

FIRE ASSESSMENT REPORT

FC18580-01-01

FIRE RESISTANCE OF NULLIFIRE SC901/902 STRUCTURAL STEEL PROTECTION IN ACCORDANCE WITH AS 4100:2020, INC. AMD 1:2021

CLIENT
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ASSESSMENT OBJECTIVE

This report gives BRANZ's assessment of structural steel members using the intumescent coating Nullifire SC901/902, for I and H-section beams and columns and rectangular and circular hollow section columns depending on the size of the steel section and thickness of coating in accordance with AS 4100:2020, inc, AMD 1:2021, Steel Structures, Section 12, Fire.

CONCLUSION

It is considered that if tested in accordance with AS 1530.4:2014, and analysed in accordance with AS 4100:2020, inc, AMD 1:2021, Steel Structures, Section 12, Fire, the intumescent coating Nullifire SC901/902 would provide a fire resistance of up to 120 minutes for I and H-section beams (three sided protection) and columns (four sided protection) and rectangular and circular hollow section columns for various thicknesses and critical temperatures as shown in Table 3 to Table 34.

The results from the for I and H-section beams (three sided protection) and columns (four sided protection) are also applicable to any re-entrant section, e.g. T sections, angles, C sections etc, depending on the number of sides protected.

LIMITATION

This report is subject to the accuracy and completeness of the information supplied.

BRANZ reserves the right to amend or withdraw this assessment if information becomes available which indicates the stated fire performance may not be achieved.

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1. INTRODUCTION

This report gives BRANZ's assessment of structural steel members using the intumescent coating Nullifire SC901/902 with a fire resistance of up to 120 minutes for I and H-section beams and columns and rectangular and circular hollow section columns depending on the size of the steel section and thickness of coating in accordance with AS 4100:2020, inc, AMD 1:2021, Steel Structures, Section 12, Fire. It considers critical steel temperatures from 350°C to 750°C.

This report has been prepared under the requirements of the NCC 2022, Part One, Building Code of Australia, Specification 1. Fire-resistance of building elements, Clause S1C2(d).

SC901 and SC 902 are identical products and only vary in the method of application which allows for onsite and offsite use.

2. BACKGROUND

The client has provided a fire resistance assessment report which included data on loaded I-section beams, tall I-section columns, loaded Circular Hollow Section (CHS) columns, short I-section beams, short H-section columns and short CHS columns. The tests were carried out by Exova Warringtonfire, UK, under the heating conditions of BS 476: Part 21: 1987. The test data from this testing has been taken from UL report Project Number 4787351003 and used in this assessment.

3. DISCUSSION

3.1 Test Standards

The fire resistance tests referenced in the UL assessment report 4787351003 were carried out in accordance with BS 476: Part 21: 1987. Based on the comparison between BS 476: Part 21:1987 and AS 1530.4:2014 it is considered that if the testing detailed in Section 2 had been performed in accordance with AS 1530.4:2014, similar results would have been achieved.

AS 4100:2020, inc, AMD 1:2021, Steel Structures, Section 12, Fire states that: Calculation of the variation of steel temperature with time shall be by interpolation of the results of a 'series of fire tests' using the regression analysis equation specified in Clause 12.6.2.2 subject to the limitations and conditions of Clause 12.6.2.3. It is the opinion of BRANZ that the tests referenced in Section 2 are meeting the requirements of a 'series of fire tests' as stated in Clause 12.6.2 of AS 4100:2020, inc, AMD 1:2021, Steel Structures, Section 12, Fire. In assessing what is a 'series of tests', BRANZ have determined that the tests referenced in Section 2 are equivalent to a test under AS 1530.4 and are meeting the requirements of a 'series of fire tests' as stated in Clause 12.6.2 of AS 4100:2020, inc, AMD 1:2021, Steel Structures, Section 12, Fire. The tests referenced in Section 2 are suitable for a regression analysis as given in Clause 12.6.2.1 of that Standard.

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3.2 Assessment Procedure

The assessment process used is that specified in AS 4100:2020, inc, AMD 1:2021, Steel Structures, Section 12, Fire. This requires a fit to an expression, based on calculations using least squares regression as:

$$t = k_0 + k_1.h_i + k_2.(h_i/k_{sm}) + k_3.T + k_4.h_i.T + k_5.(h_i.T/k_{sm}) + k_6.(T/k_{sm})$$

where:

t = time from the start of the test, in minutes
k_0 to k_6 = regression coefficients
h_i = thickness of fire protection material, in millimetres
T = steel temperature, in degrees Celsius, $T > 250°C$
k_{sm} = exposed surface area to mass ratio, in square metres/tonne (m²/tonne), or

k_{sm} may be expressed in m^{-1} or heated perimeter to surface area (A/V) and is used in this report.

The regression analysis resulted in the coefficients and correlation given in Table 1.

Table 1: Coefficients and Correlation

	3-sided (Beams)	4-sided (Columns) & 4-sided Beams	Rectangular Hollow Sections	Circular Hollow Sections
k_0	-34.04	-39.91	-40.034	-25.40
k_1	5.262	8.966	5.40	3.313
k_2	-190.53	-308.77	140.59	-377.61
k_3	0.10656	0.1238	0.126950	0.07328
k_4	0.00897	-0.00041	-0.002528	0.00515
k_5	3.803	4.278	1.6854	3.0577
k_6	2.405	2.021	1.764	2.083
r^2	0.95	0.96	0.96	0.97

The results of the analysis gave the following arrange of Section factors (A/V) and dry film thicknesses given in Table 2.

Table 2: Range of A/V and Dry film thickness

	I Beams	H Columns & 4-sided Beams	Rectangular Hollow Sections	Circular Hollow Sections
Section Factor (A/V) Range (m^{-1})	50 - 320	50 - 320	50-370	40-395
Dry Film Thickness Range (mm)	0.488-5.078	0.509-5.092	0.965-6.335	0.486-4.640

In accordance with AS 4100:2020, inc, AMD 1:2021, Steel Structures, Section 12, Fire the coefficient of correlation (r^2) must be 0.9 or higher which is the case for all section types.

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The main conditions of the analysis are as follows:

a) The regression equation is only to be used for interpolation. A window defining the limits of interpolation is determined by the range of tests carried out and used in the analysis.

b) A regression equation obtained using prototypes with a four-sided fire exposure condition may be applied to a member with a three-sided fire exposure condition provided that stickability has been demonstrated for the three-sided case. (The full scale beam results demonstrated this.)

c) Where the analysis shows results below the window defining the limits, the lower limits of the window are used for that set of data.

d) For sections to the left of the window, the last thickness within the window is used.

e) The test series for three sided and four sided protection included at least nine specimens.

3.3 Use of Data in Tables 3 to 34

The results of the analysis are given in Tables 3 to 34.

- The values are intumescent thickness only.
- The values are rounded down to the nearest section factor of 5 m^{-1}.
- Values at one temperature may be used for any higher temperature.
- Values for four-sided columns may be used for four-sided beams.
- Where a section has an A/V of less than that given in Table 3 to Table 34 the minimum coating thickness applies.
- Values given in red are outside the window of application but are considered to be applicable.
- Table 3 to Table 10 apply to three sided protection such as beams under concrete slabs and other re-entrant structural sections.
- Table 11 to Table 18 apply to four sided protection such as universal columns and other re-entrant structural sections. Four sided beam protection is included.
- Table 19 to Table 26 apply to rectangular hollow sections. Mesh is required.
- Table 19 to Table 34 apply to circular hollow sections.

Note: A re-entrant section may be a T section, angle, C section or similar.

4. CONCLUSION

It is considered that if tested in accordance with AS 1530.4:2014, and analysed in accordance with AS 4100:2020, inc, AMD 1:2021, Steel Structures, Section 12, Fire, the intumescent coating Nullifire SC901/902 would provide a fire resistance of up to 120 minutes for I and H-section beams (three sided protection) and columns (four sided protection) and rectangular and circular hollow section columns for various thicknesses and critical temperatures as shown in Table 3 to Table 34.

The results from the for I and H-section beams (three sided protection) and columns (four sided protection) are also applicable to any re-entrant section, e.g. T sections, angles, C sections etc, depending on the number of sides protected.

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Table 3: Nullifire SC901/902 I-Section Beams – 15 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
55	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
60	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
65	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
70	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
75	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
80	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
85	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
90	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
95	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
100	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
105	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
110	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491
115	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492
120	0.493	0.493	0.493	0.493	0.493	0.493	0.493	0.493	0.493	0.493	0.493
125	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495
130	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496
135	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497
140	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499
145	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
150	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501
155	0.503	0.503	0.503	0.503	0.503	0.503	0.503	0.503	0.503	0.503	0.503
160	0.504	0.504	0.504	0.504	0.504	0.504	0.504	0.504	0.504	0.504	0.504
165	0.506	0.506	0.506	0.506	0.506	0.506	0.506	0.506	0.506	0.506	0.506
170	0.507	0.507	0.507	0.507	0.507	0.507	0.507	0.507	0.507	0.507	0.507
175	0.509	0.509	0.509	0.509	0.509	0.509	0.509	0.509	0.509	0.509	0.509
180	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511
185	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513
190	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515
195	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517
200	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519
205	0.547	0.521	0.521	0.521	0.521	0.521	0.521	0.521	0.521	0.521	0.521
210	0.559	0.523	0.523	0.523	0.523	0.523	0.523	0.523	0.523	0.523	0.523
215	0.571	0.525	0.525	0.525	0.525	0.525	0.525	0.525	0.525	0.525	0.525
220	0.583	0.527	0.527	0.527	0.527	0.527	0.527	0.527	0.527	0.527	0.527
225	0.594	0.529	0.529	0.529	0.529	0.529	0.529	0.529	0.529	0.529	0.529
230	0.605	0.531	0.531	0.531	0.531	0.531	0.531	0.531	0.531	0.531	0.531
235	0.616	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533
240	0.626	0.535	0.535	0.535	0.535	0.535	0.535	0.535	0.535	0.535	0.535
245	0.636	0.537	0.537	0.537	0.537	0.537	0.537	0.537	0.537	0.537	0.537
250	0.646	0.539	0.539	0.539	0.539	0.539	0.539	0.539	0.539	0.539	0.539
255	0.656	0.586	0.586	0.586	0.586	0.586	0.586	0.586	0.586	0.586	0.586
260	0.811	0.811	0.811	0.811	0.811	0.811	0.811	0.811	0.811	0.811	0.811
265	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036
270	1.261	1.261	1.261	1.261	1.261	1.261	1.261	1.261	1.261	1.261	1.261
275	1.487	1.487	1.487	1.487	1.487	1.487	1.487	1.487	1.487	1.487	1.487
280	1.712	1.712	1.712	1.712	1.712	1.712	1.712	1.712	1.712	1.712	1.712
285	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937
290	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162
295	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387
300	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612
305	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838
310	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063
315	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288
320	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513

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Table 4: Nullifire SC901/902 I-Section Beams – 30 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	0.596	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
55	0.596	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
60	0.596	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
65	0.596	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
70	0.596	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
75	0.657	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
80	0.716	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
85	0.772	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
90	0.825	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
95	0.876	0.497	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
100	0.925	0.532	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
105	0.972	0.569	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
110	1.017	0.605	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491
115	1.060	0.639	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492
120	1.102	0.672	0.493	0.493	0.493	0.493	0.493	0.493	0.493	0.493	0.493
125	1.142	0.704	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495
130	1.180	0.734	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496
135	1.217	0.764	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497
140	1.253	0.792	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499
145	1.287	0.820	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
150	1.320	0.847	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501
155	1.352	0.872	0.503	0.503	0.503	0.503	0.503	0.503	0.503	0.503	0.503
160	1.383	0.897	0.504	0.504	0.504	0.504	0.504	0.504	0.504	0.504	0.504
165	1.413	0.921	0.506	0.506	0.506	0.506	0.506	0.506	0.506	0.506	0.506
170	1.442	0.945	0.530	0.507	0.507	0.507	0.507	0.507	0.507	0.507	0.507
175	1.470	0.967	0.551	0.509	0.509	0.509	0.509	0.509	0.509	0.509	0.509
180	1.497	0.989	0.568	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511
185	1.524	1.011	0.584	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513
190	1.549	1.031	0.601	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515
195	1.574	1.052	0.616	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517
200	1.598	1.071	0.632	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519
205	1.621	1.090	0.647	0.521	0.521	0.521	0.521	0.521	0.521	0.521	0.521
210	1.644	1.109	0.661	0.523	0.523	0.523	0.523	0.523	0.523	0.523	0.523
215	1.666	1.126	0.675	0.525	0.525	0.525	0.525	0.525	0.525	0.525	0.525
220	1.687	1.144	0.689	0.527	0.527	0.527	0.527	0.527	0.527	0.527	0.527
225	1.708	1.161	0.702	0.529	0.529	0.529	0.529	0.529	0.529	0.529	0.529
230	1.728	1.178	0.715	0.531	0.531	0.531	0.531	0.531	0.531	0.531	0.531
235	1.747	1.194	0.728	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533
240	1.767	1.209	0.741	0.535	0.535	0.535	0.535	0.535	0.535	0.535	0.535
245	1.785	1.225	0.753	0.537	0.537	0.537	0.537	0.537	0.537	0.537	0.537
250	1.803	1.240	0.764	0.539	0.539	0.539	0.539	0.539	0.539	0.539	0.539
255	1.821	1.254	0.776	0.586	0.586	0.586	0.586	0.586	0.586	0.586	0.586
260	1.838	1.268	0.811	0.811	0.811	0.811	0.811	0.811	0.811	0.811	0.811
265	1.855	1.282	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036
270	1.871	1.296	1.261	1.261	1.261	1.261	1.261	1.261	1.261	1.261	1.261
275	1.887	1.487	1.487	1.487	1.487	1.487	1.487	1.487	1.487	1.487	1.487
280	1.903	1.712	1.712	1.712	1.712	1.712	1.712	1.712	1.712	1.712	1.712
285	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937
290	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162
295	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387
300	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612
305	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838
310	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063
315	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288
320	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513

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Table 5: Nullifire SC901/902 I-Section Beams – 45 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	1.011	0.657	0.563	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
55	1.011	0.657	0.563	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
60	1.011	0.657	0.563	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
65	1.110	0.737	0.563	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
70	1.203	0.814	0.563	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
75	1.293	0.887	0.563	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
80	1.378	0.957	0.620	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
85	1.459	1.024	0.675	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
90	1.537	1.089	0.728	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
95	1.611	1.150	0.778	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488
100	1.683	1.209	0.827	0.511	0.488	0.488	0.488	0.488	0.488	0.488	0.488
105	1.751	1.266	0.874	0.549	0.489	0.489	0.489	0.489	0.489	0.489	0.489
110	1.816	1.321	0.919	0.586	0.491	0.491	0.491	0.491	0.491	0.491	0.491
115	1.879	1.374	0.962	0.621	0.492	0.492	0.492	0.492	0.492	0.492	0.492
120	1.940	1.424	1.004	0.656	0.493	0.493	0.493	0.493	0.493	0.493	0.493
125	1.998	1.473	1.045	0.689	0.495	0.495	0.495	0.495	0.495	0.495	0.495
130	2.054	1.520	1.084	0.721	0.496	0.496	0.496	0.496	0.496	0.496	0.496
135	2.107	1.566	1.122	0.752	0.497	0.497	0.497	0.497	0.497	0.497	0.497
140	2.159	1.610	1.159	0.782	0.499	0.499	0.499	0.499	0.499	0.499	0.499
145	2.209	1.652	1.194	0.811	0.500	0.500	0.500	0.500	0.500	0.500	0.500
150	2.258	1.693	1.228	0.839	0.501	0.501	0.501	0.501	0.501	0.501	0.501
155	2.304	1.733	1.261	0.866	0.530	0.503	0.503	0.503	0.503	0.503	0.503
160	2.349	1.771	1.294	0.893	0.551	0.504	0.504	0.504	0.504	0.504	0.504
165	2.393	1.808	1.325	0.918	0.572	0.506	0.506	0.506	0.506	0.506	0.506
170	2.435	1.844	1.355	0.943	0.592	0.507	0.507	0.507	0.507	0.507	0.507
175	2.476	1.879	1.384	0.967	0.611	0.509	0.509	0.509	0.509	0.509	0.509
180	2.515	1.913	1.413	0.991	0.630	0.511	0.511	0.511	0.511	0.511	0.511
185	2.553	1.946	1.441	1.014	0.649	0.513	0.513	0.513	0.513	0.513	0.513
190	2.590	1.978	1.468	1.036	0.667	0.515	0.515	0.515	0.515	0.515	0.515
195	2.626	2.009	1.494	1.058	0.684	0.517	0.517	0.517	0.517	0.517	0.517
200	2.661	2.039	1.519	1.079	0.701	0.519	0.519	0.519	0.519	0.519	0.519
205	2.695	2.068	1.544	1.100	0.718	0.521	0.521	0.521	0.521	0.521	0.521
210	2.728	2.096	1.568	1.120	0.734	0.528	0.523	0.523	0.523	0.523	0.523
215	2.760	2.124	1.591	1.139	0.750	0.542	0.525	0.525	0.525	0.525	0.525
220	2.791	2.151	1.614	1.158	0.765	0.555	0.527	0.527	0.527	0.527	0.527
225	2.821	2.177	1.636	1.177	0.781	0.568	0.529	0.529	0.529	0.529	0.529
230	2.851	2.202	1.658	1.195	0.795	0.581	0.531	0.531	0.531	0.531	0.531
235	2.879	2.227	1.679	1.212	0.810	0.593	0.533	0.533	0.533	0.533	0.533
240	2.907	2.251	1.700	1.230	0.824	0.606	0.535	0.535	0.535	0.535	0.535
245	2.934	2.275	1.720	1.246	0.837	0.618	0.537	0.537	0.537	0.537	0.537
250	2.960	2.298	1.740	1.263	0.851	0.629	0.539	0.539	0.539	0.539	0.539
255	2.986	2.320	1.759	1.279	0.864	0.641	0.586	0.586	0.586	0.586	0.586
260	3.011	2.342	1.778	1.294	0.876	0.811	0.811	0.811	0.811	0.811	0.811
265	3.036	2.364	1.796	1.310	1.036	1.036	1.036	1.036	1.036	1.036	1.036
270	3.059	2.384	1.814	1.325	1.261	1.261	1.261	1.261	1.261	1.261	1.261
275	3.083	2.405	1.831	1.487	1.487	1.487	1.487	1.487	1.487	1.487	1.487
280	3.105	2.425	1.848	1.712	1.712	1.712	1.712	1.712	1.712	1.712	1.712
285	3.127	2.444	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937	1.937
290	3.149	2.463	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162
295	3.170	2.482	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387
300	3.191	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612
305	3.211	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838
310	3.231	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063
315	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288
320	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513

