



## **Certificate No: IFCC 1268**

This certifies that the product below,

### **Phoenix 370-120H**

supplied by

## **Phoenix Fire Protection (UK) Ltd**

**40 Gerard Street**

**London**

**W1D 5QE**

**United Kingdom**

Satisfies the requirements of IFCC scheme SDP 12 "Certification Scheme for Reactive Coatings For Structural Steelwork". This includes the testing of products, the inspection of the Factory Production Control, continuing surveillance audits and testing of samples of products taken from production. The product specification and thickness for various steel sections to achieve periods of up to **120 minutes** fire resistance in accordance with EN 13381-8: 2013 are detailed herein. Circular hollow columns, rectangular hollow columns and 4-sided exposed hollow beams are encompassed by this certification. Full details regarding the scope of approval, including application of the product are given in **WF Assessment Report No. 369918**.

The certificate remains valid subject to satisfactory annual surveillance of factory production control by IFC Certification at the place of manufacture. The reader should contact IFC Certification or refer to [www.ifccertification.com](http://www.ifccertification.com) to validate its status.



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175

A handwritten signature in black ink, appearing to read 'Ian Woodhouse'.

**Ian Woodhouse**  
Director of Certification

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IFC Certification Ltd, 20 Park Street, Princes Risborough, Buckinghamshire. UK, HP27 9AH  
Tel: +44 (0)1844 275500 Fax: +44 (0)1844 274002 E-mail: [info@ifccertification.com](mailto:info@ifccertification.com) Web: [www.ifccertification.com](http://www.ifccertification.com)  
Registered No: 4777898 England

## Certificate No: IFCC 1268

**Table 1:**  
Steel Circular Hollow Columns, Rectangular Hollow Columns and 4-Sided Hollow Beams  
15 minutes Fire Resistance

| Section Factor up to (m <sup>-1</sup> ) | Protection Thickness (mm) for a temperature of: |       |       |       |       |       |       |       |       |       |
|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | 350°C   | 400°C | 450°C | 500°C | 520°C | 550°C | 600°C | 650°C | 700°C | 750°C |
| 38                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 40                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 45                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 50                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 55                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 60                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 65                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 70                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 75                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 80                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 85                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 90                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 95                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 100                                     | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 105                                     | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 110                                     | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 115                                     | 0.301   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 120                                     | 0.301   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 125                                     | 0.301   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 130                                     | 0.301   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 135                                     | 0.301   | 0.261 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 140                                     | 0.301   | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 145                                     | 0.301   | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 150                                     | 0.341   | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 155                                     | 0.381   | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 160                                     | 0.381   | 0.301 | 0.261 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 165                                     | 0.381   | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 170                                     | 0.381   | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 175                                     | 0.381   | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 180                                     | 0.381   | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 185                                     | 0.381   | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 190                                     | 0.461   | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 195                                     | 0.461   | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 200                                     | 0.461   | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 205                                     | 0.461   | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 210                                     | 0.461   | 0.381 | 0.341 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 215                                     | 0.461   | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 220                                     | 0.461   | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 225                                     | 0.541   | 0.461 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 230                                     | 0.541   | 0.461 | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 235                                     | 0.541   | 0.461 | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 240                                     | 0.541   | 0.461 | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 245                                     | 0.541   | 0.461 | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 250                                     | 0.541   | 0.461 | 0.381 | 0.341 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 255                                     | 0.541   | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 260                                     | 0.581   | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 265                                     | 0.621   | 0.501 | 0.461 | 0.381 | 0.341 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 270                                     | 0.621   | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 275                                     | 0.621   | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 280                                     | 0.621   | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 285                                     | 0.621   | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 |
| 290                                     | 0.621   | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 |
| 295                                     | 0.621   | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 |
| 300                                     | 0.701   | 0.541 | 0.461 | 0.381 | 0.381 | 0.341 | 0.301 | 0.201 | 0.201 | 0.201 |
| 305                                     | 0.701   | 0.541 | 0.461 | 0.381 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |
| 310                                     | 0.701   | 0.581 | 0.461 | 0.421 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |
| 315                                     | 0.701   | 0.621 | 0.501 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |
| 320                                     | 0.701   | 0.621 | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |
| 325                                     | 0.701   | 0.621 | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |
| 330                                     | 0.701   | 0.621 | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |
| 335                                     | 0.741   | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |
