certifire

CERTIFICATE OF APPROVAL
No CF 5857

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

JOTUN A/S
HYSTEDVEIEN 167
3209 SANDEFJORD
NORWAY
TEL NO: +4733457077

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
SteelMaster 1200HPE	**TS15 INTUMESCENT COATINGS FOR STEELWORK**

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

Paul Duggan
Certification Manager

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

SteelMaster 1200HPE

1. This approval relates to the use of SteelMaster 1200HPE for the fire protection of I/H beams, I/H columns, circular hollow columns and rectangular/square hollow columns. The precise scope is given in the Tables, which show the total dry film thickness of SteelMaster 1200HPE (excluding primer and topcoat) required to provide fire resistance periods in accordance with BS476: Part 21: 1987. The scope includes periods of fire resistance of up to 180 minutes.

2. 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.

3. The products are approved on the basis of:

   i) Initial type testing.
   ii) A design appraisal against TS15.
   iii) Certification of quality management system to ISO 9001.
   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 is applicable to steel sections blast cleaned to ISO 8501-1 Sa2.5 or equivalent and primed with a suitable and compatible primer. The data shown also applies to galvanized steel sections treated with Penguard two component epoxy primer, with a permitted theoretical Dry Film Thickness between 40µm and 120µm (any practical information given by the manufacturer must be followed). Specifications of surface preparations, primers and topcoats are available from Jotun A/S whose responsibility is to ensure that SteelMaster 1200HPE is compatible for use in respect of both ambient and fire conditions. The nominal dry film thickness of primer and topcoat should be applied at a nominal thickness tested, unless stated otherwise in this certificate.

6. The data shown is applicable to SteelMaster 1200HPE applied by spray to horizontal, vertical, flexural and compression members supporting loads up to the maximum design loads specified in EN1993-1-1.

7. Results from the analysis of I/H sections are directly applicable to angles, channels and T-sections for the same section factor.

8. The approval relates to ongoing production. The product and/or its immediate packaging shall be identified with the manufacturer's name, the product name or number, the CERTIFIRE name or name and mark, together with the CERTIFIRE certificate number and application where appropriate.

9. The data shown in the tables is based on an assessment that complies with the criteria for acceptability incorporated within the CERTIFIRE scheme.

10. For section factors below the extended minimum given in the Tables of Results, the same coating thickness as that applied to the extended minimum section factor shall be applied.

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JOTUN A/S

I/H Beams 15 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
30	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
35	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
40	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
45	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
50	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
55	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
60	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
65	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
70	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
75	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
80	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
85	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
90	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
95	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
100	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
105	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
110	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
115	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
120	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
125	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
130	0.449	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
135	0.476	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
140	0.503	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
145	0.530	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
150	0.556	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
155	0.583	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
160	0.610	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
165	0.637	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
170	0.664	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
175	0.690	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
180	0.717	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
185	0.744	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
190	0.771	0.434	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
195	0.798	0.455	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
200	0.824	0.477	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
205	0.851	0.499	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
210	0.878	0.520	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
215	0.905	0.542	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
220	0.932	0.563	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
225	0.958	0.585	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
230	0.985	0.606	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
235	1.012	0.628	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
240	1.039	0.650	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
245	1.066	0.671	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
250	1.092	0.693	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
255	1.119	0.714	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
260	1.146	0.736	0.428	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
265	1.173	0.758	0.447	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
270	1.200	0.779	0.466	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
275	1.226	0.801	0.484	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
280	1.253	0.822	0.503	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
285	1.280	0.844	0.522	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
290	1.307	0.865	0.541	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
295	1.334	0.887	0.560	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
300	1.360	0.909	0.579	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
305	1.387	0.930	0.597	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
310	1.414	0.952	0.616	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
315	1.441	0.973	0.635	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
320	1.468	0.995	0.654	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
325	1.494	1.016	0.673	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
330	1.521	1.038	0.692	0.435	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
335	1.548	1.060	0.710	0.452	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
340	1.575	1.081	0.729	0.468	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

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JOTUN A/S

I/H Beams 30 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
30	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
35	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
40	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
45	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
50	0.492	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
55	0.574	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
60	0.656	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
65	0.738	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
70	0.819	0.462	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
75	0.901	0.506	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
80	0.983	0.550	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
85	1.065	0.594	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
90	1.146	0.638	0.451	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
95	1.228	0.682	0.485	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
100	1.310	0.726	0.518	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
105	1.392	0.770	0.552	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
110	1.474	0.814	0.585	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
115	1.555	0.858	0.619	0.452	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
120	1.637	0.902	0.652	0.483	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
125	1.719	0.946	0.686	0.513	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
130	1.801	0.990	0.719	0.544	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
135	1.882	1.033	0.753	0.574	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
140	1.964	1.077	0.786	0.605	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
145	2.041	1.121	0.820	0.635	0.441	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
150	2.104	1.165	0.853	0.665	0.469	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
155	2.168	1.209	0.887	0.696	0.498	0.428	0.422	0.422	0.422	0.422	0.422	0.422	0.422
160	2.232	1.253	0.920	0.726	0.526	0.456	0.422	0.422	0.422	0.422	0.422	0.422	0.422
165	2.296	1.297	0.954	0.757	0.555	0.483	0.422	0.422	0.422	0.422	0.422	0.422	0.422
170	2.359	1.341	0.987	0.787	0.584	0.511	0.422	0.422	0.422	0.422	0.422	0.422	0.422
175	2.423	1.385	1.021	0.818	0.612	0.539	0.440	0.422	0.422	0.422	0.422	0.422	0.422
180	2.487	1.429	1.055	0.848	0.641	0.566	0.466	0.422	0.422	0.422	0.422	0.422	0.422
185	2.551	1.473	1.088	0.879	0.669	0.594	0.492	0.422	0.422	0.422	0.422	0.422	0.422
190	2.615	1.517	1.122	0.909	0.698	0.622	0.518	0.426	0.422	0.422	0.422	0.422	0.422
195	2.678	1.561	1.155	0.940	0.727	0.649	0.544	0.450	0.422	0.422	0.422	0.422	0.422
200	2.742	1.605	1.189	0.970	0.755	0.677	0.570	0.475	0.422	0.422	0.422	0.422	0.422
205	2.806	1.649	1.222	1.001	0.784	0.705	0.596	0.500	0.422	0.422	0.422	0.422	0.422
210	2.870	1.692	1.256	1.031	0.812	0.732	0.622	0.524	0.422	0.422	0.422	0.422	0.422
215	2.933	1.736	1.289	1.062	0.841	0.760	0.648	0.549	0.444	0.422	0.422	0.422	0.422
220	2.997	1.780	1.323	1.092	0.870	0.788	0.674	0.573	0.468	0.422	0.422	0.422	0.422
225	3.061	1.824	1.356	1.123	0.898	0.815	0.700	0.598	0.491	0.422	0.422	0.422	0.422
230	3.125	1.868	1.390	1.153	0.927	0.843	0.726	0.623	0.514	0.422	0.422	0.422	0.422
235	3.188	1.912	1.423	1.184	0.955	0.870	0.752	0.647	0.537	0.444	0.422	0.422	0.422
240	3.252	1.956	1.457	1.214	0.984	0.898	0.777	0.672	0.560	0.466	0.422	0.422	0.422
245	3.316	2.000	1.490	1.245	1.013	0.926	0.803	0.697	0.583	0.488	0.422	0.422	0.422
250	3.380	2.045	1.524	1.275	1.041	0.953	0.829	0.721	0.607	0.510	0.422	0.422	0.422
255	3.444	2.090	1.557	1.305	1.070	0.981	0.855	0.746	0.630	0.532	0.422	0.422	0.422
260	3.507	2.136	1.591	1.336	1.098	1.009	0.881	0.770	0.653	0.554	0.422	0.422	0.422
265	3.571	2.181	1.624	1.366	1.127	1.036	0.907	0.795	0.676	0.576	0.422	0.422	0.422
270	3.635	2.227	1.658	1.397	1.156	1.064	0.933	0.820	0.699	0.598	0.428	0.422	0.422
275	3.699	2.272	1.691	1.427	1.184	1.092	0.959	0.844	0.722	0.620	0.448	0.422	0.422
280	3.762	2.318	1.725	1.458	1.213	1.119	0.985	0.869	0.746	0.642	0.469	0.422	0.422
285	3.826	2.364	1.758	1.488	1.241	1.147	1.011	0.893	0.769	0.663	0.489	0.422	0.422
290	3.890	2.409	1.792	1.519	1.270	1.175	1.037	0.918	0.792	0.685	0.509	0.422	0.422
295	3.954	2.455	1.825	1.549	1.299	1.202	1.063	0.943	0.815	0.707	0.529	0.422	0.422
300	4.017	2.500	1.859	1.580	1.327	1.230	1.089	0.967	0.838	0.729	0.549	0.422	0.422
305	4.056	2.546	1.893	1.610	1.356	1.258	1.115	0.992	0.861	0.751	0.570	0.422	0.422
310	4.096	2.591	1.926	1.641	1.384	1.285	1.141	1.017	0.885	0.773	0.590	0.422	0.422
315	4.135	2.637	1.960	1.671	1.413	1.313	1.167	1.041	0.908	0.795	0.610	0.422	0.422
320	4.175	2.682	1.993	1.702	1.442	1.341	1.193	1.066	0.931	0.817	0.630	0.422	0.422
325	4.215	2.728	2.028	1.732	1.470	1.368	1.219	1.090	0.954	0.839	0.651	0.422	0.422
330	4.254	2.773	2.069	1.763	1.499	1.396	1.245	1.115	0.977	0.861	0.671	0.422	0.422
335	4.294	2.819	2.109	1.793	1.527	1.423	1.270	1.140	1.000	0.883	0.691	0.422	0.422
340	4.333	2.864	2.150	1.824	1.556	1.451	1.296	1.164	1.024	0.905	0.711	0.426	0.422

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 45 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	0.484	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
30	0.530	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
35	0.666	0.430	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
40	0.802	0.526	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
45	0.938	0.622	0.428	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
50	1.074	0.718	0.499	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
55	1.210	0.814	0.571	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
60	1.346	0.910	0.642	0.455	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
65	1.482	1.006	0.714	0.511	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
70	1.618	1.102	0.785	0.566	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
75	1.755	1.199	0.857	0.622	0.451	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
80	1.891	1.295	0.929	0.677	0.495	0.444	0.422	0.422	0.422	0.422	0.422	0.422	0.422
85	2.027	1.391	1.000	0.733	0.539	0.484	0.422	0.422	0.422	0.422	0.422	0.422	0.422
90	2.179	1.487	1.072	0.788	0.582	0.523	0.451	0.422	0.422	0.422	0.422	0.422	0.422
95	2.332	1.583	1.143	0.843	0.626	0.563	0.488	0.430	0.422	0.422	0.422	0.422	0.422
100	2.484	1.679	1.215	0.899	0.670	0.602	0.525	0.465	0.422	0.422	0.422	0.422	0.422
105	2.636	1.775	1.286	0.954	0.713	0.642	0.562	0.500	0.437	0.422	0.422	0.422	0.422
110	2.788	1.871	1.358	1.010	0.757	0.681	0.598	0.535	0.471	0.422	0.422	0.422	0.422
115	2.940	1.967	1.429	1.065	0.801	0.720	0.635	0.570	0.504	0.450	0.422	0.422	0.422
120	3.093	2.049	1.501	1.121	0.844	0.760	0.672	0.606	0.537	0.482	0.422	0.422	0.422
125	3.245	2.112	1.573	1.176	0.888	0.799	0.709	0.641	0.571	0.514	0.423	0.422	0.422
130	3.397	2.175	1.644	1.232	0.932	0.839	0.745	0.676	0.604	0.545	0.453	0.422	0.422
135	3.549	2.238	1.716	1.287	0.975	0.878	0.782	0.711	0.637	0.577	0.482	0.422	0.422
140	3.701	2.301	1.787	1.343	1.019	0.918	0.819	0.746	0.671	0.609	0.512	0.422	0.422
145	3.854	2.365	1.859	1.398	1.063	0.957	0.856	0.781	0.704	0.641	0.542	0.422	0.422
150	4.006	2.428	1.930	1.453	1.106	0.996	0.893	0.816	0.738	0.673	0.572	0.422	0.422
155	4.058	2.491	2.002	1.509	1.150	1.036	0.929	0.851	0.771	0.705	0.602	0.422	0.422
160	4.103	2.554	2.072	1.564	1.194	1.075	0.966	0.887	0.804	0.737	0.632	0.440	0.422
165	4.149	2.617	2.143	1.620	1.237	1.115	1.003	0.922	0.838	0.769	0.661	0.466	0.422
170	4.195	2.680	2.213	1.675	1.281	1.154	1.040	0.957	0.871	0.801	0.691	0.492	0.422
175	4.240	2.743	2.283	1.731	1.325	1.194	1.076	0.992	0.904	0.833	0.721	0.517	0.422
180	4.286	2.807	2.353	1.786	1.368	1.233	1.113	1.027	0.938	0.865	0.751	0.543	0.422
185	4.331	2.870	2.424	1.842	1.412	1.272	1.150	1.062	0.971	0.897	0.781	0.569	0.422
190	4.377	2.933	2.494	1.897	1.456	1.312	1.187	1.097	1.004	0.929	0.811	0.595	0.422
195	4.423	2.996	2.564	1.953	1.499	1.351	1.224	1.132	1.038	0.961	0.841	0.621	0.422
200	4.468	3.059	2.635	2.008	1.543	1.391	1.260	1.168	1.071	0.993	0.870	0.646	0.434
205	4.514	3.122	2.705	2.059	1.587	1.430	1.297	1.203	1.104	1.025	0.900	0.672	0.455
210	4.559	3.185	2.775	2.108	1.630	1.470	1.334	1.238	1.138	1.057	0.930	0.698	0.476
215	4.605	3.249	2.845	2.157	1.674	1.509	1.371	1.273	1.171	1.089	0.960	0.724	0.497
220	4.651	3.312	2.916	2.206	1.718	1.548	1.407	1.308	1.204	1.121	0.990	0.750	0.518
225	4.696	3.375	2.986	2.256	1.761	1.588	1.444	1.343	1.238	1.153	1.020	0.775	0.539
230	4.742	3.438	3.056	2.305	1.805	1.627	1.481	1.378	1.271	1.184	1.049	0.801	0.560
235	4.787	3.501	3.126	2.354	1.849	1.667	1.518	1.414	1.305	1.216	1.079	0.827	0.581
240	4.833	3.564	3.197	2.403	1.892	1.706	1.555	1.449	1.338	1.248	1.109	0.853	0.602
245	4.879	3.627	3.267	2.453	1.936	1.746	1.591	1.484	1.371	1.280	1.139	0.879	0.623
250	4.924	3.691	3.337	2.502	1.980	1.785	1.628	1.519	1.405	1.312	1.169	0.905	0.644
255	4.970	3.754	3.407	2.551	2.024	1.824	1.665	1.554	1.438	1.344	1.199	0.930	0.665
260	5.015	3.817	3.478	2.600	2.072	1.864	1.702	1.589	1.471	1.376	1.228	0.956	0.686
265	5.061	3.880	3.548	2.649	2.121	1.903	1.739	1.624	1.505	1.408	1.258	0.982	0.707
270	5.107	3.943	3.618	2.699	2.170	1.943	1.775	1.659	1.538	1.440	1.288	1.008	0.728
275	5.152	4.006	3.688	2.748	2.219	1.982	1.812	1.695	1.571	1.472	1.318	1.034	0.749
280	5.198	4.063	3.759	2.797	2.268	2.022	1.849	1.730	1.605	1.504	1.348	1.059	0.770
285	5.243	4.119	3.829	2.846	2.317	2.071	1.886	1.765	1.638	1.536	1.378	1.085	0.791
290	5.289	4.175	3.899	2.895	2.366	2.120	1.922	1.800	1.671	1.568	1.408	1.111	0.812
295	5.335	4.230	3.969	2.945	2.415	2.169	1.959	1.835	1.705	1.600	1.437	1.137	0.833
300	5.380	4.286	4.030	2.994	2.464	2.218	1.996	1.870	1.738	1.632	1.467	1.163	0.854
305	5.426	4.342	4.071	3.043	2.513	2.267	2.036	1.905	1.771	1.664	1.497	1.189	0.875
310	5.471	4.398	4.113	3.092	2.562	2.316	2.083	1.940	1.805	1.696	1.527	1.214	0.896
315	5.517	4.454	4.154	3.141	2.611	2.366	2.131	1.976	1.838	1.728	1.557	1.240	0.917
320	5.563	4.510	4.196	3.191	2.660	2.415	2.178	2.011	1.872	1.760	1.587	1.266	0.938
325	5.608	4.565	4.237	3.240	2.709	2.464	2.225	2.053	1.905	1.791	1.616	1.292	0.959
330	5.654	4.621	4.279	3.289	2.758	2.513	2.273	2.098	1.938	1.823	1.646	1.318	0.980
335	5.699	4.677	4.321	3.338	2.807	2.562	2.320	2.144	1.972	1.855	1.676	1.343	1.001
340	5.745	4.733	4.362	3.387	2.856	2.611	2.368	2.190	2.005	1.887	1.706	1.369	1.021

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 60 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	1.595	0.887	0.449	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
30	1.693	0.932	0.449	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
35	1.884	1.043	0.554	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
40	2.081	1.154	0.667	0.504	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
45	2.297	1.264	0.781	0.596	0.448	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
50	2.513	1.375	0.894	0.689	0.525	0.472	0.422	0.422	0.422	0.422	0.422	0.422	0.422
55	2.728	1.486	1.007	0.782	0.602	0.543	0.457	0.422	0.422	0.422	0.422	0.422	0.422
60	2.944	1.597	1.120	0.875	0.679	0.614	0.520	0.451	0.422	0.422	0.422	0.422	0.422
65	3.160	1.708	1.234	0.968	0.756	0.685	0.583	0.508	0.439	0.422	0.422	0.422	0.422
70	3.376	1.818	1.347	1.060	0.833	0.756	0.646	0.565	0.491	0.440	0.422	0.422	0.422
75	3.592	1.929	1.460	1.153	0.910	0.827	0.709	0.622	0.542	0.487	0.423	0.422	0.422
80	3.808	2.053	1.574	1.246	0.987	0.898	0.772	0.679	0.594	0.534	0.464	0.422	0.422
85	4.018	2.244	1.687	1.339	1.064	0.969	0.835	0.736	0.645	0.581	0.504	0.422	0.422
90	4.085	2.435	1.800	1.431	1.141	1.040	0.898	0.793	0.697	0.628	0.545	0.422	0.422
95	4.152	2.626	1.913	1.524	1.217	1.110	0.961	0.850	0.748	0.675	0.585	0.455	0.422
100	4.219	2.817	2.026	1.617	1.294	1.181	1.023	0.907	0.799	0.722	0.626	0.489	0.422
105	4.286	3.008	2.129	1.710	1.371	1.252	1.086	0.964	0.851	0.770	0.666	0.524	0.422
110	4.353	3.199	2.232	1.803	1.448	1.323	1.149	1.021	0.902	0.817	0.707	0.558	0.423
115	4.420	3.390	2.336	1.895	1.525	1.394	1.212	1.078	0.954	0.864	0.747	0.593	0.453
120	4.487	3.581	2.439	1.988	1.602	1.465	1.275	1.135	1.005	0.911	0.788	0.627	0.483
125	4.554	3.772	2.542	2.065	1.679	1.536	1.338	1.192	1.057	0.958	0.828	0.662	0.512
130	4.621	3.963	2.645	2.133	1.756	1.607	1.401	1.249	1.108	1.005	0.869	0.696	0.542
135	4.688	4.049	2.748	2.202	1.833	1.678	1.464	1.306	1.159	1.052	0.909	0.731	0.571
140	4.755	4.096	2.851	2.270	1.910	1.749	1.527	1.363	1.211	1.099	0.950	0.765	0.601
145	4.822	4.142	2.955	2.338	1.987	1.820	1.590	1.420	1.262	1.146	0.990	0.800	0.630
150	4.889	4.189	3.058	2.406	2.060	1.891	1.653	1.477	1.314	1.193	1.030	0.834	0.660
155	4.956	4.235	3.161	2.475	2.131	1.962	1.716	1.534	1.365	1.240	1.071	0.869	0.689
160	5.023	4.282	3.264	2.543	2.202	2.033	1.779	1.592	1.417	1.287	1.111	0.903	0.719
165	5.090	4.329	3.367	2.611	2.273	2.107	1.842	1.649	1.468	1.334	1.152	0.938	0.749
170	5.157	4.375	3.471	2.679	2.344	2.182	1.905	1.706	1.520	1.381	1.192	0.973	0.778
175	5.225	4.422	3.574	2.747	2.414	2.256	1.968	1.763	1.571	1.428	1.233	1.007	0.808
180	5.292	4.469	3.677	2.816	2.485	2.331	2.033	1.820	1.622	1.475	1.273	1.042	0.837
185	5.359	4.515	3.780	2.884	2.556	2.405	2.116	1.877	1.674	1.522	1.314	1.076	0.867
190	5.426	4.562	3.883	2.952	2.627	2.479	2.198	1.934	1.725	1.569	1.354	1.111	0.896
195	5.493	4.608	3.986	3.020	2.698	2.554	2.280	1.991	1.777	1.616	1.395	1.145	0.926
200	5.560	4.655	4.050	3.089	2.769	2.628	2.362	2.047	1.828	1.663	1.435	1.180	0.955
205	5.627	4.702	4.098	3.157	2.840	2.703	2.445	2.103	1.880	1.710	1.476	1.214	0.985
210	5.694	4.748	4.147	3.225	2.910	2.777	2.527	2.159	1.931	1.757	1.516	1.249	1.015
215	5.761	4.795	4.195	3.293	2.981	2.851	2.609	2.215	1.982	1.804	1.557	1.283	1.044
220	5.828	4.842	4.243	3.361	3.052	2.926	2.692	2.271	2.035	1.851	1.597	1.318	1.074
225	5.904	4.888	4.292	3.430	3.123	3.000	2.774	2.327	2.090	1.898	1.637	1.352	1.103
230	5.985	4.935	4.340	3.498	3.194	3.074	2.856	2.383	2.146	1.945	1.678	1.387	1.133
235	6.066	4.982	4.389	3.566	3.265	3.149	2.938	2.439	2.201	1.992	1.718	1.421	1.162
240	6.147	5.028	4.437	3.634	3.335	3.223	3.021	2.495	2.257	2.042	1.759	1.456	1.192
245	6.228	5.075	4.485	3.702	3.406	3.298	3.103	2.551	2.312	2.097	1.799	1.490	1.221
250	6.309	5.121	4.534	3.771	3.477	3.372	3.185	2.607	2.367	2.152	1.840	1.525	1.251
255	6.391	5.168	4.582	3.839	3.548	3.446	3.267	2.663	2.423	2.207	1.880	1.559	1.281
260	6.472	5.215	4.631	3.907	3.619	3.521	3.350	2.719	2.478	2.262	1.921	1.594	1.310
265	6.553	5.261	4.679	3.975	3.690	3.595	3.432	2.775	2.534	2.317	1.961	1.629	1.340
270	6.634	5.308	4.727	4.038	3.760	3.669	3.514	2.831	2.589	2.372	2.002	1.663	1.369
275	6.715	5.355	4.776	4.092	3.831	3.744	3.596	2.887	2.645	2.427	2.049	1.698	1.399
280	6.796	5.401	4.824	4.146	3.902	3.818	3.679	2.943	2.700	2.482	2.104	1.732	1.428
285	6.877	5.448	4.872	4.200	3.973	3.893	3.761	2.999	2.756	2.537	2.159	1.767	1.458
290	6.958	5.495	4.921	4.254	4.035	3.967	3.843	3.055	2.811	2.592	2.213	1.801	1.487
295	7.039	5.541	4.969	4.308	4.084	4.031	3.925	3.111	2.866	2.647	2.268	1.836	1.517
300	7.120	5.588	5.018	4.363	4.132	4.077	4.008	3.167	2.922	2.703	2.323	1.870	1.547
305	7.201	5.634	5.066	4.417	4.181	4.124	4.054	3.223	2.977	2.758	2.377	1.905	1.576
310	7.282	5.681	5.114	4.471	4.230	4.170	4.096	3.279	3.033	2.813	2.432	1.939	1.606
315	7.364	5.728	5.163	4.525	4.279	4.216	4.138	3.334	3.088	2.868	2.487	1.974	1.635
320	7.445	5.774	5.211	4.579	4.328	4.262	4.181	3.390	3.144	2.923	2.541	2.008	1.665
325	7.526	5.821	5.260	4.633	4.376	4.308	4.223	3.446	3.199	2.978	2.596	2.052	1.694
330	7.607	5.890	5.308	4.688	4.425	4.355	4.265	3.502	3.255	3.033	2.651	2.102	1.724
335	7.688	6.002	5.356	4.742	4.474	4.401	4.307	3.558	3.310	3.088	2.705	2.152	1.753
340	7.769	6.115	5.405	4.796	4.523	4.447	4.350	3.614	3.365	3.143	2.760	2.202	1.783

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 75 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	2.432	1.594	1.051	0.485	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
30	2.583	1.694	1.119	0.529	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422	0.422
35	2.906	1.879	1.223	0.658	0.517	0.474	0.422	0.422	0.422	0.422	0.422	0.422	0.422
40	3.230	2.072	1.328	0.786	0.626	0.575	0.497	0.441	0.422	0.422	0.422	0.422	0.422
45	3.553	2.290	1.432	0.915	0.734	0.676	0.588	0.525	0.468	0.426	0.422	0.422	0.422
50	3.877	2.508	1.536	1.044	0.843	0.777	0.680	0.609	0.544	0.496	0.429	0.422	0.422
55	4.098	2.726	1.640	1.172	0.951	0.878	0.771	0.693	0.621	0.566	0.492	0.422	0.422
60	4.243	2.944	1.745	1.301	1.060	0.979	0.862	0.777	0.697	0.636	0.555	0.422	0.422
65	4.388	3.162	1.849	1.430	1.168	1.080	0.954	0.861	0.773	0.707	0.618	0.471	0.422
70	4.533	3.380	1.953	1.558	1.276	1.181	1.045	0.945	0.850	0.777	0.681	0.523	0.422
75	4.678	3.598	2.104	1.687	1.385	1.282	1.137	1.029	0.926	0.847	0.744	0.575	0.445
80	4.823	3.816	2.343	1.816	1.493	1.383	1.228	1.113	1.003	0.917	0.807	0.628	0.483
85	4.967	4.021	2.583	1.945	1.602	1.483	1.320	1.197	1.079	0.988	0.870	0.680	0.522
90	5.112	4.093	2.822	2.087	1.710	1.584	1.411	1.281	1.156	1.058	0.933	0.732	0.561
95	5.257	4.164	3.061	2.249	1.819	1.685	1.503	1.365	1.232	1.128	0.996	0.785	0.600
100	5.402	4.235	3.301	2.411	1.927	1.786	1.594	1.449	1.309	1.198	1.059	0.837	0.639
105	5.547	4.307	3.540	2.574	2.036	1.887	1.686	1.532	1.385	1.268	1.122	0.889	0.678
110	5.692	4.378	3.779	2.736	2.149	1.988	1.777	1.616	1.462	1.339	1.185	0.942	0.716
115	5.837	4.450	4.016	2.898	2.261	2.086	1.869	1.700	1.538	1.409	1.248	0.994	0.755
120	5.944	4.521	4.063	3.061	2.374	2.182	1.960	1.784	1.615	1.479	1.311	1.046	0.794
125	6.047	4.592	4.111	3.223	2.487	2.279	2.047	1.868	1.691	1.549	1.374	1.099	0.833
130	6.150	4.664	4.159	3.385	2.599	2.375	2.122	1.952	1.767	1.620	1.437	1.151	0.872
135	6.253	4.735	4.207	3.548	2.712	2.472	2.198	2.034	1.844	1.690	1.500	1.203	0.911
140	6.356	4.807	4.254	3.710	2.825	2.568	2.274	2.103	1.920	1.760	1.563	1.256	0.949
145	6.459	4.878	4.302	3.872	2.937	2.664	2.350	2.173	1.997	1.830	1.626	1.308	0.988
150	6.561	4.949	4.350	4.021	3.050	2.761	2.426	2.242	2.071	1.901	1.689	1.360	1.027
155	6.664	5.021	4.397	4.067	3.163	2.857	2.502	2.312	2.144	1.971	1.752	1.413	1.066
160	6.767	5.092	4.445	4.113	3.275	2.954	2.577	2.381	2.217	2.043	1.815	1.465	1.105
165	6.870	5.164	4.493	4.160	3.388	3.050	2.653	2.451	2.290	2.120	1.878	1.518	1.144
170	6.973	5.235	4.540	4.206	3.501	3.146	2.729	2.520	2.363	2.197	1.941	1.570	1.182
175	7.076	5.307	4.588	4.252	3.613	3.243	2.805	2.590	2.436	2.274	2.004	1.622	1.221
180	7.179	5.378	4.636	4.299	3.726	3.339	2.881	2.660	2.509	2.351	2.082	1.675	1.260
185	7.281	5.449	4.684	4.345	3.839	3.435	2.957	2.729	2.581	2.428	2.166	1.727	1.299
190	7.384	5.521	4.731	4.392	3.952	3.532	3.032	2.799	2.654	2.505	2.249	1.779	1.338
195	7.487	5.592	4.779	4.438	4.037	3.628	3.108	2.868	2.727	2.582	2.333	1.832	1.376
200	7.590	5.664	4.827	4.484	4.087	3.725	3.184	2.938	2.800	2.659	2.417	1.884	1.415
205	7.693	5.735	4.874	4.531	4.136	3.821	3.260	3.007	2.873	2.736	2.500	1.936	1.454
210	7.796	5.806	4.922	4.577	4.186	3.917	3.336	3.077	2.946	2.813	2.584	1.989	1.493
215	7.899	5.885	4.970	4.623	4.236	4.014	3.412	3.146	3.019	2.890	2.668	2.043	1.532
220	8.001	5.975	5.018	4.670	4.286	4.067	3.487	3.216	3.092	2.967	2.752	2.102	1.571
225	8.104	6.065	5.065	4.716	4.336	4.120	3.563	3.285	3.165	3.044	2.835	2.161	1.609
230	8.207	6.155	5.113	4.762	4.386	4.173	3.639	3.355	3.238	3.121	2.919	2.220	1.648
235	8.305	6.245	5.161	4.809	4.436	4.225	3.715	3.424	3.311	3.198	3.003	2.279	1.687
240	8.396	6.335	5.208	4.855	4.485	4.278	3.791	3.494	3.384	3.275	3.087	2.338	1.726
245	8.486	6.425	5.256	4.901	4.535	4.331	3.867	3.563	3.457	3.352	3.170	2.397	1.765
250	8.577	6.515	5.304	4.948	4.585	4.384	3.942	3.633	3.530	3.429	3.254	2.456	1.804
255	8.668	6.605	5.351	4.994	4.635	4.437	4.018	3.702	3.602	3.506	3.338	2.515	1.842
260	8.759	6.695	5.399	5.041	4.685	4.489	4.078	3.772	3.675	3.583	3.422	2.574	1.881
265	8.849	6.785	5.447	5.087	4.735	4.542	4.138	3.842	3.748	3.660	3.505	2.633	1.920
270	8.940	6.875	5.495	5.133	4.784	4.595	4.198	3.911	3.821	3.737	3.589	2.691	1.959
275	9.031	6.966	5.542	5.180	4.834	4.648	4.258	3.981	3.894	3.814	3.673	2.750	1.998
280	9.121	7.056	5.590	5.226	4.884	4.701	4.317	4.047	3.967	3.891	3.757	2.809	2.043
285	9.212	7.146	5.638	5.272	4.934	4.753	4.377	4.109	4.035	3.968	3.840	2.868	2.100
290	9.303	7.236	5.685	5.319	4.984	4.806	4.437	4.172	4.093	4.036	3.924	2.927	2.157
295	9.394	7.326	5.733	5.365	5.034	4.859	4.497	4.234	4.151	4.090	4.008	2.986	2.214
300	9.484	7.416	5.781	5.411	5.084	4.912	4.557	4.297	4.209	4.145	4.060	3.045	2.271
305	9.575	7.506	5.829	5.458	5.133	4.965	4.617	4.359	4.267	4.199	4.109	3.104	2.328
310	9.666	7.596	5.910	5.504	5.183	5.017	4.677	4.422	4.325	4.253	4.158	3.163	2.385
315	9.756	7.686	6.025	5.551	5.233	5.070	4.737	4.485	4.383	4.308	4.207	3.222	2.442
320	9.847	7.776	6.139	5.597	5.283	5.123	4.797	4.547	4.440	4.362	4.256	3.281	2.499
325	9.938	7.866	6.254	5.643	5.333	5.176	4.857	4.610	4.498	4.416	4.305	3.340	2.556
330	10.029	7.956	6.369	5.690	5.383	5.229	4.917	4.672	4.556	4.471	4.354	3.398	2.613
335	10.119	8.047	6.483	5.736	5.432	5.281	4.977	4.735	4.614	4.525	4.403	3.457	2.670
340	10.210	8.137	6.598	5.782	5.482	5.334	5.037	4.797	4.672	4.579	4.452	3.516	2.726