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Table 6: Nullifire SC901/902 I-Section Beams – 60 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	1.687	1.140	0.809	0.617	0.556	0.509	0.488	0.488	0.488	0.488	0.488
55	1.687	1.140	0.809	0.617	0.556	0.509	0.488	0.488	0.488	0.488	0.488
60	1.687	1.140	0.810	0.617	0.556	0.509	0.488	0.488	0.488	0.488	0.488
65	1.688	1.249	0.900	0.617	0.556	0.509	0.488	0.488	0.488	0.488	0.488
70	1.811	1.352	0.987	0.690	0.556	0.509	0.488	0.488	0.488	0.488	0.488
75	1.928	1.451	1.070	0.759	0.556	0.509	0.488	0.488	0.488	0.488	0.488
80	2.040	1.546	1.150	0.826	0.556	0.509	0.488	0.488	0.488	0.488	0.488
85	2.147	1.636	1.227	0.891	0.610	0.509	0.488	0.488	0.488	0.488	0.488
90	2.249	1.723	1.300	0.953	0.662	0.509	0.488	0.488	0.488	0.488	0.488
95	2.346	1.806	1.371	1.012	0.712	0.554	0.488	0.488	0.488	0.488	0.488
100	2.440	1.886	1.439	1.070	0.760	0.597	0.497	0.488	0.488	0.488	0.488
105	2.530	1.963	1.505	1.125	0.807	0.639	0.535	0.489	0.489	0.489	0.489
110	2.615	2.037	1.568	1.179	0.852	0.679	0.573	0.491	0.491	0.491	0.491
115	2.698	2.108	1.628	1.231	0.895	0.718	0.609	0.492	0.492	0.492	0.492
120	2.777	2.177	1.687	1.281	0.937	0.756	0.644	0.538	0.493	0.493	0.493
125	2.854	2.243	1.744	1.329	0.978	0.793	0.678	0.570	0.495	0.495	0.495
130	2.927	2.306	1.798	1.375	1.018	0.828	0.711	0.600	0.496	0.496	0.496
135	2.998	2.368	1.851	1.421	1.056	0.863	0.743	0.630	0.497	0.497	0.497
140	3.066	2.427	1.903	1.464	1.093	0.896	0.774	0.659	0.499	0.499	0.499
145	3.131	2.484	1.952	1.507	1.129	0.928	0.804	0.686	0.522	0.500	0.500
150	3.195	2.539	2.000	1.548	1.164	0.960	0.833	0.714	0.546	0.501	0.501
155	3.256	2.593	2.046	1.588	1.198	0.990	0.862	0.740	0.569	0.503	0.503
160	3.315	2.645	2.091	1.626	1.230	1.020	0.889	0.765	0.592	0.504	0.504
165	3.372	2.695	2.135	1.664	1.262	1.049	0.916	0.790	0.614	0.506	0.506
170	3.428	2.744	2.177	1.700	1.293	1.077	0.942	0.815	0.636	0.507	0.507
175	3.481	2.791	2.218	1.736	1.324	1.104	0.967	0.838	0.657	0.509	0.509
180	3.533	2.836	2.258	1.770	1.353	1.130	0.992	0.861	0.677	0.511	0.511
185	3.583	2.881	2.297	1.804	1.382	1.156	1.016	0.883	0.697	0.513	0.513
190	3.632	2.924	2.334	1.836	1.409	1.181	1.040	0.905	0.716	0.515	0.515
195	3.679	2.966	2.371	1.868	1.436	1.206	1.063	0.927	0.735	0.517	0.517
200	3.725	3.006	2.407	1.899	1.463	1.230	1.085	0.947	0.754	0.519	0.519
205	3.769	3.046	2.441	1.929	1.488	1.253	1.106	0.967	0.772	0.521	0.521
210	3.812	3.084	2.475	1.958	1.514	1.276	1.128	0.987	0.789	0.523	0.523
215	3.854	3.121	2.508	1.986	1.538	1.298	1.148	1.006	0.807	0.525	0.525
220	3.895	3.158	2.540	2.014	1.562	1.320	1.168	1.025	0.823	0.527	0.527
225	3.935	3.193	2.571	2.041	1.585	1.341	1.188	1.043	0.840	0.531	0.529
230	3.973	3.227	2.601	2.067	1.608	1.361	1.207	1.061	0.856	0.544	0.531
235	4.011	3.261	2.630	2.093	1.630	1.381	1.226	1.079	0.871	0.557	0.533
240	4.047	3.293	2.659	2.118	1.652	1.401	1.245	1.096	0.887	0.569	0.535
245	4.083	3.325	2.687	2.143	1.673	1.420	1.262	1.113	0.902	0.581	0.537
250	4.117	3.356	2.715	2.167	1.693	1.439	1.280	1.129	0.916	0.593	0.539
255	4.151	3.387	2.742	2.190	1.713	1.457	1.297	1.145	0.930	0.605	0.586
260	4.184	3.416	2.768	2.213	1.733	1.475	1.314	1.161	0.944	0.811	0.811
265	4.216	3.445	2.793	2.235	1.753	1.493	1.330	1.176	1.036	1.036	1.036
270	4.247	3.473	2.818	2.257	1.771	1.510	1.346	1.261	1.261	1.261	1.261
275	4.278	3.501	2.843	2.279	1.790	1.527	1.487	1.487	1.487	1.487	1.487
280	4.308	3.527	2.866	2.300	1.808	1.712	1.712	1.712	1.712	1.712	1.712
285	4.337	3.554	2.890	2.320	1.937	1.937	1.937	1.937	1.937	1.937	1.937
290	4.365	3.579	2.913	2.340	2.162	2.162	2.162	2.162	2.162	2.162	2.162
295	4.393	3.604	2.935	2.387	2.387	2.387	2.387	2.387	2.387	2.387	2.387
300	4.420	3.629	2.957	2.612	2.612	2.612	2.612	2.612	2.612	2.612	2.612
305	4.446	3.653	2.978	2.838	2.838	2.838	2.838	2.838	2.838	2.838	2.838
310	4.472	3.676	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063	3.063
315	4.498	3.699	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288	3.288
320	4.522	3.721	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513

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Table 7: Nullifire SC901/902 I-Section Beams – 75 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	2.834	1.890	1.242	0.933	0.678	0.621	0.604	0.581	0.563	0.488	0.488
55	2.834	1.890	1.242	0.933	0.678	0.621	0.604	0.581	0.563	0.488	0.488
60	2.834	1.890	1.243	0.933	0.678	0.621	0.604	0.581	0.563	0.488	0.488
65	2.834	1.890	1.359	1.033	0.763	0.622	0.604	0.581	0.563	0.488	0.488
70	2.834	1.891	1.471	1.128	0.844	0.696	0.604	0.581	0.563	0.488	0.488
75	2.834	2.015	1.578	1.220	0.923	0.767	0.671	0.581	0.563	0.488	0.488
80	2.834	2.134	1.680	1.308	0.998	0.836	0.736	0.642	0.563	0.488	0.488
85	2.834	2.248	1.778	1.393	1.071	0.902	0.798	0.700	0.564	0.488	0.488
90	2.961	2.358	1.873	1.474	1.141	0.966	0.858	0.756	0.615	0.488	0.488
95	3.081	2.463	1.964	1.553	1.209	1.028	0.916	0.811	0.664	0.488	0.488
100	3.197	2.563	2.051	1.628	1.274	1.087	0.972	0.864	0.712	0.488	0.488
105	3.308	2.660	2.135	1.701	1.337	1.145	1.026	0.914	0.758	0.525	0.489
110	3.415	2.753	2.216	1.772	1.398	1.200	1.079	0.964	0.803	0.563	0.491
115	3.517	2.843	2.294	1.840	1.457	1.254	1.129	1.011	0.846	0.600	0.492
120	3.615	2.929	2.370	1.905	1.514	1.306	1.178	1.058	0.889	0.635	0.493
125	3.709	3.012	2.443	1.969	1.569	1.357	1.226	1.102	0.929	0.670	0.494
130	3.800	3.092	2.513	2.030	1.622	1.406	1.272	1.146	0.969	0.704	0.496
135	3.888	3.169	2.581	2.090	1.674	1.453	1.317	1.188	1.007	0.736	0.497
140	3.972	3.244	2.647	2.147	1.724	1.499	1.360	1.229	1.045	0.768	0.524
145	4.053	3.316	2.710	2.203	1.772	1.544	1.402	1.268	1.081	0.799	0.550
150	4.132	3.386	2.772	2.257	1.820	1.587	1.443	1.307	1.116	0.829	0.575
155	4.208	3.453	2.831	2.309	1.865	1.629	1.483	1.345	1.150	0.858	0.600
160	4.281	3.519	2.889	2.360	1.910	1.670	1.522	1.381	1.184	0.887	0.623
165	4.352	3.582	2.945	2.410	1.953	1.710	1.559	1.416	1.216	0.914	0.647
170	4.420	3.643	2.999	2.457	1.995	1.749	1.596	1.451	1.248	0.941	0.670
175	4.487	3.702	3.052	2.504	2.036	1.786	1.631	1.484	1.278	0.967	0.692
180	4.551	3.760	3.103	2.549	2.076	1.823	1.666	1.517	1.308	0.993	0.713
185	4.613	3.816	3.153	2.593	2.114	1.859	1.700	1.549	1.337	1.018	0.734
190	4.673	3.870	3.201	2.636	2.152	1.893	1.732	1.580	1.366	1.042	0.755
195	4.732	3.923	3.248	2.678	2.188	1.927	1.764	1.610	1.393	1.066	0.775
200	4.788	3.974	3.294	2.718	2.224	1.960	1.796	1.640	1.420	1.089	0.795
205	4.843	4.023	3.338	2.758	2.259	1.992	1.826	1.669	1.447	1.112	0.814
210	4.897	4.072	3.382	2.796	2.293	2.023	1.856	1.697	1.473	1.134	0.832
215	4.949	4.119	3.424	2.833	2.326	2.054	1.885	1.724	1.498	1.155	0.851
220		4.164	3.465	2.870	2.358	2.084	1.913	1.751	1.522	1.177	0.869
225		4.209	3.505	2.906	2.390	2.113	1.940	1.777	1.546	1.197	0.886
230		4.252	3.544	2.940	2.420	2.141	1.967	1.802	1.570	1.217	0.903
235		4.294	3.582	2.974	2.450	2.169	1.994	1.827	1.592	1.237	0.920
240		4.336	3.619	3.007	2.479	2.196	2.019	1.852	1.615	1.256	0.936
245		4.376	3.655	3.039	2.508	2.223	2.045	1.875	1.637	1.275	0.952
250		4.415	3.690	3.071	2.536	2.249	2.069	1.899	1.658	1.293	0.968
255		4.453	3.724	3.102	2.563	2.274	2.093	1.921	1.679	1.311	0.983
260		4.490	3.758	3.132	2.590	2.299	2.117	1.944	1.699	1.329	0.998
265		4.526	3.791	3.161	2.616	2.323	2.140	1.965	1.719	1.346	1.013
270		4.562	3.823	3.190	2.642	2.347	2.162	1.987	1.739	1.363	1.261
275		4.596	3.854	3.218	2.667	2.370	2.184	2.008	1.758	1.487	1.487
280		4.630	3.885	3.245	2.691	2.392	2.206	2.028	1.777	1.712	1.712
285		4.663	3.915	3.272	2.715	2.415	2.227	2.048	1.937	1.937	1.937
290		4.695	3.944	3.299	2.738	2.436	2.247	2.162	2.162	2.162	2.162
295		4.727	3.973	3.324	2.761	2.458	2.387	2.387	2.387	2.387	2.387
300		4.758	4.001	3.350	2.784	2.612	2.612	2.612	2.612	2.612	2.612
305		4.788	4.028	3.374	2.838	2.838	2.838	2.838	2.838	2.838	2.838
310		4.817	4.055	3.398	3.063	3.063	3.063	3.063	3.063	3.063	3.063
315		4.846	4.081	3.422	3.288	3.288	3.288	3.288	3.288	3.288	3.288
320		4.875	4.107	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513

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Table 8: Nullifire SC901/902 I-Section Beams – 90 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50		2.861	1.954	1.325	1.036	0.885	0.792	0.705	0.585	0.542	0.529
55		2.861	1.954	1.325	1.036	0.885	0.792	0.705	0.585	0.542	0.529
60		2.861	1.954	1.326	1.036	0.885	0.792	0.706	0.585	0.542	0.529
65		2.861	1.954	1.449	1.143	0.983	0.885	0.793	0.665	0.542	0.529
70		2.861	1.954	1.567	1.246	1.078	0.975	0.878	0.743	0.542	0.529
75		2.861	2.085	1.681	1.345	1.169	1.061	0.959	0.817	0.607	0.529
80		2.861	2.210	1.790	1.440	1.256	1.144	1.037	0.890	0.669	0.529
85		2.861	2.330	1.895	1.532	1.341	1.224	1.113	0.959	0.730	0.529
90		2.992	2.445	1.996	1.620	1.422	1.301	1.186	1.026	0.788	0.579
95		3.119	2.556	2.093	1.705	1.501	1.375	1.257	1.092	0.845	0.628
100		3.240	2.663	2.187	1.787	1.577	1.447	1.325	1.154	0.900	0.676
105		3.357	2.766	2.277	1.867	1.651	1.517	1.391	1.215	0.953	0.722
110		3.469	2.865	2.365	1.944	1.722	1.584	1.455	1.274	1.004	0.766
115		3.577	2.960	2.449	2.018	1.790	1.650	1.517	1.331	1.054	0.809
120		3.681	3.052	2.530	2.090	1.857	1.713	1.577	1.387	1.102	0.851
125		3.781	3.141	2.609	2.159	1.921	1.774	1.635	1.441	1.149	0.892
130		3.878	3.227	2.685	2.226	1.984	1.833	1.691	1.493	1.195	0.932
135		3.971	3.310	2.759	2.292	2.044	1.891	1.746	1.543	1.239	0.970
140		4.061	3.391	2.830	2.355	2.103	1.947	1.799	1.592	1.282	1.008
145		4.148	3.468	2.899	2.416	2.160	2.001	1.851	1.640	1.324	1.044
150		4.232	3.543	2.966	2.475	2.215	2.053	1.901	1.686	1.364	1.079
155		4.314	3.616	3.031	2.533	2.269	2.104	1.949	1.731	1.404	1.114
160		4.392	3.687	3.094	2.589	2.321	2.154	1.997	1.775	1.442	1.147
165		4.469	3.755	3.155	2.644	2.372	2.202	2.043	1.818	1.480	1.180
170		4.542	3.822	3.215	2.697	2.421	2.249	2.087	1.859	1.516	1.212
175		4.614	3.886	3.272	2.748	2.469	2.295	2.131	1.900	1.552	1.243
180		4.683	3.948	3.328	2.798	2.515	2.340	2.173	1.939	1.587	1.273
185		4.751	4.009	3.383	2.847	2.561	2.383	2.215	1.978	1.620	1.303
190		4.816	4.068	3.436	2.894	2.605	2.425	2.255	2.015	1.653	1.332
195		4.880	4.126	3.488	2.941	2.648	2.466	2.294	2.052	1.685	1.360
200			4.181	3.538	2.986	2.690	2.507	2.332	2.087	1.717	1.388
205			4.236	3.587	3.029	2.731	2.546	2.370	2.122	1.747	1.414
210			4.289	3.634	3.072	2.771	2.584	2.406	2.156	1.777	1.441
215			4.340	3.681	3.114	2.810	2.621	2.442	2.189	1.807	1.466
220			4.390	3.726	3.154	2.848	2.657	2.476	2.221	1.835	1.491
225			4.439	3.770	3.194	2.885	2.693	2.510	2.253	1.863	1.516
230			4.486	3.813	3.233	2.922	2.727	2.543	2.283	1.890	1.540
235			4.533	3.855	3.271	2.957	2.761	2.575	2.314	1.917	1.563
240			4.578	3.896	3.307	2.991	2.794	2.607	2.343	1.943	1.586
245			4.622	3.936	3.343	3.025	2.827	2.638	2.372	1.968	1.608
250			4.665	3.975	3.379	3.058	2.858	2.668	2.400	1.993	1.630
255			4.707	4.013	3.413	3.091	2.889	2.698	2.428	2.018	1.652
260			4.748	4.050	3.447	3.122	2.919	2.727	2.454	2.042	1.673
265			4.788	4.087	3.480	3.153	2.949	2.755	2.481	2.065	1.693
270			4.827	4.123	3.512	3.183	2.978	2.782	2.507	2.088	1.714
275			4.866	4.157	3.543	3.213	3.006	2.810	2.532	2.111	1.733
280			4.903	4.191	3.574	3.242	3.034	2.836	2.557	2.133	1.753
285			4.940	4.225	3.604	3.270	3.061	2.862	2.581	2.154	1.937
290			4.975	4.257	3.634	3.298	3.087	2.887	2.605	2.175	2.162
295			5.010	4.289	3.663	3.325	3.114	2.912	2.628	2.387	2.387
300			5.045	4.320	3.691	3.352	3.139	2.937	2.651	2.612	2.612
305			5.078	4.351	3.719	3.378	3.164	2.961	2.838	2.838	2.838
310				4.381	3.746	3.403	3.189	3.063	3.063	3.063	3.063
315				4.410	3.773	3.428	3.288	3.288	3.288	3.288	3.288
320				4.439	3.799	3.513	3.513	3.513	3.513	3.513	3.513