| 340                                     | 0.781   | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |
| 343                                     | 0.781   | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |

*Thickness is in mm and is intumescent only.*

## Certificate No: IFCC 1268

**Table 2:**  
Steel Circular Hollow Columns, Rectangular Hollow Columns and 4-Sided Hollow Beams  
30 minutes Fire Resistance

| Section Factor up to (m <sup>-1</sup> ) | Protection Thickness (mm) for a temperature of: |       |       |       |       |       |       |       |       |       |
|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | 350°C   | 400°C | 450°C | 500°C | 520°C | 550°C | 600°C | 650°C | 700°C | 750°C |
| 38                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 40                                      | 0.201   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 45                                      | 0.301   | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 50                                      | 0.301   | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 55                                      | 0.381   | 0.301 | 0.261 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 60                                      | 0.381   | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 65                                      | 0.381   | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 70                                      | 0.461   | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 75                                      | 0.461   | 0.381 | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 80                                      | 0.541   | 0.461 | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 85                                      | 0.541   | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 90                                      | 0.541   | 0.461 | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 |
| 95                                      | 0.621   | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 |
| 100                                     | 0.621   | 0.541 | 0.461 | 0.381 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 | 0.201 |
| 105                                     | 0.661   | 0.541 | 0.461 | 0.461 | 0.381 | 0.381 | 0.301 | 0.261 | 0.201 | 0.201 |
| 110                                     | 0.701   | 0.621 | 0.541 | 0.461 | 0.421 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 |
| 115                                     | 0.701   | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 |
| 120                                     | 0.781   | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 | 0.201 |
| 125                                     | 0.781   | 0.701 | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.301 | 0.201 | 0.201 |
| 130                                     | 0.781   | 0.701 | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.301 | 0.201 | 0.201 |
| 135                                     | 0.862   | 0.701 | 0.621 | 0.541 | 0.541 | 0.461 | 0.381 | 0.301 | 0.301 | 0.201 |
| 140                                     | 0.862   | 0.781 | 0.621 | 0.541 | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 |
| 145                                     | 0.942   | 0.781 | 0.701 | 0.621 | 0.541 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 150                                     | 0.942   | 0.781 | 0.701 | 0.621 | 0.541 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 155                                     | 0.942   | 0.862 | 0.701 | 0.621 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 160                                     | 1.022   | 0.862 | 0.781 | 0.621 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 165                                     | 1.022   | 0.862 | 0.781 | 0.661 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 170                                     | 1.062   | 0.942 | 0.781 | 0.701 | 0.621 | 0.621 | 0.541 | 0.381 | 0.301 | 0.201 |
| 175                                     | 1.102   | 0.942 | 0.781 | 0.701 | 0.661 | 0.621 | 0.541 | 0.461 | 0.381 | 0.201 |
| 180                                     | 1.102   | 0.942 | 0.862 | 0.701 | 0.701 | 0.621 | 0.541 | 0.461 | 0.381 | 0.201 |
| 185                                     | 1.182   | 1.022 | 0.862 | 0.741 | 0.701 | 0.621 | 0.541 | 0.461 | 0.381 | 0.201 |
| 190                                     | 1.182   | 1.022 | 0.862 | 0.781 | 0.701 | 0.621 | 0.541 | 0.461 | 0.381 | 0.201 |
| 195                                     | 1.182   | 1.022 | 0.902 | 0.781 | 0.701 | 0.701 | 0.541 | 0.461 | 0.381 | 0.201 |
| 200                                     | 1.262   | 1.102 | 0.942 | 0.781 | 0.781 | 0.701 | 0.621 | 0.461 | 0.381 | 0.201 |
| 205                                     | 1.262   | 1.102 | 0.942 | 0.781 | 0.781 | 0.701 | 0.621 | 0.501 | 0.381 | 0.201 |
| 210                                     | 1.302   | 1.102 | 0.942 | 0.862 | 0.781 | 0.701 | 0.621 | 0.541 | 0.381 | 0.261 |
| 215                                     | 1.342   | 1.142 | 1.022 | 0.862 | 0.781 | 0.701 | 0.621 | 0.541 | 0.421 | 0.301 |
| 220                                     | 1.342   | 1.182 | 1.022 | 0.862 | 0.862 | 0.781 | 0.621 | 0.541 | 0.461 | 0.301 |
| 225                                     | 1.422   | 1.182 | 1.022 | 0.862 | 0.862 | 0.781 | 0.661 | 0.541 | 0.461 | 0.301 |
| 230                                     | 1.422   | 1.222 | 1.022 | 0.942 | 0.862 | 0.781 | 0.701 | 0.541 | 0.461 | 0.301 |
| 235                                     | 1.422   | 1.262 | 1.102 | 0.942 | 0.862 | 0.781 | 0.701 | 0.541 | 0.461 | 0.301 |
| 240                                     | 1.502   | 1.262 | 1.102 | 0.942 | 0.902 | 0.781 | 0.701 | 0.621 | 0.461 | 0.301 |
| 245                                     | 1.502   | 1.262 | 1.102 | 0.942 | 0.942 | 0.862 | 0.701 | 0.621 | 0.461 | 0.301 |
| 250                                     | 1.502   | 1.342 | 1.182 | 1.022 | 0.942 | 0.862 | 0.701 | 0.621 | 0.461 | 0.301 |
| 255                                     | 1.583   | 1.342 | 1.182 | 1.022 | 0.942 | 0.862 | 0.781 | 0.621 | 0.461 | 0.301 |
| 260                                     | 1.583   | 1.342 | 1.182 | 1.022 | 0.942 | 0.862 | 0.781 | 0.621 | 0.501 | 0.301 |
| 265                                     | 1.623   | 1.422 | 1.182 | 1.022 | 1.022 | 0.902 | 0.781 | 0.621 | 0.541 | 0.301 |
| 270                                     | 1.663   | 1.422 | 1.262 | 1.102 | 1.022 | 0.942 | 0.781 | 0.621 | 0.541 | 0.301 |
| 275                                     | 1.663   | 1.422 | 1.262 | 1.102 | 1.022 | 0.942 | 0.781 | 0.701 | 0.541 | 0.301 |
| 280                                     | 1.743   | 1.502 | 1.262 | 1.102 | 1.022 | 0.942 | 0.781 | 0.701 | 0.541 | 0.341 |
| 285                                     | 1.743   | 1.502 | 1.302 | 1.102 | 1.062 | 0.942 | 0.862 | 0.701 | 0.541 | 0.381 |
| 290                                     | 1.743   | 1.502 | 1.342 | 1.142 | 1.102 | 0.982 | 0.862 | 0.701 | 0.541 | 0.381 |
| 295                                     | 1.823   | 1.583 | 1.342 | 1.182 | 1.102 | 1.022 | 0.862 | 0.701 | 0.541 | 0.381 |
| 300                                     | 1.823   | 1.583 | 1.342 | 1.182 | 1.102 | 1.022 | 0.862 | 0.701 | 0.541 | 0.381 |
| 305                                     | 1.863   | 1.583 | 1.422 | 1.182 | 1.102 | 1.022 | 0.862 | 0.701 | 0.621 | 0.381 |
| 310                                     | 1.903   | 1.623 | 1.422 | 1.182 | 1.182 | 1.022 | 0.902 | 0.781 | 0.621 | 0.381 |
| 315                                     | 1.903   | 1.663 | 1.422 | 1.262 | 1.182 | 1.062 | 0.942 | 0.781 | 0.621 | 0.381 |
| 320                                     | 1.943   | 1.663 | 1.422 | 1.262 | 1.182 | 1.102 | 0.942 | 0.781 | 0.621 | 0.381 |
| 325                                     | 1.983   | 1.703 | 1.502 | 1.262 | 1.182 | 1.102 | 0.942 | 0.781 | 0.621 | 0.381 |
| 330                                     | 1.983   | 1.743 | 1.502 | 1.262 | 1.222 | 1.102 | 0.942 | 0.781 | 0.621 | 0.381 |
| 335                                     | 2.063   | 1.743 | 1.502 | 1.342 | 1.262 | 1.102 | 0.942 | 0.781 | 0.621 | 0.381 |
| 340                                     | 2.063   | 1.743 | 1.502 | 1.342 | 1.262 | 1.142 | 0.982 | 0.781 | 0.621 | 0.381 |
| 343                                     | 2.063   | 1.823 | 1.583 | 1.342 | 1.262 | 1.182 | 1.022 | 0.822 | 0.621 | 0.381 |