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 90 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	3.247	2.303	1.649	1.199	0.856	0.747	0.449	0.422	0.422	0.422	0.422	0.422	0.422
30	3.449	2.445	1.751	1.279	0.897	0.775	0.485	0.435	0.422	0.422	0.422	0.422	0.422
35	3.919	2.749	1.950	1.396	1.008	0.886	0.605	0.548	0.494	0.453	0.422	0.422	0.422
40	4.439	3.053	2.170	1.514	1.118	0.998	0.726	0.660	0.600	0.553	0.487	0.422	0.422
45	4.972	3.358	2.401	1.631	1.229	1.109	0.846	0.773	0.705	0.652	0.577	0.456	0.422
50	5.505	3.662	2.633	1.748	1.340	1.220	0.966	0.885	0.810	0.752	0.668	0.532	0.422
55	6.059	3.966	2.864	1.866	1.450	1.332	1.087	0.998	0.916	0.851	0.758	0.608	0.468
60	6.653	4.133	3.096	1.983	1.561	1.443	1.207	1.110	1.021	0.951	0.849	0.685	0.539
65	7.247	4.275	3.327	2.191	1.672	1.554	1.327	1.223	1.127	1.050	0.939	0.761	0.610
70	7.841	4.416	3.559	2.445	1.782	1.666	1.447	1.335	1.232	1.150	1.030	0.837	0.680
75	8.295	4.557	3.790	2.698	1.893	1.777	1.568	1.448	1.338	1.249	1.120	0.914	0.751
80	8.393	4.698	4.017	2.951	2.004	1.888	1.688	1.560	1.443	1.349	1.210	0.990	0.821
85	8.490	4.839	4.097	3.204	2.207	2.000	1.808	1.673	1.548	1.448	1.301	1.066	0.892
90	8.588	4.981	4.177	3.457	2.429	2.176	1.929	1.785	1.654	1.548	1.391	1.143	0.962
95	8.686	5.122	4.257	3.710	2.650	2.368	2.058	1.898	1.759	1.647	1.482	1.219	1.033
100	8.784	5.263	4.337	3.963	2.872	2.561	2.220	2.010	1.865	1.747	1.572	1.295	1.104
105	8.882	5.404	4.417	4.059	3.094	2.753	2.383	2.142	1.970	1.846	1.663	1.372	1.174
110	8.980	5.546	4.496	4.115	3.315	2.945	2.545	2.277	2.079	1.946	1.753	1.448	1.245
115	9.077	5.687	4.576	4.171	3.537	3.138	2.707	2.411	2.192	2.045	1.844	1.524	1.315
120	9.175	5.828	4.656	4.227	3.759	3.330	2.869	2.545	2.305	2.144	1.934	1.601	1.386
125	9.273	5.978	4.736	4.283	3.980	3.523	3.031	2.679	2.418	2.244	2.024	1.677	1.456
130	9.371	6.130	4.816	4.339	4.057	3.715	3.193	2.814	2.531	2.343	2.102	1.753	1.527
135	9.469	6.282	4.896	4.395	4.106	3.907	3.355	2.948	2.644	2.442	2.179	1.830	1.598
140	9.567	6.434	4.976	4.450	4.155	4.037	3.517	3.082	2.757	2.542	2.257	1.906	1.668
145	9.665	6.585	5.055	4.506	4.204	4.087	3.680	3.217	2.870	2.641	2.335	1.983	1.739
150	9.762	6.737	5.135	4.562	4.254	4.137	3.842	3.351	2.983	2.740	2.412	2.057	1.809
155	9.860	6.889	5.215	4.618	4.303	4.187	4.004	3.485	3.096	2.840	2.490	2.130	1.880
160	9.958	7.041	5.295	4.674	4.352	4.237	4.062	3.619	3.209	2.939	2.567	2.203	1.950
165	10.056	7.193	5.375	4.730	4.402	4.287	4.113	3.754	3.322	3.038	2.645	2.276	2.021
170	10.154	7.345	5.455	4.786	4.451	4.337	4.164	3.888	3.435	3.137	2.723	2.349	2.098
175	10.252	7.497	5.535	4.842	4.500	4.387	4.214	4.018	3.548	3.237	2.800	2.421	2.175
180	10.349	7.648	5.614	4.897	4.550	4.437	4.265	4.070	3.661	3.336	2.878	2.494	2.252
185	-	7.800	5.694	4.953	4.599	4.487	4.316	4.123	3.774	3.435	2.955	2.567	2.329
190	-	7.952	5.774	5.009	4.648	4.537	4.366	4.175	3.886	3.535	3.033	2.640	2.406
195	-	8.104	5.854	5.065	4.697	4.587	4.417	4.228	3.999	3.634	3.110	2.713	2.483
200	-	8.256	5.936	5.121	4.747	4.636	4.468	4.281	4.062	3.733	3.188	2.786	2.560
205	-	8.329	6.017	5.177	4.796	4.686	4.518	4.333	4.117	3.833	3.266	2.858	2.637
210	-	8.396	6.099	5.233	4.845	4.736	4.569	4.386	4.172	3.932	3.343	2.931	2.714
215	-	8.463	6.180	5.288	4.895	4.786	4.620	4.438	4.227	4.024	3.421	3.004	2.791
220	-	8.531	6.262	5.344	4.944	4.836	4.670	4.491	4.282	4.082	3.498	3.077	2.868
225	-	8.598	6.344	5.400	4.993	4.886	4.721	4.544	4.337	4.139	3.576	3.150	2.945
230	-	8.665	6.425	5.456	5.043	4.936	4.772	4.596	4.392	4.196	3.654	3.223	3.022
235	-	8.732	6.507	5.512	5.092	4.986	4.822	4.649	4.447	4.253	3.731	3.295	3.099
240	-	8.799	6.588	5.568	5.141	5.036	4.873	4.701	4.501	4.310	3.809	3.368	3.176
245	-	8.866	6.670	5.624	5.190	5.086	4.924	4.754	4.556	4.368	3.886	3.441	3.253
250	-	8.933	6.751	5.679	5.240	5.136	4.974	4.806	4.611	4.425	3.964	3.514	3.330
255	-	9.000	6.833	5.735	5.289	5.186	5.025	4.859	4.666	4.482	4.037	3.587	3.407
260	-	9.068	6.915	5.791	5.338	5.236	5.076	4.912	4.721	4.539	4.102	3.660	3.484
265	-	9.135	6.996	5.847	5.388	5.286	5.126	4.964	4.776	4.596	4.168	3.732	3.561
270	-	9.202	7.078	5.943	5.437	5.336	5.177	5.017	4.831	4.653	4.233	3.805	3.639
275	-	9.269	7.159	6.044	5.486	5.386	5.228	5.069	4.886	4.711	4.298	3.878	3.716
280	-	9.336	7.241	6.144	5.535	5.436	5.278	5.122	4.940	4.768	4.363	3.951	3.793
285	-	9.403	7.323	6.244	5.585	5.486	5.329	5.174	4.995	4.825	4.428	4.022	3.870
290	-	9.470	7.404	6.344	5.634	5.536	5.380	5.227	5.050	4.882	4.494	4.083	3.947
295	-	9.538	7.486	6.444	5.683	5.586	5.430	5.280	5.105	4.939	4.559	4.144	4.020
300	-	9.605	7.567	6.545	5.733	5.636	5.481	5.332	5.160	4.997	4.624	4.205	4.067
305	-	9.672	7.649	6.645	5.782	5.685	5.532	5.385	5.215	5.054	4.689	4.266	4.114
310	-	9.739	7.730	6.745	5.831	5.735	5.582	5.437	5.270	5.111	4.754	4.327	4.161
315	-	9.806	7.812	6.845	5.918	5.785	5.633	5.490	5.325	5.168	4.820	4.388	4.209
320	-	9.873	7.894	6.946	6.033	5.835	5.684	5.542	5.380	5.225	4.885	4.448	4.256
325	-	9.940	7.975	7.046	6.148	5.926	5.734	5.595	5.434	5.282	4.950	4.509	4.303
330	-	10.007	8.057	7.146	6.263	6.037	5.785	5.648	5.489	5.340	5.015	4.570	4.350
335	-	10.075	8.138	7.246	6.377	6.148	5.836	5.700	5.544	5.397	5.080	4.631	4.397
340	-	10.142	8.220	7.347	6.492	6.260	5.924	5.753	5.599	5.454	5.146	4.692	4.444

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 105 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	4.220	3.014	2.277	1.726	1.340	1.219	1.048	0.918	0.503	0.464	0.449	0.422	0.422
30	4.660	3.198	2.409	1.833	1.430	1.307	1.118	0.971	0.549	0.508	0.449	0.422	0.422
35	5.956	3.631	2.732	2.047	1.564	1.411	1.217	1.075	0.683	0.637	0.570	0.456	0.422
40	7.277	4.065	3.055	2.285	1.698	1.515	1.316	1.179	0.817	0.766	0.692	0.565	0.432
45	8.409	4.520	3.377	2.523	1.833	1.619	1.415	1.284	0.952	0.895	0.813	0.674	0.536
50	8.976	4.975	3.700	2.762	1.967	1.723	1.513	1.388	1.086	1.024	0.935	0.784	0.639
55	9.542	5.430	4.019	3.000	2.165	1.828	1.612	1.492	1.221	1.154	1.056	0.893	0.743
60	10.109	5.899	4.190	3.238	2.406	1.932	1.711	1.597	1.355	1.283	1.178	1.003	0.846
65	-	6.553	4.362	3.476	2.648	2.058	1.809	1.701	1.490	1.412	1.299	1.112	0.949
70	-	7.207	4.533	3.714	2.889	2.329	1.908	1.806	1.624	1.541	1.421	1.222	1.053
75	-	7.860	4.704	3.953	3.131	2.601	2.007	1.910	1.758	1.670	1.542	1.331	1.156
80	-	8.298	4.875	4.086	3.372	2.873	2.244	2.014	1.893	1.799	1.664	1.441	1.259
85	-	8.380	5.046	4.182	3.613	3.144	2.507	2.224	2.029	1.929	1.785	1.550	1.363
90	-	8.462	5.217	4.279	3.855	3.416	2.769	2.442	2.209	2.066	1.907	1.659	1.466
95	-	8.544	5.389	4.375	4.040	3.688	3.031	2.660	2.388	2.224	2.028	1.769	1.570
100	-	8.626	5.560	4.471	4.115	3.959	3.294	2.878	2.568	2.382	2.158	1.878	1.673
105	-	8.708	5.731	4.567	4.189	4.069	3.556	3.096	2.748	2.540	2.288	1.988	1.776
110	-	8.790	5.882	4.663	4.264	4.137	3.819	3.314	2.928	2.698	2.418	2.091	1.880
115	-	8.872	5.984	4.760	4.338	4.204	4.030	3.532	3.107	2.856	2.548	2.192	1.983
120	-	8.954	6.086	4.856	4.413	4.272	4.089	3.751	3.287	3.014	2.678	2.293	2.070
125	-	9.036	6.188	4.952	4.487	4.340	4.149	3.969	3.467	3.173	2.808	2.394	2.147
130	-	9.118	6.290	5.048	4.562	4.408	4.209	4.058	3.647	3.331	2.938	2.495	2.225
135	-	9.200	6.392	5.145	4.636	4.476	4.268	4.112	3.826	3.489	3.068	2.596	2.302
140	-	9.282	6.494	5.241	4.711	4.543	4.328	4.167	4.006	3.647	3.198	2.697	2.379
145	-	9.364	6.596	5.337	4.785	4.611	4.387	4.221	4.067	3.805	3.328	2.797	2.456
150	-	9.447	6.698	5.433	4.860	4.679	4.447	4.276	4.122	3.963	3.458	2.898	2.534
155	-	9.529	6.801	5.530	4.934	4.747	4.506	4.330	4.176	4.052	3.588	2.999	2.611
160	-	9.611	6.903	5.626	5.009	4.815	4.566	4.385	4.231	4.107	3.718	3.100	2.688
165	-	9.693	7.005	5.722	5.083	4.882	4.625	4.439	4.286	4.163	3.848	3.201	2.765
170	-	9.775	7.107	5.818	5.158	4.950	4.685	4.493	4.341	4.218	3.978	3.302	2.842
175	-	9.857	7.209	5.902	5.232	5.018	4.744	4.548	4.395	4.274	4.056	3.403	2.920
180	-	9.939	7.311	5.978	5.307	5.086	4.804	4.602	4.450	4.329	4.113	3.504	2.997
185	-	10.021	7.413	6.055	5.381	5.153	4.864	4.657	4.505	4.384	4.169	3.605	3.074
190	-	10.103	7.515	6.131	5.456	5.221	4.923	4.711	4.559	4.440	4.226	3.705	3.151
195	-	10.185	7.617	6.208	5.530	5.289	4.983	4.766	4.614	4.495	4.283	3.806	3.229
200	-	10.267	7.719	6.284	5.605	5.357	5.042	4.820	4.669	4.550	4.340	3.907	3.306
205	-	-	7.821	6.361	5.679	5.425	5.102	4.875	4.724	4.606	4.397	4.008	3.383
210	-	-	7.923	6.437	5.754	5.492	5.161	4.929	4.778	4.661	4.454	4.068	3.460
215	-	-	8.025	6.513	5.829	5.560	5.221	4.983	4.833	4.716	4.510	4.126	3.538
220	-	-	8.128	6.590	5.911	5.628	5.280	5.038	4.888	4.772	4.567	4.183	3.615
225	-	-	8.230	6.666	5.998	5.696	5.340	5.092	4.943	4.827	4.624	4.241	3.692
230	-	-	8.323	6.743	6.085	5.764	5.399	5.147	4.997	4.882	4.681	4.298	3.769
235	-	-	8.412	6.819	6.171	5.831	5.459	5.201	5.052	4.938	4.738	4.355	3.847
240	-	-	8.500	6.896	6.258	5.916	5.519	5.256	5.107	4.993	4.794	4.413	3.924
245	-	-	8.589	6.972	6.344	6.009	5.578	5.310	5.161	5.048	4.851	4.470	4.001
250	-	-	8.677	7.049	6.431	6.102	5.638	5.365	5.216	5.104	4.908	4.528	4.062
255	-	-	8.766	7.125	6.517	6.195	5.697	5.419	5.271	5.159	4.965	4.585	4.119
260	-	-	8.854	7.202	6.604	6.287	5.757	5.473	5.326	5.215	5.022	4.642	4.176
265	-	-	8.943	7.278	6.691	6.380	5.816	5.528	5.380	5.270	5.079	4.700	4.233
270	-	-	9.032	7.355	6.777	6.473	5.894	5.582	5.435	5.325	5.135	4.757	4.290
275	-	-	9.120	7.431	6.864	6.566	5.998	5.637	5.490	5.381	5.192	4.814	4.347
280	-	-	9.209	7.508	6.950	6.658	6.102	5.691	5.544	5.436	5.249	4.872	4.404
285	-	-	9.297	7.584	7.037	6.751	6.206	5.746	5.599	5.491	5.306	4.929	4.461
290	-	-	9.386	7.660	7.124	6.844	6.310	5.800	5.654	5.547	5.363	4.987	4.518
295	-	-	9.474	7.737	7.210	6.936	6.414	5.858	5.709	5.602	5.419	5.044	4.575
300	-	-	9.563	7.813	7.297	7.029	6.518	5.973	5.763	5.657	5.476	5.101	4.632
305	-	-	9.652	7.890	7.383	7.122	6.622	6.088	5.818	5.713	5.533	5.159	4.689
310	-	-	9.740	7.966	7.470	7.215	6.726	6.203	5.894	5.768	5.590	5.216	4.746
315	-	-	9.829	8.043	7.557	7.307	6.830	6.318	6.006	5.823	5.647	5.274	4.803
320	-	-	9.917	8.119	7.643	7.400	6.934	6.433	6.117	5.903	5.704	5.331	4.860
325	-	-	10.006	8.196	7.730	7.493	7.038	6.548	6.228	6.008	5.760	5.388	4.917
330	-	-	10.094	8.281	7.816	7.586	7.142	6.663	6.339	6.114	5.817	5.446	4.974
335	-	-	10.183	8.486	7.903	7.678	7.246	6.778	6.451	6.219	5.889	5.503	5.031
340	-	-	10.272	8.692	7.990	7.771	7.350	6.894	6.562	6.324	5.986	5.560	5.089

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 120 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	-	3.614	2.917	2.296	1.820	1.690	1.522	1.401	1.273	1.166	1.002	0.449	0.422
30	-	3.913	3.087	2.427	1.934	1.801	1.629	1.505	1.372	1.255	1.065	0.495	0.422
35	-	4.924	3.525	2.757	2.170	1.989	1.777	1.625	1.469	1.345	1.168	0.638	0.506
40	-	5.977	3.963	3.087	2.405	2.209	1.925	1.744	1.566	1.435	1.271	0.781	0.643
45	-	7.497	4.418	3.417	2.641	2.437	2.098	1.863	1.663	1.525	1.374	0.924	0.780
50	-	8.375	4.874	3.747	2.876	2.664	2.317	1.982	1.760	1.615	1.478	1.067	0.916
55	-	8.595	5.330	4.061	3.112	2.891	2.536	2.168	1.857	1.706	1.581	1.210	1.053
60	-	8.814	5.786	4.305	3.347	3.118	2.754	2.387	1.954	1.796	1.684	1.353	1.190
65	-	9.034	6.250	4.549	3.583	3.345	2.973	2.606	2.092	1.886	1.788	1.496	1.327
70	-	9.253	6.715	4.793	3.818	3.572	3.192	2.825	2.325	1.976	1.891	1.639	1.463
75	-	9.473	7.181	5.037	4.033	3.799	3.411	3.044	2.558	2.142	1.994	1.782	1.600
80	-	9.692	7.646	5.281	4.143	4.020	3.630	3.263	2.791	2.384	2.167	1.925	1.737
85	-	9.912	8.111	5.525	4.253	4.120	3.849	3.482	3.024	2.627	2.366	2.063	1.874
90	-	10.131	8.322	5.769	4.363	4.219	4.036	3.700	3.257	2.869	2.564	2.191	2.010
95	-	10.351	8.404	5.914	4.473	4.319	4.123	3.919	3.490	3.112	2.762	2.320	2.130
100	-	-	8.486	6.009	4.582	4.418	4.210	4.059	3.722	3.354	2.961	2.448	2.247
105	-	-	8.568	6.104	4.692	4.518	4.297	4.137	3.955	3.597	3.159	2.576	2.365
110	-	-	8.651	6.198	4.802	4.618	4.383	4.216	4.068	3.840	3.358	2.704	2.482
115	-	-	8.733	6.293	4.912	4.717	4.470	4.294	4.139	4.033	3.556	2.832	2.600
120	-	-	8.815	6.387	5.022	4.817	4.557	4.373	4.210	4.099	3.754	2.960	2.718
125	-	-	8.897	6.482	5.132	4.917	4.644	4.451	4.282	4.165	3.953	3.089	2.835
130	-	-	8.979	6.576	5.242	5.016	4.731	4.529	4.353	4.231	4.057	3.217	2.953
135	-	-	9.062	6.671	5.351	5.116	4.817	4.608	4.424	4.297	4.117	3.345	3.070
140	-	-	9.144	6.766	5.461	5.215	4.904	4.686	4.495	4.363	4.178	3.473	3.188
145	-	-	9.226	6.860	5.571	5.315	4.991	4.764	4.567	4.429	4.239	3.601	3.306
150	-	-	9.308	6.955	5.681	5.415	5.078	4.843	4.638	4.495	4.300	3.729	3.423
155	-	-	9.390	7.049	5.791	5.514	5.165	4.921	4.709	4.561	4.360	3.858	3.541
160	-	-	9.473	7.144	5.887	5.614	5.252	5.000	4.780	4.627	4.421	3.986	3.659
165	-	-	9.555	7.238	5.966	5.713	5.338	5.078	4.852	4.693	4.482	4.061	3.776
170	-	-	9.637	7.333	6.045	5.813	5.425	5.156	4.923	4.759	4.543	4.121	3.894
175	-	-	9.719	7.428	6.124	5.902	5.512	5.235	4.994	4.825	4.603	4.181	4.011
180	-	-	9.801	7.522	6.204	5.984	5.599	5.313	5.065	4.891	4.664	4.240	4.066
185	-	-	9.884	7.617	6.283	6.065	5.686	5.391	5.137	4.957	4.725	4.300	4.120
190	-	-	9.966	7.711	6.362	6.147	5.773	5.470	5.208	5.023	4.786	4.360	4.173
195	-	-	10.048	7.806	6.441	6.229	5.859	5.548	5.279	5.089	4.846	4.420	4.226
200	-	-	10.130	7.901	6.520	6.311	5.946	5.626	5.350	5.155	4.907	4.479	4.279
205	-	-	10.212	7.995	6.599	6.393	6.032	5.705	5.422	5.221	4.968	4.539	4.332
210	-	-	10.295	8.090	6.678	6.474	6.119	5.783	5.493	5.287	5.029	4.599	4.385
215	-	-	-	8.184	6.757	6.556	6.205	5.863	5.564	5.353	5.089	4.659	4.438
220	-	-	-	8.277	6.837	6.638	6.291	5.954	5.635	5.419	5.150	4.718	4.491
225	-	-	-	8.360	6.916	6.720	6.378	6.044	5.707	5.485	5.211	4.778	4.544
230	-	-	-	8.443	6.995	6.802	6.464	6.135	5.778	5.551	5.272	4.838	4.598
235	-	-	-	8.526	7.074	6.883	6.551	6.226	5.849	5.617	5.332	4.898	4.651
240	-	-	-	8.608	7.153	6.965	6.637	6.317	5.943	5.683	5.393	4.957	4.704
245	-	-	-	8.691	7.232	7.047	6.723	6.407	6.039	5.749	5.454	5.017	4.757
250	-	-	-	8.774	7.311	7.129	6.810	6.498	6.134	5.815	5.515	5.077	4.810
255	-	-	-	8.857	7.390	7.211	6.896	6.589	6.229	5.896	5.575	5.137	4.863
260	-	-	-	8.940	7.470	7.292	6.983	6.679	6.325	5.995	5.636	5.196	4.916
265	-	-	-	9.022	7.549	7.374	7.069	6.770	6.420	6.094	5.697	5.256	4.969
270	-	-	-	9.105	7.628	7.456	7.155	6.861	6.515	6.192	5.758	5.316	5.022
275	-	-	-	9.188	7.707	7.538	7.242	6.951	6.611	6.291	5.818	5.376	5.075
280	-	-	-	9.271	7.786	7.620	7.328	7.042	6.706	6.390	5.897	5.435	5.129
285	-	-	-	9.353	7.865	7.701	7.415	7.133	6.801	6.489	5.999	5.495	5.182
290	-	-	-	9.436	7.944	7.783	7.501	7.223	6.897	6.588	6.100	5.555	5.235
295	-	-	-	9.519	8.023	7.865	7.587	7.314	6.992	6.686	6.202	5.615	5.288
300	-	-	-	9.602	8.102	7.947	7.674	7.405	7.087	6.785	6.303	5.674	5.341
305	-	-	-	9.685	8.182	8.029	7.760	7.495	7.183	6.884	6.405	5.734	5.394
310	-	-	-	9.767	8.261	8.110	7.847	7.586	7.278	6.983	6.506	5.794	5.447
315	-	-	-	9.850	8.466	8.192	7.933	7.677	7.373	7.082	6.607	5.855	5.500
320	-	-	-	9.933	8.683	8.285	8.020	7.767	7.469	7.181	6.709	5.951	5.553
325	-	-	-	10.016	8.900	8.500	8.106	7.858	7.564	7.279	6.810	6.046	5.606
330	-	-	-	10.099	9.116	8.715	8.192	7.949	7.659	7.378	6.912	6.142	5.660
335	-	-	-	10.181	9.333	8.930	8.297	8.039	7.755	7.477	7.013	6.238	5.713
340	-	-	-	10.264	9.550	9.144	8.514	8.130	7.850	7.576	7.115	6.334	5.766

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 135 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	-	5.267	3.556	2.876	2.346	2.218	2.051	1.945	1.764	1.663	1.514	1.234	0.474
30	-	6.051	3.771	3.042	2.485	2.315	2.127	2.014	1.886	1.779	1.619	1.315	0.531
35	-	8.489	4.531	3.476	2.811	2.600	2.352	2.218	2.073	1.948	1.770	1.441	0.702
40	-	9.810	5.455	3.911	3.137	2.886	2.577	2.422	2.265	2.128	1.921	1.567	0.872
45	-	-	6.661	4.428	3.464	3.171	2.802	2.626	2.457	2.316	2.084	1.694	1.043
50	-	-	8.083	4.971	3.790	3.456	3.027	2.829	2.649	2.504	2.271	1.820	1.213
55	-	-	8.375	5.513	4.108	3.742	3.252	3.033	2.841	2.692	2.458	1.946	1.384
60	-	-	8.499	5.964	4.409	4.025	3.477	3.237	3.033	2.879	2.645	2.092	1.554
65	-	-	8.624	6.263	4.709	4.248	3.702	3.441	3.225	3.067	2.832	2.266	1.724
70	-	-	8.748	6.562	5.010	4.471	3.927	3.645	3.417	3.255	3.018	2.440	1.895
75	-	-	8.872	6.861	5.310	4.695	4.093	3.849	3.609	3.443	3.205	2.614	2.062
80	-	-	8.996	7.160	5.611	4.918	4.220	4.034	3.801	3.631	3.392	2.788	2.219
85	-	-	9.120	7.459	5.873	5.142	4.347	4.137	3.994	3.819	3.579	2.962	2.376
90	-	-	9.245	7.758	5.983	5.365	4.475	4.240	4.097	4.006	3.766	3.136	2.533
95	-	-	9.369	8.057	6.092	5.589	4.602	4.342	4.189	4.095	3.953	3.310	2.690
100	-	-	9.493	8.291	6.201	5.812	4.730	4.445	4.281	4.178	4.065	3.484	2.846
105	-	-	9.617	8.371	6.310	5.933	4.857	4.548	4.373	4.262	4.141	3.658	3.003
110	-	-	9.741	8.452	6.420	6.032	4.984	4.651	4.465	4.346	4.217	3.832	3.160
115	-	-	9.866	8.532	6.529	6.131	5.112	4.753	4.557	4.429	4.292	4.006	3.317
120	-	-	9.990	8.613	6.638	6.230	5.239	4.856	4.649	4.513	4.368	4.080	3.474
125	-	-	10.114	8.693	6.747	6.328	5.367	4.959	4.741	4.596	4.443	4.150	3.631
130	-	-	10.238	8.774	6.857	6.427	5.494	5.062	4.833	4.680	4.519	4.219	3.788
135	-	-	10.363	8.854	6.966	6.526	5.621	5.164	4.925	4.763	4.594	4.288	3.945
140	-	-	-	8.935	7.075	6.625	5.749	5.267	5.017	4.847	4.670	4.357	4.046
145	-	-	-	9.015	7.184	6.723	5.870	5.370	5.109	4.931	4.746	4.427	4.101
150	-	-	-	9.096	7.294	6.822	5.963	5.473	5.201	5.014	4.821	4.496	4.156
155	-	-	-	9.176	7.403	6.921	6.056	5.575	5.293	5.098	4.897	4.565	4.211
160	-	-	-	9.256	7.512	7.020	6.149	5.678	5.385	5.181	4.972	4.634	4.266
165	-	-	-	9.337	7.621	7.118	6.242	5.781	5.477	5.265	5.048	4.703	4.321
170	-	-	-	9.417	7.731	7.217	6.336	5.879	5.569	5.349	5.124	4.773	4.376
175	-	-	-	9.498	7.840	7.316	6.429	5.966	5.661	5.432	5.199	4.842	4.431
180	-	-	-	9.578	7.949	7.415	6.522	6.053	5.753	5.516	5.275	4.911	4.486
185	-	-	-	9.659	8.058	7.514	6.615	6.139	5.845	5.599	5.350	4.980	4.541
190	-	-	-	9.739	8.168	7.612	6.708	6.226	5.935	5.683	5.426	5.050	4.596
195	-	-	-	9.820	8.274	7.711	6.801	6.313	6.025	5.766	5.501	5.119	4.651
200	-	-	-	9.900	8.354	7.810	6.895	6.400	6.115	5.850	5.577	5.188	4.706
205	-	-	-	9.981	8.434	7.909	6.988	6.487	6.205	5.942	5.653	5.257	4.761
210	-	-	-	10.061	8.514	8.007	7.081	6.574	6.294	6.034	5.728	5.326	4.816
215	-	-	-	10.142	8.595	8.106	7.174	6.661	6.384	6.126	5.804	5.396	4.871
220	-	-	-	10.222	8.675	8.205	7.267	6.748	6.474	6.218	5.885	5.465	4.926
225	-	-	-	10.303	8.755	8.301	7.360	6.834	6.564	6.311	5.977	5.534	4.981
230	-	-	-	10.383	8.835	8.392	7.454	6.921	6.654	6.403	6.069	5.603	5.036
235	-	-	-	-	8.915	8.483	7.547	7.008	6.743	6.495	6.160	5.673	5.091
240	-	-	-	-	8.995	8.573	7.640	7.095	6.833	6.587	6.252	5.742	5.146
245	-	-	-	-	9.075	8.664	7.733	7.182	6.923	6.679	6.344	5.811	5.201
250	-	-	-	-	9.155	8.755	7.826	7.269	7.013	6.772	6.436	5.887	5.256
255	-	-	-	-	9.235	8.846	7.919	7.356	7.103	6.864	6.527	5.974	5.311
260	-	-	-	-	9.315	8.937	8.013	7.442	7.192	6.956	6.619	6.061	5.366
265	-	-	-	-	9.396	9.028	8.106	7.529	7.282	7.048	6.711	6.147	5.421
270	-	-	-	-	9.476	9.119	8.199	7.616	7.372	7.140	6.802	6.234	5.476
275	-	-	-	-	9.556	9.210	8.308	7.703	7.462	7.232	6.894	6.321	5.531
280	-	-	-	-	9.636	9.301	8.458	7.790	7.552	7.325	6.986	6.407	5.586
285	-	-	-	-	9.716	9.392	8.609	7.877	7.641	7.417	7.078	6.494	5.641
290	-	-	-	-	9.796	9.483	8.760	7.964	7.731	7.509	7.169	6.581	5.696
295	-	-	-	-	9.876	9.574	8.911	8.051	7.821	7.601	7.261	6.668	5.751
300	-	-	-	-	9.956	9.665	9.062	8.137	7.911	7.693	7.353	6.754	5.806
305	-	-	-	-	10.036	9.755	9.212	8.224	8.001	7.785	7.445	6.841	5.869
310	-	-	-	-	10.117	9.846	9.363	8.395	8.090	7.878	7.536	6.928	5.971
315	-	-	-	-	10.197	9.937	9.514	8.646	8.180	7.970	7.628	7.014	6.073
320	-	-	-	-	10.277	10.028	9.665	8.897	8.276	8.062	7.720	7.101	6.175
325	-	-	-	-	10.357	10.119	9.816	9.149	8.537	8.154	7.811	7.188	6.276
330	-	-	-	-	10.437	10.210	9.967	9.400	8.798	8.246	7.903	7.274	6.378
335	-	-	-	-	10.517	10.301	10.117	9.651	9.059	8.483	7.995	7.361	6.480
340	-	-	-	-	-	10.392	10.268	9.902	9.320	8.761	8.087	7.448	6.582

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 150 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	-	-	4.544	3.455	2.867	2.679	2.453	2.312	2.253	2.172	2.067	1.791	1.538
30	-	-	5.103	3.661	3.038	2.842	2.612	2.473	2.326	2.239	2.133	1.900	1.619
35	-	-	7.730	4.356	3.458	3.217	2.920	2.728	2.541	2.437	2.329	2.108	1.835
40	-	-	-	5.348	3.878	3.592	3.228	2.984	2.756	2.636	2.524	2.295	2.045
45	-	-	-	6.378	4.427	3.967	3.535	3.239	2.972	2.834	2.719	2.482	2.221
50	-	-	-	7.446	5.037	4.441	3.843	3.494	3.187	3.032	2.914	2.668	2.397
55	-	-	-	8.291	5.647	4.930	4.163	3.749	3.402	3.230	3.109	2.855	2.573
60	-	-	-	8.393	6.044	5.419	4.498	4.005	3.617	3.428	3.305	3.042	2.749
65	-	-	-	8.495	6.334	5.870	4.833	4.230	3.832	3.626	3.500	3.228	2.925
70	-	-	-	8.598	6.624	6.032	5.168	4.454	4.034	3.824	3.695	3.415	3.100
75	-	-	-	8.700	6.914	6.193	5.503	4.678	4.160	4.019	3.890	3.602	3.276
80	-	-	-	8.803	7.204	6.354	5.838	4.902	4.286	4.120	4.048	3.788	3.452
85	-	-	-	8.905	7.493	6.515	5.968	5.126	4.412	4.221	4.138	3.975	3.628
90	-	-	-	9.007	7.783	6.676	6.089	5.350	4.538	4.322	4.229	4.082	3.804
95	-	-	-	9.110	8.073	6.837	6.210	5.574	4.664	4.423	4.319	4.167	3.980
100	-	-	-	9.212	8.298	6.998	6.331	5.799	4.790	4.524	4.410	4.253	4.074
105	-	-	-	9.314	8.393	7.159	6.452	5.939	4.916	4.626	4.500	4.338	4.149
110	-	-	-	9.417	8.487	7.320	6.574	6.053	5.042	4.727	4.591	4.423	4.223
115	-	-	-	9.519	8.582	7.481	6.695	6.168	5.168	4.828	4.681	4.509	4.297
120	-	-	-	9.621	8.676	7.642	6.816	6.282	5.294	4.929	4.772	4.594	4.372
125	-	-	-	9.724	8.771	7.804	6.937	6.397	5.420	5.030	4.862	4.679	4.446
130	-	-	-	9.826	8.865	7.965	7.058	6.511	5.546	5.131	4.953	4.764	4.520
135	-	-	-	9.928	8.960	8.126	7.179	6.625	5.672	5.232	5.044	4.850	4.594
140	-	-	-	10.031	9.054	8.282	7.300	6.740	5.799	5.334	5.134	4.935	4.669
145	-	-	-	10.133	9.149	8.400	7.421	6.854	5.923	5.435	5.225	5.020	4.743
150	-	-	-	10.236	9.243	8.518	7.542	6.968	6.046	5.536	5.315	5.106	4.817
155	-	-	-	-	9.338	8.636	7.664	7.083	6.170	5.637	5.406	5.191	4.891
160	-	-	-	-	9.432	8.755	7.785	7.197	6.293	5.738	5.496	5.276	4.966
165	-	-	-	-	9.527	8.873	7.906	7.311	6.417	5.839	5.587	5.361	5.040
170	-	-	-	-	9.621	8.991	8.027	7.426	6.540	5.948	5.677	5.447	5.114
175	-	-	-	-	9.716	9.110	8.148	7.540	6.663	6.058	5.768	5.532	5.188
180	-	-	-	-	9.810	9.228	8.269	7.654	6.787	6.168	5.858	5.617	5.263
185	-	-	-	-	9.905	9.346	8.400	7.769	6.910	6.278	5.949	5.703	5.337
190	-	-	-	-	9.999	9.465	8.530	7.883	7.033	6.388	6.040	5.788	5.411
195	-	-	-	-	10.094	9.583	8.660	7.998	7.157	6.498	6.130	5.872	5.485
200	-	-	-	-	10.188	9.701	8.791	8.112	7.280	6.608	6.221	5.951	5.560
205	-	-	-	-	10.283	9.819	8.921	8.226	7.404	6.718	6.312	6.031	5.634
210	-	-	-	-	10.377	9.938	9.051	8.341	7.527	6.828	6.402	6.111	5.708
215	-	-	-	-	-	10.056	9.181	8.456	7.650	6.938	6.493	6.191	5.782
220	-	-	-	-	-	10.174	9.312	8.571	7.774	7.048	6.584	6.270	5.857
225	-	-	-	-	-	10.293	9.442	8.687	7.897	7.158	6.674	6.350	5.934
230	-	-	-	-	-	10.411	9.572	8.802	8.020	7.268	6.765	6.430	6.012
235	-	-	-	-	-	10.529	9.703	8.917	8.144	7.378	6.856	6.509	6.090
240	-	-	-	-	-	-	9.833	9.032	8.267	7.488	6.946	6.589	6.167
245	-	-	-	-	-	-	9.963	9.147	8.381	7.598	7.037	6.669	6.245
250	-	-	-	-	-	-	10.094	9.262	8.495	7.708	7.128	6.748	6.322
255	-	-	-	-	-	-	10.224	9.377	8.609	7.818	7.219	6.828	6.400
260	-	-	-	-	-	-	10.354	9.493	8.724	7.928	7.309	6.908	6.477
265	-	-	-	-	-	-	10.485	9.608	8.838	8.038	7.400	6.987	6.555
270	-	-	-	-	-	-	10.615	9.723	8.952	8.148	7.491	7.067	6.633
275	-	-	-	-	-	-	10.745	9.838	9.066	8.258	7.581	7.147	6.710
280	-	-	-	-	-	-	-	9.953	9.180	8.429	7.672	7.226	6.788
285	-	-	-	-	-	-	-	10.068	9.294	8.607	7.763	7.306	6.865
290	-	-	-	-	-	-	-	10.183	9.408	8.785	7.853	7.386	6.943
295	-	-	-	-	-	-	-	10.299	9.522	8.962	7.944	7.466	7.020
300	-	-	-	-	-	-	-	10.414	9.636	9.140	8.035	7.545	7.098
305	-	-	-	-	-	-	-	10.529	9.750	9.318	8.125	7.625	7.175
310	-	-	-	-	-	-	-	10.644	9.864	9.495	8.216	7.705	7.253
315	-	-	-	-	-	-	-	-	9.979	9.673	8.422	7.784	7.331
320	-	-	-	-	-	-	-	-	10.093	9.851	8.777	7.864	7.408
325	-	-	-	-	-	-	-	-	10.207	10.028	9.132	7.944	7.486
330	-	-	-	-	-	-	-	-	10.321	10.206	9.486	8.023	7.563
335	-	-	-	-	-	-	-	-	10.435	10.384	9.841	8.103	7.641
340	-	-	-	-	-	-	-	-	10.561	10.561	10.195	8.183	7.718