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Table 9: Nullifire SC901/902 I-Section Beams – 105 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50			2.881	2.004	1.391	1.223	1.119	1.022	0.888	0.689	0.593
55			2.881	2.004	1.391	1.223	1.119	1.022	0.888	0.689	0.593
60			2.881	2.004	1.394	1.226	1.122	1.025	0.890	0.690	0.593
65			2.881	2.004	1.523	1.345	1.236	1.133	0.990	0.778	0.593
70			2.881	2.006	1.647	1.460	1.345	1.237	1.086	0.862	0.667
75			2.881	2.141	1.767	1.571	1.450	1.337	1.179	0.944	0.739
80			2.881	2.272	1.882	1.677	1.551	1.433	1.268	1.023	0.808
85			2.882	2.397	1.992	1.780	1.649	1.526	1.355	1.099	0.875
90			3.018	2.518	2.099	1.879	1.744	1.616	1.438	1.173	0.940
95			3.149	2.634	2.202	1.975	1.835	1.703	1.519	1.244	1.003
100			3.275	2.745	2.301	2.067	1.923	1.787	1.597	1.313	1.064
105			3.397	2.853	2.397	2.156	2.008	1.868	1.672	1.380	1.123
110			3.514	2.957	2.489	2.243	2.090	1.946	1.746	1.445	1.181
115			3.626	3.058	2.579	2.326	2.170	2.022	1.816	1.508	1.236
120			3.735	3.155	2.666	2.407	2.247	2.096	1.885	1.569	1.290
125			3.840	3.249	2.750	2.485	2.322	2.168	1.952	1.628	1.343
130			3.942	3.340	2.831	2.561	2.394	2.237	2.016	1.686	1.394
135			4.040	3.428	2.909	2.635	2.465	2.304	2.079	1.741	1.443
140			4.134	3.513	2.986	2.706	2.533	2.369	2.140	1.796	1.491
145			4.226	3.595	3.060	2.775	2.599	2.433	2.199	1.848	1.538
150			4.315	3.675	3.131	2.843	2.663	2.494	2.257	1.900	1.584
155			4.401	3.753	3.201	2.908	2.726	2.554	2.313	1.950	1.628
160			4.484	3.828	3.269	2.971	2.787	2.612	2.367	1.998	1.671
165			4.565	3.901	3.334	3.033	2.846	2.669	2.420	2.045	1.714
170			4.644	3.972	3.398	3.093	2.903	2.724	2.471	2.091	1.755
175			4.720	4.041	3.460	3.151	2.959	2.777	2.522	2.136	1.795
180			4.794	4.108	3.521	3.208	3.014	2.829	2.570	2.180	1.834
185			4.865	4.173	3.580	3.263	3.066	2.880	2.618	2.223	1.872
190			4.935	4.236	3.637	3.317	3.118	2.930	2.664	2.264	1.909
195				4.297	3.693	3.369	3.168	2.978	2.710	2.305	1.945
200				4.357	3.747	3.421	3.217	3.025	2.754	2.344	1.980
205				4.416	3.800	3.470	3.265	3.071	2.797	2.383	2.015
210				4.473	3.851	3.519	3.312	3.115	2.839	2.421	2.049
215				4.528	3.902	3.566	3.357	3.159	2.880	2.458	2.082
220				4.582	3.951	3.613	3.402	3.202	2.920	2.494	2.114
225				4.635	3.999	3.658	3.445	3.243	2.959	2.529	2.145
230				4.686	4.045	3.702	3.487	3.284	2.997	2.563	2.176
235				4.736	4.091	3.745	3.529	3.324	3.035	2.597	2.206
240				4.785	4.135	3.787	3.569	3.363	3.071	2.630	2.236
245				4.833	4.179	3.828	3.609	3.401	3.107	2.662	2.265
250				4.879	4.221	3.868	3.647	3.438	3.142	2.693	2.293
255				4.925	4.263	3.907	3.685	3.474	3.176	2.724	2.321
260				4.969	4.304	3.946	3.722	3.509	3.209	2.754	2.348
265				5.013	4.343	3.983	3.758	3.544	3.242	2.784	2.374
270					4.382	4.020	3.793	3.578	3.274	2.813	2.400
275					4.420	4.056	3.828	3.611	3.306	2.841	2.426
280					4.457	4.091	3.862	3.644	3.336	2.869	2.451
285					4.494	4.125	3.895	3.676	3.366	2.896	2.475
290					4.529	4.159	3.928	3.707	3.396	2.923	2.499
295					4.564	4.192	3.959	3.738	3.425	2.949	2.523
300					4.598	4.225	3.991	3.768	3.453	2.975	2.612
305					4.632	4.256	4.021	3.797	3.481	3.000	2.838
310					4.665	4.287	4.051	3.826	3.508	3.063	3.063
315					4.697	4.318	4.080	3.854	3.535	3.288	3.288
320					4.728	4.348	4.109	3.882	3.561	3.513	3.513

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Table 10: Nullifire SC901/902 I-Section Beams – 120 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50				2.899	2.049	1.660	1.586	1.344	1.195	0.974	0.782
55				2.899	2.049	1.660	1.586	1.344	1.195	0.974	0.782
60				2.899	2.049	1.660	1.586	1.345	1.196	0.975	0.782
65				2.899	2.049	1.660	1.586	1.472	1.315	1.080	0.876
70				2.899	2.049	1.792	1.715	1.596	1.429	1.182	0.967
75				2.899	2.189	1.920	1.839	1.714	1.540	1.281	1.055
80				2.899	2.323	2.043	1.959	1.829	1.647	1.376	1.139
85				2.899	2.453	2.162	2.075	1.939	1.750	1.468	1.222
90				3.039	2.578	2.277	2.186	2.046	1.850	1.557	1.301
95				3.174	2.698	2.388	2.294	2.149	1.946	1.644	1.378
100				3.304	2.815	2.495	2.398	2.248	2.039	1.727	1.453
105				3.429	2.927	2.599	2.499	2.345	2.129	1.808	1.525
110				3.550	3.035	2.699	2.596	2.438	2.217	1.886	1.595
115				3.667	3.140	2.796	2.690	2.528	2.301	1.962	1.663
120				3.780	3.242	2.890	2.781	2.615	2.383	2.036	1.729
125				3.889	3.340	2.981	2.870	2.700	2.463	2.107	1.793
130				3.995	3.435	3.070	2.956	2.782	2.540	2.176	1.856
135				4.097	3.527	3.156	3.039	2.862	2.615	2.244	1.916
140				4.196	3.617	3.239	3.119	2.940	2.688	2.309	1.975
145				4.291	3.703	3.320	3.198	3.015	2.758	2.373	2.033
150				4.384	3.787	3.398	3.274	3.088	2.827	2.435	2.088
155				4.474	3.869	3.474	3.347	3.159	2.894	2.495	2.143
160				4.562	3.948	3.549	3.419	3.228	2.959	2.554	2.195
165				4.647	4.025	3.621	3.489	3.295	3.022	2.611	2.247
170				4.729	4.100	3.691	3.557	3.360	3.083	2.667	2.297
175				4.809	4.173	3.759	3.623	3.423	3.143	2.721	2.346
180				4.887	4.243	3.826	3.687	3.485	3.202	2.774	2.394
185					4.312	3.891	3.750	3.546	3.258	2.825	2.440
190					4.379	3.954	3.811	3.604	3.314	2.875	2.486
195					4.445	4.015	3.870	3.662	3.368	2.924	2.530
200					4.508	4.075	3.928	3.717	3.420	2.972	2.573
205					4.570	4.134	3.985	3.772	3.472	3.019	2.616
210					4.631	4.191	4.040	3.825	3.522	3.064	2.657
215					4.690	4.247	4.094	3.877	3.571	3.109	2.697
220					4.747	4.301	4.146	3.927	3.619	3.152	2.737
225					4.803	4.354	4.197	3.977	3.666	3.195	2.775
230					4.858	4.406	4.247	4.025	3.711	3.236	2.813
235					4.911	4.457	4.296	4.072	3.756	3.277	2.850
240					4.963	4.506	4.344	4.118	3.799	3.317	2.886
245						4.555	4.391	4.163	3.842	3.356	2.921
250						4.602	4.436	4.207	3.884	3.394	2.956
255						4.648	4.481	4.250	3.925	3.431	2.989
260						4.694	4.525	4.292	3.965	3.467	3.023
265						4.738	4.567	4.334	4.004	3.503	3.055
270						4.781	4.609	4.374	4.042	3.538	3.087
275						4.824	4.650	4.413	4.079	3.572	3.118
280						4.865	4.690	4.452	4.116	3.605	3.148
285						4.906	4.729	4.490	4.152	3.638	3.178
290						4.946	4.768	4.527	4.187	3.670	3.208
295						4.985	4.805	4.563	4.222	3.702	3.236
300						5.023	4.842	4.599	4.255	3.733	3.265
305							4.878	4.634	4.289	3.763	3.292
310							4.914	4.668	4.321	3.793	3.320
315							4.948	4.702	4.353	3.822	3.346
320							4.982	4.735	4.384	3.851	3.513

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Table 11: Nullifire SC901/902 Columns – 15 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
55	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
60	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
65	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
70	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
75	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
80	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
85	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
90	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
95	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
100	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
105	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
110	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
115	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
120	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
125	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
130	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
135	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
140	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
145	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
150	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
155	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
160	0.509	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
165	0.509	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511
170	0.509	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511
175	0.509	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512
180	0.509	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512
185	0.509	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513
190	0.521	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513
195	0.533	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513
200	0.545	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514
205	0.556	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514
210	0.567	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515
215	0.578	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515
220	0.588	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516
225	0.598	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516
230	0.608	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517
235	0.617	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517
240	0.627	0.518	0.518	0.518	0.518	0.518	0.518	0.518	0.518	0.518	0.518
245	0.636	0.518	0.518	0.518	0.518	0.518	0.518	0.518	0.518	0.518	0.518
250	0.645	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519
255	0.653	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533
260	0.762	0.762	0.762	0.762	0.762	0.762	0.762	0.762	0.762	0.762	0.762
265	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991
270	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220
275	1.449	1.449	1.449	1.449	1.449	1.449	1.449	1.449	1.449	1.449	1.449
280	1.678	1.678	1.678	1.678	1.678	1.678	1.678	1.678	1.678	1.678	1.678
285	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908
290	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137
295	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366
300	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595
305	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824
310	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053
315	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282
320	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512

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Table 12: Nullifire SC901/902 Columns – 30 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	0.579	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
55	0.579	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
60	0.579	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
65	0.579	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
70	0.639	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
75	0.695	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
80	0.749	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
85	0.801	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
90	0.850	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
95	0.897	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
100	0.942	0.539	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
105	0.985	0.573	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
110	1.027	0.605	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
115	1.066	0.636	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
120	1.105	0.666	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
125	1.141	0.695	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
130	1.177	0.723	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
135	1.211	0.750	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
140	1.244	0.777	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
145	1.275	0.802	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
150	1.306	0.826	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
155	1.335	0.850	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
160	1.364	0.873	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
165	1.391	0.895	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511
170	1.418	0.917	0.513	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511
175	1.443	0.938	0.514	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512
180	1.468	0.958	0.515	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512
185	1.493	0.978	0.530	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513
190	1.516	0.997	0.544	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513
195	1.539	1.016	0.559	0.513	0.513	0.513	0.513	0.513	0.513	0.513	0.513
200	1.561	1.034	0.572	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514
205	1.582	1.051	0.586	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514
210	1.603	1.068	0.599	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515
215	1.623	1.085	0.612	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515
220	1.643	1.101	0.624	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516
225	1.662	1.117	0.636	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516
230	1.680	1.133	0.648	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517
235	1.698	1.148	0.660	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517
240	1.716	1.162	0.671	0.518	0.518	0.518	0.518	0.518	0.518	0.518	0.518
245	1.733	1.177	0.682	0.518	0.518	0.518	0.518	0.518	0.518	0.518	0.518
250	1.749	1.190	0.693	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519
255	1.766	1.204	0.703	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533
260	1.781	1.217	0.762	0.762	0.762	0.762	0.762	0.762	0.762	0.762	0.762
265	1.797	1.230	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991
270	1.812	1.243	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220
275	1.826	1.449	1.449	1.449	1.449	1.449	1.449	1.449	1.449	1.449	1.449
280	1.841	1.678	1.678	1.678	1.678	1.678	1.678	1.678	1.678	1.678	1.678
285	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908
290	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137
295	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366
300	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595
305	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824
310	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053
315	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282
320	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512

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Table 13: Nullifire SC901/902 Columns – 45 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	1.041	0.681	0.563	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
55	1.041	0.681	0.563	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
60	1.040	0.681	0.563	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
65	1.132	0.756	0.563	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
70	1.220	0.827	0.563	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
75	1.303	0.895	0.563	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
80	1.383	0.960	0.615	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
85	1.458	1.023	0.666	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
90	1.531	1.083	0.714	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
95	1.600	1.141	0.761	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
100	1.666	1.196	0.806	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
105	1.730	1.250	0.850	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
110	1.791	1.301	0.892	0.544	0.510	0.510	0.510	0.510	0.510	0.510	0.510
115	1.849	1.351	0.932	0.576	0.510	0.510	0.510	0.510	0.510	0.510	0.510
120	1.906	1.398	0.972	0.608	0.510	0.510	0.510	0.510	0.510	0.510	0.510
125	1.960	1.445	1.010	0.638	0.510	0.510	0.510	0.510	0.510	0.510	0.510
130	2.012	1.489	1.047	0.667	0.510	0.510	0.510	0.510	0.510	0.510	0.510
135	2.062	1.532	1.082	0.696	0.510	0.510	0.510	0.510	0.510	0.510	0.510
140	2.110	1.574	1.117	0.723	0.510	0.510	0.510	0.510	0.510	0.510	0.510
145	2.156	1.614	1.151	0.750	0.510	0.510	0.510	0.510	0.510	0.510	0.510
150	2.201	1.653	1.183	0.776	0.510	0.510	0.510	0.510	0.510	0.510	0.510
155	2.245	1.690	1.215	0.802	0.510	0.510	0.510	0.510	0.510	0.510	0.510
160	2.287	1.727	1.245	0.826	0.510	0.510	0.510	0.510	0.510	0.510	0.510
165	2.327	1.762	1.275	0.851	0.511	0.511	0.511	0.511	0.511	0.511	0.511
170	2.366	1.797	1.304	0.874	0.512	0.511	0.511	0.511	0.511	0.511	0.511
175	2.404	1.830	1.332	0.897	0.513	0.512	0.512	0.512	0.512	0.512	0.512
180	2.441	1.862	1.360	0.919	0.530	0.512	0.512	0.512	0.512	0.512	0.512
185	2.476	1.893	1.386	0.941	0.546	0.513	0.513	0.513	0.513	0.513	0.513
190	2.511	1.924	1.412	0.962	0.563	0.513	0.513	0.513	0.513	0.513	0.513
195	2.544	1.954	1.437	0.982	0.578	0.513	0.513	0.513	0.513	0.513	0.513
200	2.577	1.982	1.462	1.003	0.594	0.514	0.514	0.514	0.514	0.514	0.514
205	2.608	2.010	1.486	1.022	0.609	0.514	0.514	0.514	0.514	0.514	0.514
210	2.639	2.037	1.509	1.041	0.624	0.515	0.515	0.515	0.515	0.515	0.515
215	2.668	2.064	1.532	1.060	0.638	0.515	0.515	0.515	0.515	0.515	0.515
220	2.697	2.090	1.554	1.078	0.653	0.516	0.516	0.516	0.516	0.516	0.516
225	2.725	2.115	1.576	1.096	0.666	0.516	0.516	0.516	0.516	0.516	0.516
230	2.752	2.139	1.597	1.114	0.680	0.517	0.517	0.517	0.517	0.517	0.517
235	2.779	2.163	1.618	1.131	0.693	0.517	0.517	0.517	0.517	0.517	0.517
240	2.805	2.186	1.638	1.147	0.706	0.518	0.518	0.518	0.518	0.518	0.518
245	2.830	2.209	1.657	1.164	0.719	0.518	0.518	0.518	0.518	0.518	0.518
250	2.854	2.231	1.677	1.179	0.731	0.519	0.519	0.519	0.519	0.519	0.519
255	2.878	2.253	1.695	1.195	0.744	0.533	0.533	0.533	0.533	0.533	0.533
260	2.901	2.274	1.714	1.210	0.756	0.762	0.762	0.762	0.762	0.762	0.762
265	2.924	2.295	1.732	1.225	0.991	0.991	0.991	0.991	0.991	0.991	0.991
270	2.946	2.315	1.749	1.240	1.220	1.220	1.220	1.220	1.220	1.220	1.220
275	2.968	2.334	1.766	1.449	1.449	1.449	1.449	1.449	1.449	1.449	1.449
280	2.989	2.353	1.783	1.678	1.678	1.678	1.678	1.678	1.678	1.678	1.678
285	3.009	2.372	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908	1.908
290	3.029	2.391	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137	2.137
295	3.049	2.409	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366
300	3.068	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595
305	3.087	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824
310	3.105	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053
315	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282
320	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512

