CERTIFICATE OF APPROVAL
No CF 5171

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

JOTUN A/S

PO BOX 2021, N-3202, Sandefjord, Norway
Tel: 0047 334 5700 Fax: 0047 334 57242
Website: http://www.jotun.com

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 60WB	**TS15 Intumescent Coatings for Steelwork**

Signed and sealed for and on behalf of Exova (UK) Limited trading as Warrington Certification

Paul Duggan
Certification Manager

Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

1. This approval relates to the use of SteelMaster 60WB for the fire protection of I-shaped and hollow steel sections. The precise scope is given in Tables 1 to 19 which show the total dry film thickness of SteelMaster 60WB (excluding primer and top sealer) required to provide fire resistance periods in accordance with BS476: Part 21: 1987 of 30 minutes up to 90 minutes for differing sections and section factors.

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: 2008.
   iv) Inspection and surveillance of factory production control
   v) Audit testing

4. The data referring to three-sided fire exposure of beams relate 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 Swedish Standard SA2.5 or equivalent and primed with a suitable and compatible primer. Specifications of surface preparations, primers and top sealers is available from Jotun Paints whose responsibility is to ensure that SteelMaster 60WB is compatible for use in respect of both ambient and fire conditions. The total dry film thickness of primer and topcoat should not exceed that tested.

6. The data shown is applicable to SteelMaster 60WB applied by spray to horizontal, vertical, flexural and compression members supporting loads up to the maximum design loads specified in BS449: Part 2 as indicated in Tables 1 and 2.

7. The approval relates to ongoing production. Product and/or its immediate packaging is identified with the manufacturers' name, the product name or number, the CERTIFIRE name or name and mark, together with the CERTIFIRE certificate number and application where appropriate.

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

Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 1

I Section Columns at 400 °C							
30 minutes				45 minutes			
section	DFT mm	section	DFT mm	section	DFT mm	section	DFT mm
85	0.229	205	0.435	30	0.244	170	0.606
90	0.238	210	0.444	35	0.257	175	0.619
95	0.246	215	0.452	40	0.270	180	0.632
100	0.255	220	0.461	45	0.283	185	0.645
105	0.263	225	0.469	50	0.296	190	0.662
110	0.272	230	0.478	55	0.309	195	0.699
115	0.280	235	0.487	60	0.322	200	0.736
120	0.289	240	0.495	65	0.335	205	0.773
125	0.298	245	0.504	70	0.348	210	0.810
130	0.306	250	0.512	75	0.361	215	0.846
135	0.315	255	0.521	80	0.373	220	0.883
140	0.323	260	0.530	85	0.386	225	0.920
145	0.332	265	0.538	90	0.399	230	0.957
150	0.341	270	0.547	95	0.412	235	0.994
155	0.349	275	0.555	100	0.425	240	1.031
160	0.358	280	0.564	105	0.438	245	1.069
165	0.366	285	0.573	110	0.451	250	1.113
170	0.375	290	0.581	115	0.464	255	1.157
175	0.384	295	0.590	120	0.477	260	1.201
180	0.392	300	0.598	125	0.490	265	1.245
185	0.401	305	0.607	130	0.503	270	1.289
190	0.409	310	0.615	135	0.516	275	1.333
195	0.418	315	0.624	140	0.528	280	1.377
200	0.426	320	0.633	145	0.541	285	1.421
				150	0.554	290	1.465
				155	0.567	295	1.509
				160	0.580	300	1.553
				165	0.593	305	1.597
						310	1.641

Thickness is intumescent only. Table applies to four sided beams limited to maximum 0.821 mm

Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 1 (continued)

I Section Columns at 400 °C			
60 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
30	0.361	120	1.006
35	0.397	125	1.042
40	0.433	130	1.078
45	0.469	135	1.113
50	0.505	140	1.149
55	0.540	145	1.185
60	0.576	150	1.221
65	0.612	155	1.257
70	0.648	160	1.292
75	0.684	165	1.328
80	0.719	170	1.364
85	0.755	175	1.400
90	0.791	180	1.436
95	0.827	185	1.471
100	0.863	190	1.507
105	0.898	195	1.543
110	0.934	200	1.579
115	0.970	205	1.615

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Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 2