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 165 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	-	-	8.491	4.140	3.389	3.178	2.915	2.746	2.605	2.504	2.374	2.275	2.133
30	-	-	9.085	4.695	3.594	3.372	3.101	2.932	2.790	2.686	2.545	2.353	2.203
35	-	-	-	6.856	4.208	3.838	3.492	3.265	3.077	2.948	2.793	2.582	2.410
40	-	-	-	8.455	5.266	4.560	3.883	3.598	3.363	3.211	3.042	2.811	2.617
45	-	-	-	8.772	6.310	5.442	4.453	3.931	3.649	3.473	3.290	3.039	2.823
50	-	-	-	9.089	7.336	6.196	5.114	4.386	3.935	3.736	3.538	3.268	3.030
55	-	-	-	9.405	8.277	6.839	5.775	4.880	4.259	3.998	3.787	3.497	3.237
60	-	-	-	9.722	8.380	7.482	6.134	5.375	4.596	4.217	4.024	3.725	3.444
65	-	-	-	10.039	8.483	8.126	6.452	5.858	4.934	4.432	4.142	3.954	3.650
70	-	-	-	10.356	8.587	8.345	6.771	6.029	5.272	4.648	4.260	4.088	3.857
75	-	-	-	-	8.690	8.445	7.089	6.201	5.610	4.864	4.378	4.187	4.038
80	-	-	-	-	8.793	8.545	7.408	6.372	5.889	5.079	4.496	4.286	4.136
85	-	-	-	-	8.896	8.645	7.726	6.543	6.021	5.295	4.614	4.385	4.234
90	-	-	-	-	9.000	8.745	8.045	6.714	6.154	5.510	4.732	4.484	4.332
95	-	-	-	-	9.103	8.845	8.301	6.886	6.286	5.726	4.850	4.583	4.430
100	-	-	-	-	9.206	8.945	8.414	7.057	6.418	5.909	4.968	4.682	4.527
105	-	-	-	-	9.310	9.045	8.527	7.228	6.550	6.046	5.086	4.781	4.625
110	-	-	-	-	9.413	9.145	8.640	7.399	6.682	6.184	5.204	4.881	4.723
115	-	-	-	-	9.516	9.245	8.753	7.571	6.814	6.321	5.322	4.980	4.821
120	-	-	-	-	9.619	9.345	8.866	7.742	6.946	6.458	5.440	5.079	4.919
125	-	-	-	-	9.723	9.445	8.979	7.913	7.078	6.596	5.558	5.178	5.017
130	-	-	-	-	9.826	9.545	9.092	8.084	7.211	6.733	5.676	5.277	5.115
135	-	-	-	-	9.929	9.645	9.205	8.256	7.343	6.870	5.794	5.376	5.212
140	-	-	-	-	10.033	9.745	9.318	8.435	7.475	7.007	5.932	5.475	5.310
145	-	-	-	-	10.136	9.845	9.431	8.614	7.607	7.145	6.089	5.574	5.408
150	-	-	-	-	10.239	9.945	9.544	8.793	7.739	7.282	6.245	5.674	5.506
155	-	-	-	-	-	10.045	9.656	8.973	7.871	7.419	6.402	5.773	5.604
160	-	-	-	-	-	10.145	9.769	9.152	8.003	7.557	6.558	5.868	5.702
165	-	-	-	-	-	10.245	9.882	9.332	8.135	7.694	6.714	5.947	5.799
170	-	-	-	-	-	10.345	9.995	9.511	8.268	7.831	6.871	6.026	5.885
175	-	-	-	-	-	-	10.108	9.691	8.547	7.968	7.027	6.105	5.956
180	-	-	-	-	-	-	10.221	9.870	8.826	8.106	7.184	6.184	6.027
185	-	-	-	-	-	-	10.334	10.049	9.105	8.243	7.340	6.264	6.098
190	-	-	-	-	-	-	10.447	10.229	9.384	8.471	7.497	6.343	6.169
195	-	-	-	-	-	-	-	10.408	9.663	8.717	7.653	6.422	6.240
200	-	-	-	-	-	-	-	10.588	9.941	8.964	7.810	6.501	6.312
205	-	-	-	-	-	-	-	-	10.220	9.211	7.966	6.580	6.383
210	-	-	-	-	-	-	-	-	10.499	9.458	8.123	6.659	6.454
215	-	-	-	-	-	-	-	-	10.778	9.705	8.280	6.739	6.525
220	-	-	-	-	-	-	-	-	-	9.951	8.441	6.818	6.596
225	-	-	-	-	-	-	-	-	-	10.198	8.603	6.897	6.667
230	-	-	-	-	-	-	-	-	-	10.445	8.765	6.976	6.738
235	-	-	-	-	-	-	-	-	-	10.692	8.926	7.055	6.809
240	-	-	-	-	-	-	-	-	-	10.938	9.088	7.134	6.880
245	-	-	-	-	-	-	-	-	-	-	9.250	7.214	6.951
250	-	-	-	-	-	-	-	-	-	-	9.411	7.293	7.022
255	-	-	-	-	-	-	-	-	-	-	9.573	7.372	7.094
260	-	-	-	-	-	-	-	-	-	-	9.735	7.451	7.165
265	-	-	-	-	-	-	-	-	-	-	9.896	7.530	7.236
270	-	-	-	-	-	-	-	-	-	-	10.058	7.609	7.307
275	-	-	-	-	-	-	-	-	-	-	10.220	7.689	7.378
280	-	-	-	-	-	-	-	-	-	-	10.382	7.768	7.449
285	-	-	-	-	-	-	-	-	-	-	10.543	7.847	7.520
290	-	-	-	-	-	-	-	-	-	-	10.705	7.926	7.591
295	-	-	-	-	-	-	-	-	-	-	10.867	8.005	7.662
300	-	-	-	-	-	-	-	-	-	-	-	8.084	7.733
305	-	-	-	-	-	-	-	-	-	-	-	8.164	7.805
310	-	-	-	-	-	-	-	-	-	-	-	8.243	7.876
315	-	-	-	-	-	-	-	-	-	-	-	8.642	7.947
320	-	-	-	-	-	-	-	-	-	-	-	9.183	8.018
325	-	-	-	-	-	-	-	-	-	-	-	9.725	8.089
330	-	-	-	-	-	-	-	-	-	-	-	10.266	8.160
335	-	-	-	-	-	-	-	-	-	-	-	-	8.231
340	-	-	-	-	-	-	-	-	-	-	-	-	8.553

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

certifire

CERTIFICATE No CF 5857

JOTUN A/S

I/H Beams 180 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	620	650	700	750
28.3	-	-	-	8.279	3.827	3.614	3.376	3.180	3.021	2.910	2.768	2.572	2.416
30	-	-	-	8.573	4.397	3.735	3.593	3.394	3.232	3.116	2.962	2.748	2.582
35	-	-	-	9.439	6.323	5.166	4.141	3.805	3.593	3.451	3.281	3.048	2.859
40	-	-	-	10.304	8.386	6.913	5.278	4.459	3.954	3.786	3.600	3.347	3.136
45	-	-	-	-	8.649	8.321	6.347	5.366	4.581	4.173	3.919	3.647	3.413
50	-	-	-	-	8.911	8.483	7.345	6.127	5.264	4.669	4.247	3.946	3.689
55	-	-	-	-	9.173	8.645	8.276	6.721	5.902	5.165	4.578	4.217	3.966
60	-	-	-	-	9.435	8.807	8.391	7.315	6.261	5.661	4.909	4.480	4.200
65	-	-	-	-	9.698	8.969	8.506	7.909	6.621	6.013	5.241	4.743	4.423
70	-	-	-	-	9.960	9.132	8.621	8.318	6.981	6.276	5.572	5.006	4.647
75	-	-	-	-	10.222	9.294	8.736	8.445	7.341	6.539	5.882	5.269	4.871
80	-	-	-	-	10.484	9.456	8.851	8.573	7.700	6.802	6.075	5.532	5.095
85	-	-	-	-	-	9.618	8.966	8.701	8.060	7.065	6.267	5.795	5.319
90	-	-	-	-	-	9.780	9.081	8.828	8.334	7.327	6.460	5.953	5.543
95	-	-	-	-	-	9.942	9.196	8.956	8.492	7.590	6.653	6.081	5.767
100	-	-	-	-	-	10.104	9.311	9.084	8.649	7.853	6.846	6.210	5.888
105	-	-	-	-	-	10.266	9.426	9.212	8.807	8.116	7.038	6.339	5.945
110	-	-	-	-	-	10.428	9.541	9.339	8.964	8.352	7.231	6.467	6.003
115	-	-	-	-	-	-	9.656	9.467	9.122	8.552	7.424	6.596	6.061
120	-	-	-	-	-	-	9.771	9.595	9.279	8.753	7.617	6.725	6.118
125	-	-	-	-	-	-	9.886	9.722	9.437	8.953	7.809	6.853	6.176
130	-	-	-	-	-	-	10.001	9.850	9.594	9.153	8.002	6.982	6.233
135	-	-	-	-	-	-	10.116	9.978	9.752	9.353	8.195	7.111	6.291
140	-	-	-	-	-	-	10.231	10.105	9.909	9.554	8.424	7.239	6.348
145	-	-	-	-	-	-	10.346	10.233	10.067	9.754	8.674	7.368	6.406
150	-	-	-	-	-	-	-	10.361	10.225	9.954	8.925	7.497	6.464
155	-	-	-	-	-	-	-	-	10.382	10.154	9.175	7.625	6.521
160	-	-	-	-	-	-	-	-	-	10.355	9.426	7.754	6.579
165	-	-	-	-	-	-	-	-	-	10.555	9.676	7.883	6.636
170	-	-	-	-	-	-	-	-	-	10.755	9.927	8.011	6.694
175	-	-	-	-	-	-	-	-	-	-	10.177	8.140	6.751
180	-	-	-	-	-	-	-	-	-	-	10.428	8.269	6.809
185	-	-	-	-	-	-	-	-	-	-	10.678	8.424	6.867
190	-	-	-	-	-	-	-	-	-	-	-	8.580	6.924
195	-	-	-	-	-	-	-	-	-	-	-	8.735	6.982
200	-	-	-	-	-	-	-	-	-	-	-	8.891	7.039
205	-	-	-	-	-	-	-	-	-	-	-	9.046	7.097
210	-	-	-	-	-	-	-	-	-	-	-	9.201	7.154
215	-	-	-	-	-	-	-	-	-	-	-	9.357	7.212
220	-	-	-	-	-	-	-	-	-	-	-	9.512	7.270
225	-	-	-	-	-	-	-	-	-	-	-	9.667	7.327
230	-	-	-	-	-	-	-	-	-	-	-	9.823	7.385
235	-	-	-	-	-	-	-	-	-	-	-	9.978	7.442
240	-	-	-	-	-	-	-	-	-	-	-	10.134	7.500
245	-	-	-	-	-	-	-	-	-	-	-	10.289	7.557
250	-	-	-	-	-	-	-	-	-	-	-	10.444	7.615
255	-	-	-	-	-	-	-	-	-	-	-	10.600	7.673
260	-	-	-	-	-	-	-	-	-	-	-	10.755	7.730
265	-	-	-	-	-	-	-	-	-	-	-	-	7.788
270	-	-	-	-	-	-	-	-	-	-	-	-	7.845
275	-	-	-	-	-	-	-	-	-	-	-	-	7.903
280	-	-	-	-	-	-	-	-	-	-	-	-	7.960
285	-	-	-	-	-	-	-	-	-	-	-	-	8.018
290	-	-	-	-	-	-	-	-	-	-	-	-	8.076
295	-	-	-	-	-	-	-	-	-	-	-	-	8.133
300	-	-	-	-	-	-	-	-	-	-	-	-	8.191
305	-	-	-	-	-	-	-	-	-	-	-	-	8.248
310	-	-	-	-	-	-	-	-	-	-	-	-	8.697
315	-	-	-	-	-	-	-	-	-	-	-	-	9.334
320	-	-	-	-	-	-	-	-	-	-	-	-	9.970
325	-	-	-	-	-	-	-	-	-	-	-	-	10.606
330	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to I/H section beams with concrete slabs with 3-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 15 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
30	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
35	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
40	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
45	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
50	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
55	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
60	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
65	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
70	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
75	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
80	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
85	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
90	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
95	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
100	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
105	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
110	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
115	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
120	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
125	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
130	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
135	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
140	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
145	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
150	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
155	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
160	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
165	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
170	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
175	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
180	0.428	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
185	0.452	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
190	0.476	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
195	0.500	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
200	0.524	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
205	0.548	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
210	0.572	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
215	0.596	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
220	0.621	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
225	0.645	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
230	0.669	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
235	0.693	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
240	0.717	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
245	0.741	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
250	0.765	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
255	0.789	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
260	0.813	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
265	0.837	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
270	0.861	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
275	0.885	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
280	0.909	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
285	0.934	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
290	0.958	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
295	0.982	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
300	1.006	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
305	1.030	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
310	1.054	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
315	1.078	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
320	1.102	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
325	1.126	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
330	1.150	0.434	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
335	1.174	0.455	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
340	1.198	0.476	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
345	1.223	0.498	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
350	1.247	0.519	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
355	1.271	0.540	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
360	1.295	0.561	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
365	1.319	0.582	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
370	1.343	0.604	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
375	1.367	0.625	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
380	1.391	0.646	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 30 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
30	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
35	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
40	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
45	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
50	0.500	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
55	0.603	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
60	0.706	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
65	0.810	0.428	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
70	0.913	0.459	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
75	1.017	0.490	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
80	1.120	0.521	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
85	1.223	0.552	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
90	1.327	0.583	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
95	1.430	0.614	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
100	1.533	0.644	0.431	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
105	1.637	0.675	0.457	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
110	1.740	0.706	0.483	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
115	1.843	0.737	0.509	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
120	1.947	0.768	0.535	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
125	2.018	0.799	0.561	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
130	2.053	0.830	0.588	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
135	2.087	0.861	0.614	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
140	2.122	0.892	0.640	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
145	2.156	0.923	0.666	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
150	2.191	0.953	0.692	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
155	2.225	0.984	0.718	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
160	2.260	1.015	0.744	0.438	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
165	2.294	1.046	0.770	0.465	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
170	2.329	1.077	0.796	0.493	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
175	2.363	1.108	0.822	0.520	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
180	2.398	1.139	0.849	0.547	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
185	2.432	1.170	0.875	0.574	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
190	2.467	1.201	0.901	0.601	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
195	2.501	1.231	0.927	0.628	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
200	2.536	1.262	0.953	0.655	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
205	2.570	1.293	0.979	0.682	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
210	2.605	1.324	1.005	0.709	0.428	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
215	2.639	1.355	1.031	0.736	0.454	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
220	2.674	1.386	1.057	0.763	0.481	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
225	2.708	1.417	1.083	0.791	0.508	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
230	2.743	1.448	1.110	0.818	0.535	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
235	2.777	1.479	1.136	0.845	0.561	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
240	2.812	1.509	1.162	0.872	0.588	0.448	0.421	0.421	0.421	0.421	0.421	0.421	0.421
245	2.846	1.540	1.188	0.899	0.615	0.475	0.421	0.421	0.421	0.421	0.421	0.421	0.421
250	2.881	1.571	1.214	0.926	0.642	0.501	0.423	0.421	0.421	0.421	0.421	0.421	0.421
255	2.915	1.602	1.240	0.953	0.668	0.528	0.449	0.421	0.421	0.421	0.421	0.421	0.421
260	2.950	1.633	1.266	0.980	0.695	0.555	0.476	0.421	0.421	0.421	0.421	0.421	0.421
265	2.984	1.664	1.292	1.007	0.722	0.581	0.503	0.421	0.421	0.421	0.421	0.421	0.421
270	3.019	1.695	1.318	1.034	0.749	0.608	0.530	0.441	0.421	0.421	0.421	0.421	0.421
275	3.054	1.726	1.344	1.061	0.775	0.635	0.557	0.468	0.421	0.421	0.421	0.421	0.421
280	3.088	1.757	1.370	1.089	0.802	0.662	0.583	0.495	0.421	0.421	0.421	0.421	0.421
285	3.123	1.788	1.397	1.116	0.829	0.688	0.610	0.522	0.426	0.421	0.421	0.421	0.421
290	3.157	1.818	1.423	1.143	0.855	0.715	0.637	0.549	0.453	0.421	0.421	0.421	0.421
295	3.192	1.849	1.449	1.170	0.882	0.742	0.664	0.576	0.480	0.421	0.421	0.421	0.421
300	3.226	1.880	1.475	1.197	0.909	0.769	0.691	0.602	0.508	0.421	0.421	0.421	0.421
305	3.261	1.911	1.501	1.224	0.936	0.795	0.717	0.629	0.535	0.421	0.421	0.421	0.421
310	3.295	1.942	1.527	1.251	0.962	0.822	0.744	0.656	0.562	0.421	0.421	0.421	0.421
315	3.330	1.973	1.553	1.278	0.989	0.849	0.771	0.683	0.589	0.421	0.421	0.421	0.421
320	3.364	2.005	1.579	1.305	1.016	0.876	0.798	0.710	0.616	0.421	0.421	0.421	0.421
325	3.399	2.051	1.605	1.332	1.043	0.902	0.825	0.737	0.644	0.421	0.421	0.421	0.421
330	3.433	2.096	1.631	1.360	1.069	0.929	0.851	0.764	0.671	0.421	0.421	0.421	0.421
335	3.468	2.142	1.658	1.387	1.096	0.956	0.878	0.791	0.698	0.421	0.421	0.421	0.421
340	3.502	2.188	1.684	1.414	1.123	0.983	0.905	0.818	0.725	0.421	0.421	0.421	0.421
345	3.537	2.234	1.710	1.441	1.150	1.009	0.932	0.845	0.752	0.421	0.421	0.421	0.421
350	3.571	2.280	1.736	1.468	1.176	1.036	0.958	0.872	0.780	0.421	0.421	0.421	0.421
355	3.606	2.326	1.762	1.495	1.203	1.063	0.985	0.899	0.807	0.421	0.421	0.421	0.421
360	3.640	2.372	1.788	1.522	1.230	1.090	1.012	0.926	0.834	0.421	0.421	0.421	0.421
365	3.675	2.418	1.814	1.549	1.257	1.116	1.039	0.953	0.861	0.421	0.421	0.421	0.421
370	3.709	2.464	1.840	1.576	1.283	1.143	1.066	0.980	0.888	0.435	0.421	0.421	0.421
375	3.744	2.510	1.866	1.603	1.310	1.170	1.092	1.007	0.916	0.462	0.421	0.421	0.421
380	3.778	2.555	1.892	1.630	1.337	1.197	1.119	1.034	0.943	0.489	0.421	0.421	0.421

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 45 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	0.733	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
30	0.733	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
35	0.969	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
40	1.274	0.571	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
45	1.580	0.740	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
50	1.885	0.909	0.503	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
55	2.049	1.079	0.589	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
60	2.125	1.248	0.674	0.457	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
65	2.201	1.417	0.760	0.510	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
70	2.277	1.586	0.846	0.564	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
75	2.354	1.756	0.931	0.617	0.440	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
80	2.430	1.925	1.017	0.671	0.478	0.423	0.421	0.421	0.421	0.421	0.421	0.421	0.421
85	2.506	2.022	1.102	0.724	0.515	0.455	0.422	0.421	0.421	0.421	0.421	0.421	0.421
90	2.582	2.059	1.188	0.778	0.552	0.486	0.452	0.421	0.421	0.421	0.421	0.421	0.421
95	2.658	2.096	1.273	0.832	0.589	0.518	0.482	0.447	0.421	0.421	0.421	0.421	0.421
100	2.734	2.133	1.359	0.885	0.626	0.549	0.512	0.477	0.441	0.421	0.421	0.421	0.421
105	2.810	2.169	1.445	0.939	0.664	0.581	0.542	0.507	0.471	0.421	0.421	0.421	0.421
110	2.887	2.206	1.530	0.992	0.701	0.613	0.572	0.537	0.500	0.421	0.421	0.421	0.421
115	2.963	2.243	1.616	1.046	0.738	0.644	0.602	0.567	0.530	0.421	0.421	0.421	0.421
120	3.039	2.280	1.701	1.099	0.775	0.676	0.633	0.597	0.559	0.421	0.421	0.421	0.421
125	3.115	2.317	1.787	1.153	0.812	0.708	0.663	0.627	0.589	0.421	0.421	0.421	0.421
130	3.191	2.354	1.873	1.206	0.850	0.739	0.693	0.656	0.619	0.421	0.421	0.421	0.421
135	3.267	2.390	1.958	1.260	0.887	0.771	0.723	0.686	0.648	0.421	0.421	0.421	0.421
140	3.344	2.427	2.019	1.313	0.924	0.802	0.753	0.716	0.678	0.421	0.421	0.421	0.421
145	3.420	2.464	2.054	1.367	0.961	0.834	0.783	0.746	0.707	0.443	0.421	0.421	0.421
150	3.496	2.501	2.090	1.420	0.998	0.866	0.813	0.776	0.737	0.472	0.421	0.421	0.421
155	3.572	2.538	2.125	1.474	1.036	0.897	0.844	0.806	0.767	0.502	0.421	0.421	0.421
160	3.648	2.575	2.160	1.527	1.073	0.929	0.874	0.835	0.796	0.531	0.421	0.421	0.421
165	3.724	2.612	2.196	1.581	1.110	0.960	0.904	0.865	0.826	0.561	0.421	0.421	0.421
170	3.801	2.648	2.231	1.634	1.147	0.992	0.934	0.895	0.856	0.590	0.421	0.421	0.421
175	3.877	2.685	2.266	1.688	1.184	1.024	0.964	0.925	0.885	0.619	0.421	0.421	0.421
180	3.953	2.722	2.301	1.741	1.222	1.055	0.994	0.955	0.915	0.649	0.421	0.421	0.421
185	4.022	2.759	2.337	1.795	1.259	1.087	1.024	0.985	0.944	0.678	0.421	0.421	0.421
190	4.066	2.796	2.372	1.848	1.296	1.118	1.054	1.015	0.974	0.708	0.421	0.421	0.421
195	4.111	2.833	2.407	1.902	1.333	1.150	1.085	1.044	1.004	0.737	0.430	0.421	0.421
200	4.156	2.869	2.443	1.955	1.370	1.182	1.115	1.074	1.033	0.767	0.458	0.421	0.421
205	4.200	2.906	2.478	2.007	1.408	1.213	1.145	1.104	1.063	0.796	0.487	0.421	0.421
210	4.245	2.943	2.513	2.045	1.445	1.245	1.175	1.134	1.092	0.825	0.516	0.421	0.421
215	4.290	2.980	2.548	2.084	1.482	1.276	1.205	1.164	1.122	0.855	0.545	0.421	0.421
220	4.334	3.017	2.584	2.122	1.519	1.308	1.235	1.194	1.152	0.884	0.573	0.421	0.421
225	4.379	3.054	2.619	2.160	1.556	1.340	1.265	1.224	1.181	0.914	0.602	0.421	0.421
230	4.424	3.091	2.654	2.198	1.594	1.371	1.296	1.253	1.211	0.943	0.631	0.421	0.421
235	4.469	3.127	2.689	2.237	1.631	1.403	1.326	1.283	1.240	0.972	0.659	0.421	0.421
240	4.513	3.164	2.725	2.275	1.668	1.434	1.356	1.313	1.270	1.002	0.688	0.421	0.421
245	4.558	3.201	2.760	2.313	1.705	1.466	1.386	1.343	1.300	1.031	0.717	0.421	0.421
250	4.603	3.238	2.795	2.351	1.742	1.498	1.416	1.373	1.329	1.061	0.746	0.421	0.421
255	4.647	3.275	2.831	2.390	1.780	1.529	1.446	1.403	1.359	1.090	0.774	0.421	0.421
260	4.692	3.312	2.866	2.428	1.817	1.561	1.476	1.433	1.388	1.120	0.803	0.421	0.421
265	4.737	3.348	2.901	2.466	1.854	1.592	1.506	1.462	1.418	1.149	0.832	0.421	0.421
270	4.781	3.385	2.936	2.504	1.891	1.624	1.537	1.492	1.448	1.178	0.861	0.438	0.421
275	4.826	3.422	2.972	2.543	1.928	1.656	1.567	1.522	1.477	1.208	0.889	0.466	0.421
280	4.871	3.459	3.007	2.581	1.966	1.687	1.597	1.552	1.507	1.237	0.918	0.493	0.421
285	4.916	3.496	3.042	2.619	2.003	1.719	1.627	1.582	1.537	1.267	0.947	0.521	0.421
290	4.960	3.533	3.078	2.657	2.047	1.751	1.657	1.612	1.566	1.296	0.975	0.548	0.421
295	5.005	3.569	3.113	2.696	2.091	1.782	1.687	1.642	1.596	1.325	1.004	0.576	0.421
300	5.050	3.606	3.148	2.734	2.135	1.814	1.717	1.671	1.625	1.355	1.033	0.603	0.421
305	5.094	3.643	3.183	2.772	2.179	1.845	1.748	1.701	1.655	1.384	1.062	0.630	0.421
310	5.139	3.680	3.219	2.810	2.223	1.877	1.778	1.731	1.685	1.414	1.090	0.658	0.421
315	5.184	3.717	3.254	2.849	2.267	1.909	1.808	1.761	1.714	1.443	1.119	0.685	0.421
320	5.228	3.754	3.289	2.887	2.311	1.940	1.838	1.791	1.744	1.473	1.148	0.713	0.421
325	5.273	3.791	3.324	2.925	2.355	1.972	1.868	1.821	1.773	1.502	1.177	0.740	0.421
330	5.318	3.827	3.360	2.964	2.399	2.004	1.898	1.851	1.803	1.531	1.205	0.768	0.421
335	5.362	3.864	3.395	3.002	2.443	2.053	1.928	1.880	1.833	1.561	1.234	0.795	0.421
340	5.407	3.901	3.430	3.040	2.487	2.102	1.959	1.910	1.862	1.590	1.263	0.823	0.421
345	5.452	3.938	3.466	3.078	2.531	2.150	1.989	1.940	1.892	1.620	1.292	0.850	0.421
350	5.497	3.975	3.501	3.117	2.575	2.199	2.030	1.970	1.921	1.649	1.320	0.877	0.421
355	5.541	4.012	3.536	3.155	2.619	2.248	2.080	2.000	1.951	1.679	1.349	0.905	0.421
360	5.586	4.078	3.571	3.193	2.662	2.297	2.130	2.047	1.981	1.708	1.378	0.932	0.421
365	5.631	4.144	3.607	3.231	2.706	2.345	2.180	2.096	2.015	1.737	1.406	0.960	0.421
370	5.675	4.210	3.642	3.270	2.750	2.394	2.230	2.145	2.063	1.767	1.435	0.987	0.421
375	5.720	4.276	3.677	3.308	2.794	2.443	2.280	2.194	2.110	1.796	1.464	1.015	0.422
380	5.765	4.342	3.713	3.346	2.838	2.492	2.330	2.243	2.157	1.826	1.493	1.042	0.447

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 60 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	1.619	0.922	0.437	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
30	1.619	0.922	0.437	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
35	2.031	1.193	0.651	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
40	2.214	1.516	0.885	0.530	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
45	2.396	1.838	1.118	0.680	0.449	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
50	2.579	2.046	1.352	0.830	0.548	0.480	0.444	0.421	0.421	0.421	0.421	0.421	0.421
55	2.762	2.137	1.586	0.979	0.647	0.563	0.521	0.488	0.459	0.421	0.421	0.421	0.421
60	2.945	2.227	1.819	1.129	0.746	0.646	0.598	0.557	0.523	0.421	0.421	0.421	0.421
65	3.128	2.317	2.014	1.279	0.845	0.730	0.674	0.627	0.587	0.433	0.421	0.421	0.421
70	3.311	2.408	2.069	1.428	0.944	0.813	0.751	0.697	0.652	0.481	0.421	0.421	0.421
75	3.494	2.498	2.124	1.578	1.043	0.896	0.828	0.767	0.716	0.528	0.421	0.421	0.421
80	3.677	2.588	2.179	1.728	1.142	0.979	0.904	0.837	0.780	0.576	0.421	0.421	0.421
85	3.860	2.679	2.234	1.877	1.241	1.063	0.981	0.907	0.844	0.623	0.452	0.421	0.421
90	4.031	2.769	2.289	2.009	1.340	1.146	1.058	0.977	0.909	0.671	0.486	0.421	0.421
95	4.146	2.859	2.344	2.049	1.439	1.229	1.134	1.047	0.973	0.718	0.519	0.421	0.421
100	4.261	2.950	2.399	2.089	1.538	1.312	1.211	1.117	1.037	0.766	0.553	0.421	0.421
105	4.376	3.040	2.454	2.130	1.637	1.396	1.288	1.187	1.101	0.814	0.587	0.421	0.421
110	4.491	3.130	2.509	2.170	1.736	1.479	1.364	1.257	1.165	0.861	0.621	0.421	0.421
115	4.606	3.221	2.564	2.211	1.835	1.562	1.441	1.327	1.230	0.909	0.655	0.437	0.421
120	4.721	3.311	2.619	2.251	1.934	1.645	1.518	1.397	1.294	0.956	0.689	0.466	0.421
125	4.835	3.401	2.674	2.291	2.014	1.729	1.594	1.467	1.358	1.004	0.723	0.495	0.421
130	4.950	3.492	2.729	2.332	2.054	1.812	1.671	1.537	1.422	1.051	0.756	0.524	0.421
135	5.065	3.582	2.784	2.372	2.093	1.895	1.748	1.607	1.487	1.099	0.790	0.554	0.421
140	5.180	3.673	2.839	2.412	2.132	1.978	1.824	1.677	1.551	1.146	0.824	0.583	0.421
145	5.295	3.763	2.894	2.453	2.172	2.030	1.901	1.747	1.615	1.194	0.858	0.612	0.421
150	5.410	3.853	2.949	2.493	2.211	2.070	1.978	1.817	1.679	1.241	0.892	0.641	0.421
155	5.525	3.944	3.004	2.533	2.251	2.110	2.029	1.886	1.743	1.289	0.926	0.670	0.421
160	5.640	4.023	3.059	2.574	2.290	2.150	2.069	1.956	1.808	1.337	0.960	0.700	0.421
165	5.755	4.069	3.114	2.614	2.330	2.190	2.110	2.016	1.872	1.384	0.993	0.729	0.421
170	5.870	4.115	3.169	2.655	2.369	2.229	2.150	2.057	1.936	1.432	1.027	0.758	0.421
175	5.985	4.161	3.224	2.695	2.408	2.269	2.190	2.097	2.000	1.479	1.061	0.787	0.421
180	6.071	4.207	3.279	2.735	2.448	2.309	2.230	2.138	2.042	1.527	1.095	0.816	0.447
185	6.126	4.253	3.333	2.776	2.487	2.349	2.270	2.178	2.083	1.574	1.129	0.846	0.476
190	6.181	4.299	3.388	2.816	2.527	2.389	2.310	2.219	2.124	1.622	1.163	0.875	0.505
195	6.236	4.345	3.443	2.856	2.566	2.428	2.350	2.259	2.164	1.669	1.197	0.904	0.533
200	6.291	4.391	3.498	2.897	2.605	2.468	2.390	2.300	2.205	1.717	1.230	0.933	0.562
205	6.345	4.437	3.553	2.937	2.645	2.508	2.430	2.340	2.246	1.765	1.264	0.962	0.591
210	6.400	4.483	3.608	2.977	2.684	2.548	2.471	2.381	2.287	1.812	1.298	0.992	0.620
215	6.455	4.529	3.663	3.018	2.724	2.588	2.511	2.422	2.328	1.860	1.332	1.021	0.649
220	6.510	4.575	3.718	3.058	2.763	2.627	2.551	2.462	2.369	1.907	1.366	1.050	0.678
225	6.565	4.622	3.773	3.099	2.802	2.667	2.591	2.503	2.410	1.955	1.400	1.079	0.707
230	6.620	4.668	3.828	3.139	2.842	2.707	2.631	2.543	2.450	2.002	1.434	1.108	0.735
235	6.675	4.714	3.883	3.179	2.881	2.747	2.671	2.584	2.491	2.042	1.467	1.138	0.764
240	6.730	4.760	3.938	3.220	2.921	2.787	2.711	2.624	2.532	2.083	1.501	1.167	0.793
245	6.784	4.806	3.993	3.260	2.960	2.826	2.751	2.665	2.573	2.123	1.535	1.196	0.822
250	6.839	4.852	4.049	3.300	2.999	2.866	2.791	2.705	2.614	2.163	1.569	1.225	0.851
255	6.894	4.898	4.105	3.341	3.039	2.906	2.832	2.746	2.655	2.203	1.603	1.254	0.880
260	6.949	4.944	4.162	3.381	3.078	2.946	2.872	2.786	2.696	2.243	1.637	1.284	0.909
265	7.004	4.990	4.218	3.421	3.118	2.985	2.912	2.827	2.736	2.283	1.671	1.313	0.937
270	7.059	5.036	4.274	3.462	3.157	3.025	2.952	2.867	2.777	2.324	1.704	1.342	0.966
275	7.114	5.082	4.330	3.502	3.196	3.065	2.992	2.908	2.818	2.364	1.738	1.371	0.995
280	7.169	5.128	4.387	3.543	3.236	3.105	3.032	2.949	2.859	2.404	1.772	1.400	1.024
285	7.224	5.174	4.443	3.583	3.275	3.145	3.072	2.989	2.900	2.444	1.806	1.430	1.053
290	7.278	5.220	4.499	3.623	3.315	3.184	3.112	3.030	2.941	2.484	1.840	1.459	1.082
295	7.333	5.266	4.555	3.664	3.354	3.224	3.152	3.070	2.982	2.525	1.874	1.488	1.111
300	7.388	5.312	4.612	3.704	3.393	3.264	3.193	3.111	3.022	2.565	1.908	1.517	1.139
305	7.443	5.359	4.668	3.744	3.433	3.304	3.233	3.151	3.063	2.605	1.941	1.546	1.168
310	7.498	5.405	4.724	3.785	3.472	3.344	3.273	3.192	3.104	2.645	1.975	1.576	1.197
315	7.553	5.451	4.780	3.825	3.512	3.383	3.313	3.232	3.145	2.685	2.011	1.605	1.226
320	7.608	5.497	4.837	3.865	3.551	3.423	3.353	3.273	3.186	2.725	2.052	1.634	1.255
325	7.663	5.543	4.893	3.906	3.590	3.463	3.393	3.313	3.227	2.766	2.093	1.663	1.284
330	7.717	5.589	4.949	3.946	3.630	3.503	3.433	3.354	3.268	2.806	2.134	1.693	1.313
335	7.772	5.635	5.005	3.987	3.669	3.543	3.473	3.394	3.309	2.846	2.175	1.722	1.341
340	7.827	5.681	5.062	4.043	3.709	3.582	3.513	3.435	3.349	2.886	2.216	1.751	1.370
345	7.882	5.727	5.118	4.122	3.748	3.622	3.554	3.476	3.390	2.926	2.258	1.780	1.399
350	7.937	5.773	5.174	4.202	3.787	3.662	3.594	3.516	3.431	2.966	2.299	1.809	1.428
355	7.992	5.819	5.230	4.282	3.827	3.702	3.634	3.557	3.472	3.007	2.340	1.839	1.457
360	8.047	5.865	5.287	4.362	3.866	3.742	3.674	3.597	3.513	3.047	2.381	1.868	1.486
365	8.102	5.911	5.343	4.442	3.906	3.781	3.714	3.638	3.554	3.087	2.422	1.897	1.515
370	8.156	5.957	5.399	4.521	3.945	3.821	3.754	3.678	3.595	3.127	2.463	1.926	1.543
375	8.211	6.003	5.455	4.601	3.984	3.861	3.794	3.719	3.635	3.167	2.505	1.955	1.572
380	8.266	6.057	5.512	4.681	4.036	3.901	3.834	3.759	3.676	3.207	2.546	1.985	1.601