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Table 14: Nullifire SC901/902 Columns – 60 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	1.686	1.147	0.813	0.608	0.572	0.538	0.532	0.532	0.510	0.510	0.510
55	1.686	1.147	0.813	0.608	0.572	0.538	0.532	0.532	0.510	0.510	0.510
60	1.686	1.147	0.813	0.608	0.572	0.538	0.532	0.532	0.510	0.510	0.510
65	1.686	1.249	0.898	0.608	0.572	0.538	0.532	0.532	0.510	0.510	0.510
70	1.801	1.347	0.979	0.675	0.572	0.538	0.532	0.532	0.510	0.510	0.510
75	1.911	1.440	1.057	0.740	0.572	0.538	0.532	0.532	0.510	0.510	0.510
80	2.016	1.530	1.133	0.802	0.572	0.538	0.532	0.532	0.510	0.510	0.510
85	2.116	1.616	1.205	0.862	0.572	0.538	0.532	0.532	0.510	0.510	0.510
90	2.212	1.698	1.275	0.920	0.619	0.538	0.532	0.532	0.510	0.510	0.510
95	2.303	1.777	1.342	0.977	0.665	0.538	0.532	0.532	0.510	0.510	0.510
100	2.391	1.853	1.407	1.031	0.710	0.538	0.532	0.532	0.510	0.510	0.510
105	2.475	1.927	1.470	1.084	0.753	0.576	0.532	0.532	0.510	0.510	0.510
110	2.555	1.997	1.531	1.135	0.795	0.613	0.532	0.532	0.510	0.510	0.510
115	2.632	2.065	1.589	1.184	0.836	0.649	0.532	0.532	0.510	0.510	0.510
120	2.707	2.131	1.646	1.232	0.875	0.683	0.564	0.532	0.510	0.510	0.510
125	2.778	2.194	1.701	1.279	0.914	0.717	0.595	0.532	0.510	0.510	0.510
130	2.847	2.255	1.754	1.324	0.951	0.750	0.625	0.532	0.510	0.510	0.510
135	2.913	2.314	1.805	1.368	0.988	0.783	0.654	0.532	0.510	0.510	0.510
140	2.976	2.371	1.855	1.410	1.023	0.814	0.683	0.558	0.510	0.510	0.510
145	3.038	2.426	1.903	1.452	1.058	0.844	0.711	0.583	0.510	0.510	0.510
150	3.097	2.479	1.950	1.492	1.091	0.874	0.738	0.608	0.510	0.510	0.510
155	3.154	2.531	1.996	1.531	1.124	0.903	0.765	0.632	0.510	0.510	0.510
160	3.210	2.581	2.040	1.569	1.156	0.932	0.791	0.656	0.510	0.510	0.510
165	3.263	2.629	2.083	1.606	1.187	0.959	0.816	0.679	0.514	0.511	0.511
170	3.315	2.676	2.124	1.642	1.218	0.986	0.841	0.702	0.519	0.511	0.511
175	3.365	2.722	2.165	1.677	1.247	1.013	0.865	0.724	0.523	0.512	0.512
180	3.413	2.766	2.204	1.711	1.276	1.038	0.888	0.745	0.541	0.512	0.512
185	3.460	2.809	2.242	1.745	1.304	1.063	0.912	0.766	0.559	0.513	0.513
190	3.506	2.851	2.280	1.777	1.332	1.088	0.934	0.787	0.577	0.513	0.513
195	3.550	2.891	2.316	1.809	1.359	1.112	0.956	0.807	0.594	0.513	0.513
200	3.592	2.931	2.351	1.840	1.385	1.136	0.978	0.827	0.611	0.514	0.514
205	3.634	2.969	2.386	1.870	1.411	1.158	0.999	0.846	0.628	0.514	0.514
210	3.674	3.006	2.420	1.900	1.436	1.181	1.020	0.865	0.644	0.515	0.515
215	3.713	3.043	2.452	1.928	1.460	1.203	1.040	0.883	0.660	0.515	0.515
220	3.752	3.078	2.484	1.956	1.484	1.224	1.060	0.902	0.676	0.516	0.516
225	3.788	3.113	2.515	1.984	1.508	1.245	1.079	0.919	0.691	0.516	0.516
230	3.824	3.146	2.546	2.011	1.531	1.266	1.098	0.937	0.706	0.517	0.517
235	3.859	3.179	2.575	2.037	1.553	1.286	1.117	0.954	0.721	0.517	0.517
240	3.894	3.211	2.604	2.063	1.575	1.306	1.135	0.971	0.735	0.518	0.518
245	3.927	3.242	2.633	2.088	1.597	1.325	1.153	0.987	0.749	0.518	0.518
250	3.959	3.272	2.660	2.112	1.618	1.344	1.171	1.003	0.763	0.519	0.519
255	3.991	3.302	2.687	2.136	1.639	1.363	1.188	1.019	0.777	0.533	0.533
260	4.021	3.331	2.714	2.160	1.659	1.381	1.205	1.034	0.790	0.762	0.762
265	4.051	3.359	2.740	2.183	1.679	1.399	1.221	1.050	0.991	0.991	0.991
270	4.080	3.386	2.765	2.205	1.698	1.417	1.237	1.220	1.220	1.220	1.220
275	4.109	3.413	2.790	2.227	1.717	1.434	1.449	1.449	1.449	1.449	1.449
280	4.137	3.440	2.814	2.249	1.736	1.678	1.678	1.678	1.678	1.678	1.678
285	4.164	3.465	2.837	2.270	1.908	1.908	1.908	1.908	1.908	1.908	1.908
290	4.190	3.490	2.861	2.291	2.137	2.137	2.137	2.137	2.137	2.137	2.137
295	4.216	3.515	2.883	2.366	2.366	2.366	2.366	2.366	2.366	2.366	2.366
300	4.241	3.539	2.905	2.595	2.595	2.595	2.595	2.595	2.595	2.595	2.595
305	4.266	3.563	2.927	2.824	2.824	2.824	2.824	2.824	2.824	2.824	2.824
310	4.290	3.586	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053	3.053
315	4.314	3.608	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282	3.282
320	4.337	3.630	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512

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Table 15: Nullifire SC901/902 Columns – 75 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50	2.774	1.986	1.233	0.921	0.661	0.595	0.569	0.569	0.549	0.530	0.510
55	2.774	1.986	1.233	0.921	0.661	0.595	0.569	0.569	0.549	0.530	0.510
60	2.774	1.986	1.233	0.921	0.661	0.595	0.569	0.569	0.549	0.530	0.510
65	2.774	1.986	1.344	1.015	0.739	0.595	0.569	0.569	0.549	0.530	0.510
70	2.774	1.986	1.450	1.105	0.815	0.663	0.569	0.569	0.549	0.530	0.510
75	2.774	1.986	1.552	1.192	0.889	0.729	0.630	0.569	0.549	0.530	0.510
80	2.774	2.100	1.650	1.276	0.960	0.793	0.689	0.592	0.549	0.530	0.510
85	2.774	2.209	1.745	1.357	1.029	0.855	0.747	0.645	0.549	0.530	0.510
90	2.893	2.313	1.836	1.436	1.096	0.915	0.803	0.697	0.549	0.530	0.510
95	3.006	2.414	1.924	1.512	1.161	0.974	0.858	0.748	0.594	0.530	0.510
100	3.115	2.511	2.009	1.585	1.224	1.031	0.911	0.797	0.637	0.530	0.510
105	3.219	2.604	2.091	1.656	1.285	1.086	0.962	0.845	0.680	0.530	0.510
110	3.319	2.693	2.170	1.725	1.344	1.139	1.012	0.892	0.722	0.530	0.510
115	3.415	2.779	2.246	1.792	1.401	1.192	1.061	0.937	0.762	0.530	0.510
120	3.508	2.863	2.320	1.857	1.457	1.242	1.109	0.981	0.802	0.530	0.510
125	3.596	2.943	2.391	1.920	1.511	1.292	1.155	1.024	0.840	0.561	0.510
130	3.682	3.021	2.461	1.981	1.564	1.340	1.200	1.066	0.878	0.592	0.510
135	3.764	3.095	2.528	2.040	1.616	1.387	1.244	1.107	0.915	0.622	0.510
140	3.843	3.168	2.593	2.097	1.666	1.433	1.287	1.147	0.951	0.651	0.510
145	3.919	3.238	2.656	2.153	1.714	1.477	1.328	1.186	0.986	0.680	0.510
150	3.993	3.306	2.717	2.207	1.762	1.520	1.369	1.225	1.020	0.708	0.510
155	4.064	3.371	2.776	2.260	1.808	1.563	1.409	1.262	1.053	0.735	0.510
160	4.133	3.435	2.834	2.312	1.853	1.604	1.448	1.298	1.086	0.762	0.510
165	4.199	3.496	2.890	2.362	1.897	1.644	1.485	1.334	1.118	0.788	0.517
170	4.263	3.556	2.944	2.410	1.940	1.684	1.522	1.368	1.149	0.814	0.524
175	4.325	3.614	2.997	2.458	1.982	1.722	1.559	1.402	1.180	0.839	0.531
180	4.386	3.670	3.049	2.504	2.022	1.760	1.594	1.435	1.210	0.864	0.551
185	4.444	3.725	3.099	2.549	2.062	1.796	1.628	1.468	1.239	0.888	0.570
190	4.500	3.778	3.147	2.593	2.101	1.832	1.662	1.499	1.268	0.912	0.589
195	4.555	3.829	3.195	2.636	2.139	1.867	1.695	1.531	1.296	0.935	0.607
200	4.608	3.879	3.241	2.677	2.176	1.901	1.727	1.561	1.323	0.958	0.625
205	4.660	3.928	3.286	2.718	2.212	1.935	1.759	1.591	1.350	0.980	0.643
210	4.710	3.975	3.330	2.758	2.248	1.967	1.790	1.620	1.377	1.002	0.661
215	4.759	4.022	3.373	2.797	2.282	1.999	1.820	1.648	1.403	1.024	0.678
220	4.806	4.066	3.414	2.835	2.316	2.031	1.850	1.676	1.428	1.045	0.695
225	4.852	4.110	3.455	2.872	2.349	2.061	1.879	1.704	1.453	1.065	0.711
230	4.897	4.153	3.495	2.908	2.382	2.091	1.907	1.730	1.477	1.086	0.727
235	4.940	4.194	3.533	2.943	2.414	2.121	1.935	1.757	1.501	1.106	0.743
240	4.983	4.235	3.571	2.978	2.445	2.150	1.963	1.782	1.525	1.125	0.759
245		4.274	3.608	3.012	2.475	2.178	1.989	1.808	1.548	1.144	0.775
250		4.313	3.644	3.045	2.505	2.206	2.016	1.832	1.570	1.163	0.790
255		4.351	3.679	3.077	2.534	2.233	2.041	1.857	1.592	1.182	0.805
260		4.387	3.714	3.109	2.563	2.259	2.066	1.881	1.614	1.200	0.819
265		4.423	3.748	3.140	2.591	2.285	2.091	1.904	1.635	1.218	0.991
270		4.458	3.781	3.170	2.618	2.311	2.115	1.927	1.656	1.235	1.220
275		4.492	3.813	3.200	2.645	2.336	2.139	1.949	1.677	1.449	1.449
280		4.526	3.844	3.229	2.671	2.361	2.163	1.972	1.697	1.678	1.678
285		4.558	3.875	3.258	2.697	2.385	2.186	1.993	1.908	1.908	1.908
290		4.590	3.906	3.286	2.723	2.408	2.208	2.137	2.137	2.137	2.137
295		4.622	3.935	3.313	2.747	2.432	2.366	2.366	2.366	2.366	2.366
300		4.652	3.964	3.340	2.772	2.595	2.595	2.595	2.595	2.595	2.595
305		4.682	3.993	3.367	2.824	2.824	2.824	2.824	2.824	2.824	2.824
310		4.711	4.020	3.392	3.053	3.053	3.053	3.053	3.053	3.053	3.053
315		4.740	4.048	3.418	3.282	3.282	3.282	3.282	3.282	3.282	3.282
320		4.768	4.074	3.512	3.512	3.512	3.512	3.512	3.512	3.512	3.512

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Table 16: Nullifire SC901/902 Columns – 90 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50		2.801	1.920	1.303	1.011	0.858	0.764	0.676	0.626	0.605	0.544
55		2.801	1.920	1.303	1.011	0.858	0.764	0.676	0.626	0.605	0.544
60		2.801	1.920	1.303	1.011	0.858	0.764	0.676	0.626	0.605	0.544
65		2.801	1.920	1.421	1.113	0.951	0.851	0.757	0.626	0.605	0.544
70		2.801	1.920	1.535	1.211	1.040	0.935	0.836	0.697	0.605	0.544
75		2.801	2.046	1.644	1.306	1.127	1.016	0.912	0.766	0.605	0.544
80		2.801	2.168	1.750	1.398	1.211	1.095	0.986	0.834	0.605	0.544
85		2.801	2.284	1.853	1.487	1.293	1.172	1.059	0.900	0.661	0.544
90		2.928	2.397	1.951	1.573	1.372	1.247	1.129	0.963	0.715	0.544
95		3.050	2.505	2.047	1.656	1.449	1.319	1.197	1.026	0.767	0.544
100		3.168	2.610	2.140	1.738	1.523	1.390	1.264	1.086	0.819	0.582
105		3.281	2.711	2.229	1.816	1.596	1.458	1.328	1.145	0.869	0.624
110		3.389	2.809	2.316	1.893	1.666	1.525	1.391	1.203	0.918	0.665
115		3.494	2.903	2.400	1.967	1.735	1.590	1.453	1.259	0.966	0.705
120		3.595	2.994	2.482	2.039	1.801	1.653	1.512	1.314	1.013	0.744
125		3.692	3.082	2.561	2.109	1.866	1.715	1.571	1.367	1.059	0.783
130		3.786	3.168	2.637	2.177	1.930	1.775	1.627	1.419	1.103	0.820
135		3.877	3.251	2.712	2.244	1.991	1.833	1.683	1.470	1.147	0.857
140		3.965	3.331	2.784	2.308	2.051	1.890	1.737	1.520	1.190	0.893
145		4.050	3.409	2.855	2.371	2.110	1.946	1.789	1.568	1.231	0.928
150		4.132	3.484	2.923	2.432	2.167	2.000	1.841	1.616	1.272	0.963
155		4.211	3.557	2.989	2.492	2.222	2.053	1.891	1.662	1.312	0.997
160		4.289	3.628	3.054	2.550	2.276	2.104	1.940	1.707	1.351	1.030
165		4.363	3.697	3.117	2.607	2.329	2.155	1.988	1.752	1.389	1.063
170		4.436	3.765	3.178	2.662	2.381	2.204	2.035	1.795	1.427	1.094
175		4.506	3.830	3.238	2.716	2.432	2.252	2.081	1.837	1.464	1.126
180		4.574	3.893	3.296	2.769	2.481	2.299	2.126	1.879	1.500	1.156
185		4.640	3.955	3.353	2.820	2.529	2.345	2.169	1.919	1.535	1.186
190		4.705	4.015	3.408	2.870	2.576	2.390	2.212	1.959	1.569	1.216
195		4.767	4.073	3.462	2.919	2.622	2.434	2.254	1.998	1.603	1.245
200		4.828	4.130	3.515	2.967	2.667	2.477	2.295	2.036	1.636	1.273
205		4.887	4.186	3.566	3.014	2.711	2.519	2.335	2.073	1.669	1.301
210		4.944	4.240	3.616	3.060	2.754	2.560	2.375	2.110	1.701	1.328
215			4.293	3.665	3.104	2.796	2.601	2.413	2.145	1.732	1.355
220			4.344	3.713	3.148	2.837	2.640	2.451	2.180	1.763	1.381
225			4.394	3.760	3.191	2.877	2.679	2.488	2.215	1.793	1.407
230			4.443	3.805	3.233	2.917	2.717	2.524	2.249	1.822	1.433
235			4.491	3.850	3.274	2.955	2.754	2.559	2.282	1.851	1.458
240			4.538	3.893	3.314	2.993	2.790	2.594	2.314	1.880	1.482
245			4.583	3.936	3.353	3.030	2.826	2.628	2.346	1.908	1.506
250			4.628	3.978	3.391	3.067	2.860	2.662	2.377	1.935	1.530
255			4.672	4.018	3.429	3.102	2.895	2.695	2.408	1.962	1.553
260			4.714	4.058	3.466	3.137	2.928	2.727	2.438	1.989	1.576
265			4.756	4.097	3.502	3.172	2.961	2.758	2.467	2.015	1.599
270			4.796	4.136	3.538	3.205	2.994	2.789	2.497	2.041	1.621
275			4.836	4.173	3.572	3.238	3.025	2.820	2.525	2.066	1.643
280			4.875	4.210	3.606	3.270	3.056	2.850	2.553	2.091	1.664
285			4.913	4.246	3.640	3.302	3.087	2.879	2.580	2.115	1.908
290			4.950	4.281	3.673	3.333	3.117	2.908	2.608	2.139	2.137
295			4.987	4.316	3.705	3.364	3.146	2.936	2.634	2.366	2.366
300			5.023	4.350	3.736	3.394	3.175	2.964	2.660	2.595	2.595
305			5.058	4.383	3.767	3.423	3.204	2.991	2.824	2.824	2.824
310			5.092	4.415	3.798	3.452	3.232	3.018	3.053	3.053	3.053
315				4.447	3.827	3.481	3.282	3.282	3.282	3.282	3.282
320				4.479	3.857	3.509	3.512	3.512	3.512	3.512	3.512

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Table 17: Nullifire SC901/902 Columns – 105 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50			2.824	1.964	1.362	1.192	1.088	0.990	0.853	0.649	0.607
55			2.824	1.964	1.362	1.192	1.088	0.990	0.853	0.649	0.607
60			2.824	1.964	1.362	1.192	1.088	0.990	0.853	0.649	0.607
65			2.824	1.964	1.486	1.307	1.196	1.092	0.947	0.730	0.607
70			2.824	1.964	1.606	1.417	1.301	1.191	1.038	0.809	0.607
75			2.824	2.097	1.722	1.525	1.403	1.287	1.126	0.885	0.673
80			2.824	2.224	1.835	1.629	1.501	1.381	1.213	0.960	0.737
85			2.824	2.348	1.944	1.730	1.597	1.472	1.297	1.033	0.800
90			2.958	2.467	2.050	1.828	1.691	1.561	1.378	1.104	0.862
95			3.087	2.582	2.152	1.923	1.781	1.647	1.458	1.173	0.921
100			3.211	2.694	2.252	2.016	1.869	1.730	1.535	1.241	0.980
105			3.331	2.802	2.348	2.106	1.955	1.812	1.611	1.307	1.037
110			3.448	2.907	2.442	2.193	2.038	1.891	1.684	1.371	1.093
115			3.560	3.008	2.533	2.278	2.119	1.968	1.756	1.434	1.148
120			3.668	3.106	2.621	2.361	2.198	2.044	1.826	1.496	1.201
125			3.773	3.202	2.707	2.441	2.275	2.117	1.894	1.556	1.254
130			3.875	3.294	2.791	2.519	2.350	2.188	1.961	1.614	1.305
135			3.973	3.384	2.872	2.596	2.423	2.258	2.026	1.672	1.355
140			4.069	3.471	2.951	2.670	2.494	2.326	2.089	1.728	1.404
145			4.161	3.556	3.028	2.742	2.563	2.393	2.151	1.783	1.452
150			4.251	3.639	3.103	2.813	2.631	2.457	2.211	1.836	1.499
155			4.338	3.719	3.176	2.882	2.697	2.521	2.271	1.889	1.545
160			4.423	3.797	3.247	2.949	2.761	2.582	2.328	1.940	1.590
165			4.505	3.873	3.317	3.015	2.824	2.643	2.385	1.990	1.634
170			4.585	3.947	3.385	3.079	2.886	2.702	2.440	2.040	1.678
175			4.662	4.019	3.451	3.141	2.946	2.759	2.494	2.088	1.720
180			4.738	4.089	3.515	3.202	3.005	2.816	2.547	2.135	1.762
185			4.811	4.157	3.578	3.262	3.062	2.871	2.599	2.181	1.803
190			4.883	4.224	3.640	3.320	3.118	2.925	2.650	2.227	1.843
195				4.289	3.700	3.377	3.173	2.978	2.699	2.271	1.882
200				4.352	3.758	3.433	3.227	3.029	2.748	2.315	1.921
205				4.414	3.816	3.487	3.279	3.080	2.796	2.358	1.959
210				4.475	3.872	3.540	3.331	3.129	2.842	2.399	1.996
215				4.533	3.926	3.592	3.381	3.178	2.888	2.441	2.032
220				4.591	3.980	3.643	3.430	3.225	2.933	2.481	2.068
225				4.647	4.032	3.693	3.478	3.272	2.977	2.520	2.104
230				4.702	4.084	3.742	3.526	3.318	3.020	2.559	2.138
235				4.756	4.134	3.790	3.572	3.362	3.062	2.597	2.172
240				4.809	4.183	3.837	3.617	3.406	3.104	2.635	2.206
245				4.860	4.231	3.883	3.662	3.449	3.144	2.672	2.238
250				4.910	4.278	3.928	3.705	3.491	3.184	2.708	2.271
255				4.960	4.324	3.972	3.748	3.533	3.223	2.743	2.302
260				5.008	4.370	4.015	3.790	3.573	3.262	2.778	2.334
265					4.414	4.058	3.831	3.613	3.300	2.812	2.364
270					4.457	4.099	3.872	3.652	3.337	2.846	2.394
275					4.500	4.140	3.911	3.690	3.373	2.879	2.424
280					4.542	4.180	3.950	3.728	3.409	2.912	2.453
285					4.582	4.220	3.988	3.765	3.444	2.944	2.482
290					4.623	4.258	4.026	3.801	3.478	2.975	2.510
295					4.662	4.296	4.062	3.837	3.512	3.006	2.538
300					4.701	4.333	4.099	3.872	3.546	3.036	2.595
305					4.739	4.370	4.134	3.906	3.578	3.066	2.824
310					4.776	4.405	4.169	3.940	3.611	3.096	3.053
315					4.812	4.441	4.203	3.973	3.642	3.282	3.282
320					4.848	4.475	4.237	4.006	3.674	3.512	3.512

