# CERTIFICATE OF APPROVAL
# No CF 845

**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 120SB | TS15 INTUMESCENT COATINGS FOR STEELWORK |

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

Paul Duggan
**Certification Manager**

Issued: 28th March 2011
Revised: 5th November 2019
Valid to: 26th June 2024

# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

1. This certification is provided to the client for their own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.

2. This approval relates to the use of SteelMaster 120SB for the fire protection of steel I/H beams and columns, and circular hollow columns. The precise scope is given in Tables 1 to 24 which show the total dry film thickness of SteelMaster 120SB (excluding primer and top sealer) required to provide fire resistance periods in accordance with BS476: Parts 20 and 21: 1987 of 15 minutes up to 120 minutes for design temperatures in the range 300°C to 750°C.

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 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 ISO 8501-1 Sa2.5 or equivalent and primed with a suitable and compatible primer. Specifications of surface preparations, primers and top sealers are available from JOTUN A/S whose responsibility is to ensure that SteelMaster 120SB is compatible for use in respect of both ambient and fire conditions. The nominal dry film thickness of primer and top sealer should be applied at a nominal thickness tested.

6. The data shown is applicable to SteelMaster 120SB applied by spray to horizontal, vertical, flexural and compression members supporting loads up to the maximum design loads specified in BS449: Part 2.

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

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

# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 1 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 |
| 30 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 35 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 40 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 45 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 50 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 55 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 60 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 65 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 70 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 75 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 80 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 85 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 90 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 95 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 100 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 105 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 110 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 115 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 120 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 125 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 130 | 0.288 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 135 | 0.306 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 140 | 0.323 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 145 | 0.341 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 150 | 0.358 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 155 | 0.376 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 160 | 0.393 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 165 | 0.410 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 170 | 0.428 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 175 | 0.445 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 180 | 0.463 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 185 | 0.480 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 190 | 0.498 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 195 | 0.515 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 200 | 0.533 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 205 | 0.550 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 210 | 0.567 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 215 | 0.585 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 220 | 0.602 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 225 | 0.620 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 230 | 0.637 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 235 | 0.655 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 240 | 0.672 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 245 | 0.690 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 250 | 0.707 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 255 | 0.725 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 260 | 0.742 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 265 | 0.759 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 270 | 0.777 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 275 | 0.794 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 280 | 0.812 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 285 | 0.829 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 290 | 0.847 | 0.295 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 295 | 0.864 | 0.306 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 300 | 0.882 | 0.317 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 305 | 0.899 | 0.328 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 310 | 0.916 | 0.339 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 315 | 0.934 | 0.350 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 320 | 0.951 | 0.361 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 325 | 0.969 | 0.372 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 330 | 0.986 | 0.384 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 335 | 1.004 | 0.395 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 340 | 1.021 | 0.406 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 345 | 1.039 | 0.417 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 350 | 1.056 | 0.428 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |

Thickness is intumescent only.

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



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 2 I/H Beams: 30 minutes<br>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 |
| 30 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 35 | 0.291 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 40 | 0.367 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 45 | 0.442 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 50 | 0.518 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 55 | 0.594 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 60 | 0.670 | 0.289 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 65 | 0.745 | 0.306 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 70 | 0.821 | 0.324 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 75 | 0.897 | 0.341 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 80 | 0.973 | 0.359 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 85 | 1.048 | 0.376 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 90 | 1.124 | 0.394 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 95 | 1.200 | 0.411 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 100 | 1.276 | 0.429 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 105 | 1.351 | 0.446 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 110 | 1.427 | 0.464 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 115 | 1.499 | 0.481 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 120 | 1.569 | 0.499 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 125 | 1.639 | 0.516 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 130 | 1.709 | 0.534 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 135 | 1.779 | 0.551 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 140 | 1.849 | 0.569 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 145 | 1.919 | 0.586 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 150 | 1.989 | 0.604 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 155 | 2.059 | 0.621 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 160 | 2.129 | 0.639 | 0.286 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 165 | 2.199 | 0.657 | 0.301 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 170 | 2.269 | 0.674 | 0.317 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 175 | 2.338 | 0.692 | 0.332 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 180 | 2.408 | 0.709 | 0.347 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 185 | 2.478 | 0.727 | 0.363 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 190 | 2.548 | 0.744 | 0.378 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 195 | 2.618 | 0.762 | 0.394 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 200 | 2.688 | 0.779 | 0.409 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 205 | 2.758 | 0.797 | 0.425 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 210 | 2.828 | 0.814 | 0.440 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 215 | 2.898 | 0.832 | 0.456 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 220 | 2.968 | 0.849 | 0.471 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 225 | - | 0.867 | 0.487 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 230 | - | 0.884 | 0.502 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 235 | - | 0.902 | 0.518 | 0.293 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 240 | - | 0.919 | 0.533 | 0.307 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 245 | - | 0.937 | 0.549 | 0.320 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 250 | - | 0.954 | 0.564 | 0.334 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 255 | - | 0.972 | 0.580 | 0.348 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 260 | - | 0.989 | 0.595 | 0.362 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 265 | - | 1.007 | 0.610 | 0.375 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 270 | - | 1.024 | 0.626 | 0.389 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 275 | - | 1.042 | 0.641 | 0.403 | 0.291 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 280 | - | 1.059 | 0.657 | 0.416 | 0.302 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 285 | - | 1.077 | 0.672 | 0.430 | 0.314 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 290 | - | 1.094 | 0.688 | 0.444 | 0.326 | 0.287 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 295 | - | 1.112 | 0.703 | 0.457 | 0.337 | 0.298 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 300 | - | 1.129 | 0.719 | 0.471 | 0.349 | 0.309 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 305 | - | 1.147 | 0.734 | 0.485 | 0.361 | 0.320 | 0.287 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 310 | - | 1.165 | 0.750 | 0.499 | 0.372 | 0.331 | 0.297 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 315 | - | 1.182 | 0.765 | 0.512 | 0.384 | 0.342 | 0.307 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 320 | - | 1.200 | 0.781 | 0.526 | 0.395 | 0.352 | 0.317 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 325 | - | 1.217 | 0.796 | 0.540 | 0.407 | 0.363 | 0.327 | 0.289 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 330 | - | 1.235 | 0.812 | 0.553 | 0.419 | 0.374 | 0.337 | 0.298 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 335 | - | 1.252 | 0.827 | 0.567 | 0.430 | 0.385 | 0.347 | 0.307 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 340 | - | 1.270 | 0.843 | 0.581 | 0.442 | 0.396 | 0.357 | 0.317 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 345 | - | 1.287 | 0.858 | 0.594 | 0.454 | 0.407 | 0.366 | 0.326 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 350 | - | 1.305 | 0.873 | 0.608 | 0.465 | 0.418 | 0.376 | 0.335 | 0.293 | 0.284 | 0.284 | 0.284 | 0.284 |

Thickness is intumescent only.

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



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 3 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 |
| 30 | 0.939 | 0.295 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 35 | 1.118 | 0.350 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 40 | 1.297 | 0.405 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 45 | 1.474 | 0.459 | 0.302 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 50 | 1.632 | 0.514 | 0.321 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 55 | 1.791 | 0.569 | 0.340 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 60 | 1.949 | 0.624 | 0.359 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 65 | 2.107 | 0.679 | 0.377 | 0.290 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 70 | 2.266 | 0.733 | 0.396 | 0.306 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 75 | 2.424 | 0.788 | 0.415 | 0.322 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 80 | 2.582 | 0.843 | 0.433 | 0.338 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 85 | 2.740 | 0.898 | 0.452 | 0.354 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 90 | 2.839 | 0.953 | 0.471 | 0.371 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 95 | 2.894 | 1.008 | 0.490 | 0.387 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 100 | 2.950 | 1.062 | 0.508 | 0.403 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 105 | 3.005 | 1.117 | 0.527 | 0.419 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 110 | 3.060 | 1.172 | 0.546 | 0.435 | 0.298 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 115 | 3.115 | 1.227 | 0.565 | 0.451 | 0.313 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 120 | 3.171 | 1.282 | 0.583 | 0.467 | 0.328 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 125 | 3.226 | 1.337 | 0.602 | 0.483 | 0.343 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 130 | 3.281 | 1.391 | 0.621 | 0.499 | 0.358 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 135 | 3.337 | 1.446 | 0.640 | 0.515 | 0.373 | 0.288 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 140 | 3.392 | 1.508 | 0.658 | 0.531 | 0.388 | 0.303 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 145 | 3.447 | 1.571 | 0.677 | 0.547 | 0.402 | 0.317 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 150 | 3.502 | 1.634 | 0.696 | 0.563 | 0.417 | 0.332 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 155 | 3.558 | 1.697 | 0.715 | 0.579 | 0.432 | 0.347 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 160 | 3.613 | 1.760 | 0.733 | 0.595 | 0.447 | 0.362 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 165 | 3.668 | 1.823 | 0.752 | 0.611 | 0.462 | 0.377 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 170 | 3.723 | 1.886 | 0.771 | 0.627 | 0.477 | 0.392 | 0.293 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 175 | - | 1.949 | 0.790 | 0.643 | 0.492 | 0.407 | 0.308 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 180 | - | 2.012 | 0.808 | 0.659 | 0.507 | 0.422 | 0.323 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 185 | - | 2.076 | 0.827 | 0.675 | 0.522 | 0.436 | 0.337 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 190 | - | 2.139 | 0.846 | 0.691 | 0.536 | 0.451 | 0.352 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 195 | - | 2.202 | 0.865 | 0.707 | 0.551 | 0.466 | 0.367 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 200 | - | 2.265 | 0.883 | 0.723 | 0.566 | 0.481 | 0.381 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 205 | - | 2.328 | 0.902 | 0.739 | 0.581 | 0.496 | 0.396 | 0.294 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 210 | - | 2.391 | 0.921 | 0.755 | 0.596 | 0.511 | 0.411 | 0.309 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 215 | - | 2.454 | 0.939 | 0.771 | 0.611 | 0.526 | 0.425 | 0.323 | 0.291 | 0.284 | 0.284 | 0.284 | 0.284 |
| 220 | - | 2.517 | 0.958 | 0.787 | 0.626 | 0.540 | 0.440 | 0.338 | 0.304 | 0.284 | 0.284 | 0.284 | 0.284 |
| 225 | - | 2.580 | 0.977 | 0.803 | 0.641 | 0.555 | 0.455 | 0.353 | 0.318 | 0.287 | 0.284 | 0.284 | 0.284 |
| 230 | - | 2.644 | 0.996 | 0.819 | 0.656 | 0.570 | 0.469 | 0.367 | 0.331 | 0.300 | 0.284 | 0.284 | 0.284 |
| 235 | - | 2.707 | 1.014 | 0.835 | 0.670 | 0.585 | 0.484 | 0.382 | 0.345 | 0.313 | 0.284 | 0.284 | 0.284 |
| 240 | - | 2.770 | 1.033 | 0.851 | 0.685 | 0.600 | 0.499 | 0.396 | 0.359 | 0.326 | 0.284 | 0.284 | 0.284 |
| 245 | - | 2.833 | 1.052 | 0.867 | 0.700 | 0.615 | 0.513 | 0.411 | 0.372 | 0.339 | 0.284 | 0.284 | 0.284 |
| 250 | - | 2.896 | 1.071 | 0.883 | 0.715 | 0.630 | 0.528 | 0.426 | 0.386 | 0.352 | 0.284 | 0.284 | 0.284 |
| 255 | - | 2.959 | 1.089 | 0.899 | 0.730 | 0.645 | 0.543 | 0.440 | 0.400 | 0.365 | 0.284 | 0.284 | 0.284 |
| 260 | - | 3.022 | 1.108 | 0.915 | 0.745 | 0.659 | 0.557 | 0.455 | 0.413 | 0.378 | 0.284 | 0.284 | 0.284 |
| 265 | - | - | 1.127 | 0.931 | 0.760 | 0.674 | 0.572 | 0.469 | 0.427 | 0.391 | 0.284 | 0.284 | 0.284 |
| 270 | - | - | 1.146 | 0.947 | 0.775 | 0.689 | 0.587 | 0.484 | 0.441 | 0.404 | 0.291 | 0.284 | 0.284 |
| 275 | - | - | 1.164 | 0.963 | 0.790 | 0.704 | 0.601 | 0.499 | 0.454 | 0.417 | 0.304 | 0.284 | 0.284 |
| 280 | - | - | 1.183 | 0.979 | 0.804 | 0.719 | 0.616 | 0.513 | 0.468 | 0.430 | 0.317 | 0.284 | 0.284 |
| 285 | - | - | 1.202 | 0.995 | 0.819 | 0.734 | 0.631 | 0.528 | 0.482 | 0.443 | 0.329 | 0.284 | 0.284 |
| 290 | - | - | 1.221 | 1.011 | 0.834 | 0.749 | 0.645 | 0.542 | 0.495 | 0.456 | 0.342 | 0.284 | 0.284 |
| 295 | - | - | 1.239 | 1.027 | 0.849 | 0.764 | 0.660 | 0.557 | 0.509 | 0.469 | 0.355 | 0.287 | 0.284 |
| 300 | - | - | 1.258 | 1.043 | 0.864 | 0.778 | 0.675 | 0.572 | 0.522 | 0.482 | 0.367 | 0.298 | 0.284 |
| 305 | - | - | 1.277 | 1.059 | 0.879 | 0.793 | 0.689 | 0.586 | 0.536 | 0.495 | 0.380 | 0.309 | 0.284 |
| 310 | - | - | 1.296 | 1.075 | 0.894 | 0.808 | 0.704 | 0.601 | 0.550 | 0.508 | 0.393 | 0.319 | 0.284 |
| 315 | - | - | 1.314 | 1.091 | 0.909 | 0.823 | 0.719 | 0.615 | 0.563 | 0.521 | 0.405 | 0.330 | 0.284 |
| 320 | - | - | 1.333 | 1.107 | 0.924 | 0.838 | 0.733 | 0.630 | 0.577 | 0.534 | 0.418 | 0.340 | 0.284 |
| 325 | - | - | 1.352 | 1.123 | 0.938 | 0.853 | 0.748 | 0.644 | 0.591 | 0.547 | 0.431 | 0.351 | 0.284 |
| 330 | - | - | 1.370 | 1.139 | 0.953 | 0.868 | 0.763 | 0.659 | 0.604 | 0.560 | 0.443 | 0.362 | 0.284 |
| 335 | - | - | 1.389 | 1.155 | 0.968 | 0.883 | 0.777 | 0.674 | 0.618 | 0.573 | 0.456 | 0.372 | 0.284 |
| 340 | - | - | 1.408 | 1.171 | 0.983 | 0.897 | 0.792 | 0.688 | 0.632 | 0.586 | 0.469 | 0.383 | 0.284 |
| 345 | - | - | 1.427 | 1.187 | 0.998 | 0.912 | 0.807 | 0.703 | 0.645 | 0.599 | 0.482 | 0.393 | 0.291 |
| 350 | - | - | 1.445 | 1.203 | 1.013 | 0.927 | 0.821 | 0.717 | 0.659 | 0.612 | 0.494 | 0.404 | 0.299 |

Thickness is intumescent only.

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



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 4 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 |
| 30 | 1.731 | 0.923 | 0.327 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 35 | 2.014 | 1.029 | 0.371 | 0.291 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 40 | 2.297 | 1.135 | 0.415 | 0.336 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 45 | 2.579 | 1.242 | 0.459 | 0.381 | 0.302 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 50 | 2.834 | 1.348 | 0.503 | 0.427 | 0.320 | 0.299 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 55 | 2.974 | 1.455 | 0.547 | 0.472 | 0.338 | 0.316 | 0.294 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 60 | 3.114 | 1.519 | 0.591 | 0.518 | 0.356 | 0.333 | 0.310 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 65 | 3.254 | 1.583 | 0.635 | 0.563 | 0.373 | 0.350 | 0.326 | 0.299 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 70 | 3.395 | 1.646 | 0.679 | 0.608 | 0.391 | 0.367 | 0.343 | 0.315 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 75 | 3.535 | 1.709 | 0.723 | 0.654 | 0.409 | 0.385 | 0.359 | 0.330 | 0.297 | 0.284 | 0.284 | 0.284 | 0.284 |
| 80 | 3.675 | 1.773 | 0.767 | 0.699 | 0.427 | 0.402 | 0.375 | 0.346 | 0.312 | 0.284 | 0.284 | 0.284 | 0.284 |
| 85 | - | 1.836 | 0.811 | 0.745 | 0.445 | 0.419 | 0.391 | 0.361 | 0.327 | 0.292 | 0.284 | 0.284 | 0.284 |
| 90 | - | 1.900 | 0.855 | 0.790 | 0.463 | 0.436 | 0.407 | 0.377 | 0.342 | 0.306 | 0.284 | 0.284 | 0.284 |
| 95 | - | 1.963 | 0.899 | 0.835 | 0.481 | 0.453 | 0.424 | 0.392 | 0.357 | 0.321 | 0.284 | 0.284 | 0.284 |
| 100 | - | 2.027 | 0.943 | 0.881 | 0.499 | 0.470 | 0.440 | 0.408 | 0.372 | 0.335 | 0.284 | 0.284 | 0.284 |
| 105 | - | 2.090 | 0.987 | 0.926 | 0.517 | 0.487 | 0.456 | 0.423 | 0.386 | 0.350 | 0.284 | 0.284 | 0.284 |
| 110 | - | 2.154 | 1.031 | 0.972 | 0.534 | 0.504 | 0.472 | 0.439 | 0.401 | 0.365 | 0.284 | 0.284 | 0.284 |
| 115 | - | 2.217 | 1.075 | 1.017 | 0.552 | 0.522 | 0.488 | 0.454 | 0.416 | 0.379 | 0.284 | 0.284 | 0.284 |
| 120 | - | 2.281 | 1.119 | 1.062 | 0.570 | 0.539 | 0.504 | 0.470 | 0.431 | 0.394 | 0.284 | 0.284 | 0.284 |
| 125 | - | 2.344 | 1.163 | 1.108 | 0.588 | 0.556 | 0.521 | 0.485 | 0.446 | 0.408 | 0.284 | 0.284 | 0.284 |
| 130 | - | 2.408 | 1.207 | 1.153 | 0.606 | 0.573 | 0.537 | 0.501 | 0.461 | 0.423 | 0.284 | 0.284 | 0.284 |
| 135 | - | 2.471 | 1.251 | 1.199 | 0.624 | 0.590 | 0.553 | 0.516 | 0.476 | 0.437 | 0.284 | 0.284 | 0.284 |
| 140 | - | 2.535 | 1.296 | 1.244 | 0.642 | 0.607 | 0.569 | 0.532 | 0.491 | 0.452 | 0.284 | 0.284 | 0.284 |
| 145 | - | 2.598 | 1.340 | 1.289 | 0.660 | 0.624 | 0.585 | 0.547 | 0.506 | 0.467 | 0.284 | 0.284 | 0.284 |
| 150 | - | 2.662 | 1.384 | 1.335 | 0.678 | 0.641 | 0.602 | 0.562 | 0.521 | 0.481 | 0.284 | 0.284 | 0.284 |
| 155 | - | 2.725 | 1.428 | 1.380 | 0.695 | 0.659 | 0.618 | 0.578 | 0.535 | 0.496 | 0.296 | 0.284 | 0.284 |
| 160 | - | 2.789 | 1.484 | 1.426 | 0.713 | 0.676 | 0.634 | 0.593 | 0.550 | 0.510 | 0.312 | 0.284 | 0.284 |
| 165 | - | 2.903 | 1.564 | 1.471 | 0.731 | 0.693 | 0.650 | 0.609 | 0.565 | 0.525 | 0.328 | 0.284 | 0.284 |
| 170 | - | 3.039 | 1.644 | 1.516 | 0.749 | 0.710 | 0.666 | 0.624 | 0.580 | 0.540 | 0.344 | 0.284 | 0.284 |
| 175 | - | 3.174 | 1.724 | 1.562 | 0.767 | 0.727 | 0.682 | 0.640 | 0.595 | 0.554 | 0.360 | 0.284 | 0.284 |
| 180 | - | 3.309 | 1.804 | 1.607 | 0.785 | 0.744 | 0.699 | 0.655 | 0.610 | 0.569 | 0.376 | 0.284 | 0.284 |
| 185 | - | 3.444 | 1.884 | 1.653 | 0.803 | 0.761 | 0.715 | 0.671 | 0.625 | 0.583 | 0.392 | 0.284 | 0.284 |
| 190 | - | 3.579 | 1.964 | 1.698 | 0.821 | 0.778 | 0.731 | 0.686 | 0.640 | 0.598 | 0.408 | 0.284 | 0.284 |
| 195 | - | 3.714 | 2.045 | 1.743 | 0.839 | 0.796 | 0.747 | 0.702 | 0.655 | 0.612 | 0.424 | 0.284 | 0.284 |
| 200 | - | - | 2.125 | 1.789 | 0.856 | 0.813 | 0.763 | 0.717 | 0.669 | 0.627 | 0.440 | 0.284 | 0.284 |
| 205 | - | - | 2.205 | 1.834 | 0.874 | 0.830 | 0.779 | 0.733 | 0.684 | 0.642 | 0.456 | 0.292 | 0.284 |
| 210 | - | - | 2.285 | 1.880 | 0.892 | 0.847 | 0.796 | 0.748 | 0.699 | 0.656 | 0.472 | 0.307 | 0.284 |
| 215 | - | - | 2.365 | 1.925 | 0.910 | 0.864 | 0.812 | 0.764 | 0.714 | 0.671 | 0.488 | 0.322 | 0.284 |
| 220 | - | - | 2.445 | 1.970 | 0.928 | 0.881 | 0.828 | 0.779 | 0.729 | 0.685 | 0.504 | 0.338 | 0.284 |
| 225 | - | - | 2.525 | 2.016 | 0.946 | 0.898 | 0.844 | 0.795 | 0.744 | 0.700 | 0.520 | 0.353 | 0.286 |
| 230 | - | - | 2.605 | 2.061 | 0.964 | 0.915 | 0.860 | 0.810 | 0.759 | 0.715 | 0.536 | 0.368 | 0.299 |
| 235 | - | - | 2.686 | 2.107 | 0.982 | 0.932 | 0.877 | 0.826 | 0.774 | 0.729 | 0.552 | 0.384 | 0.312 |
| 240 | - | - | 2.766 | 2.152 | 0.999 | 0.950 | 0.893 | 0.841 | 0.789 | 0.744 | 0.568 | 0.399 | 0.326 |
| 245 | - | - | 2.846 | 2.197 | 1.017 | 0.967 | 0.909 | 0.857 | 0.803 | 0.758 | 0.584 | 0.414 | 0.339 |
| 250 | - | - | 2.926 | 2.243 | 1.035 | 0.984 | 0.925 | 0.872 | 0.818 | 0.773 | 0.600 | 0.430 | 0.352 |
| 255 | - | - | 3.006 | 2.288 | 1.053 | 1.001 | 0.941 | 0.887 | 0.833 | 0.787 | 0.616 | 0.445 | 0.365 |
| 260 | - | - | - | 2.333 | 1.071 | 1.018 | 0.957 | 0.903 | 0.848 | 0.802 | 0.632 | 0.461 | 0.378 |
| 265 | - | - | - | 2.379 | 1.089 | 1.035 | 0.974 | 0.918 | 0.863 | 0.817 | 0.648 | 0.476 | 0.392 |
| 270 | - | - | - | 2.424 | 1.107 | 1.052 | 0.990 | 0.934 | 0.878 | 0.831 | 0.664 | 0.491 | 0.405 |
| 275 | - | - | - | 2.470 | 1.125 | 1.069 | 1.006 | 0.949 | 0.893 | 0.846 | 0.680 | 0.507 | 0.418 |
| 280 | - | - | - | 2.515 | 1.143 | 1.087 | 1.022 | 0.965 | 0.908 | 0.860 | 0.696 | 0.522 | 0.431 |
| 285 | - | - | - | 2.560 | 1.160 | 1.104 | 1.038 | 0.980 | 0.923 | 0.875 | 0.712 | 0.537 | 0.444 |
| 290 | - | - | - | 2.606 | 1.178 | 1.121 | 1.055 | 0.996 | 0.937 | 0.889 | 0.728 | 0.553 | 0.458 |
| 295 | - | - | - | 2.651 | 1.196 | 1.138 | 1.071 | 1.011 | 0.952 | 0.904 | 0.744 | 0.568 | 0.471 |
| 300 | - | - | - | 2.697 | 1.214 | 1.155 | 1.087 | 1.027 | 0.967 | 0.919 | 0.760 | 0.583 | 0.484 |
| 305 | - | - | - | 2.742 | 1.232 | 1.172 | 1.103 | 1.042 | 0.982 | 0.933 | 0.776 | 0.599 | 0.497 |
| 310 | - | - | - | 2.787 | 1.250 | 1.189 | 1.119 | 1.058 | 0.997 | 0.948 | 0.791 | 0.614 | 0.511 |
| 315 | - | - | - | 2.833 | 1.268 | 1.206 | 1.135 | 1.073 | 1.012 | 0.962 | 0.807 | 0.629 | 0.524 |
| 320 | - | - | - | 2.878 | 1.286 | 1.224 | 1.152 | 1.089 | 1.027 | 0.977 | 0.823 | 0.645 | 0.537 |
| 325 | - | - | - | 2.924 | 1.304 | 1.241 | 1.168 | 1.104 | 1.042 | 0.992 | 0.839 | 0.660 | 0.550 |
| 330 | - | - | - | 2.969 | 1.321 | 1.258 | 1.184 | 1.120 | 1.057 | 1.006 | 0.855 | 0.675 | 0.563 |
| 335 | - | - | - | 3.014 | 1.339 | 1.275 | 1.200 | 1.135 | 1.072 | 1.021 | 0.871 | 0.691 | 0.577 |
| 340 | - | - | - | 3.060 | 1.357 | 1.292 | 1.216 | 1.151 | 1.086 | 1.035 | 0.887 | 0.706 | 0.590 |
| 345 | - | - | - | - | 1.375 | 1.309 | 1.233 | 1.166 | 1.101 | 1.050 | 0.903 | 0.722 | 0.603 |
| 350 | - | - | - | - | 1.393 | 1.326 | 1.249 | 1.182 | 1.116 | 1.064 | 0.919 | 0.737 | 0.616 |