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 75 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	2.447	1.617	1.083	0.712	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
30	2.594	1.617	1.083	0.712	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.421
35	2.932	2.027	1.386	0.920	0.563	0.487	0.443	0.421	0.421	0.421	0.421	0.421	0.421
40	3.270	2.218	1.725	1.176	0.752	0.651	0.597	0.554	0.516	0.421	0.421	0.421	0.421
45	3.607	2.409	2.023	1.432	0.941	0.815	0.751	0.698	0.651	0.469	0.421	0.421	0.421
50	3.945	2.600	2.136	1.687	1.129	0.979	0.905	0.842	0.785	0.564	0.423	0.421	0.421
55	4.158	2.790	2.249	1.943	1.318	1.143	1.059	0.986	0.920	0.659	0.487	0.421	0.421
60	4.340	2.981	2.362	2.065	1.507	1.307	1.213	1.130	1.054	0.754	0.551	0.421	0.421
65	4.523	3.172	2.475	2.146	1.696	1.471	1.367	1.273	1.189	0.849	0.614	0.459	0.421
70	4.705	3.363	2.588	2.228	1.884	1.635	1.521	1.417	1.323	0.944	0.678	0.506	0.421
75	4.888	3.553	2.701	2.309	2.027	1.799	1.675	1.561	1.458	1.039	0.742	0.554	0.421
80	5.070	3.744	2.814	2.391	2.093	1.963	1.829	1.705	1.592	1.134	0.806	0.601	0.423
85	5.253	3.935	2.927	2.472	2.159	2.047	1.983	1.849	1.727	1.229	0.870	0.648	0.456
90	5.435	4.083	3.040	2.554	2.225	2.107	2.052	1.992	1.861	1.324	0.933	0.695	0.489
95	5.618	4.203	3.153	2.635	2.291	2.167	2.108	2.052	1.996	1.419	0.997	0.743	0.522
100	5.800	4.322	3.266	2.717	2.357	2.227	2.165	2.105	2.049	1.514	1.061	0.790	0.555
105	5.983	4.442	3.379	2.798	2.423	2.287	2.222	2.158	2.099	1.609	1.125	0.837	0.589
110	6.095	4.562	3.492	2.880	2.489	2.346	2.278	2.212	2.149	1.704	1.188	0.884	0.622
115	6.170	4.681	3.605	2.961	2.555	2.406	2.335	2.265	2.198	1.799	1.252	0.932	0.655
120	6.246	4.801	3.718	3.043	2.621	2.466	2.392	2.318	2.248	1.894	1.316	0.979	0.688
125	6.321	4.921	3.831	3.124	2.687	2.526	2.449	2.372	2.298	1.989	1.380	1.026	0.721
130	6.396	5.040	3.944	3.206	2.753	2.586	2.505	2.425	2.347	2.037	1.443	1.074	0.754
135	6.472	5.160	4.035	3.287	2.819	2.645	2.562	2.478	2.397	2.077	1.507	1.121	0.787
140	6.547	5.280	4.094	3.369	2.885	2.705	2.619	2.532	2.447	2.117	1.571	1.168	0.820
145	6.623	5.400	4.153	3.450	2.951	2.765	2.675	2.585	2.496	2.157	1.635	1.215	0.854
150	6.698	5.519	4.211	3.532	3.017	2.825	2.732	2.638	2.546	2.197	1.698	1.263	0.887
155	6.773	5.639	4.270	3.613	3.083	2.885	2.789	2.692	2.596	2.237	1.762	1.310	0.920
160	6.849	5.759	4.329	3.695	3.149	2.944	2.845	2.745	2.646	2.278	1.826	1.357	0.953
165	6.924	5.878	4.388	3.776	3.215	3.004	2.902	2.798	2.695	2.318	1.890	1.404	0.986
170	7.000	5.998	4.446	3.858	3.282	3.064	2.959	2.852	2.745	2.358	1.954	1.452	1.019
175	7.075	6.082	4.505	3.939	3.348	3.124	3.015	2.905	2.795	2.398	2.011	1.499	1.052
180	7.151	6.143	4.564	4.017	3.414	3.183	3.072	2.958	2.844	2.438	2.050	1.546	1.086
185	7.226	6.204	4.623	4.071	3.480	3.243	3.129	3.012	2.894	2.478	2.089	1.593	1.119
190	7.301	6.265	4.682	4.124	3.546	3.303	3.185	3.065	2.944	2.518	2.128	1.641	1.152
195	7.377	6.326	4.740	4.178	3.612	3.363	3.242	3.118	2.993	2.559	2.167	1.688	1.185
200	7.452	6.387	4.799	4.231	3.678	3.423	3.299	3.172	3.043	2.599	2.205	1.735	1.218
205	7.528	6.448	4.858	4.285	3.744	3.482	3.355	3.225	3.093	2.639	2.244	1.782	1.251
210	7.603	6.509	4.917	4.338	3.810	3.542	3.412	3.278	3.142	2.679	2.283	1.830	1.284
215	7.678	6.570	4.975	4.391	3.876	3.602	3.469	3.332	3.192	2.719	2.322	1.877	1.317
220	7.754	6.631	5.034	4.445	3.942	3.662	3.526	3.385	3.242	2.759	2.361	1.924	1.351
225	7.829	6.692	5.093	4.498	4.008	3.722	3.582	3.438	3.291	2.800	2.399	1.971	1.384
230	7.905	6.753	5.152	4.552	4.066	3.781	3.639	3.492	3.341	2.840	2.438	2.015	1.417
235	7.980	6.814	5.211	4.605	4.123	3.841	3.696	3.545	3.391	2.880	2.477	2.052	1.450
240	8.056	6.874	5.269	4.659	4.180	3.901	3.752	3.598	3.440	2.920	2.516	2.089	1.483
245	8.131	6.935	5.328	4.712	4.237	3.961	3.809	3.652	3.490	2.960	2.555	2.125	1.516
250	8.206	6.996	5.387	4.766	4.294	4.021	3.866	3.705	3.540	3.000	2.594	2.162	1.549
255	8.282	7.057	5.446	4.819	4.352	4.082	3.922	3.758	3.589	3.040	2.632	2.199	1.583
260	8.357	7.118	5.504	4.872	4.409	4.143	3.979	3.812	3.639	3.081	2.671	2.236	1.616
265	8.433	7.179	5.563	4.926	4.466	4.204	4.039	3.865	3.689	3.121	2.710	2.272	1.649
270	8.508	7.240	5.622	4.979	4.523	4.264	4.102	3.918	3.739	3.161	2.749	2.309	1.682
275	8.584	7.301	5.681	5.033	4.581	4.325	4.166	3.972	3.788	3.201	2.788	2.346	1.715
280	8.769	7.362	5.740	5.086	4.638	4.386	4.229	4.029	3.838	3.241	2.826	2.383	1.748
285	9.485	7.423	5.798	5.140	4.695	4.447	4.293	4.096	3.888	3.281	2.865	2.420	1.781
290	10.200	7.484	5.857	5.193	4.752	4.508	4.356	4.163	3.937	3.322	2.904	2.456	1.814
295	-	7.545	5.916	5.247	4.809	4.569	4.420	4.231	3.987	3.362	2.943	2.493	1.848
300	-	7.606	5.975	5.300	4.867	4.630	4.483	4.298	4.049	3.402	2.982	2.530	1.881
305	-	7.667	6.033	5.354	4.924	4.691	4.547	4.365	4.122	3.442	3.020	2.567	1.914
310	-	7.728	6.134	5.407	4.981	4.752	4.611	4.433	4.195	3.482	3.059	2.603	1.947
315	-	7.789	6.244	5.460	5.038	4.813	4.674	4.500	4.268	3.522	3.098	2.640	1.980
320	-	7.850	6.355	5.514	5.096	4.874	4.738	4.568	4.341	3.562	3.137	2.677	2.016
325	-	7.911	6.465	5.567	5.153	4.935	4.801	4.635	4.414	3.603	3.176	2.714	2.057
330	-	7.972	6.576	5.621	5.210	4.996	4.865	4.702	4.487	3.643	3.215	2.750	2.098
335	-	8.033	6.686	5.674	5.267	5.057	4.928	4.770	4.560	3.683	3.253	2.787	2.138
340	-	8.094	6.797	5.728	5.324	5.118	4.992	4.837	4.633	3.723	3.292	2.824	2.179
345	-	8.155	6.907	5.781	5.382	5.179	5.055	4.904	4.706	3.763	3.331	2.861	2.220
350	-	8.216	7.018	5.835	5.439	5.240	5.119	4.972	4.779	3.803	3.370	2.898	2.261
355	-	8.277	7.128	5.888	5.496	5.301	5.183	5.039	4.852	3.844	3.409	2.934	2.302
360	-	8.337	7.239	5.941	5.553	5.362	5.246	5.106	4.925	3.884	3.447	2.971	2.343
365	-	8.398	7.349	5.995	5.611	5.423	5.310	5.174	4.998	3.924	3.486	3.008	2.384
370	-	8.459	7.460	6.054	5.668	5.484	5.373	5.241	5.071	3.964	3.525	3.045	2.425
375	-	8.520	7.570	6.201	5.725	5.544	5.437	5.309	5.144	4.004	3.564	3.081	2.465
380	-	8.581	7.681	6.348	5.782	5.605	5.500	5.376	5.217	4.097	3.603	3.118	2.506

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 90 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	3.260	2.321	1.672	1.230	0.895	0.790	0.728	0.472	0.437	0.421	0.421	0.421	0.421
30	3.459	2.457	1.675	1.230	0.895	0.790	0.728	0.549	0.509	0.421	0.421	0.421	0.421
35	3.943	2.785	2.061	1.560	1.136	1.000	0.923	0.777	0.720	0.517	0.421	0.421	0.421
40	4.468	3.113	2.277	1.910	1.406	1.240	1.151	1.004	0.931	0.675	0.498	0.421	0.421
45	5.000	3.442	2.493	2.108	1.677	1.480	1.378	1.232	1.143	0.833	0.621	0.454	0.421
50	5.532	3.770	2.710	2.252	1.948	1.720	1.606	1.460	1.354	0.992	0.744	0.544	0.421
55	6.051	4.056	2.926	2.396	2.091	1.960	1.833	1.687	1.565	1.150	0.866	0.634	0.457
60	6.233	4.227	3.143	2.540	2.203	2.085	2.026	1.915	1.776	1.309	0.989	0.724	0.517
65	6.414	4.397	3.359	2.683	2.314	2.184	2.121	2.057	1.988	1.467	1.112	0.813	0.578
70	6.596	4.567	3.576	2.827	2.425	2.284	2.215	2.146	2.082	1.625	1.235	0.903	0.639
75	6.777	4.738	3.792	2.971	2.537	2.384	2.310	2.236	2.168	1.784	1.357	0.993	0.699
80	6.958	4.908	4.009	3.115	2.648	2.484	2.404	2.325	2.253	1.942	1.480	1.083	0.760
85	7.140	5.078	4.127	3.259	2.759	2.584	2.499	2.414	2.339	2.042	1.603	1.172	0.820
90	7.321	5.249	4.244	3.403	2.871	2.684	2.593	2.504	2.425	2.106	1.726	1.262	0.881
95	7.502	5.419	4.361	3.546	2.982	2.784	2.688	2.593	2.510	2.170	1.849	1.352	0.941
100	7.684	5.590	4.478	3.690	3.094	2.884	2.782	2.682	2.596	2.234	1.971	1.442	1.002
105	7.865	5.760	4.595	3.834	3.205	2.984	2.877	2.772	2.682	2.298	2.032	1.532	1.062
110	8.046	5.930	4.712	3.978	3.316	3.083	2.971	2.861	2.767	2.362	2.072	1.621	1.123
115	8.228	6.075	4.829	4.090	3.428	3.183	3.066	2.950	2.853	2.426	2.112	1.711	1.184
120	8.409	6.168	4.946	4.193	3.539	3.283	3.160	3.040	2.939	2.490	2.152	1.801	1.244
125	8.591	6.260	5.064	4.296	3.650	3.383	3.255	3.129	3.024	2.554	2.191	1.891	1.305
130	8.811	6.353	5.181	4.399	3.762	3.483	3.349	3.218	3.110	2.617	2.231	1.980	1.365
135	9.048	6.445	5.298	4.502	3.873	3.583	3.444	3.308	3.196	2.681	2.271	2.030	1.426
140	9.285	6.538	5.415	4.605	3.984	3.683	3.538	3.397	3.281	2.745	2.311	2.066	1.486
145	9.522	6.630	5.532	4.708	4.065	3.783	3.633	3.486	3.367	2.809	2.351	2.103	1.547
150	9.759	6.723	5.649	4.811	4.135	3.883	3.727	3.576	3.453	2.873	2.391	2.140	1.607
155	9.996	6.815	5.766	4.913	4.205	3.983	3.822	3.665	3.538	2.937	2.431	2.176	1.668
160	10.233	6.908	5.883	5.016	4.276	4.054	3.916	3.754	3.624	3.001	2.470	2.213	1.728
165	10.470	7.000	6.000	5.119	4.346	4.114	4.011	3.844	3.710	3.065	2.510	2.250	1.789
170	10.708	7.093	6.088	5.222	4.416	4.174	4.066	3.933	3.796	3.129	2.550	2.286	1.850
175	10.945	7.185	6.159	5.325	4.487	4.234	4.121	4.018	3.881	3.193	2.590	2.323	1.910
180	-	7.278	6.229	5.428	4.557	4.294	4.176	4.075	3.967	3.257	2.630	2.359	1.971
185	-	7.370	6.299	5.531	4.627	4.353	4.231	4.131	4.039	3.321	2.670	2.396	2.020
190	-	7.463	6.370	5.634	4.698	4.413	4.287	4.187	4.096	3.385	2.710	2.433	2.058
195	-	7.555	6.440	5.737	4.768	4.473	4.342	4.244	4.153	3.449	2.750	2.469	2.095
200	-	7.648	6.510	5.839	4.838	4.533	4.397	4.300	4.210	3.513	2.789	2.506	2.133
205	-	7.740	6.581	5.942	4.909	4.593	4.452	4.356	4.268	3.577	2.829	2.543	2.171
210	-	7.833	6.651	6.045	4.979	4.653	4.507	4.413	4.325	3.641	2.869	2.579	2.208
215	-	7.925	6.721	6.122	5.049	4.713	4.562	4.469	4.382	3.705	2.909	2.616	2.246
220	-	8.017	6.792	6.198	5.120	4.773	4.618	4.525	4.439	3.769	2.949	2.652	2.284
225	-	8.110	6.862	6.275	5.190	4.833	4.673	4.582	4.496	3.833	2.989	2.689	2.321
230	-	8.202	6.932	6.351	5.260	4.893	4.728	4.638	4.554	3.897	3.029	2.726	2.359
235	-	8.295	7.002	6.428	5.331	4.953	4.783	4.695	4.611	3.961	3.068	2.762	2.397
240	-	8.387	7.073	6.504	5.401	5.013	4.838	4.751	4.668	4.025	3.108	2.799	2.434
245	-	8.480	7.143	6.581	5.472	5.072	4.893	4.807	4.725	4.093	3.148	2.835	2.472
250	-	8.572	7.213	6.657	5.542	5.132	4.948	4.864	4.782	4.160	3.188	2.872	2.510
255	-	9.118	7.284	6.734	5.612	5.192	5.004	4.920	4.840	4.228	3.228	2.909	2.547
260	-	9.664	7.354	6.810	5.683	5.252	5.059	4.976	4.897	4.295	3.268	2.945	2.585
265	-	-	7.424	6.887	5.753	5.312	5.114	5.033	4.954	4.363	3.308	2.982	2.623
270	-	-	7.495	6.963	5.823	5.372	5.169	5.089	5.011	4.430	3.347	3.019	2.660
275	-	-	7.565	7.040	5.894	5.432	5.224	5.145	5.068	4.498	3.387	3.055	2.698
280	-	-	7.635	7.116	5.964	5.492	5.279	5.202	5.126	4.565	3.427	3.092	2.735
285	-	-	7.705	7.193	6.034	5.552	5.334	5.258	5.183	4.633	3.467	3.128	2.773
290	-	-	7.776	7.269	6.132	5.612	5.390	5.314	5.240	4.700	3.507	3.165	2.811
295	-	-	7.846	7.346	6.235	5.672	5.445	5.371	5.297	4.768	3.547	3.202	2.848
300	-	-	7.916	7.423	6.338	5.732	5.500	5.427	5.354	4.835	3.587	3.238	2.886
305	-	-	7.987	7.499	6.441	5.792	5.555	5.484	5.412	4.902	3.627	3.275	2.924
310	-	-	8.057	7.576	6.543	5.851	5.610	5.540	5.469	4.970	3.666	3.312	2.961
315	-	-	8.127	7.652	6.646	5.911	5.665	5.596	5.526	5.037	3.706	3.348	2.999
320	-	-	8.198	7.729	6.749	5.971	5.721	5.653	5.583	5.105	3.746	3.385	3.037
325	-	-	8.268	7.805	6.852	6.031	5.776	5.709	5.640	5.172	3.786	3.421	3.074
330	-	-	8.338	7.882	6.955	6.145	5.831	5.765	5.698	5.240	3.826	3.458	3.112
335	-	-	8.408	7.958	7.057	6.275	5.886	5.822	5.755	5.307	3.866	3.495	3.150
340	-	-	8.479	8.035	7.160	6.405	5.941	5.878	5.812	5.375	3.906	3.531	3.187
345	-	-	8.549	8.111	7.263	6.535	5.996	5.934	5.869	5.442	3.945	3.568	3.225
350	-	-	8.619	8.188	7.366	6.665	6.063	5.991	5.926	5.510	3.985	3.605	3.262
355	-	-	8.690	8.264	7.469	6.794	6.218	6.051	5.984	5.577	4.061	3.641	3.300
360	-	-	8.760	8.341	7.571	6.924	6.373	6.201	6.041	5.645	4.203	3.678	3.338
365	-	-	8.830	8.417	7.674	7.054	6.528	6.352	6.180	5.712	4.344	3.714	3.375
370	-	-	8.901	8.494	7.777	7.184	6.682	6.503	6.325	5.780	4.485	3.751	3.413
375	-	-	8.971	8.570	7.880	7.314	6.837	6.654	6.470	5.847	4.626	3.788	3.451
380	-	-	9.041	8.647	7.983	7.444	6.992	6.805	6.616	5.914	4.768	3.824	3.488

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 105 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	4.191	3.029	2.296	1.747	1.370	1.251	1.191	1.138	1.087	0.835	0.437	0.421	0.421
30	4.558	3.208	2.424	1.763	1.370	1.251	1.191	1.138	1.087	0.835	0.454	0.421	0.421
35	5.637	3.664	2.763	2.122	1.724	1.570	1.494	1.426	1.360	1.034	0.641	0.464	0.421
40	6.491	4.112	3.102	2.380	2.041	1.894	1.805	1.723	1.642	1.241	0.828	0.625	0.427
45	7.207	4.536	3.441	2.638	2.215	2.105	2.056	2.010	1.924	1.447	1.015	0.787	0.559
50	7.922	4.960	3.780	2.896	2.390	2.259	2.203	2.150	2.098	1.653	1.201	0.949	0.690
55	8.638	5.384	4.067	3.155	2.564	2.413	2.351	2.291	2.232	1.859	1.388	1.111	0.822
60	8.893	5.808	4.243	3.413	2.739	2.567	2.498	2.431	2.365	2.033	1.575	1.272	0.953
65	9.143	6.106	4.420	3.671	2.913	2.722	2.645	2.571	2.498	2.136	1.762	1.434	1.085
70	9.393	6.243	4.596	3.929	3.088	2.876	2.792	2.711	2.632	2.238	1.949	1.596	1.217
75	9.643	6.381	4.772	4.103	3.262	3.030	2.939	2.851	2.765	2.340	2.054	1.758	1.348
80	9.894	6.519	4.948	4.237	3.437	3.184	3.086	2.991	2.898	2.442	2.127	1.919	1.480
85	10.144	6.657	5.124	4.371	3.612	3.338	3.234	3.131	3.031	2.544	2.201	2.023	1.612
90	10.394	6.794	5.300	4.505	3.786	3.492	3.381	3.271	3.165	2.646	2.274	2.067	1.743
95	-	6.932	5.476	4.639	3.961	3.647	3.528	3.411	3.298	2.749	2.347	2.111	1.875
100	-	7.070	5.652	4.773	4.107	3.801	3.675	3.552	3.431	2.851	2.420	2.155	2.003
105	-	7.207	5.828	4.907	4.242	3.955	3.822	3.692	3.564	2.953	2.493	2.198	2.040
110	-	7.345	6.005	5.041	4.377	4.094	3.969	3.832	3.698	3.055	2.566	2.242	2.077
115	-	7.483	6.139	5.175	4.513	4.223	4.099	3.972	3.831	3.157	2.640	2.286	2.113
120	-	7.621	6.260	5.309	4.648	4.353	4.221	4.094	3.964	3.259	2.713	2.330	2.150
125	-	7.758	6.382	5.444	4.783	4.483	4.343	4.210	4.082	3.361	2.786	2.373	2.187
130	-	7.896	6.504	5.578	4.918	4.613	4.466	4.325	4.191	3.464	2.859	2.417	2.223
135	-	8.034	6.625	5.712	5.053	4.743	4.588	4.441	4.300	3.566	2.932	2.461	2.260
140	-	8.172	6.747	5.846	5.188	4.873	4.710	4.557	4.409	3.668	3.006	2.505	2.297
145	-	8.309	6.869	5.980	5.324	5.002	4.833	4.672	4.518	3.770	3.079	2.548	2.334
150	-	8.447	6.990	6.096	5.459	5.132	4.955	4.788	4.627	3.872	3.152	2.592	2.370
155	-	8.585	7.112	6.194	5.594	5.262	5.077	4.903	4.736	3.974	3.225	2.636	2.407
160	-	8.722	7.234	6.292	5.729	5.392	5.199	5.019	4.845	4.063	3.298	2.680	2.444
165	-	8.860	7.355	6.391	5.864	5.522	5.322	5.134	4.954	4.144	3.371	2.724	2.480
170	-	8.998	7.477	6.489	5.999	5.651	5.444	5.250	5.063	4.224	3.445	2.767	2.517
175	-	9.136	7.599	6.587	6.093	5.781	5.566	5.365	5.172	4.305	3.518	2.811	2.554
180	-	-	7.720	6.686	6.165	5.911	5.689	5.481	5.281	4.386	3.591	2.855	2.591
185	-	-	7.842	6.784	6.237	6.041	5.811	5.596	5.391	4.467	3.664	2.899	2.627
190	-	-	7.964	6.882	6.310	6.116	5.933	5.712	5.500	4.547	3.737	2.942	2.664
195	-	-	8.085	6.981	6.382	6.189	6.051	5.828	5.609	4.628	3.810	2.986	2.701
200	-	-	8.207	7.079	6.454	6.262	6.126	5.943	5.718	4.709	3.884	3.030	2.737
205	-	-	8.329	7.177	6.526	6.335	6.200	6.054	5.827	4.790	3.957	3.074	2.774
210	-	-	8.450	7.276	6.599	6.408	6.275	6.130	5.936	4.870	4.028	3.117	2.811
215	-	-	8.572	7.374	6.671	6.481	6.349	6.206	6.045	4.951	4.096	3.161	2.847
220	-	-	9.059	7.472	6.743	6.554	6.424	6.282	6.122	5.032	4.164	3.205	2.884
225	-	-	9.547	7.570	6.816	6.627	6.498	6.358	6.200	5.113	4.231	3.249	2.921
230	-	-	-	7.669	6.888	6.700	6.573	6.434	6.277	5.193	4.299	3.292	2.958
235	-	-	-	7.767	6.960	6.773	6.647	6.510	6.355	5.274	4.366	3.336	2.994
240	-	-	-	7.865	7.032	6.846	6.721	6.586	6.432	5.355	4.434	3.380	3.031
245	-	-	-	7.964	7.105	6.919	6.796	6.662	6.510	5.436	4.501	3.424	3.068
250	-	-	-	8.062	7.177	6.991	6.870	6.738	6.587	5.516	4.569	3.467	3.104
255	-	-	-	8.160	7.249	7.064	6.945	6.814	6.664	5.597	4.636	3.511	3.141
260	-	-	-	8.259	7.321	7.137	7.019	6.890	6.742	5.678	4.704	3.555	3.178
265	-	-	-	8.357	7.394	7.210	7.094	6.966	6.819	5.759	4.771	3.599	3.214
270	-	-	-	8.455	7.466	7.283	7.168	7.041	6.897	5.839	4.839	3.643	3.251
275	-	-	-	8.554	7.538	7.356	7.243	7.117	6.974	5.920	4.907	3.686	3.288
280	-	-	-	8.751	7.610	7.429	7.317	7.193	7.052	6.001	4.974	3.730	3.325
285	-	-	-	8.949	7.683	7.502	7.391	7.269	7.129	6.091	5.042	3.774	3.361
290	-	-	-	9.147	7.755	7.575	7.466	7.345	7.207	6.192	5.109	3.818	3.398
295	-	-	-	9.344	7.827	7.648	7.540	7.421	7.284	6.293	5.177	3.861	3.435
300	-	-	-	9.542	7.899	7.721	7.615	7.497	7.361	6.394	5.244	3.905	3.471
305	-	-	-	-	7.972	7.794	7.689	7.573	7.439	6.495	5.312	3.949	3.508
310	-	-	-	-	8.044	7.867	7.764	7.649	7.516	6.596	5.379	3.993	3.545
315	-	-	-	-	8.116	7.940	7.838	7.725	7.594	6.697	5.447	4.081	3.582
320	-	-	-	-	8.188	8.013	7.913	7.801	7.671	6.798	5.514	4.201	3.618
325	-	-	-	-	8.261	8.086	7.987	7.877	7.749	6.899	5.582	4.321	3.655
330	-	-	-	-	8.333	8.159	8.061	7.953	7.826	7.000	5.650	4.441	3.692
335	-	-	-	-	8.405	8.232	8.136	8.029	7.903	7.101	5.717	4.562	3.728
340	-	-	-	-	8.477	8.305	8.210	8.105	7.981	7.202	5.785	4.682	3.765
345	-	-	-	-	8.550	8.378	8.285	8.181	8.058	7.303	5.852	4.802	3.802
350	-	-	-	-	8.622	8.451	8.359	8.257	8.136	7.404	5.920	4.922	3.838
355	-	-	-	-	8.694	8.524	8.434	8.333	8.213	7.505	5.987	5.043	3.875
360	-	-	-	-	8.767	8.597	8.508	8.409	8.291	7.606	6.066	5.163	3.912
365	-	-	-	-	8.839	8.670	8.583	8.485	8.368	7.707	6.208	5.283	3.949
370	-	-	-	-	8.911	8.743	8.657	8.561	8.446	7.808	6.350	5.403	3.985
375	-	-	-	-	8.983	8.816	8.731	8.637	8.523	7.909	6.492	5.524	4.051
380	-	-	-	-	9.056	8.889	8.806	8.713	8.600	8.010	6.634	5.644	4.186

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 120 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	6.223	3.655	2.931	2.316	1.820	1.713	1.654	1.601	1.551	1.313	1.057	0.457	0.421
30	6.822	3.945	3.098	2.436	1.919	1.738	1.676	1.621	1.570	1.330	1.062	0.546	0.421
35	8.582	4.797	3.552	2.802	2.211	2.093	2.044	2.003	1.937	1.623	1.303	0.807	0.557
40	-	5.650	4.005	3.167	2.503	2.347	2.281	2.222	2.170	1.916	1.545	1.068	0.780
45	-	6.364	4.413	3.532	2.795	2.601	2.517	2.442	2.374	2.106	1.786	1.329	1.003
50	-	6.959	4.821	3.898	3.087	2.855	2.754	2.662	2.577	2.252	2.014	1.590	1.226
55	-	7.554	5.228	4.162	3.379	3.109	2.990	2.881	2.781	2.399	2.126	1.851	1.449
60	-	8.149	5.635	4.382	3.670	3.364	3.227	3.101	2.984	2.546	2.238	2.035	1.672
65	-	8.675	6.042	4.601	3.962	3.618	3.464	3.320	3.188	2.692	2.351	2.113	1.895
70	-	8.853	6.201	4.821	4.144	3.872	3.700	3.540	3.392	2.839	2.463	2.191	2.032
75	-	9.030	6.358	5.040	4.303	4.076	3.937	3.760	3.595	2.986	2.575	2.269	2.091
80	-	9.207	6.515	5.260	4.463	4.221	4.105	3.979	3.799	3.132	2.687	2.347	2.149
85	-	9.384	6.673	5.479	4.622	4.365	4.242	4.122	4.003	3.279	2.800	2.425	2.207
90	-	9.561	6.830	5.699	4.782	4.510	4.379	4.252	4.132	3.426	2.912	2.503	2.266
95	-	9.739	6.987	5.918	4.941	4.654	4.516	4.382	4.259	3.572	3.024	2.582	2.324
100	-	9.916	7.144	6.104	5.100	4.799	4.653	4.511	4.385	3.719	3.137	2.660	2.382
105	-	10.093	7.301	6.242	5.260	4.943	4.790	4.641	4.512	3.866	3.249	2.738	2.440
110	-	10.270	7.458	6.381	5.419	5.087	4.927	4.771	4.638	4.012	3.361	2.816	2.499
115	-	10.447	7.615	6.520	5.579	5.232	5.064	4.901	4.765	4.151	3.473	2.894	2.557
120	-	-	7.772	6.659	5.738	5.376	5.202	5.031	4.891	4.290	3.586	2.972	2.615
125	-	-	7.930	6.798	5.898	5.521	5.339	5.161	5.018	4.428	3.698	3.050	2.673
130	-	-	8.087	6.936	6.054	5.665	5.476	5.290	5.144	4.567	3.810	3.128	2.732
135	-	-	8.244	7.075	6.176	5.809	5.613	5.420	5.270	4.706	3.923	3.206	2.790
140	-	-	8.401	7.214	6.298	5.954	5.750	5.550	5.397	4.845	4.033	3.284	2.848
145	-	-	8.558	7.353	6.421	6.087	5.887	5.680	5.523	4.983	4.138	3.362	2.906
150	-	-	9.338	7.491	6.543	6.199	6.024	5.810	5.650	5.122	4.242	3.440	2.965
155	-	-	10.119	7.630	6.665	6.312	6.136	5.940	5.776	5.261	4.347	3.518	3.023
160	-	-	-	7.769	6.787	6.424	6.244	6.064	5.903	5.400	4.451	3.597	3.081
165	-	-	-	7.908	6.909	6.536	6.351	6.167	6.029	5.538	4.556	3.675	3.140
170	-	-	-	8.046	7.031	6.649	6.459	6.269	6.127	5.677	4.660	3.753	3.198
175	-	-	-	8.185	7.154	6.761	6.567	6.371	6.221	5.816	4.764	3.831	3.256
180	-	-	-	8.324	7.276	6.874	6.674	6.474	6.315	5.955	4.869	3.909	3.314
185	-	-	-	8.463	7.398	6.986	6.782	6.576	6.409	6.071	4.973	3.987	3.373
190	-	-	-	8.601	7.520	7.099	6.890	6.679	6.503	6.146	5.078	4.062	3.431
195	-	-	-	9.077	7.642	7.211	6.998	6.781	6.597	6.220	5.182	4.137	3.489
200	-	-	-	9.712	7.764	7.324	7.105	6.883	6.690	6.295	5.287	4.211	3.547
205	-	-	-	10.347	7.887	7.436	7.213	6.986	6.784	6.370	5.391	4.285	3.606
210	-	-	-	-	8.009	7.549	7.321	7.088	6.878	6.444	5.496	4.359	3.664
215	-	-	-	-	8.131	7.661	7.428	7.191	6.972	6.519	5.600	4.434	3.722
220	-	-	-	-	8.253	7.774	7.536	7.293	7.066	6.594	5.705	4.508	3.780
225	-	-	-	-	8.375	7.886	7.644	7.395	7.160	6.668	5.809	4.582	3.839
230	-	-	-	-	8.497	7.999	7.751	7.498	7.254	6.743	5.914	4.656	3.897
235	-	-	-	-	8.620	8.111	7.859	7.600	7.348	6.818	6.018	4.731	3.955
240	-	-	-	-	9.071	8.224	7.967	7.702	7.441	6.892	6.108	4.805	4.014
245	-	-	-	-	9.612	8.336	8.074	7.805	7.535	6.967	6.192	4.879	4.084
250	-	-	-	-	10.153	8.449	8.182	7.907	7.629	7.042	6.277	4.953	4.155
255	-	-	-	-	-	8.561	8.290	8.010	7.723	7.116	6.361	5.028	4.225
260	-	-	-	-	-	8.763	8.397	8.112	7.817	7.191	6.446	5.102	4.296
265	-	-	-	-	-	9.235	8.505	8.214	7.911	7.266	6.530	5.176	4.366
270	-	-	-	-	-	9.707	8.613	8.317	8.005	7.340	6.614	5.250	4.437
275	-	-	-	-	-	10.180	8.951	8.419	8.099	7.415	6.699	5.325	4.507
280	-	-	-	-	-	10.652	9.393	8.522	8.192	7.490	6.783	5.399	4.577
285	-	-	-	-	-	-	9.834	8.624	8.286	7.564	6.868	5.473	4.648
290	-	-	-	-	-	-	10.275	8.970	8.380	7.639	6.952	5.547	4.718
295	-	-	-	-	-	-	10.717	9.382	8.474	7.714	7.037	5.622	4.789
300	-	-	-	-	-	-	-	9.794	8.568	7.788	7.121	5.696	4.859
305	-	-	-	-	-	-	-	10.207	8.662	7.863	7.206	5.770	4.929
310	-	-	-	-	-	-	-	10.619	8.756	7.938	7.290	5.845	5.000
315	-	-	-	-	-	-	-	-	8.850	8.012	7.375	5.919	5.070
320	-	-	-	-	-	-	-	-	8.943	8.087	7.459	5.993	5.141
325	-	-	-	-	-	-	-	-	9.037	8.162	7.544	6.081	5.211
330	-	-	-	-	-	-	-	-	9.131	8.236	7.628	6.200	5.281
335	-	-	-	-	-	-	-	-	9.225	8.311	7.713	6.319	5.352
340	-	-	-	-	-	-	-	-	-	8.386	7.797	6.439	5.422
345	-	-	-	-	-	-	-	-	-	8.460	7.881	6.558	5.493
350	-	-	-	-	-	-	-	-	-	8.535	7.966	6.677	5.563
355	-	-	-	-	-	-	-	-	-	8.610	8.050	6.796	5.634
360	-	-	-	-	-	-	-	-	-	8.684	8.135	6.915	5.704
365	-	-	-	-	-	-	-	-	-	8.759	8.219	7.035	5.774
370	-	-	-	-	-	-	-	-	-	8.834	8.304	7.154	5.845
375	-	-	-	-	-	-	-	-	-	8.908	8.388	7.273	5.915
380	-	-	-	-	-	-	-	-	-	8.983	8.473	7.392	5.986

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 135 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	-	5.389	3.566	2.890	2.365	2.053	2.009	1.974	1.943	1.791	1.554	1.294	0.540
30	-	5.634	3.777	3.046	2.485	2.181	2.128	2.085	2.048	1.840	1.588	1.294	0.680
35	-	7.027	4.464	3.515	2.867	2.556	2.480	2.414	2.356	2.129	1.920	1.619	1.093
40	-	8.616	5.234	3.985	3.249	2.931	2.832	2.743	2.664	2.352	2.120	1.944	1.505
45	-	-	6.003	4.448	3.631	3.307	3.184	3.072	2.972	2.574	2.277	2.101	1.917
50	-	-	6.651	4.911	4.013	3.682	3.535	3.401	3.280	2.796	2.433	2.221	2.077
55	-	-	7.293	5.374	4.284	4.037	3.887	3.730	3.587	3.018	2.590	2.342	2.172
60	-	-	7.935	5.837	4.556	4.249	4.136	4.038	3.895	3.240	2.747	2.462	2.267
65	-	-	8.576	6.174	4.828	4.461	4.328	4.221	4.120	3.462	2.904	2.583	2.361
70	-	-	8.786	6.408	5.100	4.673	4.520	4.405	4.295	3.685	3.061	2.703	2.456
75	-	-	8.944	6.642	5.372	4.885	4.712	4.588	4.470	3.907	3.217	2.824	2.551
80	-	-	9.101	6.876	5.644	5.097	4.904	4.771	4.645	4.081	3.374	2.944	2.645
85	-	-	9.259	7.110	5.915	5.309	5.096	4.955	4.820	4.214	3.531	3.065	2.740
90	-	-	9.416	7.344	6.124	5.521	5.288	5.138	4.994	4.347	3.688	3.185	2.835
95	-	-	9.574	7.578	6.275	5.733	5.480	5.321	5.169	4.479	3.845	3.306	2.929
100	-	-	9.731	7.812	6.426	5.945	5.673	5.505	5.344	4.612	4.001	3.426	3.024
105	-	-	9.889	8.046	6.577	6.127	5.865	5.688	5.519	4.744	4.144	3.547	3.119
110	-	-	10.046	8.280	6.728	6.281	6.055	5.871	5.694	4.877	4.286	3.667	3.213
115	-	-	10.204	8.514	6.880	6.436	6.209	6.053	5.868	5.010	4.428	3.788	3.308
120	-	-	10.361	8.771	7.031	6.590	6.364	6.203	6.043	5.142	4.570	3.908	3.403
125	-	-	-	9.058	7.182	6.744	6.518	6.352	6.187	5.275	4.712	4.027	3.497
130	-	-	-	9.344	7.333	6.899	6.673	6.502	6.330	5.408	4.854	4.135	3.592
135	-	-	-	9.630	7.484	7.053	6.828	6.651	6.474	5.540	4.996	4.242	3.687
140	-	-	-	9.917	7.635	7.208	6.982	6.801	6.617	5.673	5.138	4.350	3.781
145	-	-	-	10.203	7.786	7.362	7.137	6.950	6.761	5.805	5.280	4.457	3.876
150	-	-	-	10.490	7.937	7.517	7.291	7.100	6.904	5.938	5.422	4.565	3.971
155	-	-	-	10.776	8.088	7.671	7.446	7.249	7.047	6.069	5.564	4.672	4.050
160	-	-	-	-	8.239	7.826	7.600	7.399	7.191	6.192	5.705	4.780	4.117
165	-	-	-	-	8.390	7.980	7.755	7.549	7.334	6.316	5.847	4.887	4.184
170	-	-	-	-	8.541	8.135	7.910	7.698	7.478	6.439	5.989	4.995	4.252
175	-	-	-	-	8.798	8.289	8.064	7.848	7.621	6.563	6.092	5.102	4.319
180	-	-	-	-	9.290	8.443	8.219	7.997	7.764	6.686	6.169	5.210	4.386
185	-	-	-	-	9.783	8.598	8.373	8.147	7.908	6.810	6.246	5.317	4.453
190	-	-	-	-	10.275	8.946	8.528	8.296	8.051	6.933	6.323	5.425	4.521
195	-	-	-	-	-	9.381	8.743	8.446	8.195	7.057	6.400	5.532	4.588
200	-	-	-	-	-	9.816	9.153	8.595	8.338	7.180	6.477	5.640	4.655
205	-	-	-	-	-	10.252	9.564	8.902	8.481	7.304	6.554	5.747	4.723
210	-	-	-	-	-	10.687	9.974	9.289	8.625	7.427	6.631	5.855	4.790
215	-	-	-	-	-	-	10.384	9.676	8.963	7.551	6.708	5.962	4.857
220	-	-	-	-	-	-	10.794	10.063	9.336	7.674	6.785	6.064	4.925
225	-	-	-	-	-	-	-	10.450	9.709	7.798	6.862	6.144	4.992
230	-	-	-	-	-	-	-	-	10.081	7.921	6.939	6.225	5.059
235	-	-	-	-	-	-	-	-	10.454	8.045	7.016	6.306	5.127
240	-	-	-	-	-	-	-	-	-	8.168	7.093	6.387	5.194
245	-	-	-	-	-	-	-	-	-	8.292	7.170	6.467	5.261
250	-	-	-	-	-	-	-	-	-	8.415	7.247	6.548	5.329
255	-	-	-	-	-	-	-	-	-	8.539	7.325	6.629	5.396
260	-	-	-	-	-	-	-	-	-	8.674	7.402	6.709	5.463
265	-	-	-	-	-	-	-	-	-	8.884	7.479	6.790	5.531
270	-	-	-	-	-	-	-	-	-	9.094	7.556	6.871	5.598
275	-	-	-	-	-	-	-	-	-	9.304	7.633	6.951	5.665
280	-	-	-	-	-	-	-	-	-	9.515	7.710	7.032	5.733
285	-	-	-	-	-	-	-	-	-	9.725	7.787	7.113	5.800
290	-	-	-	-	-	-	-	-	-	9.935	7.864	7.193	5.867
295	-	-	-	-	-	-	-	-	-	10.145	7.941	7.274	5.935
300	-	-	-	-	-	-	-	-	-	10.355	8.018	7.355	6.002
305	-	-	-	-	-	-	-	-	-	10.565	8.095	7.436	6.085
310	-	-	-	-	-	-	-	-	-	10.775	8.172	7.516	6.197
315	-	-	-	-	-	-	-	-	-	-	8.249	7.597	6.309
320	-	-	-	-	-	-	-	-	-	-	8.326	7.678	6.421
325	-	-	-	-	-	-	-	-	-	-	8.403	7.758	6.534
330	-	-	-	-	-	-	-	-	-	-	8.480	7.839	6.646
335	-	-	-	-	-	-	-	-	-	-	8.557	7.920	6.758
340	-	-	-	-	-	-	-	-	-	-	8.634	8.000	6.870
345	-	-	-	-	-	-	-	-	-	-	8.711	8.081	6.982
350	-	-	-	-	-	-	-	-	-	-	8.788	8.162	7.094
355	-	-	-	-	-	-	-	-	-	-	8.865	8.242	7.206
360	-	-	-	-	-	-	-	-	-	-	8.942	8.323	7.318
365	-	-	-	-	-	-	-	-	-	-	9.019	8.404	7.430
370	-	-	-	-	-	-	-	-	-	-	9.096	8.485	7.542
375	-	-	-	-	-	-	-	-	-	-	9.174	8.565	7.654
380	-	-	-	-	-	-	-	-	-	-	-	8.646	7.766