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Table 18: Nullifire SC901/902 Columns – 120 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:										
	350	400	450	500	550	580	600	620	650	700	750
50				2.843	2.002	1.662	1.411	1.304	1.153	0.929	0.733
55				2.843	2.002	1.662	1.411	1.304	1.153	0.929	0.733
60				2.843	2.002	1.662	1.411	1.304	1.153	0.929	0.733
65				2.843	2.002	1.662	1.541	1.427	1.268	1.030	0.821
70				2.843	2.001	1.795	1.667	1.547	1.379	1.127	0.907
75				2.843	2.139	1.923	1.789	1.663	1.486	1.222	0.990
80				2.843	2.272	2.047	1.907	1.776	1.591	1.315	1.071
85				2.843	2.401	2.167	2.023	1.886	1.694	1.405	1.151
90				2.983	2.527	2.284	2.134	1.992	1.793	1.493	1.229
95				3.118	2.648	2.398	2.243	2.096	1.890	1.579	1.304
100				3.248	2.766	2.508	2.348	2.197	1.984	1.663	1.378
105				3.375	2.880	2.615	2.451	2.295	2.076	1.745	1.451
110				3.497	2.991	2.720	2.551	2.391	2.165	1.825	1.521
115				3.616	3.098	2.821	2.648	2.484	2.253	1.903	1.591
120				3.731	3.203	2.920	2.743	2.575	2.338	1.979	1.658
125				3.843	3.305	3.016	2.835	2.663	2.421	2.053	1.724
130				3.951	3.404	3.109	2.925	2.749	2.502	2.126	1.789
135				4.056	3.500	3.200	3.012	2.833	2.581	2.197	1.853
140				4.158	3.594	3.289	3.097	2.915	2.658	2.266	1.915
145				4.258	3.685	3.375	3.181	2.996	2.734	2.334	1.975
150				4.354	3.774	3.459	3.262	3.074	2.807	2.401	2.035
155				4.448	3.860	3.541	3.341	3.150	2.879	2.466	2.093
160				4.539	3.945	3.621	3.418	3.225	2.950	2.529	2.150
165				4.628	4.027	3.700	3.494	3.297	3.018	2.592	2.206
170				4.715	4.107	3.776	3.568	3.369	3.086	2.653	2.261
175				4.799	4.185	3.850	3.640	3.438	3.152	2.712	2.315
180				4.881	4.262	3.923	3.710	3.506	3.216	2.771	2.368
185					4.336	3.994	3.779	3.573	3.279	2.828	2.419
190					4.409	4.064	3.846	3.638	3.341	2.884	2.470
195					4.480	4.132	3.912	3.701	3.401	2.939	2.520
200					4.549	4.198	3.976	3.764	3.460	2.993	2.569
205					4.617	4.263	4.039	3.825	3.518	3.046	2.617
210					4.684	4.327	4.101	3.884	3.575	3.098	2.664
215					4.748	4.389	4.161	3.943	3.631	3.149	2.710
220					4.812	4.450	4.220	4.000	3.685	3.199	2.755
225					4.874	4.509	4.278	4.056	3.739	3.248	2.800
230					4.935	4.568	4.335	4.111	3.791	3.296	2.843
235						4.625	4.390	4.165	3.843	3.343	2.886
240						4.681	4.445	4.218	3.893	3.390	2.929
245						4.735	4.498	4.270	3.943	3.435	2.970
250						4.789	4.550	4.321	3.991	3.480	3.011
255						4.842	4.602	4.370	4.039	3.524	3.051
260						4.893	4.652	4.419	4.086	3.567	3.091
265						4.944	4.701	4.467	4.132	3.610	3.129
270						4.994	4.750	4.514	4.177	3.651	3.168
275						5.042	4.797	4.561	4.221	3.692	3.205
280							4.844	4.606	4.265	3.733	3.242
285							4.889	4.651	4.307	3.772	3.278
290							4.934	4.694	4.349	3.811	3.314
295							4.978	4.737	4.391	3.849	3.349
300							5.022	4.780	4.431	3.887	3.384
305							5.064	4.821	4.471	3.924	3.418
310								4.862	4.510	3.960	3.452
315								4.902	4.549	3.996	3.485
320								4.941	4.587	4.032	3.517

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Table 19: Nullifire SC901/902 Rectangular Hollow Sections – 15 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
50	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
55	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
60	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
65	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
70	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
75	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
80	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
85	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
90	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
95	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
100	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
105	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
110	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
115	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
120	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
125	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
130	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
135	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
140	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
145	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
150	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
155	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
160	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
165	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
170	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
175	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
180	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
185	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
190	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
195	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
200	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
205	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
210	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
215	0.977	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
220	0.995	0.968	0.968	0.968	0.968	0.968	0.968	0.968	0.968	0.968	0.968	0.968
225	1.012	1.012	1.012	1.012	1.012	1.012	1.012	1.012	1.012	1.012	1.012	1.012
230	1.029	1.037	1.037	1.037	1.037	1.037	1.037	1.037	1.037	1.037	1.037	1.037
235	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071
240	1.106	1.106	1.106	1.106	1.106	1.106	1.106	1.106	1.106	1.106	1.106	1.106
245	1.141	1.141	1.141	1.141	1.141	1.141	1.141	1.141	1.141	1.141	1.141	1.141
250	1.175	1.175	1.175	1.175	1.175	1.175	1.175	1.175	1.175	1.175	1.175	1.175
255	1.210	1.210	1.210	1.210	1.210	1.210	1.210	1.210	1.210	1.210	1.210	1.210
260	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244
265	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279
270	1.313	1.313	1.313	1.313	1.313	1.313	1.313	1.313	1.313	1.313	1.313	1.313
275	1.348	1.348	1.348	1.348	1.348	1.348	1.348	1.348	1.348	1.348	1.348	1.348
280	1.383	1.383	1.383	1.383	1.383	1.383	1.383	1.383	1.383	1.383	1.383	1.383
285	1.417	1.417	1.417	1.417	1.417	1.417	1.417	1.417	1.417	1.417	1.417	1.417
290	1.452	1.452	1.452	1.452	1.452	1.452	1.452	1.452	1.452	1.452	1.452	1.452
295	1.486	1.486	1.486	1.486	1.486	1.486	1.486	1.486	1.486	1.486	1.486	1.486
300	1.521	1.521	1.521	1.521	1.521	1.521	1.521	1.521	1.521	1.521	1.521	1.521
305	1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555
310	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590
315	1.625	1.625	1.625	1.625	1.625	1.625	1.625	1.625	1.625	1.625	1.625	1.625
320	1.659	1.659	1.659	1.659	1.659	1.659	1.659	1.659	1.659	1.659	1.659	1.659

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Table 19/cont: Nullifire SC901/902 Rectangular Hollow Sections – 15 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
325	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
330	1.728	1.728	1.728	1.728	1.728	1.728	1.728	1.728	1.728	1.728	1.728	1.728
335	1.763	1.763	1.763	1.763	1.763	1.763	1.763	1.763	1.763	1.763	1.763	1.763
340	1.797	1.797	1.797	1.797	1.797	1.797	1.797	1.797	1.797	1.797	1.797	1.797
345	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832
350	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867
355	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901
360	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936
365	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970
370	2.005	2.005	2.005	2.005	2.005	2.005	2.005	2.005	2.005	2.005	2.005	2.005

Mesh is required.

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Table 20: Nullifire SC901/902 Rectangular Hollow Sections – 30 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
50	1.122	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
55	1.122	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
60	1.122	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
65	1.122	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
70	1.122	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
75	1.218	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
80	1.311	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
85	1.399	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
90	1.484	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
95	1.565	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
100	1.644	0.973	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
105	1.719	1.032	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
110	1.792	1.088	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
115	1.862	1.143	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
120	1.929	1.196	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
125	1.995	1.248	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
130	2.058	1.298	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
135	2.118	1.346	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
140	2.177	1.392	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
145	2.234	1.438	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
150	2.289	1.482	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
155	2.343	1.524	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
160	2.394	1.566	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
165	2.445	1.606	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
170	2.493	1.645	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
175	2.540	1.683	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
180	2.586	1.720	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
185	2.631	1.756	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
190	2.674	1.791	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
195	2.716	1.825	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
200	2.757	1.858	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
205	2.796	1.891	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
210	2.835	1.922	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
215	2.873	1.953	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
220	2.909	1.983	0.968	0.968	0.968	0.968	0.968	0.968	0.968	0.968	0.968	0.968
225	2.945	2.012	1.002	1.002	1.002	1.002	1.002	1.002	1.002	1.002	1.002	1.002
230	2.980	2.041	1.037	1.037	1.037	1.037	1.037	1.037	1.037	1.037	1.037	1.037
235	3.014	2.069	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071
240	3.047	2.096	1.106	1.106	1.106	1.106	1.106	1.106	1.106	1.106	1.106	1.106
245	3.079	2.123	1.141	1.141	1.141	1.141	1.141	1.141	1.141	1.141	1.141	1.141
250	3.110	2.149	1.175	1.175	1.175	1.175	1.175	1.175	1.175	1.175	1.175	1.175
255	3.141	2.174	1.210	1.210	1.210	1.210	1.210	1.210	1.210	1.210	1.210	1.210
260	3.171	2.199	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244
265	3.200	2.223	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279
270	3.229	2.247	1.313	1.313	1.313	1.313	1.313	1.313	1.313	1.313	1.313	1.313
275	3.257	2.270	1.348	1.348	1.348	1.348	1.348	1.348	1.348	1.348	1.348	1.348
280	3.284	2.293	1.383	1.383	1.383	1.383	1.383	1.383	1.383	1.383	1.383	1.383
285	3.311	2.315	1.417	1.417	1.417	1.417	1.417	1.417	1.417	1.417	1.417	1.417
290	3.337	2.337	1.452	1.452	1.452	1.452	1.452	1.452	1.452	1.452	1.452	1.452
295	3.363	2.358	1.486	1.486	1.486	1.486	1.486	1.486	1.486	1.486	1.486	1.486
300	3.387	2.379	1.521	1.521	1.521	1.521	1.521	1.521	1.521	1.521	1.521	1.521
305	3.412	2.399	1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555
310	3.436	2.420	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590
315	3.459	2.439	1.625	1.625	1.625	1.625	1.625	1.625	1.625	1.625	1.625	1.625
320	3.482	2.458	1.659	1.659	1.659	1.659	1.659	1.659	1.659	1.659	1.659	1.659

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Table 20/cont: Nullifire SC901/902 Rectangular Hollow Sections – 30 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
325	3.505	2.477	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
330	3.527	2.496	1.728	1.728	1.728	1.728	1.728	1.728	1.728	1.728	1.728	1.728
335	3.548	2.514	1.763	1.763	1.763	1.763	1.763	1.763	1.763	1.763	1.763	1.763
340	3.569	2.532	1.797	1.797	1.797	1.797	1.797	1.797	1.797	1.797	1.797	1.797
345	3.590	2.549	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832
350	3.610	2.566	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867
355	3.630	2.583	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901
360	3.650	2.600	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936
365	3.669	2.616	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970
370	3.688	2.632	2.005	2.005	2.005	2.005	2.005	2.005	2.005	2.005	2.005	2.005

Mesh is required.

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Table 21: Nullifire SC901/902 Rectangular Hollow Sections – 45 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
50	1.974	1.383	1.066	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
55	1.974	1.383	1.066	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
60	1.974	1.383	1.066	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
65	1.974	1.383	1.066	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
70	2.126	1.508	1.066	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
75	2.271	1.629	1.066	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
80	2.410	1.745	1.160	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
85	2.543	1.857	1.251	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
90	2.671	1.965	1.339	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
95	2.794	2.069	1.424	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
100	2.913	2.170	1.507	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
105	3.027	2.266	1.587	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
110	3.136	2.360	1.664	1.036	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
115	3.242	2.451	1.739	1.095	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
120	3.344	2.538	1.811	1.152	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
125	3.443	2.623	1.882	1.208	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
130	3.538	2.705	1.950	1.263	1.005	0.988	0.965	0.965	0.965	0.965	0.965	0.965
135	3.630	2.785	2.017	1.316	1.052	0.988	0.965	0.965	0.965	0.965	0.965	0.965
140	3.718	2.862	2.081	1.367	1.099	0.988	0.965	0.965	0.965	0.965	0.965	0.965
145	3.804	2.936	2.144	1.418	1.144	0.988	0.965	0.965	0.965	0.965	0.965	0.965
150	3.888	3.009	2.205	1.467	1.188	0.988	0.965	0.965	0.965	0.965	0.965	0.965
155	3.968	3.079	2.264	1.514	1.231	0.988	0.965	0.965	0.965	0.965	0.965	0.965
160	4.046	3.148	2.322	1.561	1.272	0.988	0.965	0.965	0.965	0.965	0.965	0.965
165	4.122	3.214	2.378	1.606	1.313	0.988	0.965	0.965	0.965	0.965	0.965	0.965
170	4.195	3.279	2.433	1.650	1.353	0.988	0.965	0.965	0.965	0.965	0.965	0.965
175	4.267	3.341	2.486	1.693	1.392	0.988	0.965	0.965	0.965	0.965	0.965	0.965
180	4.336	3.403	2.538	1.736	1.430	0.988	0.965	0.965	0.965	0.965	0.965	0.965
185	4.403	3.462	2.589	1.777	1.467	1.019	0.965	0.965	0.965	0.965	0.965	0.965
190	4.468	3.520	2.638	1.817	1.504	1.050	0.965	0.965	0.965	0.965	0.965	0.965
195	4.531	3.576	2.686	1.856	1.539	1.079	0.965	0.965	0.965	0.965	0.965	0.965
200	4.593	3.631	2.733	1.894	1.574	1.108	0.965	0.965	0.965	0.965	0.965	0.965
205	4.653	3.684	2.779	1.932	1.608	1.137	0.965	0.965	0.965	0.965	0.965	0.965
210	4.711	3.736	2.824	1.969	1.641	1.165	0.965	0.965	0.965	0.965	0.965	0.965
215	4.768	3.787	2.868	2.004	1.674	1.192	0.965	0.965	0.965	0.965	0.965	0.965
220	4.824	3.837	2.910	2.039	1.705	1.219	0.968	0.968	0.968	0.968	0.968	0.968
225	4.877	3.885	2.952	2.074	1.736	1.245	1.002	1.002	1.002	1.002	1.002	1.002
230	4.930	3.932	2.993	2.107	1.767	1.271	1.037	1.037	1.037	1.037	1.037	1.037
235	4.981	3.978	3.033	2.140	1.797	1.296	1.071	1.071	1.071	1.071	1.071	1.071
240	5.031	4.023	3.072	2.172	1.826	1.321	1.106	1.106	1.106	1.106	1.106	1.106
245	5.080	4.067	3.110	2.204	1.855	1.345	1.141	1.141	1.141	1.141	1.141	1.141
250	5.127	4.110	3.147	2.235	1.883	1.368	1.175	1.175	1.175	1.175	1.175	1.175
255	5.174	4.152	3.184	2.265	1.910	1.392	1.210	1.210	1.210	1.210	1.210	1.210
260	5.219	4.193	3.219	2.294	1.937	1.415	1.244	1.244	1.244	1.244	1.244	1.244
265	5.263	4.233	3.254	2.323	1.964	1.437	1.279	1.279	1.279	1.279	1.279	1.279
270	5.306	4.272	3.288	2.352	1.990	1.459	1.313	1.313	1.313	1.313	1.313	1.313
275	5.348	4.310	3.322	2.380	2.015	1.480	1.348	1.348	1.348	1.348	1.348	1.348
280	5.390	4.348	3.355	2.407	2.040	1.502	1.383	1.383	1.383	1.383	1.383	1.383
285	5.430	4.385	3.387	2.434	2.065	1.522	1.417	1.417	1.417	1.417	1.417	1.417
290	5.469	4.421	3.419	2.460	2.089	1.543	1.452	1.452	1.452	1.452	1.452	1.452
295	5.508	4.456	3.450	2.486	2.112	1.563	1.486	1.486	1.486	1.486	1.486	1.486
300	5.546	4.490	3.480	2.511	2.135	1.583	1.521	1.521	1.521	1.521	1.521	1.521
305	5.583	4.524	3.510	2.536	2.158	1.602	1.555	1.555	1.555	1.555	1.555	1.555
310	5.619	4.557	3.539	2.561	2.180	1.621	1.590	1.590	1.590	1.590	1.590	1.590
315	5.654	4.590	3.567	2.585	2.202	1.625	1.625	1.625	1.625	1.625	1.625	1.625
320	5.689	4.621	3.595	2.608	2.224	1.659	1.659	1.659	1.659	1.659	1.659	1.659

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Table 21/cont: Nullifire SC901/902 Rectangular Hollow Sections – 45 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
325	5.723	4.653	3.623	2.631	2.245	1.694	1.694	1.694	1.694	1.694	1.694	1.694
330	5.756	4.683	3.650	2.654	2.266	1.728	1.728	1.728	1.728	1.728	1.728	1.728
335	5.789	4.713	3.676	2.677	2.286	1.763	1.763	1.763	1.763	1.763	1.763	1.763
340	5.820	4.743	3.703	2.698	2.306	1.797	1.797	1.797	1.797	1.797	1.797	1.797
345	5.852	4.771	3.728	2.720	2.326	1.832	1.832	1.832	1.832	1.832	1.832	1.832
350	5.882	4.800	3.753	2.741	2.346	1.867	1.867	1.867	1.867	1.867	1.867	1.867
355	5.913	4.828	3.778	2.762	2.365	1.901	1.901	1.901	1.901	1.901	1.901	1.901
360	5.942	4.855	3.802	2.783	2.384	1.936	1.936	1.936	1.936	1.936	1.936	1.936
365	5.971	4.882	3.826	2.803	2.402	1.970	1.970	1.970	1.970	1.970	1.970	1.970
370	5.999	4.908	3.849	2.823	2.420	2.005	2.005	2.005	2.005	2.005	2.005	2.005

Mesh is required.