*Thickness is in mm and is intumescent only.*

## Certificate No: IFCC 1268

**Table 3:**  
**Steel Circular Hollow Columns, Rectangular Hollow Columns and 4-Sided Hollow Beams**  
**45 minutes Fire Resistance**

| Section Factor up to (m <sup>-1</sup> ) | Protection Thickness (mm) for a temperature of: |       |       |       |       |       |       |       |       |       |
|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | 350°C   | 400°C | 450°C | 500°C | 520°C | 550°C | 600°C | 650°C | 700°C | 750°C |
| 38                                      | 0.461   | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 40                                      | 0.461   | 0.381 | 0.341 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 | 0.201 |
| 45                                      | 0.541   | 0.461 | 0.381 | 0.301 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 | 0.201 |
| 50                                      | 0.541   | 0.461 | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 | 0.201 |
| 55                                      | 0.621   | 0.541 | 0.461 | 0.381 | 0.381 | 0.381 | 0.301 | 0.261 | 0.201 | 0.201 |
| 60                                      | 0.701   | 0.621 | 0.541 | 0.461 | 0.421 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 |
| 65                                      | 0.701   | 0.621 | 0.541 | 0.461 | 0.461 | 0.421 | 0.381 | 0.301 | 0.201 | 0.201 |
| 70                                      | 0.781   | 0.701 | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.301 | 0.301 | 0.201 |
| 75                                      | 0.862   | 0.701 | 0.621 | 0.541 | 0.541 | 0.461 | 0.381 | 0.381 | 0.301 | 0.201 |
| 80                                      | 0.942   | 0.781 | 0.701 | 0.621 | 0.541 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 85                                      | 0.942   | 0.862 | 0.701 | 0.621 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 90                                      | 1.022   | 0.862 | 0.781 | 0.661 | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.201 |
| 95                                      | 1.102   | 0.942 | 0.781 | 0.701 | 0.661 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 |
| 100                                     | 1.102   | 0.942 | 0.862 | 0.701 | 0.701 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 |
| 105                                     | 1.182   | 1.022 | 0.862 | 0.781 | 0.701 | 0.701 | 0.541 | 0.461 | 0.381 | 0.301 |
| 110                                     | 1.262   | 1.102 | 0.942 | 0.781 | 0.781 | 0.701 | 0.621 | 0.541 | 0.421 | 0.301 |
| 115                                     | 1.262   | 1.102 | 0.942 | 0.862 | 0.781 | 0.701 | 0.621 | 0.541 | 0.461 | 0.301 |
| 120                                     | 1.342   | 1.182 | 1.022 | 0.862 | 0.862 | 0.781 | 0.621 | 0.541 | 0.461 | 0.301 |
| 125                                     | 1.422   | 1.182 | 1.022 | 0.942 | 0.862 | 0.781 | 0.701 | 0.621 | 0.461 | 0.381 |
| 130                                     | 1.462   | 1.262 | 1.102 | 0.942 | 0.902 | 0.862 | 0.701 | 0.621 | 0.461 | 0.381 |
| 135                                     | 1.502   | 1.302 | 1.102 | 1.022 | 0.942 | 0.862 | 0.701 | 0.621 | 0.541 | 0.381 |
| 140                                     | 1.583   | 1.342 | 1.182 | 1.022 | 0.942 | 0.862 | 0.781 | 0.621 | 0.541 | 0.381 |
| 145                                     | 1.623   | 1.422 | 1.182 | 1.022 | 1.022 | 0.942 | 0.781 | 0.701 | 0.541 | 0.381 |
| 150                                     | 1.663   | 1.422 | 1.262 | 1.102 | 1.022 | 0.942 | 0.781 | 0.701 | 0.541 | 0.381 |
| 155                                     | 1.743   | 1.502 | 1.302 | 1.102 | 1.102 | 1.022 | 0.862 | 0.701 | 0.621 | 0.461 |
| 160                                     | 1.823   | 1.543 | 1.342 | 1.182 | 1.102 | 1.022 | 0.862 | 0.781 | 0.621 | 0.461 |
| 165                                     | 1.823   | 1.583 | 1.382 | 1.182 | 1.102 | 1.022 | 0.862 | 0.781 | 0.621 | 0.461 |
| 170                                     | 1.903   | 1.663 | 1.422 | 1.262 | 1.182 | 1.102 | 0.942 | 0.781 | 0.621 | 0.461 |
| 175                                     | 1.983   | 1.663 | 1.462 | 1.262 | 1.182 | 1.102 | 0.942 | 0.781 | 0.661 | 0.461 |
| 180                                     | 1.983   | 1.743 | 1.502 | 1.302 | 1.262 | 1.142 | 0.942 | 0.862 | 0.701 | 0.461 |
| 185                                     | 2.063   | 1.743 | 1.543 | 1.342 | 1.262 | 1.182 | 1.022 | 0.862 | 0.701 | 0.541 |
| 190                                     | 2.143   | 1.823 | 1.583 | 1.342 | 1.302 | 1.182 | 1.022 | 0.862 | 0.701 | 0.541 |
| 195                                     | 2.143   | 1.863 | 1.623 | 1.422 | 1.342 | 1.262 | 1.022 | 0.902 | 0.701 | 0.541 |
| 200                                     | 2.224   | 1.903 | 1.663 | 1.422 | 1.342 | 1.262 | 1.102 | 0.942 | 0.781 | 0.541 |
| 205                                     | 2.304   | 1.983 | 1.703 | 1.502 | 1.422 | 1.262 | 1.102 | 0.942 | 0.781 | 0.541 |
| 210                                     | 2.304   | 1.983 | 1.743 | 1.502 | 1.422 | 1.342 | 1.102 | 0.942 | 0.781 | 0.541 |
| 215                                     | 2.384   | 2.063 | 1.783 | 1.583 | 1.502 | 1.342 | 1.182 | 1.022 | 0.781 | 0.581 |
| 220                                     | 2.464   | 2.063 | 1.823 | 1.583 | 1.502 | 1.382 | 1.182 | 1.022 | 0.822 | 0.621 |
| 225                                     | 2.464   | 2.143 | 1.863 | 1.583 | 1.502 | 1.422 | 1.182 | 1.022 | 0.862 | 0.621 |
| 230                                     | 2.544   | 2.183 | 1.903 | 1.663 | 1.583 | 1.422 | 1.262 | 1.022 | 0.862 | 0.621 |
| 235                                     | 2.624   | 2.224 | 1.943 | 1.663 | 1.583 | 1.502 | 1.262 | 1.102 | 0.862 | 0.621 |
| 240                                     | 2.624   | 2.304 | 1.983 | 1.743 | 1.663 | 1.502 | 1.262 | 1.102 | 0.862 | 0.621 |
| 245                                     | 2.704   | 2.304 | 2.023 | 1.743 | 1.663 | 1.502 | 1.342 | 1.102 | 0.942 | 0.661 |
| 250                                     | 2.784   | 2.384 | 2.063 | 1.823 | 1.703 | 1.583 | 1.342 | 1.182 | 0.942 | 0.701 |
| 255                                     | 2.784   | 2.424 | 2.103 | 1.823 | 1.743 | 1.583 | 1.342 | 1.182 | 0.942 | 0.701 |
| 260                                     | 2.864   | 2.464 | 2.143 | 1.863 | 1.743 | 1.623 | 1.422 | 1.182 | 0.942 | 0.701 |
| 265                                     | 2.945   | 2.504 | 2.183 | 1.903 | 1.823 | 1.663 | 1.422 | 1.182 | 0.982 | 0.701 |
| 270                                     | 2.945   | 2.544 | 2.224 | 1.903 | 1.823 | 1.663 | 1.422 | 1.262 | 1.022 | 0.701 |
| 275                                     | 3.025   | 2.624 | 2.264 | 1.983 | 1.863 | 1.743 | 1.502 | 1.262 | 1.022 | 0.741 |
| 280                                     | 3.065   | 2.624 | 2.304 | 1.983 | 1.903 | 1.743 | 1.502 | 1.262 | 1.022 | 0.781 |
| 285                                     | 3.105   | 2.704 | 2.344 | 2.063 | 1.903 | 1.743 | 1.502 | 1.302 | 1.022 | 0.781 |
| 290                                     | 3.185   | 2.704 | 2.384 | 2.063 | 1.983 | 1.823 | 1.543 | 1.342 | 1.102 | 0.781 |
| 295                                     | 3.225   | 2.784 | 2.424 | 2.063 | 1.983 | 1.823 | 1.583 | 1.342 | 1.102 | 0.781 |
| 300                                     | 3.265   | 2.824 | 2.464 | 2.143 | 2.023 | 1.863 | 1.583 | 1.342 | 1.102 | 0.781 |
| 305                                     | 3.345   | 2.864 | 2.464 | 2.143 | 2.063 | 1.903 | 1.623 | 1.382 | 1.102 | 0.822 |
| 310                                     | 3.385   | 2.904 | 2.544 | 2.224 | 2.063 | 1.903 | 1.663 | 1.422 | 1.142 | 0.862 |
| 315                                     | 3.425   | 2.945 | 2.544 | 2.224 | 2.143 | 1.983 | 1.663 | 1.422 | 1.182 | 0.862 |
| 320                                     | 3.505   | 3.025 | 2.624 | 2.264 | 2.143 | 1.983 | 1.663 | 1.422 | 1.182 | 0.862 |
| 325                                     | 3.545   | 3.025 | 2.624 | 2.304 | 2.183 | 1.983 | 1.743 | 1.502 | 1.182 | 0.862 |
| 330                                     | 3.585   | 3.105 | 2.704 | 2.304 | 2.224 | 2.063 | 1.743 | 1.502 | 1.182 | 0.862 |
| 335                                     | 3.666   | 3.105 | 2.704 | 2.384 | 2.224 | 2.063 | 1.743 | 1.502 | 1.262 | 0.862 |
| 340                                     | 3.706   | 3.185 | 2.784 | 2.384 | 2.304 | 2.103 | 1.823 | 1.502 | 1.262 | 0.902 |
| 343                                     | 3.746   | 3.185 | 2.784 | 2.424 | 2.304 | 2.143 | 1.823 | 1.583 | 1.262 | 0.942 |