Thickness is intumescent only.

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



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 5 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 |
| 30 | 2.472 | 1.521 | 0.926 | 0.563 | 0.310 | 0.298 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 35 | 2.862 | 1.675 | 0.998 | 0.603 | 0.338 | 0.321 | 0.293 | 0.293 | 0.284 | 0.284 | 0.284 | 0.284 | 0.284 |
| 40 | 3.170 | 1.829 | 1.071 | 0.643 | 0.366 | 0.344 | 0.336 | 0.312 | 0.295 | 0.284 | 0.284 | 0.284 | 0.284 |
| 45 | 3.478 | 1.983 | 1.143 | 0.683 | 0.394 | 0.381 | 0.381 | 0.330 | 0.313 | 0.297 | 0.284 | 0.284 | 0.284 |
| 50 | - | 2.137 | 1.215 | 0.723 | 0.426 | 0.426 | 0.426 | 0.349 | 0.331 | 0.315 | 0.284 | 0.284 | 0.284 |
| 55 | - | 2.292 | 1.288 | 0.762 | 0.471 | 0.471 | 0.471 | 0.368 | 0.349 | 0.332 | 0.284 | 0.284 | 0.284 |
| 60 | - | 2.446 | 1.360 | 0.802 | 0.516 | 0.516 | 0.516 | 0.387 | 0.367 | 0.349 | 0.294 | 0.284 | 0.284 |
| 65 | - | 2.600 | 1.432 | 0.842 | 0.561 | 0.561 | 0.561 | 0.405 | 0.385 | 0.367 | 0.311 | 0.284 | 0.284 |
| 70 | - | 2.754 | 1.497 | 0.882 | 0.605 | 0.605 | 0.605 | 0.424 | 0.403 | 0.384 | 0.328 | 0.284 | 0.284 |
| 75 | - | 2.840 | 1.558 | 0.921 | 0.650 | 0.650 | 0.650 | 0.443 | 0.421 | 0.402 | 0.345 | 0.286 | 0.284 |
| 80 | - | 2.891 | 1.619 | 0.961 | 0.695 | 0.695 | 0.695 | 0.462 | 0.439 | 0.419 | 0.362 | 0.301 | 0.284 |
| 85 | - | 2.942 | 1.680 | 1.001 | 0.740 | 0.740 | 0.740 | 0.481 | 0.456 | 0.436 | 0.379 | 0.317 | 0.284 |
| 90 | - | 2.992 | 1.741 | 1.041 | 0.785 | 0.785 | 0.785 | 0.499 | 0.474 | 0.454 | 0.396 | 0.333 | 0.284 |
| 95 | - | 3.043 | 1.803 | 1.081 | 0.830 | 0.830 | 0.830 | 0.518 | 0.492 | 0.471 | 0.413 | 0.349 | 0.284 |
| 100 | - | 3.094 | 1.864 | 1.120 | 0.875 | 0.875 | 0.875 | 0.537 | 0.510 | 0.489 | 0.430 | 0.365 | 0.284 |
| 105 | - | 3.145 | 1.925 | 1.160 | 0.920 | 0.920 | 0.920 | 0.556 | 0.528 | 0.506 | 0.447 | 0.380 | 0.284 |
| 110 | - | 3.195 | 1.986 | 1.200 | 0.965 | 0.965 | 0.965 | 0.574 | 0.546 | 0.523 | 0.464 | 0.396 | 0.296 |
| 115 | - | 3.246 | 2.047 | 1.240 | 1.010 | 1.010 | 1.010 | 0.593 | 0.564 | 0.541 | 0.481 | 0.412 | 0.311 |
| 120 | - | 3.297 | 2.108 | 1.279 | 1.055 | 1.055 | 1.055 | 0.612 | 0.582 | 0.558 | 0.498 | 0.428 | 0.326 |
| 125 | - | 3.348 | 2.169 | 1.319 | 1.100 | 1.100 | 1.100 | 0.631 | 0.600 | 0.576 | 0.515 | 0.443 | 0.341 |
| 130 | - | 3.398 | 2.230 | 1.359 | 1.145 | 1.145 | 1.145 | 0.650 | 0.618 | 0.593 | 0.532 | 0.459 | 0.356 |
| 135 | - | 3.449 | 2.291 | 1.399 | 1.190 | 1.190 | 1.190 | 0.668 | 0.636 | 0.610 | 0.549 | 0.475 | 0.371 |
| 140 | - | 3.500 | 2.352 | 1.439 | 1.234 | 1.234 | 1.234 | 0.687 | 0.654 | 0.628 | 0.566 | 0.491 | 0.386 |
| 145 | - | 3.551 | 2.413 | 1.502 | 1.279 | 1.279 | 1.279 | 0.706 | 0.672 | 0.645 | 0.583 | 0.506 | 0.401 |
| 150 | - | 3.601 | 2.474 | 1.586 | 1.324 | 1.324 | 1.324 | 0.725 | 0.690 | 0.663 | 0.600 | 0.522 | 0.416 |
| 155 | - | 3.652 | 2.535 | 1.671 | 1.369 | 1.369 | 1.369 | 0.743 | 0.708 | 0.680 | 0.617 | 0.538 | 0.431 |
| 160 | - | 3.703 | 2.596 | 1.755 | 1.414 | 1.414 | 1.414 | 0.762 | 0.726 | 0.697 | 0.634 | 0.554 | 0.446 |
| 165 | - | 3.754 | 2.657 | 1.839 | 1.459 | 1.459 | 1.459 | 0.781 | 0.744 | 0.715 | 0.651 | 0.570 | 0.461 |
| 170 | - | - | 2.718 | 1.923 | 1.504 | 1.504 | 1.504 | 0.800 | 0.762 | 0.732 | 0.669 | 0.585 | 0.476 |
| 175 | - | - | 2.779 | 2.007 | 1.549 | 1.549 | 1.549 | 0.819 | 0.780 | 0.750 | 0.686 | 0.601 | 0.491 |
| 180 | - | - | 2.863 | 2.092 | 1.594 | 1.594 | 1.594 | 0.837 | 0.798 | 0.767 | 0.703 | 0.617 | 0.506 |
| 185 | - | - | 2.966 | 2.176 | 1.639 | 1.639 | 1.639 | 0.856 | 0.816 | 0.785 | 0.720 | 0.633 | 0.521 |
| 190 | - | - | 3.069 | 2.260 | 1.684 | 1.684 | 1.684 | 0.875 | 0.834 | 0.802 | 0.737 | 0.648 | 0.536 |
| 195 | - | - | 3.171 | 2.344 | 1.729 | 1.729 | 1.729 | 0.894 | 0.851 | 0.819 | 0.754 | 0.664 | 0.551 |
| 200 | - | - | 3.274 | 2.429 | 1.774 | 1.774 | 1.774 | 0.912 | 0.869 | 0.837 | 0.771 | 0.680 | 0.566 |
| 205 | - | - | 3.377 | 2.513 | 1.818 | 1.818 | 1.818 | 0.931 | 0.887 | 0.854 | 0.788 | 0.696 | 0.581 |
| 210 | - | - | 3.479 | 2.597 | 1.863 | 1.863 | 1.863 | 0.950 | 0.905 | 0.872 | 0.805 | 0.712 | 0.596 |
| 215 | - | - | 3.582 | 2.681 | 1.908 | 1.908 | 1.908 | 0.969 | 0.923 | 0.889 | 0.822 | 0.727 | 0.611 |
| 220 | - | - | 3.685 | 2.766 | 1.953 | 1.953 | 1.953 | 0.988 | 0.941 | 0.906 | 0.839 | 0.743 | 0.626 |
| 225 | - | - | - | 2.835 | 1.998 | 1.998 | 1.998 | 1.006 | 0.959 | 0.924 | 0.856 | 0.759 | 0.641 |
| 230 | - | - | - | 2.891 | 2.043 | 2.043 | 2.043 | 1.025 | 0.977 | 0.941 | 0.873 | 0.775 | 0.656 |
| 235 | - | - | - | 2.946 | 2.088 | 2.088 | 2.088 | 1.044 | 0.995 | 0.959 | 0.890 | 0.790 | 0.671 |
| 240 | - | - | - | 3.001 | 2.133 | 2.133 | 2.133 | 1.063 | 1.013 | 0.976 | 0.907 | 0.806 | 0.686 |
| 245 | - | - | - | 3.057 | 2.178 | 2.178 | 2.178 | 1.081 | 1.031 | 0.993 | 0.924 | 0.822 | 0.700 |
| 250 | - | - | - | 3.112 | 2.223 | 2.223 | 2.223 | 1.100 | 1.049 | 1.011 | 0.941 | 0.838 | 0.715 |
| 255 | - | - | - | 3.168 | 2.281 | 2.268 | 2.268 | 1.119 | 1.067 | 1.028 | 0.958 | 0.853 | 0.730 |
| 260 | - | - | - | 3.223 | 2.471 | 2.313 | 2.313 | 1.138 | 1.085 | 1.046 | 0.975 | 0.869 | 0.745 |
| 265 | - | - | - | 3.279 | 2.662 | 2.358 | 2.358 | 1.157 | 1.103 | 1.063 | 0.992 | 0.885 | 0.760 |
| 270 | - | - | - | 3.334 | 2.852 | 2.403 | 2.403 | 1.175 | 1.121 | 1.080 | 1.009 | 0.901 | 0.775 |
| 275 | - | - | - | - | - | 2.447 | 2.447 | 1.194 | 1.139 | 1.098 | 1.026 | 0.917 | 0.790 |
| 280 | - | - | - | - | - | 2.492 | 2.492 | 1.213 | 1.157 | 1.115 | 1.043 | 0.932 | 0.805 |
| 285 | - | - | - | - | - | 2.537 | 2.537 | 1.232 | 1.175 | 1.133 | 1.060 | 0.948 | 0.820 |
| 290 | - | - | - | - | - | - | 2.582 | 1.250 | 1.193 | 1.150 | 1.077 | 0.964 | 0.835 |
| 295 | - | - | - | - | - | - | 2.627 | 1.269 | 1.211 | 1.168 | 1.094 | 0.980 | 0.850 |
| 300 | - | - | - | - | - | - | 2.672 | 1.288 | 1.228 | 1.185 | 1.111 | 0.995 | 0.865 |
| 305 | - | - | - | - | - | - | 2.717 | 1.307 | 1.246 | 1.202 | 1.128 | 1.011 | 0.880 |
| 310 | - | - | - | - | - | - | 2.762 | 1.326 | 1.264 | 1.220 | 1.145 | 1.027 | 0.895 |
| 315 | - | - | - | - | - | - | 2.807 | 1.344 | 1.282 | 1.237 | 1.162 | 1.043 | 0.910 |
| 320 | - | - | - | - | - | - | 2.852 | 1.363 | 1.300 | 1.255 | 1.179 | 1.059 | 0.925 |
| 325 | - | - | - | - | - | - | 2.897 | 1.382 | 1.318 | 1.272 | 1.196 | 1.074 | 0.940 |
| 330 | - | - | - | - | - | - | 2.942 | 1.401 | 1.336 | 1.289 | 1.213 | 1.090 | 0.955 |
| 335 | - | - | - | - | - | - | 2.987 | 1.419 | 1.354 | 1.307 | 1.230 | 1.106 | 0.970 |
| 340 | - | - | - | - | - | - | 3.031 | 1.438 | 1.372 | 1.324 | 1.247 | 1.122 | 0.985 |
| 345 | - | - | - | - | - | - | 3.076 | 1.457 | 1.390 | 1.342 | 1.264 | 1.137 | 1.000 |
| 350 | - | - | - | - | - | - | - | 1.476 | 1.408 | 1.359 | 1.281 | 1.153 | 1.015 |

Thickness is intumescent only.