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Table 22: Nullifire SC901/902 Rectangular Hollow Sections – 60 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
50	2.715	2.087	1.696	1.318	1.124	1.042	0.997	0.993	0.988	0.977	0.965	0.965
55	2.715	2.087	1.696	1.318	1.124	1.042	0.997	0.993	0.988	0.977	0.965	0.965
60	2.715	2.087	1.696	1.318	1.124	1.042	0.997	0.993	0.988	0.977	0.965	0.965
65	2.927	2.269	1.696	1.318	1.124	1.042	0.997	0.993	0.988	0.977	0.965	0.965
70	3.129	2.444	1.845	1.318	1.124	1.042	0.997	0.993	0.988	0.977	0.965	0.965
75	3.323	2.612	1.989	1.438	1.235	1.042	0.997	0.993	0.988	0.977	0.965	0.965
80	3.509	2.775	2.128	1.554	1.343	1.042	0.997	0.993	0.988	0.977	0.965	0.965
85	3.687	2.931	2.262	1.667	1.447	1.134	0.997	0.993	0.988	0.977	0.965	0.965
90	3.859	3.081	2.392	1.777	1.549	1.224	0.997	0.993	0.988	0.977	0.965	0.965
95	4.023	3.226	2.517	1.883	1.647	1.312	0.997	0.993	0.988	0.977	0.965	0.965
100	4.182	3.366	2.639	1.986	1.743	1.397	1.070	0.993	0.988	0.977	0.965	0.965
105	4.334	3.501	2.756	2.086	1.836	1.479	1.142	0.993	0.988	0.977	0.965	0.965
110	4.481	3.632	2.870	2.183	1.926	1.560	1.213	0.993	0.988	0.977	0.965	0.965
115	4.622	3.758	2.980	2.277	2.014	1.638	1.282	1.055	0.988	0.977	0.965	0.965
120	4.759	3.880	3.088	2.369	2.100	1.714	1.349	1.116	0.988	0.977	0.965	0.965
125	4.891	3.998	3.191	2.458	2.183	1.789	1.415	1.176	0.988	0.977	0.965	0.965
130	5.018	4.113	3.292	2.545	2.264	1.861	1.479	1.234	0.997	0.977	0.965	0.965
135	5.141	4.224	3.390	2.629	2.343	1.932	1.541	1.291	1.048	0.977	0.965	0.965
140	5.260	4.331	3.485	2.712	2.420	2.001	1.602	1.346	1.099	0.977	0.965	0.965
145	5.375	4.435	3.578	2.792	2.495	2.068	1.661	1.401	1.148	0.977	0.965	0.965
150	5.486	4.536	3.668	2.870	2.568	2.134	1.720	1.454	1.196	0.977	0.965	0.965
155	5.594	4.635	3.755	2.946	2.640	2.198	1.776	1.506	1.243	0.977	0.965	0.965
160	5.698	4.730	3.840	3.020	2.709	2.261	1.832	1.556	1.289	0.977	0.965	0.965
165	5.799	4.822	3.923	3.092	2.777	2.322	1.886	1.606	1.334	0.977	0.965	0.965
170	5.898	4.912	4.004	3.162	2.843	2.382	1.939	1.655	1.378	0.977	0.965	0.965
175	5.993	5.000	4.082	3.231	2.908	2.440	1.991	1.702	1.421	1.013	0.965	0.965
180	6.085	5.085	4.159	3.298	2.971	2.497	2.042	1.749	1.464	1.049	0.965	0.965
185		5.168	4.233	3.364	3.033	2.553	2.092	1.795	1.505	1.084	0.965	0.965
190		5.248	4.306	3.428	3.093	2.607	2.141	1.839	1.546	1.119	0.965	0.965
195		5.327	4.377	3.490	3.152	2.661	2.188	1.883	1.586	1.153	0.965	0.965
200		5.403	4.446	3.551	3.210	2.713	2.235	1.926	1.625	1.186	0.965	0.965
205		5.478	4.514	3.611	3.266	2.764	2.281	1.968	1.663	1.218	0.965	0.965
210		5.550	4.580	3.670	3.321	2.814	2.326	2.009	1.700	1.250	0.965	0.965
215		5.621	4.644	3.727	3.375	2.863	2.370	2.050	1.737	1.282	0.965	0.965
220		5.690	4.707	3.782	3.428	2.911	2.413	2.089	1.773	1.312	0.968	0.968
225		5.758	4.769	3.837	3.480	2.958	2.455	2.128	1.809	1.343	1.002	1.002
230		5.823	4.829	3.891	3.530	3.005	2.496	2.166	1.844	1.372	1.037	1.037
235		5.888	4.887	3.943	3.580	3.050	2.537	2.204	1.878	1.402	1.071	1.071
240		5.950	4.945	3.994	3.628	3.094	2.577	2.241	1.911	1.430	1.106	1.106
245		6.011	5.001	4.044	3.676	3.138	2.616	2.277	1.944	1.458	1.141	1.141
250		6.071	5.056	4.093	3.722	3.180	2.654	2.312	1.977	1.486	1.175	1.175
255		6.130	5.110	4.142	3.768	3.222	2.692	2.347	2.009	1.513	1.210	1.210
260		6.187	5.162	4.189	3.813	3.263	2.729	2.381	2.040	1.540	1.244	1.244
265			5.214	4.235	3.857	3.303	2.765	2.414	2.070	1.566	1.279	1.279
270			5.264	4.280	3.900	3.343	2.800	2.447	2.101	1.592	1.313	1.313
275			5.314	4.325	3.942	3.381	2.835	2.480	2.130	1.617	1.348	1.348
280			5.362	4.368	3.984	3.419	2.870	2.511	2.159	1.642	1.383	1.383
285			5.409	4.411	4.024	3.457	2.904	2.543	2.188	1.667	1.417	1.417
290			5.456	4.453	4.064	3.493	2.937	2.573	2.216	1.691	1.452	1.452
295			5.502	4.494	4.103	3.529	2.969	2.604	2.244	1.715	1.486	1.486
300			5.546	4.535	4.142	3.565	3.001	2.633	2.271	1.739	1.521	1.521
305			5.590	4.574	4.180	3.599	3.033	2.662	2.298	1.762	1.555	1.555
310			5.633	4.613	4.217	3.634	3.064	2.691	2.324	1.784	1.590	1.590
315			5.675	4.652	4.253	3.667	3.094	2.719	2.350	1.807	1.625	1.625
320			5.716	4.689	4.289	3.700	3.124	2.747	2.376	1.829	1.659	1.659

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Table 22/cont: Nullifire SC901/902 Rectangular Hollow Sections – 60 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
325			5.757	4.726	4.324	3.732	3.154	2.775	2.401	1.850	1.694	1.694
330			5.797	4.762	4.359	3.764	3.183	2.801	2.426	1.872	1.728	1.728
335			5.836	4.798	4.393	3.796	3.211	2.828	2.450	1.893	1.763	1.763
340			5.874	4.833	4.426	3.827	3.239	2.854	2.474	1.913	1.797	1.797
345			5.912	4.867	4.459	3.857	3.267	2.880	2.498	1.934	1.832	1.832
350			5.949	4.901	4.491	3.887	3.294	2.905	2.521	1.954	1.867	1.867
355			5.985	4.934	4.523	3.916	3.321	2.930	2.544	1.974	1.901	1.901
360			6.021	4.967	4.554	3.945	3.347	2.954	2.566	1.993	1.936	1.936
365			6.056	4.999	4.585	3.973	3.373	2.978	2.589	2.012	1.970	1.970
370			6.091	5.031	4.615	4.001	3.398	3.002	2.610	2.031	2.005	2.005

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Table 23: Nullifire SC901/902 Rectangular Hollow Sections – 75 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
50	3.336	2.678	2.321	1.972	1.769	1.482	1.346	1.167	1.004	1.004	1.004	0.982
55	3.336	2.678	2.321	1.972	1.769	1.482	1.346	1.167	1.004	1.004	1.004	0.982
60	3.614	2.922	2.321	1.972	1.769	1.482	1.346	1.167	1.004	1.004	1.004	0.982
65	3.879	3.155	2.525	1.972	1.769	1.482	1.346	1.167	1.004	1.004	1.004	0.982
70	4.132	3.380	2.722	2.143	1.930	1.628	1.346	1.167	1.004	1.004	1.004	0.982
75	4.375	3.596	2.912	2.308	2.085	1.769	1.473	1.286	1.107	1.004	1.004	0.982
80	4.608	3.804	3.096	2.468	2.236	1.906	1.598	1.402	1.215	1.004	1.004	0.982
85	4.832	4.004	3.273	2.622	2.382	2.040	1.719	1.515	1.319	1.040	1.004	0.982
90	5.046	4.197	3.444	2.773	2.524	2.169	1.836	1.625	1.421	1.131	1.004	0.982
95	5.252	4.383	3.610	2.918	2.661	2.295	1.951	1.732	1.521	1.219	1.004	0.982
100	5.451	4.563	3.770	3.060	2.795	2.418	2.062	1.836	1.618	1.306	1.004	0.982
105	5.642	4.736	3.926	3.197	2.925	2.537	2.171	1.938	1.713	1.391	1.004	0.982
110	5.825	4.903	4.076	3.330	3.052	2.653	2.277	2.037	1.806	1.473	1.004	0.982
115		5.065	4.222	3.460	3.175	2.767	2.380	2.134	1.896	1.554	1.021	0.982
120		5.222	4.364	3.585	3.294	2.877	2.481	2.228	1.984	1.633	1.085	0.982
125		5.374	4.501	3.708	3.411	2.984	2.579	2.321	2.071	1.711	1.148	0.982
130		5.520	4.634	3.827	3.524	3.089	2.675	2.411	2.155	1.786	1.209	0.982
135		5.663	4.764	3.943	3.634	3.191	2.769	2.499	2.237	1.860	1.269	0.982
140		5.800	4.889	4.056	3.742	3.290	2.860	2.585	2.318	1.933	1.328	0.982
145		5.934	5.011	4.166	3.847	3.387	2.950	2.669	2.397	2.004	1.386	0.982
150		6.064	5.130	4.273	3.949	3.482	3.037	2.751	2.474	2.073	1.443	0.982
155			5.246	4.377	4.048	3.575	3.122	2.831	2.549	2.141	1.498	0.982
160			5.358	4.479	4.146	3.665	3.205	2.910	2.623	2.208	1.553	0.982
165			5.468	4.578	4.240	3.753	3.287	2.987	2.695	2.273	1.606	0.982
170			5.574	4.674	4.333	3.839	3.366	3.062	2.766	2.337	1.659	1.023
175			5.678	4.769	4.423	3.924	3.444	3.136	2.835	2.400	1.710	1.063
180			5.779	4.861	4.512	4.006	3.521	3.208	2.903	2.461	1.761	1.103
185			5.878	4.951	4.598	4.087	3.595	3.278	2.970	2.521	1.810	1.142
190			5.974	5.039	4.682	4.165	3.668	3.348	3.035	2.580	1.859	1.180
195			6.068	5.125	4.765	4.242	3.740	3.415	3.099	2.638	1.907	1.218
200				5.208	4.845	4.318	3.810	3.482	3.161	2.695	1.954	1.255
205				5.290	4.924	4.392	3.879	3.547	3.223	2.751	2.000	1.291
210				5.371	5.001	4.464	3.946	3.611	3.283	2.806	2.046	1.327
215				5.449	5.077	4.535	4.012	3.673	3.342	2.860	2.090	1.362
220				5.526	5.150	4.604	4.076	3.734	3.400	2.912	2.134	1.396
225				5.601	5.223	4.672	4.140	3.795	3.457	2.964	2.177	1.430
230				5.674	5.293	4.738	4.202	3.854	3.513	3.015	2.220	1.464
235				5.746	5.363	4.804	4.263	3.911	3.568	3.065	2.261	1.497
240				5.816	5.431	4.868	4.322	3.968	3.621	3.114	2.302	1.529
245				5.885	5.497	4.930	4.381	4.024	3.674	3.162	2.343	1.561
250				5.952	5.562	4.992	4.438	4.079	3.726	3.210	2.382	1.593
255				6.019	5.626	5.052	4.495	4.132	3.777	3.257	2.421	1.624
260				6.083	5.689	5.111	4.550	4.185	3.827	3.302	2.460	1.654
265				6.147	5.750	5.169	4.605	4.237	3.876	3.347	2.497	1.684
270				6.209	5.810	5.226	4.658	4.288	3.925	3.392	2.535	1.714
275					5.869	5.282	4.711	4.338	3.972	3.435	2.571	1.743
280					5.927	5.337	4.762	4.387	4.019	3.478	2.607	1.772
285					5.984	5.391	4.813	4.436	4.065	3.520	2.643	1.800
290					6.040	5.444	4.862	4.483	4.110	3.562	2.678	1.828
295					6.095	5.496	4.911	4.530	4.154	3.603	2.712	1.856
300					6.148	5.547	4.959	4.576	4.198	3.643	2.746	1.883
305					6.201	5.597	5.007	4.621	4.241	3.682	2.779	1.909
310					6.253	5.646	5.053	4.665	4.283	3.721	2.812	1.936
315						5.694	5.099	4.709	4.325	3.760	2.844	1.962
320						5.742	5.144	4.752	4.366	3.797	2.876	1.987

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Table 23/cont: Nullifire SC901/902 Rectangular Hollow Sections – 75 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
325						5.789	5.188	4.794	4.406	3.834	2.908	2.013
330						5.835	5.231	4.836	4.446	3.871	2.939	2.038
335						5.880	5.274	4.877	4.485	3.907	2.969	2.062
340						5.925	5.316	4.917	4.523	3.942	2.999	2.086
345						5.968	5.357	4.957	4.561	3.977	3.029	2.110
350						6.011	5.398	4.996	4.598	4.012	3.058	2.134
355						6.054	5.438	5.034	4.635	4.046	3.087	2.157
360						6.096	5.478	5.072	4.671	4.079	3.116	2.180
365						6.137	5.517	5.109	4.707	4.112	3.144	2.203
370						6.177	5.555	5.146	4.742	4.145	3.172	2.225

Mesh is required.

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Table 24: Nullifire SC901/902 Rectangular Hollow Sections – 90 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
50	4.179	3.459	2.837	2.527	2.317	2.020	1.924	1.740	1.563	1.312	1.004	1.004
55	4.179	3.459	2.837	2.527	2.317	2.020	1.924	1.740	1.563	1.312	1.004	1.004
60	4.512	3.756	3.101	2.527	2.317	2.020	1.924	1.740	1.563	1.312	1.004	1.004
65	4.831	4.042	3.354	2.751	2.529	2.216	1.924	1.740	1.563	1.312	1.004	1.004
70	5.136	4.316	3.599	2.968	2.735	2.407	2.099	1.905	1.719	1.454	1.046	1.004
75	5.428	4.579	3.835	3.177	2.935	2.591	2.269	2.066	1.871	1.592	1.163	1.016
80		4.833	4.063	3.381	3.129	2.771	2.435	2.223	2.019	1.728	1.278	1.028
85		5.077	4.284	3.578	3.316	2.945	2.596	2.375	2.163	1.859	1.390	1.041
90		5.313	4.497	3.768	3.499	3.115	2.753	2.524	2.304	1.988	1.500	1.053
95		5.540	4.703	3.954	3.676	3.279	2.906	2.669	2.441	2.114	1.607	1.142
100		5.759	4.902	4.133	3.847	3.439	3.055	2.810	2.574	2.237	1.712	1.230
105			5.095	4.308	4.014	3.595	3.200	2.948	2.705	2.357	1.815	1.316
110			5.283	4.477	4.177	3.747	3.341	3.082	2.832	2.474	1.915	1.401
115			5.464	4.642	4.335	3.895	3.479	3.213	2.957	2.588	2.014	1.483
120			5.640	4.802	4.488	4.039	3.613	3.341	3.078	2.700	2.110	1.565
125			5.810	4.958	4.638	4.179	3.744	3.466	3.197	2.810	2.205	1.644
130			5.976	5.109	4.783	4.316	3.872	3.588	3.313	2.917	2.297	1.722
135				5.256	4.925	4.449	3.997	3.707	3.427	3.022	2.388	1.799
140				5.400	5.063	4.579	4.119	3.823	3.537	3.125	2.477	1.874
145				5.539	5.198	4.706	4.238	3.937	3.646	3.225	2.564	1.948
150				5.676	5.329	4.830	4.354	4.048	3.752	3.323	2.649	2.021
155				5.808	5.457	4.951	4.468	4.157	3.856	3.420	2.733	2.092
160				5.937	5.582	5.069	4.579	4.264	3.957	3.514	2.815	2.162
165				6.064	5.704	5.184	4.687	4.368	4.057	3.607	2.896	2.230
170					5.823	5.297	4.794	4.469	4.154	3.697	2.975	2.298
175					5.939	5.407	4.897	4.569	4.250	3.786	3.053	2.364
180					6.053	5.515	4.999	4.667	4.343	3.873	3.129	2.429
185						5.620	5.099	4.762	4.434	3.958	3.204	2.494
190						5.723	5.196	4.856	4.524	4.042	3.277	2.557
195						5.824	5.291	4.948	4.612	4.124	3.349	2.618
200						5.923	5.385	5.037	4.698	4.205	3.420	2.679
205						6.019	5.476	5.125	4.783	4.284	3.490	2.739
210						6.114	5.566	5.212	4.866	4.361	3.558	2.798
215							5.654	5.296	4.947	4.438	3.625	2.856
220							5.740	5.379	5.027	4.512	3.691	2.913
225							5.824	5.461	5.105	4.586	3.756	2.969
230							5.907	5.541	5.182	4.658	3.820	3.025
235							5.988	5.619	5.257	4.729	3.883	3.079
240							6.068	5.696	5.331	4.798	3.945	3.132
245							6.146	5.771	5.404	4.867	4.006	3.185
250								5.845	5.475	4.934	4.065	3.237
255								5.918	5.546	5.000	4.124	3.288
260								5.990	5.614	5.065	4.182	3.338
265								6.060	5.682	5.129	4.239	3.388
270								6.129	5.749	5.191	4.295	3.437
275								6.196	5.814	5.253	4.350	3.485
280								6.263	5.878	5.314	4.404	3.532
285									5.942	5.374	4.458	3.579
290									6.004	5.432	4.510	3.625
295									6.065	5.490	4.562	3.670
300									6.125	5.547	4.613	3.715
305									6.184	5.603	4.664	3.759
310									6.242	5.658	4.713	3.803
315									6.300	5.712	4.762	3.845
320										5.766	4.810	3.888

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Table 24/cont: Nullifire SC901/902 Rectangular Hollow Sections – 90 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
325										5.818	4.858	3.929
330										5.870	4.904	3.970
335										5.921	4.950	4.011
340										5.972	4.996	4.051
345										6.021	5.041	4.090
350										6.070	5.085	4.129
355										6.118	5.128	4.168
360										6.165	5.171	4.206
365										6.212	5.213	4.243
370										6.258	5.255	4.280

Mesh is required.