I Section Columns at 450 °C							
30 minutes				45 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
125	0.225	225	0.372	55	0.224	195	0.553
130	0.233	230	0.380	60	0.232	200	0.565
135	0.240	235	0.387	65	0.244	205	0.577
140	0.247	240	0.395	70	0.255	210	0.588
145	0.255	245	0.402	75	0.267	215	0.600
150	0.262	250	0.409	80	0.279	220	0.612
155	0.269	255	0.417	85	0.291	225	0.624
160	0.277	260	0.424	90	0.303	230	0.636
165	0.284	265	0.431	95	0.315	235	0.648
170	0.291	270	0.439	100	0.327	240	0.664
175	0.299	275	0.446	105	0.339	245	0.685
180	0.306	280	0.453	110	0.351	250	0.706
185	0.314	285	0.461	115	0.363	255	0.727
190	0.321	290	0.468	120	0.374	260	0.749
195	0.328	295	0.475	125	0.386	265	0.770
200	0.336	300	0.483	130	0.398	270	0.791
205	0.343	305	0.490	135	0.410	275	0.813
210	0.350	310	0.498	140	0.422	280	0.834
215	0.358	315	0.505	145	0.434	285	0.855
220	0.365	320	0.512	150	0.446	290	0.877
				155	0.458	295	0.898
				160	0.470	300	0.919
				165	0.481	305	0.941
				170	0.493	310	0.962
				175	0.505	315	0.983
				180	0.517	320	1.005
				185	0.529	325	1.026
				190	0.541	330	1.047

Thickness is intumescent only. Table applies to four sided beams limited to maximum 0.821 mm

Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 2 (continued)

I Section Columns at 450 °C			
60 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
30	0.278	160	0.771
35	0.295	165	0.805
40	0.312	170	0.839
45	0.328	175	0.873
50	0.345	180	0.907
55	0.362	185	0.941
60	0.378	190	0.975
65	0.395	195	1.009
70	0.412	200	1.043
75	0.428	205	1.078
80	0.445	210	1.112
85	0.462	215	1.146
90	0.478	220	1.18
95	0.495	225	1.214
100	0.512	230	1.248
105	0.528	235	1.282
110	0.545	240	1.316
115	0.562	245	1.35
120	0.578	250	1.384
125	0.595	255	1.418
130	0.612	260	1.452
135	0.628	265	1.486
140	0.645	270	1.52
145	0.669	275	1.555
150	0.703	280	1.589
155	0.737	285	1.623

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Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 3

I Section Columns at 500 °C					
30 minutes		45 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
190	0.224	75	0.226	200	0.480
195	0.232	80	0.237	205	0.490
200	0.239	85	0.247	210	0.501
205	0.247	90	0.257	215	0.511
210	0.254	95	0.267	220	0.521
215	0.262	100	0.277	225	0.531
220	0.270	105	0.287	230	0.541
225	0.277	110	0.298	235	0.551
230	0.285	115	0.308	240	0.562
235	0.292	120	0.318	245	0.572
240	0.300	125	0.328	250	0.582
245	0.307	130	0.338	255	0.592
250	0.315	135	0.348	260	0.602
255	0.322	140	0.358	265	0.612
260	0.330	145	0.369	270	0.623
265	0.337	150	0.379	275	0.633
270	0.345	155	0.389	280	0.643
275	0.352	160	0.399	285	0.653
280	0.360	165	0.409	290	0.670
285	0.367	170	0.419	295	0.689
290	0.375	175	0.430	300	0.708
295	0.382	180	0.440	305	0.728
300	0.390	185	0.450	310	0.747
305	0.398	190	0.460	315	0.766
310	0.405	195	0.470	320	0.785
315	0.413				
320	0.420				

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Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 3 (continued)

I Section Columns at 500 °C					
60 minutes				90 minutes	
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
30	0.251	175	0.596	165	1.464
35	0.263	180	0.607	170	1.509
40	0.275	185	0.619	175	1.553
45	0.286	190	0.631	180	1.598
50	0.298	195	0.643		
55	0.31	200	0.655		
60	0.322	205	0.701		
65	0.334	210	0.747		
70	0.346	215	0.793		
75	0.358	220	0.839		
80	0.37	225	0.885		
85	0.382	230	0.931		
90	0.393	235	0.977		
95	0.405	240	1.023		
100	0.417	245	1.066		
105	0.429	250	1.098		
110	0.441	255	1.13		
115	0.453	260	1.162		
120	0.465	265	1.194		
125	0.477	270	1.226		
130	0.489	275	1.258		
135	0.5	280	1.29		
140	0.512	285	1.321		
145	0.524	290	1.353		
150	0.536	295	1.385		
155	0.548	300	1.417		
160	0.56	305	1.449		
165	0.572	310	1.481		
170	0.584	315	1.513		
		320	1.545		

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Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 4