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



Issued: 28th March 2011
Revised: 5th November 2019
Valid to: 26th June 2024

# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 6 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 |
| 30 | 3.269 | 2.176 | 1.435 | 1.006 | 0.695 | 0.588 | 0.337 | 0.320 | 0.305 | 0.284 | 0.284 | 0.284 | 0.284 |
| 35 | - | 2.426 | 1.529 | 1.067 | 0.739 | 0.624 | 0.375 | 0.351 | 0.331 | 0.316 | 0.289 | 0.284 | 0.284 |
| 40 | - | 2.677 | 1.622 | 1.128 | 0.783 | 0.659 | 0.412 | 0.382 | 0.364 | 0.364 | 0.309 | 0.284 | 0.284 |
| 45 | - | 2.882 | 1.715 | 1.189 | 0.827 | 0.695 | 0.449 | 0.413 | 0.412 | 0.412 | 0.329 | 0.292 | 0.284 |
| 50 | - | 3.038 | 1.809 | 1.250 | 0.871 | 0.731 | 0.486 | 0.460 | 0.460 | 0.460 | 0.349 | 0.311 | 0.284 |
| 55 | - | 3.194 | 1.902 | 1.311 | 0.915 | 0.766 | 0.523 | 0.509 | 0.509 | 0.509 | 0.369 | 0.329 | 0.284 |
| 60 | - | 3.350 | 1.996 | 1.373 | 0.959 | 0.802 | 0.561 | 0.557 | 0.557 | 0.557 | 0.389 | 0.348 | 0.291 |
| 65 | - | 3.506 | 2.089 | 1.434 | 1.003 | 0.838 | 0.605 | 0.605 | 0.605 | 0.605 | 0.409 | 0.366 | 0.308 |
| 70 | - | 3.662 | 2.182 | 1.496 | 1.047 | 0.873 | 0.653 | 0.653 | 0.653 | 0.653 | 0.429 | 0.385 | 0.326 |
| 75 | - | - | 2.276 | 1.560 | 1.091 | 0.909 | 0.701 | 0.701 | 0.701 | 0.701 | 0.449 | 0.403 | 0.343 |
| 80 | - | - | 2.369 | 1.624 | 1.135 | 0.945 | 0.750 | 0.750 | 0.750 | 0.750 | 0.469 | 0.421 | 0.360 |
| 85 | - | - | 2.463 | 1.688 | 1.179 | 0.981 | 0.798 | 0.798 | 0.798 | 0.798 | 0.489 | 0.440 | 0.378 |
| 90 | - | - | 2.556 | 1.751 | 1.222 | 1.016 | 0.846 | 0.846 | 0.846 | 0.846 | 0.509 | 0.458 | 0.395 |
| 95 | - | - | 2.649 | 1.815 | 1.266 | 1.052 | 0.894 | 0.894 | 0.894 | 0.894 | 0.529 | 0.477 | 0.412 |
| 100 | - | - | 2.743 | 1.879 | 1.310 | 1.088 | 0.942 | 0.942 | 0.942 | 0.942 | 0.548 | 0.495 | 0.429 |
| 105 | - | - | 2.827 | 1.943 | 1.354 | 1.123 | 0.991 | 0.991 | 0.991 | 0.991 | 0.568 | 0.514 | 0.447 |
| 110 | - | - | 2.891 | 2.006 | 1.398 | 1.159 | 1.039 | 1.039 | 1.039 | 1.039 | 0.588 | 0.532 | 0.464 |
| 115 | - | - | 2.955 | 2.070 | 1.442 | 1.195 | 1.087 | 1.087 | 1.087 | 1.087 | 0.608 | 0.550 | 0.481 |
| 120 | - | - | 3.019 | 2.134 | 1.508 | 1.230 | 1.135 | 1.135 | 1.135 | 1.135 | 0.628 | 0.569 | 0.499 |
| 125 | - | - | 3.083 | 2.198 | 1.584 | 1.266 | 1.183 | 1.183 | 1.183 | 1.183 | 0.648 | 0.587 | 0.516 |
| 130 | - | - | 3.147 | 2.261 | 1.660 | 1.302 | 1.231 | 1.231 | 1.231 | 1.231 | 0.668 | 0.606 | 0.533 |
| 135 | - | - | 3.211 | 2.325 | 1.736 | 1.337 | 1.280 | 1.280 | 1.280 | 1.280 | 0.688 | 0.624 | 0.551 |
| 140 | - | - | 3.274 | 2.389 | 1.812 | 1.373 | 1.328 | 1.328 | 1.328 | 1.328 | 0.708 | 0.643 | 0.568 |
| 145 | - | - | 3.338 | 2.453 | 1.888 | 1.409 | 1.376 | 1.376 | 1.376 | 1.376 | 0.728 | 0.661 | 0.585 |
| 150 | - | - | 3.402 | 2.516 | 1.964 | 1.445 | 1.424 | 1.424 | 1.424 | 1.424 | 0.748 | 0.679 | 0.603 |
| 155 | - | - | 3.466 | 2.580 | 2.039 | 1.523 | 1.472 | 1.472 | 1.472 | 1.472 | 0.768 | 0.698 | 0.620 |
| 160 | - | - | 3.530 | 2.644 | 2.115 | 1.624 | 1.521 | 1.521 | 1.521 | 1.521 | 0.788 | 0.716 | 0.637 |
| 165 | - | - | 3.594 | 2.707 | 2.191 | 1.725 | 1.569 | 1.569 | 1.569 | 1.569 | 0.808 | 0.735 | 0.655 |
| 170 | - | - | 3.658 | 2.771 | 2.267 | 1.826 | 1.617 | 1.617 | 1.617 | 1.617 | 0.827 | 0.753 | 0.672 |
| 175 | - | - | 3.722 | 2.850 | 2.343 | 1.927 | 1.665 | 1.665 | 1.665 | 1.665 | 0.847 | 0.772 | 0.689 |
| 180 | - | - | - | 2.949 | 2.419 | 2.028 | 1.713 | 1.713 | 1.713 | 1.713 | 0.867 | 0.790 | 0.707 |
| 185 | - | - | - | 3.047 | 2.495 | 2.129 | 1.762 | 1.762 | 1.762 | 1.762 | 0.887 | 0.808 | 0.724 |
| 190 | - | - | - | 3.146 | 2.571 | 2.230 | 1.810 | 1.810 | 1.810 | 1.810 | 0.907 | 0.827 | 0.741 |
| 195 | - | - | - | 3.244 | 2.647 | 2.331 | 1.858 | 1.858 | 1.858 | 1.858 | 0.927 | 0.845 | 0.759 |
| 200 | - | - | - | 3.343 | 2.723 | 2.432 | 1.918 | 1.906 | 1.906 | 1.906 | 0.947 | 0.864 | 0.776 |
| 205 | - | - | - | 3.442 | 2.799 | 2.532 | 2.036 | 1.954 | 1.954 | 1.954 | 0.967 | 0.882 | 0.793 |
| 210 | - | - | - | 3.540 | 2.867 | 2.633 | 2.154 | 2.003 | 2.003 | 2.003 | 0.987 | 0.901 | 0.811 |
| 215 | - | - | - | 3.639 | 2.935 | 2.734 | 2.272 | 2.051 | 2.051 | 2.051 | 1.007 | 0.919 | 0.828 |
| 220 | - | - | - | 3.737 | 3.002 | 2.828 | 2.390 | 2.099 | 2.099 | 2.099 | 1.027 | 0.937 | 0.845 |
| 225 | - | - | - | - | 3.070 | 2.904 | 2.508 | 2.147 | 2.147 | 2.147 | 1.047 | 0.956 | 0.863 |
| 230 | - | - | - | - | 3.137 | 2.979 | 2.626 | 2.195 | 2.195 | 2.195 | 1.067 | 0.974 | 0.880 |
| 235 | - | - | - | - | 3.205 | 3.055 | 2.744 | 2.244 | 2.244 | 2.244 | 1.087 | 0.993 | 0.897 |
| 240 | - | - | - | - | 3.272 | 3.130 | 2.851 | 2.329 | 2.292 | 2.292 | 1.107 | 1.011 | 0.915 |
| 245 | - | - | - | - | 3.340 | 3.206 | 2.945 | 2.484 | 2.340 | 2.340 | 1.126 | 1.030 | 0.932 |
| 250 | - | - | - | - | 3.407 | 3.281 | 3.039 | 2.640 | 2.388 | 2.388 | 1.146 | 1.048 | 0.949 |
| 255 | - | - | - | - | 3.475 | 3.357 | 3.133 | 2.796 | 2.436 | 2.436 | 1.166 | 1.066 | 0.967 |
| 260 | - | - | - | - | 3.543 | 3.432 | 3.226 | 2.921 | 2.485 | 2.485 | 1.186 | 1.085 | 0.984 |
| 265 | - | - | - | - | 3.610 | 3.508 | 3.320 | 3.044 | 2.533 | 2.533 | 1.206 | 1.103 | 1.001 |
| 270 | - | - | - | - | 3.678 | 3.583 | 3.414 | 3.166 | 2.581 | 2.581 | 1.226 | 1.122 | 1.019 |
| 275 | - | - | - | - | 3.745 | 3.659 | 3.508 | 3.289 | 2.803 | 2.629 | 1.246 | 1.140 | 1.036 |
| 280 | - | - | - | - | - | 3.734 | 3.602 | 3.412 | 2.993 | 2.677 | 1.266 | 1.159 | 1.053 |
| 285 | - | - | - | - | - | - | 3.696 | 3.535 | 3.181 | 2.726 | 1.286 | 1.177 | 1.071 |
| 290 | - | - | - | - | - | - | - | 3.657 | 3.370 | 2.774 | 1.306 | 1.195 | 1.088 |
| 295 | - | - | - | - | - | - | - | - | 3.558 | 2.929 | 1.326 | 1.214 | 1.105 |
| 300 | - | - | - | - | - | - | - | - | 3.747 | 3.321 | 1.346 | 1.232 | 1.123 |
| 305 | - | - | - | - | - | - | - | - | - | - | 1.366 | 1.251 | 1.140 |
| 310 | - | - | - | - | - | - | - | - | - | - | 1.386 | 1.269 | 1.157 |
| 315 | - | - | - | - | - | - | - | - | - | - | 1.406 | 1.288 | 1.175 |
| 320 | - | - | - | - | - | - | - | - | - | - | 1.425 | 1.306 | 1.192 |
| 325 | - | - | - | - | - | - | - | - | - | - | 1.445 | 1.324 | 1.209 |
| 330 | - | - | - | - | - | - | - | - | - | - | 1.465 | 1.343 | 1.227 |
| 335 | - | - | - | - | - | - | - | - | - | - | 1.485 | 1.361 | 1.244 |
| 340 | - | - | - | - | - | - | - | - | - | - | 1.505 | 1.380 | 1.261 |
| 345 | - | - | - | - | - | - | - | - | - | - | 1.525 | 1.398 | 1.279 |
| 350 | - | - | - | - | - | - | - | - | - | - | 1.545 | 1.417 | 1.296 |

Thickness is intumescent only.

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



Issued: 28th March 2011
Revised: 5th November 2019
Valid to: 26th June 2024

# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 7 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 |
| 30 | - | 2.787 | 2.004 | 1.437 | 1.080 | 0.958 | 0.820 | 0.698 | 0.583 | 0.343 | 0.311 | 0.284 | 0.284 |
| 35 | - | 3.134 | 2.189 | 1.526 | 1.150 | 1.014 | 0.872 | 0.744 | 0.622 | 0.384 | 0.347 | 0.306 | 0.284 |
| 40 | - | 3.480 | 2.374 | 1.614 | 1.221 | 1.070 | 0.924 | 0.790 | 0.660 | 0.426 | 0.382 | 0.331 | 0.287 |
| 45 | - | - | 2.559 | 1.703 | 1.291 | 1.125 | 0.976 | 0.836 | 0.699 | 0.467 | 0.417 | 0.356 | 0.307 |
| 50 | - | - | 2.745 | 1.792 | 1.362 | 1.181 | 1.028 | 0.882 | 0.738 | 0.508 | 0.453 | 0.381 | 0.327 |
| 55 | - | - | 2.865 | 1.880 | 1.432 | 1.237 | 1.080 | 0.928 | 0.777 | 0.550 | 0.488 | 0.406 | 0.348 |
| 60 | - | - | 2.951 | 1.969 | 1.497 | 1.293 | 1.131 | 0.974 | 0.815 | 0.591 | 0.523 | 0.431 | 0.368 |
| 65 | - | - | 3.038 | 2.057 | 1.559 | 1.348 | 1.183 | 1.020 | 0.854 | 0.633 | 0.558 | 0.455 | 0.388 |
| 70 | - | - | 3.125 | 2.146 | 1.620 | 1.404 | 1.235 | 1.065 | 0.893 | 0.674 | 0.594 | 0.480 | 0.408 |
| 75 | - | - | 3.211 | 2.235 | 1.682 | 1.460 | 1.287 | 1.111 | 0.932 | 0.715 | 0.629 | 0.505 | 0.428 |
| 80 | - | - | 3.298 | 2.323 | 1.743 | 1.527 | 1.339 | 1.157 | 0.970 | 0.757 | 0.664 | 0.530 | 0.449 |
| 85 | - | - | 3.385 | 2.412 | 1.805 | 1.593 | 1.391 | 1.203 | 1.009 | 0.798 | 0.700 | 0.555 | 0.469 |
| 90 | - | - | 3.471 | 2.501 | 1.866 | 1.659 | 1.443 | 1.249 | 1.048 | 0.846 | 0.735 | 0.580 | 0.489 |
| 95 | - | - | 3.558 | 2.589 | 1.928 | 1.726 | 1.507 | 1.295 | 1.087 | 0.894 | 0.770 | 0.605 | 0.509 |
| 100 | - | - | 3.645 | 2.678 | 1.990 | 1.792 | 1.575 | 1.341 | 1.125 | 0.942 | 0.805 | 0.630 | 0.529 |
| 105 | - | - | 3.731 | 2.766 | 2.051 | 1.858 | 1.643 | 1.386 | 1.164 | 0.991 | 0.841 | 0.654 | 0.550 |
| 110 | - | - | - | 2.843 | 2.113 | 1.925 | 1.711 | 1.432 | 1.203 | 1.039 | 0.876 | 0.679 | 0.570 |
| 115 | - | - | - | 2.910 | 2.174 | 1.991 | 1.778 | 1.491 | 1.241 | 1.087 | 0.911 | 0.704 | 0.590 |
| 120 | - | - | - | 2.976 | 2.236 | 2.057 | 1.846 | 1.566 | 1.280 | 1.135 | 0.947 | 0.729 | 0.610 |
| 125 | - | - | - | 3.043 | 2.298 | 2.124 | 1.914 | 1.640 | 1.319 | 1.183 | 0.982 | 0.754 | 0.630 |
| 130 | - | - | - | 3.110 | 2.359 | 2.190 | 1.982 | 1.714 | 1.358 | 1.231 | 1.017 | 0.779 | 0.651 |
| 135 | - | - | - | 3.176 | 2.421 | 2.256 | 2.050 | 1.789 | 1.396 | 1.280 | 1.052 | 0.804 | 0.671 |
| 140 | - | - | - | 3.243 | 2.482 | 2.323 | 2.118 | 1.863 | 1.435 | 1.328 | 1.088 | 0.829 | 0.691 |
| 145 | - | - | - | 3.310 | 2.544 | 2.389 | 2.185 | 1.938 | 1.497 | 1.376 | 1.123 | 0.854 | 0.711 |
| 150 | - | - | - | 3.376 | 2.605 | 2.455 | 2.253 | 2.012 | 1.588 | 1.424 | 1.158 | 0.878 | 0.732 |
| 155 | - | - | - | 3.443 | 2.667 | 2.522 | 2.321 | 2.087 | 1.679 | 1.472 | 1.194 | 0.903 | 0.752 |
| 160 | - | - | - | 3.510 | 2.729 | 2.588 | 2.389 | 2.161 | 1.770 | 1.521 | 1.229 | 0.928 | 0.772 |
| 165 | - | - | - | 3.576 | 2.790 | 2.655 | 2.457 | 2.235 | 1.861 | 1.569 | 1.264 | 0.953 | 0.792 |
| 170 | - | - | - | 3.643 | 2.891 | 2.721 | 2.525 | 2.310 | 1.952 | 1.617 | 1.299 | 0.978 | 0.812 |
| 175 | - | - | - | 3.710 | 3.006 | 2.787 | 2.592 | 2.384 | 2.042 | 1.674 | 1.335 | 1.003 | 0.833 |
| 180 | - | - | - | - | 3.121 | 2.856 | 2.660 | 2.459 | 2.133 | 1.778 | 1.370 | 1.028 | 0.853 |
| 185 | - | - | - | - | 3.236 | 2.926 | 2.728 | 2.533 | 2.224 | 1.883 | 1.405 | 1.053 | 0.873 |
| 190 | - | - | - | - | 3.351 | 2.995 | 2.796 | 2.607 | 2.315 | 1.987 | 1.441 | 1.077 | 0.893 |
| 195 | - | - | - | - | 3.466 | 3.065 | 2.871 | 2.682 | 2.406 | 2.092 | 1.521 | 1.102 | 0.913 |
| 200 | - | - | - | - | 3.582 | 3.135 | 2.948 | 2.756 | 2.497 | 2.196 | 1.641 | 1.127 | 0.934 |
| 205 | - | - | - | - | 3.697 | 3.204 | 3.025 | 2.834 | 2.588 | 2.300 | 1.760 | 1.152 | 0.954 |
| 210 | - | - | - | - | - | 3.274 | 3.101 | 2.920 | 2.679 | 2.405 | 1.880 | 1.177 | 0.974 |
| 215 | - | - | - | - | - | 3.344 | 3.178 | 3.005 | 2.770 | 2.509 | 2.000 | 1.202 | 0.994 |
| 220 | - | - | - | - | - | 3.413 | 3.255 | 3.091 | 2.866 | 2.614 | 2.119 | 1.227 | 1.014 |
| 225 | - | - | - | - | - | 3.483 | 3.332 | 3.176 | 2.964 | 2.718 | 2.239 | 1.252 | 1.035 |
| 230 | - | - | - | - | - | 3.553 | 3.408 | 3.262 | 3.063 | 2.824 | 2.358 | 1.277 | 1.055 |
| 235 | - | - | - | - | - | 3.622 | 3.485 | 3.347 | 3.161 | 2.940 | 2.478 | 1.301 | 1.075 |
| 240 | - | - | - | - | - | 3.692 | 3.562 | 3.433 | 3.260 | 3.056 | 2.598 | 1.326 | 1.095 |
| 245 | - | - | - | - | - | 3.762 | 3.639 | 3.519 | 3.358 | 3.172 | 2.717 | 1.351 | 1.115 |
| 250 | - | - | - | - | - | - | 3.715 | 3.604 | 3.457 | 3.288 | 2.848 | 1.376 | 1.136 |
| 255 | - | - | - | - | - | - | - | 3.690 | 3.555 | 3.404 | 3.011 | 1.401 | 1.156 |
| 260 | - | - | - | - | - | - | - | - | 3.654 | 3.519 | 3.174 | 1.426 | 1.176 |
| 265 | - | - | - | - | - | - | - | - | 3.752 | 3.635 | 3.337 | 1.451 | 1.196 |
| 270 | - | - | - | - | - | - | - | - | - | 3.751 | 3.500 | 1.711 | 1.216 |
| 275 | - | - | - | - | - | - | - | - | - | - | 3.663 | 2.051 | 1.237 |
| 280 | - | - | - | - | - | - | - | - | - | - | - | 2.391 | 1.257 |
| 285 | - | - | - | - | - | - | - | - | - | - | - | 2.732 | 1.277 |
| 290 | - | - | - | - | - | - | - | - | - | - | - | 3.337 | 1.297 |
| 295 | - | - | - | - | - | - | - | - | - | - | - | - | 1.317 |
| 300 | - | - | - | - | - | - | - | - | - | - | - | - | 1.338 |
| 305 | - | - | - | - | - | - | - | - | - | - | - | - | 1.358 |
| 310 | - | - | - | - | - | - | - | - | - | - | - | - | 1.378 |
| 315 | - | - | - | - | - | - | - | - | - | - | - | - | 1.398 |
| 320 | - | - | - | - | - | - | - | - | - | - | - | - | 1.419 |
| 325 | - | - | - | - | - | - | - | - | - | - | - | - | 1.439 |
| 330 | - | - | - | - | - | - | - | - | - | - | - | - | 1.459 |
| 335 | - | - | - | - | - | - | - | - | - | - | - | - | 1.479 |
| 340 | - | - | - | - | - | - | - | - | - | - | - | - | 1.499 |
| 345 | - | - | - | - | - | - | - | - | - | - | - | - | 1.520 |
| 350 | - | - | - | - | - | - | - | - | - | - | - | - | 1.540 |

Thickness is intumescent only.

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



Issued: 28th March 2011
Revised: 5th November 2019
Valid to: 26th June 2024

# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 8 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 |
| 30 | - | - | 2.560 | 1.947 | 1.452 | 1.313 | 1.157 | 1.022 | 0.890 | 0.784 | 0.607 | 0.323 | 0.284 |
| 35 | - | - | 2.834 | 2.119 | 1.548 | 1.425 | 1.246 | 1.093 | 0.951 | 0.841 | 0.660 | 0.367 | 0.306 |
| 40 | - | - | 3.073 | 2.290 | 1.644 | 1.503 | 1.334 | 1.164 | 1.011 | 0.899 | 0.713 | 0.412 | 0.339 |
| 45 | - | - | 3.312 | 2.461 | 1.740 | 1.568 | 1.423 | 1.236 | 1.071 | 0.956 | 0.767 | 0.456 | 0.371 |
| 50 | - | - | 3.551 | 2.632 | 1.836 | 1.634 | 1.494 | 1.307 | 1.132 | 1.014 | 0.820 | 0.500 | 0.404 |
| 55 | - | - | - | 2.804 | 1.931 | 1.699 | 1.554 | 1.378 | 1.192 | 1.071 | 0.874 | 0.544 | 0.437 |
| 60 | - | - | - | 2.889 | 2.027 | 1.764 | 1.614 | 1.449 | 1.252 | 1.129 | 0.927 | 0.589 | 0.470 |
| 65 | - | - | - | 2.972 | 2.123 | 1.829 | 1.674 | 1.513 | 1.313 | 1.186 | 0.980 | 0.633 | 0.503 |
| 70 | - | - | - | 3.055 | 2.219 | 1.894 | 1.734 | 1.575 | 1.373 | 1.243 | 1.034 | 0.677 | 0.535 |
| 75 | - | - | - | 3.138 | 2.315 | 1.960 | 1.794 | 1.637 | 1.434 | 1.301 | 1.087 | 0.721 | 0.568 |
| 80 | - | - | - | 3.222 | 2.411 | 2.025 | 1.854 | 1.699 | 1.497 | 1.358 | 1.141 | 0.765 | 0.601 |
| 85 | - | - | - | 3.305 | 2.507 | 2.090 | 1.914 | 1.761 | 1.563 | 1.416 | 1.194 | 0.810 | 0.634 |
| 90 | - | - | - | 3.388 | 2.603 | 2.155 | 1.974 | 1.824 | 1.629 | 1.476 | 1.247 | 0.854 | 0.667 |
| 95 | - | - | - | 3.472 | 2.699 | 2.220 | 2.034 | 1.886 | 1.695 | 1.544 | 1.301 | 0.898 | 0.699 |
| 100 | - | - | - | 3.555 | 2.795 | 2.286 | 2.094 | 1.948 | 1.761 | 1.612 | 1.354 | 0.942 | 0.732 |
| 105 | - | - | - | 3.638 | 2.863 | 2.351 | 2.154 | 2.010 | 1.827 | 1.679 | 1.408 | 0.986 | 0.765 |
| 110 | - | - | - | 3.722 | 2.927 | 2.416 | 2.214 | 2.072 | 1.893 | 1.747 | 1.462 | 1.031 | 0.798 |
| 115 | - | - | - | - | 2.991 | 2.481 | 2.274 | 2.135 | 1.959 | 1.815 | 1.535 | 1.075 | 0.831 |
| 120 | - | - | - | - | 3.056 | 2.546 | 2.334 | 2.197 | 2.025 | 1.883 | 1.608 | 1.119 | 0.863 |
| 125 | - | - | - | - | 3.120 | 2.612 | 2.394 | 2.259 | 2.091 | 1.951 | 1.681 | 1.163 | 0.896 |
| 130 | - | - | - | - | 3.184 | 2.677 | 2.454 | 2.321 | 2.157 | 2.019 | 1.754 | 1.208 | 0.929 |
| 135 | - | - | - | - | 3.248 | 2.742 | 2.514 | 2.384 | 2.223 | 2.086 | 1.827 | 1.252 | 0.962 |
| 140 | - | - | - | - | 3.313 | 2.808 | 2.574 | 2.446 | 2.289 | 2.154 | 1.900 | 1.296 | 0.995 |
| 145 | - | - | - | - | 3.377 | 2.922 | 2.634 | 2.508 | 2.355 | 2.222 | 1.973 | 1.340 | 1.027 |
| 150 | - | - | - | - | 3.441 | 3.036 | 2.694 | 2.570 | 2.421 | 2.290 | 2.046 | 1.384 | 1.060 |
| 155 | - | - | - | - | 3.505 | 3.150 | 2.754 | 2.632 | 2.488 | 2.358 | 2.119 | 1.429 | 1.093 |
| 160 | - | - | - | - | 3.570 | 3.264 | 2.822 | 2.695 | 2.554 | 2.426 | 2.192 | 1.491 | 1.126 |
| 165 | - | - | - | - | 3.634 | 3.378 | 2.949 | 2.757 | 2.620 | 2.493 | 2.266 | 1.586 | 1.159 |
| 170 | - | - | - | - | 3.698 | 3.492 | 3.075 | 2.829 | 2.686 | 2.561 | 2.339 | 1.682 | 1.191 |
| 175 | - | - | - | - | - | 3.606 | 3.201 | 2.942 | 2.752 | 2.629 | 2.412 | 1.777 | 1.224 |
| 180 | - | - | - | - | - | 3.720 | 3.327 | 3.055 | 2.822 | 2.697 | 2.485 | 1.873 | 1.257 |
| 185 | - | - | - | - | - | - | 3.454 | 3.168 | 2.916 | 2.765 | 2.558 | 1.968 | 1.290 |
| 190 | - | - | - | - | - | - | 3.580 | 3.281 | 3.009 | 2.840 | 2.631 | 2.063 | 1.323 |
| 195 | - | - | - | - | - | - | 3.706 | 3.394 | 3.103 | 2.929 | 2.704 | 2.159 | 1.355 |
| 200 | - | - | - | - | - | - | - | 3.507 | 3.196 | 3.017 | 2.777 | 2.254 | 1.388 |
| 205 | - | - | - | - | - | - | - | 3.619 | 3.290 | 3.106 | 2.867 | 2.349 | 1.421 |
| 210 | - | - | - | - | - | - | - | 3.732 | 3.383 | 3.194 | 2.969 | 2.445 | 1.454 |
| 215 | - | - | - | - | - | - | - | - | 3.477 | 3.283 | 3.071 | 2.540 | 1.588 |
| 220 | - | - | - | - | - | - | - | - | 3.570 | 3.371 | 3.173 | 2.636 | 1.733 |
| 225 | - | - | - | - | - | - | - | - | 3.664 | 3.459 | 3.275 | 2.731 | 1.878 |
| 230 | - | - | - | - | - | - | - | - | 3.758 | 3.548 | 3.377 | 2.836 | 2.023 |
| 235 | - | - | - | - | - | - | - | - | - | 3.636 | 3.479 | 2.981 | 2.169 |
| 240 | - | - | - | - | - | - | - | - | - | 3.725 | 3.581 | 3.125 | 2.314 |
| 245 | - | - | - | - | - | - | - | - | - | - | 3.684 | 3.270 | 2.459 |
| 250 | - | - | - | - | - | - | - | - | - | - | - | 3.415 | 2.604 |
| 255 | - | - | - | - | - | - | - | - | - | - | - | 3.559 | 2.749 |
| 260 | - | - | - | - | - | - | - | - | - | - | - | 3.704 | 2.933 |
| 265 | - | - | - | - | - | - | - | - | - | - | - | - | 3.142 |
| 270 | - | - | - | - | - | - | - | - | - | - | - | - | 3.352 |
| 275 | - | - | - | - | - | - | - | - | - | - | - | - | 3.561 |
| 280 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 285 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 290 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 295 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 300 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 305 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 310 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 315 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 320 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 325 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 330 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 335 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 340 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 345 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 350 | - | - | - | - | - | - | - | - | - | - | - | - | - |

Thickness is intumescent only.