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 150 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	-	-	4.413	3.465	2.882	2.695	2.611	2.536	2.469	2.132	1.988	1.802	1.600
30	-	-	4.845	3.661	3.034	2.837	2.750	2.673	2.604	2.239	2.069	1.944	1.600
35	-	-	6.142	4.326	3.510	3.274	3.168	3.071	2.983	2.552	2.309	2.123	2.014
40	-	-	7.903	5.134	3.985	3.712	3.585	3.468	3.362	2.866	2.548	2.303	2.155
45	-	-	9.141	5.943	4.501	4.145	4.003	3.866	3.740	3.180	2.788	2.482	2.296
50	-	-	9.996	6.720	5.019	4.571	4.388	4.230	4.098	3.493	3.027	2.661	2.436
55	-	-	10.851	7.493	5.537	4.997	4.772	4.574	4.405	3.807	3.267	2.840	2.577
60	-	-	-	8.265	6.051	5.423	5.156	4.919	4.712	4.073	3.507	3.020	2.718
65	-	-	-	8.733	6.399	5.849	5.540	5.263	5.019	4.250	3.746	3.199	2.858
70	-	-	-	8.905	6.746	6.178	5.924	5.607	5.327	4.427	3.986	3.378	2.999
75	-	-	-	9.077	7.094	6.423	6.184	5.952	5.634	4.604	4.128	3.557	3.140
80	-	-	-	9.249	7.441	6.668	6.387	6.166	5.941	4.781	4.259	3.737	3.280
85	-	-	-	9.421	7.789	6.914	6.590	6.332	6.153	4.959	4.390	3.916	3.421
90	-	-	-	9.593	8.136	7.159	6.793	6.498	6.316	5.136	4.520	4.068	3.561
95	-	-	-	9.765	8.484	7.404	6.996	6.663	6.480	5.313	4.651	4.190	3.702
100	-	-	-	9.937	8.744	7.650	7.199	6.829	6.644	5.490	4.782	4.312	3.843
105	-	-	-	10.109	8.929	7.895	7.401	6.995	6.807	5.667	4.913	4.434	3.983
110	-	-	-	10.281	9.113	8.140	7.604	7.161	6.971	5.844	5.044	4.556	4.088
115	-	-	-	10.453	9.297	8.386	7.807	7.327	7.134	6.022	5.174	4.678	4.184
120	-	-	-	-	9.481	8.631	8.010	7.493	7.298	6.190	5.305	4.800	4.280
125	-	-	-	-	9.666	8.841	8.213	7.658	7.461	6.356	5.436	4.922	4.375
130	-	-	-	-	9.850	9.049	8.416	7.824	7.625	6.523	5.567	5.043	4.471
135	-	-	-	-	10.034	9.256	8.619	7.990	7.788	6.690	5.698	5.165	4.567
140	-	-	-	-	10.219	9.464	8.858	8.156	7.952	6.856	5.829	5.287	4.663
145	-	-	-	-	10.403	9.672	9.103	8.322	8.115	7.023	5.959	5.409	4.758
150	-	-	-	-	10.587	9.880	9.348	8.488	8.279	7.190	6.093	5.531	4.854
155	-	-	-	-	-	10.087	9.593	8.664	8.442	7.356	6.233	5.653	4.950
160	-	-	-	-	-	10.295	9.838	9.068	8.606	7.523	6.373	5.775	5.046
165	-	-	-	-	-	10.503	10.083	9.471	8.949	7.690	6.513	5.897	5.142
170	-	-	-	-	-	10.710	10.328	9.875	9.349	7.856	6.653	6.019	5.237
175	-	-	-	-	-	-	10.574	10.279	9.750	8.023	6.793	6.112	5.333
180	-	-	-	-	-	-	10.819	10.683	10.150	8.190	6.933	6.198	5.429
185	-	-	-	-	-	-	-	-	10.551	8.356	7.073	6.284	5.525
190	-	-	-	-	-	-	-	-	-	8.523	7.213	6.370	5.620
195	-	-	-	-	-	-	-	-	-	8.723	7.353	6.455	5.716
200	-	-	-	-	-	-	-	-	-	9.017	7.493	6.541	5.812
205	-	-	-	-	-	-	-	-	-	9.311	7.633	6.627	5.908
210	-	-	-	-	-	-	-	-	-	9.605	7.773	6.713	6.003
215	-	-	-	-	-	-	-	-	-	9.898	7.913	6.798	6.091
220	-	-	-	-	-	-	-	-	-	10.192	8.053	6.884	6.172
225	-	-	-	-	-	-	-	-	-	10.486	8.193	6.970	6.254
230	-	-	-	-	-	-	-	-	-	10.780	8.333	7.056	6.335
235	-	-	-	-	-	-	-	-	-	-	8.473	7.142	6.416
240	-	-	-	-	-	-	-	-	-	-	8.613	7.227	6.497
245	-	-	-	-	-	-	-	-	-	-	8.787	7.313	6.578
250	-	-	-	-	-	-	-	-	-	-	8.971	7.399	6.660
255	-	-	-	-	-	-	-	-	-	-	9.156	7.485	6.741
260	-	-	-	-	-	-	-	-	-	-	9.341	7.570	6.822
265	-	-	-	-	-	-	-	-	-	-	9.525	7.656	6.903
270	-	-	-	-	-	-	-	-	-	-	9.710	7.742	6.985
275	-	-	-	-	-	-	-	-	-	-	9.894	7.828	7.066
280	-	-	-	-	-	-	-	-	-	-	10.079	7.914	7.147
285	-	-	-	-	-	-	-	-	-	-	10.264	7.999	7.228
290	-	-	-	-	-	-	-	-	-	-	10.448	8.085	7.310
295	-	-	-	-	-	-	-	-	-	-	10.633	8.171	7.391
300	-	-	-	-	-	-	-	-	-	-	10.818	8.257	7.472
305	-	-	-	-	-	-	-	-	-	-	-	8.342	7.553
310	-	-	-	-	-	-	-	-	-	-	-	8.428	7.635
315	-	-	-	-	-	-	-	-	-	-	-	8.514	7.716
320	-	-	-	-	-	-	-	-	-	-	-	8.600	7.797
325	-	-	-	-	-	-	-	-	-	-	-	8.685	7.878
330	-	-	-	-	-	-	-	-	-	-	-	8.771	7.960
335	-	-	-	-	-	-	-	-	-	-	-	8.857	8.041
340	-	-	-	-	-	-	-	-	-	-	-	8.943	8.122
345	-	-	-	-	-	-	-	-	-	-	-	9.029	8.203
350	-	-	-	-	-	-	-	-	-	-	-	9.114	8.285
355	-	-	-	-	-	-	-	-	-	-	-	9.200	8.366
360	-	-	-	-	-	-	-	-	-	-	-	-	8.447
365	-	-	-	-	-	-	-	-	-	-	-	-	8.528
370	-	-	-	-	-	-	-	-	-	-	-	-	8.610
375	-	-	-	-	-	-	-	-	-	-	-	-	8.691
380	-	-	-	-	-	-	-	-	-	-	-	-	8.772

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 165 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	-	-	7.781	4.081	3.399	3.189	3.093	3.005	2.926	2.616	2.386	2.136	2.029
30	-	-	7.875	4.514	3.587	3.364	3.263	3.172	3.090	2.773	2.539	2.226	2.104
35	-	-	-	5.786	4.230	3.891	3.768	3.654	3.551	3.143	2.841	2.492	2.323
40	-	-	-	7.643	5.088	4.572	4.358	4.171	4.013	3.513	3.143	2.757	2.542
45	-	-	-	8.895	5.945	5.299	5.027	4.783	4.573	3.883	3.444	3.022	2.760
50	-	-	-	9.392	6.901	6.026	5.696	5.396	5.132	4.222	3.746	3.287	2.979
55	-	-	-	9.889	7.869	6.747	6.342	6.009	5.692	4.544	4.032	3.552	3.198
60	-	-	-	10.387	8.679	7.468	6.962	6.546	6.213	4.866	4.202	3.817	3.417
65	-	-	-	-	8.849	8.188	7.582	7.079	6.668	5.188	4.371	4.043	3.636
70	-	-	-	-	9.019	8.706	8.203	7.612	7.122	5.510	4.541	4.163	3.855
75	-	-	-	-	9.189	8.871	8.693	8.145	7.577	5.832	4.711	4.283	4.041
80	-	-	-	-	9.358	9.036	8.856	8.656	8.032	6.106	4.881	4.403	4.147
85	-	-	-	-	9.528	9.202	9.020	8.817	8.486	6.288	5.050	4.523	4.253
90	-	-	-	-	9.698	9.367	9.183	8.979	8.750	6.469	5.220	4.643	4.359
95	-	-	-	-	9.867	9.532	9.347	9.141	8.911	6.651	5.390	4.763	4.464
100	-	-	-	-	10.037	9.697	9.511	9.303	9.072	6.832	5.560	4.883	4.570
105	-	-	-	-	10.207	9.862	9.674	9.465	9.233	7.014	5.729	5.003	4.676
110	-	-	-	-	10.377	10.027	9.838	9.626	9.394	7.195	5.899	5.123	4.782
115	-	-	-	-	-	10.192	10.001	9.788	9.555	7.377	6.070	5.243	4.887
120	-	-	-	-	-	10.357	10.165	9.950	9.716	7.558	6.250	5.363	4.993
125	-	-	-	-	-	10.522	10.329	10.112	9.877	7.740	6.430	5.483	5.099
130	-	-	-	-	-	-	10.492	10.273	10.037	7.921	6.609	5.603	5.205
135	-	-	-	-	-	-	-	10.435	10.198	8.103	6.789	5.723	5.311
140	-	-	-	-	-	-	-	-	10.359	8.284	6.969	5.843	5.416
145	-	-	-	-	-	-	-	-	-	8.466	7.149	5.963	5.522
150	-	-	-	-	-	-	-	-	-	8.648	7.328	6.092	5.628
155	-	-	-	-	-	-	-	-	-	8.952	7.508	6.243	5.734
160	-	-	-	-	-	-	-	-	-	9.257	7.688	6.393	5.839
165	-	-	-	-	-	-	-	-	-	9.561	7.868	6.544	5.945
170	-	-	-	-	-	-	-	-	-	9.866	8.048	6.694	6.050
175	-	-	-	-	-	-	-	-	-	10.170	8.227	6.845	6.144
180	-	-	-	-	-	-	-	-	-	10.474	8.407	6.995	6.237
185	-	-	-	-	-	-	-	-	-	10.779	8.587	7.146	6.330
190	-	-	-	-	-	-	-	-	-	-	8.829	7.296	6.423
195	-	-	-	-	-	-	-	-	-	-	9.101	7.447	6.517
200	-	-	-	-	-	-	-	-	-	-	9.374	7.597	6.610
205	-	-	-	-	-	-	-	-	-	-	9.646	7.748	6.703
210	-	-	-	-	-	-	-	-	-	-	9.919	7.898	6.797
215	-	-	-	-	-	-	-	-	-	-	10.191	8.048	6.890
220	-	-	-	-	-	-	-	-	-	-	10.464	8.199	6.983
225	-	-	-	-	-	-	-	-	-	-	10.736	8.349	7.077
230	-	-	-	-	-	-	-	-	-	-	-	8.500	7.170
235	-	-	-	-	-	-	-	-	-	-	-	8.651	7.263
240	-	-	-	-	-	-	-	-	-	-	-	8.810	7.357
245	-	-	-	-	-	-	-	-	-	-	-	8.969	7.450
250	-	-	-	-	-	-	-	-	-	-	-	9.129	7.543
255	-	-	-	-	-	-	-	-	-	-	-	9.288	7.636
260	-	-	-	-	-	-	-	-	-	-	-	9.448	7.730
265	-	-	-	-	-	-	-	-	-	-	-	9.607	7.823
270	-	-	-	-	-	-	-	-	-	-	-	9.766	7.916
275	-	-	-	-	-	-	-	-	-	-	-	9.926	8.010
280	-	-	-	-	-	-	-	-	-	-	-	10.085	8.103
285	-	-	-	-	-	-	-	-	-	-	-	10.245	8.196
290	-	-	-	-	-	-	-	-	-	-	-	10.404	8.290
295	-	-	-	-	-	-	-	-	-	-	-	10.563	8.383
300	-	-	-	-	-	-	-	-	-	-	-	10.723	8.476
305	-	-	-	-	-	-	-	-	-	-	-	10.882	8.570
310	-	-	-	-	-	-	-	-	-	-	-	-	8.663
315	-	-	-	-	-	-	-	-	-	-	-	-	8.756
320	-	-	-	-	-	-	-	-	-	-	-	-	8.850
325	-	-	-	-	-	-	-	-	-	-	-	-	8.943
330	-	-	-	-	-	-	-	-	-	-	-	-	9.036
335	-	-	-	-	-	-	-	-	-	-	-	-	9.129
340	-	-	-	-	-	-	-	-	-	-	-	-	9.223
345	-	-	-	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-	-	-	-	-
380	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

I/H Columns 180 minutes													
Required Thickness (mm) for a Design Temperature (°C)													
Section Factor (m^{-1})	300	350	400	450	500	520	530	540	550	600	650	700	750
28.3	-	-	-	5.441	3.827	3.610	3.575	3.474	3.384	3.028	2.775	2.582	2.430
30	-	-	-	6.310	4.271	3.796	3.779	3.673	3.578	3.211	2.951	2.754	2.599
35	-	-	-	-	5.579	4.927	4.653	4.408	4.198	3.655	3.323	3.069	2.873
40	-	-	-	-	7.549	6.065	5.709	5.389	5.109	4.128	3.695	3.383	3.148
45	-	-	-	-	8.884	7.771	7.044	6.463	6.020	4.713	4.059	3.698	3.422
50	-	-	-	-	9.333	8.797	8.508	7.722	7.094	5.299	4.383	4.011	3.697
55	-	-	-	-	9.781	9.108	8.881	8.703	8.172	5.884	4.707	4.169	3.971
60	-	-	-	-	10.230	9.419	9.141	8.916	8.743	6.410	5.030	4.326	4.124
65	-	-	-	-	10.679	9.730	9.400	9.129	8.915	6.912	5.354	4.483	4.257
70	-	-	-	-	-	10.040	9.660	9.343	9.087	7.415	5.678	4.640	4.389
75	-	-	-	-	-	10.351	9.919	9.556	9.259	7.918	6.002	4.797	4.522
80	-	-	-	-	-	-	10.178	9.769	9.431	8.420	6.219	4.954	4.655
85	-	-	-	-	-	-	10.438	9.982	9.604	8.733	6.421	5.111	4.787
90	-	-	-	-	-	-	-	10.195	9.776	8.890	6.622	5.268	4.920
95	-	-	-	-	-	-	-	10.409	9.948	9.048	6.824	5.425	5.052
100	-	-	-	-	-	-	-	-	10.120	9.205	7.025	5.582	5.185
105	-	-	-	-	-	-	-	-	10.292	9.363	7.226	5.739	5.317
110	-	-	-	-	-	-	-	-	10.465	9.520	7.428	5.896	5.450
115	-	-	-	-	-	-	-	-	-	9.677	7.629	6.054	5.582
120	-	-	-	-	-	-	-	-	-	9.835	7.831	6.240	5.715
125	-	-	-	-	-	-	-	-	-	9.992	8.032	6.426	5.847
130	-	-	-	-	-	-	-	-	-	10.150	8.233	6.613	5.980
135	-	-	-	-	-	-	-	-	-	10.307	8.435	6.799	6.113
140	-	-	-	-	-	-	-	-	-	10.465	8.636	6.985	6.246
145	-	-	-	-	-	-	-	-	-	-	8.993	7.171	6.379
150	-	-	-	-	-	-	-	-	-	-	9.358	7.357	6.512
155	-	-	-	-	-	-	-	-	-	-	9.722	7.544	6.645
160	-	-	-	-	-	-	-	-	-	-	10.087	7.730	6.778
165	-	-	-	-	-	-	-	-	-	-	10.452	7.916	6.911
170	-	-	-	-	-	-	-	-	-	-	-	8.102	7.044
175	-	-	-	-	-	-	-	-	-	-	-	8.288	7.177
180	-	-	-	-	-	-	-	-	-	-	-	8.475	7.310
185	-	-	-	-	-	-	-	-	-	-	-	8.664	7.443
190	-	-	-	-	-	-	-	-	-	-	-	8.895	7.576
195	-	-	-	-	-	-	-	-	-	-	-	9.126	7.709
200	-	-	-	-	-	-	-	-	-	-	-	9.357	7.842
205	-	-	-	-	-	-	-	-	-	-	-	9.588	7.975
210	-	-	-	-	-	-	-	-	-	-	-	9.818	8.108
215	-	-	-	-	-	-	-	-	-	-	-	10.049	8.241
220	-	-	-	-	-	-	-	-	-	-	-	10.280	8.374
225	-	-	-	-	-	-	-	-	-	-	-	10.511	8.507
230	-	-	-	-	-	-	-	-	-	-	-	10.742	8.640
235	-	-	-	-	-	-	-	-	-	-	-	-	8.788
240	-	-	-	-	-	-	-	-	-	-	-	-	8.936
245	-	-	-	-	-	-	-	-	-	-	-	-	9.085
250	-	-	-	-	-	-	-	-	-	-	-	-	9.233
255	-	-	-	-	-	-	-	-	-	-	-	-	9.381
260	-	-	-	-	-	-	-	-	-	-	-	-	9.530
265	-	-	-	-	-	-	-	-	-	-	-	-	9.678
270	-	-	-	-	-	-	-	-	-	-	-	-	9.827
275	-	-	-	-	-	-	-	-	-	-	-	-	9.975
280	-	-	-	-	-	-	-	-	-	-	-	-	10.123
285	-	-	-	-	-	-	-	-	-	-	-	-	10.272
290	-	-	-	-	-	-	-	-	-	-	-	-	10.420
295	-	-	-	-	-	-	-	-	-	-	-	-	10.568
300	-	-	-	-	-	-	-	-	-	-	-	-	10.717
305	-	-	-	-	-	-	-	-	-	-	-	-	10.865
310	-	-	-	-	-	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-	-	-	-	-	-
320	-	-	-	-	-	-	-	-	-	-	-	-	-
325	-	-	-	-	-	-	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-	-	-	-	-	-	-
335	-	-	-	-	-	-	-	-	-	-	-	-	-
340	-	-	-	-	-	-	-	-	-	-	-	-	-
345	-	-	-	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-	-	-	-
355	-	-	-	-	-	-	-	-	-	-	-	-	-
360	-	-	-	-	-	-	-	-	-	-	-	-	-
365	-	-	-	-	-	-	-	-	-	-	-	-	-
370	-	-	-	-	-	-	-	-	-	-	-	-	-
375	-	-	-	-	-	-	-	-	-	-	-	-	-
380	-	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to I/H section columns with 4-sided fire exposure. Results also apply to I/H beams exposed on all 4 sides limited to a maximum protection thickness of 11.026mm.

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Issued: 20th February 2020
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CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 15 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
40	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
45	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
50	0.482	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
55	0.495	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
60	0.508	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
65	0.521	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
70	0.534	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
75	0.547	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
80	0.560	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
85	0.573	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
90	0.586	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
95	0.598	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
100	0.611	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
105	0.624	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
110	0.637	0.482	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
115	0.650	0.494	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
120	0.663	0.507	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
125	0.676	0.519	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
130	0.689	0.531	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
135	0.702	0.543	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
140	0.715	0.556	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
145	0.728	0.568	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
150	0.741	0.580	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
155	0.754	0.593	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
160	0.767	0.605	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
165	0.780	0.617	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
170	0.793	0.630	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
175	0.806	0.642	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
180	0.819	0.654	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
185	0.832	0.667	0.484	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
190	0.844	0.679	0.498	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
195	0.857	0.691	0.511	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
200	0.870	0.704	0.525	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
205	0.883	0.716	0.538	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
210	0.896	0.728	0.552	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
215	0.909	0.741	0.565	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
220	0.922	0.753	0.579	0.473	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
225	0.935	0.765	0.593	0.485	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
230	0.948	0.777	0.606	0.497	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
235	0.961	0.790	0.620	0.510	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
240	0.974	0.802	0.633	0.522	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
245	0.987	0.814	0.647	0.534	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
250	1.000	0.827	0.660	0.547	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
255	1.028	0.839	0.674	0.559	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
260	1.076	0.851	0.687	0.571	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
265	1.124	0.864	0.701	0.584	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
270	1.172	0.876	0.714	0.596	0.477	0.472	0.472	0.472	0.472	0.472	0.472	0.472
275	1.221	0.888	0.728	0.608	0.488	0.472	0.472	0.472	0.472	0.472	0.472	0.472
280	1.269	0.901	0.742	0.620	0.499	0.472	0.472	0.472	0.472	0.472	0.472	0.472
285	1.317	0.913	0.755	0.633	0.510	0.472	0.472	0.472	0.472	0.472	0.472	0.472
290	1.365	0.925	0.769	0.645	0.520	0.472	0.472	0.472	0.472	0.472	0.472	0.472
295	1.413	0.938	0.782	0.657	0.531	0.480	0.472	0.472	0.472	0.472	0.472	0.472
300	1.461	0.950	0.796	0.670	0.542	0.491	0.472	0.472	0.472	0.472	0.472	0.472

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 30 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	0.634	0.524	0.479	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
40	0.665	0.537	0.489	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
45	0.727	0.561	0.510	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
50	0.789	0.586	0.531	0.482	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
55	0.851	0.611	0.551	0.500	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
60	0.913	0.636	0.572	0.518	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
65	0.975	0.661	0.593	0.536	0.482	0.472	0.472	0.472	0.472	0.472	0.472	0.472
70	1.042	0.686	0.614	0.554	0.498	0.473	0.472	0.472	0.472	0.472	0.472	0.472
75	1.116	0.711	0.634	0.572	0.514	0.489	0.472	0.472	0.472	0.472	0.472	0.472
80	1.190	0.736	0.655	0.590	0.530	0.505	0.472	0.472	0.472	0.472	0.472	0.472
85	1.264	0.761	0.676	0.608	0.547	0.520	0.480	0.472	0.472	0.472	0.472	0.472
90	1.337	0.786	0.697	0.626	0.563	0.536	0.495	0.472	0.472	0.472	0.472	0.472
95	1.411	0.811	0.718	0.644	0.579	0.552	0.510	0.472	0.472	0.472	0.472	0.472
100	1.485	0.836	0.738	0.662	0.595	0.567	0.525	0.472	0.472	0.472	0.472	0.472
105	1.558	0.861	0.759	0.680	0.611	0.583	0.540	0.472	0.472	0.472	0.472	0.472
110	1.632	0.886	0.780	0.698	0.627	0.599	0.555	0.472	0.472	0.472	0.472	0.472
115	1.706	0.911	0.801	0.716	0.643	0.614	0.570	0.472	0.472	0.472	0.472	0.472
120	1.780	0.936	0.822	0.734	0.659	0.630	0.585	0.472	0.472	0.472	0.472	0.472
125	1.853	0.961	0.842	0.752	0.675	0.646	0.600	0.472	0.472	0.472	0.472	0.472
130	1.927	0.986	0.863	0.770	0.691	0.661	0.614	0.473	0.472	0.472	0.472	0.472
135	2.001	1.018	0.884	0.788	0.707	0.677	0.629	0.491	0.472	0.472	0.472	0.472
140	2.075	1.095	0.905	0.806	0.723	0.693	0.644	0.508	0.472	0.472	0.472	0.472
145	2.148	1.172	0.926	0.824	0.740	0.708	0.659	0.526	0.472	0.472	0.472	0.472
150	2.222	1.248	0.946	0.842	0.756	0.724	0.674	0.544	0.472	0.472	0.472	0.472
155	2.296	1.325	0.967	0.860	0.772	0.740	0.689	0.561	0.472	0.472	0.472	0.472
160	2.370	1.402	0.988	0.878	0.788	0.755	0.704	0.579	0.472	0.472	0.472	0.472
165	2.443	1.478	1.013	0.896	0.804	0.771	0.719	0.596	0.482	0.472	0.472	0.472
170	2.517	1.555	1.087	0.914	0.820	0.787	0.734	0.614	0.501	0.472	0.472	0.472
175	2.591	1.632	1.161	0.932	0.836	0.803	0.749	0.632	0.520	0.472	0.472	0.472
180	2.664	1.708	1.235	0.950	0.852	0.818	0.764	0.649	0.539	0.472	0.472	0.472
185	2.738	1.785	1.309	0.968	0.868	0.834	0.779	0.667	0.558	0.472	0.472	0.472
190	2.812	1.861	1.383	0.986	0.884	0.850	0.794	0.684	0.577	0.472	0.472	0.472
195	2.886	1.938	1.456	1.004	0.900	0.865	0.809	0.702	0.596	0.479	0.472	0.472
200	2.959	2.015	1.530	1.066	0.917	0.881	0.824	0.720	0.615	0.495	0.472	0.472
205	3.033	2.091	1.604	1.136	0.933	0.897	0.839	0.737	0.634	0.511	0.472	0.472
210	3.107	2.168	1.678	1.206	0.949	0.912	0.854	0.755	0.653	0.527	0.472	0.472
215	3.181	2.245	1.752	1.276	0.965	0.928	0.869	0.772	0.672	0.543	0.472	0.472
220	3.254	2.321	1.826	1.346	0.981	0.944	0.884	0.790	0.690	0.559	0.472	0.472
225	3.328	2.398	1.900	1.416	0.997	0.959	0.898	0.808	0.709	0.575	0.472	0.472
230	3.402	2.475	1.974	1.486	1.031	0.975	0.913	0.825	0.728	0.591	0.472	0.472
235	3.476	2.551	2.048	1.556	1.096	0.991	0.928	0.843	0.747	0.607	0.472	0.472
240	3.549	2.628	2.122	1.626	1.160	1.006	0.943	0.860	0.766	0.623	0.478	0.472
245	3.623	2.705	2.196	1.696	1.225	1.066	0.958	0.878	0.785	0.639	0.491	0.472
250	3.697	2.781	2.269	1.766	1.289	1.128	0.973	0.896	0.804	0.656	0.504	0.472
255	3.770	2.858	2.343	1.836	1.354	1.189	0.988	0.913	0.823	0.672	0.516	0.472
260	3.844	2.934	2.417	1.906	1.418	1.251	1.003	0.931	0.842	0.688	0.529	0.472
265	3.918	3.011	2.491	1.976	1.483	1.312	1.049	0.948	0.861	0.704	0.541	0.472
270	3.992	3.088	2.565	2.046	1.547	1.374	1.106	0.966	0.880	0.720	0.554	0.472
275	4.065	3.164	2.639	2.116	1.612	1.435	1.163	0.984	0.899	0.736	0.567	0.472
280	4.139	3.241	2.713	2.186	1.676	1.497	1.221	1.001	0.918	0.752	0.579	0.472
285	4.213	3.318	2.787	2.256	1.741	1.558	1.278	1.042	0.936	0.768	0.592	0.472
290	4.287	3.394	2.861	2.326	1.805	1.620	1.335	1.096	0.955	0.784	0.604	0.472
295	4.443	3.471	2.935	2.396	1.870	1.681	1.392	1.149	0.974	0.800	0.617	0.472
300	4.612	3.548	3.009	2.466	1.934	1.743	1.449	1.202	0.993	0.816	0.630	0.472

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 45 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	1.603	0.953	0.658	0.544	0.498	0.482	0.472	0.472	0.472	0.472	0.472	0.472
40	1.739	0.997	0.699	0.568	0.512	0.495	0.472	0.472	0.472	0.472	0.472	0.472
45	1.841	1.084	0.782	0.616	0.540	0.522	0.497	0.477	0.472	0.472	0.472	0.472
50	1.943	1.171	0.864	0.664	0.567	0.548	0.521	0.500	0.480	0.472	0.472	0.472
55	2.045	1.257	0.946	0.713	0.595	0.575	0.545	0.523	0.501	0.472	0.472	0.472
60	2.147	1.344	1.029	0.761	0.623	0.601	0.570	0.545	0.522	0.481	0.472	0.472
65	2.249	1.431	1.114	0.809	0.651	0.627	0.594	0.568	0.543	0.498	0.472	0.472
70	2.352	1.518	1.198	0.858	0.679	0.654	0.618	0.590	0.564	0.516	0.472	0.472
75	2.454	1.605	1.282	0.906	0.707	0.680	0.643	0.613	0.585	0.533	0.483	0.472
80	2.556	1.692	1.366	0.954	0.734	0.707	0.667	0.635	0.605	0.551	0.499	0.472
85	2.658	1.779	1.451	1.002	0.762	0.733	0.692	0.658	0.626	0.568	0.514	0.472
90	2.760	1.866	1.535	1.083	0.790	0.760	0.716	0.680	0.647	0.586	0.529	0.472
95	2.862	1.952	1.619	1.168	0.818	0.786	0.740	0.703	0.668	0.603	0.544	0.472
100	2.965	2.039	1.704	1.252	0.846	0.813	0.765	0.726	0.689	0.621	0.559	0.472
105	3.067	2.126	1.788	1.337	0.873	0.839	0.789	0.748	0.710	0.638	0.574	0.472
110	3.169	2.213	1.872	1.421	0.901	0.866	0.813	0.771	0.730	0.656	0.589	0.472
115	3.271	2.300	1.957	1.506	0.929	0.892	0.838	0.793	0.751	0.673	0.605	0.472
120	3.373	2.387	2.041	1.590	0.957	0.919	0.862	0.816	0.772	0.690	0.620	0.472
125	3.475	2.474	2.125	1.675	0.985	0.945	0.887	0.838	0.793	0.708	0.635	0.472
130	3.577	2.561	2.209	1.759	1.025	0.972	0.911	0.861	0.814	0.725	0.650	0.472
135	3.680	2.647	2.294	1.844	1.115	0.998	0.935	0.883	0.835	0.743	0.665	0.472
140	3.782	2.734	2.378	1.928	1.206	1.065	0.960	0.906	0.855	0.760	0.680	0.472
145	3.884	2.821	2.462	2.013	1.296	1.152	0.984	0.929	0.876	0.778	0.695	0.472
150	3.986	2.908	2.547	2.097	1.387	1.240	1.012	0.951	0.897	0.795	0.710	0.472
155	4.088	2.995	2.631	2.181	1.477	1.327	1.095	0.974	0.918	0.813	0.726	0.472
160	4.190	3.082	2.715	2.266	1.568	1.415	1.178	0.996	0.939	0.830	0.741	0.472
165	4.292	3.169	2.800	2.350	1.658	1.502	1.261	1.049	0.959	0.848	0.756	0.488
170	4.458	3.255	2.884	2.435	1.749	1.590	1.344	1.128	0.980	0.865	0.771	0.507
175	4.625	3.342	2.968	2.519	1.839	1.677	1.427	1.207	1.001	0.883	0.786	0.525
180	4.792	3.429	3.052	2.604	1.929	1.765	1.511	1.287	1.061	0.900	0.801	0.544
185	4.960	3.516	3.137	2.688	2.020	1.852	1.594	1.366	1.136	0.918	0.816	0.562
190	5.127	3.603	3.221	2.773	2.110	1.940	1.677	1.445	1.211	0.935	0.832	0.581
195	5.295	3.690	3.305	2.857	2.201	2.028	1.760	1.525	1.287	0.953	0.847	0.599
200	5.462	3.777	3.390	2.942	2.291	2.115	1.843	1.604	1.362	0.970	0.862	0.618
205	5.629	3.864	3.474	3.026	2.382	2.203	1.926	1.683	1.437	0.988	0.877	0.636
210	5.797	3.950	3.558	3.110	2.472	2.290	2.009	1.763	1.512	1.005	0.892	0.655
215	5.964	4.037	3.643	3.195	2.563	2.378	2.093	1.842	1.588	1.113	0.907	0.673
220	6.131	4.124	3.727	3.279	2.653	2.465	2.176	1.922	1.663	1.230	0.922	0.692
225	6.299	4.211	3.811	3.364	2.744	2.553	2.259	2.001	1.738	1.348	0.938	0.710
230	6.466	4.301	3.896	3.448	2.834	2.640	2.342	2.080	1.813	1.465	0.953	0.729
235	6.634	4.518	3.980	3.533	2.925	2.728	2.425	2.160	1.889	1.583	0.968	0.747
240	6.768	4.735	4.064	3.617	3.015	2.815	2.508	2.239	1.964	1.701	0.983	0.766
245	6.902	4.952	4.148	3.702	3.106	2.903	2.591	2.318	2.039	1.818	0.998	0.784
250	7.037	5.169	4.233	3.786	3.196	2.990	2.674	2.398	2.114	1.936	1.051	0.803
255	7.171	5.386	4.351	3.871	3.287	3.078	2.758	2.477	2.190	2.053	1.157	0.821
260	7.305	5.603	4.574	3.955	3.377	3.165	2.841	2.557	2.265	2.171	1.263	0.839
265	7.439	5.820	4.796	4.040	3.468	3.253	2.924	2.636	2.340	2.289	1.370	0.858
270	7.574	6.037	5.018	4.124	3.558	3.340	3.007	2.715	2.415	2.406	1.476	0.876
275	7.708	6.254	5.240	4.208	3.649	3.428	3.090	2.795	2.524	2.524	1.583	0.895
280	7.842	6.471	5.462	4.293	3.739	3.515	3.173	2.874	2.641	2.641	1.689	0.913
285	7.976	6.664	5.685	4.542	3.830	3.603	3.256	2.953	2.759	2.759	1.795	0.932
290	8.110	6.783	5.907	4.797	3.920	3.690	3.339	3.033	2.876	2.876	1.902	0.950
295	8.245	6.901	6.129	5.052	4.011	3.778	3.423	3.112	2.994	2.994	2.008	0.969
300	8.379	7.020	6.351	5.308	4.101	3.866	3.506	3.191	3.112	3.112	2.115	0.987