I Section Columns at 550 °C					
30 minutes		45 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
280	0.224	100	0.232	215	0.441
285	0.227	105	0.241	220	0.450
290	0.231	110	0.250	225	0.459
295	0.235	115	0.260	230	0.468
300	0.239	120	0.269	235	0.477
305	0.243	125	0.278	240	0.486
310	0.247	130	0.287	245	0.495
315	0.251	135	0.296	250	0.504
320	0.255	140	0.305	255	0.514
		145	0.314	260	0.523
		150	0.323	265	0.532
		155	0.332	270	0.541
		160	0.341	275	0.550
		165	0.350	280	0.559
		170	0.359	285	0.568
		175	0.368	290	0.577
		180	0.377	295	0.586
		185	0.387	300	0.595
		190	0.396	305	0.604
		195	0.405	310	0.613
		200	0.414	315	0.622
		205	0.423	320	0.631
		210	0.432		

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Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 4 (continued)

I Section Columns at 550 °C					
60 minutes				90 minutes	
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
45	0.235	185	0.558	65	0.620
50	0.247	190	0.57	70	0.655
55	0.258	195	0.581	75	0.690
60	0.27	200	0.593	80	0.724
65	0.281	205	0.604	85	0.759
70	0.293	210	0.616	90	0.794
75	0.304	215	0.627	95	0.828
80	0.316	220	0.639	100	0.863
85	0.327	225	0.65	105	0.897
90	0.339	230	0.67	110	0.932
95	0.35	235	0.695	115	0.967
100	0.362	240	0.72	120	1.001
105	0.373	245	0.745	125	1.036
110	0.385	250	0.77	130	1.071
115	0.397	255	0.795	135	1.105
120	0.408	260	0.82	140	1.140
125	0.42	265	0.845	145	1.174
130	0.431	270	0.87	150	1.209
135	0.443	275	0.895	155	1.244
140	0.454	280	0.92	160	1.278
145	0.466	285	0.945	165	1.313
150	0.477	290	0.97	170	1.348
155	0.489	295	0.995	175	1.382
160	0.5	300	1.02	180	1.417
165	0.512	305	1.045	185	1.452
170	0.523	310	1.07	190	1.486
175	0.535	315	1.095	195	1.521
180	0.547	320	1.12	200	1.555
				205	1.590
				210	1.625

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Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 5

I Section Columns at 600 °C					
30 minutes		45 minutes			
section factor m^{-1}		section factor m^{-1}		section factor m^{-1}	
320	0.224	125	0.224	225	0.395
		130	0.233	230	0.404
		135	0.241	235	0.412
		140	0.250	240	0.421
		145	0.258	245	0.429
		150	0.267	250	0.438
		155	0.275	255	0.446
		160	0.284	260	0.455
		165	0.292	265	0.463
		170	0.301	270	0.472
		175	0.309	275	0.481
		180	0.318	280	0.489
		185	0.327	285	0.498
		190	0.335	290	0.506
		195	0.344	295	0.515
		200	0.352	300	0.523
		205	0.361	305	0.532
		210	0.369	310	0.540
		215	0.378	315	0.549
		220	0.386	320	0.558

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Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 5 (continued)

I Section Columns at 600 °C					
60 minutes				90 minutes	
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
70	0.232	195	0.506	125	0.589
75	0.243	200	0.517	130	0.636
80	0.254	205	0.528	135	0.683
85	0.265	210	0.539	140	0.730
90	0.276	215	0.55	145	0.777
95	0.287	220	0.561	150	0.824
100	0.298	225	0.572	155	0.871
105	0.309	230	0.583	160	0.918
110	0.32	235	0.594	165	0.965
115	0.331	240	0.605	170	1.012
120	0.342	245	0.616	175	1.059
125	0.353	250	0.627	180	1.106
130	0.364	255	0.637	185	1.153
135	0.375	260	0.648	190	1.200
140	0.386	265	0.664	195	1.247
145	0.396	270	0.685	200	1.293
150	0.407	275	0.707	205	1.340
155	0.418	280	0.728	210	1.387
160	0.429	285	0.75	215	1.434
165	0.44	290	0.771	220	1.481
170	0.451	295	0.793	225	1.528
175	0.462	300	0.814	230	1.575
180	0.473	305	0.836	235	1.622
185	0.484	310	0.858		
190	0.495	315	0.879		
		320	0.901		

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Issued: 25th July 2013
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Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 6

