1.079	1.065	1.032	0.989	0.941	0.826	0.716	0.529
150	3.686	2.505	2.068	1.349	1.213	1.151	1.124	1.109	1.095	1.061	1.017	0.968	0.851	0.739	0.553
155	3.733	2.561	2.119	1.387	1.246	1.183	1.155	1.139	1.125	1.090	1.045	0.995	0.876	0.762	0.577
160	3.781	2.616	2.169	1.426	1.279	1.214	1.185	1.169	1.155	1.119	1.073	1.021	0.901	0.786	0.601
165	3.828	2.671	2.220	1.464	1.312	1.245	1.216	1.200	1.185	1.148	1.101	1.048	0.925	0.809	0.624
170	3.876	2.727	2.270	1.503	1.346	1.277	1.247	1.230	1.215	1.177	1.129	1.075	0.950	0.833	0.648
175	3.923	2.782	2.320	1.553	1.379	1.308	1.277	1.260	1.245	1.206	1.157	1.102	0.975	0.856	0.672
180	3.971	2.837	2.371	1.613	1.412	1.340	1.308	1.291	1.275	1.235	1.185	1.129	1.000	0.880	0.696
185	4.019	2.893	2.421	1.672	1.445	1.371	1.339	1.321	1.305	1.264	1.213	1.156	1.024	0.903	0.720
190	4.066	2.948	2.472	1.732	1.479	1.403	1.370	1.351	1.335	1.293	1.241	1.183	1.049	0.927	0.744
195	4.114	3.003	2.522	1.792	1.512	1.434	1.400	1.382	1.365	1.322	1.269	1.210	1.074	0.950	0.768
200	4.161	3.059	2.573	1.851	1.570	1.466	1.431	1.412	1.395	1.351	1.297	1.236	1.099	0.973	0.791
205	4.209	3.121	2.623	1.911	1.635	1.497	1.462	1.442	1.425	1.380	1.325	1.263	1.123	0.997	0.815
210	4.256	3.183	2.674	1.971	1.701	1.538	1.492	1.473	1.454	1.409	1.353	1.290	1.148	1.020	0.839
215	4.304	3.245	2.724	2.030	1.766	1.598	1.527	1.503	1.484	1.438	1.381	1.317	1.173	1.044	0.863
220	4.351	3.308	2.775	2.090	1.831	1.658	1.588	1.547	1.514	1.467	1.409	1.344	1.198	1.067	0.887
225	4.399	3.370	2.825	2.149	1.897	1.718	1.648	1.608	1.570	1.496	1.437	1.371	1.222	1.091	0.911
230	4.447	3.432	2.876	2.209	1.962	1.779	1.709	1.669	1.631	1.533	1.465	1.398	1.247	1.114	0.935
235	4.494	3.495	2.926	2.269	2.027	1.839	1.769	1.729	1.692	1.594	1.493	1.425	1.272	1.137	0.958
240	4.542	3.557	2.977	2.328	2.093	1.899	1.829	1.790	1.753	1.655	1.523	1.451	1.296	1.161	0.982
245	4.589	3.619	3.027	2.388	2.158	1.959	1.890	1.851	1.814	1.716	1.584	1.478	1.321	1.184	1.006
250	4.637	3.681	3.083	2.448	2.223	2.019	1.950	1.912	1.874	1.777	1.646	1.505	1.346	1.208	1.030
255	4.684	3.744	3.149	2.507	2.289	2.080	2.011	1.972	1.935	1.839	1.708	1.549	1.371	1.231	1.054
260	4.732	3.806	3.215	2.567	2.354	2.140	2.071	2.033	1.996	1.900	1.769	1.611	1.395	1.255	1.078
265	4.780	3.868	3.280	2.627	2.419	2.200	2.132	2.094	2.057	1.961	1.831	1.674	1.420	1.278	1.102
270	4.827	3.930	3.346	2.686	2.485	2.260	2.192	2.154	2.118	2.022	1.893	1.736	1.445	1.302	1.126
275	4.875	3.993	3.412	2.746	2.550	2.321	2.253	2.215	2.178	2.083	1.954	1.798	1.470	1.325	1.149
280	4.922	4.055	3.477	2.806	2.615	2.381	2.313	2.276	2.239	2.145	2.016	1.860	1.494	1.348	1.173
285	4.970	4.117	3.543	2.865	2.681	2.441	2.374	2.336	2.300	2.206	2.078	1.923	1.520	1.372	1.197
290	5.017	4.179	3.609	2.925	2.746	2.501	2.434	2.397	2.361	2.267	2.139	1.985	1.584	1.395	1.221
295	5.065	4.242	3.674	2.984	2.811	2.562	2.495	2.458	2.422	2.328	2.201	2.047	1.648	1.419	1.245
300	5.160	4.304	3.740	3.044	2.877	2.622	2.555	2.518	2.482	2.389	2.263	2.109	1.713	1.442	1.269
305	5.288	4.366	3.806	3.116	2.942	2.682	2.615	2.579	2.543	2.450	2.324	2.172	1.777	1.466	1.293
310	5.415	4.428	3.871	3.191	3.007	2.742	2.676	2.640	2.604	2.512	2.386	2.234	1.842	1.489	1.316
315	5.543	4.491	3.937	3.266	3.075	2.803	2.736	2.700	2.665	2.573	2.448	2.296	1.906	1.512	1.340
320	5.670	4.553	4.003	3.342	3.155	2.863	2.797	2.761	2.726	2.634	2.509	2.359	1.971	1.569	1.364
325	5.798	4.615	4.068	3.417	3.234	2.923	2.857	2.822	2.786	2.695	2.571	2.421	2.035	1.639	1.388
330	5.926	4.677	4.134	3.493	3.313	2.983	2.918	2.882	2.847	2.756	2.633	2.483	2.100	1.709	1.412
335	6.053	4.740	4.200	3.568	3.392	3.043	2.978	2.943	2.908	2.818	2.694	2.545	2.164	1.778	1.436
340	6.181	4.802	4.265	3.644	3.471	3.122	3.039	3.004	2.969	2.879	2.756	2.608	2.229	1.848	1.460
345	6.308	4.864	4.331	3.719	3.550	3.206	3.115	3.066	3.030	2.940	2.818	2.670	2.293	1.918	1.483
350	6.436	4.927	4.397	3.794	3.629	3.291	3.198	3.149	3.102	3.001	2.879	2.732	2.358	1.987	1.507
355	6.563	4.989	4.462	3.870	3.708	3.376	3.282	3.232	3.184	3.063	2.941	2.794	2.422	2.057	1.560
360	6.691	5.051	4.528	3.945	3.787	3.460	3.365	3.315	3.266	3.144	3.003	2.857	2.487	2.127	1.640
365	6.818	5.167	4.594	4.021	3.866	3.545	3.449	3.398	3.349	3.225	3.066	2.919	2.551	2.196	1.720
370	6.946	5.343	4.659	4.096	3.945	3.630	3.532	3.481	3.431	3.305	3.144	2.981	2.616	2.266	1.800
375	7.073	5.518	4.725	4.172	4.024	3.714	3.616	3.564	3.514	3.386	3.223	3.043	2.680	2.336	1.880
380	-	5.694	4.791	4.247	4.103	3.799	3.699	3.647	3.596	3.467	3.301	3.116	2.745	2.406	1.960
385	-	5.870	4.856	4.323	4.183	3.883	3.783	3.730	3.678	3.547	3.379	3.191	2.809	2.475	2.040

Thickness is intumescent only. Results also apply to I-section beams exposed on all four sides limited to a maximum protection thickness of 6.0445mm.

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SHERWIN WILLIAMS

Table 7 I-Section Columns 90 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	1.554	1.220	0.969	0.773	0.737	0.665	0.630	0.611	0.594	0.553	0.422	0.402	0.354	0.354	0.354
35	2.080	1.367	1.077	0.851	0.809	0.727	0.686	0.665	0.646	0.599	0.464	0.435	0.390	0.354	0.354
40	2.607	1.513	1.185	0.929	0.882	0.789	0.743	0.720	0.698	0.645	0.505	0.469	0.421	0.374	0.354
45	3.068	1.732	1.292	1.007	0.954	0.851	0.800	0.774	0.750	0.690	0.546	0.502	0.451	0.403	0.354
50	3.131	1.954	1.400	1.085	1.027	0.913	0.857	0.828	0.802	0.736	0.587	0.535	0.482	0.432	0.362
55	3.195	2.176	1.508	1.163	1.099	0.974	0.914	0.882	0.853	0.782	0.628	0.569	0.512	0.461	0.390
60	3.259	2.399	1.611	1.240	1.172	1.036	0.971	0.936	0.905	0.828	0.669	0.602	0.543	0.490	0.418
65	3.322	2.621	1.714	1.318	1.245	1.098	1.028	0.990	0.957	0.873	0.711	0.635	0.574	0.519	0.446
70	3.386	2.843	1.817	1.396	1.317	1.160	1.084	1.045	1.009	0.919	0.752	0.668	0.604	0.548	0.474
75	3.449	3.060	1.920	1.474	1.390	1.222	1.141	1.099	1.061	0.965	0.793	0.702	0.635	0.577	0.501
80	3.513	3.113	2.023	1.546	1.462	1.284	1.198	1.153	1.112	1.011	0.834	0.735	0.665	0.606	0.529
85	3.576	3.165	2.125	1.609	1.533	1.346	1.255	1.207	1.164	1.056	0.875	0.768	0.696	0.635	0.557
90	3.640	3.217	2.228	1.672	1.596	1.408	1.312	1.261	1.216	1.102	0.916	0.802	0.727	0.664	0.585
95	3.703	3.269	2.331	1.735	1.659	1.470	1.369	1.316	1.268	1.148	0.958	0.835	0.757	0.693	0.613
100	3.767	3.321	2.434	1.798	1.722	1.532	1.425	1.370	1.320	1.194	0.999	0.868	0.788	0.723	0.641
105	3.830	3.373	2.536	1.861	1.786	1.597	1.482	1.424	1.371	1.239	1.040	0.902	0.818	0.752	0.668
110	3.894	3.425	2.639	1.924	1.849	1.662	1.543	1.478	1.423	1.285	1.081	0.935	0.849	0.781	0.696
115	3.957	3.477	2.742	1.987	1.912	1.727	1.609	1.536	1.475	1.331	1.122	0.968	0.880	0.810	0.724
120	4.021	3.529	2.845	2.050	1.975	1.791	1.675	1.603	1.529	1.377	1.164	1.002	0.910	0.839	0.752
125	4.084	3.581	2.948	2.113	2.039	1.856	1.742	1.671	1.598	1.422	1.205	1.035	0.941	0.868	0.780
130	4.148	3.633	3.050	2.176	2.102	1.921	1.808	1.739	1.667	1.468	1.246	1.068	0.971	0.897	0.807
135	4.212	3.685	3.105	2.239	2.165	1.986	1.875	1.806	1.736	1.514	1.287	1.102	1.002	0.926	0.835
140	4.275	3.737	3.154	2.302	2.228	2.051	1.941	1.874	1.805	1.584	1.328	1.135	1.033	0.955	0.863
145	4.339	3.789	3.204	2.365	2.291	2.116	2.008	1.942	1.873	1.658	1.369	1.168	1.063	0.984	0.891
150	4.402	3.841	3.254	2.428	2.355	2.180	2.074	2.010	1.942	1.731	1.411	1.202	1.094	1.013	0.919
155	4.466	3.893	3.304	2.491	2.418	2.245	2.140	2.077	2.011	1.804	1.452	1.235	1.124	1.042	0.947
160	4.529	3.945	3.354	2.554	2.481	2.310	2.207	2.145	2.080	1.878	1.493	1.268	1.155	1.071	0.974
165	4.593	3.997	3.403	2.617	2.544	2.375	2.273	2.213	2.149	1.951	1.550	1.302	1.186	1.100	1.002
170	4.656	4.049	3.453	2.680	2.608	2.440	2.340	2.280	2.217	2.024	1.634	1.335	1.216	1.129	1.030
175	4.720	4.101	3.503	2.743	2.671	2.504	2.406	2.348	2.286	2.098	1.719	1.368	1.247	1.158	1.058
180	4.783	4.154	3.553	2.806	2.734	2.569	2.473	2.416	2.355	2.171	1.803	1.402	1.277	1.187	1.086
185	4.847	4.206	3.603	2.869	2.797	2.634	2.539	2.484	2.424	2.244	1.887	1.435	1.308	1.216	1.114
190	4.910	4.258	3.653	2.932	2.861	2.699	2.605	2.551	2.493	2.318	1.971	1.468	1.339	1.245	1.141
195	4.974	4.310	3.702	2.995	2.924	2.764	2.672	2.619	2.561	2.391	2.056	1.501	1.369	1.274	1.169
200	5.038	4.362	3.752	3.058	2.987	2.829	2.738	2.687	2.630	2.464	2.140	1.568	1.400	1.303	1.197
205	5.124	4.414	3.802	3.121	3.050	2.893	2.805	2.754	2.699	2.538	2.224	1.670	1.431	1.332	1.225
210	5.272	4.466	3.852	3.184	3.114	2.958	2.871	2.822	2.768	2.611	2.308	1.772	1.461	1.361	1.253
215	5.420	4.518	3.902	3.247	3.177	3.023	2.938	2.890	2.837	2.684	2.393	1.875	1.492	1.390	1.280
220	5.569	4.570	3.951	3.310	3.240	3.087	3.004	2.958	2.905	2.758	2.477	1.977	1.527	1.419	1.308
225	5.717	4.622	4.001	3.373	3.303	3.151	3.070	3.025	2.974	2.831	2.561	2.080	1.599	1.448	1.336
230	5.865	4.674	4.051	3.437	3.367	3.215	3.134	3.091	3.043	2.904	2.645	2.182	1.672	1.477	1.364
235	6.014	4.726	4.101	3.500	3.430	3.278	3.198	3.155	3.109	2.978	2.730	2.284	1.744	1.506	1.392
240	6.162	4.778	4.151	3.563	3.493	3.342	3.262	3.220	3.173	3.051	2.814	2.387	1.817	1.560	1.420
245	6.310	4.830	4.200	3.626	3.557	3.406	3.326	3.284	3.238	3.117	2.898	2.489	1.889	1.631	1.447
250	6.459	4.882	4.250	3.689	3.620	3.470	3.390	3.348	3.302	3.182	2.982	2.592	1.961	1.702	1.475
255	6.607	4.934	4.300	3.752	3.683	3.533	3.454	3.412	3.367	3.247	3.065	2.694	2.034	1.773	1.503
260	6.755	4.986	4.350	3.816	3.747	3.597	3.518	3.477	3.431	3.312	3.132	2.796	2.106	1.845	1.552
265	6.904	5.038	4.400	3.879	3.810	3.661	3.582	3.541	3.496	3.378	3.198	2.899	2.179	1.916	1.629
270	7.052	5.102	4.449	3.942	3.873	3.724	3.646	3.605	3.560	3.443	3.265	3.001	2.251	1.987	1.707
275	-	5.250	4.499	4.005	3.936	3.788	3.710	3.669	3.625	3.508	3.331	3.089	2.324	2.058	1.784
280	-	5.398	4.549	4.068	4.000	3.852	3.774	3.733	3.689	3.573	3.398	3.158	2.396	2.129	1.861
285	-	5.546	4.599	4.131	4.063	3.915	3.838	3.798	3.754	3.638	3.465	3.227	2.468	2.201	1.939
290	-	5.695	4.649	4.194	4.126	3.979	3.902	3.862	3.818	3.703	3.531	3.296	2.541	2.272	2.016
295	-	5.843	4.699	4.258	4.190	4.043	3.966	3.926	3.883	3.768	3.598	3.365	2.613	2.343	2.093
300	-	5.991	4.748	4.321	4.253	4.106	4.030	3.990	3.947	3.834	3.664	3.434	2.686	2.414	2.171
305	-	6.139	4.798	4.384	4.316	4.170	4.094	4.054	4.012	3.899	3.731	3.504	2.758	2.486	2.248
310	-	6.287	4.848	4.447	4.379	4.234	4.158	4.119	4.076	3.964	3.798	3.573	2.831	2.557	2.326
315	-	6.435	4.898	4.510	4.443	4.298	4.222	4.183	4.141	4.029	3.864	3.642	2.903	2.628	2.403
320	-	6.583	4.948	4.573	4.506	4.361	4.286	4.247	4.205	4.094	3.931	3.711	2.975	2.699	2.480
325	-	6.731	4.997	4.636	4.569	4.425	4.350	4.311	4.270	4.159	3.998	3.780	3.048	2.771	2.558
330	-	6.879	5.047	4.700	4.633	4.489	4.415	4.376	4.334	4.225	4.064	3.849	3.127	2.842	2.635
335	-	7.027	5.134	4.763	4.696	4.552	4.479	4.440	4.399	4.290	4.131	3.918	3.206	2.913	2.712
340	-	-	5.324	4.826	4.759	4.616	4.543	4.504	4.463	4.355	4.197	3.987	3.286	2.984	2.790
345	-	-	5.513	4.889	4.823	4.680	4.607	4.568	4.528	4.420	4.264	4.056	3.366	3.056	2.867
350	-	-	5.703	4.952	4.886	4.743	4.671	4.632	4.592	4.485	4.331	4.125	3.446	3.129	2.944
355	-	-	5.893	5.015	4.949	4.807	4.735	4.697	4.657	4.550	4.397	4.194	3.526	3.202	3.022
360	-	-	6.083	5.079	5.012	4.871	4.799	4.761	4.721	4.615	4.464	4.263	3.606	3.275	3.090
365	-	-	6.273	5.246	5.076	4.934	4.863	4.825	4.786	4.681	4.530	4.332	3.686	3.348	3.150
370	-	-	6.463	5.422	5.236	4.998	4.927	4.889	4.851	4.746	4.597	4.402	3.766	3.421	3.209
375	-	-	6.653	5.599	5.412	5.062	4.991	4.953	4.915	4.811	4.664	4.471	3.845	3.494	3.269
380	-	-	6.843	5.776	5.587	5.198	5.055	5.018	4.980	4.876	4.730	4.540	3.925	3.567	3.329
385	-	-	7.033	5.953	5.762	5.372	5.179	5.082	5.044	4.941	4.797	4.609	4.005	3.640	3.388

Thickness is intumescent only. Results also apply to I-section beams exposed on all four sides limited to a maximum protection thickness of 6.0445mm.

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 8 I-Section Columns 105 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	3.056	1.517	1.240	1.029	0.990	0.912	0.871	0.850	0.832	0.788	0.734	0.670	0.436	0.391	0.354
35	3.285	2.044	1.393	1.150	1.105	1.015	0.968	0.944	0.924	0.873	0.811	0.738	0.491	0.431	0.384
40	3.514	2.570	1.570	1.270	1.220	1.118	1.065	1.038	1.015	0.957	0.888	0.806	0.545	0.471	0.418
45	3.743	3.064	1.855	1.391	1.334	1.221	1.162	1.132	1.106	1.042	0.965	0.874	0.600	0.511	0.453
50	3.972	3.131	2.140	1.511	1.449	1.324	1.259	1.226	1.198	1.127	1.042	0.942	0.654	0.552	0.487
55	4.201	3.199	2.425	1.690	1.585	1.427	1.356	1.321	1.289	1.212	1.119	1.010	0.709	0.592	0.522
60	4.430	3.266	2.710	1.872	1.753	1.534	1.453	1.415	1.381	1.297	1.196	1.079	0.764	0.632	0.556
65	4.659	3.333	2.995	2.055	1.922	1.682	1.564	1.509	1.472	1.382	1.273	1.147	0.818	0.672	0.591
70	4.888	3.401	3.104	2.237	2.090	1.829	1.703	1.639	1.583	1.466	1.350	1.215	0.873	0.713	0.626
75	5.092	3.468	3.162	2.419	2.259	1.976	1.841	1.774	1.713	1.565	1.427	1.283	0.927	0.753	0.660
80	5.151	3.536	3.221	2.602	2.427	2.123	1.980	1.909	1.843	1.684	1.504	1.351	0.982	0.793	0.695
85	5.210	3.603	3.279	2.784	2.596	2.270	2.119	2.044	1.973	1.804	1.604	1.420	1.036	0.833	0.729
90	5.268	3.670	3.337	2.967	2.764	2.417	2.258	2.179	2.103	1.924	1.709	1.488	1.091	0.874	0.764
95	5.327	3.738	3.395	3.085	2.933	2.564	2.397	2.314	2.233	2.044	1.815	1.569	1.145	0.914	0.798
100	5.386	3.805	3.454	3.138	3.072	2.711	2.536	2.449	2.363	2.163	1.921	1.661	1.200	0.954	0.833
105	5.444	3.873	3.512	3.191	3.124	2.858	2.675	2.584	2.493	2.283	2.026	1.753	1.255	0.994	0.867
110	5.503	3.940	3.570	3.243	3.176	3.006	2.814	2.719	2.623	2.403	2.132	1.845	1.309	1.035	0.902
115	5.561	4.007	3.628	3.296	3.228	3.091	2.953	2.854	2.753	2.523	2.238	1.937	1.364	1.075	0.936
120	5.620	4.075	3.686	3.349	3.280	3.141	3.071	2.989	2.884	2.642	2.344	2.029	1.418	1.115	0.971
125	5.679	4.142	3.745	3.402	3.332	3.191	3.120	3.083	3.014	2.762	2.449	2.121	1.473	1.155	1.006
130	5.737	4.210	3.803	3.454	3.384	3.242	3.169	3.132	3.091	2.882	2.555	2.213	1.534	1.196	1.040
135	5.796	4.277	3.861	3.507	3.436	3.292	3.219	3.181	3.141	3.002	2.661	2.305	1.628	1.236	1.075
140	5.855	4.344	3.919	3.560	3.488	3.342	3.268	3.231	3.191	3.086	2.766	2.397	1.723	1.276	1.109
145	5.913	4.412	3.978	3.613	3.540	3.392	3.318	3.280	3.241	3.136	2.872	2.489	1.818	1.316	1.144
150	5.972	4.479	4.036	3.665	3.592	3.443	3.367	3.329	3.290	3.187	2.978	2.581	1.913	1.357	1.178
155	6.030	4.547	4.094	3.718	3.644	3.493	3.417	3.378	3.340	3.238	3.071	2.673	2.008	1.397	1.213
160	6.089	4.614	4.152	3.771	3.696	3.543	3.466	3.428	3.390	3.289	3.124	2.765	2.103	1.437	1.247
165	6.148	4.681	4.210	3.824	3.748	3.593	3.515	3.477	3.439	3.339	3.177	2.857	2.198	1.477	1.282
170	6.206	4.749	4.269	3.876	3.800	3.643	3.565	3.526	3.489	3.390	3.230	2.949	2.293	1.517	1.317
175	6.265	4.816	4.327	3.929	3.852	3.694	3.614	3.576	3.539	3.441	3.282	3.041	2.388	1.645	1.351
180	6.323	4.884	4.385	3.982	3.904	3.744	3.664	3.625	3.589	3.492	3.335	3.104	2.483	1.777	1.386
185	6.382	4.951	4.443	4.035	3.955	3.794	3.713	3.674	3.638	3.542	3.388	3.161	2.578	1.908	1.420
190	6.441	5.018	4.501	4.087	4.007	3.844	3.763	3.724	3.688	3.593	3.441	3.217	2.673	2.040	1.455
195	6.499	5.089	4.560	4.140	4.059	3.894	3.812	3.773	3.738	3.644	3.494	3.273	2.768	2.171	1.489
200	6.558	5.259	4.618	4.193	4.111	3.945	3.861	3.822	3.788	3.695	3.547	3.329	2.863	2.303	1.543
205	6.617	5.429	4.676	4.246	4.163	3.995	3.911	3.872	3.837	3.745	3.599	3.386	2.958	2.434	1.716
210	6.675	5.600	4.734	4.298	4.215	4.045	3.960	3.921	3.887	3.796	3.652	3.442	3.053	2.565	1.889
215	6.734	5.770	4.793	4.351	4.267	4.095	4.010	3.970	3.937	3.847	3.705	3.498	3.114	2.697	2.062
220	6.792	5.940	4.851	4.404	4.319	4.146	4.059	4.019	3.986	3.898	3.758	3.555	3.173	2.828	2.235
225	-	6.110	4.909	4.457	4.371	4.196	4.109	4.069	4.036	3.949	3.811	3.611	3.232	2.960	2.408
230	-	6.281	4.967	4.510	4.423	4.246	4.158	4.118	4.086	3.999	3.864	3.667	3.290	3.073	2.581
235	-	6.451	5.025	4.562	4.475	4.296	4.207	4.167	4.136	4.050	3.916	3.723	3.349	3.130	2.754
240	-	6.621	5.084	4.615	4.527	4.346	4.257	4.217	4.185	4.101	3.969	3.780	3.408	3.187	2.927
245	-	6.791	5.245	4.668	4.579	4.397	4.306	4.266	4.235	4.152	4.022	3.836	3.467	3.244	3.071
250	-	6.961	5.406	4.721	4.631	4.447	4.356	4.315	4.285	4.202	4.075	3.892	3.526	3.301	3.123
255	-	-	5.568	4.773	4.683	4.497	4.405	4.365	4.335	4.253	4.128	3.948	3.585	3.359	3.176
260	-	-	5.730	4.826	4.735	4.547	4.455	4.414	4.384	4.304	4.181	4.005	3.644	3.416	3.228
265	-	-	5.891	4.879	4.787	4.598	4.504	4.463	4.434	4.355	4.233	4.061	3.702	3.473	3.280
270	-	-	6.053	4.932	4.839	4.648	4.553	4.513	4.484	4.405	4.286	4.117	3.761	3.530	3.332
275	-	-	6.214	4.984	4.891	4.698	4.603	4.562	4.533	4.456	4.339	4.173	3.820	3.587	3.384
280	-	-	6.376	5.037	4.943	4.748	4.652	4.611	4.583	4.507	4.392	4.230	3.879	3.644	3.436
285	-	-	6.538	5.101	4.995	4.798	4.702	4.660	4.633	4.558	4.445	4.286	3.938	3.701	3.488
290	-	-	6.699	5.254	5.047	4.849	4.751	4.710	4.683	4.609	4.498	4.342	3.997	3.758	3.540
295	-	-	6.861	5.408	5.127	4.899	4.801	4.759	4.732	4.659	4.550	4.398	4.056	3.815	3.593
300	-	-	-	5.561	5.280	4.949	4.850	4.808	4.782	4.710	4.603	4.455	4.114	3.873	3.645
305	-	-	-	5.714	5.432	4.999	4.899	4.858	4.832	4.761	4.656	4.511	4.173	3.930	3.697
310	-	-	-	5.867	5.584	5.050	4.949	4.907	4.882	4.812	4.709	4.567	4.232	3.987	3.749
315	-	-	-	6.021	5.736	5.137	4.998	4.956	4.931	4.862	4.762	4.623	4.291	4.044	3.801
320	-	-	-	6.174	5.888	5.305	5.048	5.006	4.981	4.913	4.815	4.680	4.350	4.101	3.853
325	-	-	-	6.327	6.040	5.473	5.136	5.055	5.031	4.964	4.867	4.736	4.409	4.158	3.905
330	-	-	-	6.481	6.192	5.642	5.331	5.169	5.080	5.015	4.920	4.792	4.468	4.215	3.957
335	-	-	-	6.634	6.345	5.810	5.525	5.374	5.275	5.065	4.973	4.848	4.526	4.272	4.010
340	-	-	-	6.787	6.497	5.978	5.720	5.580	5.481	5.217	5.026	4.905	4.585	4.329	4.062
345	-	-	-	6.940	6.649	6.146	5.914	5.786	5.687	5.426	5.079	4.961	4.644	4.387	4.114
350	-	-	-	7.094	6.801	6.315	6.109	5.992	5.893	5.635	5.275	5.017	4.703	4.444	4.166
355	-	-	-	-	6.953	6.483	6.304	6.197	6.099	5.844	5.486	5.073	4.762	4.501	4.218
360	-	-	-	-	7.105	6.651	6.498	6.403	6.305	6.053	5.697	5.257	4.821	4.558	4.270
365	-	-	-	-	-	6.820	6.693	6.609	6.511	6.262	5.909	5.471	4.880	4.615	4.322
370	-	-	-	-	-	6.988	6.888	6.815	6.717	6.471	6.120	5.684	4.938	4.672	4.374
375	-	-	-	-	-	-	7.082	7.021	6.923	6.681	6.331	5.897	4.997	4.729	4.427
380	-	-	-	-	-	-	-	-	-	6.890	6.543	6.111	5.056	4.786	4.479
385	-	-	-	-	-	-	-	-	-	7.099	6.754	6.324	5.199	4.843	4.531

Thickness is intumescent only. Results also apply to I-section beams exposed on all four sides limited to a maximum protection thickness of 6.0445mm.

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 9 I-Section Columns 120 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	4.095	2.963	1.499	1.285	1.243	1.158	1.112	1.089	1.070	1.022	0.966	0.899	0.748	0.626	0.430
35	4.465	3.229	2.045	1.448	1.400	1.303	1.249	1.223	1.201	1.146	1.082	1.006	0.835	0.703	0.504
40	4.836	3.494	2.591	1.723	1.600	1.447	1.387	1.357	1.332	1.270	1.198	1.112	0.922	0.779	0.578
45	5.155	3.759	3.074	2.083	1.935	1.669	1.529	1.491	1.463	1.394	1.314	1.219	1.010	0.856	0.652
50	5.370	4.024	3.181	2.443	2.270	1.970	1.820	1.744	1.678	1.518	1.430	1.325	1.097	0.933	0.725
55	5.585	4.289	3.289	2.803	2.605	2.271	2.110	2.029	1.955	1.778	1.573	1.432	1.184	1.010	0.799
60	5.800	4.555	3.396	3.078	2.939	2.571	2.401	2.313	2.232	2.038	1.811	1.558	1.271	1.086	0.873
65	6.015	4.820	3.503	3.142	3.100	2.872	2.691	2.598	2.510	2.299	2.049	1.775	1.359	1.163	0.946
70	6.230	5.084	3.610	3.206	3.163	3.082	2.982	2.882	2.787	2.560	2.286	1.993	1.446	1.240	1.020
75	6.445	5.142	3.717	3.271	3.226	3.142	3.102	3.081	3.060	2.821	2.524	2.210	1.548	1.316	1.094
80	6.660	5.200	3.824	3.335	3.289	3.203	3.162	3.140	3.118	3.064	2.762	2.427	1.728	1.393	1.168
85	6.875	5.257	3.931	3.400	3.352	3.263	3.221	3.198	3.176	3.120	3.000	2.645	1.907	1.470	1.241
90	-	5.315	4.038	3.464	3.416	3.324	3.280	3.257	3.234	3.177	3.100	2.862	2.086	1.579	1.315
95	-	5.373	4.145	3.529	3.479	3.384	3.339	3.316	3.292	3.233	3.154	3.064	2.266	1.744	1.389
100	-	5.431	4.253	3.593	3.542	3.445	3.399	3.374	3.350	3.289	3.208	3.116	2.445	1.909	1.462
105	-	5.488	4.360	3.658	3.605	3.505	3.458	3.433	3.408	3.345	3.262	3.168	2.625	2.075	1.558
110	-	5.546	4.467	3.722	3.669	3.566	3.517	3.491	3.466	3.402	3.317	3.219	2.804	2.240	1.728
115	-	5.604	4.574	3.787	3.732	3.626	3.576	3.550	3.524	3.458	3.371	3.271	2.983	2.405	1.897
120	-	5.662	4.681	3.851	3.795	3.687	3.635	3.609	3.582	3.514	3.425	3.323	3.086	2.570	2.066
125	-	5.719	4.788	3.915	3.858	3.747	3.695	3.667	3.639	3.571	3.479	3.375	3.134	2.736	2.236
130	-	5.777	4.895	3.980	3.921	3.808	3.754	3.726	3.697	3.627	3.533	3.427	3.181	2.901	2.405
135	-	5.835	5.002	4.044	3.985	3.868	3.813	3.784	3.755	3.683	3.588	3.479	3.228	3.061	2.574
140	-	5.893	5.104	4.109	4.048	3.929	3.872	3.843	3.813	3.740	3.642	3.530	3.276	3.108	2.744
145	-	5.950	5.191	4.173	4.111	3.989	3.932	3.901	3.871	3.796	3.696	3.582	3.323	3.155	2.913
150	-	6.008	5.277	4.238	4.174	4.050	3.991	3.960	3.929	3.852	3.750	3.634	3.370	3.202	3.065
155	-	6.066	5.363	4.302	4.237	4.110	4.050	4.019	3.987	3.909	3.805	3.686	3.418	3.249	3.110
160	-	6.124	5.450	4.367	4.301	4.171	4.109	4.077	4.045	3.965	3.859	3.738	3.465	3.296	3.155
165	-	6.181	5.536	4.431	4.364	4.231	4.169	4.136	4.103	4.021	3.913	3.790	3.512	3.343	3.200
170	-	6.239	5.622	4.496	4.427	4.292	4.228	4.194	4.161	4.077	3.967	3.842	3.560	3.391	3.245
175	-	6.297	5.709	4.560	4.490	4.352	4.287	4.253	4.219	4.134	4.021	3.893	3.607	3.438	3.290
180	-	6.355	5.795	4.625	4.553	4.413	4.346	4.312	4.277	4.190	4.076	3.945	3.654	3.485	3.335
185	-	6.412	5.881	4.689	4.617	4.473	4.405	4.370	4.335	4.246	4.130	3.997	3.702	3.532	3.380
190	-	6.470	5.968	4.753	4.680	4.534	4.465	4.429	4.393	4.303	4.184	4.049	3.749	3.579	3.425
195	-	6.528	6.054	4.818	4.743	4.594	4.524	4.487	4.451	4.359	4.238	4.101	3.796	3.626	3.469
200	-	6.586	6.140	4.882	4.806	4.655	4.583	4.546	4.509	4.415	4.293	4.153	3.844	3.673	3.514
205	-	6.643	6.227	4.947	4.869	4.715	4.642	4.605	4.567	4.472	4.347	4.204	3.891	3.720	3.559
210	-	6.701	6.313	5.011	4.933	4.776	4.702	4.663	4.625	4.528	4.401	4.256	3.938	3.767	3.604
215	-	-	6.399	5.076	4.996	4.836	4.761	4.722	4.683	4.584	4.455	4.308	3.986	3.814	3.649
220	-	-	6.486	5.247	5.059	4.897	4.820	4.780	4.740	4.641	4.509	4.360	4.033	3.861	3.694
225	-	-	6.572	5.435	5.198	4.957	4.879	4.839	4.798	4.697	4.564	4.412	4.080	3.908	3.739
230	-	-	6.658	5.622	5.385	5.018	4.938	4.897	4.856	4.753	4.618	4.464	4.128	3.955	3.784
235	-	-	6.745	5.810	5.573	5.078	4.998	4.956	4.914	4.809	4.672	4.516	4.175	4.002	3.829
240	-	-	6.831	5.997	5.760	5.255	5.057	5.015	4.972	4.866	4.726	4.567	4.222	4.050	3.874
245	-	-	6.917	6.185	5.947	5.443	5.187	5.073	5.030	4.922	4.781	4.619	4.270	4.097	3.919
250	-	-	-	6.372	6.135	5.631	5.375	5.239	5.098	4.978	4.835	4.671	4.317	4.144	3.963
255	-	-	-	6.560	6.322	5.819	5.564	5.429	5.288	5.035	4.889	4.723	4.364	4.191	4.008
260	-	-	-	6.747	6.510	6.008	5.753	5.619	5.479	5.108	4.943	4.775	4.412	4.238	4.053
265	-	-	-	6.935	6.697	6.196	5.942	5.808	5.670	5.302	4.997	4.827	4.459	4.285	4.098
270	-	-	-	-	6.885	6.384	6.131	5.998	5.860	5.496	5.052	4.878	4.506	4.332	4.143
275	-	-	-	-	-	6.572	6.320	6.188	6.051	5.690	5.164	4.930	4.554	4.379	4.188
280	-	-	-	-	-	6.761	6.509	6.378	6.242	5.884	5.362	4.982	4.601	4.426	4.233
285	-	-	-	-	-	6.949	6.698	6.568	6.433	6.078	5.559	5.034	4.648	4.473	4.278
290	-	-	-	-	-	-	6.887	6.757	6.623	6.272	5.757	5.091	4.696	4.520	4.323
295	-	-	-	-	-	-	7.076	6.947	6.814	6.465	5.955	5.294	4.743	4.567	4.368
300	-	-	-	-	-	-	-	-	7.005	6.659	6.153	5.496	4.790	4.614	4.413
305	-	-	-	-	-	-	-	-	-	6.853	6.350	5.699	4.838	4.661	4.457
310	-	-	-	-	-	-	-	-	-	7.047	6.548	5.902	4.885	4.709	4.502
315	-	-	-	-	-	-	-	-	-	-	6.746	6.104	4.932	4.756	4.547
320	-	-	-	-	-	-	-	-	-	-	6.943	6.307	4.979	4.803	4.592
325	-	-	-	-	-	-	-	-	-	-	-	6.510	5.027	4.850	4.637
330	-	-	-	-	-	-	-	-	-	-	-	6.712	5.074	4.897	4.682
335	-	-	-	-	-	-	-	-	-	-	-	6.915	5.284	4.944	4.727
340	-	-	-	-	-	-	-	-	-	-	-	-	5.536	4.991	4.772
345	-	-	-	-	-	-	-	-	-	-	-	-	5.789	5.038	4.817
350	-	-	-	-	-	-	-	-	-	-	-	-	6.041	5.090	4.862
355	-	-	-	-	-	-	-	-	-	-	-	-	6.294	5.344	4.907
360	-	-	-	-	-	-	-	-	-	-	-	-	6.546	5.598	4.951
365	-	-	-	-	-	-	-	-	-	-	-	-	6.798	5.853	4.996
370	-	-	-	-	-	-	-	-	-	-	-	-	-	6.107	5.041
375	-	-	-	-	-	-	-	-	-	-	-	-	-	6.361	5.096
380	-	-	-	-	-	-	-	-	-	-	-	-	-	6.615	5.341
385	-	-	-	-	-	-	-	-	-	-	-	-	-	6.870	5.587

Thickness is intumescent only. Results also apply to I-section beams exposed on all four sides limited to a maximum protection thickness of 6.0445mm.