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 60 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	2.832	2.011	1.436	0.958	0.697	0.635	0.566	0.527	0.502	0.477	0.472	0.472
40	3.021	2.172	1.552	1.007	0.752	0.682	0.602	0.555	0.524	0.491	0.472	0.472
45	3.271	2.312	1.662	1.105	0.861	0.776	0.675	0.613	0.568	0.518	0.481	0.472
50	3.521	2.451	1.773	1.203	0.971	0.870	0.748	0.670	0.611	0.545	0.505	0.472
55	3.771	2.591	1.883	1.301	1.069	0.964	0.821	0.727	0.655	0.573	0.528	0.476
60	4.021	2.730	1.993	1.399	1.162	1.056	0.894	0.784	0.698	0.600	0.551	0.495
65	4.271	2.870	2.104	1.497	1.255	1.147	0.966	0.842	0.742	0.627	0.574	0.514
70	4.423	3.009	2.214	1.595	1.348	1.237	1.046	0.899	0.785	0.655	0.598	0.533
75	4.564	3.149	2.325	1.693	1.440	1.328	1.134	0.956	0.829	0.682	0.621	0.552
80	4.705	3.288	2.435	1.792	1.533	1.419	1.222	1.016	0.873	0.709	0.644	0.571
85	4.846	3.428	2.545	1.890	1.626	1.510	1.311	1.103	0.916	0.736	0.667	0.590
90	4.987	3.567	2.656	1.988	1.718	1.600	1.399	1.190	0.960	0.764	0.691	0.609
95	5.128	3.707	2.766	2.086	1.811	1.691	1.487	1.277	1.003	0.791	0.714	0.628
100	5.269	3.846	2.877	2.184	1.904	1.782	1.575	1.364	1.086	0.818	0.737	0.647
105	5.410	3.986	2.987	2.282	1.996	1.872	1.664	1.451	1.173	0.846	0.760	0.666
110	5.552	4.125	3.097	2.380	2.089	1.963	1.752	1.537	1.259	0.873	0.783	0.685
115	5.693	4.265	3.208	2.478	2.182	2.054	1.840	1.624	1.346	0.900	0.807	0.704
120	5.834	4.400	3.318	2.577	2.274	2.145	1.928	1.711	1.432	0.927	0.830	0.723
125	5.975	4.534	3.429	2.675	2.367	2.235	2.017	1.798	1.519	0.955	0.853	0.741
130	6.116	4.668	3.539	2.773	2.460	2.326	2.105	1.885	1.605	0.982	0.876	0.760
135	6.257	4.802	3.649	2.871	2.553	2.417	2.193	1.971	1.692	1.020	0.900	0.779
140	6.398	4.937	3.760	2.969	2.645	2.507	2.281	2.058	1.778	1.172	0.923	0.798
145	6.539	5.071	3.870	3.067	2.738	2.598	2.370	2.145	1.865	1.324	0.946	0.817
150	6.680	5.205	3.981	3.165	2.831	2.689	2.458	2.232	1.951	1.476	0.969	0.836
155	6.819	5.339	4.091	3.263	2.923	2.780	2.546	2.319	2.038	1.629	0.992	0.855
160	6.958	5.473	4.201	3.361	3.016	2.870	2.634	2.406	2.124	1.781	1.061	0.874
165	7.097	5.607	4.324	3.460	3.109	2.961	2.723	2.492	2.211	1.933	1.205	0.893
170	7.237	5.741	4.518	3.558	3.201	3.052	2.811	2.579	2.297	2.085	1.349	0.912
175	7.376	5.875	4.712	3.656	3.294	3.142	2.899	2.666	2.384	2.237	1.492	0.931
180	7.515	6.009	4.906	3.754	3.387	3.233	2.987	2.753	2.470	2.390	1.636	0.950
185	7.654	6.143	5.101	3.852	3.479	3.324	3.075	2.840	2.557	2.542	1.780	0.969
190	7.794	6.277	5.295	3.950	3.572	3.415	3.164	2.926	2.694	2.694	1.924	0.988
195	7.933	6.411	5.489	4.048	3.665	3.505	3.252	3.013	2.846	2.846	2.068	1.007
200	8.072	6.546	5.683	4.146	3.758	3.596	3.340	3.100	2.999	2.999	2.212	1.136
205	8.212	6.682	5.878	4.245	3.850	3.687	3.428	3.187	3.151	3.151	2.356	1.264
210	8.351	6.824	6.072	4.462	3.943	3.777	3.517	3.303	3.303	3.303	2.500	1.393
215	8.490	6.965	6.266	4.812	4.036	3.868	3.605	3.455	3.455	3.455	2.644	1.521
220	8.629	7.107	6.460	5.162	4.128	3.959	3.693	3.607	3.607	3.607	2.787	1.650
225	8.769	7.249	6.649	5.511	4.221	4.050	3.781	3.760	3.760	3.760	2.931	1.778
230	8.934	7.390	6.784	5.861	4.375	4.140	3.912	3.912	3.912	3.912	3.075	1.907
235	9.100	7.532	6.919	6.211	4.787	4.231	4.064	4.064	4.064	4.064	3.219	2.035
240	9.265	7.673	7.055	6.560	5.199	4.427	4.216	4.216	4.216	4.216	3.363	2.164
245	9.430	7.815	7.190	6.738	5.610	4.889	4.369	4.369	4.369	4.369	3.507	2.292
250	9.596	7.957	7.326	6.869	6.022	5.351	4.521	4.521	4.521	4.521	3.651	2.421
255	9.761	8.098	7.461	7.000	6.434	5.812	4.673	4.673	4.673	4.673	3.795	2.550
260	9.926	8.240	7.596	7.132	6.699	6.274	4.981	4.825	4.825	4.825	3.938	2.678
265	10.092	8.381	7.732	7.263	6.823	6.661	5.568	4.978	4.978	4.978	4.082	2.807
270	10.257	8.523	7.867	7.394	6.947	6.781	6.154	5.130	5.130	5.130	4.226	2.935
275	10.422	8.665	8.003	7.525	7.071	6.901	6.655	5.282	5.282	5.282	4.370	3.064
280	10.587	8.818	8.138	7.656	7.195	7.021	6.769	6.033	5.434	5.434	4.514	3.192
285	10.753	9.001	8.273	7.787	7.320	7.141	6.882	6.660	5.586	5.586	4.658	3.321
290	10.918	9.184	8.409	7.919	7.444	7.261	6.995	6.767	5.739	5.739	4.802	3.449
295	11.083	9.367	8.544	8.050	7.568	7.381	7.108	6.875	6.645	5.891	4.946	3.578
300	11.249	9.549	8.680	8.181	7.692	7.501	7.221	6.983	6.747	6.043	5.090	3.706

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 75 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	4.136	3.073	2.394	1.841	1.390	1.079	0.977	0.825	0.721	0.577	0.503	0.472
40	4.280	3.272	2.562	1.979	1.494	1.141	1.029	0.905	0.789	0.621	0.528	0.479
45	4.567	3.545	2.770	2.134	1.621	1.266	1.132	1.043	0.923	0.710	0.579	0.507
50	4.855	3.818	2.978	2.290	1.748	1.390	1.236	1.141	1.042	0.798	0.629	0.535
55	5.143	4.091	3.185	2.446	1.876	1.515	1.339	1.239	1.136	0.886	0.680	0.563
60	5.431	4.335	3.393	2.602	2.003	1.639	1.443	1.336	1.230	0.974	0.730	0.591
65	5.719	4.493	3.600	2.758	2.130	1.764	1.546	1.434	1.324	1.099	0.781	0.619
70	6.007	4.651	3.808	2.914	2.257	1.888	1.650	1.532	1.417	1.245	0.831	0.647
75	6.294	4.809	4.016	3.069	2.384	2.013	1.753	1.630	1.511	1.391	0.882	0.675
80	6.582	4.967	4.223	3.225	2.511	2.138	1.857	1.728	1.605	1.537	0.932	0.703
85	6.744	5.125	4.396	3.381	2.638	2.262	1.960	1.825	1.699	1.683	0.982	0.731
90	6.878	5.283	4.550	3.537	2.765	2.387	2.064	1.923	1.829	1.829	1.086	0.760
95	7.012	5.441	4.704	3.693	2.892	2.511	2.167	2.021	1.976	1.976	1.240	0.788
100	7.145	5.599	4.858	3.848	3.019	2.636	2.270	2.122	2.122	2.122	1.394	0.816
105	7.279	5.757	5.012	4.004	3.146	2.760	2.374	2.268	2.268	2.268	1.548	0.844
110	7.413	5.915	5.167	4.160	3.273	2.885	2.477	2.414	2.414	2.414	1.702	0.872
115	7.547	6.073	5.321	4.318	3.400	3.009	2.581	2.560	2.560	2.560	1.856	0.900
120	7.680	6.231	5.475	4.494	3.527	3.134	2.706	2.706	2.706	2.706	2.011	0.928
125	7.814	6.389	5.629	4.669	3.654	3.258	2.853	2.853	2.853	2.853	2.165	0.956
130	7.948	6.547	5.783	4.844	3.781	3.383	2.999	2.999	2.999	2.999	2.319	0.984
135	8.081	6.703	5.937	5.020	3.908	3.507	3.145	3.145	3.145	3.145	2.473	1.039
140	8.215	6.856	6.091	5.195	4.036	3.632	3.291	3.291	3.291	3.291	2.627	1.200
145	8.349	7.009	6.245	5.370	4.163	3.756	3.437	3.437	3.437	3.437	2.781	1.361
150	8.483	7.162	6.399	5.545	4.290	3.881	3.583	3.583	3.583	3.583	2.935	1.523
155	8.616	7.316	6.554	5.721	4.495	4.006	3.730	3.730	3.730	3.730	3.089	1.684
160	8.750	7.469	6.708	5.896	4.704	4.130	3.876	3.876	3.876	3.876	3.243	1.846
165	8.916	7.622	6.862	6.071	4.913	4.255	4.022	4.022	4.022	4.022	3.397	2.007
170	9.086	7.775	7.016	6.247	5.123	4.466	4.168	4.168	4.168	4.168	3.551	2.169
175	9.255	7.928	7.170	6.422	5.332	4.722	4.314	4.314	4.314	4.314	3.705	2.330
180	9.425	8.082	7.325	6.597	5.541	4.977	4.460	4.460	4.460	4.460	3.860	2.492
185	9.595	8.235	7.479	6.760	5.751	5.232	4.606	4.606	4.606	4.606	4.014	2.653
190	9.765	8.388	7.633	6.920	5.960	5.488	4.753	4.753	4.753	4.753	4.168	2.814
195	9.935	8.541	7.787	7.080	6.169	5.743	4.899	4.899	4.899	4.899	4.322	2.976
200	10.104	8.694	7.941	7.240	6.379	5.998	5.045	5.045	5.045	5.045	4.476	3.137
205	10.274	8.863	8.096	7.399	6.588	6.254	5.191	5.191	5.191	5.191	4.630	3.299
210	10.444	9.046	8.250	7.559	6.764	6.509	5.465	5.337	5.337	5.337	4.784	3.460
215	10.614	9.229	8.404	7.719	6.931	6.716	5.947	5.483	5.483	5.483	4.938	3.622
220	10.784	9.412	8.558	7.879	7.098	6.877	6.430	5.630	5.630	5.630	5.092	3.783
225	10.953	9.595	8.712	8.038	7.265	7.037	6.725	5.985	5.776	5.776	5.246	3.945
230	11.123	9.777	8.887	8.198	7.432	7.198	6.881	6.602	5.922	5.922	5.400	4.106
235	11.293	9.960	9.072	8.358	7.599	7.359	7.037	6.778	6.093	6.068	5.554	4.267
240	11.463	10.143	9.258	8.518	7.766	7.519	7.194	6.929	6.680	6.214	5.709	4.429
245	11.633	10.326	9.443	8.677	7.933	7.680	7.350	7.080	6.824	6.360	5.863	4.590
250	11.803	10.509	9.628	8.852	8.100	7.840	7.506	7.231	6.969	6.507	6.017	4.752
255	11.972	10.691	9.814	9.044	8.267	8.001	7.663	7.382	7.114	6.650	6.171	4.913
260	12.142	10.874	9.999	9.236	8.434	8.162	7.819	7.533	7.258	6.776	6.325	5.075
265	12.312	11.057	10.184	9.428	8.601	8.322	7.975	7.684	7.403	6.901	6.479	5.236
270	12.482	11.240	10.369	9.619	8.768	8.483	8.132	7.836	7.547	7.026	6.633	5.398
275	12.652	11.423	10.555	9.811	8.969	8.643	8.288	7.987	7.692	7.152	6.735	5.559
280	12.821	11.605	10.740	10.003	9.171	8.814	8.444	8.138	7.837	7.277	6.835	5.720
285	12.991	11.788	10.925	10.195	9.372	9.017	8.601	8.289	7.981	7.402	6.936	5.882
290	13.161	11.971	11.111	10.387	9.573	9.221	8.757	8.440	8.126	7.528	7.037	6.043
295	13.331	12.154	11.296	10.579	9.774	9.424	8.954	8.591	8.270	7.653	7.138	6.205
300	-	12.337	11.481	10.771	9.975	9.627	9.153	8.742	8.415	7.778	7.238	6.366

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
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CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 90 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	5.251	4.182	3.352	2.706	2.176	1.989	1.732	1.536	1.356	0.989	0.698	0.518
40	5.628	4.338	3.547	2.876	2.322	2.127	1.858	1.650	1.457	1.037	0.769	0.555
45	6.074	4.649	3.874	3.141	2.531	2.315	2.016	1.789	1.581	1.134	0.910	0.628
50	6.520	4.960	4.201	3.405	2.740	2.502	2.173	1.927	1.705	1.230	1.054	0.701
55	6.802	5.271	4.447	3.670	2.949	2.689	2.330	2.066	1.828	1.327	1.202	0.774
60	7.027	5.582	4.660	3.935	3.158	2.877	2.487	2.204	1.952	1.423	1.351	0.848
65	7.251	5.893	4.873	4.199	3.367	3.064	2.644	2.343	2.076	1.520	1.500	0.921
70	7.476	6.204	5.085	4.407	3.576	3.252	2.802	2.481	2.199	1.649	1.649	0.994
75	7.701	6.515	5.298	4.582	3.785	3.439	2.959	2.620	2.323	1.798	1.798	1.131
80	7.925	6.726	5.511	4.757	3.993	3.626	3.116	2.758	2.446	1.946	1.946	1.282
85	8.150	6.874	5.724	4.931	4.202	3.814	3.273	2.897	2.570	2.095	2.095	1.434
90	8.375	7.022	5.937	5.106	4.394	4.001	3.430	3.035	2.694	2.244	2.244	1.585
95	8.600	7.170	6.150	5.281	4.572	4.188	3.588	3.174	2.817	2.393	2.393	1.736
100	8.802	7.318	6.362	5.456	4.750	4.374	3.745	3.312	2.941	2.542	2.542	1.887
105	8.940	7.466	6.575	5.631	4.928	4.559	3.902	3.450	3.065	2.690	2.690	2.039
110	9.079	7.614	6.753	5.806	5.107	4.743	4.059	3.589	3.188	2.839	2.839	2.190
115	9.217	7.762	6.918	5.980	5.285	4.927	4.216	3.727	3.312	2.988	2.988	2.341
120	9.356	7.910	7.083	6.155	5.463	5.111	4.396	3.866	3.435	3.137	3.137	2.492
125	9.495	8.058	7.247	6.330	5.641	5.296	4.600	4.004	3.559	3.286	3.286	2.643
130	9.633	8.206	7.412	6.505	5.819	5.480	4.803	4.143	3.683	3.434	3.434	2.795
135	9.772	8.354	7.576	6.683	5.997	5.664	5.006	4.281	3.806	3.583	3.583	2.946
140	9.910	8.502	7.741	6.870	6.175	5.849	5.210	4.496	3.930	3.732	3.732	3.097
145	10.049	8.650	7.905	7.058	6.353	6.033	5.413	4.720	4.054	3.881	3.881	3.248
150	10.188	8.805	8.070	7.245	6.531	6.217	5.616	4.944	4.177	4.030	4.030	3.399
155	10.326	8.982	8.235	7.433	6.715	6.401	5.819	5.168	4.306	4.178	4.178	3.551
160	10.465	9.158	8.399	7.620	6.906	6.586	6.023	5.392	4.554	4.327	4.327	3.702
165	10.603	9.335	8.564	7.807	7.098	6.779	6.226	5.616	4.802	4.476	4.476	3.853
170	10.742	9.512	8.728	7.995	7.289	6.975	6.429	5.840	5.050	4.625	4.625	4.004
175	10.880	9.688	8.908	8.182	7.480	7.171	6.632	6.064	5.298	4.774	4.774	4.155
180	11.019	9.865	9.091	8.370	7.672	7.367	6.838	6.288	5.546	4.922	4.922	4.307
185	11.158	10.042	9.275	8.557	7.863	7.563	7.043	6.512	5.794	5.071	5.071	4.458
190	11.296	10.218	9.459	8.744	8.054	7.759	7.248	6.732	6.042	5.220	5.220	4.609
195	11.435	10.395	9.642	8.937	8.246	7.955	7.453	6.947	6.291	5.369	5.369	4.760
200	11.573	10.572	9.826	9.131	8.437	8.152	7.658	7.161	6.539	5.518	5.518	4.911
205	11.712	10.748	10.009	9.325	8.628	8.348	7.864	7.376	6.774	5.666	5.666	5.063
210	11.851	10.925	10.193	9.519	8.823	8.544	8.069	7.591	7.000	5.815	5.815	5.214
215	11.989	11.102	10.377	9.713	9.025	8.740	8.274	7.806	7.227	5.964	5.964	5.365
220	12.128	11.278	10.560	9.907	9.227	8.943	8.479	8.020	7.453	6.635	6.113	5.516
225	12.266	11.455	10.744	10.101	9.429	9.147	8.684	8.235	7.680	6.822	6.262	5.667
230	12.405	11.632	10.928	10.295	9.631	9.351	8.890	8.450	7.907	7.008	6.410	5.819
235	12.544	11.809	11.111	10.489	9.834	9.555	9.096	8.664	8.133	7.195	6.559	5.970
240	12.682	11.985	11.295	10.683	10.036	9.759	9.303	8.876	8.360	7.382	6.714	6.121
245	12.821	12.162	11.479	10.877	10.238	9.963	9.509	9.084	8.586	7.568	6.874	6.272
250	12.959	12.339	11.662	11.071	10.440	10.167	9.715	9.291	8.809	7.755	7.035	6.424
255	-	12.515	11.846	11.264	10.642	10.371	9.921	9.499	9.020	7.941	7.196	6.575
260	-	12.692	12.029	11.458	10.845	10.574	10.128	9.707	9.230	8.128	7.356	6.707
265	-	12.869	12.213	11.652	11.047	10.778	10.334	9.915	9.440	8.314	7.517	6.826
270	-	13.045	12.397	11.846	11.249	10.982	10.540	10.123	9.650	8.501	7.677	6.946
275	-	13.222	12.580	12.040	11.451	11.186	10.746	10.331	9.860	8.687	7.838	7.065
280	-	-	12.764	12.234	11.654	11.390	10.952	10.539	10.070	8.892	7.998	7.185
285	-	-	12.948	12.428	11.856	11.594	11.159	10.747	10.280	9.111	8.159	7.304
290	-	-	13.131	12.622	12.058	11.798	11.365	10.955	10.490	9.329	8.320	7.424
295	-	-	13.315	12.816	12.260	12.002	11.571	11.163	10.700	9.547	8.480	7.544
300	-	-	-	13.010	12.462	12.206	11.777	11.371	10.910	9.766	8.641	7.663

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 105 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	6.625	5.139	4.293	3.572	2.961	2.744	2.444	2.213	2.001	1.622	1.082	0.727
40	7.269	5.501	4.474	3.760	3.132	2.908	2.598	2.360	2.141	1.747	1.130	0.807
45	8.558	5.943	4.834	4.132	3.439	3.190	2.845	2.577	2.328	1.880	1.224	0.966
50	8.941	6.386	5.195	4.450	3.746	3.472	3.092	2.794	2.516	2.014	1.318	1.120
55	9.151	6.763	5.556	4.727	4.053	3.754	3.338	3.012	2.704	2.147	1.412	1.272
60	9.361	7.053	5.917	5.003	4.339	4.036	3.585	3.229	2.891	2.281	1.506	1.423
65	9.571	7.344	6.277	5.279	4.546	4.310	3.832	3.446	3.079	2.414	1.600	1.575
70	9.781	7.635	6.636	5.555	4.752	4.496	4.079	3.663	3.267	2.547	1.726	1.726
75	9.991	7.926	6.801	5.832	4.959	4.681	4.318	3.880	3.454	2.681	1.878	1.878
80	10.201	8.217	6.966	6.108	5.166	4.866	4.501	4.098	3.642	2.814	2.029	2.029
85	10.411	8.508	7.130	6.384	5.372	5.052	4.683	4.312	3.830	2.947	2.181	2.181
90	10.621	8.781	7.295	6.652	5.579	5.237	4.866	4.496	4.017	3.081	2.332	2.332
95	10.831	8.923	7.460	6.831	5.786	5.422	5.049	4.680	4.205	3.214	2.484	2.484
100	11.041	9.065	7.625	7.010	5.992	5.607	5.232	4.863	4.394	3.348	2.635	2.635
105	11.251	9.207	7.789	7.190	6.199	5.793	5.414	5.047	4.585	3.481	2.787	2.787
110	11.461	9.349	7.954	7.369	6.405	5.978	5.597	5.231	4.775	3.614	2.938	2.938
115	11.671	9.491	8.119	7.548	6.612	6.163	5.780	5.415	4.965	3.748	3.090	3.090
120	11.881	9.633	8.283	7.728	6.821	6.349	5.963	5.599	5.156	3.881	3.241	3.241
125	12.091	9.776	8.448	7.907	7.030	6.534	6.145	5.783	5.346	4.015	3.393	3.393
130	12.301	9.918	8.613	8.087	7.240	6.742	6.328	5.967	5.537	4.148	3.545	3.545
135	12.511	10.060	8.779	8.266	7.449	6.977	6.511	6.151	5.727	4.281	3.696	3.696
140	12.721	10.202	8.967	8.445	7.658	7.212	6.712	6.334	5.918	4.509	3.848	3.848
145	12.931	10.344	9.155	8.625	7.868	7.447	6.951	6.518	6.108	4.748	3.999	3.999
150	-	10.486	9.343	8.807	8.077	7.682	7.190	6.725	6.299	4.988	4.151	4.151
155	-	10.628	9.530	8.998	8.286	7.917	7.429	6.973	6.489	5.227	4.302	4.302
160	-	10.770	9.718	9.190	8.496	8.152	7.668	7.220	6.696	5.466	4.454	4.454
165	-	10.912	9.906	9.382	8.705	8.387	7.907	7.468	6.956	5.706	4.605	4.605
170	-	11.054	10.094	9.573	8.911	8.622	8.146	7.716	7.216	5.945	4.757	4.757
175	-	11.196	10.282	9.765	9.116	8.846	8.385	7.963	7.477	6.184	4.908	4.908
180	-	11.338	10.470	9.957	9.321	9.055	8.624	8.211	7.737	6.424	5.060	5.060
185	-	11.480	10.658	10.149	9.526	9.264	8.852	8.458	7.997	6.670	5.211	5.211
190	-	11.622	10.845	10.340	9.730	9.473	9.065	8.706	8.258	6.970	5.363	5.363
195	-	11.764	11.033	10.532	9.935	9.682	9.277	8.927	8.518	7.270	5.514	5.514
200	-	11.906	11.221	10.724	10.140	9.890	9.490	9.141	8.776	7.570	5.666	5.666
205	-	12.048	11.409	10.915	10.345	10.099	9.703	9.355	8.989	7.870	5.817	5.817
210	-	12.190	11.597	11.107	10.550	10.308	9.915	9.569	9.203	8.169	5.969	5.969
215	-	12.332	11.785	11.299	10.755	10.517	10.128	9.782	9.416	8.469	6.809	6.121
220	-	12.474	11.973	11.490	10.960	10.725	10.341	9.996	9.630	8.768	7.107	6.272
225	-	12.616	12.161	11.682	11.165	10.934	10.554	10.210	9.843	8.982	7.405	6.424
230	-	12.758	12.348	11.874	11.369	11.143	10.766	10.423	10.056	9.197	7.703	6.575
235	-	12.900	12.536	12.065	11.574	11.352	10.979	10.637	10.270	9.411	8.001	6.751
240	-	13.042	12.724	12.257	11.779	11.561	11.192	10.851	10.483	9.625	8.299	6.942
245	-	-	12.912	12.449	11.984	11.769	11.404	11.064	10.697	9.840	8.597	7.133
250	-	-	13.100	12.641	12.189	11.978	11.617	11.278	10.910	10.054	8.861	7.325
255	-	-	-	12.832	12.394	12.187	11.830	11.492	11.123	10.268	9.080	7.516
260	-	-	-	13.024	12.599	12.396	12.042	11.705	11.337	10.483	9.300	7.707
265	-	-	-	13.216	12.803	12.605	12.255	11.919	11.550	10.697	9.520	7.899
270	-	-	-	-	13.008	12.813	12.468	12.133	11.764	10.912	9.739	8.090
275	-	-	-	-	13.213	13.022	12.680	12.347	11.977	11.126	9.959	8.281
280	-	-	-	-	-	13.231	12.893	12.560	12.190	11.340	10.178	8.473
285	-	-	-	-	-	-	13.106	12.774	12.404	11.555	10.398	8.664
290	-	-	-	-	-	-	13.318	12.988	12.617	11.769	10.617	8.869
295	-	-	-	-	-	-	-	13.201	12.831	11.983	10.837	9.088
300	-	-	-	-	-	-	-	-	13.044	12.198	11.057	9.308

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 120 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	9.116	5.972	5.147	4.378	3.746	3.498	3.155	2.891	2.647	2.212	1.814	1.068
40	10.052	6.582	5.497	4.581	3.931	3.679	3.328	3.059	2.810	2.365	1.957	1.116
45	10.228	7.885	5.967	4.989	4.326	4.054	3.664	3.360	3.078	2.567	2.095	1.212
50	10.404	8.841	6.437	5.396	4.644	4.398	3.999	3.662	3.347	2.770	2.233	1.308
55	10.581	9.074	6.897	5.803	4.961	4.684	4.323	3.964	3.616	2.973	2.371	1.404
60	10.757	9.307	7.351	6.210	5.279	4.969	4.564	4.266	3.884	3.175	2.509	1.500
65	10.933	9.540	7.804	6.617	5.597	5.255	4.804	4.479	4.153	3.378	2.647	1.596
70	11.110	9.773	8.257	6.861	5.914	5.541	5.045	4.683	4.382	3.580	2.786	1.726
75	11.286	10.007	8.710	7.098	6.232	5.827	5.285	4.886	4.567	3.783	2.924	1.878
80	11.462	10.240	8.927	7.335	6.549	6.113	5.526	5.090	4.752	3.986	3.062	2.029
85	11.639	10.473	9.111	7.572	6.773	6.399	5.766	5.293	4.937	4.188	3.200	2.181
90	11.815	10.706	9.294	7.808	6.961	6.669	6.007	5.497	5.122	4.383	3.338	2.332
95	11.991	10.939	9.478	8.045	7.150	6.865	6.247	5.700	5.307	4.567	3.476	2.484
100	12.167	11.173	9.662	8.282	7.339	7.061	6.488	5.904	5.492	4.752	3.614	2.635
105	12.344	11.406	9.846	8.519	7.528	7.256	6.719	6.107	5.677	4.937	3.753	2.787
110	12.520	11.639	10.030	8.755	7.716	7.452	6.935	6.311	5.862	5.122	3.891	2.938
115	12.696	11.872	10.214	8.933	7.905	7.648	7.151	6.514	6.047	5.306	4.029	3.090
120	-	12.106	10.398	9.108	8.094	7.843	7.368	6.739	6.232	5.491	4.167	3.241
125	-	12.339	10.582	9.284	8.283	8.039	7.584	6.993	6.417	5.676	4.311	3.393
130	-	12.572	10.766	9.459	8.471	8.235	7.800	7.248	6.602	5.861	4.531	3.545
135	-	12.805	10.949	9.634	8.660	8.430	8.017	7.503	6.874	6.046	4.751	3.696
140	-	-	11.133	9.809	8.859	8.626	8.233	7.757	7.164	6.230	4.971	3.848
145	-	-	11.317	9.985	9.070	8.827	8.449	8.012	7.455	6.415	5.191	3.999
150	-	-	11.501	10.160	9.282	9.043	8.666	8.266	7.746	6.600	5.412	4.151
155	-	-	11.685	10.335	9.493	9.258	8.884	8.521	8.036	6.898	5.632	4.302
160	-	-	11.869	10.510	9.704	9.474	9.104	8.774	8.327	7.222	5.852	4.454
165	-	-	12.053	10.686	9.916	9.689	9.325	8.998	8.617	7.547	6.072	4.605
170	-	-	12.237	10.861	10.127	9.904	9.545	9.221	8.876	7.872	6.292	4.757
175	-	-	12.420	11.036	10.339	10.120	9.765	9.445	9.101	8.196	6.512	4.908
180	-	-	12.604	11.211	10.550	10.335	9.985	9.668	9.326	8.521	6.816	5.060
185	-	-	12.788	11.387	10.761	10.551	10.206	9.891	9.551	8.821	7.225	5.211
190	-	-	12.972	11.562	10.973	10.766	10.426	10.115	9.776	9.048	7.634	5.363
195	-	-	-	11.737	11.184	10.982	10.646	10.338	10.001	9.274	8.044	5.514
200	-	-	-	11.912	11.395	11.197	10.866	10.561	10.226	9.501	8.453	5.666
205	-	-	-	12.088	11.607	11.412	11.087	10.785	10.451	9.728	8.818	5.817
210	-	-	-	12.263	11.818	11.628	11.307	11.008	10.676	9.954	9.042	6.082
215	-	-	-	12.438	12.030	11.843	11.527	11.232	10.901	10.181	9.266	6.981
220	-	-	-	12.614	12.241	12.059	11.748	11.455	11.126	10.408	9.489	7.461
225	-	-	-	12.789	12.452	12.274	11.968	11.678	11.351	10.635	9.713	7.941
230	-	-	-	12.964	12.664	12.490	12.188	11.902	11.576	10.861	9.937	8.421
235	-	-	-	13.139	12.875	12.705	12.408	12.125	11.801	11.088	10.161	8.827
240	-	-	-	-	13.086	12.920	12.629	12.349	12.026	11.315	10.384	9.044
245	-	-	-	-	13.298	13.136	12.849	12.572	12.251	11.541	10.608	9.262
250	-	-	-	-	-	-	13.069	12.795	12.476	11.768	10.832	9.480
255	-	-	-	-	-	-	13.289	13.019	12.701	11.995	11.056	9.697
260	-	-	-	-	-	-	-	13.242	12.926	12.221	11.280	9.915
265	-	-	-	-	-	-	-	-	13.151	12.448	11.503	10.133
270	-	-	-	-	-	-	-	-	-	12.675	11.727	10.350
275	-	-	-	-	-	-	-	-	-	12.901	11.951	10.568
280	-	-	-	-	-	-	-	-	-	13.128	12.175	10.786
285	-	-	-	-	-	-	-	-	-	-	12.398	11.004
290	-	-	-	-	-	-	-	-	-	-	12.622	11.221
295	-	-	-	-	-	-	-	-	-	-	12.846	11.439
300	-	-	-	-	-	-	-	-	-	-	13.070	11.657