*Thickness is in mm and is intumescent only.*

## Certificate No: IFCC 1268

**Table 4:**  
**Steel Circular Hollow Columns, Rectangular Hollow Columns and 4-Sided Hollow Beams**  
**60 minutes Fire Resistance**

| Section Factor up to (m <sup>-1</sup> ) | Protection Thickness (mm) for a temperature of: |       |       |       |       |       |       |       |       |       |
|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | 350°C   | 400°C | 450°C | 500°C | 520°C | 550°C | 600°C | 650°C | 700°C | 750°C |
| 38                                      | 0.621   | 0.541 | 0.461 | 0.461 | 0.381 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 |
| 40                                      | 0.701   | 0.621 | 0.541 | 0.461 | 0.461 | 0.381 | 0.301 | 0.301 | 0.201 | 0.201 |
| 45                                      | 0.781   | 0.701 | 0.541 | 0.541 | 0.461 | 0.461 | 0.381 | 0.301 | 0.301 | 0.201 |
| 50                                      | 0.862   | 0.701 | 0.621 | 0.541 | 0.541 | 0.461 | 0.461 | 0.381 | 0.301 | 0.201 |
| 55                                      | 0.942   | 0.781 | 0.701 | 0.621 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 60                                      | 1.022   | 0.862 | 0.781 | 0.701 | 0.621 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 |
| 65                                      | 1.102   | 0.942 | 0.862 | 0.701 | 0.701 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 |
| 70                                      | 1.182   | 1.022 | 0.862 | 0.781 | 0.741 | 0.701 | 0.621 | 0.501 | 0.421 | 0.301 |
| 75                                      | 1.262   | 1.102 | 0.942 | 0.862 | 0.781 | 0.701 | 0.621 | 0.541 | 0.461 | 0.301 |
| 80                                      | 1.342   | 1.182 | 1.022 | 0.862 | 0.862 | 0.781 | 0.701 | 0.541 | 0.461 | 0.381 |
| 85                                      | 1.422   | 1.262 | 1.102 | 0.942 | 0.902 | 0.822 | 0.701 | 0.621 | 0.541 | 0.381 |
| 90                                      | 1.502   | 1.342 | 1.182 | 1.022 | 0.942 | 0.862 | 0.781 | 0.621 | 0.541 | 0.381 |
| 95                                      | 1.583   | 1.422 | 1.182 | 1.062 | 1.022 | 0.942 | 0.781 | 0.701 | 0.541 | 0.421 |
| 100                                     | 1.703   | 1.462 | 1.262 | 1.102 | 1.022 | 0.942 | 0.862 | 0.701 | 0.621 | 0.461 |
| 105                                     | 1.783   | 1.502 | 1.342 | 1.182 | 1.102 | 1.022 | 0.862 | 0.781 | 0.621 | 0.461 |
| 110                                     | 1.863   | 1.583 | 1.422 | 1.222 | 1.182 | 1.062 | 0.942 | 0.781 | 0.621 | 0.461 |
| 115                                     | 1.943   | 1.663 | 1.422 | 1.262 | 1.182 | 1.102 | 0.942 | 0.822 | 0.701 | 0.541 |
| 120                                     | 2.063   | 1.743 | 1.502 | 1.342 | 1.262 | 1.182 | 1.022 | 0.862 | 0.701 | 0.541 |
| 125                                     | 2.143   | 1.823 | 1.583 | 1.422 | 1.342 | 1.182 | 1.022 | 0.862 | 0.741 | 0.541 |
| 130                                     | 2.224   | 1.903 | 1.663 | 1.422 | 1.342 | 1.262 | 1.102 | 0.942 | 0.781 | 0.541 |
| 135                                     | 2.304   | 1.983 | 1.703 | 1.502 | 1.422 | 1.302 | 1.102 | 0.942 | 0.781 | 0.621 |
| 140                                     | 2.384   | 2.063 | 1.743 | 1.583 | 1.502 | 1.342 | 1.182 | 1.022 | 0.862 | 0.621 |
| 145                                     | 2.464   | 2.103 | 1.823 | 1.583 | 1.502 | 1.422 | 1.182 | 1.022 | 0.862 | 0.621 |
| 150                                     | 2.544   | 2.183 | 1.903 | 1.663 | 1.583 | 1.422 | 1.262 | 1.062 | 0.862 | 0.661 |
| 155                                     | 2.624   | 2.224 | 1.983 | 1.743 | 1.623 | 1.502 | 1.262 | 1.102 | 0.942 | 0.701 |
| 160                                     | 2.704   | 2.304 | 1.983 | 1.743 | 1.663 | 1.502 | 1.342 | 1.102 | 0.942 | 0.701 |
| 165                                     | 2.784   | 2.384 | 2.063 | 1.823 | 1.743 | 1.583 | 1.342 | 1.182 | 0.942 | 0.701 |
| 170                                     | 2.864   | 2.464 | 2.143 | 1.903 | 1.743 | 1.623 | 1.422 | 1.182 | 1.022 | 0.741 |
| 175                                     | 2.945   | 2.544 | 2.224 | 1.903 | 1.823 | 1.663 | 1.422 | 1.262 | 1.022 | 0.781 |
| 180                                     | 3.025   | 2.624 | 2.264 | 1.983 | 1.903 | 1.743 | 1.502 | 1.262 | 1.062 | 0.781 |
| 185                                     | 3.105   | 2.704 | 2.304 | 2.063 | 1.903 | 1.743 | 1.502 | 1.302 | 1.102 | 0.781 |
| 190                                     | 3.185   | 2.744 | 2.384 | 2.063 | 1.983 | 1.823 | 1.583 | 1.342 | 1.102 | 0.822 |
| 195                                     | 3.265   | 2.784 | 2.464 | 2.143 | 2.023 | 1.863 | 1.583 | 1.342 | 1.142 | 0.862 |
| 200                                     | 3.345   | 2.864 | 2.504 | 2.224 | 2.063 | 1.903 | 1.663 | 1.422 | 1.182 | 0.862 |
| 205                                     | 3.425   | 2.945 | 2.544 | 2.224 | 2.143 | 1.943 | 1.663 | 1.422 | 1.182 | 0.862 |
| 210                                     | 3.505   | 3.025 | 2.624 | 2.304 | 2.183 | 1.983 | 1.743 | 1.502 | 1.262 | 0.942 |
| 215                                     | 3.585   | 3.105 | 2.704 | 2.384 | 2.224 | 2.063 | 1.743 | 1.502 | 1.262 | 0.942 |
| 220                                     | 3.666   | 3.185 | 2.744 | 2.384 | 2.304 | 2.063 | 1.823 | 1.543 | 1.262 | 0.942 |
| 225                                     | 3.746   | 3.225 | 2.784 | 2.464 | 2.304 | 2.143 | 1.823 | 1.583 | 1.342 | 0.942 |
| 230                                     | 3.826   | 3.305 | 2.864 | 2.504 | 2.384 | 2.183 | 1.903 | 1.583 | 1.342 | 1.022 |
| 235                                     | 3.906   | 3.345 | 2.945 | 2.544 | 2.424 | 2.224 | 1.903 | 1.663 | 1.342 | 1.022 |
| 240                                     | 3.986   | 3.425 | 2.985 | 2.624 | 2.464 | 2.264 | 1.983 | 1.663 | 1.422 | 1.022 |
| 245                                     | 4.066   | 3.505 | 3.025 | 2.664 | 2.544 | 2.304 | 1.983 | 1.703 | 1.422 | 1.062 |
| 250                                     | 4.146   | 3.585 | 3.105 | 2.704 | 2.544 | 2.384 | 2.063 | 1.743 | 1.462 | 1.102 |
| 255                                     | 4.226   | 3.666 | 3.185 | 2.784 | 2.624 | 2.384 | 2.063 | 1.743 | 1.502 | 1.102 |
| 260                                     | 4.306   | 3.706 | 3.225 | 2.824 | 2.704 | 2.464 | 2.143 | 1.823 | 1.502 | 1.102 |
| 265                                     | 4.387   | 3.786 | 3.265 | 2.864 | 2.704 | 2.504 | 2.143 | 1.823 | 1.543 | 1.142 |
| 270                                     | 4.467   | 3.826 | 3.345 | 2.945 | 2.784 | 2.544 | 2.224 | 1.903 | 1.583 | 1.182 |
| 275                                     | 4.547   | 3.906 | 3.425 | 2.985 | 2.824 | 2.584 | 2.224 | 1.903 | 1.583 | 1.182 |
| 280                                     | 4.627   | 3.986 | 3.465 | 3.025 | 2.864 | 2.624 | 2.304 | 1.943 | 1.623 | 1.182 |
| 285                                     | 4.707   | 4.066 | 3.505 | 3.105 | 2.945 | 2.704 | 2.304 | 1.983 | 1.663 | 1.222 |
| 290                                     | 4.787   | 4.146 | 3.585 | 3.105 | 2.945 | 2.704 | 2.384 | 1.983 | 1.663 | 1.262 |
| 295                                     | 4.867   | 4.186 | 3.666 | 3.185 | 3.025 | 2.784 | 2.384 | 2.063 | 1.703 | 1.262 |
| 300                                     | 4.947   | 4.266 | 3.666 | 3.265 | 3.065 | 2.784 | 2.464 | 2.063 | 1.743 | 1.262 |
| 305                                     | 5.028   | 4.306 | 3.746 | 3.265 | 3.105 | 2.864 | 2.464 | 2.103 | 1.743 | 1.302 |
| 310                                     | 5.108   | 4.387 | 3.826 | 3.345 | 3.185 | 2.904 | 2.544 | 2.143 | 1.783 | 1.342 |
| 315                                     | -   | 4.467 | 3.866 | 3.385 | 3.185 | 2.945 | 2.544 | 2.143 | 1.823 | 1.342 |
| 320                                     | -   | 4.547 | 3.906 | 3.425 | 3.265 | 2.985 | 2.624 | 2.224 | 1.823 | 1.342 |
| 325                                     | -   | 4.587 | 3.986 | 3.505 | 3.305 | 3.025 | 2.624 | 2.224 | 1.863 | 1.382 |
| 330                                     | -   | 4.667 | 4.066 | 3.545 | 3.345 | 3.105 | 2.664 | 2.264 | 1.903 | 1.422 |
| 335                                     | -   | 4.707 | 4.106 | 3.585 | 3.425 | 3.105 | 2.704 | 2.304 | 1.903 | 1.422 |
| 340                                     | -   | 4.787 | 4.146 | 3.666 | 3.425 | 3.185 | 2.744 | 2.344 | 1.943 | 1.422 |
| 343                                     | -   | 4.827 | 4.186 | 3.666 | 3.505 | 3.185 | 2.784 | 2.384 | 1.983 | 1.462 |

*Thickness is in mm and is intumescent only.*

## Certificate No: IFCC 1268

**Table 5:**  
Steel Circular Hollow Columns, Rectangular Hollow Columns and 4-Sided Hollow Beams  
75 minutes Fire Resistance