I Section Columns at 650 °C							
45 minutes		60 minutes				90 minutes	
section factor m^{-1}		section factor m^{-1}		section factor m^{-1}		section factor m^{-1}	
180	0.229	85	0.225	205	0.477	160	0.622
185	0.238	90	0.236	210	0.487	165	0.677
190	0.247	95	0.246	215	0.498	170	0.732
195	0.256	100	0.257	220	0.508	175	0.786
200	0.265	105	0.267	225	0.519	180	0.841
205	0.274	110	0.278	230	0.529	185	0.896
210	0.283	115	0.288	235	0.54	190	0.951
215	0.292	120	0.299	240	0.55	195	1.005
220	0.301	125	0.309	245	0.561	200	1.06
225	0.310	130	0.32	250	0.571	205	1.102
230	0.319	135	0.33	255	0.582	210	1.143
235	0.328	140	0.34	260	0.592	215	1.185
240	0.337	145	0.351	265	0.603	220	1.226
245	0.346	150	0.361	270	0.613	225	1.268
250	0.355	155	0.372	275	0.624	230	1.309
255	0.364	160	0.382	280	0.634	235	1.351
260	0.373	165	0.393	285	0.645	240	1.392
265	0.382	170	0.403	290	0.655	245	1.434
270	0.391	175	0.414	295	0.673	250	1.475
275	0.400	180	0.424	300	0.692	255	1.517
280	0.409	185	0.435	305	0.71	260	1.558
285	0.418	190	0.445	310	0.729	265	1.600
290	0.427	195	0.456	315	0.747		
295	0.436	200	0.466	320	0.765		
300	0.445						
305	0.454						
310	0.463						
315	0.472						
320	0.481						

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Issued: 25th July 2013
Revised: 13th November 2018
Valid to: 30th June 2019

CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 7

I Section Columns at 700 °C									
45 minutes		60 minutes				90 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
260	0.225	110	0.225	215	0.437	30	0.250	170	0.592
265	0.236	115	0.235	220	0.447	35	0.263	175	0.604
270	0.247	120	0.245	225	0.457	40	0.275	180	0.616
275	0.258	125	0.255	230	0.467	45	0.287	185	0.628
280	0.269	130	0.265	235	0.477	50	0.299	190	0.640
285	0.280	135	0.275	240	0.487	55	0.311	195	0.653
290	0.291	140	0.285	245	0.497	60	0.324	200	0.717
295	0.302	145	0.295	250	0.507	65	0.336	205	0.795
300	0.313	150	0.305	255	0.518	70	0.348	210	0.873
305	0.324	155	0.316	260	0.528	75	0.360	215	0.951
310	0.336	160	0.326	265	0.538	80	0.372	220	1.029
315	0.347	165	0.336	270	0.548	85	0.384	225	1.081
320	0.358	170	0.346	275	0.558	90	0.397	230	1.115
		175	0.356	280	0.568	95	0.409	235	1.149
		180	0.366	285	0.578	100	0.421	240	1.184
		185	0.376	290	0.588	105	0.433	245	1.218
		190	0.386	295	0.598	110	0.445	250	1.253
		195	0.396	300	0.609	115	0.458	255	1.287
		200	0.406	305	0.619	120	0.470	260	1.321
		205	0.417	310	0.629	125	0.482	265	1.356
		210	0.427	315	0.639	130	0.494	270	1.390
				320	0.649	135	0.506	275	1.424
						140	0.519	280	1.459
						145	0.531	285	1.493
						150	0.543	290	1.528
						155	0.555	295	1.562
						160	0.567	300	1.596
						165	0.579	305	1.631

Thickness is intumescent only. Table applies to four sided beams limited to maximum 0.821 mm

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 8

I Section Beams at 400 °C							
30 minutes				45 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
135	0.209	235	0.439	30	0.246	135	0.516
140	0.222	240	0.447	35	0.257	140	0.530
145	0.236	245	0.456	40	0.269	145	0.544
150	0.250	250	0.464	45	0.281	150	0.558
155	0.263	255	0.472	50	0.293	155	0.572
160	0.277	260	0.480	55	0.304	160	0.586
165	0.290	265	0.488	60	0.316	165	0.600
170	0.304	270	0.497	65	0.328	170	0.614
175	0.318	275	0.505	70	0.340	175	0.628
180	0.331	280	0.513	75	0.351	180	0.643
185	0.345	285	0.521	80	0.363	185	0.657
190	0.359	290	0.530	85	0.375	190	0.671
195	0.372	295	0.538	90	0.389	195	0.685
200	0.382	300	0.546	95	0.403	200	0.699
205	0.390	305	0.554	100	0.417	205	0.713
210	0.398	310	0.562	105	0.431	210	0.727
215	0.406	315	0.571	110	0.445	215	0.741
220	0.414	320	0.579	115	0.459	220	0.755
225	0.423	325	0.587	120	0.474	225	0.769
230	0.431	330	0.595	125	0.488	230	0.783
				130	0.502	235	0.797
						240	0.811