Issued: 13th September 2018
Revised: 29th November 2019
Valid to: 12th September 2023

CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 10 I-Section Columns 150 minutes															
Required Thickness (mm) for a Design Temperature (°C)															
Section Factor (m-1)	350	400	450	500	510	530	539	545	550	563	580	600	650	700	750
30	6.150	5.025	3.511	2.563	2.385	1.924	1.754	1.671	1.601	1.435	1.432	1.359	1.194	1.069	0.922
35	-	5.464	4.189	3.167	3.015	2.614	2.431	2.335	2.251	2.050	1.829	1.584	1.356	1.220	1.064
40	-	5.902	4.868	3.606	3.431	3.171	3.079	3.000	2.902	2.665	2.393	2.108	1.517	1.371	1.206
45	-	6.341	5.248	4.044	3.829	3.487	3.358	3.297	3.243	3.132	2.957	2.631	1.961	1.526	1.348
50	-	6.780	5.490	4.483	4.227	3.803	3.638	3.558	3.487	3.334	3.184	3.078	2.409	1.949	1.490
55	-	-	5.732	4.921	4.626	4.119	3.917	3.820	3.730	3.536	3.337	3.183	2.857	2.373	1.871
60	-	-	5.973	5.163	5.024	4.435	4.196	4.081	3.973	3.738	3.489	3.288	3.096	2.796	2.313
65	-	-	6.215	5.289	5.178	4.751	4.476	4.342	4.216	3.940	3.642	3.393	3.162	3.083	2.754
70	-	-	6.456	5.415	5.289	5.067	4.755	4.604	4.459	4.142	3.794	3.499	3.229	3.146	3.077
75	-	-	6.698	5.541	5.400	5.157	5.034	4.865	4.703	4.344	3.947	3.604	3.295	3.209	3.137
80	-	-	6.939	5.667	5.510	5.235	5.137	5.094	4.946	4.546	4.100	3.709	3.362	3.272	3.197
85	-	-	-	5.793	5.621	5.313	5.202	5.156	5.111	4.748	4.252	3.814	3.428	3.335	3.256
90	-	-	-	5.919	5.732	5.390	5.267	5.218	5.175	4.950	4.405	3.919	3.495	3.398	3.316
95	-	-	-	6.045	5.843	5.468	5.331	5.280	5.238	5.107	4.557	4.024	3.561	3.461	3.376
100	-	-	-	6.171	5.954	5.546	5.396	5.342	5.302	5.175	4.710	4.129	3.628	3.524	3.435
105	-	-	-	6.297	6.064	5.623	5.461	5.403	5.365	5.243	4.863	4.234	3.694	3.587	3.495
110	-	-	-	6.423	6.175	5.701	5.525	5.465	5.429	5.311	5.015	4.339	3.761	3.650	3.554
115	-	-	-	6.548	6.286	5.779	5.590	5.527	5.493	5.379	5.126	4.445	3.828	3.713	3.614
120	-	-	-	6.674	6.397	5.856	5.655	5.589	5.556	5.447	5.202	4.550	3.894	3.776	3.674
125	-	-	-	6.800	6.508	5.934	5.719	5.651	5.620	5.515	5.279	4.655	3.961	3.839	3.733
130	-	-	-	-	6.618	6.012	5.784	5.713	5.683	5.583	5.355	4.760	4.027	3.902	3.793
135	-	-	-	-	6.729	6.089	5.849	5.775	5.747	5.651	5.431	4.865	4.094	3.965	3.853
140	-	-	-	-	6.840	6.167	5.913	5.837	5.810	5.720	5.508	4.970	4.160	4.028	3.912
145	-	-	-	-	-	6.245	5.978	5.899	5.874	5.788	5.584	5.075	4.227	4.091	3.972
150	-	-	-	-	-	6.322	6.043	5.960	5.937	5.856	5.660	5.178	4.293	4.154	4.031
155	-	-	-	-	-	6.400	6.108	6.022	6.001	5.924	5.737	5.281	4.360	4.217	4.091
160	-	-	-	-	-	6.478	6.172	6.084	6.064	5.992	5.813	5.384	4.427	4.280	4.151
165	-	-	-	-	-	6.555	6.237	6.146	6.128	6.060	5.889	5.487	4.493	4.343	4.210
170	-	-	-	-	-	6.633	6.302	6.208	6.191	6.128	5.966	5.589	4.560	4.406	4.270
175	-	-	-	-	-	6.711	6.366	6.270	6.255	6.196	6.042	5.692	4.626	4.469	4.329
180	-	-	-	-	-	6.788	6.431	6.332	6.318	6.264	6.118	5.795	4.693	4.532	4.389
185	-	-	-	-	-	-	6.496	6.394	6.382	6.332	6.195	5.898	4.759	4.595	4.449
190	-	-	-	-	-	-	6.560	6.456	6.445	6.400	6.271	6.000	4.826	4.658	4.508
195	-	-	-	-	-	-	6.625	6.517	6.509	6.468	6.347	6.103	4.892	4.721	4.568
200	-	-	-	-	-	-	6.690	6.579	6.572	6.536	6.424	6.206	4.959	4.784	4.628
205	-	-	-	-	-	-	6.755	6.641	6.636	6.604	6.500	6.309	5.025	4.848	4.687
210	-	-	-	-	-	-	-	6.703	6.699	6.673	6.576	6.412	5.115	4.911	4.747
215	-	-	-	-	-	-	-	-	6.763	6.741	6.653	6.514	5.371	4.974	4.806
220	-	-	-	-	-	-	-	-	6.826	6.809	6.729	6.617	5.627	5.037	4.866
225	-	-	-	-	-	-	-	-	-	-	6.805	6.720	5.883	5.139	4.926
230	-	-	-	-	-	-	-	-	-	-	6.882	6.823	6.139	5.362	4.985
235	-	-	-	-	-	-	-	-	-	-	-	6.925	6.395	5.585	5.045
240	-	-	-	-	-	-	-	-	-	-	-	-	6.651	5.808	5.145
245	-	-	-	-	-	-	-	-	-	-	-	-	6.908	6.031	5.324
250	-	-	-	-	-	-	-	-	-	-	-	-	-	6.255	5.502
255	-	-	-	-	-	-	-	-	-	-	-	-	-	6.478	5.681
260	-	-	-	-	-	-	-	-	-	-	-	-	-	6.701	5.860
265	-	-	-	-	-	-	-	-	-	-	-	-	-	6.924	6.038
270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.217
275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.395
280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.574
285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.752
290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.931
295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

Issued: 13th September 2018
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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 11 I-Section Beams 15 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
30	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
35	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
40	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
45	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
50	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
55	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
60	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
65	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
70	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
75	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
80	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
85	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
90	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
95	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
100	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
105	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
110	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
115	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
120	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
125	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
130	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
135	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
140	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
145	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
150	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
155	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
160	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
165	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
170	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
175	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
180	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
185	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
190	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
195	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
200	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
205	0.343	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
210	0.354	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
215	0.364	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
220	0.374	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
225	0.384	0.340	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
230	0.394	0.348	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
235	0.405	0.355	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
240	0.415	0.362	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
245	0.425	0.369	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
250	0.435	0.376	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
255	0.445	0.384	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
260	0.456	0.391	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
265	0.466	0.398	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
270	0.476	0.405	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
275	0.486	0.412	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
280	0.497	0.420	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
285	0.507	0.427	0.342	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
290	0.517	0.434	0.348	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
295	0.527	0.441	0.354	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
300	0.537	0.448	0.360	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
305	0.548	0.455	0.366	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
310	0.558	0.463	0.372	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
315	0.568	0.470	0.377	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
320	0.578	0.477	0.383	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
325	0.589	0.484	0.389	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
330	0.599	0.491	0.395	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
335	0.609	0.499	0.401	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
340	0.619	0.506	0.407	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 12 I-Section Beams 20 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
30	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
35	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
40	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
45	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
50	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
55	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
60	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
65	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
70	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
75	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
80	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
85	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
90	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
95	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
100	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
105	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
110	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
115	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
120	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
125	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
130	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
135	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
140	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
145	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
150	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
155	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
160	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
165	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
170	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
175	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
180	0.348	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
185	0.362	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
190	0.377	0.343	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
195	0.392	0.353	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
200	0.407	0.363	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
205	0.422	0.373	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
210	0.437	0.384	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
215	0.452	0.394	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
220	0.467	0.404	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
225	0.481	0.415	0.344	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
230	0.496	0.425	0.352	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
235	0.511	0.435	0.361	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
240	0.526	0.445	0.369	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
245	0.541	0.456	0.377	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
250	0.556	0.466	0.386	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
255	0.571	0.476	0.394	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
260	0.586	0.487	0.402	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
265	0.600	0.497	0.411	0.341	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
270	0.615	0.507	0.419	0.348	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
275	0.630	0.517	0.427	0.355	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
280	0.645	0.528	0.436	0.362	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
285	0.660	0.538	0.444	0.369	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
290	0.675	0.548	0.452	0.376	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
295	0.690	0.559	0.461	0.383	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
300	0.704	0.569	0.469	0.390	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
305	0.719	0.579	0.477	0.397	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
310	0.734	0.589	0.486	0.404	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
315	0.749	0.600	0.494	0.411	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
320	0.764	0.610	0.502	0.418	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
325	0.779	0.620	0.511	0.425	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
330	0.794	0.630	0.519	0.432	0.343	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
335	0.809	0.641	0.527	0.439	0.349	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
340	0.823	0.651	0.536	0.446	0.355	0.343	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 13 I-Section Beams 30 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
30	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
35	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
40	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
45	0.346	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
50	0.364	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
55	0.381	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
60	0.399	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
65	0.417	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
70	0.434	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
75	0.452	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
80	0.469	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
85	0.487	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
90	0.504	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
95	0.522	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
100	0.540	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
105	0.557	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
110	0.575	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
115	0.592	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
120	0.610	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
125	0.627	0.346	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
130	0.645	0.361	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
135	0.663	0.377	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
140	0.680	0.393	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
145	0.698	0.409	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
150	0.715	0.425	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
155	0.733	0.441	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
160	0.750	0.457	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
165	0.768	0.472	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
170	0.785	0.488	0.349	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
175	0.803	0.504	0.362	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
180	0.821	0.520	0.376	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
185	0.838	0.536	0.390	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
190	0.856	0.552	0.404	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
195	0.873	0.567	0.417	0.347	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
200	0.891	0.583	0.431	0.358	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
205	0.908	0.599	0.445	0.370	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
210	0.926	0.615	0.459	0.382	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
215	0.944	0.631	0.472	0.393	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
220	0.961	0.647	0.486	0.405	0.347	0.340	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
225	0.979	0.663	0.500	0.416	0.357	0.350	0.346	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
230	0.996	0.678	0.514	0.428	0.367	0.360	0.356	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
235	1.014	0.694	0.527	0.440	0.377	0.370	0.366	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
240	1.031	0.710	0.541	0.451	0.388	0.380	0.376	0.346	0.345	0.340	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
245	1.049	0.726	0.555	0.463	0.398	0.390	0.386	0.356	0.354	0.349	0.345	0.338	0.338	0.338	0.338	0.338	0.338	0.338
250	1.066	0.742	0.569	0.474	0.408	0.400	0.396	0.365	0.364	0.358	0.354	0.338	0.338	0.338	0.338	0.338	0.338	0.338
255	1.084	0.758	0.582	0.486	0.418	0.410	0.406	0.374	0.373	0.367	0.363	0.338	0.338	0.338	0.338	0.338	0.338	0.338
260	1.102	0.774	0.596	0.498	0.428	0.420	0.416	0.384	0.382	0.377	0.372	0.347	0.342	0.338	0.338	0.338	0.338	0.338
265	1.119	0.789	0.610	0.509	0.439	0.430	0.425	0.393	0.392	0.386	0.381	0.356	0.351	0.338	0.338	0.338	0.338	0.338
270	1.137	0.805	0.623	0.521	0.449	0.440	0.435	0.402	0.401	0.395	0.391	0.364	0.359	0.346	0.338	0.338	0.338	0.338
275	1.154	0.821	0.637	0.532	0.459	0.450	0.445	0.412	0.410	0.404	0.400	0.373	0.368	0.354	0.338	0.338	0.338	0.338
280	1.172	0.837	0.651	0.544	0.469	0.460	0.455	0.421	0.420	0.413	0.409	0.382	0.377	0.363	0.343	0.338	0.338	0.338
285	1.189	0.853	0.665	0.556	0.479	0.470	0.465	0.430	0.429	0.423	0.418	0.391	0.385	0.372	0.351	0.338	0.338	0.338
290	1.207	0.869	0.678	0.567	0.489	0.480	0.475	0.440	0.438	0.432	0.427	0.399	0.394	0.380	0.360	0.338	0.338	0.338
295	1.225	0.885	0.692	0.579	0.500	0.490	0.485	0.449	0.448	0.441	0.436	0.408	0.403	0.389	0.368	0.338	0.338	0.338
300	1.242	0.900	0.706	0.590	0.510	0.500	0.495	0.458	0.457	0.450	0.446	0.417	0.411	0.397	0.376	0.338	0.338	0.338
305	1.260	0.916	0.720	0.602	0.520	0.510	0.505	0.468	0.466	0.460	0.455	0.426	0.420	0.406	0.385	0.338	0.338	0.338
310	1.277	0.932	0.733	0.614	0.530	0.520	0.515	0.477	0.475	0.469	0.464	0.434	0.429	0.414	0.393	0.338	0.338	0.338
315	1.295	0.948	0.747	0.625	0.540	0.530	0.525	0.487	0.485	0.478	0.473	0.443	0.437	0.423	0.401	0.338	0.338	0.338
320	1.312	0.964	0.761	0.637	0.551	0.540	0.535	0.496	0.494	0.487	0.482	0.452	0.446	0.431	0.410	0.340	0.338	0.338
325	1.330	0.980	0.775	0.648	0.561	0.550	0.544	0.505	0.503	0.497	0.491	0.461	0.455	0.440	0.418	0.348	0.338	0.338
330	1.348	0.995	0.788	0.660	0.571	0.560	0.554	0.515	0.513	0.506	0.500	0.469	0.463	0.448	0.426	0.356	0.338	0.338
335	1.365	1.011	0.802	0.672	0.581	0.570	0.564	0.524	0.522	0.515	0.510	0.478	0.472	0.457	0.435	0.364	0.338	0.338
340	1.383	1.027	0.816	0.683	0.591	0.580	0.574	0.533	0.531	0.524	0.519	0.487	0.481	0.465	0.443	0.372	0.338	0.338

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

Issued: 13th September 2018
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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 14 I-Section Beams 45 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
30	0.497	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
35	0.543	0.376	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
40	0.588	0.395	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
45	0.634	0.415	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
50	0.680	0.434	0.345	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
55	0.725	0.454	0.363	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
60	0.771	0.474	0.380	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
65	0.816	0.493	0.397	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
70	0.862	0.513	0.414	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
75	0.907	0.532	0.432	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
80	0.953	0.552	0.449	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
85	0.999	0.572	0.466	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
90	1.044	0.591	0.483	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
95	1.090	0.611	0.501	0.342	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
100	1.135	0.630	0.518	0.358	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
105	1.181	0.650	0.535	0.375	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
110	1.226	0.670	0.552	0.391	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
115	1.272	0.689	0.570	0.408	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
120	1.318	0.709	0.587	0.424	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
125	1.363	0.728	0.604	0.441	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
130	1.409	0.748	0.621	0.457	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
135	1.454	0.768	0.639	0.474	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
140	1.488	0.787	0.656	0.490	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
145	1.513	0.807	0.673	0.507	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
150	1.538	0.826	0.691	0.523	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
155	1.563	0.846	0.708	0.540	0.348	0.341	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
160	1.587	0.866	0.725	0.556	0.364	0.358	0.354	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
165	1.612	0.885	0.742	0.573	0.381	0.374	0.371	0.344	0.343	0.339	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
170	1.637	0.905	0.760	0.589	0.398	0.391	0.387	0.360	0.359	0.355	0.351	0.338	0.338	0.338	0.338	0.338	0.338	0.338
175	1.662	0.924	0.777	0.606	0.415	0.407	0.403	0.376	0.375	0.370	0.367	0.347	0.343	0.338	0.338	0.338	0.338	0.338
180	1.686	0.944	0.794	0.622	0.432	0.424	0.420	0.391	0.390	0.385	0.382	0.361	0.358	0.349	0.338	0.338	0.338	0.338
185	1.711	0.964	0.811	0.639	0.448	0.440	0.436	0.407	0.406	0.401	0.397	0.376	0.372	0.364	0.352	0.338	0.338	0.338
190	1.736	0.983	0.829	0.655	0.465	0.457	0.453	0.422	0.421	0.416	0.413	0.391	0.387	0.378	0.366	0.338	0.338	0.338
195	1.761	1.003	0.846	0.672	0.482	0.473	0.469	0.438	0.437	0.432	0.428	0.406	0.402	0.393	0.380	0.339	0.338	0.338
200	1.785	1.022	0.863	0.688	0.499	0.490	0.485	0.454	0.452	0.447	0.443	0.420	0.416	0.407	0.394	0.352	0.338	0.338
205	1.810	1.042	0.880	0.705	0.515	0.506	0.502	0.469	0.468	0.463	0.459	0.435	0.431	0.422	0.408	0.366	0.338	0.338
210	1.835	1.062	0.898	0.721	0.532	0.523	0.518	0.485	0.483	0.478	0.474	0.450	0.446	0.436	0.422	0.380	0.338	0.338
215	1.860	1.081	0.915	0.738	0.549	0.539	0.535	0.500	0.499	0.493	0.489	0.465	0.460	0.450	0.436	0.393	0.338	0.338
220	1.884	1.101	0.932	0.755	0.566	0.556	0.551	0.516	0.515	0.509	0.504	0.479	0.475	0.465	0.450	0.407	0.338	0.338
225	1.909	1.120	0.949	0.771	0.583	0.572	0.567	0.532	0.530	0.524	0.520	0.494	0.490	0.479	0.464	0.421	0.338	0.338
230	1.934	1.140	0.967	0.788	0.599	0.589	0.584	0.547	0.546	0.540	0.535	0.509	0.504	0.494	0.479	0.435	0.344	0.338
235	1.958	1.160	0.984	0.804	0.616	0.605	0.600	0.563	0.561	0.555	0.550	0.524	0.519	0.508	0.493	0.448	0.357	0.338
240	1.983	1.179	1.001	0.821	0.633	0.622	0.617	0.578	0.577	0.570	0.566	0.538	0.533	0.523	0.507	0.462	0.370	0.338
245	2.008	1.199	1.018	0.837	0.650	0.638	0.633	0.594	0.592	0.586	0.581	0.553	0.548	0.537	0.521	0.476	0.383	0.338
250	2.033	1.218	1.036	0.854	0.667	0.655	0.650	0.610	0.608	0.601	0.596	0.568	0.563	0.551	0.535	0.489	0.396	0.338
255	2.057	1.238	1.053	0.870	0.683	0.671	0.666	0.625	0.623	0.617	0.612	0.583	0.577	0.566	0.549	0.503	0.409	0.338
260	2.082	1.258	1.070	0.887	0.700	0.688	0.682	0.641	0.639	0.632	0.627	0.597	0.592	0.580	0.563	0.517	0.422	0.338
265	2.107	1.277	1.087	0.903	0.717	0.705	0.699	0.656	0.655	0.648	0.642	0.612	0.607	0.595	0.577	0.531	0.435	0.338
270	2.132	1.297	1.105	0.920	0.734	0.721	0.715	0.672	0.670	0.663	0.658	0.627	0.621	0.609	0.592	0.544	0.448	0.338
275	2.156	1.316	1.122	0.936	0.750	0.738	0.732	0.688	0.686	0.678	0.673	0.641	0.636	0.624	0.606	0.558	0.462	0.338
280	2.181	1.336	1.139	0.953	0.767	0.754	0.748	0.703	0.701	0.694	0.688	0.656	0.651	0.638	0.620	0.572	0.475	0.342
285	2.206	1.356	1.156	0.969	0.784	0.771	0.764	0.719	0.717	0.709	0.704	0.671	0.665	0.652	0.634	0.585	0.488	0.354
290	2.231	1.375	1.174	0.986	0.801	0.787	0.781	0.734	0.732	0.725	0.719	0.686	0.680	0.667	0.648	0.599	0.501	0.366
295	2.255	1.395	1.191	1.002	0.818	0.804	0.797	0.750	0.748	0.740	0.734	0.700	0.695	0.681	0.662	0.613	0.514	0.378
300	2.280	1.414	1.208	1.019	0.834	0.820	0.814	0.766	0.763	0.755	0.749	0.715	0.709	0.696	0.676	0.626	0.527	0.390
305	2.305	1.434	1.225	1.035	0.851	0.837	0.830	0.781	0.779	0.771	0.765	0.730	0.724	0.710	0.690	0.640	0.540	0.402
310	2.329	1.454	1.243	1.052	0.868	0.853	0.846	0.797	0.795	0.786	0.780	0.745	0.738	0.725	0.705	0.654	0.553	0.414
315	2.354	1.473	1.260	1.068	0.885	0.870	0.863	0.812	0.810	0.802	0.795	0.759	0.753	0.739	0.719	0.668	0.566	0.426
320	2.379	1.520	1.277	1.085	0.902	0.886	0.879	0.828	0.826	0.817	0.811	0.774	0.768	0.753	0.733	0.681	0.580	0.438
325	2.404	1.569	1.295	1.101	0.918	0.903	0.896	0.843	0.841	0.833	0.826	0.789	0.782	0.768	0.747	0.695	0.593	0.450
330	2.428	1.619	1.312	1.118	0.935	0.919	0.912	0.859	0.857	0.848	0.841	0.804	0.797	0.782	0.761	0.709	0.606	0.462
335	2.453	1.668	1.329	1.134	0.952	0.936	0.928	0.875	0.872	0.863	0.857	0.818	0.812	0.797	0.775	0.722	0.619	0.474
340	2.529	1.718	1.346	1.151	0.969	0.952	0.945	0.890	0.888	0.879	0.872	0.833	0.826	0.811	0.789	0.736	0.632	0.486

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 15 I-Section Beams 60 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
30	0.827	0.580	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
35	0.928	0.628	0.410	0.353	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
40	1.029	0.676	0.439	0.372	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
45	1.130	0.723	0.468	0.392	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
50	1.231	0.771	0.497	0.411	0.353	0.343	0.339	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
55	1.332	0.819	0.526	0.431	0.371	0.361	0.357	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
60	1.433	0.866	0.556	0.450	0.389	0.379	0.375	0.340	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
65	1.498	0.914	0.585	0.470	0.407	0.397	0.393	0.357	0.356	0.349	0.344	0.338	0.338	0.338	0.338	0.338	0.338	0.338
70	1.537	0.962	0.614	0.489	0.425	0.415	0.411	0.375	0.373	0.366	0.361	0.338	0.338	0.338	0.338	0.338	0.338	0.338
75	1.576	1.009	0.643	0.509	0.443	0.433	0.429	0.392	0.391	0.384	0.378	0.345	0.340	0.338	0.338	0.338	0.338	0.338
80	1.615	1.057	0.672	0.528	0.462	0.451	0.446	0.410	0.408	0.401	0.396	0.363	0.357	0.341	0.338	0.338	0.338	0.338
85	1.654	1.105	0.702	0.548	0.480	0.469	0.464	0.428	0.426	0.418	0.413	0.380	0.374	0.358	0.338	0.338	0.338	0.338
90	1.693	1.152	0.731	0.567	0.498	0.487	0.482	0.445	0.443	0.436	0.431	0.397	0.391	0.376	0.353	0.338	0.338	0.338
95	1.732	1.200	0.760	0.587	0.516	0.505	0.500	0.463	0.461	0.453	0.448	0.414	0.408	0.393	0.370	0.338	0.338	0.338
100	1.771	1.248	0.789	0.606	0.534	0.523	0.518	0.480	0.478	0.471	0.465	0.432	0.425	0.410	0.387	0.338	0.338	0.338
105	1.810	1.295	0.818	0.626	0.552	0.541	0.536	0.498	0.496	0.488	0.483	0.449	0.443	0.427	0.404	0.338	0.338	0.338
110	1.849	1.343	0.848	0.645	0.570	0.559	0.554	0.515	0.513	0.506	0.500	0.466	0.460	0.444	0.421	0.341	0.338	0.338
115	1.888	1.391	0.877	0.665	0.589	0.577	0.572	0.533	0.531	0.523	0.518	0.483	0.477	0.461	0.438	0.359	0.338	0.338
120	1.927	1.438	0.906	0.684	0.607	0.595	0.590	0.550	0.548	0.541	0.535	0.500	0.494	0.478	0.455	0.376	0.338	0.338
125	1.966	1.481	0.935	0.704	0.625	0.613	0.608	0.568	0.566	0.558	0.552	0.518	0.511	0.495	0.472	0.394	0.338	0.338
130	2.005	1.508	0.965	0.723	0.643	0.631	0.626	0.585	0.583	0.576	0.570	0.535	0.529	0.513	0.490	0.411	0.338	0.338
135	2.044	1.534	0.994	0.742	0.661	0.649	0.644	0.603	0.601	0.593	0.587	0.552	0.546	0.530	0.507	0.429	0.338	0.338
140	2.082	1.561	1.023	0.762	0.679	0.667	0.662	0.620	0.618	0.611	0.605	0.569	0.563	0.547	0.524	0.447	0.338	0.338
145	2.121	1.587	1.052	0.781	0.697	0.685	0.680	0.638	0.636	0.628	0.622	0.586	0.580	0.564	0.541	0.464	0.338	0.338
150	2.160	1.614	1.081	0.801	0.715	0.703	0.698	0.655	0.653	0.645	0.640	0.604	0.597	0.581	0.558	0.482	0.338	0.338
155	2.199	1.641	1.111	0.820	0.734	0.721	0.716	0.673	0.671	0.663	0.657	0.621	0.614	0.598	0.575	0.499	0.338	0.338
160	2.238	1.667	1.140	0.840	0.752	0.739	0.734	0.691	0.688	0.680	0.674	0.638	0.632	0.615	0.592	0.517	0.345	0.338
165	2.277	1.694	1.169	0.859	0.770	0.757	0.751	0.708	0.706	0.698	0.692	0.655	0.649	0.633	0.609	0.534	0.364	0.338
170	2.316	1.720	1.198	0.879	0.788	0.775	0.769	0.726	0.723	0.715	0.709	0.672	0.666	0.650	0.626	0.552	0.383	0.338
175	2.355	1.747	1.227	0.898	0.806	0.793	0.787	0.743	0.741	0.733	0.727	0.690	0.683	0.667	0.643	0.569	0.402	0.338
180	2.394	1.773	1.257	0.918	0.824	0.811	0.805	0.761	0.759	0.750	0.744	0.707	0.700	0.684	0.660	0.587	0.421	0.343
185	2.433	1.800	1.286	0.937	0.842	0.829	0.823	0.778	0.776	0.768	0.761	0.724	0.717	0.701	0.677	0.605	0.440	0.361
190	2.482	1.827	1.315	0.957	0.861	0.847	0.841	0.796	0.794	0.785	0.779	0.741	0.735	0.718	0.694	0.622	0.459	0.379
195	2.544	1.853	1.344	0.976	0.879	0.865	0.859	0.813	0.811	0.803	0.796	0.759	0.752	0.735	0.711	0.640	0.479	0.397
200	2.605	1.880	1.374	0.996	0.897	0.883	0.877	0.831	0.829	0.820	0.814	0.776	0.769	0.752	0.728	0.657	0.498	0.415
205	2.667	1.906	1.403	1.015	0.915	0.901	0.895	0.848	0.846	0.837	0.831	0.793	0.786	0.770	0.746	0.675	0.517	0.433
210	2.729	1.933	1.432	1.035	0.933	0.919	0.913	0.866	0.864	0.855	0.849	0.810	0.803	0.787	0.763	0.692	0.536	0.451
215	2.791	1.959	1.461	1.054	0.951	0.937	0.931	0.883	0.881	0.872	0.866	0.827	0.820	0.804	0.780	0.710	0.555	0.469
220	2.852	1.986	1.494	1.074	0.969	0.955	0.949	0.901	0.899	0.890	0.883	0.845	0.838	0.821	0.797	0.727	0.574	0.487
225	2.914	2.013	1.529	1.093	0.988	0.973	0.967	0.918	0.916	0.907	0.901	0.862	0.855	0.838	0.814	0.745	0.593	0.505
230	2.976	2.039	1.564	1.113	1.006	0.991	0.985	0.936	0.934	0.925	0.918	0.879	0.872	0.855	0.831	0.763	0.612	0.523
235	3.038	2.066	1.599	1.132	1.024	1.009	1.003	0.953	0.951	0.942	0.936	0.896	0.889	0.872	0.848	0.780	0.631	0.541
240	3.100	2.092	1.635	1.152	1.042	1.027	1.021	0.971	0.969	0.960	0.953	0.913	0.906	0.889	0.865	0.798	0.650	0.559
245	3.161	2.119	1.670	1.171	1.060	1.045	1.039	0.989	0.986	0.977	0.970	0.931	0.924	0.907	0.882	0.815	0.669	0.578
250	3.223	2.145	1.705	1.190	1.078	1.063	1.056	1.006	1.004	0.995	0.988	0.948	0.941	0.924	0.899	0.833	0.688	0.596
255	3.285	2.172	1.740	1.210	1.096	1.081	1.074	1.024	1.021	1.012	1.005	0.965	0.958	0.941	0.916	0.850	0.707	0.614
260	3.347	2.199	1.776	1.229	1.115	1.099	1.092	1.041	1.039	1.030	1.023	0.982	0.975	0.958	0.933	0.868	0.726	0.632
265	3.409	2.225	1.811	1.249	1.133	1.117	1.110	1.059	1.056	1.047	1.040	0.999	0.992	0.975	0.950	0.885	0.745	0.650
270	3.498	2.252	1.846	1.268	1.151	1.135	1.128	1.076	1.074	1.064	1.058	1.017	1.009	0.992	0.967	0.903	0.764	0.668
275	3.588	2.278	1.881	1.288	1.169	1.153	1.146	1.094	1.091	1.082	1.075	1.034	1.027	1.009	0.985	0.921	0.783	0.686
280	3.679	2.305	1.916	1.307	1.187	1.171	1.164	1.111	1.109	1.099	1.092	1.051	1.044	1.027	1.002	0.938	0.802	0.704
285	3.769	2.332	1.952	1.327	1.205	1.189	1.182	1.129	1.126	1.117	1.110	1.068	1.061	1.044	1.019	0.956	0.821	0.722
290	3.859	2.358	1.987	1.346	1.223	1.207	1.200	1.146	1.144	1.134	1.127	1.085	1.078	1.061	1.036	0.973	0.840	0.740
295	3.950	2.385	2.022	1.366	1.242	1.225	1.218	1.164	1.161	1.152	1.145	1.103	1.095	1.078	1.053	0.991	0.859	0.758
300	4.040	2.411	2.057	1.385	1.260	1.243	1.236	1.181	1.179	1.169	1.162	1.120	1.112	1.095	1.070	1.008	0.878	0.776
305	4.130	2.438	2.093	1.405	1.278	1.261	1.254	1.199	1.196	1.187	1.179	1.137	1.130	1.112	1.087	1.026	0.897	0.794
310	4.221	2.492	2.128	1.424	1.296	1.279	1.272	1.216	1.214	1.204	1.197	1.154	1.147	1.129	1.104	1.043	0.916	0.812
315	4.311	2.605	2.163	1.444	1.314	1.297	1.290	1.234	1.231	1.222	1.214	1.172	1.164	1.146	1.121	1.061	0.935	0.830
320	4.401	2.718	2.198	1.463	1.332	1.315	1.308	1.251	1.249	1.239	1.232	1.189	1.181	1.164	1.138	1.079	0.954	0.848
325	4.492	2.831	2.234	1.499	1.350	1.333	1.326	1.269	1.266	1.257	1.249	1.206	1.198	1.181	1.155	1.096	0.973	0.867
330	4.534	2.944	2.269	1.562	1.369	1.351	1.344	1.287	1.284	1.274	1.266	1.223	1.215	1.198	1.172	1.114	0.993	0.885
335	4.570	3.057	2.304	1.624	1.387	1.369	1.362	1.304	1.302	1.291	1.284	1.240	1.233	1.215	1.189	1.131	1.012	0.903
340	4.605	3.170	2.339	1.686	1.405	1.387	1.379	1.322	1.319	1.309	1.301	1.258	1.250	1.232	1.206	1.149	1.031	0.921