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 135 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	10.618	8.978	5.972	5.163	4.446	4.220	3.866	3.568	3.293	2.802	2.366	1.853
40	11.600	9.101	6.143	5.501	4.663	4.417	4.097	3.749	3.471	2.974	2.531	1.997
45	11.957	9.346	7.767	6.003	5.096	4.812	4.438	4.134	3.820	3.251	2.739	2.142
50	12.313	9.592	8.861	6.506	5.529	5.207	4.779	4.466	4.168	3.527	2.947	2.287
55	12.670	9.837	9.110	7.167	5.962	5.602	5.120	4.759	4.457	3.804	3.155	2.433
60	13.026	10.083	9.359	7.884	6.395	5.998	5.461	5.053	4.712	4.080	3.363	2.578
65	-	10.328	9.608	8.601	6.780	6.393	5.802	5.346	4.967	4.336	3.571	2.724
70	-	10.574	9.857	8.976	7.106	6.730	6.143	5.639	5.222	4.519	3.779	2.869
75	-	10.819	10.106	9.250	7.433	6.976	6.484	5.932	5.477	4.702	3.987	3.014
80	-	11.065	10.355	9.523	7.759	7.221	6.747	6.225	5.731	4.885	4.195	3.160
85	-	11.310	10.604	9.797	8.085	7.467	6.947	6.519	5.986	5.069	4.387	3.305
90	-	11.556	10.853	10.071	8.411	7.712	7.147	6.763	6.241	5.252	4.565	3.450
95	-	11.801	11.102	10.344	8.737	7.958	7.347	6.975	6.496	5.435	4.742	3.596
100	-	12.047	11.351	10.618	8.990	8.203	7.547	7.187	6.739	5.618	4.919	3.741
105	-	12.292	11.600	10.891	9.236	8.449	7.747	7.398	6.967	5.801	5.097	3.887
110	-	12.538	11.849	11.165	9.483	8.694	7.947	7.610	7.196	5.984	5.274	4.032
115	-	12.783	12.098	11.439	9.729	8.940	8.147	7.822	7.425	6.167	5.451	4.177
120	-	13.029	12.347	11.712	9.975	9.186	8.347	8.034	7.654	6.351	5.629	4.331
125	-	-	12.596	11.986	10.222	9.431	8.547	8.246	7.882	6.534	5.806	4.525
130	-	-	12.845	12.260	10.468	9.677	8.747	8.458	8.111	6.787	5.984	4.718
135	-	-	-	12.533	10.714	9.923	8.976	8.670	8.340	7.126	6.161	4.911
140	-	-	-	12.807	10.960	10.169	9.208	8.895	8.568	7.466	6.338	5.104
145	-	-	-	13.080	11.207	10.414	9.440	9.131	8.798	7.805	6.516	5.297
150	-	-	-	-	11.453	10.660	9.672	9.367	9.036	8.145	6.760	5.490
155	-	-	-	-	11.699	10.906	9.904	9.603	9.274	8.485	7.141	5.683
160	-	-	-	-	11.945	11.151	10.136	9.839	9.512	8.807	7.523	5.876
165	-	-	-	-	12.192	11.397	10.368	10.075	9.749	9.049	7.904	6.069
170	-	-	-	-	12.438	11.643	10.600	10.311	9.987	9.290	8.285	6.262
175	-	-	-	-	12.684	11.889	10.832	10.547	10.225	9.532	8.666	6.455
180	-	-	-	-	12.930	12.134	11.064	10.783	10.463	9.773	8.944	6.683
185	-	-	-	-	13.177	12.380	11.296	11.019	10.701	10.015	9.185	7.379
190	-	-	-	-	-	12.626	11.528	11.255	10.938	10.256	9.426	8.075
195	-	-	-	-	-	12.872	11.760	11.491	11.176	10.498	9.668	8.767
200	-	-	-	-	-	13.117	11.992	11.727	11.414	10.740	9.909	8.988
205	-	-	-	-	-	-	12.224	11.963	11.652	10.981	10.150	9.209
210	-	-	-	-	-	-	12.456	12.199	11.890	11.223	10.391	9.430
215	-	-	-	-	-	-	12.688	12.435	12.127	11.464	10.633	9.651
220	-	-	-	-	-	-	12.920	12.671	12.365	11.706	10.874	9.872
225	-	-	-	-	-	-	13.151	12.907	12.603	11.947	11.115	10.093
230	-	-	-	-	-	-	-	13.143	12.841	12.189	11.357	10.314
235	-	-	-	-	-	-	-	-	13.079	12.430	11.598	10.535
240	-	-	-	-	-	-	-	-	13.316	12.672	11.839	10.756
245	-	-	-	-	-	-	-	-	-	12.913	12.080	10.977
250	-	-	-	-	-	-	-	-	-	13.155	12.322	11.198
255	-	-	-	-	-	-	-	-	-	-	12.563	11.419
260	-	-	-	-	-	-	-	-	-	-	12.804	11.639
265	-	-	-	-	-	-	-	-	-	-	13.046	11.860
270	-	-	-	-	-	-	-	-	-	-	13.287	12.081
275	-	-	-	-	-	-	-	-	-	-	-	12.302
280	-	-	-	-	-	-	-	-	-	-	-	12.523
285	-	-	-	-	-	-	-	-	-	-	-	12.744
290	-	-	-	-	-	-	-	-	-	-	-	12.965
295	-	-	-	-	-	-	-	-	-	-	-	13.186
300	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 150 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	-	10.377	8.883	5.945	5.158	4.881	4.497	4.215	3.866	3.392	2.918	2.413
40	-	11.341	9.014	6.357	5.487	5.185	4.770	4.407	4.159	3.577	3.101	2.579
45	-	11.695	9.276	7.805	6.004	5.666	5.199	4.793	4.501	3.927	3.378	2.795
50	-	12.048	9.539	8.911	6.521	6.148	5.628	5.178	4.843	4.276	3.655	3.011
55	-	12.401	9.801	9.177	7.308	6.629	6.057	5.564	5.185	4.538	3.932	3.227
60	-	12.755	10.063	9.443	8.170	7.270	6.487	5.949	5.527	4.795	4.209	3.443
65	-	-	10.325	9.708	8.857	7.912	6.913	6.335	5.869	5.051	4.418	3.659
70	-	-	10.587	9.974	9.151	8.555	7.337	6.703	6.210	5.308	4.596	3.875
75	-	-	10.849	10.240	9.446	8.978	7.761	7.009	6.552	5.565	4.774	4.091
80	-	-	11.111	10.506	9.741	9.294	8.185	7.316	6.795	5.821	4.952	4.305
85	-	-	11.373	10.771	10.035	9.611	8.610	7.622	7.006	6.078	5.130	4.470
90	-	-	11.635	11.037	10.330	9.927	8.978	7.928	7.217	6.335	5.308	4.635
95	-	-	11.897	11.303	10.625	10.244	9.315	8.235	7.427	6.591	5.486	4.801
100	-	-	12.159	11.568	10.920	10.560	9.651	8.541	7.638	6.834	5.664	4.966
105	-	-	12.421	11.834	11.214	10.877	9.988	8.857	7.849	7.073	5.842	5.132
110	-	-	12.683	12.100	11.509	11.193	10.324	9.199	8.060	7.313	6.020	5.297
115	-	-	12.945	12.366	11.804	11.510	10.661	9.542	8.271	7.552	6.198	5.462
120	-	-	-	12.631	12.098	11.826	10.997	9.884	8.482	7.792	6.376	5.628
125	-	-	-	12.897	12.393	12.143	11.333	10.226	8.692	8.031	6.554	5.793
130	-	-	-	-	12.688	12.459	11.670	10.568	9.009	8.271	6.838	5.959
135	-	-	-	-	12.982	12.776	12.006	10.910	9.381	8.510	7.211	6.124
140	-	-	-	-	-	13.092	12.343	11.252	9.753	8.750	7.585	6.290
145	-	-	-	-	-	-	12.679	11.595	10.126	9.007	7.959	6.455
150	-	-	-	-	-	-	13.016	11.937	10.498	9.264	8.333	6.620
155	-	-	-	-	-	-	-	12.279	10.870	9.522	8.707	7.078
160	-	-	-	-	-	-	-	12.621	11.242	9.780	8.982	7.564
165	-	-	-	-	-	-	-	12.963	11.614	10.038	9.238	8.051
170	-	-	-	-	-	-	-	13.306	11.986	10.296	9.495	8.537
175	-	-	-	-	-	-	-	-	12.359	10.554	9.751	8.894
180	-	-	-	-	-	-	-	-	12.731	10.812	10.007	9.137
185	-	-	-	-	-	-	-	-	13.103	11.070	10.264	9.379
190	-	-	-	-	-	-	-	-	-	11.328	10.520	9.622
195	-	-	-	-	-	-	-	-	-	11.586	10.777	9.865
200	-	-	-	-	-	-	-	-	-	11.844	11.033	10.108
205	-	-	-	-	-	-	-	-	-	12.102	11.290	10.351
210	-	-	-	-	-	-	-	-	-	12.360	11.546	10.593
215	-	-	-	-	-	-	-	-	-	12.618	11.803	10.836
220	-	-	-	-	-	-	-	-	-	12.875	12.059	11.079
225	-	-	-	-	-	-	-	-	-	13.133	12.316	11.322
230	-	-	-	-	-	-	-	-	-	-	12.572	11.565
235	-	-	-	-	-	-	-	-	-	-	12.829	11.807
240	-	-	-	-	-	-	-	-	-	-	13.085	12.050
245	-	-	-	-	-	-	-	-	-	-	-	12.293
250	-	-	-	-	-	-	-	-	-	-	-	12.536
255	-	-	-	-	-	-	-	-	-	-	-	12.779
260	-	-	-	-	-	-	-	-	-	-	-	13.021
265	-	-	-	-	-	-	-	-	-	-	-	13.264
270	-	-	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-

Thickness is intumescent only. Results apply to Circular hollow columns exposed to fire on all sides.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 165 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	-	-	10.216	8.817	5.857	5.552	5.127	4.770	4.481	4.030	3.470	2.972
40	-	-	11.145	8.989	6.254	5.916	5.451	5.067	4.758	4.199	3.665	3.156
45	-	-	11.541	9.333	7.554	6.493	5.969	5.528	5.176	4.535	4.010	3.441
50	-	-	11.936	9.678	8.907	7.861	6.488	5.988	5.594	4.872	4.339	3.727
55	-	-	12.332	10.023	9.192	8.895	7.348	6.448	6.012	5.209	4.592	4.013
60	-	-	12.728	10.367	9.478	9.189	8.343	7.068	6.430	5.546	4.844	4.298
65	-	-	13.124	10.712	9.764	9.483	8.945	7.798	6.893	5.882	5.096	4.466
70	-	-	-	11.056	10.050	9.777	9.257	8.528	7.399	6.219	5.348	4.635
75	-	-	-	11.401	10.335	10.071	9.569	8.993	7.905	6.556	5.600	4.803
80	-	-	-	11.746	10.621	10.364	9.882	9.331	8.411	6.814	5.852	4.971
85	-	-	-	12.090	10.907	10.658	10.194	9.669	8.880	7.049	6.104	5.140
90	-	-	-	12.435	11.193	10.952	10.506	10.007	9.261	7.283	6.357	5.308
95	-	-	-	12.779	11.478	11.246	10.819	10.344	9.643	7.518	6.609	5.477
100	-	-	-	-	11.764	11.540	11.131	10.682	10.025	7.752	6.852	5.645
105	-	-	-	-	12.050	11.833	11.443	11.020	10.407	7.987	7.094	5.813
110	-	-	-	-	12.336	12.127	11.756	11.358	10.788	8.221	7.336	5.982
115	-	-	-	-	12.621	12.421	12.068	11.696	11.170	8.456	7.578	6.150
120	-	-	-	-	12.907	12.715	12.380	12.034	11.552	8.690	7.819	6.318
125	-	-	-	-	-	13.009	12.693	12.371	11.934	9.087	8.061	6.487
130	-	-	-	-	-	-	13.005	12.709	12.315	9.559	8.303	6.686
135	-	-	-	-	-	-	-	13.047	12.697	10.032	8.545	7.111
140	-	-	-	-	-	-	-	-	13.079	10.505	8.791	7.537
145	-	-	-	-	-	-	-	-	-	10.977	9.077	7.962
150	-	-	-	-	-	-	-	-	-	11.450	9.363	8.388
155	-	-	-	-	-	-	-	-	-	11.923	9.648	8.795
160	-	-	-	-	-	-	-	-	-	12.395	9.934	9.057
165	-	-	-	-	-	-	-	-	-	12.868	10.220	9.320
170	-	-	-	-	-	-	-	-	-	-	10.505	9.582
175	-	-	-	-	-	-	-	-	-	-	10.791	9.844
180	-	-	-	-	-	-	-	-	-	-	11.077	10.107
185	-	-	-	-	-	-	-	-	-	-	11.362	10.369
190	-	-	-	-	-	-	-	-	-	-	11.648	10.632
195	-	-	-	-	-	-	-	-	-	-	11.934	10.894
200	-	-	-	-	-	-	-	-	-	-	12.220	11.157
205	-	-	-	-	-	-	-	-	-	-	12.505	11.419
210	-	-	-	-	-	-	-	-	-	-	12.791	11.682
215	-	-	-	-	-	-	-	-	-	-	13.077	11.944
220	-	-	-	-	-	-	-	-	-	-	-	12.206
225	-	-	-	-	-	-	-	-	-	-	-	12.469
230	-	-	-	-	-	-	-	-	-	-	-	12.731
235	-	-	-	-	-	-	-	-	-	-	-	12.994
240	-	-	-	-	-	-	-	-	-	-	-	13.256
245	-	-	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-

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Registered in England and Wales
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CERTIFICATE No CF 5857

JOTUN A/S

Circular Hollow Columns 180 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
37.5	-	-	-	10.099	8.723	5.972	5.757	5.348	5.034	4.484	4.071	3.532
40	-	-	-	10.981	8.938	6.815	6.140	5.696	5.354	4.694	4.237	3.726
45	-	-	-	11.449	9.366	8.988	7.101	6.238	5.850	5.112	4.569	4.082
50	-	-	-	11.916	9.795	9.335	8.865	7.108	6.347	5.530	4.902	4.390
55	-	-	-	12.384	10.224	9.682	9.169	8.783	7.116	5.949	5.234	4.626
60	-	-	-	12.851	10.652	10.030	9.473	9.096	8.262	6.367	5.566	4.862
65	-	-	-	-	11.081	10.377	9.777	9.410	8.949	6.829	5.898	5.098
70	-	-	-	-	11.510	10.724	10.081	9.724	9.277	7.366	6.230	5.334
75	-	-	-	-	11.939	11.071	10.385	10.038	9.605	7.903	6.562	5.570
80	-	-	-	-	12.367	11.418	10.689	10.352	9.933	8.440	6.804	5.806
85	-	-	-	-	12.796	11.765	10.993	10.665	10.261	8.921	7.020	6.042
90	-	-	-	-	-	12.112	11.297	10.979	10.589	9.315	7.237	6.278
95	-	-	-	-	-	12.459	11.601	11.293	10.917	9.709	7.453	6.514
100	-	-	-	-	-	12.807	11.905	11.607	11.245	10.102	7.670	6.758
105	-	-	-	-	-	-	12.209	11.921	11.573	10.496	7.886	7.009
110	-	-	-	-	-	-	12.513	12.234	11.901	10.890	8.102	7.261
115	-	-	-	-	-	-	12.817	12.548	12.229	11.284	8.319	7.512
120	-	-	-	-	-	-	13.121	12.862	12.557	11.678	8.535	7.764
125	-	-	-	-	-	-	-	13.176	12.885	12.072	8.751	8.015
130	-	-	-	-	-	-	-	-	13.213	12.466	9.311	8.267
135	-	-	-	-	-	-	-	-	-	12.860	9.893	8.519
140	-	-	-	-	-	-	-	-	-	13.254	10.476	8.772
145	-	-	-	-	-	-	-	-	-	-	11.058	9.086
150	-	-	-	-	-	-	-	-	-	-	11.641	9.401
155	-	-	-	-	-	-	-	-	-	-	12.223	9.715
160	-	-	-	-	-	-	-	-	-	-	12.806	10.030
165	-	-	-	-	-	-	-	-	-	-	-	10.345
170	-	-	-	-	-	-	-	-	-	-	-	10.659
175	-	-	-	-	-	-	-	-	-	-	-	10.974
180	-	-	-	-	-	-	-	-	-	-	-	11.289
185	-	-	-	-	-	-	-	-	-	-	-	11.603
190	-	-	-	-	-	-	-	-	-	-	-	11.918
195	-	-	-	-	-	-	-	-	-	-	-	12.233
200	-	-	-	-	-	-	-	-	-	-	-	12.547
205	-	-	-	-	-	-	-	-	-	-	-	12.862
210	-	-	-	-	-	-	-	-	-	-	-	13.177
215	-	-	-	-	-	-	-	-	-	-	-	-
220	-	-	-	-	-	-	-	-	-	-	-	-
225	-	-	-	-	-	-	-	-	-	-	-	-
230	-	-	-	-	-	-	-	-	-	-	-	-
235	-	-	-	-	-	-	-	-	-	-	-	-
240	-	-	-	-	-	-	-	-	-	-	-	-
245	-	-	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	-	-	-	-	-
255	-	-	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-	-	-
265	-	-	-	-	-	-	-	-	-	-	-	-
270	-	-	-	-	-	-	-	-	-	-	-	-
275	-	-	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	-	-	-	-
285	-	-	-	-	-	-	-	-	-	-	-	-
290	-	-	-	-	-	-	-	-	-	-	-	-
295	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-

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This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 15 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
20	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
25	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
30	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
35	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
40	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
45	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
50	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
55	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
60	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
65	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
70	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
75	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
80	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
85	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
90	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
95	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
100	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
105	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
110	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
115	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
120	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
125	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
130	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
135	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
140	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
145	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
150	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
155	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
160	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
165	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
170	0.506	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
175	0.592	0.461	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
180	0.678	0.495	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
185	0.763	0.529	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
190	0.849	0.564	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
195	0.935	0.598	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
200	1.017	0.632	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
205	1.060	0.666	0.451	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
210	1.102	0.700	0.482	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
215	1.145	0.734	0.512	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
220	1.188	0.768	0.543	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
225	1.230	0.802	0.574	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
230	1.273	0.837	0.604	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure. Results also apply to rectangular/square hollow beams exposed on all 4 sides limited to a maximum protection thickness of 7.786mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 30 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
20	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
25	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
30	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
35	0.472	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
40	0.542	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
45	0.613	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
50	0.683	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
55	0.753	0.454	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
60	0.823	0.511	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
65	0.893	0.568	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
70	0.963	0.625	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
75	1.035	0.683	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
80	1.113	0.740	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
85	1.190	0.797	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
90	1.268	0.855	0.487	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
95	1.345	0.912	0.549	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
100	1.422	0.969	0.611	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
105	1.500	1.028	0.673	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
110	1.577	1.093	0.735	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
115	1.655	1.159	0.797	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
120	1.732	1.224	0.858	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
125	1.809	1.289	0.920	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
130	1.887	1.354	0.982	0.485	0.485	0.441	0.441	0.441	0.441	0.441	0.441	0.441
135	1.964	1.420	1.044	0.539	0.539	0.441	0.441	0.441	0.441	0.441	0.441	0.441
140	2.042	1.485	1.107	0.594	0.594	0.492	0.441	0.441	0.441	0.441	0.441	0.441
145	2.119	1.550	1.170	0.648	0.648	0.544	0.441	0.441	0.441	0.441	0.441	0.441
150	2.196	1.615	1.232	0.837	0.702	0.597	0.441	0.441	0.441	0.441	0.441	0.441
155	2.274	1.680	1.295	1.024	0.757	0.649	0.466	0.441	0.441	0.441	0.441	0.441
160	2.351	1.746	1.358	1.083	0.811	0.702	0.516	0.441	0.441	0.441	0.441	0.441
165	2.429	1.811	1.420	1.142	0.866	0.754	0.566	0.444	0.441	0.441	0.441	0.441
170	2.506	1.876	1.483	1.201	0.920	0.807	0.616	0.491	0.441	0.441	0.441	0.441
175	2.583	1.941	1.545	1.260	0.974	0.860	0.665	0.538	0.441	0.441	0.441	0.441
180	2.661	2.006	1.608	1.318	1.029	0.912	0.715	0.585	0.441	0.441	0.441	0.441
185	2.738	2.072	1.671	1.377	1.083	0.965	0.765	0.632	0.441	0.441	0.441	0.441
190	2.816	2.137	1.733	1.436	1.138	1.017	0.815	0.679	0.478	0.441	0.441	0.441
195	2.893	2.202	1.796	1.495	1.192	1.070	0.865	0.726	0.522	0.441	0.441	0.441
200	2.971	2.267	1.859	1.553	1.246	1.122	0.915	0.773	0.567	0.441	0.441	0.441
205	3.048	2.332	1.921	1.612	1.301	1.175	0.965	0.820	0.611	0.441	0.441	0.441
210	3.125	2.398	1.984	1.671	1.355	1.227	1.014	0.867	0.656	0.441	0.441	0.441
215	3.203	2.463	2.047	1.730	1.410	1.280	1.064	0.914	0.701	0.441	0.441	0.441
220	3.280	2.528	2.109	1.789	1.464	1.332	1.114	0.961	0.745	0.441	0.441	0.441
225	3.358	2.593	2.172	1.847	1.519	1.385	1.164	1.008	0.790	0.441	0.441	0.441
230	3.435	2.658	2.234	1.906	1.573	1.437	1.214	1.055	0.834	0.479	0.441	0.441

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure. Results also apply to rectangular/square hollow beams exposed on all 4 sides limited to a maximum protection thickness of 7.786mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 45 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
20	0.475	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
25	0.660	0.447	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
30	0.846	0.535	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
35	1.026	0.624	0.473	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
40	1.151	0.713	0.548	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
45	1.276	0.802	0.623	0.465	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
50	1.401	0.891	0.698	0.532	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
55	1.526	0.980	0.773	0.598	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
60	1.651	1.071	0.848	0.664	0.475	0.441	0.441	0.441	0.441	0.441	0.441	0.441
65	1.776	1.164	0.923	0.730	0.536	0.446	0.441	0.441	0.441	0.441	0.441	0.441
70	1.901	1.256	0.998	0.797	0.597	0.506	0.441	0.441	0.441	0.441	0.441	0.441
75	2.026	1.349	1.083	0.863	0.658	0.566	0.441	0.441	0.441	0.441	0.441	0.441
80	2.151	1.441	1.171	0.929	0.719	0.625	0.459	0.441	0.441	0.441	0.441	0.441
85	2.276	1.534	1.258	0.996	0.780	0.685	0.518	0.441	0.441	0.441	0.441	0.441
90	2.400	1.626	1.346	1.075	0.840	0.745	0.577	0.441	0.441	0.441	0.441	0.441
95	2.525	1.719	1.433	1.159	0.901	0.804	0.636	0.441	0.441	0.441	0.441	0.441
100	2.650	1.811	1.521	1.243	0.962	0.864	0.696	0.511	0.441	0.441	0.441	0.441
105	2.775	1.904	1.608	1.327	1.026	0.924	0.755	0.582	0.441	0.441	0.441	0.441
110	2.900	1.996	1.696	1.411	1.106	0.983	0.814	0.653	0.441	0.441	0.441	0.441
115	3.025	2.089	1.783	1.494	1.186	1.052	0.873	0.724	0.441	0.441	0.441	0.441
120	3.150	2.181	1.871	1.578	1.266	1.131	0.933	0.795	0.497	0.441	0.441	0.441
125	3.275	2.274	1.958	1.662	1.347	1.210	0.992	0.865	0.597	0.441	0.441	0.441
130	3.400	2.366	2.046	1.746	1.427	1.288	1.062	0.936	0.696	0.441	0.441	0.441
135	3.525	2.459	2.133	1.830	1.507	1.367	1.139	1.007	0.795	0.441	0.441	0.441
140	3.650	2.551	2.220	1.914	1.587	1.446	1.215	1.080	0.895	0.441	0.441	0.441
145	3.775	2.644	2.308	1.998	1.667	1.525	1.292	1.153	0.994	0.441	0.441	0.441
150	3.900	2.736	2.395	2.082	1.748	1.603	1.369	1.226	1.070	0.441	0.441	0.441
155	4.024	2.829	2.483	2.166	1.828	1.682	1.445	1.300	1.139	0.441	0.441	0.441
160	4.149	2.921	2.570	2.250	1.908	1.761	1.522	1.373	1.209	0.591	0.441	0.441
165	4.274	3.014	2.658	2.334	1.988	1.839	1.598	1.446	1.279	0.780	0.485	0.441
170	4.399	3.106	2.745	2.418	2.068	1.918	1.675	1.519	1.349	0.969	0.540	0.441
175	4.523	3.199	2.833	2.502	2.149	1.997	1.752	1.592	1.419	1.062	0.595	0.441
180	4.648	3.291	2.920	2.586	2.229	2.075	1.828	1.666	1.488	1.124	0.650	0.441
185	4.772	3.384	3.008	2.670	2.309	2.154	1.905	1.739	1.558	1.186	0.705	0.441
190	4.897	3.476	3.095	2.754	2.389	2.233	1.981	1.812	1.628	1.248	0.760	0.441
195	5.021	3.569	3.183	2.838	2.469	2.311	2.058	1.885	1.698	1.311	0.814	0.441
200	5.146	3.661	3.270	2.922	2.550	2.390	2.135	1.958	1.768	1.373	0.869	0.441
205	5.270	3.754	3.358	3.006	2.630	2.469	2.211	2.032	1.837	1.435	0.924	0.441
210	5.395	3.846	3.445	3.090	2.710	2.547	2.288	2.105	1.907	1.497	0.979	0.469
215	5.519	3.939	3.533	3.174	2.790	2.626	2.365	2.178	1.977	1.560	1.034	0.513
220	5.644	4.031	3.620	3.258	2.870	2.705	2.441	2.251	2.047	1.622	1.088	0.557
225	5.768	4.124	3.708	3.342	2.950	2.783	2.518	2.325	2.117	1.684	1.143	0.601
230	5.893	4.216	3.795	3.426	3.031	2.862	2.594	2.398	2.186	1.747	1.198	0.644

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure. Results also apply to rectangular/square hollow beams exposed on all 4 sides limited to a maximum protection thickness of 7.786mm.

Signed

Issued: 20th February 2020
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Valid to: 15th November 2029

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CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 60 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	0.716	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
20	1.032	0.565	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
25	1.275	0.807	0.547	0.444	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
30	1.518	1.037	0.679	0.532	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
35	1.761	1.198	0.812	0.619	0.514	0.474	0.441	0.441	0.441	0.441	0.441	0.441
40	2.004	1.358	0.944	0.707	0.591	0.548	0.482	0.441	0.441	0.441	0.441	0.441
45	2.247	1.519	1.076	0.794	0.668	0.621	0.550	0.489	0.441	0.441	0.441	0.441
50	2.490	1.680	1.209	0.882	0.745	0.694	0.618	0.553	0.484	0.441	0.441	0.441
55	2.732	1.841	1.342	0.969	0.821	0.767	0.686	0.618	0.547	0.441	0.441	0.441
60	2.975	2.002	1.475	1.068	0.898	0.840	0.755	0.683	0.609	0.441	0.441	0.441
65	3.218	2.163	1.608	1.177	0.975	0.914	0.823	0.748	0.671	0.492	0.441	0.441
70	3.461	2.324	1.741	1.287	1.064	0.987	0.891	0.813	0.734	0.551	0.441	0.441
75	3.704	2.485	1.874	1.397	1.167	1.077	0.959	0.878	0.796	0.610	0.441	0.441
80	3.947	2.646	2.007	1.506	1.269	1.177	1.033	0.943	0.858	0.668	0.441	0.441
85	4.190	2.806	2.140	1.616	1.372	1.277	1.129	1.007	0.921	0.727	0.478	0.441
90	4.373	2.967	2.274	1.725	1.474	1.377	1.225	1.098	0.983	0.786	0.536	0.441
95	4.506	3.128	2.407	1.835	1.577	1.477	1.322	1.191	1.059	0.845	0.594	0.441
100	4.640	3.289	2.540	1.945	1.679	1.577	1.418	1.284	1.149	0.904	0.652	0.441
105	4.773	3.450	2.673	2.054	1.782	1.676	1.514	1.377	1.238	0.963	0.710	0.441
110	4.906	3.611	2.806	2.164	1.884	1.776	1.611	1.470	1.328	1.025	0.768	0.441
115	5.040	3.772	2.939	2.273	1.987	1.876	1.707	1.564	1.418	1.107	0.826	0.441
120	5.173	3.933	3.072	2.383	2.089	1.976	1.803	1.657	1.507	1.190	0.884	0.441
125	5.306	4.093	3.205	2.493	2.192	2.076	1.900	1.750	1.597	1.272	0.941	0.441
130	5.440	4.254	3.338	2.602	2.294	2.176	1.996	1.843	1.687	1.354	0.999	0.441
135	5.573	4.381	3.471	2.712	2.397	2.276	2.092	1.936	1.777	1.437	1.069	0.477
140	5.706	4.494	3.604	2.821	2.499	2.376	2.189	2.029	1.866	1.519	1.143	0.570
145	5.840	4.608	3.737	2.931	2.602	2.476	2.285	2.123	1.956	1.601	1.217	0.664
150	5.973	4.721	3.870	3.041	2.704	2.576	2.381	2.216	2.046	1.684	1.290	0.757
155	6.106	4.834	4.003	3.150	2.807	2.676	2.478	2.309	2.135	1.766	1.364	0.851
160	6.239	4.947	4.136	3.260	2.909	2.776	2.574	2.402	2.225	1.848	1.438	0.944
165	6.373	5.060	4.269	3.369	3.012	2.876	2.670	2.495	2.315	1.931	1.512	1.030
170	6.507	5.173	4.404	3.479	3.114	2.976	2.767	2.588	2.404	2.013	1.585	1.093
175	6.688	5.286	4.540	3.588	3.217	3.076	2.863	2.682	2.494	2.095	1.659	1.155
180	6.869	5.400	4.676	3.698	3.319	3.176	2.959	2.775	2.584	2.178	1.733	1.218
185	7.051	5.513	4.811	3.808	3.422	3.276	3.056	2.868	2.673	2.260	1.807	1.281
190	7.232	5.626	4.947	3.917	3.524	3.376	3.152	2.961	2.763	2.342	1.880	1.343
195	7.413	5.739	5.083	4.027	3.627	3.476	3.248	3.054	2.853	2.425	1.954	1.406
200	7.594	5.852	5.219	4.136	3.729	3.576	3.345	3.147	2.942	2.507	2.028	1.469
205	7.776	5.965	5.355	4.246	3.832	3.676	3.441	3.241	3.032	2.589	2.102	1.531
210	7.957	6.078	5.491	4.397	3.934	3.776	3.537	3.334	3.122	2.671	2.175	1.594
215	8.138	6.192	5.627	4.588	4.037	3.876	3.634	3.427	3.211	2.754	2.249	1.657
220	8.320	6.305	5.762	4.780	4.139	3.976	3.730	3.520	3.301	2.836	2.323	1.719
225	8.492	6.418	5.898	4.971	4.242	4.076	3.826	3.613	3.391	2.918	2.397	1.782
230	8.623	6.570	6.034	5.163	4.381	4.176	3.923	3.707	3.480	3.001	2.470	1.845

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure. Results also apply to rectangular/square hollow beams exposed on all 4 sides limited to a maximum protection thickness of 7.786mm.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

certifire

CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 75 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	1.371	0.750	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
20	1.735	1.058	0.668	0.491	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
25	2.088	1.337	0.956	0.667	0.532	0.500	0.458	0.441	0.441	0.441	0.441	0.441
30	2.440	1.616	1.195	0.843	0.645	0.596	0.544	0.503	0.460	0.441	0.441	0.441
35	2.793	1.895	1.422	1.019	0.758	0.692	0.630	0.585	0.538	0.441	0.441	0.441
40	3.145	2.174	1.649	1.205	0.871	0.787	0.716	0.666	0.616	0.505	0.441	0.441
45	3.498	2.453	1.876	1.391	0.984	0.883	0.802	0.747	0.695	0.579	0.443	0.441
50	3.850	2.731	2.103	1.577	1.130	0.979	0.888	0.829	0.773	0.653	0.512	0.441
55	4.203	3.010	2.330	1.763	1.288	1.107	0.974	0.910	0.851	0.727	0.581	0.441
60	4.486	3.289	2.556	1.949	1.446	1.256	1.083	0.991	0.929	0.802	0.650	0.441
65	4.742	3.568	2.783	2.135	1.604	1.404	1.214	1.099	1.007	0.876	0.719	0.486
70	4.998	3.847	3.010	2.321	1.762	1.552	1.345	1.216	1.114	0.950	0.788	0.552
75	5.254	4.126	3.237	2.507	1.920	1.701	1.477	1.334	1.223	1.028	0.857	0.618
80	5.509	4.353	3.464	2.693	2.078	1.849	1.608	1.451	1.332	1.127	0.926	0.683
85	5.765	4.494	3.691	2.879	2.236	1.997	1.739	1.568	1.442	1.227	0.995	0.749
90	6.021	4.634	3.918	3.064	2.394	2.145	1.870	1.686	1.551	1.326	1.078	0.815
95	6.277	4.774	4.144	3.250	2.552	2.294	2.001	1.803	1.660	1.426	1.168	0.880
100	6.523	4.915	4.341	3.436	2.710	2.442	2.132	1.921	1.769	1.525	1.257	0.946
105	6.689	5.055	4.469	3.622	2.867	2.590	2.263	2.038	1.878	1.625	1.346	1.012
110	6.855	5.196	4.596	3.808	3.025	2.739	2.394	2.156	1.988	1.724	1.436	1.089
115	7.021	5.336	4.724	3.994	3.183	2.887	2.525	2.273	2.097	1.824	1.525	1.166
120	7.187	5.476	4.852	4.180	3.341	3.035	2.656	2.391	2.206	1.923	1.614	1.244
125	7.352	5.617	4.980	4.345	3.499	3.184	2.787	2.508	2.315	2.022	1.704	1.321
130	7.518	5.757	5.108	4.472	3.657	3.332	2.918	2.626	2.425	2.122	1.793	1.399
135	7.684	5.897	5.236	4.598	3.815	3.480	3.049	2.743	2.534	2.221	1.882	1.476
140	7.850	6.038	5.364	4.724	3.973	3.628	3.180	2.861	2.643	2.321	1.972	1.553
145	8.016	6.178	5.492	4.850	4.131	3.777	3.311	2.978	2.752	2.420	2.061	1.631
150	8.182	6.319	5.620	4.977	4.289	3.925	3.442	3.095	2.861	2.520	2.150	1.708
155	8.348	6.459	5.748	5.103	4.435	4.073	3.573	3.213	2.971	2.619	2.240	1.786
160	8.505	6.627	5.875	5.229	4.580	4.222	3.704	3.330	3.080	2.719	2.329	1.863
165	8.640	6.809	6.003	5.355	4.725	4.373	3.835	3.448	3.189	2.818	2.418	1.941
170	8.774	6.990	6.131	5.482	4.870	4.529	3.966	3.565	3.298	2.918	2.508	2.018
175	8.908	7.172	6.259	5.608	5.014	4.684	4.097	3.683	3.407	3.017	2.597	2.096
180	9.042	7.353	6.387	5.734	5.159	4.840	4.228	3.800	3.517	3.117	2.686	2.173
185	9.176	7.535	6.522	5.860	5.304	4.995	4.380	3.918	3.626	3.216	2.775	2.251
190	9.310	7.716	6.737	5.987	5.449	5.150	4.556	4.035	3.735	3.315	2.865	2.328
195	9.444	7.898	6.951	6.113	5.594	5.306	4.732	4.153	3.844	3.415	2.954	2.406
200	9.578	8.079	7.166	6.239	5.739	5.461	4.908	4.270	3.953	3.514	3.043	2.483
205	9.712	8.261	7.380	6.365	5.884	5.617	5.085	4.449	4.063	3.614	3.133	2.560
210	9.846	8.442	7.595	6.492	6.029	5.772	5.261	4.649	4.172	3.713	3.222	2.638
215	9.981	8.598	7.810	6.750	6.174	5.928	5.437	4.850	4.281	3.813	3.311	2.715
220	10.115	8.748	8.024	7.024	6.319	6.083	5.613	5.051	4.473	3.912	3.401	2.793
225	10.249	8.899	8.239	7.297	6.464	6.239	5.789	5.251	4.683	4.012	3.490	2.870
230	10.383	9.049	8.453	7.570	6.694	6.394	5.966	5.452	4.894	4.111	3.579	2.948

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

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CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 90 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	2.085	1.308	0.788	0.467	0.441	0.441	0.441	0.441	0.441	0.441	0.441	0.441
20	2.652	1.676	1.099	0.760	0.577	0.532	0.478	0.444	0.441	0.441	0.441	0.441
25	3.209	2.046	1.427	1.065	0.786	0.713	0.628	0.570	0.523	0.441	0.441	0.441
30	3.767	2.417	1.756	1.340	0.994	0.895	0.777	0.697	0.632	0.529	0.441	0.441
35	4.319	2.787	2.084	1.615	1.222	1.087	0.927	0.823	0.741	0.622	0.513	0.441
40	4.736	3.157	2.412	1.890	1.451	1.298	1.090	0.950	0.850	0.714	0.600	0.443
45	5.152	3.528	2.741	2.165	1.680	1.509	1.274	1.098	0.959	0.806	0.686	0.523
50	5.569	3.898	3.069	2.441	1.910	1.720	1.458	1.267	1.091	0.898	0.773	0.604
55	5.986	4.269	3.397	2.716	2.139	1.931	1.642	1.436	1.246	0.990	0.859	0.685
60	6.402	4.544	3.726	2.991	2.368	2.142	1.826	1.606	1.402	1.109	0.946	0.765
65	6.675	4.810	4.054	3.266	2.597	2.353	2.010	1.775	1.557	1.237	1.036	0.846
70	6.901	5.076	4.344	3.542	2.827	2.564	2.194	1.944	1.713	1.365	1.142	0.927
75	7.127	5.342	4.517	3.817	3.056	2.775	2.378	2.114	1.868	1.493	1.249	1.007
80	7.353	5.609	4.690	4.092	3.285	2.986	2.562	2.283	2.024	1.621	1.355	1.099
85	7.579	5.875	4.863	4.340	3.514	3.197	2.746	2.453	2.179	1.749	1.461	1.192
90	7.805	6.141	5.036	4.504	3.744	3.408	2.930	2.622	2.334	1.877	1.567	1.284
95	8.031	6.407	5.209	4.668	3.973	3.619	3.114	2.791	2.490	2.005	1.673	1.377
100	8.257	6.621	5.382	4.832	4.202	3.830	3.297	2.961	2.645	2.133	1.780	1.469
105	8.477	6.804	5.555	4.996	4.390	4.041	3.481	3.130	2.801	2.261	1.886	1.562
110	8.601	6.988	5.728	5.160	4.548	4.252	3.665	3.299	2.956	2.388	1.992	1.655
115	8.726	7.172	5.902	5.324	4.705	4.421	3.849	3.469	3.111	2.516	2.098	1.747
120	8.850	7.355	6.075	5.488	4.862	4.577	4.033	3.638	3.267	2.644	2.205	1.840
125	8.974	7.539	6.248	5.652	5.019	4.734	4.217	3.808	3.422	2.772	2.311	1.933
130	9.098	7.723	6.421	5.816	5.176	4.890	4.387	3.977	3.578	2.900	2.417	2.025
135	9.222	7.906	6.608	5.980	5.333	5.046	4.544	4.146	3.733	3.028	2.523	2.118
140	9.347	8.090	6.807	6.144	5.490	5.202	4.702	4.314	3.888	3.156	2.629	2.210
145	9.471	8.274	7.006	6.308	5.648	5.359	4.860	4.469	4.044	3.284	2.736	2.303
150	9.595	8.457	7.206	6.472	5.805	5.515	5.018	4.623	4.199	3.412	2.842	2.396
155	9.719	8.599	7.405	6.652	5.962	5.671	5.175	4.777	4.358	3.540	2.948	2.488
160	9.843	8.738	7.605	6.836	6.119	5.827	5.333	4.931	4.522	3.668	3.054	2.581
165	9.968	8.877	7.804	7.020	6.276	5.984	5.491	5.085	4.686	3.795	3.161	2.674
170	10.092	9.015	8.003	7.204	6.433	6.140	5.649	5.239	4.850	3.923	3.267	2.766
175	10.216	9.154	8.203	7.388	6.621	6.296	5.806	5.393	5.014	4.051	3.373	2.859
180	10.340	9.293	8.402	7.572	6.834	6.452	5.964	5.548	5.178	4.179	3.479	2.952
185	10.464	9.432	8.570	7.756	7.046	6.656	6.122	5.702	5.342	4.310	3.585	3.044
190	10.589	9.570	8.721	7.940	7.259	6.884	6.279	5.856	5.506	4.502	3.692	3.137
195	10.713	9.709	8.872	8.124	7.472	7.112	6.437	6.010	5.670	4.694	3.798	3.229
200	10.837	9.848	9.023	8.308	7.685	7.340	6.653	6.164	5.834	4.886	3.904	3.322
205	10.961	9.986	9.174	8.489	7.897	7.567	6.911	6.318	5.998	5.078	4.010	3.415
210	11.085	10.125	9.325	8.648	8.110	7.795	7.170	6.472	6.162	5.270	4.117	3.507
215	11.210	10.264	9.476	8.808	8.323	8.023	7.428	6.735	6.326	5.462	4.223	3.600
220	11.334	10.403	9.627	8.967	8.518	8.250	7.686	7.026	6.490	5.654	4.356	3.693
225	11.509	10.541	9.778	9.126	8.672	8.475	7.945	7.316	6.760	5.846	4.566	3.785
230	11.847	10.680	9.929	9.286	8.826	8.628	8.203	7.607	7.040	6.038	4.775	3.878