| Section Factor up to (m <sup>-1</sup> ) | Protection Thickness (mm) for a temperature of: |       |       |       |       |       |       |       |       |       |
|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | 350°C   | 400°C | 450°C | 500°C | 520°C | 550°C | 600°C | 650°C | 700°C | 750°C |
| 38                                      | 0.902   | 0.781 | 0.701 | 0.621 | 0.541 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 40                                      | 0.942   | 0.781 | 0.701 | 0.621 | 0.581 | 0.541 | 0.461 | 0.381 | 0.301 | 0.201 |
| 45                                      | 1.062   | 0.942 | 0.781 | 0.701 | 0.621 | 0.621 | 0.541 | 0.461 | 0.381 | 0.301 |
| 50                                      | 1.182   | 1.022 | 0.862 | 0.781 | 0.701 | 0.701 | 0.541 | 0.461 | 0.381 | 0.301 |
| 55                                      | 1.262   | 1.102 | 0.942 | 0.862 | 0.781 | 0.701 | 0.621 | 0.541 | 0.461 | 0.381 |
| 60                                      | 1.422   | 1.182 | 1.022 | 0.942 | 0.862 | 0.781 | 0.701 | 0.621 | 0.461 | 0.381 |
| 65                                      | 1.502   | 1.342 | 1.142 | 1.022 | 0.942 | 0.862 | 0.781 | 0.621 | 0.541 | 0.381 |
| 70                                      | 1.663   | 1.422 | 1.262 | 1.102 | 1.022 | 0.942 | 0.781 | 0.701 | 0.581 | 0.461 |
| 75                                      | 1.743   | 1.502 | 1.342 | 1.182 | 1.102 | 1.022 | 0.862 | 0.741 | 0.621 | 0.461 |
| 80                                      | 1.903   | 1.583 | 1.422 | 1.222 | 1.182 | 1.102 | 0.942 | 0.781 | 0.661 | 0.541 |
| 85                                      | 1.983   | 1.743 | 1.502 | 1.302 | 1.262 | 1.102 | 0.982 | 0.862 | 0.701 | 0.541 |
| 90                                      | 2.103   | 1.823 | 1.583 | 1.342 | 1.302 | 1.182 | 1.022 | 0.862 | 0.741 | 0.541 |
| 95                                      | 2.224   | 1.903 | 1.663 | 1.422 | 1.342 | 1.262 | 1.102 | 0.942 | 0.781 | 0.621 |
| 100                                     | 2.304   | 1.983 | 1.743 | 1.502 | 1.422 | 1.342 | 1.182 | 1.022 | 0.822 | 0.621 |
| 105                                     | 2.464   | 2.103 | 1.823 | 1.583 | 1.502 | 1.422 | 1.182 | 1.022 | 0.862 | 0.661 |
| 110                                     | 2.544   | 2.224 | 1.903 | 1.663 | 1.583 | 1.462 | 1.262 | 1.102 | 0.902 | 0.701 |
| 115                                     | 2.704   | 2.304 | 1.983 | 1.743 | 1.663 | 1.502 | 1.342 | 1.102 | 0.942 | 0.701 |
| 120                                     | 2.784   | 2.384 | 2.063 | 1.823 | 1.743 | 1.583 | 1.342 | 1.182 | 0.982 | 0.781 |
| 125                                     | 2.904   | 2.504 | 2.183 | 1.903 | 1.823 | 1.663 | 1.422 | 1.262 | 1.022 | 0.781 |
| 130                                     | 3.025   | 2.624 | 2.264 | 1.983 | 1.863 | 1.743 | 1.502 | 1.262 | 1.062 | 0.781 |
| 135                                     | 3.105   | 2.704 | 2.344 | 2.063 | 1.903 | 1.783 | 1.543 | 1.342 | 1.102 | 0.862 |
| 140                                     | 3.265   | 2.784 | 2.464 | 2.143 | 1.983 | 1.823 | 1.583 | 1.342 | 1.142 | 0.862 |
| 145                                     | 3.345   | 2.864 | 2.544 | 2.224 | 2.063 | 1.903 | 1.663 | 1.422 | 1.182 | 0.942 |
| 150                                     | 3.465   | 2.985 | 2.624 | 2.264 | 2.143 | 1.983 | 1.743 | 1.502 | 1.222 | 0.942 |
| 155                                     | 3.585   | 3.105 | 2.704 | 2.344 | 2.224 | 2.063 | 1.743 | 1.502 | 1.262 | 0.942 |
| 160                                     | 3.706   | 3.185 | 2.784 | 2.424 | 2.304 | 2.103 | 1.823 | 1.583 | 1.302 | 1.022 |
| 165                                     | 3.826   | 3.265 | 2.864 | 2.464 | 2.344 | 2.143 | 1.903 | 1.583 | 1.342 | 1.022 |
| 170                                     | 3.906   | 3.345 | 2.945 | 2.544 | 2.424 | 2.224 | 1.903 | 1.663 | 1.382 | 1.062 |
| 175                                     | 4.026   | 3.465 | 3.025 | 2.624 | 2.464 | 2.304 | 1.983 | 1.703 | 1.422 | 1.102 |
| 180                                     | 4.146   | 3.585 | 3.105 | 2.704 | 2.544 | 2.384 | 2.063 | 1.743 | 1.462 | 1.102 |
| 185                                     | 4.266   | 3.666 | 3.185 | 2.784 | 2.624 | 2.424 | 2.063 | 1.823 | 1.502 | 1.182 |
| 190                                     | 4.387   | 3.746 | 3.265 | 2.864 | 2.704 | 2.464 | 2.143 | 1.823 | 1.543 | 1.182 |
| 195                                     | 4.467   | 3.866 | 3.345 | 2.945 | 2.784 | 2.544 | 2.224 | 1.903 | 1.583 | 1.182 |
| 200                                     | 4.587   | 3.946 | 3.425 | 3.025 | 2.824 | 2.624 | 2.264 | 1.943 | 1.623 | 1.262 |
| 205                                     | 4.707   | 4.066 | 3.505 | 3.105 | 2.904 | 2.704 | 2.304 | 1.983 | 1.663 | 1.262 |
| 210                                     | 4.827   | 4.146 | 3.585 | 3.145 | 2.945 | 2.744 | 2.384 | 2.063 | 1.703 | 1.302 |
| 215                                     | 4.947   | 4.226 | 3.666 | 3.225 | 3.025 | 2.784 | 2.424 | 2.063 | 1.743 | 1.342 |
| 220                                     | 5.028   | 4.306 | 3.786 | 3.265 | 3.105 | 2.864 | 2.464 | 2.143 | 1.783 | 1.342 |
| 225                                     | 5.148   | 4.427 | 3.866 | 3.345 | 3.185 | 2.945 | 2.544 | 2.183 | 1.823 | 1.422 |
| 230                                     | -   | 4.507 | 3.946 | 3.425 | 3.265 | 2.985 | 2.584 | 2.224 | 1.863 | 1.422 |
| 235                                     | -   | 4.627 | 4.026 | 3.505 | 3.305 | 3.025 | 2.624 | 2.264 | 1.903 | 1.422 |
| 240                                     | -   | 4.707 | 4.106 | 3.585 | 3.385 | 3.105 | 2.704 | 2.304 | 1.943 | 1.502 |
| 245                                     | -   | 4.787 | 4.186 | 3.666 | 3.425 | 3.185 | 2.744 | 2.384 | 1.983 | 1.502 |
| 250                                     | -   | 4.907 | 4.266 | 3.746 | 3.505 | 3.265 | 2.784 | 2.384 | 2.023 | 1.543 |
| 255                                     | -   | 4.987 | 4.347 | 3.786 | 3.585 | 3.305 | 2.864 | 2.464 | 2.063 | 1.583 |
| 260                                     | -   | 5.108 | 4.427 | 3.866 | 3.666 | 3.345 | 2.904 | 2.504 | 2.063 | 1.583 |
| 265                                     | -   | -     | 4.507 | 3.946 | 3.706 | 3.425 | 2.945 | 2.544 | 2.143 | 1.623 |
| 270                                     | -   | -     | 4.587 | 3.986 | 3.786 | 3.505 | 3.025 | 2.584 | 2.143 | 1.663 |
| 275                                     | -   | -     | 4.667 | 4.066 | 3.826 | 3.545 | 3.065 | 2.624 | 2.224 | 1.663 |
| 280                                     | -   | -     | 4.787 | 4.146 | 3.906 | 3.585 | 3.105 | 2.704 | 2.224 | 1.743 |
| 285                                     | -   | -     | 4.867 | 4.226 | 3.986 | 3.666 | 3.185 | 2.704 | 2.304 | 1.743 |
| 290                                     | -   | -     | 4.947 | 4.306 | 4.066 | 3.746 | 3.225 | 2.784 | 2.304 | 1.783 |
| 295                                     | -   | -     | 5.028 | 4.387 | 4.106 | 3.826 | 3.265 | 2.824 | 2.384 | 1.823 |
| 300                                     | -   | -     | 5.108 | 4.427 | 4.186 | 3.866 | 3.345 | 2.864 | 2.384 | 1.823 |
| 305                                     | -   | -     | -     | 4.507 | 4.226 | 3.906 | 3.385 | 2.904 | 2.424 | 1.863 |
| 310                                     | -   | -     | -     | 4.547 | 4.306 | 3.986 | 3.425 | 2.945 | 2.464 | 1.903 |
| 315                                     | -   | -     | -     | 4.627 | 4.387 | 4.066 | 3.505 | 3.025 | 2.504 | 1.903 |
| 320                                     | -   | -     | -     | 4.707 | 4.467 | 4.106 | 3.545 | 3.025 | 2.544 | 1.943 |
| 325                                     | -   | -     | -     | 4.787 | 4.507 | 4.146 | 3.585 | 3.105 | 2.584 | 1.983 |
| 330                                     | -   | -     | -     | 4.867 | 4.587 | 4.226 | 3.666 | 3.145 | 2.624 | 1.983 |
| 335                                     | -   | -     | -     | 4.947 | 4.627 | 4.306 | 3.706 | 3.185 | 2.664 | 2.063 |
| 340                                     | -   | -     | -     | 4.987 | 4.707 | 4.347 | 3.746 | 3.225 | 2.704 | 2.063 |
| 343                                     | -   | -     | -     | 5.028 | 4.747 | 4.387 | 3.786 | 3.265 | 2.704 | 2.063 |

Thickness is in mm and is intumescent only.