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

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Table 16 I-Section Beams 75 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
30	1.159	0.866	0.644	0.404	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338
35	1.315	0.962	0.704	0.443	0.386	0.380	0.377	0.358	0.358	0.355	0.353	0.339	0.338	0.338	0.338	0.338	0.338	0.338
40	1.472	1.058	0.763	0.482	0.415	0.407	0.404	0.381	0.380	0.377	0.374	0.359	0.357	0.350	0.340	0.338	0.338	0.338
45	1.682	1.154	0.822	0.521	0.444	0.435	0.431	0.404	0.403	0.399	0.396	0.380	0.377	0.370	0.360	0.338	0.338	0.338
50	1.892	1.249	0.881	0.560	0.473	0.463	0.458	0.427	0.426	0.421	0.417	0.400	0.397	0.390	0.380	0.347	0.338	0.338
55	2.103	1.345	0.940	0.599	0.502	0.491	0.486	0.450	0.449	0.443	0.439	0.420	0.417	0.410	0.399	0.367	0.338	0.338
60	2.313	1.441	0.999	0.638	0.531	0.519	0.513	0.473	0.472	0.465	0.461	0.440	0.437	0.430	0.419	0.386	0.338	0.338
65	2.476	1.502	1.058	0.677	0.560	0.547	0.540	0.496	0.494	0.487	0.482	0.461	0.457	0.450	0.439	0.406	0.338	0.338
70	2.539	1.545	1.117	0.716	0.589	0.574	0.567	0.519	0.517	0.509	0.504	0.481	0.478	0.470	0.459	0.426	0.356	0.338
75	2.602	1.587	1.176	0.755	0.618	0.602	0.595	0.542	0.540	0.531	0.525	0.501	0.498	0.490	0.479	0.446	0.376	0.338
80	2.664	1.629	1.235	0.794	0.647	0.630	0.622	0.565	0.563	0.553	0.547	0.521	0.518	0.510	0.498	0.465	0.397	0.338
85	2.727	1.671	1.294	0.833	0.676	0.658	0.649	0.588	0.586	0.575	0.568	0.541	0.538	0.530	0.518	0.485	0.417	0.338
90	2.790	1.714	1.353	0.872	0.706	0.686	0.676	0.611	0.608	0.597	0.590	0.562	0.558	0.550	0.538	0.505	0.437	0.338
95	2.853	1.756	1.413	0.911	0.735	0.713	0.704	0.634	0.631	0.619	0.611	0.582	0.578	0.570	0.558	0.525	0.457	0.358
100	2.915	1.798	1.472	0.950	0.764	0.741	0.731	0.657	0.654	0.642	0.633	0.602	0.598	0.590	0.578	0.544	0.477	0.379
105	2.978	1.841	1.507	0.989	0.793	0.769	0.758	0.680	0.677	0.664	0.654	0.622	0.619	0.610	0.597	0.564	0.497	0.399
110	3.041	1.883	1.540	1.028	0.822	0.797	0.785	0.703	0.700	0.686	0.676	0.643	0.639	0.630	0.617	0.584	0.517	0.420
115	3.104	1.925	1.573	1.067	0.851	0.825	0.813	0.726	0.722	0.708	0.697	0.663	0.659	0.650	0.637	0.604	0.537	0.440
120	3.166	1.968	1.607	1.106	0.880	0.853	0.840	0.749	0.745	0.730	0.719	0.683	0.679	0.670	0.657	0.623	0.557	0.461
125	3.229	2.010	1.640	1.145	0.909	0.880	0.867	0.772	0.768	0.752	0.740	0.703	0.699	0.690	0.677	0.643	0.577	0.481
130	3.292	2.052	1.674	1.184	0.938	0.908	0.895	0.795	0.791	0.774	0.762	0.724	0.719	0.710	0.696	0.663	0.597	0.502
135	3.355	2.095	1.707	1.222	0.967	0.936	0.922	0.818	0.814	0.796	0.783	0.744	0.740	0.730	0.716	0.683	0.617	0.522
140	3.421	2.137	1.741	1.261	0.996	0.964	0.949	0.841	0.837	0.818	0.805	0.764	0.760	0.750	0.736	0.702	0.637	0.543
145	3.521	2.179	1.774	1.300	1.025	0.992	0.976	0.864	0.859	0.840	0.826	0.784	0.780	0.770	0.756	0.722	0.657	0.563
150	3.620	2.222	1.808	1.339	1.054	1.020	1.004	0.887	0.882	0.862	0.848	0.804	0.800	0.790	0.776	0.742	0.677	0.584
155	3.719	2.264	1.841	1.378	1.083	1.047	1.031	0.910	0.905	0.884	0.869	0.825	0.820	0.810	0.795	0.762	0.698	0.604
160	3.818	2.306	1.875	1.417	1.112	1.075	1.058	0.933	0.928	0.906	0.891	0.845	0.840	0.830	0.815	0.781	0.718	0.625
165	3.917	2.349	1.908	1.456	1.141	1.103	1.085	0.956	0.951	0.928	0.912	0.865	0.861	0.850	0.835	0.801	0.738	0.645
170	4.016	2.391	1.942	1.492	1.170	1.131	1.113	0.979	0.973	0.950	0.934	0.885	0.881	0.870	0.855	0.821	0.758	0.666
175	4.115	2.433	1.975	1.524	1.199	1.159	1.140	1.002	0.996	0.973	0.955	0.906	0.901	0.890	0.875	0.841	0.778	0.686
180	4.214	2.502	2.009	1.557	1.228	1.187	1.167	1.025	1.019	0.995	0.977	0.926	0.921	0.910	0.894	0.860	0.798	0.707
185	4.313	2.601	2.042	1.589	1.257	1.214	1.194	1.048	1.042	1.017	0.998	0.946	0.941	0.930	0.914	0.880	0.818	0.727
190	4.412	2.700	2.075	1.622	1.287	1.242	1.222	1.071	1.065	1.039	1.020	0.966	0.961	0.950	0.934	0.900	0.838	0.748
195	4.506	2.799	2.109	1.654	1.316	1.270	1.249	1.094	1.087	1.061	1.041	0.987	0.982	0.970	0.954	0.920	0.858	0.768
200	4.537	2.898	2.142	1.687	1.345	1.298	1.276	1.117	1.110	1.083	1.063	1.007	1.002	0.990	0.973	0.939	0.878	0.789
205	4.568	2.997	2.176	1.719	1.374	1.326	1.303	1.140	1.133	1.105	1.084	1.027	1.022	1.010	0.993	0.959	0.898	0.809
210	4.599	3.096	2.209	1.752	1.403	1.354	1.331	1.163	1.156	1.127	1.106	1.047	1.042	1.030	1.013	0.979	0.918	0.830
215	4.630	3.195	2.243	1.784	1.432	1.381	1.358	1.186	1.179	1.149	1.127	1.068	1.062	1.050	1.033	0.999	0.938	0.850
220	4.660	3.294	2.276	1.817	1.461	1.409	1.385	1.209	1.201	1.171	1.149	1.088	1.082	1.070	1.053	1.018	0.958	0.871
225	4.691	3.393	2.310	1.849	1.495	1.437	1.413	1.232	1.224	1.193	1.170	1.108	1.102	1.090	1.072	1.038	0.978	0.891
230	4.722	3.465	2.343	1.882	1.533	1.465	1.440	1.255	1.247	1.215	1.192	1.128	1.123	1.110	1.092	1.058	0.999	0.912
235	4.753	3.530	2.377	1.914	1.572	1.501	1.467	1.278	1.270	1.237	1.213	1.148	1.143	1.130	1.112	1.078	1.019	0.932
240	4.784	3.596	2.410	1.947	1.611	1.541	1.504	1.301	1.293	1.259	1.235	1.169	1.163	1.150	1.132	1.097	1.039	0.953
245	4.815	3.662	2.444	1.979	1.649	1.581	1.545	1.324	1.315	1.281	1.256	1.189	1.183	1.170	1.152	1.117	1.059	0.973
250	4.846	3.728	2.500	2.012	1.688	1.621	1.586	1.347	1.338	1.304	1.278	1.209	1.203	1.190	1.171	1.137	1.079	0.993
255	4.876	3.793	2.571	2.044	1.727	1.661	1.627	1.370	1.361	1.326	1.299	1.229	1.223	1.210	1.191	1.157	1.099	1.014
260	4.907	3.859	2.641	2.077	1.765	1.702	1.668	1.393	1.384	1.348	1.321	1.250	1.244	1.230	1.211	1.176	1.119	1.034
265	4.938	3.925	2.712	2.109	1.804	1.742	1.709	1.416	1.407	1.370	1.342	1.270	1.264	1.250	1.231	1.196	1.139	1.055
270	4.969	3.990	2.782	2.142	1.842	1.782	1.750	1.439	1.429	1.392	1.364	1.290	1.284	1.270	1.251	1.216	1.159	1.075
275	5.000	4.056	2.853	2.174	1.881	1.822	1.791	1.462	1.452	1.414	1.385	1.310	1.304	1.290	1.270	1.236	1.179	1.096
280	5.031	4.122	2.923	2.207	1.920	1.862	1.832	1.497	1.475	1.436	1.407	1.331	1.324	1.310	1.290	1.255	1.199	1.116
285	5.061	4.187	2.994	2.239	1.958	1.903	1.873	1.550	1.528	1.458	1.428	1.351	1.344	1.330	1.310	1.275	1.219	1.137
290	5.092	4.253	3.064	2.272	1.997	1.943	1.914	1.602	1.581	1.488	1.450	1.371	1.365	1.350	1.330	1.295	1.239	1.157
295	5.123	4.319	3.135	2.304	2.036	1.983	1.955	1.654	1.634	1.545	1.471	1.391	1.385	1.370	1.350	1.315	1.259	1.178
300	5.154	4.385	3.206	2.337	2.074	2.023	1.996	1.706	1.687	1.602	1.525	1.412	1.405	1.390	1.369	1.334	1.279	1.198
305	5.185	4.450	3.276	2.369	2.113	2.063	2.037	1.758	1.740	1.659	1.585	1.432	1.425	1.410	1.389	1.354	1.300	1.219
310	5.216	4.512	3.347	2.402	2.151	2.104	2.078	1.811	1.793	1.715	1.645	1.452	1.445	1.430	1.409	1.374	1.320	1.239
315	5.247	4.555	3.427	2.434	2.190	2.144	2.119	1.863	1.846	1.772	1.706	1.472	1.465	1.450	1.429	1.394	1.340	1.260
320	5.277	4.598	3.601	2.507	2.229	2.184	2.160	1.915	1.899	1.829	1.766	1.532	1.509	1.470	1.449	1.413	1.360	1.280
325	5.308	4.640	3.774	2.661	2.267	2.224	2.201	1.967	1.952	1.886	1.826	1.598	1.575	1.525	1.468	1.433	1.380	1.301
330	5.339	4.683	3.947	2.816	2.306	2.264	2.242	2.019	2.005	1.943	1.887	1.665	1.641	1.590	1.517	1.453	1.400	1.321
335	5.370	4.726	4.120	2.970	2.345	2.305	2.283	2.071	2.058	2.000	1.947	1.731	1.707	1.655	1.580	1.473	1.420	1.342
340	5.401	4.769	4.293	3.124	2.383	2.345	2.324	2.124	2.111	2.057	2.007	1.797	1.773	1.720	1.643	1.523	1.440	1.362

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 17 I-Section Beams 90 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
30	2.433	1.154	0.905	0.700	0.535	0.433	0.428	0.396	0.394	0.389	0.386	0.338	0.338	0.338	0.338	0.338	0.338	0.338
35	2.608	1.298	1.008	0.773	0.590	0.491	0.484	0.443	0.442	0.435	0.431	0.408	0.404	0.395	0.383	0.350	0.338	0.338
40	2.783	1.442	1.111	0.845	0.645	0.548	0.541	0.491	0.489	0.481	0.476	0.450	0.446	0.436	0.422	0.386	0.338	0.338
45	2.957	1.649	1.214	0.918	0.699	0.606	0.597	0.539	0.536	0.527	0.520	0.492	0.487	0.476	0.461	0.421	0.358	0.338
50	3.132	1.876	1.316	0.991	0.754	0.663	0.654	0.587	0.584	0.573	0.565	0.534	0.529	0.517	0.500	0.457	0.390	0.338
55	3.307	2.103	1.419	1.064	0.809	0.721	0.710	0.634	0.631	0.619	0.610	0.576	0.571	0.557	0.539	0.492	0.422	0.353
60	3.431	2.330	1.496	1.137	0.864	0.778	0.766	0.682	0.678	0.665	0.655	0.619	0.612	0.598	0.578	0.528	0.453	0.381
65	3.482	2.492	1.542	1.210	0.919	0.836	0.823	0.730	0.726	0.711	0.700	0.661	0.654	0.638	0.617	0.563	0.485	0.409
70	3.534	2.572	1.588	1.283	0.974	0.893	0.879	0.777	0.773	0.757	0.745	0.703	0.696	0.679	0.656	0.598	0.517	0.437
75	3.585	2.651	1.635	1.356	1.028	0.951	0.935	0.825	0.820	0.803	0.790	0.745	0.737	0.719	0.694	0.634	0.548	0.465
80	3.637	2.731	1.681	1.429	1.083	1.008	0.992	0.873	0.868	0.849	0.835	0.787	0.779	0.760	0.733	0.669	0.580	0.493
85	3.688	2.811	1.727	1.489	1.138	1.066	1.048	0.920	0.915	0.895	0.880	0.829	0.821	0.800	0.772	0.705	0.611	0.521
90	3.740	2.891	1.773	1.527	1.193	1.124	1.104	0.968	0.963	0.940	0.925	0.872	0.862	0.841	0.811	0.740	0.643	0.549
95	3.791	2.971	1.819	1.565	1.248	1.181	1.161	1.016	1.010	0.986	0.970	0.914	0.904	0.881	0.850	0.776	0.675	0.577
100	3.843	3.051	1.865	1.603	1.303	1.239	1.217	1.064	1.057	1.032	1.015	0.956	0.946	0.922	0.889	0.811	0.706	0.605
105	3.894	3.131	1.911	1.641	1.357	1.296	1.274	1.111	1.105	1.078	1.060	0.998	0.987	0.962	0.928	0.846	0.738	0.633
110	3.946	3.211	1.957	1.679	1.412	1.354	1.330	1.159	1.152	1.124	1.105	1.040	1.029	1.003	0.967	0.882	0.770	0.661
115	3.997	3.291	2.004	1.717	1.467	1.411	1.386	1.207	1.199	1.170	1.150	1.082	1.071	1.043	1.006	0.917	0.801	0.689
120	4.049	3.371	2.050	1.755	1.504	1.469	1.443	1.254	1.247	1.216	1.195	1.125	1.112	1.083	1.044	0.953	0.833	0.717
125	4.100	3.453	2.096	1.793	1.537	1.504	1.489	1.302	1.294	1.262	1.240	1.167	1.154	1.124	1.083	0.988	0.865	0.745
130	4.152	3.539	2.142	1.831	1.571	1.537	1.522	1.350	1.341	1.308	1.285	1.209	1.196	1.164	1.122	1.023	0.896	0.773
135	4.203	3.625	2.188	1.869	1.605	1.571	1.554	1.397	1.389	1.354	1.330	1.251	1.237	1.205	1.161	1.059	0.928	0.800
140	4.255	3.711	2.234	1.907	1.639	1.604	1.587	1.445	1.436	1.400	1.375	1.293	1.279	1.245	1.200	1.094	0.960	0.828
145	4.306	3.797	2.280	1.945	1.672	1.637	1.620	1.486	1.480	1.446	1.420	1.335	1.321	1.286	1.239	1.130	0.991	0.856
150	4.358	3.883	2.326	1.983	1.706	1.670	1.652	1.517	1.511	1.486	1.465	1.378	1.362	1.326	1.278	1.165	1.023	0.884
155	4.409	3.968	2.373	2.021	1.740	1.703	1.685	1.548	1.542	1.517	1.499	1.420	1.404	1.367	1.317	1.201	1.054	0.912
160	4.461	4.054	2.419	2.059	1.773	1.736	1.718	1.578	1.572	1.547	1.529	1.462	1.446	1.407	1.355	1.236	1.086	0.940
165	4.511	4.140	2.492	2.097	1.807	1.769	1.750	1.609	1.603	1.578	1.560	1.496	1.484	1.448	1.394	1.271	1.118	0.968
170	4.557	4.226	2.681	2.135	1.841	1.802	1.783	1.640	1.633	1.608	1.591	1.527	1.515	1.485	1.433	1.307	1.149	0.996
175	4.602	4.312	2.869	2.173	1.874	1.835	1.816	1.670	1.664	1.639	1.622	1.558	1.546	1.516	1.472	1.342	1.181	1.024
180	4.647	4.398	3.057	2.211	1.908	1.868	1.849	1.701	1.695	1.670	1.653	1.589	1.577	1.548	1.504	1.378	1.213	1.052
185	4.693	4.484	3.245	2.248	1.942	1.901	1.881	1.732	1.725	1.700	1.683	1.620	1.608	1.579	1.536	1.413	1.244	1.080
190	4.738	4.529	3.422	2.286	1.975	1.934	1.914	1.762	1.756	1.731	1.714	1.651	1.639	1.610	1.567	1.449	1.276	1.108
195	4.784	4.563	3.515	2.324	2.009	1.967	1.947	1.793	1.786	1.761	1.745	1.682	1.670	1.641	1.598	1.483	1.308	1.136
200	4.829	4.596	3.608	2.362	2.043	2.000	1.979	1.824	1.817	1.792	1.776	1.713	1.701	1.672	1.630	1.515	1.339	1.164
205	4.874	4.630	3.702	2.400	2.076	2.033	2.012	1.854	1.847	1.822	1.807	1.744	1.732	1.704	1.661	1.547	1.371	1.192
210	4.920	4.663	3.795	2.438	2.110	2.066	2.045	1.885	1.878	1.853	1.837	1.774	1.763	1.735	1.693	1.579	1.403	1.220
215	4.965	4.696	3.888	2.517	2.144	2.099	2.077	1.916	1.909	1.883	1.868	1.805	1.794	1.766	1.724	1.610	1.434	1.248
220	5.011	4.730	3.982	2.631	2.177	2.132	2.110	1.946	1.939	1.914	1.899	1.836	1.825	1.797	1.756	1.642	1.466	1.276
225	5.056	4.763	4.075	2.744	2.211	2.165	2.143	1.977	1.970	1.944	1.930	1.867	1.856	1.828	1.787	1.674	1.498	1.304
230	5.101	4.797	4.169	2.858	2.245	2.198	2.175	2.008	2.000	1.975	1.960	1.898	1.887	1.860	1.819	1.706	1.530	1.332
235	5.147	4.830	4.262	2.971	2.278	2.231	2.208	2.038	2.031	2.005	1.991	1.929	1.918	1.891	1.850	1.738	1.562	1.360
240	5.192	4.863	4.355	3.085	2.312	2.265	2.241	2.069	2.062	2.036	2.022	1.960	1.949	1.922	1.881	1.769	1.594	1.387
245	5.238	4.897	4.449	3.198	2.346	2.298	2.274	2.099	2.092	2.066	2.053	1.991	1.980	1.953	1.913	1.801	1.625	1.415
250	5.283	4.930	4.520	3.312	2.379	2.331	2.306	2.130	2.123	2.097	2.084	2.022	2.011	1.984	1.944	1.833	1.657	1.443
255	5.328	4.963	4.558	3.422	2.413	2.364	2.339	2.161	2.153	2.127	2.114	2.053	2.042	2.016	1.976	1.865	1.689	1.471
260	5.374	4.997	4.597	3.512	2.447	2.397	2.372	2.191	2.184	2.158	2.145	2.083	2.073	2.047	2.007	1.897	1.721	1.505
265	5.419	5.030	4.636	3.601	2.520	2.430	2.404	2.222	2.214	2.188	2.176	2.114	2.104	2.078	2.039	1.929	1.753	1.539
270	5.464	5.064	4.674	3.691	2.608	2.476	2.437	2.253	2.245	2.219	2.207	2.145	2.135	2.109	2.070	1.960	1.785	1.573
275	5.510	5.097	4.713	3.781	2.696	2.571	2.498	2.283	2.276	2.249	2.238	2.176	2.166	2.140	2.102	1.992	1.817	1.608
280	5.555	5.130	4.752	3.870	2.784	2.666	2.597	2.314	2.306	2.280	2.268	2.207	2.197	2.172	2.133	2.024	1.849	1.642
285	5.601	5.164	4.790	3.960	2.872	2.761	2.697	2.345	2.337	2.310	2.299	2.238	2.228	2.203	2.164	2.056	1.881	1.676
290	5.646	5.197	4.829	4.050	2.960	2.856	2.796	2.375	2.367	2.341	2.330	2.269	2.259	2.234	2.196	2.088	1.913	1.711
295	5.691	5.231	4.868	4.139	3.048	2.952	2.896	2.406	2.398	2.372	2.361	2.300	2.290	2.265	2.227	2.119	1.945	1.745
300	5.737	5.264	4.907	4.229	3.136	3.047	2.995	2.437	2.429	2.402	2.392	2.331	2.320	2.296	2.259	2.151	1.977	1.779
305	5.782	5.297	4.945	4.319	3.224	3.142	3.095	2.511	2.472	2.433	2.422	2.362	2.351	2.328	2.290	2.183	2.009	1.814
310	5.828	5.331	4.984	4.408	3.312	3.237	3.194	2.661	2.625	2.494	2.453	2.392	2.382	2.359	2.322	2.215	2.041	1.848
315	5.873	5.364	5.023	4.498	3.400	3.332	3.294	2.810	2.778	2.657	2.603	2.423	2.413	2.390	2.353	2.247	2.073	1.882
320	5.918	5.397	5.061	4.549	3.599	3.448	3.393	2.960	2.931	2.821	2.765	2.454	2.444	2.421	2.385	2.279	2.105	1.917
325	5.964	5.431	5.100	4.598	3.812	3.656	3.582	3.109	3.084	2.984	2.928	2.602	2.551	2.452	2.416	2.310	2.137	1.951
330	6.009	5.464	5.139	4.646	4.024	3.864	3.788	3.259	3.237	3.147	3.090	2.756	2.703	2.587	2.447	2.342	2.169	1.985
335	-	5.498	5.177	4.694	4.237	4.071	3.994	3.409	3.390	3.310	3.252	2.911	2.855	2.735	2.560	2.374	2.201	2.019
340	-	5.531	5.216	4.743	4.450	4.279	4.200	3.618	3.593	3.492	3.416	3.065	3.007	2.883	2.704	2.406	2.233	2.054

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 18 I-Section Beams 105 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
30	3.048	2.405	1.167	0.943	0.761	0.738	0.727	0.650	0.647	0.632	0.623	0.564	0.554	0.531	0.433	0.383	0.338	0.338
35	3.323	2.567	1.313	1.057	0.854	0.828	0.817	0.733	0.729	0.714	0.703	0.641	0.630	0.606	0.510	0.451	0.369	0.338
40	3.454	2.729	1.460	1.171	0.947	0.919	0.907	0.816	0.812	0.796	0.784	0.718	0.706	0.680	0.587	0.520	0.427	0.349
45	3.519	2.892	1.716	1.285	1.039	1.010	0.997	0.899	0.895	0.877	0.865	0.795	0.782	0.755	0.664	0.589	0.485	0.399
50	3.583	3.054	1.985	1.398	1.132	1.101	1.087	0.982	0.977	0.959	0.946	0.872	0.858	0.829	0.742	0.657	0.543	0.449
55	3.647	3.216	2.253	1.491	1.225	1.191	1.177	1.065	1.060	1.041	1.027	0.948	0.934	0.904	0.819	0.726	0.601	0.498
60	3.712	3.379	2.482	1.539	1.318	1.282	1.267	1.148	1.143	1.122	1.107	1.025	1.010	0.978	0.896	0.794	0.658	0.548
65	3.776	3.453	2.586	1.587	1.411	1.373	1.357	1.231	1.225	1.204	1.188	1.102	1.086	1.053	0.974	0.863	0.716	0.598
70	3.841	3.507	2.691	1.635	1.488	1.464	1.447	1.314	1.308	1.286	1.269	1.179	1.162	1.127	1.051	0.932	0.774	0.648
75	3.905	3.561	2.795	1.684	1.530	1.511	1.503	1.397	1.391	1.368	1.350	1.256	1.238	1.202	1.128	1.000	0.832	0.698
80	3.970	3.614	2.900	1.732	1.572	1.553	1.544	1.477	1.473	1.449	1.431	1.332	1.314	1.276	1.206	1.069	0.890	0.747
85	4.034	3.668	3.004	1.780	1.614	1.594	1.585	1.515	1.512	1.501	1.492	1.409	1.390	1.351	1.283	1.137	0.948	0.797
90	4.099	3.722	3.109	1.829	1.657	1.636	1.626	1.554	1.551	1.539	1.529	1.480	1.466	1.425	1.360	1.206	1.006	0.847
95	4.163	3.776	3.213	1.877	1.699	1.677	1.667	1.592	1.589	1.577	1.567	1.516	1.507	1.487	1.438	1.275	1.064	0.897
100	4.228	3.829	3.318	1.925	1.741	1.719	1.708	1.630	1.627	1.614	1.605	1.552	1.542	1.522	1.493	1.343	1.122	0.947
105	4.292	3.883	3.419	1.973	1.783	1.760	1.749	1.669	1.665	1.652	1.642	1.588	1.578	1.557	1.527	1.412	1.180	0.997
110	4.357	3.937	3.492	2.022	1.825	1.801	1.790	1.707	1.703	1.690	1.680	1.623	1.613	1.592	1.561	1.477	1.238	1.046
115	4.421	3.991	3.565	2.070	1.867	1.843	1.831	1.745	1.742	1.728	1.717	1.659	1.649	1.627	1.595	1.508	1.296	1.096
120	4.486	4.044	3.638	2.118	1.909	1.884	1.872	1.784	1.780	1.766	1.755	1.695	1.685	1.662	1.629	1.539	1.354	1.146
125	4.617	4.098	3.712	2.166	1.952	1.926	1.913	1.822	1.818	1.803	1.792	1.731	1.720	1.697	1.663	1.570	1.412	1.196
130	4.774	4.152	3.785	2.215	1.994	1.967	1.955	1.860	1.856	1.841	1.830	1.767	1.756	1.732	1.697	1.601	1.470	1.246
135	4.932	4.205	3.858	2.263	2.036	2.009	1.996	1.899	1.894	1.879	1.867	1.802	1.791	1.767	1.731	1.632	1.499	1.295
140	5.089	4.259	3.932	2.311	2.078	2.050	2.037	1.937	1.933	1.917	1.905	1.838	1.827	1.802	1.765	1.663	1.526	1.345
145	5.247	4.313	4.005	2.359	2.120	2.091	2.078	1.975	1.971	1.955	1.942	1.874	1.863	1.837	1.799	1.694	1.552	1.395
150	5.405	4.367	4.078	2.408	2.162	2.133	2.119	2.014	2.009	1.993	1.980	1.910	1.898	1.872	1.834	1.725	1.579	1.445
155	5.562	4.420	4.151	2.456	2.205	2.174	2.160	2.052	2.047	2.030	2.017	1.946	1.934	1.907	1.868	1.756	1.606	1.486
160	5.720	4.474	4.225	2.831	2.247	2.216	2.201	2.090	2.085	2.068	2.055	1.982	1.969	1.942	1.902	1.787	1.632	1.513
165	5.877	4.530	4.298	3.209	2.289	2.257	2.242	2.129	2.124	2.106	2.093	2.017	2.005	1.977	1.936	1.818	1.659	1.541
170	6.035	4.590	4.371	3.470	2.331	2.299	2.283	2.167	2.162	2.144	2.130	2.053	2.041	2.012	1.970	1.849	1.685	1.568
175	-	4.650	4.445	3.597	2.373	2.340	2.324	2.205	2.200	2.182	2.168	2.089	2.076	2.047	2.004	1.880	1.712	1.596
180	-	4.710	4.511	3.725	2.415	2.382	2.365	2.244	2.238	2.220	2.205	2.125	2.112	2.082	2.038	1.911	1.739	1.623
185	-	4.769	4.548	3.853	2.463	2.423	2.406	2.282	2.276	2.257	2.243	2.161	2.147	2.117	2.072	1.942	1.765	1.651
190	-	4.829	4.585	3.981	2.667	2.495	2.447	2.320	2.314	2.295	2.280	2.196	2.183	2.152	2.106	1.973	1.792	1.678
195	-	4.889	4.622	4.109	2.871	2.684	2.597	2.359	2.353	2.333	2.318	2.232	2.219	2.188	2.140	2.003	1.819	1.706
200	-	4.948	4.659	4.237	3.075	2.874	2.778	2.397	2.391	2.371	2.355	2.268	2.254	2.223	2.174	2.034	1.845	1.733
205	-	5.008	4.696	4.365	3.279	3.063	2.959	2.435	2.429	2.409	2.393	2.304	2.290	2.258	2.209	2.065	1.872	1.761
210	-	5.068	4.733	4.493	3.446	3.253	3.140	2.517	2.494	2.446	2.430	2.340	2.325	2.293	2.243	2.096	1.898	1.789
215	-	5.127	4.770	4.539	3.545	3.426	3.320	2.649	2.625	2.548	2.494	2.376	2.361	2.328	2.277	2.127	1.925	1.816
220	-	5.187	4.807	4.578	3.645	3.522	3.457	2.781	2.755	2.671	2.612	2.411	2.397	2.363	2.311	2.158	1.952	1.844
225	-	5.247	4.844	4.617	3.745	3.617	3.551	2.913	2.886	2.795	2.730	2.447	2.432	2.398	2.345	2.189	1.978	1.871
230	-	5.306	4.881	4.655	3.845	3.712	3.645	3.044	3.017	2.918	2.848	2.524	2.485	2.433	2.379	2.220	2.005	1.899
235	-	5.366	4.918	4.694	3.945	3.807	3.738	3.176	3.147	3.041	2.966	2.614	2.570	2.482	2.413	2.251	2.031	1.926
240	-	5.426	4.955	4.732	4.045	3.903	3.832	3.308	3.278	3.164	3.084	2.704	2.655	2.558	2.447	2.282	2.058	1.954
245	-	5.485	4.993	4.771	4.145	3.998	3.926	3.430	3.408	3.287	3.203	2.794	2.740	2.634	2.508	2.313	2.085	1.981
250	-	5.545	5.030	4.810	4.245	4.093	4.019	3.516	3.496	3.410	3.321	2.884	2.825	2.710	2.579	2.344	2.111	2.009
255	-	5.605	5.067	4.848	4.345	4.188	4.113	3.603	3.584	3.502	3.433	2.974	2.910	2.785	2.649	2.375	2.138	2.036
260	-	5.665	5.104	4.887	4.445	4.284	4.207	3.690	3.672	3.594	3.528	3.064	2.996	2.861	2.720	2.406	2.165	2.064
265	-	5.724	5.141	4.926	4.522	4.379	4.301	3.777	3.759	3.686	3.623	3.154	3.081	2.937	2.791	2.437	2.191	2.091
270	-	5.784	5.178	4.964	4.567	4.474	4.394	3.863	3.847	3.778	3.718	3.244	3.166	3.013	2.861	2.487	2.218	2.119
275	-	5.844	5.215	5.003	4.612	4.536	4.488	3.950	3.935	3.870	3.814	3.334	3.251	3.089	2.932	2.571	2.244	2.146
280	-	5.903	5.252	5.042	4.656	4.581	4.543	4.037	4.022	3.961	3.909	3.430	3.336	3.165	3.002	2.654	2.271	2.174
285	-	5.963	5.289	5.080	4.701	4.627	4.589	4.123	4.110	4.053	4.004	3.563	3.430	3.241	3.073	2.737	2.298	2.201
290	-	6.023	5.326	5.119	4.745	4.673	4.636	4.210	4.198	4.145	4.099	3.696	3.574	3.317	3.143	2.821	2.324	2.229
295	-	-	5.363	5.158	4.790	4.719	4.683	4.297	4.285	4.237	4.194	3.828	3.719	3.393	3.214	2.904	2.351	2.256
300	-	-	5.400	5.196	4.835	4.765	4.729	4.384	4.373	4.329	4.289	3.961	3.864	3.553	3.284	2.987	2.377	2.284
305	-	-	5.437	5.235	4.879	4.811	4.776	4.470	4.461	4.421	4.384	4.093	4.009	3.737	3.355	3.071	2.404	2.311
310	-	-	5.474	5.273	4.924	4.857	4.823	4.536	4.530	4.509	4.479	4.226	4.154	3.922	3.462	3.154	2.431	2.339
315	-	-	5.511	5.312	4.968	4.903	4.869	4.588	4.582	4.561	4.542	4.358	4.299	4.106	3.703	3.237	2.462	2.366
320	-	-	5.548	5.351	5.013	4.949	4.916	4.640	4.635	4.612	4.594	4.491	4.444	4.290	3.943	3.321	2.587	2.394
325	-	-	5.585	5.389	5.058	4.995	4.963	4.692	4.687	4.664	4.646	4.550	4.533	4.475	4.184	3.404	2.713	2.421
330	-	-	5.622	5.428	5.102	5.041	5.009	4.744	4.739	4.716	4.697	4.600	4.584	4.546	4.424	3.622	2.838	2.449
335	-	-	5.659	5.467	5.147	5.087	5.056	4.796	4.791	4.768	4.749	4.651	4.634	4.596	4.537	3.851	2.963	2.539
340	-	-	5.696	5.505	5.191	5.133	5.103	4.849	4.843	4.820	4.801	4.701	4.684	4.646	4.586	4.080	3.088	2.651