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



Issued: 28th March 2011
Revised: 5th November 2019
Valid to: 26th June 2024

# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 9 I/H Columns: 15 minutes<br>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 |
| 30 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 35 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 40 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 45 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 50 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 55 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 60 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 65 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 70 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 75 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 80 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 85 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 90 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 95 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 100 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 105 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 110 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 115 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 120 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 125 | 0.294 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 130 | 0.314 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 135 | 0.333 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 140 | 0.352 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 145 | 0.371 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 150 | 0.391 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 155 | 0.410 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 160 | 0.429 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 165 | 0.448 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 170 | 0.468 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 175 | 0.487 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 180 | 0.506 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 185 | 0.526 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 190 | 0.545 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 195 | 0.564 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 200 | 0.583 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 205 | 0.603 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 210 | 0.622 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 215 | 0.641 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 220 | 0.660 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 225 | 0.680 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 230 | 0.699 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 235 | 0.718 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 240 | 0.738 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 245 | 0.757 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 250 | 0.776 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 255 | 0.795 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 260 | 0.815 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 265 | 0.834 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 270 | 0.853 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 275 | 0.872 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 280 | 0.892 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 285 | 0.911 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 290 | 0.930 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 295 | 0.949 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 300 | 0.969 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 305 | 0.988 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 310 | 1.007 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 315 | 1.027 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 320 | 1.046 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 325 | 1.065 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 330 | 1.084 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 335 | 1.104 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 340 | 1.123 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 345 | 1.142 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 350 | 1.161 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 355 | 1.181 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 360 | 1.200 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 365 | 1.219 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 370 | 1.239 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 375 | 1.258 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |

Thickness is intumescent only. Results also apply to I/H beams with 4 sided fire exposure subject to a maximum DFT of 3.192mm.



Issued: 28th March 2011
Revised: 5th November 2019
Valid to: 26th June 2024

# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 10 I/H Columns: 30 minutes<br>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 |
| 30 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 35 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 40 | 0.316 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 45 | 0.361 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 50 | 0.406 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 55 | 0.451 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 60 | 0.496 | 0.294 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 65 | 0.541 | 0.309 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 70 | 0.586 | 0.323 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 75 | 0.631 | 0.337 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 80 | 0.676 | 0.351 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 85 | 0.721 | 0.366 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 90 | 0.766 | 0.380 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 95 | 0.811 | 0.394 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 100 | 0.856 | 0.408 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 105 | 0.901 | 0.423 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 110 | 0.946 | 0.437 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 115 | 0.991 | 0.451 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 120 | 1.036 | 0.465 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 125 | 1.081 | 0.479 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 130 | 1.126 | 0.494 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 135 | 1.171 | 0.508 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 140 | 1.216 | 0.522 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 145 | 1.261 | 0.536 | 0.294 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 150 | 1.306 | 0.551 | 0.307 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 155 | 1.351 | 0.565 | 0.320 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 160 | 1.396 | 0.579 | 0.333 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 165 | 1.441 | 0.593 | 0.346 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 170 | 1.486 | 0.608 | 0.360 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 175 | 1.531 | 0.622 | 0.373 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 180 | 1.581 | 0.636 | 0.386 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 185 | 1.635 | 0.650 | 0.399 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 190 | 1.689 | 0.665 | 0.412 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 195 | 1.743 | 0.679 | 0.425 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 200 | 1.797 | 0.693 | 0.438 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 205 | 1.851 | 0.707 | 0.451 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 210 | 1.905 | 0.722 | 0.464 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 215 | 1.960 | 0.736 | 0.477 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 220 | 2.014 | 0.750 | 0.490 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 225 | 2.068 | 0.764 | 0.503 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 230 | 2.122 | 0.778 | 0.516 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 235 | 2.176 | 0.793 | 0.529 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 240 | 2.230 | 0.807 | 0.542 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 245 | 2.284 | 0.821 | 0.555 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 250 | 2.338 | 0.835 | 0.568 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 255 | 2.392 | 0.850 | 0.581 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 260 | 2.446 | 0.864 | 0.594 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 265 | 2.501 | 0.878 | 0.607 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 270 | 2.555 | 0.892 | 0.620 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 275 | 2.609 | 0.907 | 0.633 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 280 | 2.663 | 0.921 | 0.646 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 285 | 2.717 | 0.935 | 0.659 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 290 | 2.771 | 0.949 | 0.672 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 295 | 2.825 | 0.964 | 0.685 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 300 | 2.879 | 0.978 | 0.698 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 305 | 2.933 | 0.992 | 0.711 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 310 | 2.987 | 1.006 | 0.724 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 315 | 3.042 | 1.021 | 0.737 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 320 | 3.096 | 1.035 | 0.750 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 325 | 3.150 | 1.049 | 0.763 | 0.297 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 330 | - | 1.063 | 0.776 | 0.312 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 335 | - | 1.077 | 0.789 | 0.327 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 340 | - | 1.092 | 0.802 | 0.343 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 345 | - | 1.106 | 0.815 | 0.358 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 350 | - | 1.120 | 0.828 | 0.373 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 355 | - | 1.134 | 0.841 | 0.388 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 360 | - | 1.149 | 0.854 | 0.404 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 365 | - | 1.163 | 0.867 | 0.419 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 370 | - | 1.177 | 0.880 | 0.434 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 375 | - | 1.191 | 0.893 | 0.449 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |

Thickness is intumescent only. Results also apply to I/H beams with 4 sided fire exposure subject to a maximum DFT of 3.192mm.



Issued: 28th March 2011
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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 11 I/H Columns: 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 |
| 30 | 0.779 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 35 | 0.977 | 0.327 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 40 | 1.175 | 0.358 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 45 | 1.373 | 0.388 | 0.306 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 50 | 1.554 | 0.419 | 0.323 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 55 | 1.600 | 0.450 | 0.340 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 60 | 1.647 | 0.481 | 0.357 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 65 | 1.693 | 0.512 | 0.374 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 70 | 1.739 | 0.543 | 0.391 | 0.302 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 75 | 1.785 | 0.574 | 0.408 | 0.317 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 80 | 1.832 | 0.604 | 0.425 | 0.332 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 85 | 1.878 | 0.635 | 0.442 | 0.348 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 90 | 1.924 | 0.666 | 0.459 | 0.363 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 95 | 1.971 | 0.697 | 0.476 | 0.378 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 100 | 2.017 | 0.728 | 0.493 | 0.393 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 105 | 2.063 | 0.759 | 0.510 | 0.409 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 110 | 2.109 | 0.790 | 0.527 | 0.424 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 115 | 2.156 | 0.820 | 0.544 | 0.439 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 120 | 2.202 | 0.851 | 0.561 | 0.454 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 125 | 2.248 | 0.882 | 0.578 | 0.470 | 0.305 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 130 | 2.295 | 0.913 | 0.595 | 0.485 | 0.319 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 135 | 2.341 | 0.944 | 0.612 | 0.500 | 0.334 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 140 | 2.387 | 0.975 | 0.629 | 0.515 | 0.349 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 145 | 2.434 | 1.006 | 0.646 | 0.531 | 0.363 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 150 | 2.480 | 1.036 | 0.663 | 0.546 | 0.378 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 155 | 2.526 | 1.067 | 0.680 | 0.561 | 0.392 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 160 | 2.572 | 1.098 | 0.697 | 0.576 | 0.407 | 0.297 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 165 | 2.619 | 1.129 | 0.714 | 0.592 | 0.422 | 0.311 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 170 | 2.665 | 1.160 | 0.731 | 0.607 | 0.436 | 0.326 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 175 | 2.711 | 1.191 | 0.748 | 0.622 | 0.451 | 0.341 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 180 | 2.758 | 1.222 | 0.765 | 0.637 | 0.465 | 0.356 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 185 | 2.804 | 1.253 | 0.782 | 0.653 | 0.480 | 0.371 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 190 | 2.850 | 1.283 | 0.799 | 0.668 | 0.495 | 0.386 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 195 | 2.896 | 1.314 | 0.816 | 0.683 | 0.509 | 0.401 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 200 | 2.943 | 1.345 | 0.833 | 0.699 | 0.524 | 0.416 | 0.297 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 205 | 2.989 | 1.376 | 0.850 | 0.714 | 0.539 | 0.430 | 0.312 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 210 | 3.035 | 1.407 | 0.867 | 0.729 | 0.553 | 0.445 | 0.326 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 215 | 3.082 | 1.438 | 0.884 | 0.744 | 0.568 | 0.460 | 0.341 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 220 | 3.128 | 1.469 | 0.901 | 0.760 | 0.582 | 0.475 | 0.356 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 225 | - | 1.499 | 0.918 | 0.775 | 0.597 | 0.490 | 0.370 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 230 | - | 1.530 | 0.935 | 0.790 | 0.612 | 0.505 | 0.385 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 235 | - | 1.576 | 0.952 | 0.805 | 0.626 | 0.520 | 0.400 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 240 | - | 1.646 | 0.968 | 0.821 | 0.641 | 0.535 | 0.414 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 245 | - | 1.715 | 0.985 | 0.836 | 0.656 | 0.549 | 0.429 | 0.297 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 250 | - | 1.784 | 1.002 | 0.851 | 0.670 | 0.564 | 0.444 | 0.312 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 255 | - | 1.854 | 1.019 | 0.866 | 0.685 | 0.579 | 0.458 | 0.327 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 260 | - | 1.923 | 1.036 | 0.882 | 0.699 | 0.594 | 0.473 | 0.342 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 265 | - | 1.992 | 1.053 | 0.897 | 0.714 | 0.609 | 0.488 | 0.357 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 270 | - | 2.062 | 1.070 | 0.912 | 0.729 | 0.624 | 0.502 | 0.372 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 275 | - | 2.131 | 1.087 | 0.927 | 0.743 | 0.639 | 0.517 | 0.387 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 280 | - | 2.201 | 1.104 | 0.943 | 0.758 | 0.654 | 0.532 | 0.401 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 285 | - | 2.270 | 1.121 | 0.958 | 0.772 | 0.668 | 0.547 | 0.416 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 290 | - | 2.339 | 1.138 | 0.973 | 0.787 | 0.683 | 0.561 | 0.431 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 295 | - | 2.409 | 1.155 | 0.989 | 0.802 | 0.698 | 0.576 | 0.446 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 300 | - | 2.478 | 1.172 | 1.004 | 0.816 | 0.713 | 0.591 | 0.461 | 0.292 | 0.291 | 0.291 | 0.291 | 0.291 |
| 305 | - | 2.547 | 1.189 | 1.019 | 0.831 | 0.728 | 0.605 | 0.476 | 0.307 | 0.291 | 0.291 | 0.291 | 0.291 |
| 310 | - | 2.617 | 1.206 | 1.034 | 0.846 | 0.743 | 0.620 | 0.491 | 0.323 | 0.291 | 0.291 | 0.291 | 0.291 |
| 315 | - | 2.686 | 1.223 | 1.050 | 0.860 | 0.758 | 0.635 | 0.506 | 0.338 | 0.291 | 0.291 | 0.291 | 0.291 |
| 320 | - | 2.756 | 1.240 | 1.065 | 0.875 | 0.773 | 0.649 | 0.521 | 0.354 | 0.291 | 0.291 | 0.291 | 0.291 |
| 325 | - | 2.825 | 1.257 | 1.080 | 0.889 | 0.787 | 0.664 | 0.535 | 0.369 | 0.291 | 0.291 | 0.291 | 0.291 |
| 330 | - | 2.894 | 1.274 | 1.095 | 0.904 | 0.802 | 0.679 | 0.550 | 0.385 | 0.291 | 0.291 | 0.291 | 0.291 |
| 335 | - | 2.964 | 1.291 | 1.111 | 0.919 | 0.817 | 0.693 | 0.565 | 0.400 | 0.305 | 0.291 | 0.291 | 0.291 |
| 340 | - | 3.033 | 1.308 | 1.126 | 0.933 | 0.832 | 0.708 | 0.580 | 0.416 | 0.321 | 0.291 | 0.291 | 0.291 |
| 345 | - | 3.102 | 1.325 | 1.141 | 0.948 | 0.847 | 0.723 | 0.595 | 0.432 | 0.336 | 0.291 | 0.291 | 0.291 |
| 350 | - | 3.172 | 1.342 | 1.156 | 0.962 | 0.862 | 0.737 | 0.610 | 0.447 | 0.352 | 0.291 | 0.291 | 0.291 |
| 355 | - | - | 1.359 | 1.172 | 0.977 | 0.877 | 0.752 | 0.625 | 0.463 | 0.367 | 0.291 | 0.291 | 0.291 |
| 360 | - | - | 1.376 | 1.187 | 0.992 | 0.892 | 0.767 | 0.640 | 0.478 | 0.383 | 0.305 | 0.291 | 0.291 |
| 365 | - | - | 1.393 | 1.202 | 1.006 | 0.906 | 0.782 | 0.655 | 0.494 | 0.398 | 0.319 | 0.291 | 0.291 |
| 370 | - | - | 1.410 | 1.217 | 1.021 | 0.921 | 0.796 | 0.669 | 0.509 | 0.413 | 0.334 | 0.291 | 0.291 |
| 375 | - | - | 1.427 | 1.233 | 1.036 | 0.936 | 0.811 | 0.684 | 0.525 | 0.429 | 0.348 | 0.291 | 0.291 |

Thickness is intumescent only. Results also apply to I/H beams with 4 sided fire exposure subject to a maximum DFT of 3.192mm.



Issued: 28th March 2011
Revised: 5th November 2019
Valid to: 26th June 2024

# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 12 I/H Columns: 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 |
| 30 | 1.582 | 0.805 | 0.324 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 35 | 1.734 | 0.937 | 0.358 | 0.308 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 40 | 1.886 | 1.070 | 0.391 | 0.327 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 45 | 2.038 | 1.203 | 0.425 | 0.347 | 0.299 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 50 | 2.190 | 1.335 | 0.458 | 0.366 | 0.316 | 0.294 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 55 | 2.342 | 1.468 | 0.491 | 0.385 | 0.334 | 0.310 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 60 | 2.494 | 1.564 | 0.525 | 0.405 | 0.351 | 0.327 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 65 | 2.646 | 1.604 | 0.558 | 0.424 | 0.368 | 0.344 | 0.302 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 70 | 2.798 | 1.643 | 0.592 | 0.444 | 0.386 | 0.360 | 0.318 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 75 | 2.950 | 1.683 | 0.625 | 0.463 | 0.403 | 0.377 | 0.334 | 0.293 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 80 | - | 1.722 | 0.659 | 0.483 | 0.420 | 0.394 | 0.350 | 0.308 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 85 | - | 1.762 | 0.692 | 0.502 | 0.437 | 0.410 | 0.366 | 0.323 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 90 | - | 1.801 | 0.726 | 0.521 | 0.455 | 0.427 | 0.382 | 0.339 | 0.295 | 0.291 | 0.291 | 0.291 | 0.291 |
| 95 | - | 1.841 | 0.759 | 0.541 | 0.472 | 0.443 | 0.398 | 0.354 | 0.310 | 0.291 | 0.291 | 0.291 | 0.291 |
| 100 | - | 1.880 | 0.793 | 0.560 | 0.489 | 0.460 | 0.413 | 0.369 | 0.325 | 0.291 | 0.291 | 0.291 | 0.291 |
| 105 | - | 1.920 | 0.826 | 0.580 | 0.507 | 0.477 | 0.429 | 0.385 | 0.340 | 0.298 | 0.291 | 0.291 | 0.291 |
| 110 | - | 1.959 | 0.860 | 0.599 | 0.524 | 0.493 | 0.445 | 0.400 | 0.355 | 0.313 | 0.291 | 0.291 | 0.291 |
| 115 | - | 1.999 | 0.893 | 0.618 | 0.541 | 0.510 | 0.461 | 0.416 | 0.370 | 0.328 | 0.291 | 0.291 | 0.291 |
| 120 | - | 2.038 | 0.927 | 0.638 | 0.559 | 0.527 | 0.477 | 0.431 | 0.385 | 0.342 | 0.291 | 0.291 | 0.291 |
| 125 | - | 2.078 | 0.960 | 0.657 | 0.576 | 0.543 | 0.493 | 0.446 | 0.400 | 0.357 | 0.291 | 0.291 | 0.291 |
| 130 | - | 2.117 | 0.994 | 0.677 | 0.593 | 0.560 | 0.509 | 0.462 | 0.415 | 0.372 | 0.291 | 0.291 | 0.291 |
| 135 | - | 2.157 | 1.027 | 0.696 | 0.611 | 0.577 | 0.524 | 0.477 | 0.430 | 0.386 | 0.304 | 0.291 | 0.291 |
| 140 | - | 2.196 | 1.061 | 0.716 | 0.628 | 0.593 | 0.540 | 0.492 | 0.445 | 0.401 | 0.318 | 0.291 | 0.291 |
| 145 | - | 2.236 | 1.094 | 0.735 | 0.645 | 0.610 | 0.556 | 0.508 | 0.460 | 0.416 | 0.333 | 0.291 | 0.291 |
| 150 | - | 2.275 | 1.127 | 0.754 | 0.663 | 0.627 | 0.572 | 0.523 | 0.475 | 0.431 | 0.347 | 0.291 | 0.291 |
| 155 | - | 2.315 | 1.161 | 0.774 | 0.680 | 0.643 | 0.588 | 0.538 | 0.490 | 0.445 | 0.362 | 0.291 | 0.291 |
| 160 | - | 2.354 | 1.194 | 0.793 | 0.697 | 0.660 | 0.604 | 0.554 | 0.505 | 0.460 | 0.376 | 0.291 | 0.291 |
| 165 | - | 2.394 | 1.228 | 0.813 | 0.715 | 0.677 | 0.620 | 0.569 | 0.520 | 0.475 | 0.391 | 0.291 | 0.291 |
| 170 | - | 2.433 | 1.261 | 0.832 | 0.732 | 0.693 | 0.635 | 0.584 | 0.534 | 0.490 | 0.406 | 0.291 | 0.291 |
| 175 | - | 2.473 | 1.295 | 0.851 | 0.749 | 0.710 | 0.651 | 0.600 | 0.549 | 0.504 | 0.420 | 0.291 | 0.291 |
| 180 | - | 2.512 | 1.328 | 0.871 | 0.767 | 0.727 | 0.667 | 0.615 | 0.564 | 0.519 | 0.435 | 0.291 | 0.291 |
| 185 | - | 2.552 | 1.362 | 0.890 | 0.784 | 0.743 | 0.683 | 0.630 | 0.579 | 0.534 | 0.449 | 0.291 | 0.291 |
| 190 | - | 2.591 | 1.395 | 0.910 | 0.801 | 0.760 | 0.699 | 0.646 | 0.594 | 0.548 | 0.464 | 0.291 | 0.291 |
| 195 | - | 2.631 | 1.429 | 0.929 | 0.819 | 0.776 | 0.715 | 0.661 | 0.609 | 0.563 | 0.478 | 0.291 | 0.291 |
| 200 | - | 2.670 | 1.462 | 0.948 | 0.836 | 0.793 | 0.731 | 0.677 | 0.624 | 0.578 | 0.493 | 0.300 | 0.291 |
| 205 | - | 2.710 | 1.496 | 0.968 | 0.853 | 0.810 | 0.746 | 0.692 | 0.639 | 0.593 | 0.507 | 0.314 | 0.291 |
| 210 | - | 2.749 | 1.529 | 0.987 | 0.870 | 0.826 | 0.762 | 0.707 | 0.654 | 0.607 | 0.522 | 0.328 | 0.291 |
| 215 | - | 2.789 | 1.571 | 1.007 | 0.888 | 0.843 | 0.778 | 0.723 | 0.669 | 0.622 | 0.536 | 0.343 | 0.291 |
| 220 | - | 2.828 | 1.626 | 1.026 | 0.905 | 0.860 | 0.794 | 0.738 | 0.684 | 0.637 | 0.551 | 0.357 | 0.291 |
| 225 | - | 2.868 | 1.680 | 1.046 | 0.922 | 0.876 | 0.810 | 0.753 | 0.699 | 0.651 | 0.565 | 0.371 | 0.291 |
| 230 | - | 2.907 | 1.735 | 1.065 | 0.940 | 0.893 | 0.826 | 0.769 | 0.714 | 0.666 | 0.580 | 0.386 | 0.291 |
| 235 | - | 2.947 | 1.789 | 1.084 | 0.957 | 0.910 | 0.842 | 0.784 | 0.729 | 0.681 | 0.594 | 0.400 | 0.291 |
| 240 | - | 2.986 | 1.844 | 1.104 | 0.974 | 0.926 | 0.858 | 0.799 | 0.744 | 0.696 | 0.609 | 0.414 | 0.291 |
| 245 | - | 3.026 | 1.899 | 1.123 | 0.992 | 0.943 | 0.873 | 0.815 | 0.759 | 0.710 | 0.623 | 0.428 | 0.291 |
| 250 | - | 3.065 | 1.953 | 1.143 | 1.009 | 0.960 | 0.889 | 0.830 | 0.774 | 0.725 | 0.638 | 0.443 | 0.291 |
| 255 | - | - | 2.008 | 1.162 | 1.026 | 0.976 | 0.905 | 0.845 | 0.789 | 0.740 | 0.652 | 0.457 | 0.291 |
| 260 | - | - | 2.062 | 1.181 | 1.044 | 0.993 | 0.921 | 0.861 | 0.804 | 0.755 | 0.667 | 0.471 | 0.291 |
| 265 | - | - | 2.117 | 1.201 | 1.061 | 1.010 | 0.937 | 0.876 | 0.819 | 0.769 | 0.681 | 0.486 | 0.291 |
| 270 | - | - | 2.171 | 1.220 | 1.078 | 1.026 | 0.953 | 0.891 | 0.833 | 0.784 | 0.696 | 0.500 | 0.291 |
| 275 | - | - | 2.226 | 1.240 | 1.096 | 1.043 | 0.969 | 0.907 | 0.848 | 0.799 | 0.710 | 0.514 | 0.291 |
| 280 | - | - | 2.280 | 1.259 | 1.113 | 1.060 | 0.984 | 0.922 | 0.863 | 0.813 | 0.725 | 0.529 | 0.291 |
| 285 | - | - | 2.335 | 1.278 | 1.130 | 1.076 | 1.000 | 0.938 | 0.878 | 0.828 | 0.739 | 0.543 | 0.291 |
| 290 | - | - | 2.389 | 1.298 | 1.148 | 1.093 | 1.016 | 0.953 | 0.893 | 0.843 | 0.754 | 0.557 | 0.291 |
| 295 | - | - | 2.444 | 1.317 | 1.165 | 1.109 | 1.032 | 0.968 | 0.908 | 0.858 | 0.769 | 0.572 | 0.291 |
| 300 | - | - | 2.499 | 1.337 | 1.182 | 1.126 | 1.048 | 0.984 | 0.923 | 0.872 | 0.783 | 0.586 | 0.291 |
| 305 | - | - | 2.553 | 1.356 | 1.200 | 1.143 | 1.064 | 0.999 | 0.938 | 0.887 | 0.798 | 0.600 | 0.291 |
| 310 | - | - | 2.608 | 1.376 | 1.217 | 1.159 | 1.080 | 1.014 | 0.953 | 0.902 | 0.812 | 0.615 | 0.291 |
| 315 | - | - | 2.662 | 1.395 | 1.234 | 1.176 | 1.095 | 1.030 | 0.968 | 0.917 | 0.827 | 0.629 | 0.291 |
| 320 | - | - | 2.717 | 1.414 | 1.252 | 1.193 | 1.111 | 1.045 | 0.983 | 0.931 | 0.841 | 0.643 | 0.291 |
| 325 | - | - | 2.771 | 1.434 | 1.269 | 1.209 | 1.127 | 1.060 | 0.998 | 0.946 | 0.856 | 0.658 | 0.291 |
| 330 | - | - | 2.826 | 1.453 | 1.286 | 1.226 | 1.143 | 1.076 | 1.013 | 0.961 | 0.870 | 0.672 | 0.297 |
| 335 | - | - | 2.880 | 1.473 | 1.304 | 1.243 | 1.159 | 1.091 | 1.028 | 0.975 | 0.885 | 0.686 | 0.313 |
| 340 | - | - | 2.935 | 1.492 | 1.321 | 1.259 | 1.175 | 1.106 | 1.043 | 0.990 | 0.899 | 0.701 | 0.329 |
| 345 | - | - | 2.990 | 1.511 | 1.338 | 1.276 | 1.191 | 1.122 | 1.058 | 1.005 | 0.914 | 0.715 | 0.345 |
| 350 | - | - | 3.044 | 1.531 | 1.355 | 1.293 | 1.206 | 1.137 | 1.073 | 1.020 | 0.928 | 0.729 | 0.360 |
| 355 | - | - | 3.099 | 1.558 | 1.373 | 1.309 | 1.222 | 1.153 | 1.088 | 1.034 | 0.943 | 0.744 | 0.376 |
| 360 | - | - | 3.153 | 1.696 | 1.390 | 1.326 | 1.238 | 1.168 | 1.103 | 1.049 | 0.957 | 0.758 | 0.392 |
| 365 | - | - | - | 1.834 | 1.407 | 1.343 | 1.254 | 1.183 | 1.118 | 1.064 | 0.972 | 0.772 | 0.408 |
| 370 | - | - | - | 1.972 | 1.425 | 1.359 | 1.270 | 1.199 | 1.133 | 1.078 | 0.986 | 0.787 | 0.423 |
| 375 | - | - | - | 2.110 | 1.442 | 1.376 | 1.286 | 1.214 | 1.147 | 1.093 | 1.001 | 0.801 | 0.439 |