## Certificate No: IFCC 1268

**Table 6:**  
Steel Circular Hollow Columns, Rectangular Hollow Columns and 4-Sided Hollow Beams  
90 minutes Fire Resistance

| Section Factor up to (m <sup>-1</sup> ) | Protection Thickness (mm) for a temperature of: |       |       |       |       |       |       |       |       |       |
|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | 350°C   | 400°C | 450°C | 500°C | 520°C | 550°C | 600°C | 650°C | 700°C | 750°C |
| 38                                      | 1.182   | 1.022 | 0.862 | 0.781 | 0.701 | 0.661 | 0.541 | 0.461 | 0.381 | 0.301 |
| 40                                      | 1.222   | 1.022 | 0.942 | 0.781 | 0.781 | 0.701 | 0.621 | 0.541 | 0.461 | 0.301 |
| 45                                      | 1.342   | 1.182 | 1.022 | 0.862 | 0.862 | 0.781 | 0.701 | 0.581 | 0.461 | 0.381 |
| 50                                      | 1.502   | 1.342 | 1.142 | 1.022 | 0.942 | 0.862 | 0.781 | 0.621 | 0.541 | 0.421 |
| 55                                      | 1.663   | 1.422 | 1.262 | 1.102 | 1.022 | 0.942 | 0.822 | 0.701 | 0.621 | 0.461 |
| 60                                      | 1.823   | 1.583 | 1.342 | 1.182 | 1.102 | 1.022 | 0.862 | 0.781 | 0.621 | 0.501 |
| 65                                      | 1.983   | 1.663 | 1.502 | 1.262 | 1.182 | 1.102 | 0.942 | 0.862 | 0.701 | 0.541 |
| 70                                      | 2.143   | 1.823 | 1.583 | 1.382 | 1.342 | 1.182 | 1.022 | 0.902 | 0.781 | 0.621 |
| 75                                      | 2.304   | 1.983 | 1.703 | 1.502 | 1.422 | 1.262 | 1.102 | 0.942 | 0.781 | 0.621 |
| 80                                      | 2.424   | 2.063 | 1.823 | 1.583 | 1.502 | 1.342 | 1.182 | 1.022 | 0.862 | 0.701 |
| 85                                      | 2.544   | 2.224 | 1.903 | 1.663 | 1.583 | 1.462 | 1.262 | 1.102 | 0.942 | 0.781 |
| 90                                      | 2.704   | 2.344 | 2.063 | 1.743 | 1.663 | 1.543 | 1.342 | 1.182 | 0.942 | 0.781 |
| 95                                      | 2.864   | 2.464 | 2.143 | 1.863 | 1.743 | 1.663 | 1.422 | 1.182 | 1.022 | 0.781 |
| 100                                     | 3.025   | 2.584 | 2.264 | 1.983 | 1.863 | 1.743 | 1.502 | 1.262 | 1.102 | 0.862 |
| 105                                     | 3.185   | 2.704 | 2.384 | 2.063 | 1.983 | 1.823 | 1.583 | 1.342 | 1.102 | 0.862 |
| 110                                     | 3.305   | 2.864 | 2.464 | 2.143 | 2.063 | 1.903 | 1.623 | 1.422 | 1.182 | 0.942 |
| 115                                     | 3.465   | 2.945 | 2.624 | 2.224 | 2.143 | 1.983 | 1.663 | 1.462 | 1.222 | 0.942 |
| 120                                     | 3.585   | 3.105 | 2.704 | 2.344 | 2.224 | 2.063 | 1.743 | 1.502 | 1.262 | 1.022 |
| 125                                     | 3.746   | 3.225 | 2.824 | 2.464 | 2.304 | 2.143 | 1.823 | 1.583 | 1.342 | 1.022 |
| 130                                     | 3.906   | 3.345 | 2.945 | 2.544 | 2.384 | 2.224 | 1.903 | 1.663 | 1.382 | 1.102 |
| 135                                     | 4.066   | 3.505 | 3.025 | 2.624 | 2.504 | 2.304 | 1.983 | 1.743 | 1.422 | 1.102 |
| 140                                     | 4.186   | 3.585 | 3.145 | 2.704 | 2.584 | 2.384 | 2.063 | 1.783 | 1.502 | 1.182 |
| 145                                     | 4.347   | 3.746 | 3.265 | 2.824 | 2.704 | 2.464 | 2.143 | 1.823 | 1.543 | 1.182 |
| 150                                     | 4.467   | 3.866 | 3.345 | 2.945 | 2.784 | 2.544 | 2.224 | 1.903 | 1.583 | 1.262 |
| 155                                     | 4.627   | 3.986 | 3.465 | 3.025 | 2.864 | 2.624 | 2.304 | 1.983 | 1.663 | 1.262 |
| 160                                     | 4.787   | 4.106 | 3.585 | 3.105 | 2.945 | 2.704 | 2.344 | 2.023 | 1.663 | 1.342 |
| 165                                     | 4.947   | 4.226 | 3.666 | 3.185 | 3.025 | 2.784 | 2.384 | 2.063 | 1.743 | 1.342 |
| 170                                     | 5.068   | 4.347 | 3.826 | 3.305 | 3.105 | 2.864 | 2.464 | 2.143 | 1.823 | 1.422 |
| 175                                     | -   | 4.467 | 3.906 | 3.385 | 3.225 | 2.945 | 2.544 | 2.224 | 1.823 | 1.422 |
| 180                                     | -   | 4.627 | 4.026 | 3.505 | 3.305 | 3.025 | 2.624 | 2.264 | 1.903 | 1.502 |
| 185                                     | -   | 4.707 | 4.146 | 3.585 | 3.425 | 3.105 | 2.704 | 2.304 | 1.943 | 1.502 |
| 190                                     | -   | 4.867 | 4.226 | 3.666 | 3.505 | 3.185 | 2.784 | 2.384 | 1.983 | 1.583 |
| 195                                     | -   | 4.987 | 4.347 | 3.746 | 3.585 | 3.265 | 2.864 | 2.464 | 2.063 | 1.583 |
| 200                                     | -   | 5.108 | 4.467 | 3.866 | 3.666 | 3.345 | 2.904 | 2.544 | 2.103 | 1.663 |
| 205                                     | -   | -     | 4.547 | 3.946 | 3.746 | 3.465 | 2.985 | 2.584 | 2.143 | 1.663 |
| 210                                     | -   | -     | 4.667 | 4.066 | 3.826 | 3.545 | 3.025 | 2.624 | 2.224 | 1.743 |
| 215                                     | -   | -     | 4.787 | 4.146 | 3.906 | 3.626 | 3.105 | 2.704 | 2.264 | 1.743 |
| 220                                     | -   | -     | 4.867 | 4.226 | 4.026 | 3.706 | 3.185 | 2.784 | 2.304 | 1.823 |
| 225                                     | -   | -     | 4.987 | 4.306 | 4.106 | 3.786 | 3.265 | 2.824 | 2.384 | 1.823 |
| 230                                     | -   | -     | 5.108 | 4.427 | 4.186 | 3.866 | 3.345 | 2.864 | 2.384 | 1.903 |
| 235                                     | -   | -     | -     | 4.507 | 4.306 | 3.946 | 3.425 | 2.945 | 2.464 | 1.903 |
| 240                                     | -   | -     | -     | 4.627 | 4.387 | 4.026 | 3.465 | 3.025 | 2.504 | 1.943 |
| 245                                     | -   | -     | -     | 4.707 | 4.467 | 4.106 | 3.545 | 3.065 | 2.544 | 1.983 |
| 250                                     | -   | -     | -     | 4.787 | 4.547 | 4.186 | 3.585 | 3.105 | 2.624 | 2.023 |
| 255                                     | -   | -     | -     | 4.867 | 4.627 | 4.266 | 3.666 | 3.185 | 2.664 | 2.063 |
| 260                                     | -   | -     | -     | 4.987 | 4.707 | 4.347 | 3.746 | 3.265 | 2.704 | 2.103 |
| 265                                     | -   | -     | -     | 5.068 | 4.787 | 4.427 | 3.826 | 3.305 | 2.784 | 2.143 |
| 270                                     | -   | -     | -     | 5.148 | 4.867 | 4.507 | 3.906 | 3.345 | 2.784 | 2.183 |
| 275                                     | -   | -     | -     | -     | 4.987 | 4.587 | 3.946 | 3.425 | 2.864 | 2.224 |
| 280                                     | -   | -     | -     | -     | 5.068 | 4.667 | 4.026 | 3.465 | 2.904 | 2.264 |
| 285                                     | -   | -     | -     | -     | 5.148 | 4.747 | 4.066 | 3.545 | 2.945 | 2.304 |
| 290                                     | -   | -     | -     | -     | -     | 4.827 | 4.146 | 3.585 | 3.025 | 2.344 |
| 295                                     | -   | -     | -     | -     | -     | 4.907 | 4.226 | 3.666 | 3.065 | 2.384 |
| 300                                     | -   | -     | -     | -     | -     | 4.987 | 4.306 | 3.706 | 3.105 | 2.424 |
| 305                                     | -   | -     | -     | -     | -     | 5.068 | 4.387 | 3.746 | 3.145 | 2.464 |
| 310                                     | -   | -     | -     | -     | -     | 5.148 | 4.427 | 3.826 | 3.185 | 2.504 |
| 315                                     | -   | -     | -     | -     | -     | -     | 4.507 | 3.906 | 3.265 | 2.544 |
| 320                                     | -   | -     | -     | -     | -     | -     | 4.547 | 3.946 | 3.305 | 2.584 |
| 325                                     | -   | -     | -     | -     | -     | -     | 4.627 | 3.986 | 3.345 | 2.624 |
| 330                                     | -   | -     | -     | -     | -     | -     | 4.707 | 4.066 | 3.425 | 2.624 |
| 335                                     | -   | -     | -     | -     | -     | -     | 4.787 | 4.146 | 3.425 | 2.704 |
| 340                                     | -   | -     | -     | -     | -     | -     | 4.827 | 4.186 | 3.505 | 2.704 |
| 343                                     | -   | -     | -     | -     | -     | -     | 4.867 | 4.226 | 3.505 | 2.744 |

Thickness is in mm and is intumescent only.