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

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SHERWIN WILLIAMS

Table 19 I-Section Beams 120 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
30	3.473	2.894	1.328	1.187	0.988	0.962	0.952	0.870	0.866	0.852	0.841	0.780	0.769	0.745	0.710	0.609	0.406	0.338
35	3.570	3.137	2.542	1.342	1.119	1.091	1.079	0.990	0.986	0.970	0.959	0.893	0.881	0.856	0.818	0.712	0.505	0.400
40	3.667	3.381	2.709	1.516	1.250	1.219	1.207	1.109	1.105	1.089	1.076	1.007	0.993	0.966	0.926	0.814	0.603	0.486
45	3.764	3.468	2.877	1.807	1.380	1.348	1.335	1.229	1.225	1.207	1.194	1.120	1.105	1.077	1.035	0.916	0.702	0.572
50	3.861	3.534	3.044	2.097	1.498	1.476	1.462	1.349	1.344	1.326	1.311	1.233	1.217	1.188	1.143	1.018	0.800	0.659
55	3.958	3.599	3.212	2.387	1.580	1.546	1.533	1.469	1.464	1.445	1.429	1.346	1.330	1.298	1.251	1.120	0.899	0.745
60	4.055	3.665	3.379	2.554	1.662	1.615	1.597	1.520	1.518	1.510	1.504	1.459	1.442	1.409	1.359	1.223	0.997	0.831
65	4.152	3.731	3.456	2.682	1.745	1.685	1.661	1.568	1.566	1.557	1.550	1.514	1.507	1.493	1.467	1.325	1.095	0.917
70	4.249	3.797	3.512	2.810	1.827	1.755	1.726	1.616	1.613	1.604	1.597	1.559	1.552	1.538	1.516	1.427	1.194	1.003
75	4.345	3.862	3.568	2.938	1.909	1.824	1.790	1.664	1.661	1.652	1.644	1.605	1.597	1.583	1.561	1.498	1.292	1.089
80	4.442	3.928	3.625	3.066	1.991	1.894	1.854	1.711	1.709	1.699	1.691	1.650	1.643	1.628	1.605	1.541	1.391	1.175
85	4.580	3.994	3.681	3.193	2.073	1.964	1.919	1.759	1.756	1.746	1.738	1.696	1.688	1.673	1.649	1.584	1.481	1.261
90	4.789	4.060	3.737	3.321	2.156	2.033	1.983	1.807	1.804	1.793	1.785	1.741	1.733	1.717	1.694	1.626	1.521	1.348
95	4.998	4.125	3.793	3.431	2.238	2.103	2.047	1.855	1.851	1.840	1.832	1.786	1.779	1.762	1.738	1.669	1.561	1.434
100	5.207	4.191	3.850	3.500	2.320	2.173	2.112	1.902	1.899	1.887	1.879	1.832	1.824	1.807	1.783	1.712	1.601	1.494
105	5.417	4.257	3.906	3.569	2.402	2.242	2.176	1.950	1.946	1.935	1.926	1.877	1.869	1.852	1.827	1.755	1.642	1.532
110	5.626	4.322	3.962	3.638	2.499	2.312	2.240	1.998	1.994	1.982	1.973	1.923	1.914	1.897	1.871	1.798	1.682	1.569
115	5.835	4.388	4.018	3.707	2.622	2.382	2.304	2.046	2.042	2.029	2.019	1.968	1.960	1.942	1.916	1.841	1.722	1.606
120	-	4.454	4.075	3.775	2.746	2.452	2.369	2.094	2.089	2.076	2.066	2.014	2.005	1.987	1.960	1.884	1.762	1.643
125	-	4.529	4.131	3.844	2.869	2.590	2.433	2.141	2.137	2.123	2.113	2.059	2.050	2.032	2.005	1.927	1.802	1.681
130	-	4.633	4.187	3.913	2.993	2.733	2.562	2.189	2.184	2.171	2.160	2.104	2.096	2.077	2.049	1.970	1.843	1.718
135	-	4.737	4.243	3.982	3.116	2.877	2.727	2.237	2.232	2.218	2.207	2.150	2.141	2.122	2.094	2.012	1.883	1.755
140	-	4.841	4.300	4.051	3.240	3.020	2.892	2.285	2.279	2.265	2.254	2.195	2.186	2.166	2.138	2.055	1.923	1.793
145	-	4.945	4.356	4.120	3.363	3.163	3.057	2.332	2.327	2.312	2.301	2.241	2.232	2.211	2.182	2.098	1.963	1.830
150	-	5.049	4.412	4.188	3.493	3.307	3.222	2.380	2.375	2.359	2.348	2.286	2.277	2.256	2.227	2.141	2.003	1.867
155	-	5.153	4.469	4.257	3.626	3.451	3.387	2.428	2.422	2.406	2.395	2.332	2.322	2.301	2.271	2.184	2.044	1.904
160	-	5.257	4.536	4.326	3.760	3.598	3.536	2.617	2.569	2.454	2.442	2.377	2.367	2.346	2.316	2.227	2.084	1.942
165	-	5.362	4.624	4.395	3.894	3.745	3.682	3.010	2.961	2.802	2.695	2.422	2.413	2.391	2.360	2.270	2.124	1.979
170	-	5.466	4.712	4.464	4.028	3.893	3.829	3.403	3.353	3.167	3.042	2.522	2.466	2.436	2.405	2.313	2.164	2.016
175	-	5.570	4.799	4.521	4.162	4.040	3.975	3.536	3.519	3.451	3.388	2.774	2.704	2.574	2.449	2.356	2.204	2.053
180	-	5.674	4.887	4.564	4.295	4.187	4.122	3.664	3.646	3.575	3.524	3.026	2.942	2.786	2.611	2.398	2.245	2.091
185	-	5.778	4.975	4.606	4.429	4.334	4.268	3.792	3.774	3.698	3.645	3.278	3.181	2.999	2.796	2.441	2.285	2.128
190	-	5.882	5.062	4.648	4.521	4.481	4.414	3.920	3.901	3.822	3.767	3.463	3.414	3.212	2.981	2.536	2.325	2.165
195	-	5.986	5.150	4.690	4.561	4.537	4.519	4.048	4.029	3.945	3.888	3.573	3.523	3.417	3.166	2.657	2.365	2.203
200	-	-	5.237	4.732	4.600	4.577	4.559	4.176	4.156	4.068	4.010	3.684	3.632	3.521	3.351	2.778	2.405	2.240
205	-	-	5.325	4.774	4.640	4.616	4.598	4.305	4.284	4.192	4.131	3.794	3.741	3.624	3.475	2.899	2.445	2.277
210	-	-	5.413	4.816	4.679	4.656	4.638	4.433	4.411	4.315	4.253	3.905	3.850	3.727	3.570	3.020	2.496	2.314
215	-	-	5.500	4.858	4.719	4.695	4.678	4.522	4.515	4.439	4.374	4.015	3.959	3.831	3.666	3.141	2.550	2.352
220	-	-	5.588	4.900	4.758	4.734	4.717	4.563	4.557	4.524	4.496	4.126	4.068	3.934	3.762	3.262	2.604	2.389
225	-	-	5.676	4.942	4.798	4.774	4.757	4.604	4.598	4.565	4.543	4.236	4.177	4.037	3.857	3.383	2.658	2.426
230	-	-	5.763	4.984	4.837	4.813	4.796	4.646	4.639	4.607	4.585	4.347	4.286	4.141	3.953	3.471	2.712	2.466
235	-	-	5.851	5.026	4.877	4.853	4.836	4.687	4.680	4.648	4.627	4.457	4.396	4.244	4.048	3.549	2.766	2.519
240	-	-	5.939	5.068	4.916	4.892	4.875	4.728	4.721	4.690	4.668	4.529	4.504	4.347	4.144	3.628	2.820	2.572
245	-	-	6.026	5.110	4.956	4.931	4.915	4.769	4.762	4.732	4.710	4.573	4.548	4.451	4.240	3.706	2.874	2.624
250	-	-	-	5.152	4.995	4.971	4.955	4.810	4.804	4.773	4.752	4.616	4.592	4.526	4.335	3.784	2.928	2.677
255	-	-	-	5.195	5.035	5.010	4.994	4.851	4.845	4.815	4.794	4.660	4.636	4.570	4.431	3.863	2.982	2.729
260	-	-	-	5.237	5.074	5.050	5.034	4.892	4.886	4.857	4.836	4.703	4.679	4.615	4.515	3.941	3.036	2.782
265	-	-	-	5.279	5.114	5.089	5.073	4.934	4.927	4.898	4.878	4.747	4.723	4.660	4.561	4.019	3.090	2.834
270	-	-	-	5.321	5.153	5.129	5.113	4.975	4.968	4.940	4.920	4.790	4.767	4.705	4.607	4.098	3.144	2.887
275	-	-	-	5.363	5.193	5.168	5.152	5.016	5.010	4.981	4.961	4.834	4.811	4.749	4.653	4.176	3.198	2.939
280	-	-	-	5.405	5.232	5.207	5.192	5.057	5.051	5.023	5.003	4.877	4.854	4.794	4.699	4.254	3.252	2.992
285	-	-	-	5.447	5.272	5.247	5.232	5.098	5.092	5.065	5.045	4.921	4.898	4.839	4.745	4.333	3.306	3.044
290	-	-	-	5.489	5.311	5.286	5.271	5.139	5.133	5.106	5.087	4.964	4.942	4.883	4.791	4.411	3.360	3.097
295	-	-	-	5.531	5.351	5.326	5.311	5.180	5.174	5.148	5.129	5.008	4.986	4.928	4.837	4.489	3.421	3.149
300	-	-	-	5.573	5.390	5.365	5.350	5.222	5.216	5.189	5.171	5.052	5.030	4.973	4.883	4.546	3.582	3.202
305	-	-	-	5.615	5.430	5.404	5.390	5.263	5.257	5.231	5.213	5.095	5.073	5.017	4.929	4.598	3.744	3.254
310	-	-	-	5.657	5.470	5.444	5.429	5.304	5.298	5.273	5.254	5.139	5.117	5.062	4.975	4.650	3.905	3.307
315	-	-	-	5.699	5.509	5.483	5.469	5.345	5.339	5.314	5.296	5.182	5.161	5.107	5.021	4.702	4.067	3.359
320	-	-	-	5.741	5.549	5.523	5.509	5.386	5.380	5.356	5.338	5.226	5.205	5.152	5.067	4.754	4.228	3.431
325	-	-	-	5.783	5.588	5.562	5.548	5.427	5.422	5.397	5.380	5.269	5.249	5.196	5.113	4.806	4.390	4.003
330	-	-	-	5.826	5.628	5.602	5.588	5.468	5.463	5.439	5.422	5.313	5.292	5.241	5.159	4.858	4.575	4.575
335	-	-	-	5.868	5.667	5.641	5.627	5.509	5.504	5.481	5.464	5.356	5.336	5.286	5.205	5.146	5.146	5.146
340	-	-	-	5.910	5.718	5.718	5.718	5.718	5.718	5.718	5.718	5.718	5.718	5.718	5.718	5.718	5.718	5.718

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

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SHERWIN WILLIAMS

Table 20 Rectangular Hollow Columns 15 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
65	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
70	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
75	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
80	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
85	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
90	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
95	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
100	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
105	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
110	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
115	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
120	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
125	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
130	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
135	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
140	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
145	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
150	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
155	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
160	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
165	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
170	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
175	0.330	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
180	0.349	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
185	0.368	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
190	0.387	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
195	0.406	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
200	0.425	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
205	0.444	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
210	0.463	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
215	0.483	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
220	0.502	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
225	0.521	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
230	0.540	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
235	0.559	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
240	0.578	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
245	0.597	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
250	0.616	0.325	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
255	0.636	0.342	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
260	0.655	0.358	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
265	0.674	0.375	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
270	0.693	0.391	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
275	0.712	0.408	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
280	0.731	0.424	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
285	0.750	0.441	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
290	0.769	0.457	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
295	0.789	0.474	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
300	0.808	0.491	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
305	0.827	0.507	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
310	0.846	0.524	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
315	0.865	0.540	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
320	0.884	0.557	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
325	0.903	0.573	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
330	0.922	0.590	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
335	0.942	0.606	0.333	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
340	0.961	0.623	0.348	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
345	0.980	0.639	0.363	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
350	0.999	0.656	0.378	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
355	1.018	0.672	0.393	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
360	1.037	0.689	0.408	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
365	1.056	0.705	0.423	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
370	1.075	0.722	0.438	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
375	1.095	0.739	0.453	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
380	1.114	0.755	0.468	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
385	1.133	0.772	0.483	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
390	1.152	0.788	0.498	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
395	1.171	0.805	0.513	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
400	1.190	0.821	0.528	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.992mm.

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Table 21 Rectangular Hollow Columns 20 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
65	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
70	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
75	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
80	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
85	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
90	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
95	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
100	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
105	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
110	0.323	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
115	0.347	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
120	0.372	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
125	0.397	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
130	0.421	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
135	0.446	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
140	0.470	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
145	0.495	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
150	0.519	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
155	0.544	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
160	0.569	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
165	0.593	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
170	0.618	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
175	0.642	0.337	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
180	0.667	0.359	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
185	0.691	0.381	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
190	0.716	0.403	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
195	0.741	0.425	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
200	0.765	0.447	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
205	0.790	0.469	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
210	0.814	0.491	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
215	0.839	0.513	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
220	0.863	0.535	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
225	0.888	0.557	0.324	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
230	0.913	0.579	0.344	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
235	0.937	0.601	0.364	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
240	0.962	0.623	0.384	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
245	0.986	0.645	0.404	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
250	1.011	0.667	0.424	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
255	1.035	0.689	0.444	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
260	1.060	0.711	0.464	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
265	1.085	0.733	0.484	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
270	1.109	0.755	0.504	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
275	1.134	0.777	0.524	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
280	1.158	0.799	0.544	0.328	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
285	1.183	0.821	0.564	0.346	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
290	1.207	0.843	0.584	0.364	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
295	1.232	0.865	0.604	0.381	0.329	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
300	1.257	0.887	0.624	0.399	0.346	0.333	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
305	1.281	0.909	0.644	0.417	0.364	0.350	0.328	0.324	0.320	0.320	0.320	0.320	0.320	0.320
310	1.306	0.931	0.664	0.435	0.381	0.367	0.345	0.341	0.320	0.320	0.320	0.320	0.320	0.320
315	1.330	0.953	0.684	0.453	0.398	0.384	0.362	0.358	0.320	0.320	0.320	0.320	0.320	0.320
320	1.355	0.975	0.704	0.471	0.416	0.401	0.379	0.375	0.320	0.320	0.320	0.320	0.320	0.320
325	1.379	0.997	0.724	0.489	0.433	0.419	0.396	0.392	0.320	0.320	0.320	0.320	0.320	0.320
330	1.404	1.019	0.744	0.506	0.450	0.436	0.413	0.409	0.320	0.320	0.320	0.320	0.320	0.320
335	1.429	1.041	0.764	0.524	0.468	0.453	0.430	0.426	0.320	0.320	0.320	0.320	0.320	0.320
340	1.453	1.063	0.784	0.542	0.485	0.470	0.447	0.443	0.322	0.320	0.320	0.320	0.320	0.320
345	1.478	1.085	0.804	0.560	0.502	0.487	0.464	0.459	0.338	0.322	0.320	0.320	0.320	0.320
350	1.502	1.107	0.824	0.578	0.520	0.505	0.481	0.476	0.354	0.338	0.320	0.320	0.320	0.320
355	1.527	1.129	0.844	0.596	0.537	0.522	0.498	0.493	0.370	0.353	0.320	0.320	0.320	0.320
360	1.551	1.151	0.864	0.613	0.555	0.539	0.515	0.510	0.385	0.369	0.320	0.320	0.320	0.320
365	1.576	1.173	0.884	0.631	0.572	0.556	0.532	0.527	0.401	0.385	0.320	0.320	0.320	0.320
370	1.601	1.195	0.904	0.649	0.589	0.573	0.549	0.544	0.417	0.400	0.320	0.320	0.320	0.320
375	1.625	1.217	0.923	0.667	0.607	0.591	0.566	0.561	0.433	0.416	0.320	0.320	0.320	0.320
380	1.650	1.239	0.943	0.685	0.624	0.608	0.583	0.578	0.449	0.431	0.320	0.320	0.320	0.320
385	1.674	1.261	0.963	0.703	0.641	0.625	0.600	0.595	0.464	0.447	0.320	0.320	0.320	0.320
390	1.699	1.283	0.983	0.721	0.659	0.642	0.617	0.612	0.480	0.463	0.320	0.320	0.320	0.320
395	1.723	1.305	1.003	0.738	0.676	0.659	0.633	0.629	0.496	0.478	0.320	0.320	0.320	0.320
400	1.748	1.327	1.023	0.756	0.693	0.677	0.650	0.646	0.512	0.494	0.320	0.320	0.320	0.320

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.992mm.

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Table 22 Rectangular Hollow Columns 30 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
65	0.355	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
70	0.401	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
75	0.446	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
80	0.491	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
85	0.536	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
90	0.581	0.347	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
95	0.626	0.378	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
100	0.672	0.409	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
105	0.717	0.441	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
110	0.762	0.472	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
115	0.807	0.503	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
120	0.852	0.534	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
125	0.897	0.565	0.332	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
130	0.943	0.596	0.360	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
135	0.988	0.627	0.389	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
140	1.033	0.658	0.418	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
145	1.078	0.690	0.447	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
150	1.123	0.721	0.476	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
155	1.168	0.752	0.505	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
160	1.213	0.783	0.533	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
165	1.259	0.814	0.562	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
170	1.304	0.845	0.591	0.343	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
175	1.349	0.876	0.620	0.371	0.331	0.321	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
180	1.394	0.907	0.649	0.398	0.357	0.347	0.332	0.329	0.320	0.320	0.320	0.320	0.320	0.320
185	1.439	0.938	0.678	0.425	0.384	0.374	0.358	0.355	0.320	0.320	0.320	0.320	0.320	0.320
190	1.484	0.970	0.706	0.453	0.411	0.400	0.384	0.381	0.320	0.320	0.320	0.320	0.320	0.320
195	1.530	1.001	0.735	0.480	0.438	0.427	0.411	0.408	0.326	0.320	0.320	0.320	0.320	0.320
200	1.575	1.032	0.764	0.508	0.464	0.453	0.437	0.434	0.350	0.340	0.320	0.320	0.320	0.320
205	1.620	1.063	0.793	0.535	0.491	0.480	0.463	0.460	0.375	0.364	0.320	0.320	0.320	0.320
210	1.665	1.094	0.822	0.563	0.518	0.506	0.489	0.486	0.399	0.389	0.320	0.320	0.320	0.320
215	1.710	1.125	0.851	0.590	0.545	0.533	0.515	0.512	0.424	0.413	0.320	0.320	0.320	0.320
220	1.755	1.156	0.880	0.618	0.571	0.560	0.542	0.538	0.448	0.438	0.320	0.320	0.320	0.320
225	1.801	1.187	0.908	0.645	0.598	0.586	0.568	0.564	0.473	0.462	0.320	0.320	0.320	0.320
230	1.846	1.219	0.937	0.672	0.625	0.613	0.594	0.591	0.498	0.486	0.320	0.320	0.320	0.320
235	1.891	1.250	0.966	0.700	0.652	0.639	0.620	0.617	0.522	0.511	0.335	0.320	0.320	0.320
240	1.936	1.281	0.995	0.727	0.678	0.666	0.646	0.643	0.547	0.535	0.356	0.320	0.320	0.320
245	1.991	1.312	1.024	0.755	0.705	0.692	0.673	0.669	0.571	0.559	0.377	0.320	0.320	0.320
250	2.049	1.343	1.053	0.782	0.732	0.719	0.699	0.695	0.596	0.584	0.399	0.320	0.320	0.320
255	2.106	1.374	1.081	0.810	0.759	0.745	0.725	0.721	0.620	0.608	0.420	0.320	0.320	0.320
260	2.164	1.405	1.110	0.837	0.785	0.772	0.751	0.747	0.645	0.633	0.441	0.320	0.320	0.320
265	2.221	1.436	1.139	0.864	0.812	0.798	0.777	0.774	0.670	0.657	0.462	0.320	0.320	0.320
270	2.279	1.468	1.168	0.892	0.839	0.825	0.804	0.800	0.694	0.681	0.483	0.320	0.320	0.320
275	2.337	1.499	1.197	0.919	0.866	0.852	0.830	0.826	0.719	0.706	0.505	0.320	0.320	0.320
280	2.394	1.530	1.226	0.947	0.892	0.878	0.856	0.852	0.743	0.730	0.526	0.320	0.320	0.320
285	2.452	1.561	1.254	0.974	0.919	0.905	0.882	0.878	0.768	0.754	0.547	0.338	0.320	0.320
290	2.509	1.592	1.283	1.002	0.946	0.931	0.908	0.904	0.792	0.779	0.568	0.356	0.320	0.320
295	2.567	1.623	1.312	1.029	0.972	0.958	0.935	0.930	0.817	0.803	0.590	0.374	0.320	0.320
300	2.624	1.654	1.341	1.056	0.999	0.984	0.961	0.957	0.841	0.828	0.611	0.393	0.320	0.320
305	2.682	1.685	1.370	1.084	1.026	1.011	0.987	0.983	0.866	0.852	0.632	0.411	0.320	0.320
310	2.739	1.717	1.399	1.111	1.053	1.037	1.013	1.009	0.891	0.876	0.653	0.429	0.320	0.320
315	2.797	1.748	1.427	1.139	1.079	1.064	1.040	1.035	0.915	0.901	0.674	0.448	0.320	0.320
320	2.855	1.779	1.456	1.166	1.106	1.091	1.066	1.061	0.940	0.925	0.696	0.466	0.320	0.320
325	2.912	1.810	1.485	1.194	1.133	1.117	1.092	1.087	0.964	0.949	0.717	0.484	0.320	0.320
330	2.970	1.841	1.514	1.221	1.160	1.144	1.118	1.113	0.989	0.974	0.738	0.502	0.320	0.320
335	3.027	1.872	1.543	1.249	1.186	1.170	1.144	1.140	1.013	0.998	0.759	0.521	0.320	0.320
340	3.085	1.903	1.572	1.276	1.213	1.197	1.171	1.166	1.038	1.023	0.781	0.539	0.320	0.320
345	3.142	1.934	1.601	1.303	1.240	1.223	1.197	1.192	1.063	1.047	0.802	0.557	0.320	0.320
350	3.200	2.000	1.629	1.331	1.267	1.250	1.223	1.218	1.087	1.071	0.823	0.576	0.320	0.320
355	3.257	2.084	1.658	1.358	1.293	1.276	1.249	1.244	1.112	1.096	0.844	0.594	0.325	0.320
360	3.315	2.168	1.687	1.386	1.320	1.303	1.275	1.270	1.136	1.120	0.865	0.612	0.340	0.320
365	3.373	2.253	1.716	1.413	1.347	1.329	1.302	1.296	1.161	1.144	0.887	0.631	0.356	0.320
370	3.430	2.337	1.745	1.441	1.374	1.356	1.328	1.323	1.185	1.169	0.908	0.649	0.371	0.320
375	3.488	2.421	1.774	1.468	1.400	1.383	1.354	1.349	1.210	1.193	0.929	0.667	0.386	0.320
380	3.545	2.505	1.802	1.495	1.427	1.409	1.380	1.375	1.235	1.217	0.950	0.685	0.401	0.320
385	3.603	2.589	1.831	1.523	1.454	1.436	1.406	1.401	1.259	1.242	0.972	0.704	0.417	0.320
390	3.660	2.673	1.860	1.550	1.481	1.462	1.433	1.427	1.284	1.266	0.993	0.722	0.432	0.320
395	3.718	2.757	1.889	1.578	1.507	1.489	1.459	1.453	1.308	1.291	1.014	0.740	0.447	0.320
400	3.775	2.841	1.918	1.605	1.534	1.515	1.485	1.479	1.333	1.315	1.035	0.759	0.462	0.320

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.992mm.

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Table 23 Rectangular Hollow Columns 45 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
65	1.023	0.662	0.349	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
70	1.108	0.727	0.405	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
75	1.194	0.792	0.461	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
80	1.279	0.857	0.517	0.328	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
85	1.364	0.922	0.574	0.374	0.332	0.322	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
90	1.450	0.987	0.630	0.420	0.376	0.365	0.348	0.345	0.320	0.320	0.320	0.320	0.320	0.320
95	1.535	1.052	0.686	0.466	0.419	0.408	0.390	0.387	0.320	0.320	0.320	0.320	0.320	0.320
100	1.620	1.117	0.743	0.512	0.463	0.451	0.433	0.429	0.336	0.327	0.320	0.320	0.320	0.320
105	1.705	1.181	0.799	0.557	0.507	0.495	0.475	0.471	0.374	0.364	0.320	0.320	0.320	0.320
110	1.791	1.246	0.855	0.603	0.551	0.538	0.517	0.513	0.412	0.401	0.320	0.320	0.320	0.320
115	1.876	1.311	0.912	0.649	0.595	0.581	0.559	0.556	0.450	0.438	0.320	0.320	0.320	0.320
120	1.960	1.376	0.968	0.695	0.638	0.624	0.602	0.598	0.487	0.475	0.320	0.320	0.320	0.320
125	2.039	1.441	1.024	0.741	0.682	0.667	0.644	0.640	0.525	0.512	0.335	0.320	0.320	0.320
130	2.118	1.506	1.081	0.787	0.726	0.710	0.686	0.682	0.563	0.550	0.367	0.320	0.320	0.320
135	2.198	1.571	1.137	0.833	0.770	0.754	0.728	0.724	0.600	0.587	0.398	0.320	0.320	0.320
140	2.277	1.636	1.193	0.879	0.814	0.797	0.771	0.766	0.638	0.624	0.430	0.320	0.320	0.320
145	2.356	1.701	1.249	0.925	0.857	0.840	0.813	0.808	0.676	0.661	0.462	0.320	0.320	0.320
150	2.435	1.766	1.306	0.971	0.901	0.883	0.855	0.850	0.713	0.698	0.493	0.320	0.320	0.320
155	2.514	1.831	1.362	1.017	0.945	0.926	0.897	0.892	0.751	0.735	0.525	0.343	0.320	0.320
160	2.593	1.895	1.418	1.063	0.989	0.970	0.939	0.934	0.789	0.772	0.557	0.372	0.320	0.320
165	2.672	1.964	1.475	1.109	1.033	1.013	0.982	0.976	0.827	0.810	0.589	0.401	0.320	0.320
170	2.751	2.044	1.531	1.155	1.076	1.056	1.024	1.018	0.864	0.847	0.620	0.431	0.320	0.320
175	2.830	2.125	1.587	1.201	1.120	1.099	1.066	1.060	0.902	0.884	0.652	0.460	0.326	0.320
180	2.909	2.205	1.644	1.247	1.164	1.142	1.108	1.102	0.940	0.921	0.684	0.489	0.352	0.320
185	2.988	2.285	1.700	1.293	1.208	1.186	1.151	1.144	0.977	0.958	0.715	0.518	0.378	0.320
190	3.067	2.365	1.756	1.339	1.252	1.229	1.193	1.186	1.015	0.995	0.747	0.548	0.404	0.320
195	3.147	2.446	1.812	1.385	1.295	1.272	1.235	1.228	1.053	1.032	0.779	0.577	0.430	0.320
200	3.226	2.526	1.869	1.430	1.339	1.315	1.277	1.270	1.090	1.070	0.811	0.606	0.455	0.320
205	3.305	2.606	1.925	1.476	1.383	1.358	1.319	1.313	1.128	1.107	0.842	0.636	0.481	0.320
210	3.384	2.686	1.998	1.522	1.427	1.401	1.362	1.355	1.166	1.144	0.874	0.665	0.507	0.320
215	3.463	2.767	2.081	1.568	1.471	1.445	1.404	1.397	1.204	1.181	0.906	0.694	0.533	0.320
220	3.542	2.847	2.163	1.614	1.514	1.488	1.446	1.439	1.241	1.218	0.937	0.723	0.559	0.326
225	3.621	2.927	2.245	1.660	1.558	1.531	1.488	1.481	1.279	1.255	0.969	0.753	0.584	0.347
230	3.700	3.007	2.328	1.706	1.602	1.574	1.531	1.523	1.317	1.292	1.001	0.782	0.610	0.368
235	3.779	3.088	2.410	1.752	1.646	1.617	1.573	1.565	1.354	1.330	1.033	0.811	0.636	0.389
240	3.858	3.168	2.492	1.798	1.690	1.661	1.615	1.607	1.392	1.367	1.064	0.840	0.662	0.410
245	3.938	3.248	2.575	1.844	1.733	1.704	1.657	1.649	1.430	1.404	1.096	0.870	0.688	0.430
250	4.030	3.329	2.657	1.890	1.777	1.747	1.699	1.691	1.467	1.441	1.128	0.899	0.713	0.451
255	4.123	3.409	2.739	1.936	1.821	1.790	1.742	1.733	1.505	1.478	1.160	0.928	0.739	0.472
260	4.216	3.489	2.822	2.023	1.865	1.833	1.784	1.775	1.543	1.515	1.191	0.958	0.765	0.493
265	4.308	3.569	2.904	2.120	1.909	1.876	1.826	1.817	1.581	1.552	1.223	0.987	0.791	0.514
270	4.401	3.650	2.986	2.217	1.962	1.920	1.868	1.859	1.618	1.590	1.255	1.016	0.817	0.535
275	4.493	3.730	3.069	2.315	2.067	1.989	1.911	1.901	1.656	1.627	1.286	1.045	0.842	0.556
280	4.586	3.810	3.151	2.412	2.171	2.096	1.965	1.943	1.694	1.664	1.318	1.075	0.868	0.576
285	4.678	3.890	3.233	2.509	2.276	2.202	2.076	2.052	1.731	1.701	1.350	1.104	0.894	0.597
290	4.771	3.979	3.316	2.607	2.380	2.309	2.186	2.163	1.769	1.738	1.382	1.133	0.920	0.618
295	4.863	4.079	3.398	2.704	2.484	2.415	2.296	2.274	1.807	1.775	1.413	1.163	0.946	0.639
300	4.956	4.178	3.480	2.801	2.589	2.522	2.407	2.385	1.844	1.812	1.445	1.192	0.971	0.660
305	5.048	4.277	3.563	2.898	2.693	2.628	2.517	2.496	1.882	1.850	1.477	1.221	0.997	0.681
310	5.141	4.377	3.645	2.996	2.797	2.735	2.627	2.607	1.920	1.887	1.508	1.250	1.023	0.701
315	5.233	4.476	3.727	3.093	2.902	2.842	2.737	2.717	1.991	1.924	1.540	1.280	1.049	0.722
320	5.326	4.575	3.810	3.190	3.006	2.948	2.848	2.828	2.131	2.007	1.572	1.309	1.075	0.743
325	5.418	4.675	3.892	3.287	3.111	3.055	2.958	2.939	2.271	2.151	1.604	1.338	1.100	0.764
330	5.511	4.774	3.987	3.385	3.215	3.161	3.068	3.050	2.411	2.295	1.635	1.368	1.126	0.785
335	5.603	4.873	4.096	3.482	3.319	3.268	3.178	3.161	2.550	2.439	1.667	1.397	1.152	0.806
340	5.696	4.973	4.205	3.579	3.424	3.375	3.289	3.272	2.690	2.584	1.699	1.426	1.178	0.826
345	5.788	5.072	4.313	3.676	3.528	3.481	3.399	3.383	2.830	2.728	1.730	1.455	1.204	0.847
350	5.881	5.171	4.422	3.774	3.632	3.588	3.509	3.494	2.969	2.872	1.762	1.485	1.229	0.868
355	5.976	5.271	4.531	3.871	3.737	3.694	3.620	3.605	3.109	3.016	1.794	1.514	1.255	0.889
360	6.074	5.370	4.640	3.974	3.841	3.801	3.730	3.716	3.249	3.160	1.826	1.543	1.281	0.910
365	6.172	5.469	4.748	4.086	3.946	3.908	3.840	3.827	3.389	3.304	1.857	1.572	1.307	0.931
370	6.270	5.569	4.857	4.199	4.058	4.018	3.950	3.938	3.528	3.448	1.889	1.602	1.333	0.951
375	6.367	5.668	4.966	4.311	4.169	4.129	4.061	4.049	3.668	3.592	1.921	1.631	1.358	0.972
380	6.465	5.767	5.075	4.424	4.281	4.240	4.172	4.160	3.808	3.736	1.999	1.660	1.384	0.993
385	6.563	5.867	5.183	4.536	4.392	4.351	4.283	4.270	3.945	3.880	2.228	1.690	1.410	1.014
390	6.661	5.960	5.292	4.649	4.504	4.462	4.394	4.381	4.054	4.002	2.458	1.719	1.436	1.035
395	6.759	6.046	5.401	4.761	4.615	4.574	4.505	4.492	4.163	4.111	2.687	1.748	1.462	1.056
400	6.857	6.132	5.509	4.874	4.727	4.685	4.616	4.603	4.272	4.220	2.917	1.777	1.487	1.076

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.992mm.

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Table 24 Rectangular Hollow Columns 60 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
65	1.663	1.245	0.879	0.606	0.553	0.539	0.517	0.513	0.360	0.351	0.320	0.320	0.320	0.320
70	1.798	1.354	0.969	0.674	0.614	0.599	0.574	0.570	0.425	0.415	0.320	0.320	0.320	0.320
75	1.932	1.464	1.058	0.747	0.684	0.668	0.642	0.638	0.490	0.479	0.320	0.320	0.320	0.320
80	2.044	1.574	1.147	0.820	0.753	0.737	0.710	0.706	0.555	0.543	0.372	0.320	0.320	0.320
85	2.154	1.684	1.237	0.893	0.823	0.806	0.779	0.774	0.619	0.607	0.425	0.320	0.320	0.320
90	2.264	1.793	1.326	0.966	0.893	0.875	0.847	0.842	0.684	0.671	0.478	0.337	0.320	0.320
95	2.374	1.903	1.415	1.039	0.963	0.944	0.915	0.910	0.749	0.735	0.531	0.381	0.320	0.320
100	2.484	2.009	1.505	1.112	1.032	1.013	0.983	0.978	0.813	0.799	0.584	0.425	0.320	0.320
105	2.594	2.113	1.594	1.185	1.102	1.082	1.051	1.046	0.878	0.863	0.637	0.468	0.349	0.320
110	2.704	2.218	1.683	1.259	1.172	1.151	1.119	1.114	0.943	0.927	0.690	0.512	0.385	0.320
115	2.813	2.322	1.773	1.332	1.242	1.219	1.187	1.182	1.008	0.991	0.743	0.556	0.421	0.320
120	2.923	2.426	1.862	1.405	1.311	1.288	1.255	1.250	1.072	1.054	0.796	0.600	0.458	0.320
125	3.033	2.530	1.953	1.478	1.381	1.357	1.323	1.317	1.137	1.118	0.849	0.643	0.494	0.330
130	3.143	2.634	2.059	1.551	1.451	1.426	1.391	1.385	1.202	1.182	0.902	0.687	0.530	0.360
135	3.253	2.738	2.165	1.624	1.520	1.495	1.459	1.453	1.267	1.246	0.955	0.731	0.566	0.389
140	3.363	2.842	2.271	1.697	1.590	1.564	1.528	1.521	1.331	1.310	1.008	0.775	0.602	0.418
145	3.473	2.947	2.376	1.770	1.660	1.633	1.596	1.589	1.396	1.374	1.061	0.818	0.638	0.448
150	3.582	3.051	2.482	1.844	1.730	1.702	1.664	1.657	1.461	1.438	1.114	0.862	0.674	0.477
155	3.692	3.155	2.588	1.917	1.799	1.771	1.732	1.725	1.526	1.502	1.167	0.906	0.711	0.506
160	3.802	3.259	2.694	2.015	1.869	1.840	1.800	1.793	1.590	1.566	1.220	0.950	0.747	0.536
165	3.912	3.363	2.800	2.130	1.939	1.909	1.868	1.861	1.655	1.630	1.273	0.993	0.783	0.565
170	4.093	3.467	2.906	2.245	2.053	2.001	1.936	1.929	1.720	1.694	1.326	1.037	0.819	0.594
175	4.293	3.571	3.012	2.360	2.171	2.120	2.049	2.036	1.785	1.758	1.379	1.081	0.855	0.624
180	4.492	3.676	3.118	2.474	2.289	2.239	2.168	2.156	1.849	1.822	1.432	1.125	0.891	0.653
185	4.691	3.780	3.224	2.589	2.408	2.358	2.287	2.275	1.914	1.886	1.485	1.168	0.927	0.682
190	4.891	3.884	3.330	2.704	2.526	2.477	2.406	2.394	2.009	1.954	1.538	1.212	0.964	0.712
195	5.090	4.018	3.436	2.819	2.645	2.596	2.526	2.513	2.133	2.079	1.591	1.256	1.000	0.741
200	5.289	4.179	3.542	2.934	2.763	2.715	2.645	2.633	2.257	2.203	1.644	1.299	1.036	0.771
205	5.489	4.340	3.648	3.048	2.881	2.833	2.764	2.752	2.381	2.327	1.697	1.343	1.072	0.800
210	5.688	4.501	3.754	3.163	3.000	2.952	2.883	2.871	2.504	2.451	1.750	1.387	1.108	0.829
215	5.887	4.662	3.860	3.278	3.118	3.071	3.003	2.991	2.628	2.575	1.803	1.431	1.144	0.859
220	5.993	4.823	3.977	3.393	3.237	3.190	3.122	3.110	2.752	2.700	1.856	1.474	1.180	0.888
225	6.079	4.984	4.121	3.507	3.355	3.309	3.241	3.229	2.875	2.824	1.909	1.518	1.217	0.917
230	6.166	5.145	4.265	3.622	3.473	3.428	3.360	3.348	2.999	2.948	1.992	1.562	1.253	0.947
235	6.252	5.306	4.409	3.737	3.592	3.547	3.480	3.468	3.123	3.072	2.134	1.606	1.289	0.976
240	6.338	5.467	4.553	3.852	3.710	3.666	3.599	3.587	3.246	3.196	2.275	1.649	1.325	1.005
245	6.425	5.628	4.697	3.972	3.828	3.785	3.718	3.706	3.370	3.320	2.417	1.693	1.361	1.035
250	6.511	5.789	4.842	4.108	3.948	3.904	3.837	3.825	3.494	3.445	2.559	1.737	1.397	1.064
255	6.598	5.936	4.986	4.244	4.082	4.033	3.959	3.946	3.617	3.569	2.701	1.781	1.433	1.093
260	6.684	6.018	5.130	4.379	4.215	4.166	4.091	4.078	3.741	3.693	2.843	1.824	1.470	1.123
265	6.771	6.101	5.274	4.515	4.349	4.299	4.223	4.210	3.865	3.817	2.984	1.868	1.506	1.152
270	6.857	6.183	5.418	4.650	4.482	4.432	4.355	4.342	3.991	3.942	3.126	1.912	1.542	1.182
275	6.943	6.266	5.562	4.786	4.615	4.565	4.488	4.474	4.119	4.069	3.268	1.989	1.578	1.211
280	7.030	6.348	5.706	4.922	4.749	4.699	4.620	4.606	4.248	4.197	3.410	2.172	1.614	1.240
285	7.116	6.431	5.850	5.057	4.882	4.832	4.752	4.738	4.376	4.325	3.552	2.354	1.650	1.270
290	7.203	6.513	5.964	5.193	5.015	4.965	4.884	4.870	4.505	4.453	3.693	2.537	1.686	1.299
295	7.289	6.596	6.049	5.328	5.149	5.098	5.016	5.002	4.633	4.581	3.835	2.720	1.723	1.328
300	7.376	6.678	6.133	5.464	5.282	5.231	5.148	5.134	4.762	4.709	3.973	2.902	1.759	1.358
305	7.462	6.760	6.218	5.600	5.416	5.364	5.280	5.266	4.891	4.837	4.104	3.085	1.795	1.387
310	7.548	6.843	6.303	5.735	5.549	5.497	5.413	5.398	5.019	4.965	4.235	3.268	1.831	1.416
315	7.635	6.925	6.387	5.871	5.682	5.630	5.545	5.530	5.148	5.093	4.365	3.451	1.867	1.446
320	7.721	7.008	6.472	5.977	5.816	5.763	5.677	5.662	5.276	5.221	4.496	3.633	1.903	1.475
325	7.808	7.090	6.557	6.067	5.940	5.896	5.809	5.794	5.405	5.348	4.627	3.816	1.939	1.504
330	7.894	7.173	6.642	6.156	6.030	5.995	5.935	5.925	5.533	5.476	4.757	3.981	2.224	1.534
335	7.981	7.255	6.726	6.245	6.121	6.085	6.026	6.016	5.662	5.604	4.888	4.115	2.553	1.563
340	8.067	7.338	6.811	6.334	6.211	6.176	6.117	6.107	5.791	5.732	5.019	4.249	2.882	1.592
345	8.153	7.420	6.896	6.424	6.302	6.267	6.208	6.198	5.919	5.860	5.149	4.383	3.212	1.622
350	8.240	7.503	6.980	6.513	6.392	6.357	6.299	6.289	6.012	5.970	5.280	4.517	3.541	1.651
355	8.326	7.585	7.065	6.602	6.483	6.448	6.390	6.380	6.105	6.062	5.410	4.651	3.870	1.681
360	8.413	7.667	7.150	6.691	6.573	6.539	6.481	6.472	6.197	6.155	5.541	4.785	4.036	1.710
365	8.499	7.750	7.234	6.781	6.663	6.629	6.572	6.563	6.290	6.248	5.672	4.919	4.163	1.739
370	-	7.832	7.319	6.870	6.754	6.720	6.664	6.654	6.382	6.341	5.802	5.053	4.290	1.769
375	-	7.915	7.404	6.959	6.844	6.811	6.755	6.745	6.475	6.433	5.929	5.186	4.417	1.798
380	-	7.997	7.489	7.048	6.935	6.901	6.846	6.836	6.567	6.526	6.019	5.320	4.544	1.827
385	-	8.080	7.573	7.138	7.025	6.992	6.937	6.927	6.660	6.619	6.108	5.454	4.671	1.857
390	-	8.162	7.658	7.227	7.116	7.083	7.028	7.019	6.752	6.712	6.198	5.588	4.798	1.886
395	-	8.245	7.743	7.316	7.206	7.173	7.119	7.110	6.845	6.804	6.287	5.722	4.925	1.915
400	-	8.327	7.827	7.405	7.296	7.264	7.210	7.201	6.937	6.897	6.376	5.856	5.052	1.945

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.992mm.