Thickness is intumescent only. Results also apply to I/H beams with 4 sided fire exposure subject to a maximum DFT of 3.192mm.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 13 I/H Columns: 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 |
| 30 | 2.463 | 1.419 | 0.848 | 0.353 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 35 | 2.731 | 1.570 | 0.941 | 0.393 | 0.336 | 0.321 | 0.300 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 40 | 2.999 | 1.617 | 1.035 | 0.432 | 0.362 | 0.343 | 0.319 | 0.300 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 45 | - | 1.665 | 1.129 | 0.472 | 0.388 | 0.364 | 0.339 | 0.318 | 0.298 | 0.291 | 0.291 | 0.291 | 0.291 |
| 50 | - | 1.712 | 1.222 | 0.512 | 0.414 | 0.386 | 0.358 | 0.336 | 0.316 | 0.298 | 0.291 | 0.291 | 0.291 |
| 55 | - | 1.760 | 1.316 | 0.551 | 0.440 | 0.408 | 0.377 | 0.355 | 0.334 | 0.316 | 0.291 | 0.291 | 0.291 |
| 60 | - | 1.807 | 1.410 | 0.591 | 0.466 | 0.430 | 0.396 | 0.373 | 0.352 | 0.333 | 0.301 | 0.291 | 0.291 |
| 65 | - | 1.854 | 1.504 | 0.631 | 0.492 | 0.451 | 0.415 | 0.391 | 0.369 | 0.350 | 0.318 | 0.291 | 0.291 |
| 70 | - | 1.902 | 1.570 | 0.670 | 0.518 | 0.473 | 0.434 | 0.410 | 0.387 | 0.367 | 0.335 | 0.291 | 0.291 |
| 75 | - | 1.949 | 1.610 | 0.710 | 0.544 | 0.495 | 0.454 | 0.428 | 0.405 | 0.385 | 0.351 | 0.291 | 0.291 |
| 80 | - | 1.997 | 1.651 | 0.750 | 0.570 | 0.516 | 0.473 | 0.446 | 0.422 | 0.402 | 0.368 | 0.291 | 0.291 |
| 85 | - | 2.044 | 1.691 | 0.790 | 0.596 | 0.538 | 0.492 | 0.465 | 0.440 | 0.419 | 0.384 | 0.307 | 0.291 |
| 90 | - | 2.091 | 1.732 | 0.829 | 0.622 | 0.560 | 0.511 | 0.483 | 0.458 | 0.436 | 0.401 | 0.322 | 0.291 |
| 95 | - | 2.139 | 1.772 | 0.869 | 0.648 | 0.582 | 0.530 | 0.501 | 0.475 | 0.453 | 0.417 | 0.338 | 0.291 |
| 100 | - | 2.186 | 1.813 | 0.909 | 0.674 | 0.603 | 0.549 | 0.520 | 0.493 | 0.471 | 0.434 | 0.353 | 0.291 |
| 105 | - | 2.234 | 1.853 | 0.948 | 0.700 | 0.625 | 0.568 | 0.538 | 0.511 | 0.488 | 0.450 | 0.369 | 0.291 |
| 110 | - | 2.281 | 1.894 | 0.988 | 0.726 | 0.647 | 0.588 | 0.557 | 0.528 | 0.505 | 0.467 | 0.384 | 0.291 |
| 115 | - | 2.329 | 1.934 | 1.028 | 0.752 | 0.668 | 0.607 | 0.575 | 0.546 | 0.522 | 0.483 | 0.400 | 0.291 |
| 120 | - | 2.376 | 1.975 | 1.067 | 0.778 | 0.690 | 0.626 | 0.593 | 0.564 | 0.539 | 0.500 | 0.415 | 0.291 |
| 125 | - | 2.423 | 2.016 | 1.107 | 0.804 | 0.712 | 0.645 | 0.612 | 0.581 | 0.557 | 0.516 | 0.431 | 0.291 |
| 130 | - | 2.471 | 2.056 | 1.147 | 0.830 | 0.734 | 0.664 | 0.630 | 0.599 | 0.574 | 0.533 | 0.446 | 0.291 |
| 135 | - | 2.518 | 2.097 | 1.186 | 0.856 | 0.755 | 0.683 | 0.648 | 0.617 | 0.591 | 0.550 | 0.462 | 0.305 |
| 140 | - | 2.566 | 2.137 | 1.226 | 0.882 | 0.777 | 0.703 | 0.667 | 0.634 | 0.608 | 0.566 | 0.477 | 0.321 |
| 145 | - | 2.613 | 2.178 | 1.266 | 0.907 | 0.799 | 0.722 | 0.685 | 0.652 | 0.625 | 0.583 | 0.493 | 0.336 |
| 150 | - | 2.660 | 2.218 | 1.306 | 0.933 | 0.820 | 0.741 | 0.703 | 0.670 | 0.643 | 0.599 | 0.508 | 0.351 |
| 155 | - | 2.708 | 2.259 | 1.345 | 0.959 | 0.842 | 0.760 | 0.722 | 0.687 | 0.660 | 0.616 | 0.524 | 0.366 |
| 160 | - | 2.755 | 2.299 | 1.385 | 0.985 | 0.864 | 0.779 | 0.740 | 0.705 | 0.677 | 0.632 | 0.539 | 0.382 |
| 165 | - | 2.803 | 2.340 | 1.425 | 1.011 | 0.886 | 0.798 | 0.758 | 0.723 | 0.694 | 0.649 | 0.555 | 0.397 |
| 170 | - | 2.850 | 2.380 | 1.464 | 1.037 | 0.907 | 0.817 | 0.777 | 0.740 | 0.711 | 0.665 | 0.570 | 0.412 |
| 175 | - | 2.897 | 2.421 | 1.504 | 1.063 | 0.929 | 0.837 | 0.795 | 0.758 | 0.729 | 0.682 | 0.586 | 0.427 |
| 180 | - | 2.945 | 2.461 | 1.544 | 1.089 | 0.951 | 0.856 | 0.813 | 0.776 | 0.746 | 0.698 | 0.601 | 0.443 |
| 185 | - | 2.992 | 2.502 | 1.597 | 1.115 | 0.972 | 0.875 | 0.832 | 0.793 | 0.763 | 0.715 | 0.617 | 0.458 |
| 190 | - | 3.040 | 2.542 | 1.651 | 1.141 | 0.994 | 0.894 | 0.850 | 0.811 | 0.780 | 0.732 | 0.632 | 0.473 |
| 195 | - | 3.087 | 2.583 | 1.706 | 1.167 | 1.016 | 0.913 | 0.868 | 0.829 | 0.797 | 0.748 | 0.648 | 0.489 |
| 200 | - | - | 2.623 | 1.761 | 1.193 | 1.038 | 0.932 | 0.887 | 0.846 | 0.815 | 0.765 | 0.663 | 0.504 |
| 205 | - | - | 2.664 | 1.816 | 1.219 | 1.059 | 0.951 | 0.905 | 0.864 | 0.832 | 0.781 | 0.679 | 0.519 |
| 210 | - | - | 2.704 | 1.871 | 1.245 | 1.081 | 0.971 | 0.923 | 0.882 | 0.849 | 0.798 | 0.694 | 0.534 |
| 215 | - | - | 2.745 | 1.926 | 1.271 | 1.103 | 0.990 | 0.942 | 0.899 | 0.866 | 0.814 | 0.710 | 0.550 |
| 220 | - | - | 2.785 | 1.981 | 1.297 | 1.125 | 1.009 | 0.960 | 0.917 | 0.884 | 0.831 | 0.725 | 0.565 |
| 225 | - | - | 2.826 | 2.035 | 1.323 | 1.146 | 1.028 | 0.979 | 0.935 | 0.901 | 0.847 | 0.741 | 0.580 |
| 230 | - | - | 2.866 | 2.090 | 1.349 | 1.168 | 1.047 | 0.997 | 0.952 | 0.918 | 0.864 | 0.756 | 0.595 |
| 235 | - | - | 2.907 | 2.145 | 1.375 | 1.190 | 1.066 | 1.015 | 0.970 | 0.935 | 0.880 | 0.772 | 0.611 |
| 240 | - | - | 2.947 | 2.200 | 1.401 | 1.211 | 1.086 | 1.034 | 0.988 | 0.952 | 0.897 | 0.787 | 0.626 |
| 245 | - | - | 2.988 | 2.255 | 1.427 | 1.233 | 1.105 | 1.052 | 1.005 | 0.970 | 0.913 | 0.803 | 0.641 |
| 250 | - | - | 3.028 | 2.310 | 1.453 | 1.255 | 1.124 | 1.070 | 1.023 | 0.987 | 0.930 | 0.818 | 0.657 |
| 255 | - | - | 3.069 | 2.365 | 1.479 | 1.277 | 1.143 | 1.089 | 1.041 | 1.004 | 0.947 | 0.834 | 0.672 |
| 260 | - | - | - | 2.419 | 1.505 | 1.298 | 1.162 | 1.107 | 1.058 | 1.021 | 0.963 | 0.849 | 0.687 |
| 265 | - | - | - | 2.474 | 1.531 | 1.320 | 1.181 | 1.125 | 1.076 | 1.038 | 0.980 | 0.865 | 0.702 |
| 270 | - | - | - | 2.529 | 1.570 | 1.342 | 1.200 | 1.144 | 1.094 | 1.056 | 0.996 | 0.880 | 0.718 |
| 275 | - | - | - | 2.584 | 1.643 | 1.363 | 1.220 | 1.162 | 1.111 | 1.073 | 1.013 | 0.896 | 0.733 |
| 280 | - | - | - | 2.639 | 1.716 | 1.385 | 1.239 | 1.180 | 1.129 | 1.090 | 1.029 | 0.911 | 0.748 |
| 285 | - | - | - | 2.694 | 1.789 | 1.407 | 1.258 | 1.199 | 1.147 | 1.107 | 1.046 | 0.927 | 0.763 |
| 290 | - | - | - | 2.749 | 1.862 | 1.429 | 1.277 | 1.217 | 1.165 | 1.124 | 1.062 | 0.942 | 0.779 |
| 295 | - | - | - | 2.804 | 1.935 | 1.450 | 1.296 | 1.235 | 1.182 | 1.142 | 1.079 | 0.958 | 0.794 |
| 300 | - | - | - | 2.858 | 2.008 | 1.472 | 1.315 | 1.254 | 1.200 | 1.159 | 1.095 | 0.973 | 0.809 |
| 305 | - | - | - | 2.913 | 2.081 | 1.494 | 1.335 | 1.272 | 1.218 | 1.176 | 1.112 | 0.989 | 0.825 |
| 310 | - | - | - | 2.968 | 2.154 | 1.515 | 1.354 | 1.290 | 1.235 | 1.193 | 1.129 | 1.004 | 0.840 |
| 315 | - | - | - | 3.023 | 2.227 | 1.537 | 1.373 | 1.309 | 1.253 | 1.210 | 1.145 | 1.020 | 0.855 |
| 320 | - | - | - | 3.078 | 2.301 | 1.602 | 1.392 | 1.327 | 1.271 | 1.228 | 1.162 | 1.035 | 0.870 |
| 325 | - | - | - | 3.133 | 2.374 | 1.718 | 1.411 | 1.346 | 1.288 | 1.245 | 1.178 | 1.051 | 0.886 |
| 330 | - | - | - | - | 2.447 | 1.834 | 1.430 | 1.364 | 1.306 | 1.262 | 1.195 | 1.066 | 0.901 |
| 335 | - | - | - | - | 2.520 | 1.950 | 1.449 | 1.382 | 1.324 | 1.279 | 1.211 | 1.082 | 0.916 |
| 340 | - | - | - | - | 2.593 | 2.067 | 1.469 | 1.401 | 1.341 | 1.296 | 1.228 | 1.097 | 0.932 |
| 345 | - | - | - | - | 2.666 | 2.183 | 1.488 | 1.419 | 1.359 | 1.314 | 1.244 | 1.113 | 0.947 |
| 350 | - | - | - | - | 2.739 | 2.299 | 1.507 | 1.437 | 1.377 | 1.331 | 1.261 | 1.128 | 0.962 |
| 355 | - | - | - | - | 2.812 | 2.415 | 1.526 | 1.456 | 1.394 | 1.348 | 1.277 | 1.144 | 0.977 |
| 360 | - | - | - | - | 2.885 | 2.531 | 1.545 | 1.474 | 1.412 | 1.365 | 1.294 | 1.159 | 0.993 |
| 365 | - | - | - | - | 2.958 | 2.648 | 1.699 | 1.492 | 1.430 | 1.383 | 1.310 | 1.175 | 1.008 |
| 370 | - | - | - | - | 3.031 | 2.764 | 1.885 | 1.511 | 1.447 | 1.400 | 1.327 | 1.190 | 1.023 |
| 375 | - | - | - | - | 3.104 | 2.880 | 2.071 | 1.529 | 1.465 | 1.417 | 1.344 | 1.206 | 1.038 |

Thickness is intumescent only. Results also apply to I/H beams with 4 sided fire exposure subject to a maximum DFT of 3.192mm.