Thickness is intumescent only. Beams with a concrete slab

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 9

I Section Beams at 450 °C							
30 minutes				45 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
150	0.210	240	0.307	60	0.215	185	0.512
155	0.215	245	0.312	65	0.226	190	0.525
160	0.220	250	0.318	70	0.237	195	0.537
165	0.226	255	0.323	75	0.248	200	0.550
170	0.231	260	0.329	80	0.259	205	0.563
175	0.237	265	0.334	85	0.271	210	0.576
180	0.242	270	0.339	90	0.282	215	0.589
185	0.247	275	0.345	95	0.293	220	0.602
190	0.253	280	0.350	100	0.304	225	0.615
195	0.258	285	0.356	105	0.315	230	0.628
200	0.264	290	0.361	110	0.326	235	0.641
205	0.269	295	0.366	115	0.337	240	0.654
210	0.274	300	0.372	120	0.348	245	0.666
215	0.280	305	0.379	125	0.359	250	0.679
220	0.285	310	0.390	130	0.371	255	0.692
225	0.291	315	0.401	135	0.383	260	0.705
230	0.296	320	0.412	140	0.396	265	0.718
235	0.301	325	0.422	145	0.409	270	0.731
		330	0.433	150	0.421	275	0.744
				155	0.434	280	0.757
				160	0.447	285	0.770
				165	0.460	290	0.782
				170	0.473	295	0.795
				175	0.486	300	0.808
				180	0.499	305	0.821

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 9 (continued)

I Section Beams at 450 °C			
60 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
30	0.273	120	0.519
35	0.285	125	0.535
40	0.297	130	0.551
45	0.308	135	0.567
50	0.32	140	0.582
55	0.331	145	0.598
60	0.343	150	0.614
65	0.354	155	0.629
70	0.366	160	0.645
75	0.378	165	0.661
80	0.394	170	0.677
85	0.41	175	0.692
90	0.425	180	0.708
95	0.441	185	0.724
100	0.457	190	0.739
105	0.472	195	0.755
110	0.488	200	0.771
115	0.504	205	0.786
		210	0.802
		215	0.818

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 10

I Section Beams at 470 °C									
30 minutes		45 minutes				60 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
185	0.209	105	0.209	220	0.522	30	0.263	130	0.507
190	0.213	110	0.222	225	0.533	35	0.273	135	0.522
195	0.219	115	0.238	230	0.544	40	0.283	140	0.537
200	0.224	120	0.255	235	0.556	45	0.292	145	0.553
205	0.230	125	0.272	240	0.567	50	0.302	150	0.568
210	0.236	130	0.288	245	0.579	55	0.312	155	0.583
215	0.241	135	0.305	250	0.590	60	0.322	160	0.599
220	0.247	140	0.322	255	0.602	65	0.332	165	0.614
225	0.253	145	0.338	260	0.613	70	0.342	170	0.629
230	0.258	150	0.355	265	0.625	75	0.351	175	0.645
235	0.264	155	0.372	270	0.636	80	0.361	180	0.66
240	0.270	160	0.384	275	0.647	85	0.371	185	0.675
245	0.275	165	0.396	280	0.659	90	0.384	190	0.69
250	0.281	170	0.407	285	0.670	95	0.400	195	0.706
255	0.287	175	0.419	290	0.682	100	0.415	200	0.721
260	0.292	180	0.430	295	0.693	105	0.430	205	0.736
265	0.298	185	0.441	300	0.705	110	0.445	210	0.752
270	0.304	190	0.453	305	0.716	115	0.461	215	0.767
275	0.309	195	0.464	310	0.728	120	0.476	220	0.782
280	0.315	200	0.476	315	0.739	125	0.491	225	0.798
285	0.321	205	0.487	320	0.751			230	0.813
290	0.326	210	0.499	325	0.762				
295	0.332	215	0.510	330	0.773				
300	0.338								
305	0.343								
310	0.349								
315	0.355								
320	0.360								
325	0.366								
330	0.372								

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 11

I Section Beams at 500 °C									
30 minutes		45 minutes				60 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
240	0.209	120	0.209	225	0.455	30	0.252	150	0.507
245	0.212	125	0.221	230	0.466	35	0.26	155	0.520
250	0.218	130	0.233	235	0.477	40	0.269	160	0.534
255	0.224	135	0.245	240	0.489	45	0.278	165	0.547
260	0.229	140	0.257	245	0.500	50	0.286	170	0.561
265	0.235	145	0.269	250	0.511	55	0.295	175	0.574
270	0.241	150	0.281	255	0.522	60	0.304	180	0.588
275	0.247	155	0.293	260	0.533	65	0.312	185	0.601
280	0.253	160	0.305	265	0.544	70	0.321	190	0.615
285	0.258	165	0.317	270	0.555	75	0.33	195	0.628
290	0.264	170	0.329	275	0.567	80	0.338	200	0.642
295	0.270	175	0.341	280	0.578	85	0.347	205	0.655
300	0.276	180	0.353	285	0.589	90	0.356	210	0.668
305	0.282	185	0.365	290	0.600	95	0.365	215	0.682
310	0.288	190	0.377	295	0.611	100	0.373	220	0.695
315	0.293	195	0.388	300	0.622	105	0.386	225	0.709
320	0.299	200	0.400	305	0.633	110	0.399	230	0.722
325	0.305	205	0.411	310	0.645	115	0.413	235	0.736
330	0.311	210	0.422	315	0.656	120	0.426	240	0.749
		215	0.433	320	0.667	125	0.440	245	0.763
		220	0.444	325	0.678	130	0.453	250	0.776
				330	0.689	135	0.467	255	0.790
						140	0.480	260	0.803
						145	0.493	265	0.817