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Table 25: Nullifire SC901/902 Rectangular Hollow Sections – 105 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
50	5.022	4.240	3.565	2.976	2.761	2.708	2.408	2.219	2.039	1.970	1.552	1.312
55	5.022	4.240	3.565	2.976	2.761	2.708	2.408	2.219	2.039	1.970	1.552	1.312
60	5.411	4.591	3.880	3.258	3.030	2.708	2.408	2.219	2.039	1.970	1.552	1.312
65		4.928	4.184	3.529	3.290	2.950	2.634	2.434	2.243	1.971	1.552	1.312
70		5.252	4.476	3.792	3.541	3.185	2.853	2.643	2.441	2.154	1.713	1.312
75		5.563	4.759	4.047	3.785	3.414	3.066	2.846	2.635	2.334	1.870	1.447
80			5.031	4.294	4.022	3.635	3.273	3.043	2.823	2.509	2.023	1.580
85			5.295	4.533	4.251	3.850	3.474	3.236	3.007	2.679	2.173	1.710
90			5.549	4.764	4.474	4.060	3.670	3.423	3.186	2.846	2.319	1.838
95				4.989	4.690	4.263	3.861	3.606	3.360	3.008	2.463	1.963
100				5.207	4.900	4.461	4.047	3.784	3.531	3.167	2.603	2.085
105				5.419	5.104	4.653	4.228	3.958	3.697	3.323	2.740	2.205
110				5.625	5.302	4.841	4.405	4.127	3.859	3.474	2.875	2.322
115				5.824	5.495	5.023	4.577	4.292	4.018	3.622	3.006	2.438
120					5.683	5.201	4.745	4.454	4.172	3.767	3.135	2.551
125					5.865	5.374	4.909	4.611	4.323	3.909	3.261	2.662
130						5.543	5.069	4.765	4.471	4.048	3.385	2.771
135						5.708	5.225	4.915	4.616	4.184	3.506	2.877
140						5.869	5.377	5.062	4.757	4.316	3.625	2.982
145						6.025	5.526	5.205	4.895	4.446	3.741	3.085
150							5.671	5.346	5.030	4.574	3.856	3.186
155							5.813	5.483	5.162	4.698	3.968	3.285
160							5.952	5.617	5.292	4.820	4.077	3.383
165							6.088	5.748	5.418	4.940	4.185	3.479
170								5.877	5.542	5.057	4.291	3.573
175								6.002	5.664	5.172	4.395	3.665
180									5.783	5.285	4.497	3.756
185									5.899	5.395	4.597	3.845
190									6.013	5.504	4.695	3.933
195									6.125	5.610	4.791	4.019
200										5.714	4.886	4.104
205										5.816	4.979	4.188
210										5.917	5.071	4.270
215										6.015	5.160	4.351
220										6.112	5.249	4.430
225											5.336	4.508
230											5.421	4.585
235											5.505	4.661
240											5.587	4.736
245											5.669	4.809
250											5.748	4.881
255											5.827	4.952
260											5.904	5.023
265											5.980	5.092
270											6.055	5.160
275											6.129	5.227
280											6.202	5.293
285												5.358
290												5.422
295												5.485
300												5.547
305												5.609
310												5.669
315												5.729
320												5.788

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Table 25/cont: Nullifire SC901/902 Rectangular Hollow Sections – 105 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
325												5.846
330												5.903
335												5.960
340												6.016
345												6.071
350												6.125
355												6.178
360												6.231
365												6.283
370												6.335

Mesh is required.

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Table 26: Nullifire SC901/902 Rectangular Hollow Sections – 120 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
50		5.021	4.293	3.658	3.426	3.099	2.794	2.657	2.523	2.398	2.179	1.771
55		5.021	4.293	3.658	3.426	3.099	2.794	2.657	2.523	2.398	2.179	1.771
60		5.426	4.659	3.988	3.743	3.396	3.073	2.869	2.675	2.398	2.179	1.771
65			5.013	4.308	4.050	3.684	3.343	3.128	2.922	2.629	2.179	1.771
70			5.353	4.617	4.347	3.964	3.606	3.380	3.163	2.855	2.380	1.948
75				4.917	4.635	4.236	3.862	3.625	3.398	3.075	2.576	2.122
80				5.207	4.915	4.499	4.110	3.864	3.627	3.289	2.768	2.292
85				5.488	5.186	4.756	4.352	4.096	3.850	3.499	2.956	2.459
90					5.449	5.005	4.587	4.322	4.068	3.703	3.139	2.623
95					5.704	5.247	4.816	4.543	4.280	3.903	3.319	2.783
100						5.482	5.039	4.758	4.487	4.098	3.494	2.940
105						5.712	5.257	4.968	4.689	4.288	3.666	3.093
110							5.469	5.172	4.886	4.475	3.834	3.244
115							5.675	5.372	5.078	4.657	3.999	3.392
120							5.877	5.566	5.266	4.834	4.160	3.537
125								5.756	5.450	5.008	4.318	3.679
130								5.942	5.629	5.179	4.473	3.819
135									5.805	5.345	4.625	3.956
140									5.976	5.508	4.773	4.090
145										5.668	4.919	4.222
150										5.824	5.062	4.352
155										5.977	5.202	4.479
160											5.340	4.604
165											5.475	4.727
170											5.607	4.848
175											5.737	4.966
180											5.865	5.083
185											5.990	5.197
190											6.113	5.310
195												5.420
200												5.529
205												5.636
210												5.741
215												5.845
220												5.947
225												6.047
230												6.146

Mesh is required.

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Table 27: Nullifire SC901/902 Circular Hollow Sections – 15 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
40	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
45	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
50	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
55	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
60	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
65	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
70	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
75	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
80	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
85	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
90	0.519	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487
95	0.571	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
100	0.620	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490
105	0.667	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491
110	0.712	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492
115	0.755	0.494	0.494	0.494	0.494	0.494	0.494	0.494	0.494	0.494	0.494	0.494
120	0.797	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495	0.495
125	0.837	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496
130	0.876	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497
135	0.913	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499	0.499
140	0.949	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
145	0.983	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501	0.501
150	1.016	0.503	0.502	0.502	0.502	0.502	0.502	0.502	0.502	0.502	0.502	0.502
155	1.048	0.528	0.504	0.504	0.504	0.504	0.504	0.504	0.504	0.504	0.504	0.504
160	1.080	0.552	0.505	0.505	0.505	0.505	0.505	0.505	0.505	0.505	0.505	0.505
165	1.110	0.575	0.506	0.506	0.506	0.506	0.506	0.506	0.506	0.506	0.506	0.506
170	1.139	0.598	0.507	0.507	0.507	0.507	0.507	0.507	0.507	0.507	0.507	0.507
175	1.167	0.620	0.509	0.509	0.509	0.509	0.509	0.509	0.509	0.509	0.509	0.509
180	1.194	0.641	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510
185	1.220	0.662	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511
190	1.246	0.682	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512	0.512
195	1.271	0.702	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514
200	1.295	0.721	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515
205	1.318	0.740	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516	0.516
210	1.341	0.758	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517	0.517
215	1.363	0.775	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519	0.519
220	1.384	0.792	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520
225	1.405	0.809	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533	0.533
230	1.425	0.825	0.557	0.557	0.557	0.557	0.557	0.557	0.557	0.557	0.557	0.557
235	1.445	0.841	0.582	0.582	0.582	0.582	0.582	0.582	0.582	0.582	0.582	0.582
240	1.464	0.856	0.606	0.606	0.606	0.606	0.606	0.606	0.606	0.606	0.606	0.606
245	1.483	0.871	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631
250	1.501	0.886	0.655	0.655	0.655	0.655	0.655	0.655	0.655	0.655	0.655	0.655
255	1.519	0.900	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680
260	1.536	0.914	0.704	0.704	0.704	0.704	0.704	0.704	0.704	0.704	0.704	0.704
265	1.553	0.928	0.729	0.729	0.729	0.729	0.729	0.729	0.729	0.729	0.729	0.729
270	1.569	0.941	0.753	0.753	0.753	0.753	0.753	0.753	0.753	0.753	0.753	0.753
275	1.585	0.954	0.778	0.778	0.778	0.778	0.778	0.778	0.778	0.778	0.778	0.778
280	1.601	0.967	0.802	0.802	0.802	0.802	0.802	0.802	0.802	0.802	0.802	0.802
285	1.616	0.979	0.827	0.827	0.827	0.827	0.827	0.827	0.827	0.827	0.827	0.827
290	1.631	0.991	0.851	0.851	0.851	0.851	0.851	0.851	0.851	0.851	0.851	0.851
295	1.645	1.003	0.876	0.876	0.876	0.876	0.876	0.876	0.876	0.876	0.876	0.876
300	1.660	1.015	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
305	1.674	1.026	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925
310	1.687	1.037	0.949	0.949	0.949	0.949	0.949	0.949	0.949	0.949	0.949	0.949

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Table 27/cont: Nullifire SC901/902 Circular Hollow Sections – 15 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
315	1.700	1.048	0.974	0.974	0.974	0.974	0.974	0.974	0.974	0.974	0.974	0.974
320	1.713	1.059	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
325	1.726	1.069	1.023	1.023	1.023	1.023	1.023	1.023	1.023	1.023	1.023	1.023
330	1.739	1.079	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047
335	1.751	1.089	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072
340	1.763	1.099	1.096	1.096	1.096	1.096	1.096	1.096	1.096	1.096	1.096	1.096
345	1.774	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122
350	1.786	1.146	1.146	1.146	1.146	1.146	1.146	1.146	1.146	1.146	1.146	1.146
355	1.797	1.171	1.171	1.171	1.171	1.171	1.171	1.171	1.171	1.171	1.171	1.171
360	1.808	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195
365	1.819	1.219	1.219	1.219	1.219	1.219	1.219	1.219	1.219	1.219	1.219	1.219
370	1.829	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243
375	1.840	1.549	1.549	1.549	1.549	1.549	1.549	1.549	1.549	1.549	1.549	1.549
380	2.277	2.277	2.277	2.277	2.277	2.277	2.277	2.277	2.277	2.277	2.277	2.277
385	3.005	3.005	3.005	3.005	3.005	3.005	3.005	3.005	3.005	3.005	3.005	3.005
390	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733
395	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461

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Table 28: Nullifire SC901/902 Circular Hollow Sections – 30 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
40	0.661	0.627	0.524	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
45	0.661	0.627	0.524	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
50	0.800	0.627	0.524	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
55	0.932	0.627	0.524	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
60	1.057	0.627	0.524	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
65	1.175	0.722	0.524	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
70	1.288	0.813	0.524	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
75	1.396	0.900	0.524	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
80	1.499	0.983	0.591	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
85	1.596	1.063	0.656	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486	0.486
90	1.690	1.140	0.718	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487
95	1.780	1.213	0.778	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489	0.489
100	1.865	1.284	0.836	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490
105	1.948	1.352	0.892	0.525	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491
110	2.026	1.418	0.945	0.568	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492
115	2.102	1.481	0.997	0.610	0.494	0.494	0.494	0.494	0.494	0.494	0.494	0.494
120	2.175	1.542	1.047	0.651	0.514	0.495	0.495	0.495	0.495	0.495	0.495	0.495
125	2.245	1.600	1.096	0.691	0.550	0.496	0.496	0.496	0.496	0.496	0.496	0.496
130	2.312	1.657	1.143	0.729	0.585	0.498	0.497	0.497	0.497	0.497	0.497	0.497
135	2.377	1.712	1.188	0.766	0.619	0.499	0.499	0.499	0.499	0.499	0.499	0.499
140	2.439	1.764	1.232	0.802	0.652	0.500	0.500	0.500	0.500	0.500	0.500	0.500
145	2.499	1.816	1.275	0.837	0.685	0.501	0.501	0.501	0.501	0.501	0.501	0.501
150	2.558	1.865	1.317	0.871	0.716	0.503	0.502	0.502	0.502	0.502	0.502	0.502
155	2.614	1.913	1.357	0.904	0.746	0.529	0.504	0.504	0.504	0.504	0.504	0.504
160	2.668	1.959	1.396	0.936	0.776	0.555	0.505	0.505	0.505	0.505	0.505	0.505
165	2.720	2.004	1.433	0.968	0.804	0.580	0.506	0.506	0.506	0.506	0.506	0.506
170	2.771	2.048	1.470	0.998	0.832	0.605	0.507	0.507	0.507	0.507	0.507	0.507
175	2.820	2.090	1.506	1.027	0.860	0.629	0.509	0.509	0.509	0.509	0.509	0.509
180	2.867	2.131	1.540	1.056	0.886	0.652	0.510	0.510	0.510	0.510	0.510	0.510
185	2.913	2.171	1.574	1.084	0.912	0.675	0.511	0.511	0.511	0.511	0.511	0.511
190	2.958	2.209	1.607	1.111	0.937	0.697	0.512	0.512	0.512	0.512	0.512	0.512
195	3.001	2.247	1.639	1.138	0.962	0.719	0.514	0.514	0.514	0.514	0.514	0.514
200	3.043	2.283	1.670	1.164	0.986	0.740	0.516	0.515	0.515	0.515	0.515	0.515
205	3.084	2.319	1.700	1.189	1.009	0.760	0.534	0.516	0.516	0.516	0.516	0.516
210	3.124	2.353	1.730	1.214	1.032	0.780	0.552	0.517	0.517	0.517	0.517	0.517
215	3.162	2.387	1.758	1.238	1.054	0.800	0.569	0.519	0.519	0.519	0.519	0.519
220	3.199	2.420	1.786	1.261	1.076	0.819	0.586	0.520	0.520	0.520	0.520	0.520
225	3.236	2.452	1.814	1.284	1.097	0.838	0.602	0.533	0.533	0.533	0.533	0.533
230	3.271	2.483	1.840	1.306	1.117	0.856	0.618	0.557	0.557	0.557	0.557	0.557
235	3.305	2.513	1.866	1.328	1.138	0.874	0.634	0.582	0.582	0.582	0.582	0.582
240	3.339	2.542	1.891	1.350	1.157	0.891	0.649	0.606	0.606	0.606	0.606	0.606
245	3.371	2.571	1.916	1.370	1.177	0.909	0.664	0.631	0.631	0.631	0.631	0.631
250	3.403	2.599	1.940	1.391	1.196	0.925	0.679	0.655	0.655	0.655	0.655	0.655
255	3.434	2.627	1.964	1.411	1.214	0.942	0.693	0.680	0.680	0.680	0.680	0.680
260	3.464	2.653	1.987	1.430	1.232	0.958	0.707	0.704	0.704	0.704	0.704	0.704
265	3.493	2.679	2.010	1.449	1.250	0.973	0.729	0.729	0.729	0.729	0.729	0.729
270	3.522	2.705	2.032	1.468	1.267	0.989	0.753	0.753	0.753	0.753	0.753	0.753
275	3.550	2.730	2.053	1.486	1.284	1.004	0.778	0.778	0.778	0.778	0.778	0.778
280	3.577	2.754	2.074	1.504	1.301	1.019	0.802	0.802	0.802	0.802	0.802	0.802
285	3.604	2.778	2.095	1.522	1.317	1.033	0.827	0.827	0.827	0.827	0.827	0.827
290	3.630	2.801	2.115	1.539	1.333	1.047	0.851	0.851	0.851	0.851	0.851	0.851
295	3.655	2.824	2.135	1.556	1.349	1.061	0.876	0.876	0.876	0.876	0.876	0.876
300	3.680	2.846	2.154	1.572	1.364	1.075	0.900	0.900	0.900	0.900	0.900	0.900
305	3.704	2.868	2.173	1.588	1.379	1.088	0.925	0.925	0.925	0.925	0.925	0.925
310	3.728	2.889	2.192	1.604	1.394	1.101	0.949	0.949	0.949	0.949	0.949	0.949

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Table 28/cont: Nullifire SC901/902 Circular Hollow Sections – 30 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
315	3.751	2.910	2.210	1.619	1.408	1.114	0.974	0.974	0.974	0.974	0.974	0.974
320	3.774	2.930	2.228	1.635	1.422	1.127	0.998	0.998	0.998	0.998	0.998	0.998
325	3.796	2.950	2.245	1.650	1.436	1.139	1.023	1.023	1.023	1.023	1.023	1.023
330	3.818	2.970	2.262	1.664	1.450	1.151	1.047	1.047	1.047	1.047	1.047	1.047
335	3.839	2.989	2.279	1.678	1.463	1.163	1.072	1.072	1.072	1.072	1.072	1.072
340	3.860	3.007	2.296	1.693	1.476	1.175	1.096	1.096	1.096	1.096	1.096	1.096
345	3.880	3.026	2.312	1.706	1.489	1.186	1.121	1.121	1.121	1.121	1.121	1.121
350	3.900	3.044	2.328	1.720	1.502	1.198	1.145	1.145	1.145	1.145	1.145	1.145
355	3.920	3.062	2.343	1.733	1.514	1.209	1.170	1.170	1.170	1.170	1.170	1.170
360	3.939	3.079	2.359	1.746	1.526	1.220	1.194	1.194	1.194	1.194	1.194	1.194
365	3.958	3.096	2.373	1.759	1.538	1.230	1.219	1.219	1.219	1.219	1.219	1.219
370	3.976	3.113	2.388	1.772	1.550	1.241	1.241	1.241	1.241	1.241	1.241	1.241
375	3.994	3.129	2.403	1.784	1.562	1.549	1.549	1.549	1.549	1.549	1.549	1.549
380	4.012	3.145	2.417	2.277	2.277	2.277	2.277	2.277	2.277	2.277	2.277	2.277
385	4.029	3.161	3.005	3.005	3.005	3.005	3.005	3.005	3.005	3.005	3.005	3.005
390	4.046	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733
395	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461