Issued: 28th March 2011
Revised: 5th November 2019
Valid to: 26th June 2024

# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 14 I/H Columns: 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 |
| 30 | - | 2.130 | 1.317 | 0.923 | 0.642 | 0.542 | 0.331 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 | 0.291 |
| 35 | - | 2.277 | 1.488 | 1.018 | 0.686 | 0.575 | 0.364 | 0.340 | 0.322 | 0.309 | 0.291 | 0.291 | 0.291 |
| 40 | - | 2.424 | 1.580 | 1.113 | 0.730 | 0.609 | 0.397 | 0.368 | 0.346 | 0.331 | 0.310 | 0.291 | 0.291 |
| 45 | - | 2.570 | 1.627 | 1.209 | 0.775 | 0.642 | 0.429 | 0.396 | 0.371 | 0.353 | 0.329 | 0.291 | 0.291 |
| 50 | - | 2.717 | 1.674 | 1.304 | 0.819 | 0.676 | 0.462 | 0.424 | 0.395 | 0.374 | 0.349 | 0.302 | 0.291 |
| 55 | - | 2.864 | 1.722 | 1.400 | 0.864 | 0.709 | 0.495 | 0.452 | 0.419 | 0.396 | 0.368 | 0.320 | 0.291 |
| 60 | - | 3.010 | 1.769 | 1.495 | 0.908 | 0.743 | 0.528 | 0.481 | 0.443 | 0.417 | 0.388 | 0.339 | 0.291 |
| 65 | - | - | 1.816 | 1.567 | 0.952 | 0.776 | 0.561 | 0.509 | 0.468 | 0.439 | 0.408 | 0.357 | 0.291 |
| 70 | - | - | 1.864 | 1.610 | 0.997 | 0.809 | 0.594 | 0.537 | 0.492 | 0.460 | 0.427 | 0.375 | 0.292 |
| 75 | - | - | 1.911 | 1.652 | 1.041 | 0.843 | 0.627 | 0.565 | 0.516 | 0.482 | 0.447 | 0.393 | 0.309 |
| 80 | - | - | 1.958 | 1.694 | 1.085 | 0.876 | 0.660 | 0.593 | 0.541 | 0.503 | 0.466 | 0.411 | 0.327 |
| 85 | - | - | 2.006 | 1.736 | 1.130 | 0.910 | 0.692 | 0.621 | 0.565 | 0.525 | 0.486 | 0.430 | 0.344 |
| 90 | - | - | 2.053 | 1.779 | 1.174 | 0.943 | 0.725 | 0.649 | 0.589 | 0.546 | 0.505 | 0.448 | 0.361 |
| 95 | - | - | 2.100 | 1.821 | 1.219 | 0.977 | 0.758 | 0.678 | 0.614 | 0.568 | 0.525 | 0.466 | 0.379 |
| 100 | - | - | 2.148 | 1.863 | 1.263 | 1.010 | 0.791 | 0.706 | 0.638 | 0.589 | 0.544 | 0.484 | 0.396 |
| 105 | - | - | 2.195 | 1.905 | 1.307 | 1.044 | 0.824 | 0.734 | 0.662 | 0.611 | 0.564 | 0.502 | 0.413 |
| 110 | - | - | 2.242 | 1.948 | 1.352 | 1.077 | 0.857 | 0.762 | 0.686 | 0.632 | 0.584 | 0.520 | 0.431 |
| 115 | - | - | 2.290 | 1.990 | 1.396 | 1.110 | 0.890 | 0.790 | 0.711 | 0.654 | 0.603 | 0.539 | 0.448 |
| 120 | - | - | 2.337 | 2.032 | 1.440 | 1.144 | 0.923 | 0.818 | 0.735 | 0.675 | 0.623 | 0.557 | 0.465 |
| 125 | - | - | 2.384 | 2.074 | 1.485 | 1.177 | 0.956 | 0.846 | 0.759 | 0.697 | 0.642 | 0.575 | 0.483 |
| 130 | - | - | 2.432 | 2.117 | 1.529 | 1.211 | 0.988 | 0.875 | 0.784 | 0.718 | 0.662 | 0.593 | 0.500 |
| 135 | - | - | 2.479 | 2.159 | 1.576 | 1.244 | 1.021 | 0.903 | 0.808 | 0.740 | 0.681 | 0.611 | 0.518 |
| 140 | - | - | 2.526 | 2.201 | 1.625 | 1.278 | 1.054 | 0.931 | 0.832 | 0.761 | 0.701 | 0.630 | 0.535 |
| 145 | - | - | 2.574 | 2.243 | 1.674 | 1.311 | 1.087 | 0.959 | 0.856 | 0.783 | 0.720 | 0.648 | 0.552 |
| 150 | - | - | 2.621 | 2.286 | 1.723 | 1.345 | 1.120 | 0.987 | 0.881 | 0.804 | 0.740 | 0.666 | 0.570 |
| 155 | - | - | 2.668 | 2.328 | 1.772 | 1.378 | 1.153 | 1.015 | 0.905 | 0.826 | 0.759 | 0.684 | 0.587 |
| 160 | - | - | 2.716 | 2.370 | 1.821 | 1.412 | 1.186 | 1.043 | 0.929 | 0.847 | 0.779 | 0.702 | 0.604 |
| 165 | - | - | 2.763 | 2.412 | 1.870 | 1.445 | 1.219 | 1.071 | 0.954 | 0.869 | 0.799 | 0.721 | 0.622 |
| 170 | - | - | 2.810 | 2.455 | 1.919 | 1.478 | 1.251 | 1.100 | 0.978 | 0.890 | 0.818 | 0.739 | 0.639 |
| 175 | - | - | 2.858 | 2.497 | 1.968 | 1.512 | 1.284 | 1.128 | 1.002 | 0.912 | 0.838 | 0.757 | 0.657 |
| 180 | - | - | 2.905 | 2.539 | 2.017 | 1.545 | 1.317 | 1.156 | 1.027 | 0.933 | 0.857 | 0.775 | 0.674 |
| 185 | - | - | 2.953 | 2.581 | 2.066 | 1.604 | 1.350 | 1.184 | 1.051 | 0.955 | 0.877 | 0.793 | 0.691 |
| 190 | - | - | 3.000 | 2.624 | 2.115 | 1.667 | 1.383 | 1.212 | 1.075 | 0.976 | 0.896 | 0.811 | 0.709 |
| 195 | - | - | 3.047 | 2.666 | 2.164 | 1.729 | 1.416 | 1.240 | 1.099 | 0.998 | 0.916 | 0.830 | 0.726 |
| 200 | - | - | - | 2.708 | 2.213 | 1.791 | 1.449 | 1.268 | 1.124 | 1.020 | 0.935 | 0.848 | 0.743 |
| 205 | - | - | - | 2.750 | 2.262 | 1.853 | 1.482 | 1.297 | 1.148 | 1.041 | 0.955 | 0.866 | 0.761 |
| 210 | - | - | - | 2.793 | 2.311 | 1.916 | 1.515 | 1.325 | 1.172 | 1.063 | 0.975 | 0.884 | 0.778 |
| 215 | - | - | - | 2.835 | 2.360 | 1.978 | 1.547 | 1.353 | 1.197 | 1.084 | 0.994 | 0.902 | 0.795 |
| 220 | - | - | - | 2.877 | 2.409 | 2.040 | 1.612 | 1.381 | 1.221 | 1.106 | 1.014 | 0.921 | 0.813 |
| 225 | - | - | - | 2.919 | 2.458 | 2.102 | 1.678 | 1.409 | 1.245 | 1.127 | 1.033 | 0.939 | 0.830 |
| 230 | - | - | - | 2.962 | 2.507 | 2.164 | 1.744 | 1.437 | 1.269 | 1.149 | 1.053 | 0.957 | 0.848 |
| 235 | - | - | - | 3.004 | 2.556 | 2.227 | 1.810 | 1.465 | 1.294 | 1.170 | 1.072 | 0.975 | 0.865 |
| 240 | - | - | - | 3.046 | 2.605 | 2.289 | 1.877 | 1.494 | 1.318 | 1.192 | 1.092 | 0.993 | 0.882 |
| 245 | - | - | - | 3.088 | 2.654 | 2.351 | 1.943 | 1.522 | 1.342 | 1.213 | 1.111 | 1.012 | 0.900 |
| 250 | - | - | - | - | 2.703 | 2.413 | 2.009 | 1.551 | 1.367 | 1.235 | 1.131 | 1.030 | 0.917 |
| 255 | - | - | - | - | 2.752 | 2.476 | 2.075 | 1.624 | 1.391 | 1.256 | 1.151 | 1.048 | 0.934 |
| 260 | - | - | - | - | 2.801 | 2.538 | 2.141 | 1.696 | 1.415 | 1.278 | 1.170 | 1.066 | 0.952 |
| 265 | - | - | - | - | 2.850 | 2.600 | 2.207 | 1.769 | 1.440 | 1.299 | 1.190 | 1.084 | 0.969 |
| 270 | - | - | - | - | 2.899 | 2.662 | 2.273 | 1.841 | 1.464 | 1.321 | 1.209 | 1.102 | 0.987 |
| 275 | - | - | - | - | 2.948 | 2.725 | 2.339 | 1.914 | 1.488 | 1.342 | 1.229 | 1.121 | 1.004 |
| 280 | - | - | - | - | 2.997 | 2.787 | 2.406 | 1.986 | 1.512 | 1.364 | 1.248 | 1.139 | 1.021 |
| 285 | - | - | - | - | 3.046 | 2.849 | 2.472 | 2.058 | 1.537 | 1.385 | 1.268 | 1.157 | 1.039 |
| 290 | - | - | - | - | 3.095 | 2.911 | 2.538 | 2.131 | 1.598 | 1.407 | 1.287 | 1.175 | 1.056 |
| 295 | - | - | - | - | 3.144 | 2.973 | 2.604 | 2.203 | 1.696 | 1.428 | 1.307 | 1.193 | 1.073 |
| 300 | - | - | - | - | - | 3.036 | 2.670 | 2.276 | 1.795 | 1.450 | 1.327 | 1.212 | 1.091 |
| 305 | - | - | - | - | - | 3.098 | 2.736 | 2.348 | 1.893 | 1.471 | 1.346 | 1.230 | 1.108 |
| 310 | - | - | - | - | - | - | 2.802 | 2.421 | 1.991 | 1.493 | 1.366 | 1.248 | 1.125 |
| 315 | - | - | - | - | - | - | 2.868 | 2.493 | 2.090 | 1.514 | 1.385 | 1.266 | 1.143 |
| 320 | - | - | - | - | - | - | 2.935 | 2.566 | 2.188 | 1.536 | 1.405 | 1.284 | 1.160 |
| 325 | - | - | - | - | - | - | 3.001 | 2.638 | 2.287 | 1.609 | 1.424 | 1.302 | 1.178 |
| 330 | - | - | - | - | - | - | 3.067 | 2.711 | 2.385 | 1.762 | 1.444 | 1.321 | 1.195 |
| 335 | - | - | - | - | - | - | 3.133 | 2.783 | 2.483 | 1.915 | 1.463 | 1.339 | 1.212 |
| 340 | - | - | - | - | - | - | - | 2.855 | 2.582 | 2.067 | 1.483 | 1.357 | 1.230 |
| 345 | - | - | - | - | - | - | - | 2.928 | 2.680 | 2.220 | 1.502 | 1.375 | 1.247 |
| 350 | - | - | - | - | - | - | - | 3.000 | 2.779 | 2.373 | 1.522 | 1.393 | 1.264 |
| 355 | - | - | - | - | - | - | - | 3.073 | 2.877 | 2.526 | 1.542 | 1.412 | 1.282 |
| 360 | - | - | - | - | - | - | - | - | 2.975 | 2.679 | 1.696 | 1.430 | 1.299 |
| 365 | - | - | - | - | - | - | - | - | 3.074 | 2.832 | 1.931 | 1.448 | 1.316 |
| 370 | - | - | - | - | - | - | - | - | - | 2.984 | 2.167 | 1.466 | 1.334 |
| 375 | - | - | - | - | - | - | - | - | - | - | 2.403 | 1.484 | 1.351 |

Thickness is intumescent only. Results also apply to I/H beams with 4 sided fire exposure subject to a maximum DFT of 3.192mm.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 15 I/H Columns: 105 minutes<br>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 |
| 30 | - | 2.767 | 1.700 | 1.321 | 0.994 | 0.880 | 0.723 | 0.600 | 0.349 | 0.332 | 0.291 | 0.291 | 0.291 |
| 35 | - | - | 1.861 | 1.482 | 1.096 | 0.964 | 0.783 | 0.643 | 0.389 | 0.368 | 0.340 | 0.298 | 0.291 |
| 40 | - | - | 2.021 | 1.577 | 1.198 | 1.048 | 0.843 | 0.686 | 0.429 | 0.405 | 0.371 | 0.321 | 0.291 |
| 45 | - | - | 2.182 | 1.626 | 1.301 | 1.132 | 0.903 | 0.729 | 0.468 | 0.441 | 0.403 | 0.345 | 0.291 |
| 50 | - | - | 2.342 | 1.675 | 1.403 | 1.216 | 0.963 | 0.772 | 0.508 | 0.478 | 0.435 | 0.369 | 0.304 |
| 55 | - | - | 2.502 | 1.723 | 1.505 | 1.300 | 1.023 | 0.815 | 0.548 | 0.514 | 0.466 | 0.393 | 0.324 |
| 60 | - | - | 2.663 | 1.772 | 1.574 | 1.384 | 1.083 | 0.858 | 0.588 | 0.551 | 0.498 | 0.417 | 0.344 |
| 65 | - | - | 2.823 | 1.821 | 1.618 | 1.468 | 1.143 | 0.901 | 0.627 | 0.587 | 0.530 | 0.440 | 0.364 |
| 70 | - | - | 2.983 | 1.870 | 1.663 | 1.550 | 1.203 | 0.944 | 0.667 | 0.624 | 0.561 | 0.464 | 0.384 |
| 75 | - | - | - | 1.918 | 1.707 | 1.594 | 1.263 | 0.986 | 0.707 | 0.660 | 0.593 | 0.488 | 0.404 |
| 80 | - | - | - | 1.967 | 1.751 | 1.638 | 1.323 | 1.029 | 0.747 | 0.697 | 0.625 | 0.512 | 0.425 |
| 85 | - | - | - | 2.016 | 1.795 | 1.682 | 1.383 | 1.072 | 0.786 | 0.733 | 0.656 | 0.535 | 0.445 |
| 90 | - | - | - | 2.064 | 1.839 | 1.726 | 1.443 | 1.115 | 0.826 | 0.770 | 0.688 | 0.559 | 0.465 |
| 95 | - | - | - | 2.113 | 1.883 | 1.770 | 1.503 | 1.158 | 0.866 | 0.806 | 0.720 | 0.583 | 0.485 |
| 100 | - | - | - | 2.162 | 1.927 | 1.814 | 1.560 | 1.201 | 0.906 | 0.843 | 0.751 | 0.607 | 0.505 |
| 105 | - | - | - | 2.210 | 1.972 | 1.857 | 1.607 | 1.244 | 0.945 | 0.879 | 0.783 | 0.631 | 0.525 |
| 110 | - | - | - | 2.259 | 2.016 | 1.901 | 1.653 | 1.287 | 0.985 | 0.916 | 0.815 | 0.654 | 0.545 |
| 115 | - | - | - | 2.308 | 2.060 | 1.945 | 1.700 | 1.330 | 1.025 | 0.952 | 0.846 | 0.678 | 0.566 |
| 120 | - | - | - | 2.357 | 2.104 | 1.989 | 1.746 | 1.373 | 1.065 | 0.989 | 0.878 | 0.702 | 0.586 |
| 125 | - | - | - | 2.405 | 2.148 | 2.033 | 1.792 | 1.416 | 1.104 | 1.025 | 0.910 | 0.726 | 0.606 |
| 130 | - | - | - | 2.454 | 2.192 | 2.077 | 1.839 | 1.459 | 1.144 | 1.062 | 0.941 | 0.750 | 0.626 |
| 135 | - | - | - | 2.503 | 2.237 | 2.121 | 1.885 | 1.502 | 1.184 | 1.098 | 0.973 | 0.773 | 0.646 |
| 140 | - | - | - | 2.551 | 2.281 | 2.164 | 1.932 | 1.545 | 1.224 | 1.135 | 1.005 | 0.797 | 0.666 |
| 145 | - | - | - | 2.600 | 2.325 | 2.208 | 1.978 | 1.599 | 1.263 | 1.171 | 1.036 | 0.821 | 0.686 |
| 150 | - | - | - | 2.649 | 2.369 | 2.252 | 2.025 | 1.655 | 1.303 | 1.208 | 1.068 | 0.845 | 0.707 |
| 155 | - | - | - | 2.698 | 2.413 | 2.296 | 2.071 | 1.710 | 1.343 | 1.244 | 1.100 | 0.869 | 0.727 |
| 160 | - | - | - | 2.746 | 2.457 | 2.340 | 2.118 | 1.766 | 1.383 | 1.281 | 1.131 | 0.892 | 0.747 |
| 165 | - | - | - | 2.795 | 2.501 | 2.384 | 2.164 | 1.821 | 1.422 | 1.317 | 1.163 | 0.916 | 0.767 |
| 170 | - | - | - | 2.844 | 2.546 | 2.428 | 2.210 | 1.877 | 1.462 | 1.354 | 1.194 | 0.940 | 0.787 |
| 175 | - | - | - | 2.892 | 2.590 | 2.471 | 2.257 | 1.932 | 1.502 | 1.391 | 1.226 | 0.964 | 0.807 |
| 180 | - | - | - | 2.941 | 2.634 | 2.515 | 2.303 | 1.988 | 1.542 | 1.427 | 1.258 | 0.987 | 0.828 |
| 185 | - | - | - | 2.990 | 2.678 | 2.559 | 2.350 | 2.043 | 1.606 | 1.464 | 1.289 | 1.011 | 0.848 |
| 190 | - | - | - | 3.039 | 2.722 | 2.603 | 2.396 | 2.099 | 1.675 | 1.500 | 1.321 | 1.035 | 0.868 |
| 195 | - | - | - | 3.087 | 2.766 | 2.647 | 2.443 | 2.154 | 1.745 | 1.537 | 1.353 | 1.059 | 0.888 |
| 200 | - | - | - | - | 2.810 | 2.691 | 2.489 | 2.210 | 1.814 | 1.596 | 1.384 | 1.083 | 0.908 |
| 205 | - | - | - | - | 2.855 | 2.735 | 2.535 | 2.265 | 1.884 | 1.667 | 1.416 | 1.106 | 0.928 |
| 210 | - | - | - | - | 2.899 | 2.778 | 2.582 | 2.321 | 1.953 | 1.738 | 1.448 | 1.130 | 0.948 |
| 215 | - | - | - | - | 2.943 | 2.822 | 2.628 | 2.376 | 2.023 | 1.810 | 1.479 | 1.154 | 0.969 |
| 220 | - | - | - | - | 2.987 | 2.866 | 2.675 | 2.432 | 2.093 | 1.881 | 1.511 | 1.178 | 0.989 |
| 225 | - | - | - | - | 3.031 | 2.910 | 2.721 | 2.487 | 2.162 | 1.952 | 1.543 | 1.202 | 1.009 |
| 230 | - | - | - | - | 3.075 | 2.954 | 2.768 | 2.543 | 2.232 | 2.023 | 1.611 | 1.225 | 1.029 |
| 235 | - | - | - | - | 3.120 | 2.998 | 2.814 | 2.598 | 2.301 | 2.094 | 1.688 | 1.249 | 1.049 |
| 240 | - | - | - | - | - | 3.042 | 2.861 | 2.654 | 2.371 | 2.166 | 1.766 | 1.273 | 1.069 |
| 245 | - | - | - | - | - | 3.085 | 2.907 | 2.709 | 2.440 | 2.237 | 1.843 | 1.297 | 1.090 |
| 250 | - | - | - | - | - | - | 2.953 | 2.765 | 2.510 | 2.308 | 1.920 | 1.321 | 1.110 |
| 255 | - | - | - | - | - | - | 3.000 | 2.820 | 2.580 | 2.379 | 1.998 | 1.344 | 1.130 |
| 260 | - | - | - | - | - | - | 3.046 | 2.876 | 2.649 | 2.451 | 2.075 | 1.368 | 1.150 |
| 265 | - | - | - | - | - | - | 3.093 | 2.931 | 2.719 | 2.522 | 2.152 | 1.392 | 1.170 |
| 270 | - | - | - | - | - | - | - | 2.987 | 2.788 | 2.593 | 2.230 | 1.416 | 1.190 |
| 275 | - | - | - | - | - | - | - | 3.042 | 2.858 | 2.664 | 2.307 | 1.439 | 1.210 |
| 280 | - | - | - | - | - | - | - | 3.098 | 2.927 | 2.736 | 2.384 | 1.463 | 1.231 |
| 285 | - | - | - | - | - | - | - | 3.153 | 2.997 | 2.807 | 2.462 | 1.487 | 1.251 |
| 290 | - | - | - | - | - | - | - | - | 3.067 | 2.878 | 2.539 | 1.511 | 1.271 |
| 295 | - | - | - | - | - | - | - | - | 3.136 | 2.949 | 2.616 | 1.535 | 1.291 |
| 300 | - | - | - | - | - | - | - | - | - | 3.020 | 2.694 | 1.597 | 1.311 |
| 305 | - | - | - | - | - | - | - | - | - | 3.092 | 2.771 | 1.717 | 1.331 |
| 310 | - | - | - | - | - | - | - | - | - | 3.163 | 2.848 | 1.837 | 1.352 |
| 315 | - | - | - | - | - | - | - | - | - | - | 2.926 | 1.957 | 1.372 |
| 320 | - | - | - | - | - | - | - | - | - | - | 3.003 | 2.077 | 1.392 |
| 325 | - | - | - | - | - | - | - | - | - | - | 3.080 | 2.198 | 1.412 |
| 330 | - | - | - | - | - | - | - | - | - | - | - | 2.318 | 1.432 |
| 335 | - | - | - | - | - | - | - | - | - | - | - | 2.438 | 1.452 |
| 340 | - | - | - | - | - | - | - | - | - | - | - | 2.558 | 1.472 |
| 345 | - | - | - | - | - | - | - | - | - | - | - | 2.679 | 1.493 |
| 350 | - | - | - | - | - | - | - | - | - | - | - | 2.799 | 1.513 |
| 355 | - | - | - | - | - | - | - | - | - | - | - | 2.919 | 1.533 |
| 360 | - | - | - | - | - | - | - | - | - | - | - | 3.039 | 1.592 |
| 365 | - | - | - | - | - | - | - | - | - | - | - | - | 1.801 |
| 370 | - | - | - | - | - | - | - | - | - | - | - | - | 2.011 |
| 375 | - | - | - | - | - | - | - | - | - | - | - | - | 2.220 |