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 12

I Section Beams at 550 °C					
30 minutes		45 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
295	0.209	130	0.209	230	0.343
300	0.214	135	0.210	235	0.350
305	0.218	140	0.217	240	0.357
310	0.223	145	0.224	245	0.364
315	0.228	150	0.231	250	0.371
320	0.232	155	0.238	255	0.380
325	0.237	160	0.245	260	0.391
330	0.241	165	0.252	265	0.403
		170	0.259	270	0.415
		175	0.266	275	0.427
		180	0.273	280	0.439
		185	0.280	285	0.450
		190	0.287	290	0.462
		195	0.294	295	0.474
		200	0.301	300	0.486
		205	0.308	305	0.498
		210	0.315	310	0.509
		215	0.322	315	0.521
		220	0.329	320	0.533
		225	0.336	325	0.545
				330	0.556

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 12 (continued)

I Section Beams at 550 °C					
60 minutes				90 minutes	
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
30	0.213	175	0.481	50	0.318
35	0.221	180	0.493	55	0.350
40	0.229	185	0.505	60	0.381
45	0.237	190	0.517	65	0.413
50	0.245	195	0.529	70	0.445
55	0.253	200	0.541	75	0.477
60	0.261	205	0.553	80	0.508
65	0.269	210	0.565	85	0.540
70	0.277	215	0.577	90	0.572
75	0.285	220	0.589	95	0.604
80	0.293	225	0.601	100	0.636
85	0.301	230	0.613	105	0.667
90	0.309	235	0.625	110	0.699
95	0.317	240	0.637	115	0.731
100	0.325	245	0.649	120	0.763
105	0.333	250	0.661	125	0.794
110	0.341	255	0.673		
115	0.349	260	0.685		
120	0.357	265	0.697		
125	0.365	270	0.709		
130	0.373	275	0.721		
135	0.385	280	0.733		
140	0.397	285	0.745		
145	0.409	290	0.757		
150	0.421	295	0.769		
155	0.433	300	0.781		
160	0.445	305	0.793		
165	0.457	310	0.805		

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Valid to: 30th June 2019

170	0.469	315	0.817		

Thickness is intumescent only. Beams with a concrete slab.

SteelMaster 60WB

Table 13

I Section Beams at 570 °C					
30 minutes		45 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
290	0.209	130	0.209	230	0.304
295	0.211	135	0.212	235	0.309
300	0.215	140	0.217	240	0.314
305	0.218	145	0.222	245	0.319
310	0.222	150	0.227	250	0.324
315	0.225	155	0.232	255	0.329
320	0.229	160	0.237	260	0.333
325	0.232	165	0.241	265	0.338
330	0.236	170	0.246	270	0.343
		175	0.251	275	0.348
		180	0.256	280	0.353
		185	0.261	285	0.358
		190	0.266	290	0.362
		195	0.270	295	0.367
		200	0.275	300	0.372
		205	0.280	305	0.380
		210	0.285	310	0.393
		215	0.290	315	0.405
		220	0.295	320	0.418
		225	0.300	325	0.431
		230	0.304	330	0.443

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 13 (continued)

I Section Beams at 570 °C					
60 minutes				90 minutes	
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
50	0.209	190	0.461	55	0.338
55	0.218	195	0.472	60	0.350
60	0.226	200	0.482	65	0.366
65	0.235	205	0.492	70	0.381
70	0.243	210	0.503	75	0.397
75	0.252	215	0.513	80	0.412
80	0.260	220	0.523	85	0.427
85	0.269	225	0.534	90	0.443
90	0.277	230	0.544	95	0.458
95	0.285	235	0.554	100	0.474
100	0.294	240	0.564	105	0.489
105	0.302	245	0.575	110	0.504
110	0.311	250	0.585	115	0.520
115	0.319	255	0.595	120	0.535
120	0.328	260	0.606	125	0.551
125	0.336	265	0.616	130	0.566
130	0.345	270	0.626	135	0.582
135	0.353	275	0.636	140	0.597
140	0.361	280	0.647	145	0.612
145	0.370	285	0.657	150	0.628
150	0.379	290	0.667	155	0.643
155	0.389	295	0.678	160	0.659
160	0.400	300	0.688	165	0.674
165	0.410	305	0.698	170	0.689
170	0.420	310	0.709	175	0.705
175	0.431	315	0.719	180	0.720
180	0.441	320	0.729	185	0.736
185	0.451	325	0.739	190	0.751
		330	0.750	195	0.766
				200	0.782
				205	0.797
				210	0.813