## Certificate No: IFCC 1268

**Table 7:**  
**Steel Circular Hollow Columns, Rectangular Hollow Columns and 4-Sided Hollow Beams**  
**105 minutes Fire Resistance**

| Section Factor up to (m <sup>-1</sup> ) | Protection Thickness (mm) for a temperature of: |       |       |       |       |       |       |       |       |       |
|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | 350°C   | 400°C | 450°C | 500°C | 520°C | 550°C | 600°C | 650°C | 700°C | 750°C |
| 38                                      | 1.422   | 1.262 | 1.102 | 0.942 | 0.862 | 0.781 | 0.701 | 0.621 | 0.541 | 0.381 |
| 40                                      | 1.502   | 1.302 | 1.102 | 0.982 | 0.942 | 0.862 | 0.741 | 0.621 | 0.541 | 0.421 |
| 45                                      | 1.703   | 1.462 | 1.262 | 1.102 | 1.022 | 0.942 | 0.862 | 0.701 | 0.621 | 0.461 |
| 50                                      | 1.903   | 1.623 | 1.422 | 1.262 | 1.182 | 1.102 | 0.942 | 0.781 | 0.701 | 0.541 |
| 55                                      | 2.063   | 1.783 | 1.583 | 1.342 | 1.262 | 1.182 | 1.022 | 0.862 | 0.741 | 0.541 |
| 60                                      | 2.264   | 1.943 | 1.663 | 1.502 | 1.422 | 1.262 | 1.102 | 0.942 | 0.781 | 0.621 |
| 65                                      | 2.464   | 2.103 | 1.823 | 1.583 | 1.502 | 1.382 | 1.182 | 1.022 | 0.862 | 0.701 |
| 70                                      | 2.624   | 2.264 | 1.983 | 1.743 | 1.623 | 1.502 | 1.262 | 1.102 | 0.942 | 0.701 |
| 75                                      | 2.824   | 2.424 | 2.103 | 1.823 | 1.743 | 1.583 | 1.382 | 1.182 | 1.022 | 0.781 |
| 80                                      | 3.025   | 2.584 | 2.224 | 1.983 | 1.823 | 1.703 | 1.502 | 1.262 | 1.102 | 0.862 |
| 85                                      | 3.185   | 2.744 | 2.384 | 2.063 | 1.983 | 1.823 | 1.583 | 1.342 | 1.142 | 0.862 |
| 90                                      | 3.345   | 2.904 | 2.544 | 2.224 | 2.063 | 1.903 | 1.663 | 1.422 | 1.182 | 0.942 |
| 95                                      | 3.585   | 3.065 | 2.664 | 2.304 | 2.224 | 1.983 | 1.743 | 1.502 | 1.262 | 1.022 |
| 100                                     | 3.746   | 3.225 | 2.784 | 2.464 | 2.304 | 2.143 | 1.823 | 1.583 | 1.342 | 1.022 |
| 105                                     | 3.906   | 3.385 | 2.945 | 2.544 | 2.424 | 2.224 | 1.903 | 1.663 | 1.422 | 1.102 |
| 110                                     | 4.106   | 3.545 | 3.065 | 2.704 | 2.544 | 2.304 | 1.983 | 1.743 | 1.462 | 1.142 |
| 115                                     | 4.306   | 3.706 | 3.185 | 2.784 | 2.624 | 2.424 | 2.103 | 1.823 | 1.502 | 1.182 |
| 120                                     | 4.467   | 3.866 | 3.345 | 2.904 | 2.784 | 2.544 | 2.224 | 1.903 | 1.583 | 1.262 |
| 125                                     | 4.667   | 4.026 | 3.505 | 3.025 | 2.864 | 2.624 | 2.304 | 1.983 | 1.663 | 1.302 |
| 130                                     | 4.827   | 4.146 | 3.626 | 3.145 | 2.985 | 2.744 | 2.384 | 2.063 | 1.743 | 1.342 |
| 135                                     | 5.028   | 4.306 | 3.746 | 3.265 | 3.105 | 2.864 | 2.464 | 2.143 | 1.823 | 1.422 |
| 140                                     | -   | 4.467 | 3.906 | 3.385 | 3.185 | 2.945 | 2.544 | 2.224 | 1.863 | 1.422 |
| 145                                     | -   | 4.627 | 4.026 | 3.505 | 3.345 | 3.025 | 2.624 | 2.304 | 1.903 | 1.502 |
| 150                                     | -   | 4.787 | 4.146 | 3.626 | 3.425 | 3.145 | 2.704 | 2.344 | 1.983 | 1.543 |
| 155                                     | -   | 4.947 | 4.306 | 3.746 | 3.545 | 3.265 | 2.824 | 2.424 | 2.063 | 1.583 |
| 160                                     | -   | 5.108 | 4.427 | 3.866 | 3.666 | 3.345 | 2.904 | 2.504 | 2.143 | 1.663 |
| 165                                     | -   | -     | 4.547 | 3.986 | 3.746 | 3.465 | 3.025 | 2.584 | 2.183 | 1.703 |
| 170                                     | -   | -     | 4.707 | 4.066 | 3.906 | 3.585 | 3.105 | 2.664 | 2.224 | 1.743 |
| 175                                     | -   | -     | 4.827 | 4.226 | 3.986 | 3.666 | 3.185 | 2.704 | 2.304 | 1.823 |
| 180                                     | -   | -     | 4.947 | 4.306 | 4.106 | 3.746 | 3.265 | 2.784 | 2.384 | 1.823 |
| 185                                     | -   | -     | 5.108 | 4.467 | 4.226 | 3.866 | 3.345 | 2.864 | 2.464 | 1.903 |
| 190                                     | -   | -     | -     | 4.547 | 4.306 | 3.986 | 3.425 | 2.945 | 2.504 | 1.943 |
| 195                                     | -   | -     | -     | 4.667 | 4.427 | 4.066 | 3.505 | 3.025 | 2.544 | 1.983 |
| 200                                     | -   | -     | -     | 4.787 | 4.547 | 4.146 | 3.585 | 3.105 | 2.624 | 2.063 |
| 205                                     | -   | -     | -     | 4.907 | 4.627 | 4.266 | 3.706 | 3.185 | 2.704 | 2.103 |
| 210                                     | -   | -     | -     | 5.028 | 4.747 | 4.387 | 3.786 | 3.265 | 2.744 | 2.143 |
| 215                                     | -   | -     | -     | 5.148 | 4.867 | 4.467 | 3.866 | 3.345 | 2.824 | 2.224 |
| 220                                     | -   | -     | -     | -     | 4.987 | 4.547 | 3.986 | 3.425 | 2.864 | 2.224 |
| 225                                     | -   | -     | -     | -     | 5.108 | 4.667 | 4.066 | 3.505 | 2.945 | 2.304 |
| 230                                     | -   | -     | -     | -     | -     | 4.787 | 4.146 | 3.585 | 3.025 | 2.344 |
| 235                                     | -   | -     | -     | -     | -     | 4.867 | 4.226 | 3.626 | 3.065 | 2.384 |
| 240                                     | -   | -     | -     | -     | -     | 4.947 | 4.306 | 3.706 | 3.145 | 2.464 |
| 245                                     | -   | -     | -     | -     | -     | 5.068 | 4.387 | 3.786 | 3.185 | 2.504 |
| 250                                     | -   | -     | -     | -     | -     | -     | 4.467 | 3.866 | 3.265 | 2.544 |
| 255                                     | -   | -     | -     | -     | -     | -     | 4.547 | 3.906 | 3.345 | 2.584 |
| 260                                     | -   | -     | -     | -     | -     | -     | 4.627 | 3.986 | 3.385 | 2.624 |
| 265                                     | -   | -     | -     | -     | -     | -     | 4.747 | 4.066 | 3.425 | 2.704 |
| 270                                     | -   | -     | -     | -     | -     | -     | 4.827 | 4.146 | 3.505 | 2.744 |
| 275                                     | -   | -     | -     | -     | -     | -     | 4.907 | 4.226 | 3.585 | 2.784 |
| 280                                     | -   | -     | -     | -     | -     | -     | 4.987 | 4.306 | 3.626 | 2.824 |
| 285                                     | -   | -     | -     | -     | -     | -     | 5.068 | 4.387 | 3.706 | 2.864 |
| 290                                     | -   | -     | -     | -     | -     | -     | 5.148 | 4.467 | 3.746 | 2.945 |
| 295                                     | -   | -     | -     | -     | -     | -     | -     | 4.507 | 3.826 | 2.985 |
| 300                                     | -   | -     | -     | -     | -     | -     | -     | 4.587 | 3.866 | 3.025 |
| 305                                     | -   | -     | -     | -     | -     | -     | -     | 4.667 | 3.946 | 3.065 |
| 310                                     | -   | -     | -     | -     | -     | -     | -     | 4.747 | 3.986 | 3.105 |
| 315                                     | -   | -     | -     | -     | -     | -     | -     | 4.787 | 4.066 | 3.185 |
| 320                                     | -   | -     | -     | -     | -     | -     | -     | 4.867 | 4.146 | 3.225 |
| 325                                     | -   | -     | -     | -     | -     | -     | -     | 4.947 | 4.186 | 3.265 |
| 330                                     | -   | -     | -     | -     | -     | -     | -     | 5.028 | 4.266 | 3.305 |
| 335                                     | -   | -     | -     | -     | -     | -     | -     | 5.108 | 4.306 | 3.345 |
| 340                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.387 | 3.425 |
| 343                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.427 | 3.425 |