Thickness is intumescent only. Results also apply to I/H beams with 4 sided fire exposure subject to a maximum DFT of 3.192mm.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 16 I/H Columns: 120 minutes<br>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 |
| 30 | - | - | 2.496 | 1.664 | 1.343 | 1.215 | 1.037 | 0.899 | 0.783 | 0.689 | 0.547 | 0.291 | 0.291 |
| 35 | - | - | 2.726 | 1.819 | 1.503 | 1.354 | 1.149 | 0.992 | 0.860 | 0.755 | 0.596 | 0.347 | 0.291 |
| 40 | - | - | 2.955 | 1.975 | 1.585 | 1.493 | 1.261 | 1.084 | 0.937 | 0.821 | 0.646 | 0.383 | 0.311 |
| 45 | - | - | - | 2.131 | 1.637 | 1.578 | 1.372 | 1.176 | 1.014 | 0.887 | 0.696 | 0.420 | 0.340 |
| 50 | - | - | - | 2.286 | 1.688 | 1.626 | 1.484 | 1.268 | 1.091 | 0.953 | 0.746 | 0.456 | 0.368 |
| 55 | - | - | - | 2.442 | 1.739 | 1.674 | 1.568 | 1.361 | 1.169 | 1.020 | 0.795 | 0.493 | 0.397 |
| 60 | - | - | - | 2.598 | 1.790 | 1.722 | 1.615 | 1.453 | 1.246 | 1.086 | 0.845 | 0.529 | 0.426 |
| 65 | - | - | - | 2.754 | 1.841 | 1.770 | 1.661 | 1.545 | 1.323 | 1.152 | 0.895 | 0.566 | 0.455 |
| 70 | - | - | - | 2.909 | 1.892 | 1.818 | 1.708 | 1.593 | 1.400 | 1.218 | 0.944 | 0.602 | 0.483 |
| 75 | - | - | - | - | 1.943 | 1.866 | 1.754 | 1.639 | 1.477 | 1.285 | 0.994 | 0.639 | 0.512 |
| 80 | - | - | - | - | 1.994 | 1.914 | 1.800 | 1.685 | 1.552 | 1.351 | 1.044 | 0.675 | 0.541 |
| 85 | - | - | - | - | 2.046 | 1.962 | 1.847 | 1.731 | 1.599 | 1.417 | 1.094 | 0.712 | 0.569 |
| 90 | - | - | - | - | 2.097 | 2.010 | 1.893 | 1.777 | 1.646 | 1.483 | 1.143 | 0.748 | 0.598 |
| 95 | - | - | - | - | 2.148 | 2.058 | 1.940 | 1.823 | 1.693 | 1.549 | 1.193 | 0.785 | 0.627 |
| 100 | - | - | - | - | 2.199 | 2.106 | 1.986 | 1.869 | 1.740 | 1.598 | 1.243 | 0.821 | 0.656 |
| 105 | - | - | - | - | 2.250 | 2.154 | 2.032 | 1.915 | 1.787 | 1.647 | 1.293 | 0.857 | 0.684 |
| 110 | - | - | - | - | 2.301 | 2.202 | 2.079 | 1.961 | 1.834 | 1.696 | 1.342 | 0.894 | 0.713 |
| 115 | - | - | - | - | 2.352 | 2.250 | 2.125 | 2.007 | 1.880 | 1.744 | 1.392 | 0.930 | 0.742 |
| 120 | - | - | - | - | 2.403 | 2.298 | 2.172 | 2.053 | 1.927 | 1.793 | 1.442 | 0.967 | 0.770 |
| 125 | - | - | - | - | 2.455 | 2.346 | 2.218 | 2.099 | 1.974 | 1.842 | 1.492 | 1.003 | 0.799 |
| 130 | - | - | - | - | 2.506 | 2.394 | 2.264 | 2.145 | 2.021 | 1.891 | 1.541 | 1.040 | 0.828 |
| 135 | - | - | - | - | 2.557 | 2.442 | 2.311 | 2.191 | 2.068 | 1.939 | 1.598 | 1.076 | 0.857 |
| 140 | - | - | - | - | 2.608 | 2.490 | 2.357 | 2.237 | 2.115 | 1.988 | 1.657 | 1.113 | 0.885 |
| 145 | - | - | - | - | 2.659 | 2.538 | 2.404 | 2.283 | 2.162 | 2.037 | 1.715 | 1.149 | 0.914 |
| 150 | - | - | - | - | 2.710 | 2.586 | 2.450 | 2.329 | 2.208 | 2.086 | 1.773 | 1.186 | 0.943 |
| 155 | - | - | - | - | 2.761 | 2.635 | 2.496 | 2.375 | 2.255 | 2.134 | 1.832 | 1.222 | 0.971 |
| 160 | - | - | - | - | 2.813 | 2.683 | 2.543 | 2.421 | 2.302 | 2.183 | 1.890 | 1.259 | 1.000 |
| 165 | - | - | - | - | 2.864 | 2.731 | 2.589 | 2.467 | 2.349 | 2.232 | 1.948 | 1.295 | 1.029 |
| 170 | - | - | - | - | 2.915 | 2.779 | 2.636 | 2.513 | 2.396 | 2.281 | 2.007 | 1.331 | 1.058 |
| 175 | - | - | - | - | 2.966 | 2.827 | 2.682 | 2.559 | 2.443 | 2.329 | 2.065 | 1.368 | 1.086 |
| 180 | - | - | - | - | 3.017 | 2.875 | 2.728 | 2.605 | 2.490 | 2.378 | 2.123 | 1.404 | 1.115 |
| 185 | - | - | - | - | 3.068 | 2.923 | 2.775 | 2.651 | 2.536 | 2.427 | 2.182 | 1.441 | 1.144 |
| 190 | - | - | - | - | - | 2.971 | 2.821 | 2.697 | 2.583 | 2.476 | 2.240 | 1.477 | 1.172 |
| 195 | - | - | - | - | - | 3.019 | 2.868 | 2.743 | 2.630 | 2.524 | 2.298 | 1.514 | 1.201 |
| 200 | - | - | - | - | - | 3.067 | 2.914 | 2.789 | 2.677 | 2.573 | 2.356 | 1.552 | 1.230 |
| 205 | - | - | - | - | - | - | 2.960 | 2.835 | 2.724 | 2.622 | 2.415 | 1.641 | 1.259 |
| 210 | - | - | - | - | - | - | 3.007 | 2.881 | 2.771 | 2.671 | 2.473 | 1.730 | 1.287 |
| 215 | - | - | - | - | - | - | 3.053 | 2.927 | 2.818 | 2.719 | 2.531 | 1.818 | 1.316 |
| 220 | - | - | - | - | - | - | 3.100 | 2.973 | 2.865 | 2.768 | 2.590 | 1.907 | 1.345 |
| 225 | - | - | - | - | - | - | - | 3.019 | 2.911 | 2.817 | 2.648 | 1.996 | 1.373 |
| 230 | - | - | - | - | - | - | - | 3.065 | 2.958 | 2.865 | 2.706 | 2.085 | 1.402 |
| 235 | - | - | - | - | - | - | - | 3.111 | 3.005 | 2.914 | 2.765 | 2.174 | 1.431 |
| 240 | - | - | - | - | - | - | - | - | 3.052 | 2.963 | 2.823 | 2.262 | 1.460 |
| 245 | - | - | - | - | - | - | - | - | 3.099 | 3.012 | 2.881 | 2.351 | 1.488 |
| 250 | - | - | - | - | - | - | - | - | - | 3.060 | 2.940 | 2.440 | 1.517 |
| 255 | - | - | - | - | - | - | - | - | - | 3.109 | 2.998 | 2.529 | 1.546 |
| 260 | - | - | - | - | - | - | - | - | - | - | 3.056 | 2.617 | 1.633 |
| 265 | - | - | - | - | - | - | - | - | - | - | 3.114 | 2.706 | 1.729 |
| 270 | - | - | - | - | - | - | - | - | - | - | - | 2.795 | 1.824 |
| 275 | - | - | - | - | - | - | - | - | - | - | - | 2.884 | 1.919 |
| 280 | - | - | - | - | - | - | - | - | - | - | - | 2.973 | 2.015 |
| 285 | - | - | - | - | - | - | - | - | - | - | - | 3.061 | 2.110 |
| 290 | - | - | - | - | - | - | - | - | - | - | - | 3.150 | 2.205 |
| 295 | - | - | - | - | - | - | - | - | - | - | - | - | 2.301 |
| 300 | - | - | - | - | - | - | - | - | - | - | - | - | 2.396 |
| 305 | - | - | - | - | - | - | - | - | - | - | - | - | 2.491 |
| 310 | - | - | - | - | - | - | - | - | - | - | - | - | 2.587 |
| 315 | - | - | - | - | - | - | - | - | - | - | - | - | 2.682 |
| 320 | - | - | - | - | - | - | - | - | - | - | - | - | 2.777 |
| 325 | - | - | - | - | - | - | - | - | - | - | - | - | 2.873 |
| 330 | - | - | - | - | - | - | - | - | - | - | - | - | 2.968 |
| 335 | - | - | - | - | - | - | - | - | - | - | - | - | 3.063 |
| 340 | - | - | - | - | - | - | - | - | - | - | - | - | 3.159 |
| 345 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 350 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 355 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 360 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 365 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 370 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 375 | - | - | - | - | - | - | - | - | - | - | - | - | - |

Thickness is intumescent only. Results also apply to I/H beams with 4 sided fire exposure subject to a maximum DFT of 3.192mm.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 17 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 | 620 | 650 | 700 | 750 |
| 45 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 50 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 55 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 60 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 65 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 70 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 75 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 80 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 85 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 90 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 95 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 100 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 105 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 110 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 115 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 120 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 125 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 130 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 135 | 0.486 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 140 | 0.517 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 145 | 0.549 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 150 | 0.580 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 155 | 0.612 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 160 | 0.644 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 165 | 0.675 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 170 | 0.707 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 175 | 0.738 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 180 | 0.770 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 185 | 0.802 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 190 | 0.833 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 195 | 0.865 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 200 | 0.896 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 205 | 0.928 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 210 | 0.959 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 215 | 0.991 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 220 | 1.023 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 225 | 1.054 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |

Thickness is intumescent only.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 18 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 | 620 | 650 | 700 | 750 |
| 45 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 50 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 55 | 0.523 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 60 | 0.692 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 65 | 0.860 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 70 | 1.029 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 75 | 1.197 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 80 | 1.366 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 85 | 1.535 | 0.484 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 90 | 1.703 | 0.520 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 95 | 1.857 | 0.557 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 100 | 1.926 | 0.593 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 105 | 1.996 | 0.630 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 110 | 2.066 | 0.666 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 115 | 2.135 | 0.703 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 120 | 2.205 | 0.739 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 125 | 2.275 | 0.775 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 130 | 2.345 | 0.812 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 135 | 2.414 | 0.848 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 140 | 2.484 | 0.885 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 145 | 2.554 | 0.921 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 150 | 2.624 | 0.958 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 155 | 2.693 | 0.994 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 160 | 2.763 | 1.031 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 165 | 2.833 | 1.067 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 170 | 2.902 | 1.103 | 0.496 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 175 | 2.972 | 1.140 | 0.541 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 180 | 3.042 | 1.176 | 0.586 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 185 | 3.112 | 1.213 | 0.631 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 190 | 3.181 | 1.249 | 0.676 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 195 | 3.251 | 1.286 | 0.721 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 200 | 3.321 | 1.322 | 0.766 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 205 | 3.390 | 1.359 | 0.811 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 210 | 3.460 | 1.395 | 0.856 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 215 | 3.530 | 1.432 | 0.901 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 220 | 3.600 | 1.468 | 0.946 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 225 | 3.676 | 1.504 | 0.991 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |

Thickness is intumescent only.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 19 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 | 620 | 650 | 700 | 750 |
| 45 | 1.831 | 0.471 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 50 | 1.965 | 0.511 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 55 | 2.099 | 0.697 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 60 | 2.234 | 0.883 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 65 | 2.368 | 1.070 | 0.465 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 70 | 2.502 | 1.256 | 0.513 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 75 | 2.637 | 1.443 | 0.560 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 80 | 2.771 | 1.629 | 0.608 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 85 | 2.905 | 1.816 | 0.656 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 90 | 3.040 | 1.895 | 0.703 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 95 | 3.174 | 1.953 | 0.751 | 0.489 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 100 | 3.308 | 2.011 | 0.799 | 0.536 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 105 | 3.443 | 2.069 | 0.847 | 0.583 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 110 | 3.577 | 2.126 | 0.894 | 0.631 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 115 | 3.680 | 2.184 | 0.942 | 0.678 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 120 | 3.760 | 2.242 | 0.990 | 0.725 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 125 | 3.840 | 2.300 | 1.037 | 0.773 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 130 | 3.919 | 2.358 | 1.085 | 0.820 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 135 | 3.999 | 2.416 | 1.133 | 0.867 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 140 | 4.079 | 2.474 | 1.181 | 0.914 | 0.500 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 145 | 4.159 | 2.532 | 1.228 | 0.962 | 0.553 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 150 | 4.238 | 2.590 | 1.276 | 1.009 | 0.606 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 155 | 4.318 | 2.648 | 1.324 | 1.056 | 0.659 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 160 | 4.398 | 2.706 | 1.371 | 1.104 | 0.713 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 165 | 4.477 | 2.764 | 1.419 | 1.151 | 0.766 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 170 | 4.557 | 2.822 | 1.467 | 1.198 | 0.819 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 175 | 4.637 | 2.880 | 1.514 | 1.245 | 0.873 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 180 | 4.717 | 2.938 | 1.562 | 1.293 | 0.926 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 185 | 4.796 | 2.996 | 1.610 | 1.340 | 0.979 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 190 | 4.876 | 3.054 | 1.658 | 1.387 | 1.032 | 0.523 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 195 | 4.956 | 3.112 | 1.705 | 1.434 | 1.086 | 0.598 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 200 | 5.036 | 3.170 | 1.753 | 1.482 | 1.139 | 0.673 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 205 | 5.115 | 3.228 | 1.801 | 1.529 | 1.192 | 0.748 | 0.481 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 210 | 5.195 | 3.286 | 1.853 | 1.576 | 1.245 | 0.823 | 0.554 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 215 | 5.275 | 3.344 | 1.987 | 1.624 | 1.299 | 0.899 | 0.628 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 220 | 5.354 | 3.402 | 2.122 | 1.671 | 1.352 | 0.974 | 0.701 | 0.502 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 225 | 5.434 | 3.460 | 2.256 | 1.718 | 1.405 | 1.049 | 0.775 | 0.572 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |

Thickness is intumescent only.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 20 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 | 620 | 650 | 700 | 750 |
| 45 | 2.901 | 2.047 | 0.471 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 50 | 2.999 | 2.221 | 0.966 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 55 | 3.213 | 2.290 | 1.607 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 60 | 3.426 | 2.358 | 1.884 | 0.533 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 65 | 3.637 | 2.426 | 1.945 | 0.717 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 70 | 3.739 | 2.495 | 2.005 | 0.902 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 75 | 3.840 | 2.563 | 2.066 | 1.087 | 0.524 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 80 | 3.941 | 2.631 | 2.126 | 1.272 | 0.596 | 0.500 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 85 | 4.043 | 2.700 | 2.187 | 1.457 | 0.668 | 0.557 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 90 | 4.144 | 2.768 | 2.248 | 1.642 | 0.740 | 0.615 | 0.481 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 95 | 4.245 | 2.836 | 2.308 | 1.826 | 0.812 | 0.673 | 0.534 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 100 | 4.347 | 2.905 | 2.369 | 1.906 | 0.884 | 0.731 | 0.588 | 0.467 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 105 | 4.448 | 2.973 | 2.430 | 1.973 | 0.956 | 0.789 | 0.641 | 0.520 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 110 | 4.549 | 3.041 | 2.490 | 2.040 | 1.028 | 0.847 | 0.694 | 0.573 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 115 | 4.651 | 3.110 | 2.551 | 2.107 | 1.100 | 0.904 | 0.748 | 0.626 | 0.489 | 0.460 | 0.460 | 0.460 | 0.460 |
| 120 | 4.752 | 3.178 | 2.612 | 2.174 | 1.172 | 0.962 | 0.801 | 0.679 | 0.542 | 0.460 | 0.460 | 0.460 | 0.460 |
| 125 | 4.854 | 3.246 | 2.672 | 2.241 | 1.244 | 1.020 | 0.855 | 0.732 | 0.595 | 0.463 | 0.460 | 0.460 | 0.460 |
| 130 | 4.955 | 3.314 | 2.733 | 2.308 | 1.316 | 1.078 | 0.908 | 0.785 | 0.647 | 0.515 | 0.460 | 0.460 | 0.460 |
| 135 | 5.056 | 3.383 | 2.793 | 2.375 | 1.388 | 1.136 | 0.962 | 0.838 | 0.700 | 0.568 | 0.460 | 0.460 | 0.460 |
| 140 | 5.158 | 3.451 | 2.854 | 2.442 | 1.460 | 1.194 | 1.015 | 0.891 | 0.753 | 0.621 | 0.460 | 0.460 | 0.460 |
| 145 | 5.259 | 3.519 | 2.915 | 2.508 | 1.532 | 1.251 | 1.068 | 0.943 | 0.805 | 0.674 | 0.460 | 0.460 | 0.460 |
| 150 | 5.360 | 3.588 | 2.975 | 2.575 | 1.604 | 1.309 | 1.122 | 0.996 | 0.858 | 0.727 | 0.460 | 0.460 | 0.460 |
| 155 | - | 3.661 | 3.036 | 2.642 | 1.676 | 1.367 | 1.175 | 1.049 | 0.910 | 0.779 | 0.460 | 0.460 | 0.460 |
| 160 | - | 3.746 | 3.097 | 2.709 | 1.748 | 1.425 | 1.229 | 1.102 | 0.963 | 0.832 | 0.460 | 0.460 | 0.460 |
| 165 | - | 3.832 | 3.157 | 2.776 | 1.820 | 1.483 | 1.282 | 1.155 | 1.016 | 0.885 | 0.460 | 0.460 | 0.460 |
| 170 | - | 3.917 | 3.218 | 2.843 | 1.914 | 1.540 | 1.335 | 1.208 | 1.068 | 0.938 | 0.460 | 0.460 | 0.460 |
| 175 | - | 4.002 | 3.279 | 2.910 | 2.021 | 1.598 | 1.389 | 1.261 | 1.121 | 0.991 | 0.460 | 0.460 | 0.460 |
| 180 | - | 4.087 | 3.339 | 2.977 | 2.128 | 1.656 | 1.442 | 1.314 | 1.173 | 1.043 | 0.522 | 0.460 | 0.460 |
| 185 | - | 4.172 | 3.400 | 3.044 | 2.235 | 1.714 | 1.496 | 1.367 | 1.226 | 1.096 | 0.591 | 0.460 | 0.460 |
| 190 | - | 4.258 | 3.460 | 3.111 | 2.341 | 1.772 | 1.549 | 1.420 | 1.279 | 1.149 | 0.660 | 0.460 | 0.460 |
| 195 | - | 4.343 | 3.521 | 3.178 | 2.448 | 1.830 | 1.603 | 1.473 | 1.331 | 1.202 | 0.729 | 0.460 | 0.460 |
| 200 | - | 4.428 | 3.582 | 3.245 | 2.555 | 1.947 | 1.656 | 1.526 | 1.384 | 1.255 | 0.798 | 0.460 | 0.460 |
| 205 | - | 4.513 | 3.650 | 3.312 | 2.662 | 2.089 | 1.709 | 1.579 | 1.436 | 1.307 | 0.867 | 0.460 | 0.460 |
| 210 | - | 4.598 | 3.778 | 3.379 | 2.768 | 2.230 | 1.763 | 1.632 | 1.489 | 1.360 | 0.935 | 0.460 | 0.460 |
| 215 | - | 4.683 | 3.905 | 3.446 | 2.875 | 2.372 | 1.816 | 1.685 | 1.542 | 1.413 | 1.004 | 0.522 | 0.460 |
| 220 | - | 4.769 | 4.032 | 3.513 | 2.982 | 2.513 | 1.916 | 1.738 | 1.594 | 1.466 | 1.073 | 0.586 | 0.460 |
| 225 | - | 4.854 | 4.159 | 3.580 | 3.089 | 2.654 | 2.073 | 1.791 | 1.647 | 1.519 | 1.142 | 0.651 | 0.460 |