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 14

I Section Beams at 600 °C					
30 minutes		45 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
320	0.209	160	0.209	245	0.291
		165	0.214	250	0.295
		170	0.219	255	0.300
		175	0.223	260	0.305
		180	0.228	265	0.310
		185	0.233	270	0.315
		190	0.238	275	0.319
		195	0.243	280	0.324
		200	0.247	285	0.329
		205	0.252	290	0.334
		210	0.257	295	0.339
		215	0.262	300	0.343
		220	0.267	305	0.348
		225	0.271	310	0.353
		230	0.276	315	0.358
		235	0.281	320	0.363
		240	0.286	325	0.367
				330	0.372

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 14 (continued)

I Section Beams at 600 °C					
60 minutes				90 minutes	
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
105	0.209	220	0.462	60	0.338
110	0.216	225	0.473	65	0.340
115	0.227	230	0.484	70	0.356
120	0.239	235	0.494	75	0.372
125	0.250	240	0.505	80	0.388
130	0.262	245	0.516	85	0.404
135	0.273	250	0.526	90	0.420
140	0.285	255	0.537	95	0.436
145	0.297	260	0.548	100	0.452
150	0.308	265	0.558	105	0.468
155	0.320	270	0.569	110	0.485
160	0.331	275	0.580	115	0.501
165	0.343	280	0.590	120	0.517
170	0.354	285	0.601	125	0.533
175	0.366	290	0.611	130	0.549
180	0.377	295	0.622	135	0.565
185	0.388	300	0.633	140	0.581
190	0.398	305	0.643	145	0.597
195	0.409	310	0.654	150	0.614
200	0.420	315	0.665	155	0.630
205	0.430	320	0.675	160	0.646
210	0.441	325	0.686	165	0.662
215	0.452	330	0.697	170	0.678
				175	0.694
				180	0.710
				185	0.726
				190	0.743
				195	0.759
				200	0.775
				205	0.791
				210	0.807

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 15

I Section Beams at 620 °C									
30 minutes		45 minutes		60 minutes				90 minutes	
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
320	0.209	175	0.209	105	0.209	220	0.422	70	0.338
		180	0.212	110	0.213	225	0.433	75	0.353
		185	0.216	115	0.222	230	0.443	80	0.369
		190	0.221	120	0.231	235	0.454	85	0.384
		195	0.225	125	0.24	240	0.464	90	0.400
		200	0.230	130	0.249	245	0.475	95	0.415
		205	0.235	135	0.259	250	0.486	100	0.431
		210	0.239	140	0.268	255	0.496	105	0.446
		215	0.244	145	0.277	260	0.507	110	0.462
		220	0.249	150	0.286	265	0.518	115	0.477
		225	0.253	155	0.296	270	0.528	120	0.493
		230	0.258	160	0.305	275	0.539	125	0.508
		235	0.262	165	0.314	280	0.55	130	0.524
		240	0.267	170	0.323	285	0.56	135	0.539
		245	0.272	175	0.333	290	0.571	140	0.555
		250	0.276	180	0.342	295	0.582	145	0.570
		255	0.281	185	0.351	300	0.592	150	0.586
		260	0.285	190	0.36	305	0.603	155	0.601
		265	0.290	195	0.369	310	0.614	160	0.617
		270	0.295	200	0.379	315	0.624	165	0.632
		275	0.299	205	0.39	320	0.635	170	0.648
		280	0.304	210	0.401	325	0.646	175	0.663
		285	0.309	215	0.411	330	0.656	180	0.679
		290	0.313					185	0.694
		295	0.318					190	0.710
		300	0.322					195	0.725
		305	0.327					200	0.741
		310	0.332					205	0.756
		315	0.336					210	0.772
		320	0.341					215	0.787
		325	0.345					220	0.803
		330	0.350					225	0.818