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Table 25 Rectangular Hollow Columns 75 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
65	2.817	1.803	1.390	1.058	0.994	0.978	0.948	0.944	0.815	0.800	0.584	0.352	0.320	0.320
70	3.029	1.989	1.519	1.167	1.099	1.081	1.050	1.045	0.905	0.889	0.650	0.418	0.320	0.320
75	3.241	2.176	1.648	1.275	1.203	1.184	1.151	1.145	0.998	0.981	0.724	0.483	0.375	0.320
80	3.454	2.363	1.776	1.383	1.307	1.287	1.252	1.246	1.091	1.073	0.799	0.548	0.431	0.320
85	3.666	2.549	1.905	1.492	1.412	1.391	1.353	1.347	1.184	1.164	0.874	0.614	0.487	0.351
90	3.879	2.736	2.033	1.600	1.516	1.494	1.455	1.448	1.277	1.256	0.948	0.679	0.543	0.395
95	4.058	2.922	2.162	1.709	1.620	1.597	1.556	1.549	1.370	1.348	1.023	0.744	0.599	0.439
100	4.225	3.109	2.291	1.817	1.725	1.700	1.657	1.650	1.463	1.440	1.098	0.810	0.655	0.484
105	4.392	3.295	2.419	1.925	1.829	1.803	1.758	1.751	1.556	1.531	1.173	0.875	0.711	0.528
110	4.560	3.482	2.548	2.050	1.934	1.906	1.859	1.852	1.649	1.623	1.247	0.940	0.767	0.572
115	4.727	3.668	2.676	2.179	2.060	2.025	1.965	1.955	1.742	1.715	1.322	1.006	0.823	0.617
120	4.894	3.855	2.805	2.308	2.189	2.154	2.094	2.084	1.834	1.806	1.397	1.071	0.878	0.661
125	5.062	4.028	2.933	2.437	2.318	2.283	2.223	2.214	1.927	1.898	1.471	1.136	0.934	0.705
130	5.229	4.191	3.062	2.566	2.447	2.412	2.352	2.343	2.051	2.009	1.546	1.202	0.990	0.750
135	5.396	4.355	3.190	2.695	2.576	2.540	2.482	2.472	2.182	2.141	1.621	1.267	1.046	0.794
140	5.564	4.518	3.319	2.823	2.705	2.669	2.611	2.601	2.313	2.272	1.696	1.332	1.102	0.838
145	5.731	4.681	3.448	2.952	2.834	2.798	2.740	2.730	2.444	2.403	1.770	1.398	1.158	0.883
150	5.898	4.845	3.576	3.081	2.963	2.927	2.869	2.859	2.575	2.535	1.845	1.463	1.214	0.927
155	6.016	5.008	3.705	3.210	3.092	3.055	2.998	2.988	2.706	2.666	1.920	1.528	1.270	0.971
160	6.126	5.172	3.833	3.339	3.221	3.184	3.127	3.118	2.837	2.797	2.041	1.594	1.326	1.016
165	6.236	5.335	3.985	3.468	3.350	3.313	3.256	3.247	2.968	2.929	2.186	1.659	1.382	1.060
170	6.346	5.498	4.219	3.596	3.479	3.442	3.385	3.376	3.099	3.060	2.331	1.724	1.438	1.104
175	6.456	5.662	4.454	3.725	3.608	3.571	3.515	3.505	3.230	3.192	2.476	1.790	1.493	1.149
180	6.567	5.825	4.688	3.854	3.737	3.699	3.644	3.634	3.361	3.323	2.621	1.855	1.549	1.193
185	6.677	5.968	4.923	4.018	3.866	3.828	3.773	3.763	3.492	3.454	2.766	1.920	1.605	1.237
190	6.787	6.081	5.158	4.239	4.037	3.973	3.902	3.892	3.623	3.586	2.911	2.046	1.661	1.282
195	6.897	6.193	5.392	4.460	4.255	4.191	4.097	4.080	3.754	3.717	3.056	2.208	1.717	1.326
200	7.007	6.306	5.627	4.681	4.473	4.409	4.313	4.296	3.884	3.848	3.201	2.371	1.773	1.370
205	7.117	6.419	5.861	4.902	4.690	4.627	4.529	4.512	4.065	4.007	3.346	2.534	1.829	1.415
210	7.227	6.532	5.998	5.123	4.908	4.846	4.746	4.728	4.276	4.217	3.491	2.696	1.885	1.459
215	7.337	6.645	6.102	5.344	5.126	5.064	4.962	4.944	4.488	4.426	3.635	2.859	1.941	1.503
220	7.447	6.758	6.205	5.565	5.344	5.282	5.178	5.160	4.699	4.636	3.780	3.022	2.116	1.548
225	7.557	6.871	6.309	5.787	5.562	5.500	5.394	5.376	4.910	4.846	3.925	3.184	2.302	1.592
230	7.667	6.984	6.412	5.960	5.779	5.718	5.611	5.592	5.121	5.055	4.120	3.347	2.487	1.636
235	7.777	7.097	6.516	6.058	5.955	5.928	5.827	5.808	5.332	5.265	4.318	3.510	2.673	1.681
240	7.887	7.210	6.620	6.156	6.052	6.024	5.975	5.966	5.543	5.474	4.516	3.672	2.858	1.725
245	7.998	7.323	6.723	6.254	6.149	6.120	6.071	6.062	5.754	5.684	4.714	3.835	3.043	1.769
250	8.108	7.436	6.827	6.353	6.246	6.217	6.166	6.157	5.940	5.893	4.912	4.008	3.229	1.814
255	8.218	7.549	6.930	6.451	6.343	6.313	6.262	6.253	6.032	6.001	5.110	4.197	3.414	1.858
260	8.328	7.661	7.034	6.549	6.439	6.409	6.357	6.348	6.124	6.093	5.307	4.386	3.600	1.902
265	8.438	7.774	7.137	6.648	6.536	6.506	6.453	6.444	6.216	6.186	5.505	4.574	3.785	1.954
270	-	7.887	7.241	6.746	6.633	6.602	6.548	6.539	6.308	6.278	5.703	4.763	3.969	2.209
275	-	8.000	7.345	6.844	6.730	6.698	6.644	6.635	6.400	6.370	5.901	4.952	4.145	2.465
280	-	8.113	7.448	6.942	6.827	6.795	6.740	6.730	6.492	6.462	6.006	5.141	4.321	2.720
285	-	8.226	7.552	7.041	6.924	6.891	6.835	6.826	6.584	6.554	6.101	5.329	4.497	2.975
290	-	8.339	7.655	7.139	7.021	6.987	6.931	6.921	6.676	6.647	6.196	5.518	4.673	3.230
295	-	8.452	7.759	7.237	7.118	7.084	7.026	7.017	6.768	6.739	6.291	5.707	4.849	3.486
300	-	8.565	7.862	7.336	7.215	7.180	7.122	7.112	6.860	6.831	6.385	5.896	5.025	3.741
305	-	-	7.966	7.434	7.312	7.276	7.218	7.208	6.952	6.923	6.480	6.004	5.201	3.973
310	-	-	8.070	7.532	7.409	7.373	7.313	7.303	7.044	7.016	6.575	6.099	5.377	4.132
315	-	-	8.173	7.630	7.506	7.469	7.409	7.398	7.136	7.108	6.670	6.195	5.553	4.291
320	-	-	8.277	7.729	7.602	7.565	7.504	7.494	7.228	7.200	6.764	6.290	5.729	4.451
325	-	-	8.380	7.827	7.699	7.662	7.600	7.589	7.320	7.292	6.859	6.386	5.905	4.610
330	-	-	8.484	7.925	7.796	7.758	7.695	7.685	7.412	7.385	6.954	6.481	6.008	4.769
335	-	-	8.587	8.024	7.893	7.854	7.791	7.780	7.504	7.477	7.049	6.577	6.103	4.929
340	-	-	-	8.122	7.990	7.951	7.887	7.876	7.596	7.569	7.143	6.673	6.197	5.088
345	-	-	-	8.220	8.087	8.047	7.982	7.971	7.689	7.661	7.238	6.768	6.292	5.247
350	-	-	-	8.318	8.184	8.143	8.078	8.067	7.781	7.753	7.333	6.864	6.387	5.407
355	-	-	-	8.417	8.281	8.240	8.173	8.162	7.873	7.846	7.428	6.959	6.482	5.566
360	-	-	-	8.515	8.378	8.336	8.269	8.258	7.965	7.938	7.522	7.055	6.577	5.725
365	-	-	-	-	8.475	8.432	8.364	8.353	8.057	8.030	7.617	7.150	6.672	5.884
370	-	-	-	-	8.572	8.529	8.460	8.449	8.149	8.122	7.712	7.246	6.767	5.989
375	-	-	-	-	-	-	8.556	8.544	8.241	8.215	7.807	7.341	6.862	6.076
380	-	-	-	-	-	-	-	-	8.333	8.307	7.901	7.437	6.957	6.164
385	-	-	-	-	-	-	-	-	8.425	8.399	7.996	7.533	7.052	6.252
390	-	-	-	-	-	-	-	-	8.517	8.491	8.091	7.628	7.147	6.339
395	-	-	-	-	-	-	-	-	8.609	8.584	8.186	7.724	7.242	6.427
400	-	-	-	-	-	-	-	-	-	-	8.281	7.819	7.337	6.515

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.992mm.

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SHERWIN WILLIAMS

Table 26 Rectangular Hollow Columns 90 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
65	4.075	3.126	1.871	1.516	1.444	1.426	1.390	1.384	1.240	1.223	0.982	0.786	0.647	0.368
70	4.353	3.407	2.155	1.660	1.583	1.563	1.525	1.519	1.366	1.347	1.088	0.874	0.718	0.432
75	4.631	3.687	2.439	1.804	1.722	1.701	1.660	1.654	1.492	1.472	1.194	0.962	0.789	0.495
80	4.909	3.960	2.722	1.948	1.862	1.839	1.796	1.789	1.618	1.596	1.300	1.050	0.860	0.559
85	5.187	4.176	3.006	2.156	2.022	1.987	1.931	1.924	1.744	1.721	1.406	1.138	0.931	0.623
90	5.465	4.392	3.290	2.364	2.213	2.173	2.106	2.096	1.870	1.845	1.512	1.225	1.001	0.687
95	5.743	4.608	3.573	2.573	2.404	2.359	2.286	2.274	2.005	1.974	1.618	1.313	1.072	0.750
100	5.960	4.824	3.857	2.781	2.596	2.545	2.466	2.453	2.154	2.120	1.724	1.401	1.143	0.814
105	6.069	5.041	4.056	2.989	2.787	2.731	2.646	2.631	2.303	2.266	1.830	1.489	1.214	0.878
110	6.177	5.257	4.224	3.197	2.979	2.917	2.826	2.810	2.452	2.412	1.936	1.577	1.285	0.942
115	6.286	5.473	4.391	3.405	3.170	3.103	3.006	2.989	2.601	2.558	2.074	1.665	1.355	1.006
120	6.395	5.689	4.559	3.613	3.362	3.289	3.186	3.167	2.750	2.704	2.215	1.753	1.426	1.069
125	6.504	5.905	4.726	3.821	3.553	3.475	3.366	3.346	2.899	2.850	2.356	1.841	1.497	1.133
130	6.612	6.032	4.894	4.024	3.745	3.661	3.546	3.524	3.048	2.996	2.497	1.929	1.568	1.197
135	6.721	6.152	5.062	4.221	3.936	3.847	3.726	3.703	3.197	3.142	2.638	2.063	1.638	1.261
140	6.830	6.272	5.229	4.418	4.146	4.049	3.906	3.881	3.346	3.288	2.779	2.209	1.709	1.324
145	6.939	6.391	5.397	4.616	4.356	4.265	4.123	4.092	3.495	3.434	2.920	2.354	1.780	1.388
150	7.047	6.511	5.564	4.813	4.567	4.481	4.346	4.317	3.644	3.580	3.061	2.499	1.851	1.452
155	7.156	6.631	5.732	5.010	4.777	4.697	4.568	4.541	3.793	3.726	3.202	2.645	1.922	1.516
160	7.265	6.751	5.899	5.207	4.987	4.913	4.791	4.766	3.949	3.871	3.344	2.790	2.057	1.579
165	7.374	6.871	6.049	5.404	5.197	5.130	5.014	4.991	4.233	4.101	3.485	2.936	2.225	1.643
170	7.482	6.990	6.196	5.601	5.407	5.346	5.237	5.215	4.517	4.394	3.626	3.081	2.393	1.707
175	7.591	7.110	6.343	5.798	5.617	5.562	5.460	5.440	4.801	4.687	3.767	3.226	2.560	1.771
180	7.700	7.230	6.489	5.976	5.827	5.778	5.683	5.664	5.085	4.980	3.908	3.372	2.728	1.834
185	7.808	7.350	6.636	6.122	6.002	5.970	5.906	5.889	5.369	5.273	4.170	3.517	2.895	1.898
190	7.917	7.470	6.783	6.268	6.147	6.115	6.055	6.045	5.653	5.566	4.459	3.662	3.063	1.994
195	8.026	7.590	6.930	6.414	6.292	6.260	6.200	6.189	5.929	5.859	4.748	3.808	3.231	2.181
200	8.135	7.709	7.077	6.560	6.438	6.405	6.344	6.333	6.071	6.032	5.038	3.972	3.398	2.369
205	8.243	7.829	7.224	6.706	6.583	6.550	6.489	6.478	6.213	6.174	5.327	4.258	3.566	2.556
210	-	7.949	7.371	6.852	6.728	6.694	6.633	6.622	6.354	6.315	5.616	4.544	3.734	2.743
215	-	8.069	7.517	6.998	6.874	6.839	6.778	6.767	6.496	6.456	5.906	4.830	3.901	2.930
220	-	8.189	7.664	7.144	7.019	6.984	6.922	6.911	6.638	6.598	6.047	5.115	4.165	3.117
225	-	8.308	7.811	7.290	7.165	7.129	7.067	7.056	6.779	6.739	6.179	5.401	4.453	3.304
230	-	8.428	7.958	7.436	7.310	7.274	7.211	7.200	6.921	6.880	6.312	5.687	4.740	3.492
235	-	-	8.105	7.581	7.455	7.419	7.355	7.344	7.063	7.022	6.444	5.943	5.028	3.679
240	-	-	8.252	7.727	7.601	7.564	7.500	7.489	7.204	7.163	6.577	6.063	5.316	3.866
245	-	-	8.399	7.873	7.746	7.709	7.644	7.633	7.346	7.304	6.709	6.183	5.603	4.122
250	-	-	8.545	8.019	7.892	7.854	7.789	7.778	7.488	7.446	6.842	6.304	5.891	4.418
255	-	-	-	8.165	8.037	7.999	7.933	7.922	7.630	7.587	6.974	6.424	6.017	4.714
260	-	-	-	8.311	8.182	8.144	8.078	8.066	7.771	7.728	7.107	6.544	6.124	5.010
265	-	-	-	8.457	8.328	8.288	8.222	8.211	7.913	7.870	7.240	6.664	6.231	5.307
270	-	-	-	8.603	8.473	8.433	8.367	8.355	8.055	8.011	7.372	6.784	6.338	5.603
275	-	-	-	-	8.618	8.578	8.511	8.500	8.196	8.152	7.505	6.905	6.444	5.899
280	-	-	-	-	-	-	-	-	8.338	8.294	7.637	7.025	6.551	6.007
285	-	-	-	-	-	-	-	-	8.480	8.435	7.770	7.145	6.658	6.100
290	-	-	-	-	-	-	-	-	-	8.576	7.902	7.265	6.765	6.193
295	-	-	-	-	-	-	-	-	-	-	8.035	7.386	6.872	6.286
300	-	-	-	-	-	-	-	-	-	-	8.167	7.506	6.979	6.380
305	-	-	-	-	-	-	-	-	-	-	8.300	7.626	7.086	6.473
310	-	-	-	-	-	-	-	-	-	-	8.433	7.746	7.193	6.566
315	-	-	-	-	-	-	-	-	-	-	-	7.866	7.300	6.659
320	-	-	-	-	-	-	-	-	-	-	-	7.987	7.407	6.752
325	-	-	-	-	-	-	-	-	-	-	-	8.107	7.514	6.845
330	-	-	-	-	-	-	-	-	-	-	-	8.227	7.621	6.938
335	-	-	-	-	-	-	-	-	-	-	-	8.347	7.728	7.031
340	-	-	-	-	-	-	-	-	-	-	-	8.467	7.835	7.124
345	-	-	-	-	-	-	-	-	-	-	-	8.588	7.942	7.218
350	-	-	-	-	-	-	-	-	-	-	-	-	8.049	7.311
355	-	-	-	-	-	-	-	-	-	-	-	-	8.156	7.404
360	-	-	-	-	-	-	-	-	-	-	-	-	8.263	7.497
365	-	-	-	-	-	-	-	-	-	-	-	-	8.369	7.590
370	-	-	-	-	-	-	-	-	-	-	-	-	8.476	7.683
375	-	-	-	-	-	-	-	-	-	-	-	-	8.583	7.776
380	-	-	-	-	-	-	-	-	-	-	-	-	-	7.869
385	-	-	-	-	-	-	-	-	-	-	-	-	-	7.962
390	-	-	-	-	-	-	-	-	-	-	-	-	-	8.056
395	-	-	-	-	-	-	-	-	-	-	-	-	-	8.149
400	-	-	-	-	-	-	-	-	-	-	-	-	-	8.242

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.992mm.

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Table 27 Rectangular Hollow Columns 120 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
65	-	5.741	4.679	3.601	3.345	3.269	3.164	3.131	2.286	2.232	1.751	1.582	1.468	1.306
70	-	6.127	5.072	3.975	3.693	3.610	3.495	3.460	2.718	2.655	1.982	1.731	1.602	1.421
75	-	6.514	5.466	4.349	4.095	4.020	3.919	3.879	3.149	3.078	2.302	1.880	1.736	1.536
80	-	6.900	5.859	4.723	4.462	4.387	4.281	4.249	3.581	3.501	2.622	2.077	1.870	1.650
85	-	7.287	6.122	5.098	4.829	4.754	4.641	4.611	3.998	3.924	2.942	2.311	2.019	1.765
90	-	7.674	6.360	5.472	5.196	5.121	5.002	4.973	4.349	4.271	3.262	2.544	2.189	1.880
95	-	8.060	6.599	5.846	5.563	5.488	5.362	5.334	4.700	4.616	3.582	2.778	2.359	2.000
100	-	-	6.837	6.061	5.925	5.854	5.722	5.696	5.051	4.961	3.901	3.011	2.529	2.126
105	-	-	7.076	6.237	6.090	6.053	5.991	5.980	5.402	5.307	4.183	3.245	2.698	2.252
110	-	-	7.314	6.412	6.255	6.215	6.147	6.135	5.753	5.652	4.459	3.478	2.868	2.378
115	-	-	7.552	6.587	6.419	6.376	6.303	6.290	6.005	5.957	4.736	3.712	3.038	2.504
120	-	-	7.791	6.762	6.584	6.538	6.459	6.445	6.165	6.119	5.013	3.945	3.208	2.630
125	-	-	8.029	6.938	6.749	6.700	6.615	6.600	6.325	6.281	5.289	4.179	3.377	2.756
130	-	-	8.268	7.113	6.914	6.861	6.771	6.755	6.486	6.443	5.566	4.413	3.547	2.882
135	-	-	8.506	7.288	7.078	7.023	6.927	6.910	6.646	6.606	5.843	4.647	3.717	3.008
140	-	-	-	7.464	7.243	7.184	7.083	7.065	6.807	6.768	6.059	4.881	3.887	3.134
145	-	-	-	7.639	7.408	7.346	7.239	7.220	6.967	6.930	6.251	5.115	4.172	3.260
150	-	-	-	7.814	7.573	7.507	7.395	7.375	7.128	7.092	6.443	5.349	4.501	3.386
155	-	-	-	7.989	7.737	7.669	7.551	7.530	7.288	7.254	6.635	5.583	4.831	3.512
160	-	-	-	8.165	7.902	7.831	7.707	7.686	7.449	7.417	6.827	5.817	5.160	3.638
165	-	-	-	8.340	8.067	7.992	7.863	7.841	7.609	7.579	7.019	6.060	5.490	3.764
170	-	-	-	8.515	8.232	8.154	8.019	7.996	7.770	7.741	7.211	6.312	5.819	3.890
175	-	-	-	-	8.397	8.315	8.175	8.151	7.930	7.903	7.403	6.563	6.088	4.557
180	-	-	-	-	-	8.477	8.331	8.306	8.091	8.065	7.595	6.815	6.331	5.517
185	-	-	-	-	-	-	8.487	8.461	8.251	8.228	7.787	7.066	6.573	6.048
190	-	-	-	-	-	-	-	-	8.411	8.390	7.979	7.318	6.816	6.267
195	-	-	-	-	-	-	-	-	-	-	8.171	7.569	7.058	6.486
200	-	-	-	-	-	-	-	-	-	-	8.363	7.821	7.301	6.705
205	-	-	-	-	-	-	-	-	-	-	8.555	8.072	7.543	6.924
210	-	-	-	-	-	-	-	-	-	-	-	8.323	7.785	7.143
215	-	-	-	-	-	-	-	-	-	-	-	8.575	8.028	7.363
220	-	-	-	-	-	-	-	-	-	-	-	-	8.270	7.582
225	-	-	-	-	-	-	-	-	-	-	-	-	8.513	7.801
230	-	-	-	-	-	-	-	-	-	-	-	-	-	8.020
235	-	-	-	-	-	-	-	-	-	-	-	-	-	8.239
240	-	-	-	-	-	-	-	-	-	-	-	-	-	8.458
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-
380	-	-	-	-	-	-	-	-	-	-	-	-	-	-
385	-	-	-	-	-	-	-	-	-	-	-	-	-	-
390	-	-	-	-	-	-	-	-	-	-	-	-	-	-
395	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results also apply to rectangular hollow beams exposed on all four sides limited to a maximum protection thickness of 5.992mm.

Issued: 13th September 2018
Revised: 29th November 2019
Valid to: 12th September 2023

CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 28 Circular Hollow Columns 15 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
60	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
65	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
70	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
75	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
80	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
85	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
90	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
95	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
100	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
105	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
110	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
115	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
120	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
125	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
130	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
135	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
140	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
145	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
150	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
155	0.331	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
160	0.351	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
165	0.370	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
170	0.390	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
175	0.410	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
180	0.430	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
185	0.450	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
190	0.469	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
195	0.489	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
200	0.509	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
205	0.529	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
210	0.548	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
215	0.568	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
220	0.588	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
225	0.608	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
230	0.628	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
235	0.647	0.338	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
240	0.667	0.355	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
245	0.687	0.372	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
250	0.707	0.389	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
255	0.726	0.406	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
260	0.746	0.423	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
265	0.766	0.440	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
270	0.786	0.457	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
275	0.806	0.474	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
280	0.825	0.491	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
285	0.845	0.508	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
290	0.865	0.525	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
295	0.885	0.542	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
300	0.905	0.559	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
305	0.924	0.576	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
310	0.944	0.593	0.338	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
315	0.964	0.609	0.353	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
320	0.984	0.626	0.368	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
325	1.003	0.643	0.384	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
330	1.023	0.660	0.399	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
335	1.043	0.677	0.414	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
340	1.063	0.694	0.429	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
345	1.083	0.711	0.444	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
350	1.102	0.728	0.460	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
355	1.122	0.745	0.475	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
360	1.142	0.762	0.490	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
365	1.162	0.779	0.505	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
370	1.181	0.796	0.520	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
375	1.201	0.813	0.535	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
380	1.221	0.830	0.551	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
385	1.241	0.847	0.566	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
390	1.261	0.864	0.581	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
395	1.280	0.881	0.596	0.332	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
400	1.300	0.898	0.611	0.345	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324

Thickness is intumescent only.

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 29 Circular Hollow Columns 20 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
60	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
65	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
70	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
75	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
80	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
85	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
90	0.325	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
95	0.350	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
100	0.375	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
105	0.400	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
110	0.425	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
115	0.450	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
120	0.475	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
125	0.500	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
130	0.525	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
135	0.550	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
140	0.575	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
145	0.600	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
150	0.625	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
155	0.650	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
160	0.675	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
165	0.700	0.345	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
170	0.725	0.368	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
175	0.750	0.390	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
180	0.775	0.413	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
185	0.800	0.436	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
190	0.825	0.458	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
195	0.850	0.481	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
200	0.875	0.504	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
205	0.900	0.527	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
210	0.925	0.549	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
215	0.951	0.572	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
220	0.976	0.595	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
225	1.001	0.617	0.345	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
230	1.026	0.640	0.366	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
235	1.051	0.663	0.387	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
240	1.076	0.685	0.408	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
245	1.101	0.708	0.430	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
250	1.126	0.731	0.451	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
255	1.151	0.754	0.472	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
260	1.176	0.776	0.493	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
265	1.201	0.799	0.514	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
270	1.226	0.822	0.535	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
275	1.251	0.844	0.556	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
280	1.276	0.867	0.577	0.335	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
285	1.301	0.890	0.598	0.354	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
290	1.326	0.912	0.619	0.372	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
295	1.351	0.935	0.640	0.391	0.337	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
300	1.376	0.958	0.661	0.410	0.355	0.342	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
305	1.401	0.981	0.682	0.428	0.373	0.360	0.337	0.332	0.324	0.324	0.324	0.324	0.324	0.324
310	1.426	1.003	0.703	0.447	0.391	0.378	0.354	0.350	0.324	0.324	0.324	0.324	0.324	0.324
315	1.451	1.026	0.724	0.466	0.409	0.395	0.372	0.367	0.324	0.324	0.324	0.324	0.324	0.324
320	1.476	1.049	0.745	0.484	0.428	0.413	0.390	0.385	0.324	0.324	0.324	0.324	0.324	0.324
325	1.501	1.071	0.766	0.503	0.446	0.431	0.407	0.403	0.324	0.324	0.324	0.324	0.324	0.324
330	1.526	1.094	0.787	0.522	0.464	0.449	0.425	0.420	0.324	0.324	0.324	0.324	0.324	0.324
335	1.551	1.117	0.808	0.540	0.482	0.467	0.443	0.438	0.324	0.324	0.324	0.324	0.324	0.324
340	1.576	1.139	0.829	0.559	0.500	0.485	0.461	0.456	0.332	0.324	0.324	0.324	0.324	0.324
345	1.601	1.162	0.850	0.578	0.518	0.503	0.478	0.473	0.348	0.333	0.324	0.324	0.324	0.324
350	1.626	1.185	0.871	0.596	0.536	0.521	0.496	0.491	0.364	0.349	0.324	0.324	0.324	0.324
355	1.651	1.208	0.893	0.615	0.554	0.539	0.514	0.509	0.381	0.366	0.324	0.324	0.324	0.324
360	1.676	1.230	0.914	0.634	0.572	0.557	0.531	0.526	0.397	0.382	0.324	0.324	0.324	0.324
365	1.701	1.253	0.935	0.652	0.591	0.575	0.549	0.544	0.413	0.398	0.324	0.324	0.324	0.324
370	1.726	1.276	0.956	0.671	0.609	0.593	0.567	0.562	0.429	0.414	0.324	0.324	0.324	0.324
375	1.751	1.298	0.977	0.690	0.627	0.611	0.585	0.579	0.446	0.430	0.324	0.324	0.324	0.324
380	1.776	1.321	0.998	0.708	0.645	0.629	0.602	0.597	0.462	0.446	0.324	0.324	0.324	0.324
385	1.801	1.344	1.019	0.727	0.663	0.647	0.620	0.615	0.478	0.462	0.324	0.324	0.324	0.324
390	1.826	1.366	1.040	0.746	0.681	0.665	0.638	0.632	0.494	0.478	0.324	0.324	0.324	0.324
395	1.851	1.389	1.061	0.764	0.699	0.683	0.655	0.650	0.511	0.494	0.324	0.324	0.324	0.324
400	1.876	1.412	1.082	0.783	0.717	0.701	0.673	0.668	0.527	0.511	0.324	0.324	0.324	0.324

Thickness is intumescent only.

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 30 Circular Hollow Columns 30 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
60	0.469	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
65	0.510	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
70	0.550	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
75	0.590	0.340	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
80	0.631	0.371	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
85	0.671	0.403	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
90	0.712	0.434	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
95	0.752	0.465	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
100	0.793	0.496	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
105	0.833	0.528	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
110	0.874	0.559	0.331	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
115	0.914	0.590	0.360	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
120	0.955	0.622	0.389	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
125	0.995	0.653	0.418	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
130	1.036	0.684	0.447	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
135	1.076	0.715	0.476	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
140	1.116	0.747	0.505	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
145	1.157	0.778	0.535	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
150	1.197	0.809	0.564	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
155	1.238	0.841	0.593	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
160	1.278	0.872	0.622	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
165	1.319	0.903	0.651	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
170	1.359	0.934	0.680	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
175	1.400	0.966	0.710	0.340	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
180	1.440	0.997	0.739	0.369	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
185	1.481	1.028	0.768	0.398	0.335	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
190	1.521	1.060	0.797	0.428	0.364	0.351	0.330	0.326	0.324	0.324	0.324	0.324	0.324	0.324
195	1.562	1.091	0.826	0.457	0.393	0.380	0.359	0.354	0.324	0.324	0.324	0.324	0.324	0.324
200	1.602	1.122	0.855	0.487	0.422	0.409	0.387	0.383	0.324	0.324	0.324	0.324	0.324	0.324
205	1.643	1.153	0.884	0.516	0.451	0.438	0.416	0.411	0.324	0.324	0.324	0.324	0.324	0.324
210	1.683	1.185	0.914	0.545	0.480	0.466	0.444	0.440	0.328	0.324	0.324	0.324	0.324	0.324
215	1.723	1.216	0.943	0.575	0.509	0.495	0.473	0.468	0.355	0.342	0.324	0.324	0.324	0.324
220	1.764	1.247	0.972	0.604	0.538	0.524	0.501	0.496	0.382	0.369	0.324	0.324	0.324	0.324
225	1.804	1.279	1.001	0.633	0.567	0.553	0.529	0.525	0.408	0.395	0.324	0.324	0.324	0.324
230	1.845	1.310	1.030	0.663	0.596	0.582	0.558	0.553	0.435	0.421	0.324	0.324	0.324	0.324
235	1.885	1.341	1.059	0.692	0.625	0.610	0.586	0.582	0.462	0.448	0.324	0.324	0.324	0.324
240	1.926	1.373	1.089	0.722	0.654	0.639	0.615	0.610	0.488	0.474	0.324	0.324	0.324	0.324
245	1.966	1.404	1.118	0.751	0.683	0.668	0.643	0.638	0.515	0.501	0.324	0.324	0.324	0.324
250	2.007	1.435	1.147	0.780	0.712	0.697	0.672	0.667	0.541	0.527	0.324	0.324	0.324	0.324
255	2.045	1.466	1.176	0.810	0.741	0.725	0.700	0.695	0.568	0.554	0.324	0.324	0.324	0.324
260	2.083	1.498	1.205	0.839	0.769	0.754	0.729	0.724	0.595	0.580	0.345	0.324	0.324	0.324
265	2.120	1.529	1.234	0.868	0.798	0.783	0.757	0.752	0.621	0.607	0.368	0.324	0.324	0.324
270	2.158	1.560	1.263	0.898	0.827	0.812	0.785	0.780	0.648	0.633	0.391	0.324	0.324	0.324
275	2.195	1.592	1.293	0.927	0.856	0.840	0.814	0.809	0.675	0.660	0.414	0.324	0.324	0.324
280	2.232	1.623	1.322	0.957	0.885	0.869	0.842	0.837	0.701	0.686	0.437	0.324	0.324	0.324
285	2.270	1.654	1.351	0.986	0.914	0.898	0.871	0.865	0.728	0.712	0.460	0.324	0.324	0.324
290	2.307	1.685	1.380	1.015	0.943	0.927	0.899	0.894	0.755	0.739	0.484	0.324	0.324	0.324
295	2.344	1.717	1.409	1.045	0.972	0.955	0.928	0.922	0.781	0.765	0.507	0.324	0.324	0.324
300	2.382	1.748	1.438	1.074	1.001	0.984	0.956	0.951	0.808	0.792	0.530	0.324	0.324	0.324
305	2.419	1.779	1.468	1.103	1.030	1.013	0.985	0.979	0.835	0.818	0.553	0.324	0.324	0.324
310	2.457	1.811	1.497	1.133	1.059	1.042	1.013	1.007	0.861	0.845	0.576	0.324	0.324	0.324
315	2.494	1.842	1.526	1.162	1.088	1.070	1.042	1.036	0.888	0.871	0.599	0.324	0.324	0.324
320	2.531	1.873	1.555	1.192	1.117	1.099	1.070	1.064	0.915	0.898	0.622	0.336	0.324	0.324
325	2.569	1.904	1.584	1.221	1.146	1.128	1.098	1.093	0.941	0.924	0.645	0.355	0.324	0.324
330	2.606	1.936	1.613	1.250	1.175	1.157	1.127	1.121	0.968	0.951	0.669	0.375	0.324	0.324
335	2.644	1.967	1.642	1.280	1.204	1.186	1.155	1.149	0.995	0.977	0.692	0.395	0.324	0.324
340	2.681	1.998	1.672	1.309	1.233	1.214	1.184	1.178	1.021	1.004	0.715	0.415	0.324	0.324
345	2.718	2.031	1.701	1.338	1.262	1.243	1.212	1.206	1.048	1.030	0.738	0.435	0.324	0.324
350	2.756	2.071	1.730	1.368	1.291	1.272	1.241	1.234	1.075	1.056	0.761	0.454	0.324	0.324
355	2.793	2.111	1.759	1.397	1.320	1.301	1.269	1.263	1.101	1.083	0.784	0.474	0.324	0.324
360	2.831	2.151	1.788	1.427	1.349	1.329	1.298	1.291	1.128	1.109	0.807	0.494	0.324	0.324
365	2.868	2.190	1.817	1.456	1.377	1.358	1.326	1.320	1.155	1.136	0.830	0.514	0.324	0.324
370	2.905	2.230	1.847	1.485	1.406	1.387	1.354	1.348	1.181	1.162	0.853	0.533	0.324	0.324
375	2.943	2.270	1.876	1.515	1.435	1.416	1.383	1.376	1.208	1.189	0.877	0.553	0.324	0.324
380	2.980	2.310	1.905	1.544	1.464	1.444	1.411	1.405	1.235	1.215	0.900	0.573	0.324	0.324
385	3.018	2.349	1.934	1.573	1.493	1.473	1.440	1.433	1.261	1.242	0.923	0.593	0.324	0.324
390	3.055	2.389	1.963	1.603	1.522	1.502	1.468	1.462	1.288	1.268	0.946	0.613	0.324	0.324
395	3.092	2.429	1.992	1.632	1.551	1.531	1.497	1.490	1.315	1.295	0.969	0.632	0.324	0.324
400	3.130	2.469	2.021	1.662	1.580	1.559	1.525	1.518	1.341	1.321	0.992	0.652	0.324	0.324

Thickness is intumescent only.