Thickness is intumescent only.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 21 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 | 620 | 650 | 700 | 750 |
| 45 | 3.843 | 2.866 | 2.387 | 1.877 | 0.471 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 50 | 4.104 | 3.062 | 2.603 | 1.948 | 0.471 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 55 | 4.262 | 3.180 | 2.659 | 2.018 | 0.928 | 0.482 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 60 | 4.420 | 3.297 | 2.715 | 2.088 | 1.539 | 0.827 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 65 | 4.578 | 3.415 | 2.771 | 2.158 | 1.880 | 1.172 | 0.620 | 0.462 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 70 | 4.735 | 3.532 | 2.827 | 2.228 | 1.947 | 1.517 | 0.785 | 0.560 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 75 | 4.893 | 3.644 | 2.883 | 2.298 | 2.014 | 1.849 | 0.951 | 0.657 | 0.526 | 0.460 | 0.460 | 0.460 | 0.460 |
| 80 | 5.051 | 3.718 | 2.939 | 2.368 | 2.082 | 1.918 | 1.117 | 0.755 | 0.604 | 0.512 | 0.460 | 0.460 | 0.460 |
| 85 | 5.209 | 3.792 | 2.995 | 2.438 | 2.149 | 1.987 | 1.282 | 0.853 | 0.682 | 0.577 | 0.460 | 0.460 | 0.460 |
| 90 | 5.367 | 3.865 | 3.051 | 2.509 | 2.217 | 2.056 | 1.448 | 0.950 | 0.760 | 0.641 | 0.511 | 0.460 | 0.460 |
| 95 | - | 3.939 | 3.107 | 2.579 | 2.284 | 2.125 | 1.613 | 1.048 | 0.839 | 0.706 | 0.565 | 0.460 | 0.460 |
| 100 | - | 4.012 | 3.163 | 2.649 | 2.351 | 2.193 | 1.779 | 1.145 | 0.917 | 0.770 | 0.619 | 0.460 | 0.460 |
| 105 | - | 4.086 | 3.219 | 2.719 | 2.419 | 2.262 | 1.893 | 1.243 | 0.995 | 0.835 | 0.672 | 0.460 | 0.460 |
| 110 | - | 4.160 | 3.275 | 2.789 | 2.486 | 2.331 | 1.971 | 1.341 | 1.073 | 0.899 | 0.726 | 0.479 | 0.460 |
| 115 | - | 4.233 | 3.331 | 2.859 | 2.554 | 2.400 | 2.049 | 1.438 | 1.151 | 0.964 | 0.780 | 0.531 | 0.460 |
| 120 | - | 4.307 | 3.387 | 2.929 | 2.621 | 2.469 | 2.127 | 1.536 | 1.229 | 1.028 | 0.834 | 0.583 | 0.460 |
| 125 | - | 4.380 | 3.442 | 2.999 | 2.688 | 2.538 | 2.205 | 1.634 | 1.308 | 1.093 | 0.888 | 0.634 | 0.460 |
| 130 | - | 4.454 | 3.498 | 3.070 | 2.756 | 2.607 | 2.283 | 1.731 | 1.386 | 1.157 | 0.941 | 0.686 | 0.460 |
| 135 | - | 4.527 | 3.554 | 3.140 | 2.823 | 2.675 | 2.361 | 1.829 | 1.464 | 1.222 | 0.995 | 0.737 | 0.460 |
| 140 | - | 4.601 | 3.610 | 3.210 | 2.891 | 2.744 | 2.440 | 1.927 | 1.542 | 1.286 | 1.049 | 0.789 | 0.460 |
| 145 | - | 4.675 | 3.697 | 3.280 | 2.958 | 2.813 | 2.518 | 2.025 | 1.620 | 1.351 | 1.103 | 0.840 | 0.460 |
| 150 | - | 4.748 | 3.807 | 3.350 | 3.025 | 2.882 | 2.596 | 2.123 | 1.698 | 1.415 | 1.157 | 0.892 | 0.460 |
| 155 | - | 4.822 | 3.917 | 3.420 | 3.093 | 2.951 | 2.674 | 2.221 | 1.776 | 1.480 | 1.211 | 0.944 | 0.460 |
| 160 | - | 4.895 | 4.027 | 3.490 | 3.160 | 3.020 | 2.752 | 2.319 | 1.859 | 1.544 | 1.264 | 0.995 | 0.460 |
| 165 | - | 4.969 | 4.138 | 3.560 | 3.228 | 3.089 | 2.830 | 2.418 | 1.972 | 1.609 | 1.318 | 1.047 | 0.460 |
| 170 | - | 5.043 | 4.248 | 3.631 | 3.295 | 3.157 | 2.908 | 2.516 | 2.085 | 1.673 | 1.372 | 1.098 | 0.460 |
| 175 | - | 5.116 | 4.358 | 3.765 | 3.362 | 3.226 | 2.987 | 2.614 | 2.198 | 1.738 | 1.426 | 1.150 | 0.476 |
| 180 | - | 5.190 | 4.468 | 3.904 | 3.430 | 3.295 | 3.065 | 2.712 | 2.312 | 1.802 | 1.480 | 1.202 | 0.539 |
| 185 | - | 5.263 | 4.579 | 4.043 | 3.497 | 3.364 | 3.143 | 2.810 | 2.425 | 1.890 | 1.534 | 1.253 | 0.603 |
| 190 | - | 5.337 | 4.689 | 4.182 | 3.565 | 3.433 | 3.221 | 2.908 | 2.538 | 2.028 | 1.587 | 1.305 | 0.667 |
| 195 | - | - | 4.799 | 4.321 | 3.632 | 3.502 | 3.299 | 3.007 | 2.652 | 2.166 | 1.641 | 1.356 | 0.730 |
| 200 | - | - | 4.910 | 4.460 | 3.803 | 3.571 | 3.377 | 3.105 | 2.765 | 2.303 | 1.695 | 1.408 | 0.794 |
| 205 | - | - | 5.020 | 4.599 | 3.979 | 3.648 | 3.455 | 3.203 | 2.878 | 2.441 | 1.749 | 1.459 | 0.858 |
| 210 | - | - | 5.130 | 4.738 | 4.154 | 3.842 | 3.534 | 3.301 | 2.992 | 2.579 | 1.803 | 1.511 | 0.921 |
| 215 | - | - | 5.240 | 4.877 | 4.330 | 4.037 | 3.612 | 3.399 | 3.105 | 2.716 | 1.880 | 1.563 | 0.985 |
| 220 | - | - | 5.351 | 5.016 | 4.506 | 4.231 | 3.784 | 3.497 | 3.218 | 2.854 | 2.057 | 1.614 | 1.049 |
| 225 | - | - | 5.461 | 5.154 | 4.681 | 4.426 | 3.995 | 3.596 | 3.332 | 2.992 | 2.233 | 1.666 | 1.112 |

Thickness is intumescent only.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 22 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 | 620 | 650 | 700 | 750 |
| 45 | - | 3.644 | 3.183 | 2.704 | 2.229 | 1.905 | 1.773 | 0.471 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 50 | - | 3.756 | 3.183 | 2.963 | 2.427 | 1.980 | 1.846 | 0.476 | 0.460 | 0.460 | 0.460 | 0.460 | 0.460 |
| 55 | - | 3.867 | 3.521 | 3.005 | 2.487 | 2.055 | 1.920 | 1.178 | 0.543 | 0.460 | 0.460 | 0.460 | 0.460 |
| 60 | - | 3.979 | 3.624 | 3.047 | 2.546 | 2.130 | 1.993 | 1.850 | 0.908 | 0.588 | 0.460 | 0.460 | 0.460 |
| 65 | - | 4.090 | 3.708 | 3.089 | 2.605 | 2.206 | 2.066 | 1.923 | 1.273 | 0.820 | 0.520 | 0.460 | 0.460 |
| 70 | - | 4.201 | 3.790 | 3.131 | 2.664 | 2.281 | 2.140 | 1.996 | 1.638 | 1.052 | 0.641 | 0.460 | 0.460 |
| 75 | - | 4.313 | 3.873 | 3.173 | 2.723 | 2.356 | 2.213 | 2.069 | 1.878 | 1.283 | 0.763 | 0.463 | 0.460 |
| 80 | - | 4.424 | 3.955 | 3.215 | 2.783 | 2.431 | 2.286 | 2.142 | 1.952 | 1.515 | 0.884 | 0.534 | 0.460 |
| 85 | - | 4.536 | 4.037 | 3.256 | 2.842 | 2.506 | 2.360 | 2.215 | 2.026 | 1.747 | 1.006 | 0.605 | 0.460 |
| 90 | - | 4.647 | 4.119 | 3.298 | 2.901 | 2.581 | 2.433 | 2.288 | 2.101 | 1.890 | 1.127 | 0.675 | 0.460 |
| 95 | - | 4.759 | 4.202 | 3.340 | 2.960 | 2.657 | 2.506 | 2.361 | 2.175 | 1.968 | 1.249 | 0.746 | 0.460 |
| 100 | - | 4.870 | 4.284 | 3.382 | 3.019 | 2.732 | 2.580 | 2.434 | 2.249 | 2.045 | 1.370 | 0.817 | 0.508 |
| 105 | - | 4.982 | 4.366 | 3.424 | 3.079 | 2.807 | 2.653 | 2.507 | 2.324 | 2.122 | 1.492 | 0.887 | 0.561 |
| 110 | - | 5.093 | 4.449 | 3.466 | 3.138 | 2.882 | 2.727 | 2.580 | 2.398 | 2.200 | 1.613 | 0.958 | 0.615 |
| 115 | - | 5.205 | 4.531 | 3.508 | 3.197 | 2.957 | 2.800 | 2.653 | 2.472 | 2.277 | 1.735 | 1.028 | 0.668 |
| 120 | - | 5.316 | 4.613 | 3.550 | 3.256 | 3.033 | 2.873 | 2.726 | 2.547 | 2.354 | 1.854 | 1.099 | 0.721 |
| 125 | - | - | 4.695 | 3.592 | 3.315 | 3.108 | 2.947 | 2.799 | 2.621 | 2.432 | 1.946 | 1.170 | 0.775 |
| 130 | - | - | 4.778 | 3.634 | 3.375 | 3.183 | 3.020 | 2.872 | 2.695 | 2.509 | 2.039 | 1.240 | 0.828 |
| 135 | - | - | 4.860 | 3.817 | 3.434 | 3.258 | 3.093 | 2.945 | 2.770 | 2.586 | 2.131 | 1.311 | 0.882 |
| 140 | - | - | 4.942 | 4.005 | 3.493 | 3.333 | 3.167 | 3.018 | 2.844 | 2.664 | 2.224 | 1.382 | 0.935 |
| 145 | - | - | 5.025 | 4.192 | 3.552 | 3.409 | 3.240 | 3.091 | 2.918 | 2.741 | 2.317 | 1.452 | 0.989 |
| 150 | - | - | 5.107 | 4.379 | 3.611 | 3.484 | 3.313 | 3.164 | 2.993 | 2.818 | 2.409 | 1.523 | 1.042 |
| 155 | - | - | 5.189 | 4.567 | 3.755 | 3.559 | 3.387 | 3.237 | 3.067 | 2.896 | 2.502 | 1.593 | 1.096 |
| 160 | - | - | 5.271 | 4.754 | 3.954 | 3.634 | 3.460 | 3.310 | 3.141 | 2.973 | 2.595 | 1.664 | 1.149 |
| 165 | - | - | 5.354 | 4.941 | 4.154 | 3.836 | 3.534 | 3.383 | 3.216 | 3.050 | 2.687 | 1.735 | 1.203 |
| 170 | - | - | - | 5.129 | 4.353 | 4.040 | 3.607 | 3.456 | 3.290 | 3.128 | 2.780 | 1.805 | 1.256 |
| 175 | - | - | - | 5.316 | 4.553 | 4.244 | 3.765 | 3.529 | 3.364 | 3.205 | 2.873 | 1.902 | 1.309 |
| 180 | - | - | - | - | 4.752 | 4.448 | 3.975 | 3.602 | 3.438 | 3.282 | 2.965 | 2.036 | 1.363 |
| 185 | - | - | - | - | 4.952 | 4.652 | 4.186 | 3.763 | 3.513 | 3.360 | 3.058 | 2.169 | 1.416 |
| 190 | - | - | - | - | 5.152 | 4.856 | 4.396 | 3.998 | 3.587 | 3.437 | 3.150 | 2.303 | 1.470 |
| 195 | - | - | - | - | 5.351 | 5.059 | 4.607 | 4.233 | 3.732 | 3.514 | 3.243 | 2.436 | 1.523 |
| 200 | - | - | - | - | - | 5.263 | 4.817 | 4.469 | 4.006 | 3.592 | 3.336 | 2.570 | 1.577 |
| 205 | - | - | - | - | - | 5.467 | 5.028 | 4.704 | 4.279 | 3.777 | 3.428 | 2.703 | 1.630 |
| 210 | - | - | - | - | - | - | 5.238 | 4.939 | 4.553 | 4.098 | 3.521 | 2.837 | 1.684 |
| 215 | - | - | - | - | - | - | 5.449 | 5.175 | 4.826 | 4.420 | 3.614 | 2.970 | 1.737 |
| 220 | - | - | - | - | - | - | - | 5.410 | 5.100 | 4.742 | 3.925 | 3.104 | 1.791 |
| 225 | - | - | - | - | - | - | - | - | - | 5.064 | 4.301 | 3.237 | 1.844 |

Thickness is intumescent only.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 23 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 | 620 | 650 | 700 | 750 |
| 45 | - | 4.988 | 3.988 | 3.610 | 2.977 | 2.770 | 2.458 | 2.201 | 1.865 | 1.776 | 0.471 | 0.460 | 0.460 |
| 50 | - | - | 3.988 | 3.694 | 3.247 | 3.042 | 2.684 | 2.395 | 1.943 | 1.853 | 0.471 | 0.460 | 0.460 |
| 55 | - | - | 4.403 | 3.778 | 3.303 | 3.078 | 2.736 | 2.457 | 2.022 | 1.930 | 1.087 | 0.460 | 0.460 |
| 60 | - | - | 4.592 | 3.863 | 3.360 | 3.114 | 2.788 | 2.519 | 2.100 | 2.007 | 1.737 | 0.496 | 0.460 |
| 65 | - | - | 4.780 | 3.947 | 3.417 | 3.151 | 2.840 | 2.581 | 2.178 | 2.084 | 1.910 | 0.710 | 0.460 |
| 70 | - | - | 4.969 | 4.031 | 3.473 | 3.187 | 2.892 | 2.643 | 2.256 | 2.161 | 1.986 | 0.923 | 0.460 |
| 75 | - | - | 5.157 | 4.116 | 3.530 | 3.224 | 2.944 | 2.706 | 2.334 | 2.238 | 2.063 | 1.137 | 0.504 |
| 80 | - | - | 5.346 | 4.200 | 3.586 | 3.260 | 2.996 | 2.768 | 2.412 | 2.315 | 2.139 | 1.350 | 0.602 |
| 85 | - | - | - | 4.284 | 3.651 | 3.297 | 3.048 | 2.830 | 2.490 | 2.392 | 2.216 | 1.564 | 0.699 |
| 90 | - | - | - | 4.369 | 3.764 | 3.333 | 3.100 | 2.892 | 2.568 | 2.469 | 2.292 | 1.778 | 0.796 |
| 95 | - | - | - | 4.453 | 3.877 | 3.370 | 3.152 | 2.954 | 2.646 | 2.546 | 2.369 | 1.902 | 0.894 |
| 100 | - | - | - | 4.537 | 3.990 | 3.406 | 3.204 | 3.017 | 2.724 | 2.623 | 2.446 | 1.984 | 0.991 |
| 105 | - | - | - | 4.622 | 4.103 | 3.442 | 3.256 | 3.079 | 2.802 | 2.700 | 2.522 | 2.067 | 1.088 |
| 110 | - | - | - | 4.706 | 4.216 | 3.479 | 3.308 | 3.141 | 2.880 | 2.777 | 2.599 | 2.149 | 1.186 |
| 115 | - | - | - | 4.790 | 4.329 | 3.515 | 3.361 | 3.203 | 2.959 | 2.854 | 2.675 | 2.231 | 1.283 |
| 120 | - | - | - | 4.875 | 4.442 | 3.552 | 3.413 | 3.265 | 3.037 | 2.931 | 2.752 | 2.314 | 1.380 |
| 125 | - | - | - | 4.959 | 4.556 | 3.588 | 3.465 | 3.328 | 3.115 | 3.008 | 2.828 | 2.396 | 1.477 |
| 130 | - | - | - | 5.043 | 4.669 | 3.625 | 3.517 | 3.390 | 3.193 | 3.085 | 2.905 | 2.478 | 1.575 |
| 135 | - | - | - | 5.128 | 4.782 | 3.861 | 3.569 | 3.452 | 3.271 | 3.162 | 2.981 | 2.561 | 1.672 |
| 140 | - | - | - | 5.212 | 4.895 | 4.175 | 3.621 | 3.514 | 3.349 | 3.239 | 3.058 | 2.643 | 1.769 |
| 145 | - | - | - | 5.296 | 5.008 | 4.490 | 3.864 | 3.576 | 3.427 | 3.316 | 3.134 | 2.725 | 1.869 |
| 150 | - | - | - | - | 5.121 | 4.805 | 4.179 | 3.653 | 3.505 | 3.392 | 3.211 | 2.808 | 1.979 |
| 155 | - | - | - | - | 5.234 | 5.120 | 4.494 | 3.971 | 3.583 | 3.469 | 3.287 | 2.890 | 2.088 |
| 160 | - | - | - | - | - | - | 4.809 | 4.289 | 3.744 | 3.546 | 3.364 | 2.972 | 2.198 |
| 165 | - | - | - | - | - | - | 5.125 | 4.607 | 4.068 | 3.623 | 3.441 | 3.055 | 2.307 |
| 170 | - | - | - | - | - | - | - | 4.925 | 4.392 | 3.922 | 3.517 | 3.137 | 2.417 |
| 175 | - | - | - | - | - | - | - | 5.243 | 4.716 | 4.261 | 3.594 | 3.219 | 2.526 |
| 180 | - | - | - | - | - | - | - | - | 5.039 | 4.599 | 3.804 | 3.302 | 2.636 |
| 185 | - | - | - | - | - | - | - | - | 5.363 | 4.938 | 4.173 | 3.384 | 2.746 |
| 190 | - | - | - | - | - | - | - | - | - | 5.276 | 4.541 | 3.466 | 2.855 |
| 195 | - | - | - | - | - | - | - | - | - | - | 4.910 | 3.549 | 2.965 |
| 200 | - | - | - | - | - | - | - | - | - | - | 5.278 | 3.631 | 3.074 |
| 205 | - | - | - | - | - | - | - | - | - | - | - | 4.105 | 3.184 |
| 210 | - | - | - | - | - | - | - | - | - | - | - | 4.599 | 3.293 |
| 215 | - | - | - | - | - | - | - | - | - | - | - | - | 3.403 |
| 220 | - | - | - | - | - | - | - | - | - | - | - | - | 3.512 |
| 225 | - | - | - | - | - | - | - | - | - | - | - | - | 3.622 |

Thickness is intumescent only.



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# CERTIFICATE OF APPROVAL
# No CF 845

## SteelMaster 120SB

| Table 24 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 | 620 | 650 | 700 | 750 |
| 45 | - | - | - | - | 3.829 | 3.656 | 3.169 | 2.886 | 2.613 | 2.402 | 1.915 | 0.471 | 0.460 |
| 50 | - | - | - | - | 3.947 | 3.741 | 3.169 | 3.153 | 2.860 | 2.619 | 1.997 | 0.700 | 0.460 |
| 55 | - | - | - | - | 4.065 | 3.827 | 3.510 | 3.204 | 2.906 | 2.676 | 2.079 | 1.693 | 0.460 |
| 60 | - | - | - | - | 4.183 | 3.912 | 3.585 | 3.256 | 2.952 | 2.732 | 2.161 | 1.914 | 0.481 |
| 65 | - | - | - | - | 4.300 | 3.998 | 3.666 | 3.307 | 2.998 | 2.788 | 2.243 | 1.993 | 0.779 |
| 70 | - | - | - | - | 4.418 | 4.083 | 3.764 | 3.359 | 3.044 | 2.845 | 2.325 | 2.073 | 1.077 |
| 75 | - | - | - | - | 4.536 | 4.169 | 3.862 | 3.410 | 3.090 | 2.901 | 2.407 | 2.153 | 1.376 |
| 80 | - | - | - | - | 4.654 | 4.254 | 3.960 | 3.461 | 3.136 | 2.957 | 2.490 | 2.233 | 1.674 |
| 85 | - | - | - | - | 4.772 | 4.340 | 4.058 | 3.513 | 3.182 | 3.014 | 2.572 | 2.312 | 1.881 |
| 90 | - | - | - | - | 4.890 | 4.426 | 4.156 | 3.564 | 3.228 | 3.070 | 2.654 | 2.392 | 1.964 |
| 95 | - | - | - | - | 5.008 | 4.511 | 4.254 | 3.616 | 3.275 | 3.126 | 2.736 | 2.472 | 2.047 |
| 100 | - | - | - | - | 5.126 | 4.597 | 4.352 | 3.730 | 3.321 | 3.183 | 2.818 | 2.552 | 2.129 |
| 105 | - | - | - | - | 5.244 | 4.682 | 4.450 | 3.883 | 3.367 | 3.239 | 2.900 | 2.632 | 2.212 |
| 110 | - | - | - | - | 5.362 | 4.768 | 4.548 | 4.035 | 3.413 | 3.295 | 2.982 | 2.711 | 2.295 |
| 115 | - | - | - | - | - | 4.853 | 4.646 | 4.187 | 3.459 | 3.352 | 3.064 | 2.791 | 2.378 |
| 120 | - | - | - | - | - | 4.939 | 4.745 | 4.339 | 3.505 | 3.408 | 3.146 | 2.871 | 2.461 |
| 125 | - | - | - | - | - | 5.024 | 4.843 | 4.492 | 3.551 | 3.464 | 3.228 | 2.951 | 2.543 |
| 130 | - | - | - | - | - | 5.110 | 4.941 | 4.644 | 3.597 | 3.521 | 3.310 | 3.031 | 2.626 |
| 135 | - | - | - | - | - | 5.196 | 5.039 | 4.796 | 3.710 | 3.577 | 3.392 | 3.110 | 2.709 |
| 140 | - | - | - | - | - | 5.281 | 5.137 | 4.949 | 4.123 | 3.633 | 3.474 | 3.190 | 2.792 |
| 145 | - | - | - | - | - | - | 5.235 | 5.101 | 4.535 | 4.033 | 3.556 | 3.270 | 2.875 |
| 150 | - | - | - | - | - | - | 5.333 | 5.253 | 4.948 | 4.445 | 3.653 | 3.350 | 2.957 |
| 155 | - | - | - | - | - | - | - | 5.405 | 5.361 | 4.856 | 4.071 | 3.429 | 3.040 |
| 160 | - | - | - | - | - | - | - | - | - | 5.267 | 4.490 | 3.509 | 3.123 |
| 165 | - | - | - | - | - | - | - | - | - | - | 4.909 | 3.589 | 3.206 |
| 170 | - | - | - | - | - | - | - | - | - | - | 5.327 | 3.833 | 3.289 |
| 175 | - | - | - | - | - | - | - | - | - | - | - | 4.301 | 3.371 |
| 180 | - | - | - | - | - | - | - | - | - | - | - | 4.769 | 3.454 |
| 185 | - | - | - | - | - | - | - | - | - | - | - | 5.237 | 3.537 |
| 190 | - | - | - | - | - | - | - | - | - | - | - | - | 3.620 |
| 195 | - | - | - | - | - | - | - | - | - | - | - | - | 4.073 |
| 200 | - | - | - | - | - | - | - | - | - | - | - | - | 4.611 |
| 205 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 210 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 215 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 220 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 225 | - | - | - | - | - | - | - | - | - | - | - | - | - |

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