*Thickness is in mm and is intumescent only.*



## Certificate No: IFCC 1268

**Table 8:**  
Steel Circular Hollow Columns, Rectangular Hollow Columns and 4-Sided Hollow Beams  
120 minutes Fire Resistance

| Section Factor up to (m <sup>-1</sup> ) | Protection Thickness (mm) for a temperature of: |       |       |       |       |       |       |       |       |       |
|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | 350°C   | 400°C | 450°C | 500°C | 520°C | 550°C | 600°C | 650°C | 700°C | 750°C |
| 38                                      | 1.743   | 1.502 | 1.262 | 1.102 | 1.102 | 0.942 | 0.862 | 0.701 | 0.621 | 0.461 |
| 40                                      | 1.823   | 1.583 | 1.342 | 1.182 | 1.102 | 1.022 | 0.862 | 0.781 | 0.621 | 0.541 |
| 45                                      | 2.063   | 1.743 | 1.502 | 1.342 | 1.262 | 1.182 | 1.022 | 0.862 | 0.701 | 0.541 |
| 50                                      | 2.264   | 1.983 | 1.663 | 1.502 | 1.422 | 1.262 | 1.102 | 0.942 | 0.781 | 0.621 |
| 55                                      | 2.504   | 2.143 | 1.863 | 1.623 | 1.502 | 1.422 | 1.222 | 1.022 | 0.862 | 0.701 |
| 60                                      | 2.704   | 2.344 | 2.023 | 1.743 | 1.663 | 1.502 | 1.342 | 1.142 | 0.942 | 0.781 |
| 65                                      | 2.945   | 2.544 | 2.224 | 1.903 | 1.823 | 1.663 | 1.422 | 1.262 | 1.022 | 0.781 |
| 70                                      | 3.185   | 2.704 | 2.384 | 2.063 | 1.943 | 1.783 | 1.583 | 1.342 | 1.102 | 0.862 |
| 75                                      | 3.385   | 2.945 | 2.544 | 2.224 | 2.063 | 1.903 | 1.663 | 1.422 | 1.182 | 0.942 |
| 80                                      | 3.626   | 3.105 | 2.704 | 2.344 | 2.224 | 2.063 | 1.743 | 1.502 | 1.262 | 1.022 |
| 85                                      | 3.826   | 3.305 | 2.864 | 2.464 | 2.384 | 2.143 | 1.903 | 1.583 | 1.342 | 1.062 |
| 90                                      | 4.066   | 3.505 | 3.025 | 2.624 | 2.464 | 2.304 | 1.983 | 1.703 | 1.422 | 1.102 |
| 95                                      | 4.306   | 3.666 | 3.185 | 2.784 | 2.624 | 2.384 | 2.103 | 1.823 | 1.502 | 1.182 |
| 100                                     | 4.507   | 3.906 | 3.345 | 2.945 | 2.784 | 2.544 | 2.224 | 1.903 | 1.583 | 1.262 |
| 105                                     | 4.707   | 4.066 | 3.505 | 3.065 | 2.904 | 2.664 | 2.304 | 1.983 | 1.663 | 1.342 |
| 110                                     | 4.947   | 4.266 | 3.666 | 3.185 | 3.025 | 2.784 | 2.424 | 2.063 | 1.743 | 1.342 |
| 115                                     | -   | 4.467 | 3.826 | 3.345 | 3.185 | 2.904 | 2.544 | 2.143 | 1.823 | 1.422 |
| 120                                     | -   | 4.627 | 3.986 | 3.505 | 3.305 | 3.025 | 2.624 | 2.264 | 1.903 | 1.502 |
| 125                                     | -   | 4.827 | 4.186 | 3.666 | 3.425 | 3.145 | 2.744 | 2.384 | 1.983 | 1.583 |
| 130                                     | -   | 5.028 | 4.347 | 3.786 | 3.585 | 3.265 | 2.864 | 2.464 | 2.063 | 1.623 |
| 135                                     | -   | -     | 4.507 | 3.906 | 3.706 | 3.425 | 2.945 | 2.544 | 2.143 | 1.663 |
| 140                                     | -   | -     | 4.667 | 4.066 | 3.826 | 3.505 | 3.065 | 2.624 | 2.224 | 1.743 |
| 145                                     | -   | -     | 4.827 | 4.226 | 3.986 | 3.666 | 3.185 | 2.704 | 2.304 | 1.823 |
| 150                                     | -   | -     | 4.987 | 4.347 | 4.106 | 3.746 | 3.265 | 2.784 | 2.384 | 1.863 |
| 155                                     | -   | -     | 5.148 | 4.507 | 4.226 | 3.906 | 3.385 | 2.904 | 2.464 | 1.903 |
| 160                                     | -   | -     | -     | 4.627 | 4.387 | 4.026 | 3.505 | 3.025 | 2.544 | 1.983 |
| 165                                     | -   | -     | -     | 4.787 | 4.507 | 4.146 | 3.585 | 3.105 | 2.624 | 2.063 |
| 170                                     | -   | -     | -     | 4.907 | 4.627 | 4.266 | 3.706 | 3.185 | 2.704 | 2.103 |
| 175                                     | -   | -     | -     | 5.068 | 4.787 | 4.387 | 3.826 | 3.265 | 2.784 | 2.143 |
| 180                                     | -   | -     | -     | -     | 4.907 | 4.507 | 3.906 | 3.345 | 2.864 | 2.224 |
| 185                                     | -   | -     | -     | -     | 5.028 | 4.627 | 4.026 | 3.425 | 2.945 | 2.304 |
| 190                                     | -   | -     | -     | -     | -     | 4.747 | 4.146 | 3.545 | 3.025 | 2.344 |
| 195                                     | -   | -     | -     | -     | -     | 4.867 | 4.226 | 3.626 | 3.105 | 2.384 |
| 200                                     | -   | -     | -     | -     | -     | 4.987 | 4.347 | 3.746 | 3.185 | 2.464 |
| 205                                     | -   | -     | -     | -     | -     | 5.108 | 4.467 | 3.826 | 3.265 | 2.504 |
| 210                                     | -   | -     | -     | -     | -     | -     | 4.547 | 3.906 | 3.345 | 2.584 |
| 215                                     | -   | -     | -     | -     | -     | -     | 4.667 | 3.986 | 3.385 | 2.624 |
| 220                                     | -   | -     | -     | -     | -     | -     | 4.747 | 4.066 | 3.465 | 2.704 |
| 225                                     | -   | -     | -     | -     | -     | -     | 4.867 | 4.146 | 3.545 | 2.744 |
| 230                                     | -   | -     | -     | -     | -     | -     | 4.947 | 4.266 | 3.626 | 2.824 |
| 235                                     | -   | -     | -     | -     | -     | -     | 5.068 | 4.347 | 3.706 | 2.864 |
| 240                                     | -   | -     | -     | -     | -     | -     | -     | 4.427 | 3.786 | 2.945 |
| 245                                     | -   | -     | -     | -     | -     | -     | -     | 4.547 | 3.866 | 2.985 |
| 250                                     | -   | -     | -     | -     | -     | -     | -     | 4.627 | 3.946 | 3.025 |
| 255                                     | -   | -     | -     | -     | -     | -     | -     | 4.707 | 3.986 | 3.105 |
| 260                                     | -   | -     | -     | -     | -     | -     | -     | 4.787 | 4.066 | 3.185 |
| 265                                     | -   | -     | -     | -     | -     | -     | -     | 4.867 | 4.146 | 3.225 |
| 270                                     | -   | -     | -     | -     | -     | -     | -     | 4.947 | 4.226 | 3.265 |
| 275                                     | -   | -     | -     | -     | -     | -     | -     | 5.068 | 4.306 | 3.345 |
| 280                                     | -   | -     | -     | -     | -     | -     | -     | 5.148 | 4.387 | 3.385 |
| 285                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.467 | 3.465 |
| 290                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.547 | 3.505 |
| 295                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.587 | 3.585 |
| 300                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.667 | 3.626 |
| 305                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.747 | 3.706 |
| 310                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.827 | 3.746 |
| 315                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.907 | 3.786 |
| 320                                     | -   | -     | -     | -     | -     | -     | -     | -     | 4.987 | 3.866 |
| 325                                     | -   | -     | -     | -     | -     | -     | -     | -     | 5.068 | 3.906 |
| 330                                     | -   | -     | -     | -     | -     | -     | -     | -     | 5.108 | 3.986 |
| 335                                     | -   | -     | -     | -     | -     | -     | -     | -     | -     | 4.026 |
| 340                                     | -   | -     | -     | -     | -     | -     | -     | -     | -     | 4.106 |
| 343                                     | -   | -     | -     | -     | -     | -     | -     | -     | -     | 4.106 |

*Thickness is in mm and is intumescent only.*