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 16

I Section Beams at 650 °C									
45 minutes		60 minutes				90 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
225	0.209	120	0.209	225	0.372	75	0.338	160	0.576
230	0.213	125	0.212	230	0.382	80	0.343	165	0.591
235	0.218	130	0.220	235	0.393	85	0.358	170	0.605
240	0.223	135	0.228	240	0.405	90	0.372	175	0.620
245	0.227	140	0.236	245	0.417	95	0.387	180	0.635
250	0.232	145	0.244	250	0.428	100	0.401	185	0.649
255	0.237	150	0.252	255	0.440	105	0.416	190	0.664
260	0.242	155	0.260	260	0.451	110	0.430	195	0.678
265	0.246	160	0.268	265	0.463	115	0.445	200	0.693
270	0.251	165	0.276	270	0.474	120	0.460	205	0.708
275	0.256	170	0.284	275	0.486	125	0.474	210	0.722
280	0.261	175	0.292	280	0.498	130	0.489	215	0.737
285	0.265	180	0.300	285	0.509	135	0.503	220	0.751
290	0.270	185	0.308	290	0.521	140	0.518	225	0.766
295	0.275	190	0.316	295	0.532	145	0.533	230	0.780
300	0.280	195	0.324	300	0.544	150	0.547	235	0.795
305	0.285	200	0.332	305	0.555	155	0.562	240	0.810
310	0.289	205	0.340	310	0.567				
315	0.294	210	0.348	315	0.578				
320	0.299	215	0.356	320	0.590				
325	0.304	220	0.364	325	0.602				
330	0.308			330	0.613				

Thickness is intumescent only. Beams with a concrete slab.

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 17

I Section Beams at 700 °C					
45 minutes		60 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
270	0.209	135	0.209	235	0.296
275	0.211	140	0.210	240	0.300
280	0.216	145	0.214	245	0.305
285	0.220	150	0.219	250	0.309
290	0.225	155	0.223	255	0.314
295	0.230	160	0.228	260	0.318
300	0.234	165	0.232	265	0.323
305	0.239	170	0.237	270	0.327
310	0.243	175	0.241	275	0.332
315	0.248	180	0.246	280	0.336
320	0.252	185	0.250	285	0.341
325	0.257	190	0.255	290	0.345
330	0.261	195	0.260	295	0.350
		200	0.264	300	0.354
		205	0.269	305	0.359
		210	0.273	310	0.363
		215	0.278	315	0.368
		220	0.282	320	0.372
		225	0.287	325	0.385
		230	0.291	330	0.411

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CERTIFICATE No CF 5171
JOTUN A/S

SteelMaster 60WB

Table 17 (continued)

I Section Beams at 700 °C			
90 minutes			
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
95	0.338	190	0.584
100	0.349	195	0.597
105	0.362	200	0.610
110	0.375	205	0.623
115	0.388	210	0.636
120	0.401	215	0.649
125	0.414	220	0.662
130	0.427	225	0.675
135	0.440	230	0.688
140	0.453	235	0.701
145	0.466	240	0.714
150	0.479	245	0.727
155	0.492	250	0.740
160	0.505	255	0.753
165	0.518	260	0.766
170	0.531	265	0.779
175	0.544	270	0.792
180	0.557	275	0.805
185	0.570	280	0.818

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SteelMaster 60WB

Table 18

Rectangular Hollow Columns at 520 °C							
30 minutes		45 minutes				60 minutes	
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
305	0.350	105	0.370	190	1.550	50	0.354
310	0.439	110	0.470	195	1.566	55	0.414
315	0.563	115	0.570	200	1.583	60	0.475
320	0.686	120	0.670	205	1.599	65	0.535
325	0.809	125	0.770	210	1.615	70	0.595
330	0.932	130	0.870	215	1.631	75	0.656
		135	0.970	220	1.647	80	0.716
		140	1.070	225	1.664	85	0.776
		145	1.170	230	1.680	90	0.837
		150	1.270	235	1.696	95	0.897
		155	1.370	240	1.712	100	0.958
		160	1.453	245	1.728	105	1.018
		165	1.469	250	1.744	110	1.078
		170	1.486	255	1.761	115	1.139
		175	1.502	260	1.777	120	1.199
		180	1.518	265	1.793	125	1.259
		185	1.534	270	1.809	130	1.32
				275	1.825	135	1.38
						140	1.441
						145	1.501
						150	1.561
						155	1.622
						160	1.682
						165	1.742
						170	1.803

Thickness is intumescent only

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SteelMaster 60WB

Table 19

Circular Hollow Columns at 520 °C					
30 minutes		45 minutes		60 minutes	
section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm	section factor m^{-1}	DFT mm
260	1.518	150	1.527	90	1.503
265	1.547	155	1.578	95	1.587
270	1.577	160	1.629	100	1.67
275	1.606	165	1.680	105	1.754
280	1.635	170	1.731	110	1.837
285	1.664	175	1.782		
290	1.693	180	1.833		
295	1.723				
300	1.752				
305	1.781				
310	1.810				

Thickness is intumescent only

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