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 105 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	2.799	1.944	1.074	0.815	0.536	0.490	0.464	0.441	0.441	0.441	0.441	0.441
20	3.585	2.494	1.481	1.131	0.839	0.758	0.662	0.594	0.536	0.441	0.441	0.441
25	4.354	3.050	1.914	1.496	1.156	1.043	0.905	0.807	0.726	0.583	0.469	0.441
30	4.913	3.606	2.347	1.860	1.466	1.331	1.156	1.021	0.915	0.737	0.586	0.452
35	5.472	4.161	2.780	2.225	1.775	1.620	1.412	1.253	1.112	0.891	0.703	0.549
40	6.032	4.624	3.213	2.589	2.084	1.908	1.669	1.484	1.317	1.047	0.820	0.647
45	6.560	5.056	3.646	2.954	2.394	2.196	1.926	1.716	1.522	1.210	0.937	0.745
50	6.919	5.488	4.079	3.318	2.703	2.484	2.183	1.947	1.727	1.373	1.061	0.842
55	7.278	5.920	4.492	3.683	3.013	2.772	2.439	2.178	1.932	1.536	1.200	0.940
60	7.637	6.352	4.882	4.047	3.322	3.060	2.696	2.410	2.137	1.699	1.338	1.040
65	7.996	6.657	5.272	4.382	3.632	3.348	2.953	2.641	2.342	1.862	1.477	1.149
70	8.355	6.893	5.663	4.649	3.941	3.636	3.210	2.873	2.547	2.024	1.615	1.258
75	8.714	7.129	6.053	4.916	4.250	3.925	3.467	3.104	2.752	2.187	1.754	1.366
80	9.074	7.366	6.443	5.183	4.460	4.213	3.723	3.335	2.957	2.350	1.893	1.475
85	9.434	7.602	6.666	5.450	4.650	4.430	3.980	3.567	3.162	2.513	2.031	1.583
90	9.793	7.838	6.857	5.717	4.840	4.616	4.237	3.798	3.367	2.676	2.170	1.692
95	10.153	8.074	7.049	5.984	5.030	4.801	4.437	4.030	3.572	2.839	2.309	1.801
100	10.513	8.310	7.240	6.251	5.220	4.987	4.618	4.261	3.777	3.002	2.447	1.909
105	10.872	8.511	7.432	6.515	5.409	5.173	4.799	4.449	3.982	3.165	2.586	2.018
110	11.232	8.638	7.623	6.729	5.599	5.359	4.980	4.628	4.187	3.328	2.724	2.126
115	11.494	8.765	7.815	6.942	5.789	5.545	5.161	4.807	4.381	3.491	2.863	2.235
120	11.640	8.892	8.006	7.155	5.979	5.731	5.342	4.986	4.562	3.654	3.002	2.343
125	11.786	9.019	8.198	7.368	6.169	5.916	5.523	5.165	4.742	3.817	3.140	2.452
130	11.932	9.146	8.389	7.581	6.359	6.102	5.704	5.344	4.923	3.979	3.279	2.561
135	12.077	9.273	8.550	7.794	6.564	6.288	5.885	5.523	5.104	4.142	3.417	2.669
140	12.223	9.400	8.688	8.007	6.817	6.474	6.066	5.702	5.284	4.306	3.556	2.778
145	12.369	9.526	8.826	8.220	7.070	6.699	6.247	5.881	5.465	4.486	3.695	2.886
150	12.515	9.653	8.965	8.433	7.323	6.931	6.428	6.060	5.645	4.666	3.833	2.995
155	12.661	9.780	9.103	8.589	7.576	7.164	6.622	6.239	5.826	4.847	3.972	3.104
160	12.806	9.907	9.241	8.732	7.829	7.396	6.827	6.418	6.006	5.027	4.110	3.212
165	12.952	10.034	9.379	8.876	8.082	7.629	7.031	6.615	6.187	5.207	4.249	3.321
170	13.098	10.161	9.518	9.019	8.334	7.861	7.236	6.830	6.368	5.388	4.414	3.429
175	13.244	10.288	9.656	9.163	8.542	8.094	7.440	7.045	6.560	5.568	4.595	3.538
180	13.389	10.415	9.794	9.307	8.697	8.326	7.645	7.260	6.788	5.748	4.777	3.647
185	13.535	10.542	9.932	9.450	8.852	8.532	7.849	7.475	7.016	5.929	4.958	3.755
190	13.681	10.669	10.071	9.594	9.007	8.694	8.054	7.690	7.244	6.109	5.139	3.864
195	13.827	10.796	10.209	9.737	9.162	8.856	8.258	7.905	7.472	6.289	5.320	3.972
200	13.973	10.923	10.347	9.881	9.317	9.019	8.462	8.120	7.700	6.470	5.501	4.081
205	14.118	11.050	10.485	10.024	9.472	9.181	8.639	8.335	7.928	6.724	5.682	4.190
210	14.264	11.177	10.624	10.168	9.627	9.343	8.815	8.534	8.156	6.996	5.863	4.298
215	14.410	11.304	10.762	10.312	9.782	9.506	8.991	8.707	8.384	7.269	6.044	4.503
220	14.556	11.434	10.900	10.455	9.937	9.668	9.166	8.880	8.576	7.541	6.225	4.711
225	14.701	11.746	11.038	10.599	10.092	9.830	9.342	9.053	8.745	7.813	6.407	4.919
230	14.847	12.059	11.177	10.742	10.247	9.992	9.518	9.226	8.915	8.085	6.627	5.126

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

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CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 120 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	3.514	2.581	1.891	1.055	0.839	0.766	0.674	0.530	0.471	0.441	0.441	0.441
20	4.426	3.326	2.459	1.510	1.163	1.059	0.936	0.826	0.739	0.578	0.442	0.441
25	5.014	4.089	3.056	1.994	1.552	1.425	1.261	1.136	1.025	0.819	0.634	0.471
30	5.601	4.721	3.653	2.478	1.942	1.790	1.590	1.437	1.299	1.057	0.826	0.613
35	6.189	5.302	4.250	2.962	2.332	2.155	1.920	1.739	1.573	1.281	1.018	0.755
40	6.777	5.884	4.771	3.446	2.721	2.520	2.250	2.041	1.848	1.506	1.187	0.897
45	7.365	6.465	5.285	3.931	3.111	2.886	2.579	2.343	2.122	1.730	1.355	1.042
50	7.953	6.826	5.800	4.423	3.500	3.251	2.909	2.644	2.397	1.954	1.524	1.204
55	8.565	7.171	6.314	4.943	3.890	3.616	3.239	2.946	2.671	2.178	1.693	1.366
60	9.360	7.516	6.675	5.464	4.280	3.981	3.568	3.248	2.945	2.402	1.862	1.528
65	10.155	7.862	6.947	5.984	4.678	4.342	3.898	3.549	3.220	2.627	2.031	1.690
70	10.950	8.207	7.219	6.504	5.077	4.675	4.227	3.851	3.494	2.851	2.199	1.852
75	11.482	8.558	7.491	6.735	5.476	5.008	4.488	4.153	3.768	3.075	2.368	2.014
80	11.617	8.927	7.763	6.965	5.876	5.341	4.729	4.404	4.043	3.299	2.537	2.176
85	11.752	9.296	8.035	7.196	6.275	5.674	4.971	4.607	4.313	3.523	2.706	2.338
90	11.888	9.666	8.307	7.427	6.597	6.007	5.212	4.810	4.511	3.748	2.875	2.500
95	12.023	10.035	8.524	7.658	6.817	6.340	5.453	5.013	4.709	3.972	3.044	2.662
100	12.158	10.404	8.658	7.888	7.037	6.623	5.694	5.216	4.907	4.196	3.212	2.824
105	12.293	10.773	8.793	8.119	7.256	6.856	5.935	5.419	5.106	4.403	3.381	2.986
110	12.428	11.143	8.927	8.350	7.476	7.089	6.176	5.622	5.304	4.595	3.550	3.148
115	12.563	11.460	9.061	8.535	7.696	7.323	6.417	5.825	5.502	4.788	3.719	3.310
120	12.699	11.601	9.196	8.671	7.915	7.556	6.686	6.028	5.700	4.980	3.888	3.472
125	12.834	11.742	9.330	8.806	8.135	7.789	6.970	6.231	5.899	5.172	4.056	3.634
130	12.969	11.883	9.464	8.942	8.354	8.023	7.254	6.434	6.097	5.364	4.225	3.796
135	13.104	12.024	9.599	9.078	8.539	8.256	7.538	6.710	6.295	5.557	4.414	3.958
140	13.239	12.165	9.733	9.214	8.686	8.482	7.822	7.023	6.493	5.749	4.620	4.120
145	13.375	12.306	9.868	9.349	8.832	8.631	8.106	7.337	6.759	5.941	4.826	4.282
150	13.510	12.447	10.002	9.485	8.978	8.780	8.390	7.650	7.029	6.133	5.031	4.424
155	13.645	12.588	10.136	9.621	9.124	8.929	8.581	7.964	7.299	6.325	5.237	4.562
160	13.780	12.729	10.271	9.757	9.271	9.078	8.734	8.277	7.568	6.519	5.442	4.700
165	13.915	12.870	10.405	9.892	9.417	9.227	8.888	8.532	7.838	6.735	5.648	4.839
170	14.050	13.011	10.539	10.028	9.563	9.375	9.042	8.692	8.108	6.950	5.854	4.977
175	14.186	13.152	10.674	10.164	9.709	9.524	9.196	8.852	8.377	7.166	6.059	5.116
180	14.321	13.293	10.808	10.299	9.856	9.673	9.350	9.012	8.581	7.381	6.265	5.254
185	14.456	13.434	10.943	10.435	10.002	9.822	9.504	9.173	8.750	7.597	6.471	5.393
190	14.591	13.575	11.077	10.571	10.148	9.971	9.658	9.333	8.919	7.812	6.699	5.531
195	14.726	13.716	11.211	10.707	10.294	10.120	9.812	9.493	9.089	8.028	6.932	5.670
200	14.862	13.857	11.346	10.842	10.441	10.268	9.966	9.653	9.258	8.244	7.165	5.808
205	14.997	13.998	11.536	10.978	10.587	10.417	10.119	9.814	9.427	8.459	7.398	5.947
210	15.132	14.139	11.813	11.114	10.733	10.566	10.273	9.974	9.596	8.645	7.631	6.085
215	15.267	14.280	12.091	11.249	10.879	10.715	10.427	10.134	9.765	8.829	7.864	6.224
220	15.402	14.421	12.369	11.385	11.026	10.864	10.581	10.294	9.934	9.014	8.097	6.362
225	15.538	14.562	12.646	11.618	11.172	11.013	10.735	10.454	10.104	9.198	8.330	6.500
230	15.673	14.703	12.924	11.895	11.318	11.162	10.889	10.615	10.273	9.383	8.538	6.752

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 135 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	4.279	3.217	2.486	1.864	1.042	0.949	0.883	0.804	0.727	0.478	0.441	0.441
20	5.125	4.157	3.238	2.455	1.536	1.365	1.221	1.112	1.012	0.800	0.603	0.441
25	6.025	4.786	4.029	3.094	2.062	1.807	1.624	1.484	1.356	1.128	0.884	0.642
30	6.926	5.354	4.723	3.732	2.588	2.250	2.026	1.856	1.700	1.433	1.152	0.859
35	7.826	5.923	5.365	4.368	3.115	2.692	2.429	2.228	2.044	1.738	1.409	1.084
40	8.726	6.492	6.008	4.976	3.641	3.134	2.831	2.600	2.388	2.043	1.666	1.328
45	9.626	7.061	6.587	5.584	4.167	3.577	3.234	2.972	2.732	2.348	1.923	1.573
50	10.527	7.629	6.953	6.192	4.792	4.019	3.636	3.344	3.076	2.653	2.180	1.817
55	11.451	8.198	7.318	6.653	5.450	4.569	4.038	3.716	3.419	2.958	2.437	2.062
60	11.739	8.864	7.683	6.960	6.109	5.309	4.500	4.088	3.763	3.263	2.693	2.306
65	12.026	9.619	8.048	7.266	6.609	6.049	5.072	4.491	4.107	3.568	2.950	2.550
70	12.314	10.374	8.414	7.573	6.872	6.600	5.643	4.937	4.447	3.873	3.207	2.795
75	12.602	11.129	8.842	7.880	7.135	6.851	6.215	5.382	4.782	4.178	3.464	3.039
80	12.889	11.507	9.282	8.186	7.398	7.101	6.621	5.828	5.117	4.419	3.721	3.284
85	13.177	11.638	9.723	8.491	7.661	7.351	6.857	6.273	5.451	4.618	3.977	3.528
90	13.464	11.770	10.163	8.766	7.923	7.601	7.094	6.617	5.786	4.817	4.234	3.773
95	13.752	11.901	10.603	9.042	8.186	7.851	7.330	6.851	6.121	5.016	4.441	4.017
100	14.040	12.032	11.043	9.318	8.449	8.101	7.567	7.084	6.456	5.215	4.630	4.262
105	14.327	12.163	11.445	9.594	8.616	8.352	7.803	7.318	6.724	5.413	4.819	4.420
110	14.615	12.295	11.581	9.869	8.774	8.545	8.040	7.552	6.981	5.612	5.008	4.562
115	14.903	12.426	11.717	10.145	8.933	8.686	8.276	7.786	7.238	5.811	5.197	4.705
120	15.190	12.557	11.853	10.421	9.091	8.828	8.497	8.020	7.495	6.010	5.386	4.847
125	15.478	12.688	11.989	10.696	9.250	8.970	8.645	8.254	7.752	6.209	5.574	4.989
130	15.765	12.819	12.125	10.972	9.408	9.112	8.792	8.482	8.008	6.408	5.763	5.131
135	-	12.951	12.261	11.248	9.566	9.253	8.940	8.635	8.265	6.671	5.952	5.273
140	-	13.082	12.397	11.482	9.725	9.395	9.088	8.789	8.502	6.995	6.141	5.415
145	-	13.213	12.533	11.639	9.883	9.537	9.236	8.942	8.658	7.319	6.330	5.557
150	-	13.344	12.669	11.795	10.042	9.679	9.384	9.096	8.815	7.643	6.520	5.700
155	-	13.476	12.805	11.952	10.200	9.820	9.532	9.250	8.972	7.967	6.713	5.842
160	-	13.607	12.941	12.108	10.359	9.962	9.679	9.403	9.128	8.291	6.907	5.984
165	-	13.738	13.077	12.264	10.517	10.104	9.827	9.557	9.285	8.545	7.101	6.126
170	-	13.869	13.213	12.421	10.675	10.245	9.975	9.710	9.441	8.711	7.295	6.268
175	-	14.000	13.349	12.577	10.834	10.387	10.123	9.864	9.598	8.877	7.489	6.410
180	-	14.132	13.485	12.734	10.992	10.529	10.271	10.017	9.754	9.044	7.683	6.568
185	-	14.263	13.621	12.890	11.151	10.671	10.419	10.171	9.911	9.210	7.877	6.756
190	-	14.394	13.756	13.047	11.309	10.812	10.566	10.325	10.067	9.376	8.071	6.945
195	-	14.525	13.892	13.203	11.488	10.954	10.714	10.478	10.224	9.543	8.264	7.133
200	-	14.657	14.028	13.360	11.730	11.096	10.862	10.632	10.380	9.709	8.458	7.321
205	-	14.788	14.164	13.516	11.971	11.238	11.010	10.785	10.537	9.875	8.653	7.509
210	-	14.919	14.300	13.672	12.212	11.379	11.158	10.939	10.693	10.042	8.848	7.697
215	-	15.050	14.436	13.829	12.454	11.615	11.306	11.093	10.850	10.208	9.043	7.886
220	-	15.181	14.572	13.985	12.695	11.901	11.475	11.246	11.007	10.374	9.237	8.074
225	-	15.313	14.708	14.142	12.936	12.187	11.748	11.400	11.163	10.541	9.432	8.262
230	-	15.444	14.844	14.298	13.178	12.472	12.022	11.642	11.320	10.707	9.627	8.450

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

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Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 150 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	10.285	3.853	3.082	2.440	1.865	1.657	1.073	0.974	0.913	0.756	0.467	0.441
20	10.285	4.708	4.016	3.207	2.476	2.205	1.596	1.394	1.280	1.074	0.828	0.581
25	10.285	5.406	4.716	4.034	3.148	2.812	2.152	1.840	1.693	1.460	1.200	0.886
30	10.285	6.104	5.301	4.644	3.821	3.419	2.709	2.286	2.106	1.847	1.562	1.224
35	10.285	6.802	5.885	5.150	4.504	4.026	3.265	2.732	2.520	2.233	1.924	1.585
40	11.073	7.500	6.469	5.657	5.213	4.702	3.821	3.178	2.933	2.620	2.286	1.946
45	11.565	8.198	7.054	6.163	5.922	5.434	4.411	3.624	3.346	3.006	2.648	2.307
50	12.058	9.251	7.638	6.669	6.561	6.166	5.215	4.070	3.760	3.393	3.011	2.668
55	12.550	10.529	8.222	7.176	6.882	6.667	6.019	4.778	4.173	3.779	3.373	3.030
60	13.043	11.482	8.938	7.682	7.203	6.969	6.615	5.765	4.841	4.166	3.735	3.391
65	13.535	11.666	9.751	8.188	7.524	7.270	6.894	6.571	5.623	4.563	4.097	3.752
70	14.028	11.849	10.564	8.716	7.845	7.572	7.174	6.835	6.405	4.967	4.395	4.113
75	14.520	12.032	11.377	9.269	8.165	7.874	7.453	7.099	6.723	5.371	4.612	4.383
80	15.013	12.216	11.551	9.823	8.490	8.176	7.733	7.363	6.974	5.774	4.828	4.554
85	15.505	12.399	11.682	10.376	8.890	8.479	8.012	7.627	7.225	6.178	5.045	4.725
90	15.998	12.582	11.813	10.929	9.291	8.843	8.292	7.891	7.475	6.548	5.261	4.895
95	-	12.765	11.944	11.441	9.691	9.206	8.569	8.156	7.726	6.779	5.478	5.066
100	-	12.949	12.075	11.577	10.091	9.569	8.841	8.420	7.977	7.009	5.694	5.237
105	-	13.132	12.206	11.713	10.491	9.932	9.114	8.637	8.228	7.239	5.911	5.408
110	-	13.315	12.338	11.848	10.892	10.295	9.386	8.842	8.475	7.470	6.127	5.578
115	-	13.499	12.469	11.984	11.292	10.659	9.659	9.048	8.627	7.700	6.343	5.749
120	-	13.682	12.600	12.120	11.524	11.022	9.932	9.254	8.780	7.931	6.571	5.920
125	-	13.865	12.731	12.255	11.670	11.385	10.204	9.460	8.932	8.161	6.832	6.091
130	-	14.048	12.862	12.391	11.816	11.560	10.477	9.665	9.084	8.392	7.092	6.261
135	-	14.232	12.993	12.526	11.962	11.710	10.749	9.871	9.236	8.575	7.352	6.432
140	-	14.415	13.124	12.662	12.107	11.860	11.022	10.077	9.388	8.733	7.613	6.588
145	-	14.598	13.255	12.798	12.253	12.009	11.295	10.283	9.540	8.891	7.873	6.734
150	-	14.782	13.386	12.933	12.399	12.159	11.513	10.488	9.693	9.050	8.133	6.879
155	-	14.965	13.518	13.069	12.545	12.309	11.681	10.694	9.845	9.208	8.394	7.025
160	-	15.148	13.649	13.204	12.690	12.459	11.848	10.900	9.997	9.367	8.586	7.170
165	-	15.331	13.780	13.340	12.836	12.609	12.016	11.106	10.149	9.525	8.751	7.316
170	-	15.515	13.911	13.476	12.982	12.758	12.183	11.312	10.301	9.684	8.916	7.461
175	-	15.698	14.042	13.611	13.128	12.908	12.350	11.514	10.454	9.842	9.080	7.607
180	-	-	14.173	13.747	13.273	13.058	12.518	11.712	10.606	10.001	9.245	7.752
185	-	-	14.304	13.883	13.419	13.208	12.685	11.910	10.758	10.159	9.410	7.897
190	-	-	14.435	14.018	13.565	13.358	12.852	12.107	10.910	10.318	9.574	8.043
195	-	-	14.567	14.154	13.711	13.507	13.020	12.305	11.062	10.476	9.739	8.188
200	-	-	14.698	14.289	13.857	13.657	13.187	12.503	11.215	10.634	9.903	8.334
205	-	-	14.829	14.425	14.002	13.807	13.354	12.701	11.367	10.793	10.068	8.483
210	-	-	14.960	14.561	14.148	13.957	13.522	12.899	11.592	10.951	10.233	8.693
215	-	-	15.091	14.696	14.294	14.107	13.689	13.097	11.866	11.110	10.397	8.903
220	-	-	15.222	14.832	14.440	14.256	13.856	13.295	12.141	11.268	10.562	9.113
225	-	-	15.353	14.968	14.585	14.406	14.024	13.493	12.415	11.427	10.727	9.323
230	-	-	15.484	15.103	14.731	14.556	14.191	13.690	12.689	11.696	10.891	9.533

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

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CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 165 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	12.282	4.470	3.677	3.015	2.430	2.217	1.944	1.734	1.117	0.913	0.755	0.464
20	12.282	5.496	4.592	3.960	3.214	2.937	2.571	2.289	1.684	1.371	1.105	0.795
25	12.282	6.586	5.287	4.698	4.072	3.727	3.257	2.892	2.288	1.872	1.576	1.235
30	12.282	7.677	5.983	5.296	4.685	4.438	3.943	3.496	2.891	2.374	2.047	1.718
35	12.282	8.768	6.678	5.894	5.208	4.940	4.684	4.099	3.495	2.876	2.517	2.201
40	12.282	9.859	7.374	6.493	5.732	5.485	5.485	4.847	4.099	3.378	2.988	2.684
45	12.282	10.950	8.069	7.091	6.287	6.287	6.287	5.668	4.877	3.880	3.459	3.168
50	13.320	11.657	9.038	7.689	6.779	6.741	6.741	6.488	5.744	4.418	3.929	3.651
55	13.902	12.065	10.378	8.287	7.303	7.067	7.067	6.804	6.540	5.144	4.404	4.134
60	14.484	12.472	11.466	9.120	7.826	7.449	7.393	7.110	6.828	5.869	4.895	4.522
65	15.066	12.880	11.642	10.057	8.350	7.951	7.718	7.417	7.117	6.535	5.386	4.860
70	15.648	13.288	11.817	10.993	8.975	8.453	8.044	7.723	7.406	6.782	5.877	5.197
75	16.230	13.696	11.993	11.500	9.630	9.010	8.370	8.029	7.695	7.030	6.367	5.535
80	-	14.103	12.168	11.635	10.285	9.569	8.784	8.335	7.984	7.277	6.642	5.873
85	-	14.511	12.344	11.769	10.940	10.127	9.239	8.697	8.272	7.525	6.833	6.211
90	-	14.919	12.519	11.904	11.464	10.686	9.693	9.104	8.587	7.772	7.024	6.522
95	-	15.327	12.695	12.038	11.603	11.245	10.147	9.510	8.957	8.019	7.215	6.662
100	-	15.734	12.870	12.173	11.743	11.524	10.602	9.916	9.327	8.267	7.407	6.801
105	-	-	13.046	12.307	11.882	11.667	11.056	10.323	9.697	8.506	7.598	6.941
110	-	-	13.221	12.442	12.022	11.809	11.455	10.729	10.068	8.708	7.789	7.080
115	-	-	13.397	12.576	12.161	11.952	11.603	11.136	10.438	8.910	7.980	7.219
120	-	-	13.572	12.711	12.301	12.095	11.750	11.470	10.808	9.112	8.171	7.359
125	-	-	13.748	12.845	12.440	12.238	11.898	11.620	11.178	9.314	8.362	7.498
130	-	-	13.923	12.980	12.580	12.381	12.046	11.770	11.478	9.516	8.538	7.638
135	-	-	14.099	13.114	12.720	12.523	12.194	11.920	11.631	9.718	8.695	7.777
140	-	-	14.274	13.249	12.859	12.666	12.342	12.070	11.783	9.920	8.852	7.916
145	-	-	14.450	13.383	12.999	12.809	12.489	12.220	11.936	10.122	9.008	8.056
150	-	-	14.625	13.518	13.138	12.952	12.637	12.370	12.089	10.324	9.165	8.195
155	-	-	14.801	13.653	13.278	13.095	12.785	12.520	12.242	10.526	9.322	8.335
160	-	-	14.976	13.787	13.417	13.237	12.933	12.671	12.395	10.728	9.478	8.475
165	-	-	15.152	13.922	13.557	13.380	13.080	12.821	12.548	10.930	9.635	8.644
170	-	-	15.327	14.056	13.696	13.523	13.228	12.971	12.701	11.132	9.792	8.813
175	-	-	15.503	14.191	13.836	13.666	13.376	13.121	12.854	11.334	9.948	8.982
180	-	-	15.678	14.325	13.975	13.808	13.524	13.271	13.007	11.540	10.105	9.150
185	-	-	-	14.460	14.115	13.951	13.672	13.421	13.159	11.749	10.262	9.319
190	-	-	-	14.594	14.255	14.094	13.819	13.571	13.312	11.959	10.418	9.488
195	-	-	-	14.729	14.394	14.237	13.967	13.721	13.465	12.168	10.575	9.657
200	-	-	-	14.863	14.534	14.380	14.115	13.871	13.618	12.377	10.732	9.826
205	-	-	-	14.998	14.673	14.522	14.263	14.021	13.771	12.587	10.888	9.995
210	-	-	-	15.132	14.813	14.665	14.411	14.171	13.924	12.796	11.045	10.164
215	-	-	-	15.267	14.952	14.808	14.558	14.321	14.077	13.005	11.202	10.333
220	-	-	-	15.401	15.092	14.951	14.706	14.471	14.230	13.214	11.358	10.502
225	-	-	-	15.536	15.231	15.094	14.854	14.621	14.383	13.424	11.593	10.671
230	-	-	-	15.670	15.371	15.236	15.002	14.771	14.535	13.633	11.890	10.840

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 180 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	13.359	11.725	4.285	3.591	2.995	2.777	2.498	2.293	2.100	1.669	0.913	0.702
20	13.359	11.725	5.300	4.537	3.953	3.669	3.296	3.019	2.761	2.267	1.544	1.081
25	13.359	11.725	6.379	5.227	4.700	4.501	4.163	3.806	3.475	2.955	2.307	1.834
30	13.359	11.725	7.459	5.918	5.298	5.071	4.749	4.488	4.189	3.643	3.069	2.587
35	13.359	11.725	8.539	6.608	5.896	5.641	5.281	4.995	4.993	4.332	3.832	3.340
40	13.359	11.725	9.618	7.299	6.495	6.211	5.814	5.813	5.813	5.037	4.534	4.092
45	13.359	11.725	10.698	7.989	7.093	6.781	6.556	6.556	6.556	5.742	5.137	4.685
50	14.444	12.756	11.548	8.915	7.691	7.352	6.886	6.886	6.886	6.446	5.741	5.215
55	15.528	13.247	11.917	10.381	8.290	7.922	7.411	7.216	7.216	6.764	6.345	5.746
60	-	13.738	12.287	11.486	9.202	8.505	7.944	7.546	7.546	7.048	6.667	6.276
65	-	14.229	12.657	11.688	10.248	9.407	8.478	8.032	7.876	7.331	6.888	6.591
70	-	14.720	13.027	11.890	11.295	10.309	9.192	8.547	8.206	7.615	7.110	6.743
75	-	15.211	13.396	12.092	11.564	11.212	9.905	9.124	8.565	7.898	7.331	6.895
80	-	15.702	13.766	12.294	11.720	11.535	10.619	9.701	9.036	8.182	7.553	7.047
85	-	-	14.136	12.496	11.876	11.677	11.332	10.278	9.506	8.465	7.774	7.200
90	-	-	14.505	12.698	12.032	11.818	11.552	10.855	9.977	8.859	7.996	7.352
95	-	-	14.875	12.901	12.188	11.959	11.696	11.429	10.448	9.255	8.217	7.504
100	-	-	15.245	13.103	12.344	12.100	11.840	11.575	10.919	9.651	8.438	7.656
105	-	-	15.614	13.305	12.499	12.242	11.983	11.722	11.390	10.047	8.658	7.808
110	-	-	15.984	13.507	12.655	12.383	12.127	11.868	11.567	10.443	8.878	7.960
115	-	-	-	13.709	12.811	12.524	12.270	12.015	11.718	10.839	9.098	8.112
120	-	-	-	13.911	12.967	12.666	12.414	12.161	11.868	11.236	9.317	8.265
125	-	-	-	14.113	13.123	12.807	12.558	12.307	12.019	11.507	9.537	8.417
130	-	-	-	14.315	13.279	12.948	12.701	12.454	12.170	11.660	9.757	8.568
135	-	-	-	14.518	13.435	13.089	12.845	12.600	12.321	11.814	9.976	8.719
140	-	-	-	14.720	13.591	13.231	12.989	12.746	12.472	11.967	10.196	8.870
145	-	-	-	14.922	13.747	13.372	13.132	12.893	12.623	12.120	10.416	9.021
150	-	-	-	15.124	13.902	13.513	13.276	13.039	12.773	12.274	10.635	9.172
155	-	-	-	15.326	14.058	13.654	13.419	13.186	12.924	12.427	10.855	9.323
160	-	-	-	15.528	14.214	13.796	13.563	13.332	13.075	12.580	11.075	9.474
165	-	-	-	15.730	14.370	13.937	13.707	13.478	13.226	12.734	11.294	9.625
170	-	-	-	-	14.526	14.078	13.850	13.625	13.377	12.887	11.507	9.775
175	-	-	-	-	14.682	14.219	13.994	13.771	13.527	13.041	11.709	9.926
180	-	-	-	-	14.838	14.361	14.138	13.918	13.678	13.194	11.911	10.077
185	-	-	-	-	14.994	14.502	14.281	14.064	13.829	13.347	12.113	10.228
190	-	-	-	-	15.150	14.643	14.425	14.210	13.980	13.501	12.315	10.379
195	-	-	-	-	15.305	14.784	14.568	14.357	14.131	13.654	12.517	10.530
200	-	-	-	-	15.461	14.926	14.712	14.503	14.282	13.807	12.719	10.681
205	-	-	-	-	15.617	15.067	14.856	14.649	14.432	13.961	12.921	10.832
210	-	-	-	-	-	15.208	14.999	14.796	14.583	14.114	13.122	10.983
215	-	-	-	-	-	15.349	15.143	14.942	14.734	14.268	13.324	11.134
220	-	-	-	-	-	15.491	15.287	15.089	14.885	14.421	13.526	11.285
225	-	-	-	-	-	15.632	15.430	15.235	15.036	14.574	13.728	11.446
230	-	-	-	-	-	15.773	15.574	15.381	15.187	14.728	13.930	11.806

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436

CERTIFICATE No CF 5857

JOTUN A/S

Rectangular Hollow Columns 210 minutes												
Required Thickness (mm) for a Design Temperature (°C)												
Section Factor (m^{-1})	300	350	400	450	500	520	550	575	600	650	700	750
15.3	-	-	12.418	11.495	4.156	4.074	3.607	3.411	3.242	2.903	2.454	1.016
20	-	-	12.418	11.495	5.136	4.743	4.539	4.398	4.255	3.881	3.444	2.576
25	-	-	12.418	11.495	6.178	5.455	5.198	5.019	4.862	4.618	4.427	4.237
30	-	-	12.418	11.495	7.221	6.167	5.856	5.640	5.448	5.134	4.872	4.657
35	-	-	12.418	11.495	8.264	6.879	6.515	6.261	6.034	5.651	5.316	5.028
40	-	-	12.418	11.495	9.306	7.591	7.174	6.881	6.620	6.167	5.760	5.399
45	-	-	12.418	11.495	10.349	8.303	7.833	7.502	7.205	6.683	6.205	5.769
50	-	-	13.495	12.513	11.391	10.006	8.523	8.123	7.791	7.199	6.649	6.140
55	-	-	14.032	12.985	11.854	11.546	10.140	9.065	8.377	7.715	7.094	6.510
60	-	-	14.568	13.457	12.295	11.953	11.476	10.414	9.396	8.231	7.538	6.881
65	-	-	15.105	13.929	12.736	12.360	11.714	11.480	10.496	8.867	7.983	7.252
70	-	-	15.642	14.402	13.177	12.767	11.951	11.689	11.460	9.605	8.427	7.622
75	-	-	-	14.874	13.618	13.173	12.189	11.898	11.670	10.343	8.929	7.993
80	-	-	-	15.346	14.059	13.580	12.427	12.107	11.880	11.081	9.437	8.363
85	-	-	-	15.818	14.500	13.987	12.664	12.316	12.089	11.507	9.945	8.784
90	-	-	-	-	14.941	14.393	12.902	12.525	12.299	11.655	10.453	9.225
95	-	-	-	-	15.382	14.800	13.140	12.734	12.509	11.803	10.960	9.667
100	-	-	-	-	15.823	15.207	13.377	12.943	12.719	11.951	11.440	10.108
105	-	-	-	-	-	15.614	13.615	13.153	12.928	12.099	11.592	10.549
110	-	-	-	-	-	16.020	13.852	13.362	13.138	12.247	11.745	10.990
115	-	-	-	-	-	-	14.090	13.571	13.348	12.396	11.897	11.429
120	-	-	-	-	-	-	14.328	13.780	13.558	12.544	12.050	11.584
125	-	-	-	-	-	-	14.565	13.989	13.767	12.692	12.202	11.739
130	-	-	-	-	-	-	14.803	14.198	13.977	12.840	12.354	11.894
135	-	-	-	-	-	-	15.040	14.407	14.187	12.988	12.507	12.049
140	-	-	-	-	-	-	15.278	14.616	14.397	13.136	12.659	12.204
145	-	-	-	-	-	-	15.516	14.825	14.606	13.285	12.812	12.359
150	-	-	-	-	-	-	15.753	15.034	14.816	13.433	12.964	12.514
155	-	-	-	-	-	-	-	15.243	15.026	13.581	13.116	12.669
160	-	-	-	-	-	-	-	15.452	15.236	13.729	13.269	12.824
165	-	-	-	-	-	-	-	15.662	15.445	13.877	13.421	12.979
170	-	-	-	-	-	-	-	15.871	15.655	14.025	13.574	13.134
175	-	-	-	-	-	-	-	-	15.865	14.174	13.726	13.289
180	-	-	-	-	-	-	-	-	-	14.322	13.878	13.444
185	-	-	-	-	-	-	-	-	-	14.470	14.031	13.599
190	-	-	-	-	-	-	-	-	-	14.618	14.183	13.754
195	-	-	-	-	-	-	-	-	-	14.766	14.336	13.909
200	-	-	-	-	-	-	-	-	-	14.914	14.488	14.064
205	-	-	-	-	-	-	-	-	-	15.063	14.640	14.219
210	-	-	-	-	-	-	-	-	-	15.211	14.793	14.374
215	-	-	-	-	-	-	-	-	-	15.359	14.945	14.529
220	-	-	-	-	-	-	-	-	-	15.507	15.098	14.684
225	-	-	-	-	-	-	-	-	-	15.655	15.250	14.839
230	-	-	-	-	-	-	-	-	-	15.803	15.402	14.994

Thickness is intumescent only. Results apply to rectangular/square hollow columns with 4-sided fire exposure.

Signed

Issued: 20th February 2020
Revised: 10th November 2025
Valid to: 15th November 2029

This certificate is the property of Warringtonfire Testing and Certification Limited
Registered in England and Wales
Registered Office: 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA. Company Registration No: 11371436