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 31 Circular Hollow Columns 45 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
60	1.023	0.701	0.387	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
65	1.095	0.752	0.434	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
70	1.168	0.802	0.482	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
75	1.241	0.853	0.529	0.361	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324	0.324
80	1.314	0.903	0.577	0.402	0.360	0.350	0.332	0.328	0.324	0.324	0.324	0.324	0.324	0.324
85	1.386	0.954	0.624	0.443	0.400	0.389	0.371	0.367	0.324	0.324	0.324	0.324	0.324	0.324
90	1.459	1.005	0.671	0.484	0.440	0.428	0.409	0.406	0.324	0.324	0.324	0.324	0.324	0.324
95	1.532	1.055	0.719	0.525	0.479	0.468	0.448	0.444	0.340	0.327	0.324	0.324	0.324	0.324
100	1.604	1.106	0.766	0.565	0.519	0.507	0.487	0.483	0.376	0.363	0.324	0.324	0.324	0.324
105	1.677	1.156	0.814	0.606	0.559	0.546	0.526	0.522	0.412	0.399	0.324	0.324	0.324	0.324
110	1.750	1.207	0.861	0.647	0.598	0.586	0.565	0.561	0.448	0.435	0.324	0.324	0.324	0.324
115	1.823	1.257	0.909	0.688	0.638	0.625	0.604	0.599	0.485	0.471	0.324	0.324	0.324	0.324
120	1.895	1.308	0.956	0.729	0.678	0.665	0.643	0.638	0.521	0.507	0.324	0.324	0.324	0.324
125	1.968	1.358	1.003	0.770	0.717	0.704	0.681	0.677	0.557	0.543	0.324	0.324	0.324	0.324
130	2.037	1.409	1.051	0.811	0.757	0.743	0.720	0.716	0.593	0.579	0.324	0.324	0.324	0.324
135	2.092	1.459	1.098	0.852	0.797	0.783	0.759	0.754	0.630	0.615	0.338	0.324	0.324	0.324
140	2.147	1.510	1.146	0.893	0.836	0.822	0.798	0.793	0.666	0.651	0.372	0.324	0.324	0.324
145	2.203	1.560	1.193	0.933	0.876	0.861	0.837	0.832	0.702	0.687	0.406	0.324	0.324	0.324
150	2.258	1.611	1.241	0.974	0.916	0.901	0.876	0.871	0.738	0.723	0.439	0.324	0.324	0.324
155	2.313	1.662	1.288	1.015	0.955	0.940	0.915	0.910	0.775	0.759	0.473	0.324	0.324	0.324
160	2.369	1.712	1.335	1.056	0.995	0.979	0.953	0.948	0.811	0.795	0.507	0.324	0.324	0.324
165	2.424	1.763	1.383	1.097	1.035	1.019	0.992	0.987	0.847	0.831	0.541	0.324	0.324	0.324
170	2.479	1.813	1.430	1.138	1.075	1.058	1.031	1.026	0.883	0.867	0.575	0.324	0.324	0.324
175	2.535	1.864	1.478	1.179	1.114	1.098	1.070	1.065	0.920	0.902	0.608	0.324	0.324	0.324
180	2.590	1.914	1.525	1.220	1.154	1.137	1.109	1.103	0.956	0.938	0.642	0.324	0.324	0.324
185	2.645	1.965	1.573	1.261	1.194	1.176	1.148	1.142	0.992	0.974	0.676	0.324	0.324	0.324
190	2.701	2.015	1.620	1.302	1.233	1.216	1.187	1.181	1.028	1.010	0.710	0.348	0.324	0.324
195	2.756	2.065	1.667	1.342	1.273	1.255	1.225	1.220	1.064	1.046	0.744	0.381	0.324	0.324
200	2.812	2.115	1.715	1.383	1.313	1.294	1.264	1.258	1.101	1.082	0.777	0.414	0.324	0.324
205	2.867	2.165	1.762	1.424	1.352	1.334	1.303	1.297	1.137	1.118	0.811	0.447	0.324	0.324
210	2.922	2.215	1.810	1.465	1.392	1.373	1.342	1.336	1.173	1.154	0.845	0.481	0.324	0.324
215	2.978	2.265	1.857	1.506	1.432	1.413	1.381	1.375	1.209	1.190	0.879	0.514	0.324	0.324
220	3.033	2.315	1.905	1.547	1.471	1.452	1.420	1.413	1.246	1.226	0.913	0.547	0.324	0.324
225	3.088	2.365	1.952	1.588	1.511	1.491	1.459	1.452	1.282	1.262	0.947	0.580	0.339	0.324
230	3.144	2.415	1.999	1.629	1.551	1.531	1.498	1.491	1.318	1.298	0.980	0.614	0.368	0.324
235	3.199	2.465	2.048	1.670	1.590	1.570	1.536	1.530	1.354	1.334	1.014	0.647	0.397	0.324
240	3.254	2.515	2.099	1.710	1.630	1.609	1.575	1.568	1.391	1.370	1.048	0.680	0.425	0.324
245	3.310	2.565	2.150	1.751	1.670	1.649	1.614	1.607	1.427	1.406	1.082	0.713	0.454	0.324
250	3.365	2.615	2.201	1.792	1.709	1.688	1.653	1.646	1.463	1.442	1.116	0.747	0.483	0.324
255	3.420	2.665	2.251	1.833	1.749	1.728	1.692	1.685	1.499	1.478	1.149	0.780	0.512	0.324
260	3.476	2.715	2.302	1.874	1.789	1.767	1.731	1.723	1.536	1.514	1.183	0.813	0.540	0.324
265	3.531	2.765	2.353	1.915	1.829	1.806	1.770	1.762	1.572	1.550	1.217	0.847	0.569	0.324
270	3.587	2.815	2.404	1.956	1.868	1.846	1.808	1.801	1.608	1.586	1.251	0.880	0.598	0.324
275	3.642	2.865	2.454	1.997	1.908	1.885	1.847	1.840	1.644	1.622	1.285	0.913	0.627	0.324
280	3.697	2.915	2.505	2.042	1.948	1.924	1.886	1.879	1.681	1.658	1.319	0.946	0.655	0.324
285	3.753	2.965	2.556	2.094	1.987	1.964	1.925	1.917	1.717	1.694	1.352	0.980	0.684	0.339
290	3.808	3.015	2.607	2.146	2.028	2.003	1.964	1.956	1.753	1.730	1.386	1.013	0.713	0.363
295	3.863	3.065	2.657	2.198	2.081	2.049	2.003	1.995	1.789	1.766	1.420	1.046	0.742	0.387
300	3.919	3.115	2.708	2.250	2.133	2.101	2.048	2.037	1.825	1.802	1.454	1.079	0.770	0.411
305	3.974	3.165	2.759	2.302	2.185	2.154	2.101	2.090	1.862	1.838	1.488	1.113	0.799	0.435
310	4.037	3.215	2.810	2.354	2.237	2.206	2.153	2.142	1.898	1.873	1.521	1.146	0.828	0.459
315	4.107	3.265	2.860	2.407	2.290	2.259	2.206	2.195	1.934	1.909	1.555	1.179	0.857	0.482
320	4.177	3.315	2.911	2.459	2.342	2.311	2.258	2.248	1.970	1.945	1.589	1.212	0.885	0.506
325	4.247	3.365	2.962	2.511	2.394	2.363	2.311	2.300	2.007	1.981	1.623	1.246	0.914	0.530
330	4.317	3.415	3.013	2.563	2.447	2.416	2.363	2.353	2.052	2.017	1.657	1.279	0.943	0.554
335	4.387	3.465	3.063	2.615	2.499	2.468	2.416	2.405	2.106	2.068	1.690	1.312	0.972	0.578
340	4.456	3.515	3.114	2.667	2.551	2.521	2.468	2.458	2.159	2.122	1.724	1.346	1.000	0.602
345	4.526	3.565	3.165	2.720	2.604	2.573	2.521	2.510	2.213	2.175	1.758	1.379	1.029	0.626
350	4.596	3.615	3.216	2.772	2.656	2.625	2.573	2.563	2.266	2.229	1.792	1.412	1.058	0.649
355	4.666	3.665	3.266	2.824	2.708	2.678	2.626	2.615	2.320	2.282	1.826	1.445	1.086	0.673
360	4.736	3.715	3.317	2.876	2.761	2.730	2.678	2.668	2.373	2.336	1.860	1.479	1.115	0.697
365	4.806	3.765	3.368	2.928	2.813	2.782	2.731	2.720	2.427	2.390	1.893	1.512	1.144	0.721
370	4.876	3.815	3.419	2.980	2.865	2.835	2.783	2.773	2.480	2.443	1.927	1.545	1.173	0.745
375	4.946	3.865	3.469	3.032	2.918	2.887	2.836	2.826	2.533	2.497	1.961	1.578	1.201	0.769
380	5.016	3.915	3.520	3.085	2.970	2.940	2.889	2.878	2.587	2.550	1.995	1.612	1.230	0.793
385	5.086	3.965	3.571	3.137	3.022	2.992	2.941	2.931	2.640	2.604	2.032	1.645	1.259	0.816
390	5.156	4.023	3.622	3.189	3.075	3.044	2.994	2.983	2.694	2.658	2.084	1.678	1.288	0.840
395	5.226	4.099	3.672	3.241	3.127	3.097	3.046	3.036	2.747	2.711	2.136	1.711	1.316	0.864
400	5.296	4.176	3.723	3.293	3.179	3.149	3.099	3.088	2.801	2.765	2.188	1.745	1.345	0.888

Thickness is intumescent only.

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 32 Circular Hollow Columns 60 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
60	1.561	1.189	0.886	0.625	0.568	0.554	0.531	0.527	0.380	0.372	0.324	0.324	0.324	0.324
65	1.678	1.277	0.954	0.680	0.621	0.607	0.584	0.579	0.432	0.424	0.324	0.324	0.324	0.324
70	1.795	1.365	1.022	0.734	0.675	0.661	0.637	0.632	0.484	0.475	0.327	0.324	0.324	0.324
75	1.912	1.454	1.091	0.788	0.728	0.714	0.690	0.685	0.536	0.527	0.373	0.324	0.324	0.324
80	2.030	1.542	1.159	0.842	0.782	0.767	0.743	0.738	0.588	0.578	0.418	0.324	0.324	0.324
85	2.150	1.630	1.228	0.897	0.835	0.821	0.796	0.791	0.640	0.630	0.464	0.324	0.324	0.324
90	2.269	1.718	1.296	0.951	0.889	0.874	0.849	0.844	0.692	0.681	0.510	0.326	0.324	0.324
95	2.389	1.806	1.364	1.005	0.942	0.927	0.902	0.897	0.744	0.733	0.555	0.366	0.324	0.324
100	2.509	1.894	1.433	1.059	0.996	0.980	0.955	0.950	0.796	0.784	0.601	0.406	0.324	0.324
105	2.629	1.982	1.501	1.114	1.049	1.034	1.008	1.003	0.848	0.836	0.646	0.447	0.324	0.324
110	2.749	2.069	1.570	1.168	1.103	1.087	1.061	1.055	0.900	0.888	0.692	0.487	0.324	0.324
115	2.868	2.154	1.638	1.222	1.156	1.140	1.114	1.108	0.952	0.939	0.737	0.528	0.324	0.324
120	2.988	2.239	1.706	1.276	1.210	1.194	1.167	1.161	1.003	0.991	0.783	0.568	0.324	0.324
125	3.108	2.324	1.775	1.331	1.263	1.247	1.220	1.214	1.055	1.042	0.829	0.609	0.347	0.324
130	3.228	2.408	1.843	1.385	1.317	1.300	1.272	1.267	1.107	1.094	0.874	0.649	0.383	0.324
135	3.348	2.493	1.911	1.439	1.371	1.354	1.325	1.320	1.159	1.145	0.920	0.690	0.419	0.324
140	3.467	2.578	1.980	1.493	1.424	1.407	1.378	1.373	1.211	1.197	0.965	0.730	0.455	0.324
145	3.587	2.663	2.051	1.548	1.478	1.460	1.431	1.426	1.263	1.248	1.011	0.770	0.491	0.324
150	3.707	2.748	2.129	1.602	1.531	1.514	1.484	1.479	1.315	1.300	1.057	0.811	0.527	0.324
155	3.827	2.833	2.206	1.656	1.585	1.567	1.537	1.531	1.367	1.351	1.102	0.851	0.563	0.324
160	3.946	2.918	2.283	1.710	1.638	1.620	1.590	1.584	1.419	1.403	1.148	0.892	0.599	0.324
165	4.041	3.003	2.360	1.765	1.692	1.674	1.643	1.637	1.471	1.455	1.193	0.932	0.635	0.324
170	4.114	3.088	2.438	1.819	1.745	1.727	1.696	1.690	1.523	1.506	1.239	0.973	0.671	0.324
175	4.187	3.173	2.515	1.873	1.799	1.780	1.749	1.743	1.575	1.558	1.284	1.013	0.707	0.324
180	4.260	3.258	2.592	1.927	1.852	1.833	1.802	1.796	1.627	1.609	1.330	1.054	0.744	0.324
185	4.334	3.343	2.669	1.982	1.906	1.887	1.855	1.849	1.679	1.661	1.376	1.094	0.780	0.327
190	4.407	3.428	2.747	2.041	1.959	1.940	1.908	1.902	1.731	1.712	1.421	1.134	0.816	0.363
195	4.480	3.513	2.824	2.114	2.013	1.993	1.961	1.954	1.783	1.764	1.467	1.175	0.852	0.399
200	4.553	3.598	2.901	2.187	2.079	2.054	2.014	2.007	1.834	1.815	1.512	1.215	0.888	0.435
205	4.627	3.683	2.978	2.260	2.149	2.122	2.079	2.070	1.886	1.867	1.558	1.256	0.924	0.471
210	4.700	3.768	3.055	2.333	2.218	2.191	2.146	2.137	1.938	1.918	1.604	1.296	0.960	0.508
215	4.773	3.853	3.133	2.406	2.288	2.259	2.213	2.204	1.990	1.970	1.649	1.337	0.996	0.544
220	4.846	3.937	3.210	2.479	2.357	2.328	2.280	2.271	2.046	2.022	1.695	1.377	1.032	0.580
225	4.919	4.016	3.287	2.552	2.426	2.396	2.347	2.337	2.110	2.084	1.740	1.418	1.068	0.616
230	4.993	4.078	3.364	2.625	2.496	2.465	2.414	2.404	2.173	2.147	1.786	1.458	1.104	0.652
235	5.066	4.139	3.442	2.698	2.565	2.533	2.481	2.471	2.236	2.211	1.831	1.499	1.140	0.689
240	5.139	4.201	3.519	2.771	2.635	2.602	2.548	2.538	2.299	2.274	1.877	1.539	1.176	0.725
245	5.212	4.262	3.596	2.844	2.704	2.671	2.616	2.605	2.362	2.337	1.923	1.579	1.212	0.761
250	5.285	4.324	3.673	2.917	2.774	2.739	2.683	2.672	2.425	2.400	1.968	1.620	1.248	0.797
255	5.359	4.385	3.750	2.990	2.843	2.808	2.750	2.738	2.488	2.463	2.014	1.660	1.284	0.833
260	5.432	4.447	3.828	3.063	2.913	2.876	2.817	2.805	2.551	2.526	2.073	1.701	1.320	0.869
265	5.505	4.508	3.905	3.136	2.982	2.945	2.884	2.872	2.614	2.589	2.135	1.741	1.356	0.906
270	5.578	4.569	3.982	3.210	3.051	3.013	2.951	2.939	2.678	2.652	2.197	1.782	1.392	0.942
275	5.651	4.631	4.052	3.283	3.121	3.082	3.018	3.006	2.741	2.715	2.259	1.822	1.428	0.978
280	5.725	4.692	4.120	3.356	3.190	3.150	3.085	3.073	2.804	2.778	2.322	1.863	1.464	1.014
285	5.798	4.754	4.188	3.429	3.260	3.219	3.153	3.139	2.867	2.842	2.384	1.903	1.500	1.050
290	5.871	4.815	4.256	3.502	3.329	3.288	3.220	3.206	2.930	2.905	2.446	1.943	1.536	1.086
295	5.944	4.877	4.323	3.575	3.399	3.356	3.287	3.273	2.993	2.968	2.509	1.984	1.572	1.123
300	6.048	4.938	4.391	3.648	3.468	3.425	3.354	3.340	3.056	3.031	2.571	2.025	1.608	1.159
305	6.175	4.999	4.459	3.721	3.538	3.493	3.421	3.407	3.119	3.094	2.633	2.086	1.644	1.195
310	6.302	5.061	4.527	3.794	3.607	3.562	3.488	3.474	3.183	3.157	2.695	2.147	1.680	1.231
315	6.429	5.122	4.594	3.867	3.676	3.630	3.555	3.541	3.246	3.220	2.758	2.208	1.717	1.267
320	6.556	5.184	4.662	3.940	3.746	3.699	3.623	3.607	3.309	3.283	2.820	2.270	1.753	1.304
325	6.683	5.245	4.730	4.014	3.815	3.767	3.690	3.674	3.372	3.346	2.882	2.331	1.789	1.340
330	6.811	5.307	4.798	4.092	3.885	3.836	3.757	3.741	3.435	3.409	2.944	2.392	1.825	1.376
335	6.938	5.368	4.865	4.170	3.954	3.905	3.824	3.808	3.498	3.473	3.007	2.453	1.861	1.412
340	7.065	5.430	4.933	4.249	4.028	3.973	3.891	3.875	3.561	3.536	3.069	2.514	1.897	1.448
345	7.192	5.491	5.001	4.327	4.109	4.050	3.958	3.942	3.624	3.599	3.131	2.575	1.933	1.484
350	7.319	5.552	5.069	4.405	4.191	4.133	4.032	4.010	3.687	3.662	3.193	2.637	1.969	1.521
355	7.446	5.614	5.136	4.483	4.273	4.216	4.116	4.095	3.751	3.725	3.256	2.698	2.005	1.557
360	7.573	5.675	5.204	4.561	4.354	4.298	4.200	4.180	3.814	3.788	3.318	2.759	2.052	1.593
365	7.700	5.737	5.272	4.640	4.436	4.381	4.285	4.265	3.877	3.851	3.380	2.820	2.112	1.629
370	7.828	5.798	5.340	4.718	4.518	4.464	4.369	4.349	3.940	3.914	3.443	2.881	2.171	1.665
375	7.955	5.860	5.408	4.796	4.600	4.546	4.454	4.434	4.004	3.977	3.505	2.942	2.231	1.702
380	8.082	5.921	5.475	4.874	4.681	4.629	4.538	4.519	4.092	4.056	3.567	3.003	2.290	1.738
385	8.209	6.003	5.543	4.952	4.763	4.712	4.622	4.604	4.181	4.144	3.629	3.065	2.350	1.774
390	8.336	6.266	5.611	5.031	4.845	4.794	4.707	4.689	4.270	4.233	3.692	3.126	2.409	1.810
395	8.463	6.528	5.679	5.109	4.926	4.877	4.791	4.773	4.358	4.321	3.754	3.187	2.469	1.846
400	8.590	6.790	5.746	5.187	5.008	4.960	4.876	4.858	4.447	4.409	3.816	3.248	2.528	1.882

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Table 33 Circular Hollow Columns 75 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
60	2.183	1.673	1.327	1.027	0.964	0.949	0.924	0.919	0.794	0.780	0.567	0.352	0.324	0.324
65	2.536	1.801	1.432	1.112	1.045	1.029	1.002	0.997	0.863	0.848	0.623	0.406	0.324	0.324
70	2.888	1.929	1.537	1.197	1.126	1.109	1.080	1.075	0.932	0.916	0.680	0.460	0.324	0.324
75	3.240	2.073	1.642	1.282	1.206	1.189	1.158	1.152	1.001	0.985	0.736	0.514	0.358	0.324
80	3.592	2.262	1.747	1.367	1.287	1.268	1.236	1.230	1.071	1.053	0.793	0.567	0.406	0.324
85	3.945	2.451	1.851	1.452	1.368	1.348	1.315	1.308	1.140	1.122	0.850	0.621	0.455	0.324
90	4.080	2.640	1.956	1.537	1.449	1.428	1.393	1.386	1.209	1.190	0.906	0.675	0.503	0.324
95	4.174	2.829	2.065	1.622	1.530	1.508	1.471	1.463	1.279	1.258	0.963	0.728	0.551	0.324
100	4.268	3.018	2.181	1.707	1.610	1.587	1.549	1.541	1.348	1.327	1.019	0.782	0.599	0.365
105	4.362	3.207	2.296	1.792	1.691	1.667	1.627	1.619	1.417	1.395	1.076	0.836	0.647	0.408
110	4.456	3.396	2.412	1.877	1.772	1.747	1.705	1.697	1.487	1.463	1.132	0.889	0.695	0.450
115	4.550	3.585	2.527	1.962	1.853	1.827	1.783	1.774	1.556	1.532	1.189	0.943	0.744	0.492
120	4.644	3.774	2.643	2.053	1.933	1.907	1.861	1.852	1.625	1.600	1.245	0.997	0.792	0.534
125	4.739	3.963	2.758	2.157	2.014	1.986	1.939	1.930	1.694	1.669	1.302	1.050	0.840	0.577
130	4.833	4.070	2.874	2.261	2.115	2.078	2.017	2.007	1.764	1.737	1.358	1.104	0.888	0.619
135	4.927	4.156	2.989	2.366	2.217	2.180	2.117	2.104	1.833	1.805	1.415	1.158	0.936	0.661
140	5.021	4.242	3.105	2.470	2.320	2.283	2.219	2.206	1.902	1.874	1.471	1.211	0.984	0.704
145	5.115	4.329	3.220	2.574	2.423	2.385	2.320	2.307	1.972	1.942	1.528	1.265	1.033	0.746
150	5.209	4.415	3.336	2.678	2.525	2.487	2.422	2.409	2.049	2.011	1.585	1.319	1.081	0.788
155	5.303	4.502	3.451	2.782	2.628	2.590	2.524	2.511	2.148	2.104	1.641	1.372	1.129	0.830
160	5.397	4.588	3.567	2.887	2.731	2.692	2.626	2.612	2.248	2.203	1.698	1.426	1.177	0.873
165	5.491	4.674	3.682	2.991	2.833	2.794	2.727	2.714	2.347	2.303	1.754	1.480	1.225	0.915
170	5.585	4.761	3.798	3.095	2.936	2.896	2.829	2.815	2.446	2.402	1.811	1.533	1.273	0.957
175	5.679	4.847	3.913	3.199	3.039	2.999	2.931	2.917	2.546	2.501	1.867	1.587	1.321	0.999
180	5.773	4.933	4.023	3.304	3.141	3.101	3.032	3.019	2.645	2.600	1.924	1.641	1.370	1.042
185	5.867	5.020	4.114	3.408	3.244	3.203	3.134	3.120	2.745	2.699	1.980	1.694	1.418	1.084
190	5.961	5.106	4.204	3.512	3.347	3.305	3.236	3.222	2.844	2.799	2.046	1.748	1.466	1.126
195	6.146	5.192	4.295	3.616	3.449	3.408	3.337	3.323	2.944	2.898	2.138	1.802	1.514	1.169
200	6.347	5.279	4.386	3.721	3.552	3.510	3.439	3.425	3.043	2.997	2.231	1.855	1.562	1.211
205	6.548	5.365	4.476	3.825	3.655	3.612	3.541	3.527	3.143	3.096	2.324	1.909	1.610	1.253
210	6.749	5.451	4.567	3.929	3.757	3.715	3.643	3.628	3.242	3.196	2.417	1.963	1.659	1.295
215	6.950	5.538	4.658	4.024	3.860	3.817	3.744	3.730	3.341	3.295	2.509	2.016	1.707	1.338
220	7.152	5.624	4.749	4.100	3.963	3.919	3.846	3.831	3.441	3.394	2.602	2.087	1.755	1.380
225	7.353	5.710	4.839	4.176	4.046	4.015	3.948	3.933	3.540	3.493	2.695	2.160	1.803	1.422
230	7.554	5.797	4.930	4.252	4.118	4.086	4.035	4.024	3.640	3.592	2.788	2.232	1.851	1.465
235	7.755	5.883	5.021	4.327	4.189	4.157	4.105	4.095	3.739	3.692	2.880	2.305	1.899	1.507
240	7.956	5.969	5.112	4.403	4.261	4.227	4.175	4.165	3.839	3.791	2.973	2.378	1.948	1.549
245	8.157	6.111	5.202	4.479	4.333	4.298	4.246	4.236	3.938	3.890	3.066	2.451	1.996	1.591
250	8.358	6.257	5.293	4.555	4.405	4.369	4.316	4.307	4.028	3.989	3.159	2.523	2.051	1.634
255	8.560	6.402	5.384	4.630	4.476	4.440	4.387	4.377	4.101	4.066	3.252	2.596	2.116	1.676
260	-	6.548	5.474	4.706	4.548	4.511	4.457	4.448	4.174	4.139	3.344	2.669	2.181	1.718
265	-	6.694	5.565	4.782	4.620	4.581	4.528	4.518	4.247	4.212	3.437	2.742	2.246	1.760
270	-	6.840	5.656	4.858	4.692	4.652	4.598	4.589	4.320	4.286	3.530	2.814	2.311	1.803
275	-	6.986	5.747	4.933	4.763	4.723	4.669	4.659	4.393	4.359	3.623	2.887	2.376	1.845
280	-	7.131	5.837	5.009	4.835	4.794	4.739	4.730	4.466	4.432	3.715	2.960	2.441	1.887
285	-	7.277	5.928	5.085	4.907	4.864	4.810	4.800	4.539	4.506	3.808	3.033	2.506	1.930
290	-	7.423	6.038	5.161	4.979	4.935	4.880	4.871	4.612	4.579	3.901	3.105	2.571	1.972
295	-	7.569	6.170	5.236	5.050	5.006	4.951	4.942	4.685	4.652	3.994	3.178	2.636	2.014
300	-	7.715	6.302	5.312	5.122	5.077	5.021	5.012	4.758	4.726	4.075	3.251	2.701	2.071
305	-	7.861	6.434	5.388	5.194	5.148	5.092	5.083	4.831	4.799	4.156	3.324	2.766	2.131
310	-	8.006	6.566	5.464	5.266	5.218	5.162	5.153	4.904	4.872	4.237	3.396	2.831	2.192
315	-	8.152	6.698	5.540	5.337	5.289	5.233	5.224	4.977	4.946	4.317	3.469	2.896	2.252
320	-	8.298	6.831	5.615	5.409	5.360	5.303	5.294	5.050	5.019	4.398	3.542	2.961	2.313
325	-	8.444	6.963	5.691	5.481	5.431	5.374	5.365	5.123	5.093	4.479	3.614	3.026	2.373
330	-	8.590	7.095	5.767	5.553	5.501	5.444	5.436	5.196	5.166	4.559	3.687	3.091	2.434
335	-	-	7.227	5.843	5.624	5.572	5.515	5.506	5.269	5.239	4.640	3.760	3.156	2.494
340	-	-	7.359	5.918	5.696	5.643	5.585	5.577	5.342	5.313	4.721	3.833	3.221	2.555
345	-	-	7.491	6.031	5.768	5.714	5.656	5.647	5.415	5.386	4.802	3.905	3.286	2.615
350	-	-	7.623	6.260	5.840	5.785	5.726	5.718	5.488	5.459	4.882	3.978	3.351	2.676
355	-	-	7.755	6.489	5.911	5.855	5.797	5.788	5.561	5.533	4.963	4.066	3.416	2.736
360	-	-	7.887	6.718	6.005	5.926	5.867	5.859	5.634	5.606	5.044	4.161	3.481	2.797
365	-	-	8.019	6.947	6.298	6.069	5.938	5.929	5.707	5.679	5.124	4.257	3.546	2.857
370	-	-	8.151	7.176	6.590	6.384	6.126	6.088	5.780	5.753	5.205	4.352	3.611	2.918
375	-	-	8.283	7.405	6.882	6.698	6.456	6.418	5.853	5.826	5.286	4.447	3.676	2.979
380	-	-	8.415	7.634	7.175	7.013	6.785	6.748	5.926	5.899	5.366	4.542	3.741	3.039
385	-	-	8.547	7.863	7.467	7.327	7.115	7.078	6.081	5.973	5.447	4.637	3.806	3.100
390	-	-	-	8.093	7.760	7.642	7.445	7.408	6.411	6.290	5.528	4.732	3.871	3.160
395	-	-	-	8.322	8.052	7.957	7.774	7.738	6.741	6.620	5.609	4.827	3.936	3.221
400	-	-	-	8.551	8.345	8.271	8.104	8.067	7.071	6.950	5.689	4.922	4.001	3.281

Thickness is intumescent only.

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 34 Circular Hollow Columns 90 minutes														
Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
60	4.074	2.747	1.767	1.426	1.354	1.337	1.309	1.303	1.160	1.145	0.908	0.705	0.515	0.324
65	4.292	3.002	1.908	1.544	1.467	1.449	1.419	1.413	1.260	1.243	0.991	0.773	0.568	0.353
70	4.509	3.347	2.074	1.662	1.580	1.561	1.529	1.522	1.360	1.342	1.073	0.841	0.627	0.407
75	4.727	3.693	2.349	1.780	1.693	1.673	1.639	1.632	1.459	1.440	1.155	0.910	0.685	0.462
80	4.944	4.016	2.623	1.897	1.806	1.785	1.748	1.741	1.559	1.539	1.237	0.978	0.744	0.516
85	5.162	4.156	2.898	2.015	1.919	1.896	1.858	1.851	1.658	1.637	1.319	1.046	0.803	0.571
90	5.379	4.297	3.172	2.196	2.036	2.008	1.968	1.960	1.758	1.736	1.401	1.114	0.861	0.625
95	5.597	4.437	3.447	2.381	2.203	2.165	2.101	2.089	1.858	1.834	1.484	1.182	0.920	0.680
100	5.815	4.577	3.722	2.566	2.371	2.328	2.257	2.244	1.957	1.933	1.566	1.250	0.978	0.734
105	6.017	4.718	3.996	2.750	2.538	2.491	2.414	2.399	2.065	2.033	1.648	1.319	1.037	0.789
110	6.177	4.858	4.107	2.935	2.705	2.654	2.570	2.554	2.189	2.156	1.730	1.387	1.095	0.843
115	6.336	4.998	4.215	3.120	2.873	2.817	2.726	2.709	2.312	2.279	1.812	1.455	1.154	0.898
120	6.495	5.139	4.323	3.305	3.040	2.980	2.882	2.863	2.436	2.402	1.894	1.523	1.213	0.952
125	6.655	5.279	4.431	3.490	3.208	3.143	3.039	3.018	2.559	2.525	1.977	1.591	1.271	1.007
130	6.814	5.419	4.539	3.675	3.375	3.306	3.195	3.173	2.683	2.648	2.072	1.660	1.330	1.061
135	6.974	5.559	4.647	3.860	3.542	3.469	3.351	3.328	2.806	2.771	2.185	1.728	1.388	1.115
140	7.133	5.700	4.755	4.027	3.710	3.632	3.507	3.483	2.930	2.894	2.298	1.796	1.447	1.170
145	7.293	5.840	4.863	4.136	3.877	3.795	3.664	3.638	3.054	3.017	2.411	1.864	1.505	1.224
150	7.452	5.982	4.971	4.244	4.030	3.958	3.820	3.793	3.177	3.140	2.524	1.932	1.564	1.279
155	7.612	6.171	5.079	4.353	4.140	4.083	3.976	3.948	3.301	3.263	2.637	2.001	1.623	1.333
160	7.771	6.361	5.187	4.462	4.250	4.193	4.095	4.074	3.424	3.386	2.750	2.093	1.681	1.388
165	7.930	6.551	5.295	4.571	4.360	4.304	4.206	4.186	3.548	3.509	2.863	2.196	1.740	1.442
170	8.090	6.740	5.403	4.680	4.470	4.414	4.317	4.297	3.671	3.632	2.976	2.300	1.798	1.497
175	8.249	6.930	5.511	4.789	4.580	4.525	4.429	4.409	3.795	3.755	3.089	2.404	1.857	1.551
180	8.409	7.119	5.619	4.898	4.690	4.635	4.540	4.520	3.918	3.877	3.202	2.508	1.915	1.606
185	8.568	7.309	5.727	5.007	4.800	4.746	4.651	4.632	4.040	4.000	3.315	2.612	1.974	1.660
190	-	7.498	5.835	5.116	4.911	4.857	4.762	4.743	4.159	4.118	3.428	2.716	2.038	1.715
195	-	7.688	5.943	5.225	5.021	4.967	4.874	4.855	4.278	4.236	3.541	2.819	2.128	1.769
200	-	7.878	6.150	5.334	5.131	5.078	4.985	4.966	4.397	4.353	3.654	2.923	2.219	1.823
205	-	8.067	6.399	5.443	5.241	5.188	5.096	5.078	4.516	4.471	3.767	3.027	2.309	1.878
210	-	8.257	6.649	5.552	5.351	5.299	5.208	5.190	4.635	4.589	3.880	3.131	2.400	1.932
215	-	8.446	6.899	5.661	5.461	5.409	5.319	5.301	4.754	4.706	3.993	3.235	2.490	1.987
220	-	8.636	7.149	5.770	5.571	5.520	5.430	5.413	4.873	4.824	4.091	3.339	2.581	2.046
225	-	-	7.398	5.879	5.681	5.630	5.542	5.524	4.992	4.941	4.187	3.442	2.671	2.112
230	-	-	7.648	6.000	5.792	5.741	5.653	5.636	5.111	5.059	4.284	3.546	2.762	2.179
235	-	-	7.898	6.218	5.902	5.852	5.764	5.747	5.230	5.177	4.380	3.650	2.852	2.246
240	-	-	8.148	6.436	6.044	5.962	5.876	5.859	5.349	5.294	4.477	3.754	2.943	2.313
245	-	-	8.397	6.654	6.254	6.158	5.996	5.970	5.468	5.412	4.573	3.858	3.033	2.380
250	-	-	8.647	6.873	6.465	6.365	6.200	6.168	5.586	5.529	4.670	3.962	3.124	2.447
255	-	-	-	7.091	6.675	6.573	6.404	6.371	5.705	5.647	4.766	4.052	3.214	2.514
260	-	-	-	7.309	6.885	6.781	6.608	6.575	5.824	5.765	4.863	4.134	3.305	2.581
265	-	-	-	7.528	7.095	6.989	6.812	6.778	5.943	5.882	4.959	4.217	3.395	2.648
270	-	-	-	7.746	7.305	7.197	7.016	6.981	6.106	6.012	5.056	4.299	3.486	2.715
275	-	-	-	7.964	7.516	7.405	7.220	7.184	6.285	6.188	5.152	4.381	3.576	2.782
280	-	-	-	8.182	7.726	7.612	7.424	7.387	6.464	6.364	5.249	4.464	3.667	2.849
285	-	-	-	8.401	7.936	7.820	7.628	7.590	6.643	6.540	5.345	4.546	3.757	2.916
290	-	-	-	-	8.146	8.028	7.832	7.793	6.822	6.716	5.442	4.628	3.848	2.983
295	-	-	-	-	8.356	8.236	8.036	7.996	7.001	6.893	5.538	4.711	3.938	3.050
300	-	-	-	-	8.567	8.444	8.240	8.199	7.180	7.069	5.635	4.793	4.029	3.116
305	-	-	-	-	-	-	8.444	8.402	7.359	7.245	5.731	4.875	4.121	3.183
310	-	-	-	-	-	-	-	-	7.538	7.421	5.828	4.958	4.214	3.250
315	-	-	-	-	-	-	-	-	7.717	7.597	5.924	5.040	4.306	3.317
320	-	-	-	-	-	-	-	-	7.897	7.773	6.065	5.122	4.398	3.384
325	-	-	-	-	-	-	-	-	8.076	7.950	6.259	5.205	4.490	3.451
330	-	-	-	-	-	-	-	-	8.255	8.126	6.452	5.287	4.582	3.518
335	-	-	-	-	-	-	-	-	8.434	8.302	6.646	5.369	4.674	3.585
340	-	-	-	-	-	-	-	-	8.613	8.478	6.839	5.452	4.766	3.652
345	-	-	-	-	-	-	-	-	-	8.654	7.033	5.534	4.859	3.719
350	-	-	-	-	-	-	-	-	-	-	7.226	5.616	4.951	3.786
355	-	-	-	-	-	-	-	-	-	-	7.420	5.699	5.043	3.853
360	-	-	-	-	-	-	-	-	-	-	7.613	5.781	5.135	3.920
365	-	-	-	-	-	-	-	-	-	-	7.806	5.863	5.227	3.987
370	-	-	-	-	-	-	-	-	-	-	8.000	5.946	5.319	4.092
375	-	-	-	-	-	-	-	-	-	-	8.193	6.194	5.412	4.208
380	-	-	-	-	-	-	-	-	-	-	8.387	6.539	5.504	4.323
385	-	-	-	-	-	-	-	-	-	-	8.580	6.884	5.596	4.439
390	-	-	-	-	-	-	-	-	-	-	-	7.229	5.688	4.555
395	-	-	-	-	-	-	-	-	-	-	-	7.574	5.780	4.671
400	-	-	-	-	-	-	-	-	-	-	-	7.919	5.872	4.786

Thickness is intumescent only.

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SHERWIN WILLIAMS

Table 35 Circular Hollow Columns 120 minutes Required Thickness (mm) for a Design Temperature (°C)														
Section Factor (m-1)	350	400	450	500	512	515	520	521	547	550	600	650	700	750
60	6.480	5.422	4.172	3.095	2.346	2.282	2.175	2.154	1.821	1.821	1.584	1.346	1.137	1.032
65	6.853	5.778	4.528	3.368	2.883	2.807	2.681	2.657	2.096	2.041	1.721	1.468	1.245	1.129
70	7.225	6.116	4.884	3.843	3.421	3.332	3.187	3.159	2.518	2.455	1.859	1.589	1.352	1.225
75	7.597	6.432	5.241	4.188	3.958	3.856	3.694	3.662	2.940	2.870	1.997	1.710	1.460	1.322
80	7.970	6.748	5.597	4.468	4.242	4.188	4.100	4.083	3.361	3.285	2.256	1.831	1.568	1.419
85	8.342	7.065	5.953	4.748	4.505	4.446	4.351	4.333	3.783	3.699	2.542	1.952	1.675	1.515
90	-	7.381	6.247	5.028	4.767	4.705	4.603	4.583	4.106	4.059	2.828	2.102	1.783	1.612
95	-	7.697	6.537	5.308	5.029	4.963	4.854	4.833	4.323	4.272	3.114	2.290	1.890	1.708
100	-	8.013	6.827	5.588	5.292	5.221	5.106	5.083	4.541	4.486	3.400	2.478	1.998	1.805
105	-	8.329	7.117	5.868	5.554	5.479	5.357	5.334	4.758	4.699	3.686	2.667	2.113	1.902
110	-	-	7.407	6.146	5.816	5.737	5.608	5.584	4.975	4.913	3.972	2.855	2.230	1.998
115	-	-	7.696	6.424	6.084	5.997	5.860	5.834	5.193	5.126	4.140	3.044	2.347	2.090
120	-	-	7.986	6.701	6.362	6.274	6.125	6.096	5.410	5.339	4.295	3.232	2.464	2.180
125	-	-	8.276	6.979	6.639	6.552	6.403	6.374	5.627	5.553	4.451	3.420	2.581	2.270
130	-	-	-	7.257	6.917	6.829	6.681	6.651	5.845	5.766	4.606	3.609	2.698	2.360
135	-	-	-	7.534	7.194	7.107	6.958	6.929	6.086	5.981	4.761	3.797	2.815	2.450
140	-	-	-	7.812	7.471	7.384	7.236	7.206	6.363	6.258	4.916	3.986	2.932	2.539
145	-	-	-	8.089	7.749	7.662	7.514	7.484	6.640	6.535	5.071	4.138	3.049	2.629
150	-	-	-	8.367	8.026	7.939	7.791	7.761	6.917	6.812	5.226	4.286	3.165	2.719
155	-	-	-	-	8.304	8.217	8.069	8.039	7.194	7.089	5.381	4.435	3.282	2.809
160	-	-	-	-	-	8.494	8.347	8.317	7.472	7.366	5.536	4.584	3.399	2.899
165	-	-	-	-	-	-	-	-	7.749	7.643	5.691	4.733	3.516	2.989
170	-	-	-	-	-	-	-	-	8.026	7.920	5.847	4.881	3.633	3.079
175	-	-	-	-	-	-	-	-	8.303	8.197	6.054	5.030	3.750	3.169
180	-	-	-	-	-	-	-	-	-	8.474	6.525	5.179	3.867	3.259
185	-	-	-	-	-	-	-	-	-	-	6.995	5.327	3.984	3.349
190	-	-	-	-	-	-	-	-	-	-	7.466	5.476	4.157	3.438
195	-	-	-	-	-	-	-	-	-	-	7.936	5.625	4.338	3.528
200	-	-	-	-	-	-	-	-	-	-	8.407	5.774	4.519	3.618
205	-	-	-	-	-	-	-	-	-	-	-	5.922	4.701	3.708
210	-	-	-	-	-	-	-	-	-	-	-	6.297	4.882	3.798
215	-	-	-	-	-	-	-	-	-	-	-	6.800	5.064	3.888
220	-	-	-	-	-	-	-	-	-	-	-	7.302	5.245	3.978
225	-	-	-	-	-	-	-	-	-	-	-	7.805	5.427	4.128
230	-	-	-	-	-	-	-	-	-	-	-	8.307	5.608	4.298
235	-	-	-	-	-	-	-	-	-	-	-	-	5.790	4.469
240	-	-	-	-	-	-	-	-	-	-	-	-	5.971	4.640
245	-	-	-	-	-	-	-	-	-	-	-	-	6.274	4.811
250	-	-	-	-	-	-	-	-	-	-	-	-	6.580	4.981
255	-	-	-	-	-	-	-	-	-	-	-	-	6.886	5.152
260	-	-	-	-	-	-	-	-	-	-	-	-	7.192	5.323
265	-	-	-	-	-	-	-	-	-	-	-	-	7.498	5.493
270	-	-	-	-	-	-	-	-	-	-	-	-	7.804	5.664
275	-	-	-	-	-	-	-	-	-	-	-	-	8.110	5.835
280	-	-	-	-	-	-	-	-	-	-	-	-	8.416	5.999
285	-	-	-	-	-	-	-	-	-	-	-	-	-	6.129
290	-	-	-	-	-	-	-	-	-	-	-	-	-	6.259
295	-	-	-	-	-	-	-	-	-	-	-	-	-	6.390
300	-	-	-	-	-	-	-	-	-	-	-	-	-	6.520
305	-	-	-	-	-	-	-	-	-	-	-	-	-	6.650
310	-	-	-	-	-	-	-	-	-	-	-	-	-	6.781
315	-	-	-	-	-	-	-	-	-	-	-	-	-	6.911
320	-	-	-	-	-	-	-	-	-	-	-	-	-	7.041
325	-	-	-	-	-	-	-	-	-	-	-	-	-	7.172
330	-	-	-	-	-	-	-	-	-	-	-	-	-	7.302
335	-	-	-	-	-	-	-	-	-	-	-	-	-	7.432
340	-	-	-	-	-	-	-	-	-	-	-	-	-	7.563
345	-	-	-	-	-	-	-	-	-	-	-	-	-	7.693
350	-	-	-	-	-	-	-	-	-	-	-	-	-	7.824
355	-	-	-	-	-	-	-	-	-	-	-	-	-	7.954
360	-	-	-	-	-	-	-	-	-	-	-	-	-	8.084
365	-	-	-	-	-	-	-	-	-	-	-	-	-	8.215
370	-	-	-	-	-	-	-	-	-	-	-	-	-	8.345
375	-	-	-	-	-	-	-	-	-	-	-	-	-	8.475
380	-	-	-	-	-	-	-	-	-	-	-	-	-	8.606
385	-	-	-	-	-	-	-	-	-	-	-	-	-	8.736
390	-	-	-	-	-	-	-	-	-	-	-	-	-	-
395	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only.

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Valid to: 12th September 2023

CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 36 Rectangular Hollow Beams 15 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
65	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
70	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
75	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
80	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
85	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
90	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
95	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
100	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
105	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
110	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
115	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
120	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
125	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
130	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
135	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
140	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
145	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
150	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
155	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
160	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
165	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
170	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
175	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
180	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
185	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
190	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
195	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
200	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
205	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
210	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
215	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
220	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
225	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
230	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
235	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
240	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
245	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
250	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
255	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
260	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
265	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
270	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
275	0.337	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
280	0.352	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
285	0.366	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
290	0.381	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
295	0.396	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
300	0.411	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
305	0.426	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
310	0.441	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
315	0.455	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
320	0.470	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
325	0.485	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
330	0.500	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
335	0.515	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
340	0.529	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
345	0.544	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
350	0.559	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
355	0.574	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
360	0.589	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
365	0.604	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
370	0.618	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
375	0.633	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
380	0.648	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
385	0.663	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
390	0.678	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
395	0.692	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
400	0.707	0.339	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
405	0.722	0.352	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
410	0.737	0.366	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
415	0.752	0.380	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
420	0.766	0.394	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
425	0.781	0.407	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329

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

Issued: 13th September 2018
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Valid to: 12th September 2023

CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 37 Rectangular Hollow Beams 20 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
65	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
70	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
75	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
80	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
85	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
90	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
95	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
100	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
105	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
110	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
115	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
120	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
125	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
130	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
135	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
140	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
145	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
150	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
155	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
160	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
165	0.341	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
170	0.359	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
175	0.376	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
180	0.394	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
185	0.411	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
190	0.429	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
195	0.447	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
200	0.464	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
205	0.482	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
210	0.500	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
215	0.517	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
220	0.535	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
225	0.552	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
230	0.570	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
235	0.588	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
240	0.605	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
245	0.623	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
250	0.641	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
255	0.658	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
260	0.676	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
265	0.693	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
270	0.711	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
275	0.729	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
280	0.746	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
285	0.764	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
290	0.782	0.330	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
295	0.799	0.349	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
300	0.817	0.368	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
305	0.834	0.387	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
310	0.852	0.406	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
315	0.870	0.425	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
320	0.887	0.443	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
325	0.905	0.462	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
330	0.923	0.481	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
335	0.940	0.500	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
340	0.958	0.519	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
345	0.975	0.538	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
350	0.993	0.556	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
355	1.011	0.575	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
360	1.028	0.594	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
365	1.046	0.613	0.330	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
370	1.064	0.632	0.347	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
375	1.081	0.651	0.364	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
380	1.099	0.669	0.381	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
385	1.116	0.688	0.398	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
390	1.134	0.707	0.414	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
395	1.152	0.726	0.431	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
400	1.169	0.745	0.448	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
405	1.187	0.763	0.465	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
410	1.205	0.782	0.482	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
415	1.222	0.801	0.499	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
420	1.240	0.820	0.516	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
425	1.257	0.839	0.533	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 38 Rectangular Hollow Beams 30 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
65	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
70	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
75	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
80	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
85	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
90	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
95	0.359	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
100	0.394	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
105	0.429	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
110	0.464	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
115	0.499	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
120	0.534	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
125	0.569	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
130	0.603	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
135	0.638	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
140	0.673	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
145	0.708	0.347	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
150	0.743	0.371	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
155	0.778	0.395	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
160	0.813	0.419	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
165	0.848	0.443	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
170	0.883	0.467	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
175	0.918	0.492	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
180	0.952	0.516	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
185	0.987	0.540	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
190	1.022	0.564	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
195	1.057	0.588	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
200	1.092	0.612	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
205	1.127	0.636	0.335	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
210	1.162	0.660	0.358	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
215	1.197	0.684	0.381	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
220	1.232	0.708	0.404	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
225	1.267	0.732	0.427	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
230	1.301	0.756	0.450	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
235	1.336	0.780	0.473	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
240	1.371	0.804	0.496	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
245	1.406	0.828	0.519	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
250	1.441	0.853	0.542	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
255	1.474	0.877	0.565	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
260	1.507	0.901	0.588	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
265	1.540	0.925	0.611	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
270	1.573	0.949	0.634	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
275	1.606	0.973	0.657	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
280	1.639	0.997	0.680	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
285	1.672	1.021	0.703	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
290	1.705	1.045	0.726	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
295	1.738	1.069	0.749	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
300	1.771	1.093	0.772	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
305	1.804	1.117	0.795	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
310	1.837	1.141	0.818	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
315	1.870	1.165	0.841	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
320	1.903	1.189	0.864	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
325	1.936	1.213	0.887	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
330	1.969	1.238	0.910	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
335	2.002	1.262	0.933	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
340	2.035	1.286	0.956	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
345	2.068	1.310	0.979	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
350	2.101	1.334	1.002	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
355	2.134	1.358	1.025	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
360	2.167	1.382	1.048	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
365	2.200	1.406	1.071	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
370	2.233	1.430	1.094	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
375	2.266	1.465	1.117	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
380	2.299	1.516	1.140	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
385	2.332	1.566	1.163	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
390	2.365	1.617	1.186	0.363	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
395	2.398	1.667	1.209	0.405	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
400	2.431	1.718	1.232	0.447	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
405	2.464	1.768	1.255	0.489	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
410	2.497	1.819	1.278	0.532	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
415	2.530	1.869	1.301	0.574	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
420	2.563	1.919	1.324	0.616	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
425	2.596	1.970	1.347	0.659	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 39 Rectangular Hollow Beams 45 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
65	0.489	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
70	0.597	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
75	0.706	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
80	0.815	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
85	0.924	0.375	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
90	1.032	0.436	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
95	1.141	0.497	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
100	1.250	0.559	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
105	1.359	0.620	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
110	1.453	0.681	0.359	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
115	1.496	0.742	0.404	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
120	1.539	0.803	0.449	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
125	1.582	0.864	0.493	0.352	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
130	1.626	0.925	0.538	0.384	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
135	1.669	0.986	0.583	0.417	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
140	1.712	1.047	0.627	0.450	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
145	1.755	1.108	0.672	0.483	0.345	0.330	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
150	1.798	1.169	0.717	0.515	0.371	0.355	0.348	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
155	1.841	1.231	0.761	0.548	0.396	0.380	0.372	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
160	1.884	1.292	0.806	0.581	0.422	0.404	0.396	0.339	0.336	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
165	1.927	1.353	0.851	0.614	0.447	0.429	0.420	0.361	0.358	0.348	0.340	0.329	0.329	0.329	0.329	0.329	0.329	0.329
170	1.970	1.414	0.895	0.646	0.473	0.454	0.445	0.384	0.381	0.370	0.362	0.329	0.329	0.329	0.329	0.329	0.329	0.329
175	2.013	1.468	0.940	0.679	0.498	0.478	0.469	0.406	0.403	0.392	0.384	0.337	0.329	0.329	0.329	0.329	0.329	0.329
180	2.056	1.517	0.985	0.712	0.524	0.503	0.493	0.429	0.426	0.415	0.406	0.358	0.350	0.330	0.329	0.329	0.329	0.329
185	2.099	1.565	1.029	0.745	0.550	0.528	0.517	0.451	0.448	0.437	0.429	0.380	0.371	0.351	0.329	0.329	0.329	0.329
190	2.143	1.614	1.074	0.778	0.575	0.552	0.541	0.474	0.471	0.459	0.451	0.401	0.392	0.372	0.342	0.329	0.329	0.329
195	2.186	1.662	1.119	0.810	0.601	0.577	0.566	0.496	0.493	0.482	0.473	0.423	0.414	0.393	0.363	0.329	0.329	0.329
200	2.229	1.710	1.163	0.843	0.626	0.602	0.590	0.519	0.516	0.504	0.495	0.444	0.435	0.414	0.384	0.329	0.329	0.329
205	2.272	1.759	1.208	0.876	0.652	0.626	0.614	0.541	0.538	0.526	0.518	0.465	0.456	0.435	0.404	0.329	0.329	0.329
210	2.315	1.807	1.253	0.909	0.677	0.651	0.638	0.564	0.561	0.549	0.540	0.487	0.478	0.456	0.425	0.338	0.329	0.329
215	2.358	1.856	1.297	0.941	0.703	0.676	0.662	0.586	0.583	0.571	0.562	0.508	0.499	0.477	0.445	0.358	0.329	0.329
220	2.401	1.904	1.342	0.974	0.729	0.700	0.686	0.609	0.606	0.593	0.584	0.530	0.520	0.498	0.466	0.377	0.329	0.329
225	2.444	1.952	1.387	1.007	0.754	0.725	0.711	0.631	0.628	0.616	0.606	0.551	0.542	0.519	0.487	0.396	0.329	0.329
230	2.487	2.001	1.431	1.040	0.780	0.749	0.735	0.654	0.651	0.638	0.629	0.573	0.563	0.540	0.507	0.415	0.329	0.329
235	2.530	2.049	1.483	1.072	0.805	0.774	0.759	0.676	0.673	0.660	0.651	0.594	0.584	0.561	0.528	0.434	0.329	0.329
240	2.573	2.098	1.539	1.105	0.831	0.799	0.783	0.699	0.696	0.683	0.673	0.615	0.605	0.582	0.549	0.453	0.329	0.329
245	2.616	2.146	1.594	1.138	0.856	0.823	0.807	0.721	0.718	0.705	0.695	0.637	0.627	0.603	0.569	0.472	0.329	0.329
250	2.659	2.194	1.649	1.171	0.882	0.848	0.832	0.744	0.741	0.727	0.718	0.658	0.648	0.624	0.590	0.491	0.329	0.329
255	2.703	2.243	1.704	1.203	0.908	0.873	0.856	0.766	0.763	0.750	0.740	0.680	0.669	0.645	0.611	0.510	0.329	0.329
260	2.746	2.291	1.759	1.236	0.933	0.897	0.880	0.789	0.786	0.772	0.762	0.701	0.691	0.666	0.631	0.530	0.329	0.329
265	2.789	2.340	1.815	1.269	0.959	0.922	0.904	0.811	0.808	0.794	0.784	0.723	0.712	0.687	0.652	0.549	0.329	0.329
270	2.832	2.388	1.870	1.302	0.984	0.947	0.928	0.834	0.830	0.817	0.806	0.744	0.733	0.708	0.672	0.568	0.329	0.329
275	2.875	2.436	1.925	1.334	1.010	0.971	0.953	0.856	0.853	0.839	0.829	0.765	0.755	0.729	0.693	0.587	0.329	0.329
280	2.918	2.485	1.980	1.367	1.035	0.996	0.977	0.879	0.875	0.861	0.851	0.787	0.776	0.750	0.714	0.606	0.329	0.329
285	2.961	2.533	2.035	1.400	1.061	1.021	1.001	0.901	0.898	0.884	0.873	0.808	0.797	0.771	0.734	0.625	0.329	0.329
290	3.012	2.582	2.090	1.433	1.087	1.045	1.025	0.924	0.920	0.906	0.895	0.830	0.818	0.792	0.755	0.644	0.329	0.329
295	3.066	2.630	2.146	1.489	1.112	1.070	1.049	0.946	0.943	0.928	0.918	0.851	0.840	0.813	0.776	0.663	0.329	0.329
300	3.119	2.678	2.201	1.557	1.138	1.095	1.073	0.969	0.965	0.951	0.940	0.873	0.861	0.834	0.796	0.682	0.329	0.329
305	3.172	2.727	2.256	1.624	1.163	1.119	1.098	0.991	0.988	0.973	0.962	0.894	0.882	0.855	0.817	0.702	0.329	0.329
310	3.225	2.775	2.311	1.692	1.189	1.144	1.122	1.014	1.010	0.995	0.984	0.916	0.904	0.876	0.837	0.721	0.329	0.329
315	3.279	2.824	2.366	1.760	1.214	1.169	1.146	1.036	1.033	1.018	1.007	0.937	0.925	0.897	0.858	0.740	0.329	0.329
320	3.332	2.872	2.422	1.828	1.240	1.193	1.170	1.059	1.055	1.040	1.029	0.958	0.946	0.918	0.879	0.759	0.329	0.329
325	3.385	2.920	2.477	1.896	1.266	1.218	1.194	1.081	1.078	1.062	1.051	0.980	0.968	0.939	0.899	0.778	0.329	0.329
330	3.439	2.969	2.532	1.964	1.291	1.243	1.219	1.104	1.100	1.085	1.073	1.001	0.989	0.960	0.920	0.797	0.329	0.329
335	3.492	3.085	2.587	2.032	1.317	1.267	1.243	1.127	1.123	1.107	1.095	1.023	1.010	0.982	0.941	0.816	0.329	0.329
340	3.545	3.203	2.642	2.100	1.342	1.292	1.267	1.149	1.145	1.129	1.118	1.044	1.031	1.003	0.961	0.835	0.329	0.329
345	3.599	3.321	2.698	2.168	1.368	1.316	1.291	1.172	1.168	1.152	1.140	1.066	1.053	1.024	0.982	0.855	0.329	0.329
350	3.652	3.438	2.753	2.236	1.393	1.341	1.315	1.194	1.190	1.174	1.162	1.087	1.074	1.045	1.003	0.874	0.329	0.329
355	3.705	3.556	2.808	2.304	1.419	1.366	1.340	1.217	1.213	1.196	1.184	1.108	1.095	1.066	1.023	0.893	0.329	0.329
360	3.759	3.674	2.863	2.372	1.446	1.390	1.364	1.239	1.235	1.219	1.207	1.130	1.117	1.087	1.044	0.912	0.329	0.329
365	3.812	3.792	2.918	2.440	1.546	1.415	1.388	1.262	1.257	1.241	1.229	1.151	1.138	1.108	1.064	0.931	0.329	0.329
370	3.910	3.910	2.977	2.508	1.646	1.440	1.412	1.284	1.280	1.263	1.251	1.173	1.159	1.129	1.085	0.950	0.329	0.329
375	4.028	4.028	3.093	2.576	1.747	1.534	1.436	1.307	1.302	1.286	1.273	1.194	1.181	1.150	1.106	0.969	0.329	0.329
380	4.524	4.145	3.208	2.644	1.847	1.644	1.522	1.329	1.325	1.308	1.296	1.216	1.202	1.171	1.126	0.988	0.329	0.329
385	-	4.263	3.324	2.712	1.947	1.753	1.637	1.352	1.347	1.330	1.318	1.237	1.223	1.192	1.147	1.007	0.329	0.329
390	-	4.381	3.439	2.780	2.047	1.862	1.752	1.374	1.370	1.353	1.340	1.258	1.244	1.213	1.168	1.027	0.329	0.329
395	-	4.499	3.554	2.848	2.147	1.971	1.867	1.397	1.392	1.375	1.362	1.280	1.266	1.234	1.188	1.046	0.329	0.329
400	-	4.617	3.670	2.915	2.247	2.081	1.982	1.419	1.415	1.397	1.384	1.301	1.287	1.255	1.209	1.065	0.329	0.329
405	-	4.734	3.785	2.991	2.347	2.190	2.097	1.442	1.437	1.420	1.407	1.323	1.308	1.276	1.230	1.084	0.329	0.329
410	-	4.852	3.901	3.098	2.447	2.299	2.211	1.564	1.538	1.442	1.429	1.344	1.330	1.297	1.250	1.103	0.329	0.329
415	-	4.970	4.016	3.205	2.547	2.408	2.326	1.698	1.673	1.568	1.487	1.366	1.351	1.318	1.271	1.122	0.329	0.329
420	-	5.088	4.132	3.312	2.647	2.518	2.441	1.833	1.807	1.703	1.623	1.387	1.372	1.339	1.291	1.141	0.329	0.329
425	-	5.206	4.247	3.419	2.747	2.627	2.556	1.967	1.941	1.838	1.758	1.408	1.393	1.360	1.312	1.160	0.345	0.329

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 40 Rectangular Hollow Beams 60 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
65	1.427	0.532	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
70	1.488	0.690	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
75	1.549	0.848	0.348	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
80	1.610	1.006	0.451	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
85	1.671	1.164	0.553	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
90	1.732	1.322	0.656	0.385	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
95	1.793	1.457	0.759	0.449	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
100	1.854	1.514	0.861	0.513	0.357	0.338	0.330	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
105	1.915	1.571	0.964	0.577	0.408	0.389	0.380	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
110	1.976	1.628	1.066	0.642	0.459	0.439	0.430	0.365	0.362	0.351	0.343	0.329	0.329	0.329	0.329	0.329	0.329	0.329
115	2.037	1.685	1.169	0.706	0.510	0.489	0.480	0.411	0.409	0.397	0.388	0.341	0.334	0.329	0.329	0.329	0.329	0.329
120	2.098	1.742	1.271	0.770	0.561	0.539	0.529	0.458	0.455	0.443	0.434	0.384	0.376	0.357	0.331	0.329	0.329	0.329
125	2.159	1.799	1.374	0.834	0.612	0.590	0.579	0.505	0.501	0.489	0.479	0.426	0.418	0.397	0.370	0.329	0.329	0.329
130	2.220	1.856	1.463	0.898	0.663	0.640	0.629	0.551	0.548	0.534	0.525	0.469	0.460	0.438	0.409	0.340	0.329	0.329
135	2.281	1.912	1.522	0.963	0.714	0.690	0.679	0.598	0.594	0.580	0.570	0.512	0.502	0.479	0.448	0.372	0.329	0.329
140	2.342	1.969	1.581	1.027	0.766	0.741	0.729	0.644	0.640	0.626	0.615	0.554	0.544	0.520	0.487	0.404	0.329	0.329
145	2.403	2.026	1.641	1.091	0.817	0.791	0.779	0.691	0.687	0.672	0.661	0.597	0.586	0.561	0.526	0.436	0.336	0.329
150	2.464	2.083	1.700	1.155	0.868	0.841	0.828	0.737	0.733	0.718	0.706	0.639	0.628	0.602	0.566	0.468	0.357	0.329
155	2.525	2.140	1.759	1.220	0.919	0.891	0.878	0.784	0.780	0.763	0.751	0.682	0.670	0.643	0.605	0.500	0.378	0.329
160	2.586	2.197	1.818	1.284	0.970	0.942	0.928	0.830	0.826	0.809	0.797	0.724	0.712	0.683	0.644	0.533	0.399	0.329
165	2.647	2.254	1.878	1.348	1.021	0.992	0.978	0.877	0.872	0.855	0.842	0.767	0.754	0.724	0.683	0.565	0.420	0.329
170	2.708	2.311	1.937	1.412	1.072	1.042	1.028	0.923	0.919	0.901	0.887	0.809	0.796	0.765	0.722	0.597	0.441	0.329
175	2.769	2.368	1.996	1.478	1.123	1.093	1.077	0.970	0.965	0.946	0.933	0.852	0.838	0.806	0.761	0.629	0.462	0.332
180	2.830	2.425	2.055	1.547	1.175	1.143	1.127	1.016	1.011	0.992	0.978	0.895	0.880	0.847	0.800	0.661	0.483	0.351
185	2.891	2.482	2.115	1.615	1.226	1.193	1.177	1.063	1.058	1.038	1.024	0.937	0.922	0.888	0.839	0.693	0.504	0.370
190	2.951	2.539	2.174	1.684	1.277	1.243	1.227	1.109	1.104	1.084	1.069	0.980	0.964	0.929	0.878	0.726	0.525	0.389
195	3.093	2.596	2.233	1.752	1.328	1.294	1.277	1.156	1.151	1.130	1.114	1.022	1.006	0.969	0.917	0.758	0.546	0.408
200	3.269	2.653	2.292	1.820	1.379	1.344	1.327	1.202	1.197	1.175	1.160	1.065	1.048	1.010	0.956	0.790	0.567	0.427
205	3.446	2.710	2.352	1.889	1.430	1.394	1.376	1.249	1.243	1.221	1.205	1.107	1.090	1.051	0.995	0.822	0.588	0.446
210	3.622	2.767	2.411	1.957	1.498	1.445	1.426	1.295	1.290	1.267	1.250	1.150	1.132	1.092	1.034	0.854	0.609	0.464
215	3.798	2.824	2.470	2.026	1.572	1.519	1.492	1.342	1.336	1.313	1.296	1.192	1.174	1.133	1.074	0.886	0.630	0.483
220	3.990	2.881	2.530	2.094	1.646	1.593	1.566	1.388	1.382	1.358	1.341	1.235	1.216	1.174	1.113	0.918	0.651	0.502
225	4.310	2.938	2.589	2.162	1.721	1.667	1.640	1.435	1.429	1.404	1.386	1.278	1.258	1.214	1.152	0.951	0.672	0.521
230	4.630	3.116	2.648	2.231	1.795	1.742	1.715	1.504	1.494	1.454	1.432	1.320	1.300	1.255	1.191	0.983	0.693	0.540
235	4.950	3.453	2.707	2.299	1.869	1.816	1.789	1.578	1.568	1.528	1.499	1.363	1.342	1.296	1.230	1.015	0.714	0.559
240	5.270	3.791	2.767	2.367	1.943	1.890	1.863	1.653	1.643	1.603	1.573	1.405	1.384	1.337	1.269	1.047	0.735	0.578
245	5.590	4.128	2.826	2.436	2.017	1.964	1.937	1.727	1.717	1.677	1.648	1.451	1.426	1.378	1.308	1.079	0.756	0.597
250	-	4.465	2.885	2.504	2.092	2.039	2.012	1.802	1.792	1.752	1.722	1.526	1.488	1.419	1.347	1.111	0.777	0.616
255	-	4.802	2.944	2.573	2.166	2.113	2.086	1.876	1.866	1.826	1.796	1.602	1.563	1.473	1.386	1.144	0.798	0.635
260	-	5.139	3.009	2.641	2.240	2.187	2.160	1.950	1.941	1.901	1.871	1.678	1.639	1.549	1.425	1.176	0.819	0.654
265	-	5.477	3.077	2.709	2.314	2.261	2.235	2.025	2.015	1.975	1.945	1.753	1.715	1.626	1.484	1.208	0.840	0.672
270	-	-	3.146	2.778	2.388	2.336	2.309	2.099	2.089	2.050	2.020	1.829	1.791	1.702	1.562	1.240	0.861	0.691
275	-	-	3.215	2.846	2.463	2.410	2.383	2.173	2.164	2.124	2.094	1.905	1.867	1.778	1.640	1.272	0.882	0.710
280	-	-	3.283	2.915	2.537	2.484	2.457	2.248	2.238	2.199	2.169	1.980	1.943	1.854	1.718	1.304	0.903	0.729
285	-	-	3.352	2.994	2.611	2.558	2.532	2.322	2.313	2.273	2.243	2.056	2.019	1.931	1.796	1.336	0.924	0.748
290	-	-	3.420	3.119	2.685	2.633	2.606	2.397	2.387	2.348	2.318	2.132	2.095	2.007	1.873	1.369	0.945	0.767
295	-	-	3.489	3.245	2.759	2.707	2.680	2.471	2.461	2.422	2.392	2.207	2.170	2.083	1.951	1.401	0.966	0.786
300	-	-	3.557	3.371	2.834	2.781	2.755	2.545	2.536	2.497	2.467	2.283	2.246	2.159	2.029	1.433	0.987	0.805
305	-	-	3.626	3.496	2.908	2.855	2.829	2.620	2.610	2.571	2.541	2.359	2.322	2.235	2.107	1.501	1.008	0.824
310	-	-	3.695	3.622	2.989	2.930	2.903	2.694	2.685	2.646	2.616	2.434	2.398	2.312	2.184	1.589	1.029	0.843
315	-	-	3.763	3.747	3.109	3.024	2.982	2.768	2.759	2.720	2.690	2.510	2.474	2.388	2.262	1.676	1.050	0.861
320	-	-	3.873	3.873	3.229	3.143	3.101	2.843	2.834	2.795	2.765	2.586	2.550	2.464	2.340	1.763	1.071	0.880
325	-	-	3.999	3.999	3.349	3.263	3.220	2.917	2.908	2.869	2.839	2.661	2.626	2.540	2.418	1.851	1.092	0.899
330	-	-	4.124	4.124	3.469	3.382	3.338	3.004	2.989	2.944	2.914	2.737	2.701	2.617	2.496	1.938	1.113	0.918
335	-	-	4.391	4.250	3.589	3.501	3.457	3.120	3.105	3.045	2.998	2.812	2.777	2.693	2.573	2.025	1.134	0.937
340	-	-	4.759	4.375	3.709	3.620	3.576	3.236	3.221	3.160	3.113	2.888	2.853	2.769	2.651	2.113	1.155	0.956
345	-	-	5.126	4.501	3.829	3.739	3.695	3.352	3.337	3.276	3.229	2.964	2.929	2.845	2.729	2.200	1.176	0.975
350	-	-	5.493	4.627	3.949	3.858	3.813	3.468	3.453	3.392	3.344	3.074	3.022	2.922	2.807	2.288	1.197	0.994
355	-	-	-	4.752	4.069	3.978	3.932	3.584	3.569	3.507	3.459	3.186	3.134	3.011	2.884	2.375	1.218	1.013
360	-	-	-	4.878	4.189	4.097	4.051	3.700	3.685	3.623	3.575	3.299	3.247	3.123	2.962	2.462	1.239	1.032
365	-	-	-	5.003	4.309	4.216	4.170	3.816	3.801	3.738	3.690	3.412	3.360	3.235	3.070	2.550	1.260	1.050
370	-	-	-	5.129	4.429	4.335	4.289	3.932	3.917	3.854	3.805	3.525	3.472	3.347	3.180	2.637	1.281	1.069
375	-	-	-	5.255	4.549	4.454	4.407	4.048	4.033	3.969	3.921	3.638	3.585	3.459	3.291	2.724	1.302	1.088
380	-	-	-	5.380	4.669	4.574	4.526	4.164	4.149	4.085	4.036	3.751	3.697	3.571	3.402	2.812	1.323	1.107
385	-	-	-	5.506	4.789	4.693	4.645	4.280	4.264	4.200	4.152	3.863	3.810	3.683	3.513	2.899	1.344	1.126
390	-	-	-	5.632	4.909	4.812	4.764	4.396	4.380	4.316	4.267	3.976	3.923	3.796	3.623	2.991	1.365	1.145
395	-	-	-	5.757	5.029	4.931	4.882	4.512	4.496	4.432	4.382	4.089	4.035	3.908	3.734	3.101	1.386	1.164
400	-	-	-	5.883	5.149	5.050	5.001	4.628	4.612	4.547	4.498	4.202	4.148	4.020	3.845	3.211	1.407	1.183
405	-	-	-	-	5.269	5.169	5.120	4.744	4.728	4.663	4.613	4.315	4.260	4.132	3.955	3.322	1.428	1.202
410	-	-	-	-	5.389	5.289	5.239	4.860	4.844	4.778	4.728	4.428	4.373	4.244	4.066	3.432	1.513	1.221
415	-	-	-	-	5.509	5.408	5.357	4.976	4.960	4.894	4.844	4.540	4.485	4.356	4.177	3.542	1.834	1.239
420	-	-	-	-	5.629	5.527	5.476	5.092	5.076	5.009	4.959	4.653	4.598	4.468	4.288	3.653	2.155	1.258
425	-	-	-	-	5.749	5.646	5.595	5.209	5.192	5.125	5.074	4.766	4.711	4.580	4.398	3.763	2.476	1.277

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 41 Rectangular Hollow Beams 75 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
65	2.222	1.453	0.760	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
70	2.337	1.543	0.940	0.413	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
75	2.452	1.632	1.120	0.555	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
80	2.567	1.722	1.300	0.697	0.436	0.408	0.396	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
85	2.682	1.812	1.458	0.838	0.543	0.513	0.499	0.408	0.404	0.389	0.379	0.329	0.329	0.329	0.329	0.329	0.329	0.329
90	2.797	1.901	1.525	0.980	0.650	0.617	0.602	0.501	0.496	0.480	0.469	0.404	0.394	0.369	0.335	0.329	0.329	0.329
95	2.913	1.991	1.593	1.121	0.757	0.721	0.705	0.593	0.589	0.572	0.559	0.488	0.478	0.450	0.414	0.329	0.329	0.329
100	3.089	2.081	1.660	1.263	0.864	0.826	0.807	0.686	0.681	0.663	0.649	0.573	0.561	0.532	0.494	0.390	0.329	0.329
105	3.325	2.170	1.727	1.404	0.971	0.930	0.910	0.779	0.774	0.754	0.739	0.657	0.645	0.614	0.573	0.463	0.329	0.329
110	3.562	2.260	1.795	1.493	1.079	1.035	1.013	0.872	0.866	0.845	0.829	0.742	0.729	0.696	0.653	0.537	0.357	0.329
115	3.799	2.350	1.862	1.562	1.186	1.139	1.116	0.965	0.959	0.936	0.918	0.827	0.812	0.778	0.732	0.610	0.423	0.329
120	3.993	2.439	1.930	1.630	1.293	1.244	1.219	1.058	1.051	1.027	1.008	0.911	0.896	0.860	0.812	0.684	0.490	0.329
125	4.103	2.529	1.997	1.698	1.400	1.348	1.321	1.151	1.144	1.118	1.098	0.996	0.979	0.942	0.892	0.758	0.556	0.334
130	4.212	2.619	2.064	1.767	1.485	1.450	1.424	1.244	1.236	1.209	1.188	1.080	1.063	1.024	0.971	0.831	0.622	0.384
135	4.322	2.708	2.132	1.835	1.555	1.519	1.500	1.336	1.329	1.300	1.278	1.165	1.146	1.105	1.051	0.905	0.688	0.434
140	4.432	2.798	2.199	1.903	1.625	1.589	1.570	1.429	1.421	1.391	1.368	1.249	1.230	1.187	1.130	0.978	0.754	0.484
145	4.541	2.888	2.267	1.972	1.694	1.659	1.640	1.503	1.497	1.473	1.455	1.334	1.314	1.269	1.210	1.052	0.820	0.533
150	4.651	2.985	2.334	2.040	1.764	1.728	1.709	1.573	1.567	1.543	1.525	1.418	1.397	1.351	1.289	1.125	0.887	0.583
155	4.761	3.165	2.402	2.109	1.834	1.798	1.779	1.643	1.637	1.613	1.595	1.493	1.475	1.433	1.369	1.199	0.953	0.633
160	4.870	3.345	2.469	2.177	1.903	1.868	1.849	1.712	1.706	1.683	1.665	1.563	1.544	1.504	1.448	1.273	1.019	0.683
165	4.980	3.526	2.536	2.245	1.973	1.937	1.919	1.782	1.776	1.753	1.734	1.632	1.614	1.574	1.517	1.346	1.085	0.733
170	5.090	3.706	2.604	2.314	2.043	2.007	1.988	1.852	1.846	1.822	1.804	1.702	1.684	1.643	1.586	1.420	1.151	0.783
175	5.199	3.887	2.671	2.382	2.113	2.077	2.058	1.922	1.916	1.892	1.874	1.772	1.754	1.713	1.656	1.489	1.217	0.833
180	5.309	4.431	2.739	2.450	2.182	2.146	2.128	1.992	1.986	1.962	1.944	1.842	1.824	1.782	1.725	1.557	1.283	0.883
185	5.419	5.202	2.806	2.519	2.252	2.216	2.197	2.062	2.056	2.032	2.014	1.912	1.893	1.852	1.794	1.625	1.350	0.933
190	-	-	2.874	2.587	2.322	2.286	2.267	2.131	2.126	2.102	2.084	1.982	1.963	1.921	1.864	1.692	1.416	0.983
195	-	-	2.941	2.656	2.391	2.355	2.337	2.201	2.195	2.172	2.153	2.051	2.033	1.991	1.933	1.760	1.480	1.033
200	-	-	3.310	2.724	2.461	2.425	2.407	2.271	2.265	2.241	2.223	2.121	2.103	2.060	2.002	1.828	1.543	1.083
205	-	-	3.908	2.792	2.531	2.495	2.476	2.341	2.335	2.311	2.293	2.191	2.173	2.130	2.071	1.895	1.606	1.133
210	-	-	4.061	2.861	2.601	2.565	2.546	2.411	2.405	2.381	2.363	2.261	2.243	2.199	2.141	1.963	1.669	1.183
215	-	-	4.175	2.929	2.670	2.634	2.616	2.481	2.475	2.451	2.433	2.331	2.312	2.269	2.210	2.030	1.732	1.233
220	-	-	4.288	3.063	2.740	2.704	2.686	2.551	2.545	2.521	2.503	2.401	2.382	2.338	2.279	2.098	1.795	1.283
225	-	-	4.402	3.296	2.810	2.774	2.755	2.620	2.615	2.591	2.572	2.471	2.452	2.408	2.349	2.166	1.858	1.332
230	-	-	4.516	3.529	2.879	2.843	2.825	2.690	2.684	2.661	2.642	2.540	2.522	2.478	2.418	2.233	1.921	1.382
235	-	-	4.630	3.762	2.949	2.913	2.895	2.760	2.754	2.730	2.712	2.610	2.592	2.547	2.487	2.301	1.984	1.432
240	-	-	4.744	3.977	3.050	2.989	2.964	2.830	2.824	2.800	2.782	2.680	2.661	2.617	2.557	2.369	2.047	1.496
245	-	-	4.858	4.108	3.164	3.094	3.062	2.900	2.894	2.870	2.852	2.750	2.731	2.686	2.626	2.436	2.110	1.563
250	-	-	4.972	4.238	3.279	3.199	3.163	2.970	2.964	2.940	2.922	2.820	2.801	2.756	2.695	2.504	2.173	1.631
255	-	-	5.085	4.369	3.393	3.304	3.263	3.042	3.035	3.008	2.989	2.890	2.871	2.825	2.764	2.572	2.236	1.699
260	-	-	5.199	4.499	3.507	3.409	3.363	3.113	3.105	3.074	3.053	2.960	2.941	2.895	2.834	2.639	2.299	1.766
265	-	-	5.313	4.630	3.621	3.514	3.463	3.185	3.176	3.141	3.117	3.083	3.046	2.964	2.903	2.707	2.362	1.834
270	-	-	5.427	4.760	3.736	3.619	3.564	3.257	3.247	3.215	3.215	3.215	3.178	3.089	2.974	2.775	2.425	1.901
275	-	-	5.541	4.891	3.850	3.724	3.664	3.348	3.348	3.348	3.348	3.348	3.310	3.219	3.101	2.842	2.488	1.969
280	-	-	5.655	5.021	3.969	3.829	3.764	3.481	3.481	3.481	3.481	3.481	3.442	3.349	3.228	2.910	2.551	2.037
285	-	-	5.769	5.152	4.152	3.934	3.865	3.613	3.613	3.613	3.613	3.613	3.573	3.479	3.356	2.983	2.614	2.104
290	-	-	5.883	5.282	4.334	4.111	3.974	3.746	3.746	3.746	3.746	3.746	3.705	3.609	3.483	3.102	2.677	2.172
295	-	-	-	5.413	4.517	4.309	4.182	3.878	3.878	3.878	3.878	3.878	3.837	3.739	3.610	3.221	2.740	2.239
300	-	-	-	5.543	4.700	4.506	4.389	4.011	4.011	4.011	4.011	4.011	3.969	3.869	3.737	3.340	2.803	2.307
305	-	-	-	5.673	4.883	4.703	4.596	4.143	4.143	4.143	4.143	4.143	4.100	3.999	3.864	3.459	2.866	2.374
310	-	-	-	5.804	5.065	4.901	4.803	4.276	4.276	4.276	4.276	4.276	4.232	4.129	3.991	3.577	2.929	2.442
315	-	-	-	5.934	5.248	5.098	5.010	4.409	4.409	4.409	4.409	4.409	4.364	4.259	4.118	3.696	3.009	2.510
320	-	-	-	-	5.431	5.296	5.217	4.541	4.541	4.541	4.541	4.541	4.495	4.389	4.245	3.815	3.117	2.577
325	-	-	-	-	5.613	5.493	5.425	4.674	4.674	4.674	4.674	4.674	4.627	4.519	4.373	3.934	3.225	2.645
330	-	-	-	-	5.796	5.690	5.632	4.806	4.806	4.806	4.806	4.806	4.759	4.649	4.500	4.053	3.332	2.712
335	-	-	-	-	-	-	5.839	5.175	5.117	4.939	4.939	4.939	4.891	4.779	4.627	4.172	3.440	2.780
340	-	-	-	-	-	-	-	5.544	5.428	5.294	5.072	5.072	5.022	4.909	4.754	4.290	3.548	2.848
345	-	-	-	-	-	-	-	-	-	5.649	5.204	5.204	5.154	5.039	4.881	4.409	3.656	2.915
350	-	-	-	-	-	-	-	-	-	-	5.337	5.337	5.286	5.169	5.008	4.528	3.764	2.988
355	-	-	-	-	-	-	-	-	-	-	5.469	5.469	5.418	5.299	5.135	4.647	3.872	3.085
360	-	-	-	-	-	-	-	-	-	-	-	5.602	5.549	5.429	5.263	4.766	3.980	3.182
365	-	-	-	-	-	-	-	-	-	-	-	5.735	5.681	5.559	5.390	4.884	4.088	3.279
370	-	-	-	-	-	-	-	-	-	-	-	5.867	5.813	5.689	5.517	5.003	4.196	3.376
375	-	-	-	-	-	-	-	-	-	-	-	-	-	5.819	5.644	5.122	4.304	3.472
380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.771	5.241	4.412	3.569
385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.898	5.360	4.520	3.666
390	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.479	4.628	3.763
395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.597	4.736	3.860
400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.716	4.844	3.956
405	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.835	4.952	4.053
410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.060	4.150
415	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.168	4.247
420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.276	4.344
425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.384	4.440

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

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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 42 Rectangular Hollow Beams 90 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
65	3.014	2.275	1.513	0.958	0.487	0.449	0.433	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329	0.329
70	3.317	2.420	1.645	1.162	0.680	0.638	0.619	0.490	0.485	0.465	0.450	0.368	0.357	0.329	0.329	0.329	0.329	0.329
75	3.620	2.565	1.777	1.365	0.872	0.826	0.804	0.657	0.651	0.629	0.612	0.520	0.507	0.471	0.425	0.329	0.329	0.329
80	3.923	2.709	1.910	1.502	1.065	1.015	0.990	0.825	0.818	0.793	0.774	0.673	0.658	0.619	0.568	0.431	0.329	0.329
85	4.042	2.854	2.042	1.596	1.257	1.204	1.175	0.992	0.985	0.958	0.937	0.825	0.808	0.766	0.711	0.562	0.340	0.329
90	4.137	3.014	2.174	1.689	1.448	1.392	1.361	1.159	1.152	1.122	1.099	0.977	0.959	0.914	0.854	0.694	0.458	0.329
95	4.233	3.236	2.306	1.783	1.575	1.536	1.515	1.327	1.319	1.287	1.261	1.130	1.109	1.061	0.997	0.826	0.576	0.329
100	4.329	3.458	2.439	1.877	1.701	1.663	1.642	1.481	1.475	1.449	1.423	1.282	1.260	1.209	1.140	0.957	0.694	0.402
105	4.425	3.680	2.571	1.971	1.828	1.791	1.770	1.605	1.599	1.572	1.551	1.434	1.410	1.356	1.284	1.089	0.812	0.516
110	4.521	3.902	2.703	2.065	1.955	1.918	1.898	1.729	1.722	1.695	1.673	1.513	1.501	1.474	1.427	1.221	0.930	0.629
115	4.617	4.033	2.835	2.159	2.081	2.045	2.025	1.853	1.846	1.818	1.796	1.586	1.574	1.546	1.508	1.353	1.048	0.742
120	4.713	4.135	2.968	2.253	2.208	2.172	2.153	1.977	1.970	1.941	1.918	1.659	1.647	1.619	1.581	1.466	1.166	0.855
125	4.808	4.236	3.102	2.346	2.335	2.300	2.281	2.102	2.094	2.064	2.040	1.733	1.720	1.692	1.653	1.538	1.284	0.968
130	4.904	4.338	3.236	2.461	2.461	2.427	2.408	2.226	2.218	2.187	2.163	1.806	1.794	1.765	1.726	1.611	1.402	1.081
135	5.000	4.439	3.370	2.588	2.588	2.554	2.536	2.350	2.342	2.310	2.285	1.879	1.867	1.838	1.799	1.683	1.490	1.194
140	5.096	4.541	3.504	2.714	2.714	2.681	2.664	2.474	2.466	2.433	2.407	1.952	1.940	1.911	1.871	1.755	1.560	1.308
145	5.192	4.642	3.638	2.841	2.841	2.809	2.792	2.598	2.590	2.556	2.530	2.026	2.013	1.984	1.944	1.827	1.631	1.421
150	5.288	4.744	3.772	2.968	2.968	2.936	2.919	2.722	2.714	2.679	2.652	2.099	2.087	2.057	2.017	1.900	1.702	1.498
155	5.384	4.846	3.906	3.094	3.094	3.063	3.047	2.846	2.837	2.802	2.774	2.172	2.160	2.130	2.089	1.972	1.773	1.566
160	5.479	4.947	4.029	3.221	3.221	3.190	3.175	2.970	2.961	2.925	2.897	2.246	2.233	2.203	2.162	2.044	1.843	1.634
165	5.575	5.049	4.145	3.348	3.348	3.318	3.302	3.094	3.085	3.048	3.019	2.319	2.306	2.276	2.235	2.117	1.914	1.702
170	5.671	5.150	4.261	3.560	3.474	3.445	3.430	3.218	3.209	3.171	3.142	2.392	2.379	2.349	2.307	2.189	1.985	1.770
175	5.767	5.252	4.377	3.810	3.601	3.572	3.558	3.343	3.333	3.294	3.264	2.465	2.453	2.422	2.380	2.261	2.056	1.838
180	-	5.353	4.493	4.005	3.728	3.699	3.685	3.467	3.457	3.417	3.386	2.539	2.526	2.495	2.452	2.333	2.126	1.906
185	-	5.455	4.608	4.122	3.854	3.827	3.813	3.591	3.581	3.540	3.509	2.612	2.599	2.568	2.525	2.406	2.197	1.974
190	-	5.557	4.724	4.238	3.976	3.954	3.941	3.715	3.705	3.663	3.631	2.685	2.672	2.641	2.598	2.478	2.268	2.042
195	-	5.658	4.840	4.355	4.080	4.056	4.044	3.839	3.828	3.786	3.753	2.759	2.746	2.713	2.670	2.550	2.339	2.110
200	-	5.760	4.956	4.472	4.184	4.157	4.144	3.962	3.952	3.909	3.876	2.832	2.819	2.786	2.743	2.622	2.409	2.178
205	-	-	5.072	4.588	4.287	4.258	4.245	4.060	4.052	4.017	3.990	2.905	2.892	2.859	2.816	2.695	2.480	2.246
210	-	-	5.188	4.705	4.391	4.360	4.345	4.159	4.150	4.115	4.088	3.191	2.965	2.932	2.888	2.767	2.551	2.314
215	-	-	5.304	4.822	4.494	4.461	4.445	4.258	4.249	4.214	4.187	4.015	3.984	3.452	2.961	2.839	2.622	2.382
220	-	-	5.420	4.939	4.598	4.562	4.545	4.356	4.348	4.312	4.285	4.114	4.083	4.005	3.517	2.912	2.692	2.450
225	-	-	5.536	5.055	4.701	4.663	4.645	4.455	4.446	4.411	4.384	4.213	4.182	4.105	3.986	3.026	2.763	2.518
230	-	-	5.651	5.172	4.805	4.765	4.745	4.554	4.545	4.509	4.482	4.312	4.281	4.205	4.087	3.318	2.834	2.586
235	-	-	5.767	5.289	4.908	4.866	4.846	4.652	4.643	4.608	4.581	4.411	4.380	4.304	4.188	3.610	2.905	2.654
240	-	-	5.883	5.406	5.012	4.967	4.946	4.751	4.742	4.706	4.679	4.510	4.479	4.404	4.288	3.902	2.975	2.722
245	-	-	-	5.522	5.115	5.069	5.046	4.849	4.841	4.805	4.778	4.609	4.578	4.503	4.389	4.043	3.043	2.789
250	-	-	-	5.639	5.219	5.170	5.146	4.948	4.939	4.903	4.876	4.708	4.677	4.603	4.490	4.149	3.110	2.857
255	-	-	-	5.756	5.322	5.271	5.246	5.047	5.038	5.002	4.975	4.807	4.776	4.703	4.591	4.255	3.177	2.925
260	-	-	-	5.873	5.426	5.372	5.346	5.145	5.136	5.100	5.073	4.906	4.875	4.802	4.692	4.361	3.245	3.005
265	-	-	-	-	5.529	5.474	5.447	5.244	5.235	5.198	5.172	5.005	4.975	4.902	4.793	4.467	3.312	3.109
270	-	-	-	-	5.633	5.575	5.547	5.343	5.334	5.297	5.270	5.104	5.074	5.001	4.894	4.573	3.379	3.212
275	-	-	-	-	5.736	5.676	5.647	5.441	5.432	5.395	5.368	5.203	5.173	5.101	4.994	4.679	3.447	3.315
280	-	-	-	-	5.840	5.778	5.747	5.540	5.531	5.494	5.467	5.302	5.272	5.201	5.095	4.785	3.514	3.418
285	-	-	-	-	-	5.879	5.847	5.639	5.629	5.592	5.565	5.401	5.371	5.300	5.196	4.890	3.581	3.521
290	-	-	-	-	-	-	-	5.737	5.728	5.691	5.664	5.500	5.470	5.400	5.297	4.996	3.649	3.624
295	-	-	-	-	-	-	-	5.836	5.827	5.789	5.762	5.599	5.569	5.499	5.398	5.102	3.727	3.727
300	-	-	-	-	-	-	-	5.935	5.925	5.888	5.861	5.698	5.668	5.599	5.499	5.208	3.830	3.830
305	-	-	-	-	-	-	-	-	-	-	-	5.797	5.767	5.699	5.600	5.314	3.933	3.933
310	-	-	-	-	-	-	-	-	-	-	-	5.896	5.866	5.798	5.700	5.420	4.036	4.036
315	-	-	-	-	-	-	-	-	-	-	-	-	-	5.898	5.801	5.526	4.139	4.139
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.902	5.632	4.352	4.242
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.738	4.628	4.345
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.844	4.904	4.448
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.179	4.551
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.455	4.654
345	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.757
350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.860
355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.963
360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.066
365	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.169
370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.272
375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.375
380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.478
385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.581
390	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.684
395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.787
400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.890
405	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
415	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Issued: 13th September 2018
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CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 43 Rectangular Hollow Beams 105 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
65	4.120	3.077	2.360	1.615	1.236	1.188	1.161	0.975	0.968	0.939	0.915	0.788	0.770	0.632	0.571	0.410	0.329	0.329
70	4.328	3.399	2.541	1.794	1.458	1.418	1.390	1.193	1.185	1.156	1.130	0.995	0.974	0.862	0.794	0.613	0.350	0.329
75	4.536	3.721	2.722	1.973	1.599	1.564	1.546	1.411	1.403	1.372	1.346	1.205	1.182	1.092	1.017	0.816	0.530	0.329
80	4.744	3.990	2.903	2.153	1.740	1.700	1.679	1.544	1.539	1.520	1.505	1.414	1.390	1.322	1.240	1.019	0.710	0.383
85	4.952	4.118	3.124	2.332	1.881	1.835	1.812	1.661	1.655	1.634	1.617	1.532	1.519	1.490	1.452	1.222	0.890	0.550
90	5.160	4.246	3.367	2.512	2.023	1.971	1.945	1.778	1.772	1.748	1.729	1.635	1.620	1.587	1.544	1.426	1.070	0.717
95	5.367	4.374	3.611	2.691	2.164	2.106	2.078	1.896	1.889	1.862	1.841	1.738	1.722	1.685	1.637	1.520	1.250	0.883
100	5.575	4.502	3.854	2.870	2.305	2.242	2.211	2.013	2.005	1.976	1.953	1.841	1.823	1.782	1.730	1.604	1.430	1.050
105	5.783	4.630	4.007	3.033	2.446	2.377	2.344	2.130	2.122	2.090	2.066	1.944	1.924	1.880	1.823	1.688	1.580	1.217
110	-	4.758	4.095	3.175	2.587	2.512	2.478	2.247	2.238	2.204	2.178	2.047	2.026	1.977	1.916	1.772	1.727	1.383
115	-	4.886	4.183	3.317	2.728	2.648	2.611	2.365	2.355	2.318	2.290	2.150	2.127	2.075	2.009	1.874	1.874	1.549
120	-	5.014	4.271	3.459	2.869	2.783	2.744	2.482	2.471	2.432	2.402	2.252	2.228	2.172	2.102	2.021	2.021	1.714
125	-	5.142	4.359	3.601	3.003	2.919	2.877	2.599	2.588	2.546	2.514	2.355	2.329	2.270	2.195	2.168	2.168	1.878
130	-	5.270	4.447	3.744	3.118	3.045	3.007	2.717	2.704	2.660	2.626	2.458	2.431	2.368	2.315	2.315	2.315	2.043
135	-	5.398	4.535	3.886	3.234	3.166	3.131	2.834	2.821	2.774	2.738	2.561	2.532	2.465	2.463	2.463	2.463	2.208
140	-	5.526	4.622	4.012	3.349	3.287	3.254	2.951	2.938	2.888	2.851	2.664	2.633	2.610	2.610	2.610	2.610	2.373
145	-	5.654	4.710	4.124	3.465	3.407	3.377	3.098	3.081	3.015	2.963	2.767	2.757	2.757	2.757	2.757	2.757	2.538
150	-	5.782	4.798	4.236	3.581	3.528	3.501	3.250	3.236	3.176	3.127	2.904	2.904	2.904	2.904	2.904	2.904	2.702
155	-	-	4.886	4.348	3.696	3.649	3.624	3.403	3.390	3.338	3.295	3.051	3.051	3.051	3.051	3.051	3.051	2.867
160	-	-	4.974	4.459	3.812	3.769	3.748	3.555	3.544	3.500	3.464	3.198	3.198	3.198	3.198	3.198	3.198	3.032
165	-	-	5.062	4.571	3.927	3.890	3.871	3.707	3.698	3.661	3.632	3.412	3.358	3.345	3.345	3.345	3.345	3.197
170	-	-	5.150	4.683	4.060	4.018	3.998	3.859	3.852	3.823	3.800	3.630	3.589	3.493	3.493	3.493	3.493	3.361
175	-	-	5.238	4.795	4.198	4.154	4.134	4.002	3.998	3.978	3.965	3.848	3.821	3.742	3.640	3.640	3.640	3.526
180	-	-	5.326	4.906	4.336	4.291	4.269	4.129	4.124	4.103	4.088	4.014	4.004	3.980	3.938	3.787	3.787	3.691
185	-	-	5.414	5.018	4.474	4.427	4.404	4.256	4.251	4.228	4.212	4.131	4.118	4.092	4.058	3.999	3.934	3.856
190	-	-	5.502	5.130	4.613	4.564	4.540	4.383	4.377	4.353	4.336	4.247	4.233	4.203	4.165	4.096	4.024	3.981
195	-	-	5.590	5.242	4.751	4.700	4.675	4.510	4.504	4.478	4.459	4.363	4.347	4.314	4.272	4.193	4.105	4.045
200	-	-	5.677	5.353	4.889	4.837	4.811	4.637	4.630	4.602	4.583	4.479	4.462	4.426	4.379	4.291	4.185	4.110
205	-	-	5.765	5.465	5.027	4.973	4.946	4.764	4.757	4.727	4.706	4.595	4.577	4.537	4.486	4.388	4.265	4.174
210	-	-	-	5.577	5.165	5.109	5.082	4.891	4.883	4.852	4.830	4.711	4.691	4.649	4.593	4.485	4.345	4.238
215	-	-	-	5.689	5.304	5.246	5.217	5.018	5.010	4.977	4.954	4.827	4.806	4.760	4.700	4.582	4.426	4.302
220	-	-	-	5.800	5.442	5.382	5.353	5.145	5.136	5.102	5.077	4.943	4.920	4.872	4.807	4.679	4.506	4.367
225	-	-	-	-	5.580	5.519	5.488	5.272	5.263	5.226	5.201	5.059	5.035	4.983	4.914	4.776	4.586	4.431
230	-	-	-	-	5.718	5.655	5.624	5.399	5.389	5.351	5.324	5.175	5.150	5.094	5.021	4.874	4.667	4.495
235	-	-	-	-	5.857	5.792	5.759	5.526	5.516	5.476	5.448	5.291	5.264	5.206	5.128	4.971	4.747	4.559
240	-	-	-	-	-	-	-	5.653	5.642	5.601	5.571	5.407	5.379	5.317	5.235	5.068	4.827	4.623
245	-	-	-	-	-	-	-	5.780	5.769	5.726	5.695	5.523	5.493	5.429	5.342	5.165	4.907	4.688
250	-	-	-	-	-	-	-	5.907	5.895	5.850	5.819	5.639	5.608	5.540	5.449	5.262	4.988	4.752
255	-	-	-	-	-	-	-	-	-	-	-	5.755	5.723	5.652	5.556	5.360	5.068	4.816
260	-	-	-	-	-	-	-	-	-	-	-	5.871	5.837	5.763	5.663	5.457	5.148	4.880
265	-	-	-	-	-	-	-	-	-	-	-	-	-	5.875	5.770	5.554	5.229	4.945
270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.651	5.309	5.009
275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.748	5.389	5.073
280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.845	5.469	5.137
285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.550	5.201
290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.630	5.266
295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.710	5.330
300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.791	5.394
305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.871	5.458
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.523
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.587
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.651
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.715
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.779
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.844
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
390	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
405	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
415	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Issued: 13th September 2018
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Valid to: 12th September 2023

CERTIFICATE No CF 5644
SHERWIN WILLIAMS

Table 44 Rectangular Hollow Beams 120 minutes																		
Required Thickness (mm) for a Design Temperature (°C)																		
Section Factor (m-1)	350	400	450	500	544	550	553	575	576	580	583	600	603	610	620	650	700	750
65	5.194	4.151	3.182	2.483	2.002	1.787	1.761	1.584	1.578	1.554	1.533	1.429	1.413	1.377	1.268	1.046	0.638	0.329
70	5.594	4.386	3.545	2.702	2.204	2.014	1.985	1.787	1.780	1.752	1.728	1.610	1.592	1.550	1.494	1.290	0.889	0.517
75	-	4.620	3.907	2.921	2.406	2.242	2.210	1.990	1.981	1.949	1.924	1.792	1.770	1.723	1.661	1.500	1.139	0.742
80	-	4.854	4.093	3.166	2.607	2.470	2.435	2.193	2.183	2.147	2.119	1.973	1.949	1.896	1.827	1.650	1.390	0.967
85	-	5.089	4.252	3.418	2.809	2.697	2.660	2.396	2.385	2.345	2.315	2.155	2.128	2.069	1.993	1.800	1.545	1.192
90	-	5.323	4.411	3.670	3.002	2.925	2.884	2.599	2.586	2.543	2.510	2.337	2.307	2.243	2.159	1.950	1.674	1.417
95	-	5.558	4.570	3.923	3.162	3.090	3.059	2.802	2.788	2.741	2.706	2.518	2.485	2.416	2.325	2.100	1.804	1.549
100	-	5.792	4.729	4.047	3.321	3.239	3.203	2.989	2.981	2.939	2.901	2.700	2.664	2.589	2.491	2.250	1.933	1.669
105	-	-	4.888	4.151	3.480	3.389	3.347	3.099	3.089	3.056	3.034	2.881	2.843	2.762	2.658	2.400	2.062	1.788
110	-	-	5.047	4.256	3.640	3.538	3.491	3.208	3.197	3.159	3.132	3.016	2.996	2.936	2.824	2.550	2.191	1.908
115	-	-	5.206	4.360	3.799	3.687	3.635	3.318	3.306	3.261	3.231	3.107	3.088	3.045	2.982	2.700	2.320	2.027
120	-	-	5.365	4.465	3.958	3.837	3.779	3.428	3.414	3.364	3.329	3.197	3.179	3.138	3.078	2.851	2.450	2.147
125	-	-	5.524	4.570	4.064	3.978	3.923	3.537	3.523	3.467	3.427	3.288	3.271	3.232	3.174	2.992	2.579	2.267
130	-	-	5.683	4.674	4.169	4.087	4.041	3.647	3.631	3.569	3.526	3.379	3.362	3.325	3.271	3.100	2.708	2.386
135	-	-	5.842	4.779	4.275	4.196	4.153	3.757	3.739	3.672	3.624	3.469	3.454	3.419	3.367	3.208	2.837	2.506
140	-	-	-	4.883	4.381	4.306	4.264	3.867	3.848	3.774	3.723	3.560	3.545	3.512	3.464	3.316	2.966	2.625
145	-	-	-	4.988	4.487	4.415	4.375	3.981	3.956	3.877	3.821	3.650	3.637	3.605	3.560	3.423	3.109	2.745
150	-	-	-	5.093	4.592	4.524	4.486	4.113	4.090	3.988	3.919	3.741	3.728	3.699	3.657	3.531	3.251	2.864
155	-	-	-	5.197	4.698	4.633	4.597	4.246	4.224	4.128	4.048	3.831	3.820	3.792	3.753	3.639	3.394	2.994
160	-	-	-	5.302	4.804	4.742	4.709	4.378	4.358	4.269	4.194	3.922	3.911	3.886	3.850	3.747	3.536	3.199
165	-	-	-	5.406	4.910	4.852	4.820	4.511	4.492	4.409	4.340	4.055	4.036	3.994	3.946	3.855	3.679	3.404
170	-	-	-	5.511	5.015	4.961	4.931	4.643	4.626	4.549	4.485	4.215	4.194	4.149	4.090	3.964	3.822	3.609
175	-	-	-	5.616	5.121	5.070	5.042	4.776	4.760	4.690	4.631	4.374	4.352	4.303	4.239	4.106	3.963	3.815
180	-	-	-	5.720	5.227	5.179	5.153	4.908	4.894	4.830	4.777	4.534	4.510	4.457	4.388	4.247	4.085	3.987
185	-	-	-	5.825	5.333	5.289	5.265	5.041	5.028	4.970	4.923	4.694	4.668	4.612	4.537	4.388	4.206	4.085
190	-	-	-	-	5.439	5.398	5.376	5.173	5.162	5.111	5.069	4.853	4.826	4.766	4.687	4.529	4.328	4.183
195	-	-	-	-	5.544	5.507	5.487	5.306	5.295	5.251	5.215	5.013	4.984	4.920	4.836	4.670	4.449	4.282
200	-	-	-	-	5.650	5.616	5.598	5.438	5.429	5.391	5.361	5.172	5.142	5.075	4.985	4.812	4.571	4.380
205	-	-	-	-	5.756	5.725	5.710	5.571	5.563	5.532	5.507	5.332	5.300	5.229	5.134	4.953	4.692	4.479
210	-	-	-	-	5.862	5.835	5.821	5.703	5.697	5.672	5.653	5.491	5.457	5.384	5.283	5.094	4.814	4.577
215	-	-	-	-	-	-	-	5.836	5.831	5.812	5.799	5.651	5.615	5.538	5.432	5.235	4.935	4.676
220	-	-	-	-	-	-	-	-	-	-	-	5.810	5.773	5.692	5.581	5.376	5.057	4.774
225	-	-	-	-	-	-	-	-	-	-	-	-	-	5.847	5.730	5.517	5.178	4.873
230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.880	5.659	5.300	4.971
235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.800	5.421	5.069
240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.543	5.168
245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.664	5.266
250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.786	5.365
255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.907	5.463
260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.562
265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.660
270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.758
275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.857
280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
390	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
405	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
415	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

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