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Table 29: Nullifire SC901/902 Circular Hollow Sections – 45 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
40	1.392	0.934	0.730	0.654	0.634	0.554	0.539	0.498	0.486	0.486	0.486	0.486
45	1.392	0.934	0.730	0.654	0.634	0.554	0.539	0.498	0.486	0.486	0.486	0.486
50	1.591	1.096	0.730	0.654	0.634	0.554	0.539	0.498	0.486	0.486	0.486	0.486
55	1.779	1.250	0.857	0.654	0.634	0.554	0.539	0.498	0.486	0.486	0.486	0.486
60	1.957	1.398	0.979	0.654	0.634	0.554	0.539	0.498	0.486	0.486	0.486	0.486
65	2.126	1.538	1.096	0.752	0.634	0.554	0.539	0.498	0.486	0.486	0.486	0.486
70	2.288	1.672	1.208	0.845	0.722	0.554	0.539	0.498	0.486	0.486	0.486	0.486
75	2.441	1.801	1.316	0.936	0.806	0.630	0.539	0.498	0.486	0.486	0.486	0.486
80	2.588	1.924	1.420	1.023	0.887	0.703	0.539	0.498	0.486	0.486	0.486	0.486
85	2.727	2.042	1.519	1.107	0.965	0.773	0.602	0.498	0.486	0.486	0.486	0.486
90	2.861	2.155	1.615	1.188	1.041	0.842	0.664	0.555	0.506	0.487	0.487	0.487
95	2.989	2.264	1.707	1.266	1.114	0.908	0.723	0.611	0.506	0.489	0.489	0.489
100	3.111	2.369	1.796	1.342	1.185	0.971	0.781	0.664	0.556	0.490	0.490	0.490
105	3.228	2.469	1.882	1.415	1.253	1.033	0.837	0.716	0.604	0.491	0.491	0.491
110	3.341	2.566	1.965	1.485	1.319	1.093	0.891	0.767	0.651	0.492	0.492	0.492
115	3.449	2.660	2.045	1.554	1.384	1.151	0.943	0.816	0.697	0.532	0.494	0.494
120	3.553	2.749	2.123	1.620	1.446	1.208	0.994	0.864	0.741	0.572	0.495	0.495
125	3.652	2.836	2.198	1.684	1.506	1.263	1.044	0.910	0.785	0.611	0.496	0.496
130	3.748	2.920	2.270	1.746	1.564	1.316	1.092	0.955	0.827	0.649	0.497	0.497
135	3.841	3.001	2.340	1.807	1.621	1.367	1.139	0.999	0.868	0.685	0.499	0.499
140	3.930	3.079	2.408	1.865	1.676	1.417	1.184	1.041	0.907	0.721	0.500	0.500
145	4.016	3.154	2.474	1.922	1.730	1.466	1.228	1.083	0.946	0.756	0.501	0.501
150	4.099	3.228	2.537	1.977	1.782	1.513	1.272	1.123	0.984	0.790	0.503	0.502
155	4.179	3.298	2.599	2.031	1.832	1.559	1.313	1.162	1.020	0.823	0.530	0.504
160	4.256	3.367	2.659	2.083	1.881	1.604	1.354	1.201	1.056	0.855	0.557	0.505
165	4.331	3.433	2.717	2.133	1.929	1.648	1.394	1.238	1.091	0.887	0.583	0.506
170	4.403	3.498	2.774	2.183	1.975	1.690	1.433	1.274	1.125	0.918	0.609	0.507
175	4.473	3.560	2.829	2.231	2.021	1.732	1.471	1.310	1.158	0.948	0.634	0.509
180	4.541	3.621	2.882	2.277	2.065	1.772	1.507	1.344	1.191	0.977	0.658	0.510
185	4.607	3.679	2.934	2.323	2.108	1.812	1.543	1.378	1.222	1.006	0.682	0.511
190		3.736	2.985	2.367	2.149	1.850	1.578	1.411	1.253	1.034	0.706	0.512
195		3.792	3.034	2.410	2.190	1.887	1.613	1.443	1.284	1.061	0.729	0.514
200		3.846	3.082	2.452	2.230	1.924	1.646	1.474	1.313	1.088	0.751	0.515
205		3.898	3.129	2.493	2.269	1.959	1.679	1.505	1.342	1.114	0.773	0.516
210		3.949	3.174	2.533	2.307	1.994	1.710	1.535	1.370	1.139	0.794	0.517
215		3.999	3.218	2.572	2.344	2.028	1.742	1.564	1.397	1.164	0.815	0.519
220		4.047	3.261	2.610	2.380	2.061	1.772	1.593	1.424	1.189	0.836	0.520
225		4.094	3.303	2.647	2.415	2.094	1.802	1.621	1.451	1.212	0.856	0.533
230		4.140	3.344	2.683	2.449	2.126	1.831	1.648	1.476	1.236	0.875	0.557
235		4.185	3.385	2.719	2.483	2.157	1.859	1.675	1.502	1.259	0.895	0.582
240		4.229	3.424	2.753	2.516	2.187	1.887	1.702	1.526	1.281	0.913	0.606
245		4.271	3.462	2.787	2.548	2.217	1.914	1.727	1.550	1.303	0.932	0.631
250		4.312	3.499	2.820	2.579	2.246	1.941	1.752	1.574	1.325	0.950	0.655
255		4.353	3.535	2.853	2.610	2.274	1.967	1.777	1.597	1.346	0.968	0.680
260		4.392	3.571	2.884	2.640	2.302	1.993	1.801	1.620	1.366	0.985	0.704
265		4.431	3.606	2.915	2.670	2.329	2.018	1.825	1.642	1.387	1.002	0.729
270		4.469	3.640	2.946	2.698	2.355	2.042	1.848	1.664	1.406	1.019	0.753
275		4.505	3.673	2.975	2.727	2.382	2.066	1.871	1.685	1.426	1.036	0.778
280		4.541	3.706	3.004	2.754	2.407	2.090	1.893	1.706	1.445	1.052	0.802
285		4.576	3.737	3.033	2.781	2.432	2.113	1.915	1.727	1.464	1.068	0.827
290		4.611	3.768	3.060	2.808	2.457	2.135	1.936	1.747	1.482	1.083	0.851
295			3.799	3.088	2.834	2.481	2.158	1.957	1.767	1.500	1.098	0.876
300			3.829	3.114	2.859	2.504	2.179	1.977	1.786	1.518	1.113	0.900
305			3.858	3.140	2.884	2.527	2.201	1.998	1.805	1.535	1.128	0.925
310			3.887	3.166	2.909	2.550	2.222	2.018	1.824	1.552	1.142	0.949

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Table 29/cont: Nullifire SC901/902 Circular Hollow Sections – 45 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
320			3.915	3.191	2.933	2.572	2.242	2.037	1.842	1.569	1.157	0.974
315			3.942	3.216	2.956	2.594	2.262	2.056	1.860	1.586	1.171	0.998
325			3.969	3.240	2.979	2.616	2.282	2.075	1.878	1.602	1.184	1.023
330			3.995	3.264	3.002	2.637	2.302	2.093	1.896	1.618	1.198	1.047
335			4.021	3.287	3.024	2.657	2.321	2.111	1.913	1.633	1.211	1.072
340			4.047	3.310	3.046	2.678	2.340	2.129	1.929	1.649	1.224	1.096
345			4.072	3.332	3.067	2.698	2.358	2.147	1.946	1.664	1.237	1.121
350			4.096	3.354	3.088	2.717	2.376	2.164	1.962	1.678	1.250	1.145
355			4.120	3.376	3.109	2.736	2.394	2.181	1.978	1.693	1.262	1.170
360			4.143	3.397	3.129	2.755	2.411	2.197	1.994	1.707	1.274	1.194
365			4.167	3.418	3.149	2.774	2.429	2.213	2.009	1.721	1.286	1.219
370			4.189	3.439	3.169	2.792	2.445	2.229	2.024	1.735	1.298	1.243
375			4.211	3.459	3.188	2.810	2.462	2.245	2.039	1.749	1.549	1.549
380			4.233	3.478	3.207	2.828	2.478	2.261	2.261	2.261	2.261	2.261
385			4.255	3.498	3.225	3.005	3.005	3.005	3.005	3.005	3.005	3.005
390			4.276	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733	3.733
395			4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461	4.461

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Table 30: Nullifire SC901/902 Circular Hollow Sections – 60 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
40	2.124	1.555	1.136	0.814	0.705	0.688	0.661	0.582	0.580	0.550	0.518	0.486
45	2.124	1.555	1.136	0.814	0.705	0.688	0.661	0.582	0.580	0.550	0.518	0.486
50	2.382	1.769	1.316	0.966	0.848	0.688	0.661	0.582	0.580	0.550	0.518	0.486
55	2.626	1.973	1.488	1.112	0.985	0.813	0.661	0.582	0.580	0.550	0.518	0.486
60	2.857	2.168	1.653	1.252	1.116	0.933	0.770	0.671	0.580	0.550	0.518	0.486
65	3.078	2.354	1.811	1.387	1.243	1.048	0.875	0.770	0.673	0.550	0.518	0.486
70	3.287	2.532	1.962	1.517	1.365	1.160	0.977	0.866	0.763	0.621	0.518	0.486
75	3.487	2.702	2.108	1.642	1.483	1.267	1.075	0.959	0.850	0.701	0.518	0.486
80	3.677	2.865	2.248	1.763	1.596	1.371	1.170	1.049	0.935	0.778	0.548	0.486
85	3.858	3.021	2.382	1.879	1.706	1.471	1.262	1.135	1.017	0.853	0.613	0.486
90	4.032	3.171	2.512	1.991	1.812	1.568	1.351	1.219	1.096	0.926	0.675	0.487
95	4.198	3.315	2.637	2.099	1.914	1.662	1.438	1.301	1.173	0.996	0.736	0.512
100	4.357	3.454	2.757	2.204	2.013	1.753	1.521	1.380	1.247	1.065	0.795	0.563
105	4.509	3.587	2.873	2.305	2.109	1.841	1.602	1.456	1.320	1.131	0.853	0.612
110		3.715	2.985	2.403	2.201	1.927	1.681	1.530	1.390	1.196	0.909	0.660
115		3.838	3.093	2.497	2.291	2.009	1.757	1.603	1.458	1.258	0.963	0.707
120		3.957	3.198	2.589	2.378	2.089	1.831	1.673	1.524	1.319	1.016	0.753
125		4.072	3.299	2.678	2.462	2.167	1.903	1.741	1.589	1.379	1.068	0.797
130		4.183	3.397	2.764	2.544	2.243	1.972	1.807	1.652	1.436	1.118	0.841
135		4.290	3.492	2.847	2.623	2.316	2.040	1.871	1.713	1.492	1.167	0.883
140		4.393	3.583	2.928	2.700	2.388	2.106	1.934	1.772	1.547	1.214	0.924
145		4.493	3.672	3.007	2.775	2.457	2.170	1.995	1.830	1.601	1.261	0.965
150		4.590	3.758	3.083	2.847	2.524	2.233	2.054	1.886	1.652	1.306	1.004
155			3.842	3.157	2.918	2.590	2.293	2.112	1.941	1.703	1.350	1.042
160			3.923	3.229	2.987	2.654	2.353	2.168	1.994	1.752	1.393	1.080
165			4.002	3.299	3.053	2.716	2.410	2.223	2.046	1.801	1.436	1.116
170			4.078	3.368	3.118	2.776	2.466	2.276	2.097	1.848	1.477	1.152
175			4.152	3.434	3.182	2.835	2.521	2.328	2.147	1.894	1.517	1.187
180			4.224	3.498	3.243	2.892	2.575	2.379	2.195	1.938	1.556	1.221
185			4.295	3.561	3.303	2.948	2.627	2.429	2.242	1.982	1.594	1.255
190			4.363	3.622	3.362	3.003	2.678	2.477	2.288	2.025	1.632	1.287
195			4.429	3.682	3.419	3.056	2.727	2.524	2.333	2.066	1.669	1.319
200			4.494	3.740	3.475	3.108	2.776	2.570	2.377	2.107	1.704	1.351
205			4.557	3.797	3.529	3.159	2.823	2.615	2.420	2.147	1.739	1.381
210			4.618	3.852	3.582	3.208	2.869	2.659	2.462	2.186	1.774	1.411
215				3.906	3.633	3.257	2.914	2.703	2.503	2.224	1.807	1.441
220				3.959	3.684	3.304	2.958	2.745	2.543	2.262	1.840	1.469
225				4.010	3.733	3.350	3.001	2.786	2.582	2.298	1.872	1.498
230				4.060	3.781	3.395	3.043	2.826	2.621	2.334	1.904	1.525
235				4.109	3.828	3.439	3.085	2.865	2.658	2.369	1.935	1.552
240				4.157	3.874	3.482	3.125	2.904	2.695	2.403	1.965	1.579
245				4.204	3.919	3.524	3.165	2.942	2.731	2.437	1.995	1.605
250				4.250	3.963	3.566	3.203	2.979	2.767	2.470	2.024	1.630
255				4.295	4.006	3.606	3.241	3.015	2.801	2.502	2.052	1.655
260				4.338	4.048	3.646	3.278	3.050	2.835	2.533	2.080	1.680
265				4.381	4.089	3.684	3.314	3.085	2.868	2.564	2.108	1.704
270				4.423	4.129	3.722	3.350	3.119	2.901	2.595	2.135	1.728
275				4.464	4.169	3.759	3.385	3.152	2.933	2.624	2.161	1.751
280				4.504	4.208	3.796	3.419	3.185	2.964	2.654	2.187	1.774
285				4.544	4.245	3.831	3.452	3.217	2.995	2.682	2.212	1.796
290				4.582	4.282	3.866	3.485	3.249	3.025	2.710	2.237	1.818
295				4.620	4.319	3.900	3.517	3.279	3.054	2.738	2.262	1.839
300					4.354	3.934	3.549	3.310	3.083	2.765	2.286	1.861
305					4.389	3.967	3.580	3.339	3.112	2.792	2.309	1.881
310					4.423	3.999	3.610	3.368	3.139	2.818	2.333	1.902

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Table 30/cont: Nullifire SC901/902 Circular Hollow Sections – 60 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
315					4.457	4.031	3.640	3.397	3.167	2.843	2.355	1.922
320					4.490	4.062	3.669	3.425	3.194	2.869	2.378	1.942
325					4.522	4.092	3.698	3.453	3.220	2.893	2.400	1.961
330					4.554	4.122	3.726	3.480	3.246	2.918	2.421	1.980
335					4.585	4.152	3.754	3.506	3.272	2.941	2.443	1.999
340					4.615	4.181	3.781	3.532	3.297	2.965	2.464	2.018
345						4.209	3.808	3.558	3.321	2.988	2.484	2.036
350						4.237	3.834	3.583	3.345	3.011	2.504	2.054
355						4.264	3.860	3.608	3.369	3.033	2.524	2.071
360						4.291	3.885	3.632	3.393	3.055	2.544	2.089
365						4.317	3.910	3.656	3.416	3.076	2.563	2.106
370						4.343	3.935	3.680	3.438	3.098	2.582	2.122
375						4.369	3.959	3.703	3.460	3.118	2.601	2.139
380						4.394	3.982	3.726	3.482	3.139	2.619	2.277
385						4.418	4.006	3.748	3.504	3.159	3.005	3.005
390						4.443	4.029	3.770	3.733	3.733	3.733	3.733
395						4.467	4.461	4.461	4.461	4.461	4.461	4.461

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Table 31: Nullifire SC901/902 Circular Hollow Sections – 75 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
40	2.855	2.176	1.675	1.291	1.161	0.986	0.832	0.739	0.653	0.620	0.584	0.584
45	2.855	2.176	1.675	1.291	1.161	0.986	0.832	0.739	0.653	0.620	0.584	0.584
50	3.172	2.442	1.902	1.485	1.344	1.154	0.986	0.884	0.790	0.661	0.584	0.584
55	3.473	2.696	2.118	1.671	1.520	1.315	1.134	1.025	0.923	0.783	0.584	0.584
60	3.758	2.939	2.326	1.850	1.689	1.471	1.277	1.160	1.051	0.902	0.683	0.584
65	4.029	3.170	2.525	2.023	1.852	1.620	1.415	1.291	1.175	1.016	0.784	0.584
70	4.286	3.391	2.716	2.189	2.009	1.765	1.549	1.417	1.295	1.127	0.881	0.669
75	4.532	3.603	2.900	2.348	2.160	1.905	1.678	1.540	1.411	1.234	0.975	0.752
80		3.806	3.076	2.502	2.306	2.039	1.802	1.658	1.523	1.338	1.066	0.833
85		4.000	3.246	2.651	2.446	2.169	1.923	1.772	1.632	1.439	1.155	0.911
90		4.187	3.409	2.794	2.582	2.295	2.039	1.883	1.738	1.537	1.241	0.987
95		4.366	3.566	2.932	2.714	2.417	2.152	1.991	1.840	1.632	1.325	1.061
100		4.538	3.718	3.066	2.841	2.535	2.262	2.095	1.939	1.724	1.406	1.132
105			3.864	3.195	2.964	2.649	2.368	2.196	2.035	1.813	1.486	1.202
110			4.005	3.320	3.083	2.760	2.471	2.294	2.129	1.900	1.562	1.270
115			4.142	3.441	3.198	2.867	2.570	2.389	2.219	1.984	1.637	1.337
120			4.273	3.558	3.310	2.971	2.667	2.481	2.307	2.066	1.710	1.401
125			4.401	3.671	3.418	3.072	2.761	2.571	2.393	2.146	1.781	1.464
130			4.524	3.781	3.523	3.170	2.853	2.658	2.476	2.224	1.850	1.525
135				3.888	3.625	3.265	2.942	2.743	2.558	2.300	1.917	1.585
140				3.991	3.724	3.358	3.028	2.826	2.636	2.373	1.983	1.643
145				4.092	3.820	3.448	3.112	2.906	2.713	2.445	2.047	1.700
150				4.189	3.913	3.535	3.194	2.985	2.788	2.515	2.109	1.756
155				4.284	4.004	3.620	3.274	3.061	2.861	2.583	2.170	1.810
160				4.376	4.092	3.703	3.351	3.135	2.932	2.649	2.230	1.863
165				4.465	4.178	3.783	3.427	3.207	3.001	2.714	2.288	1.915
170				4.552	4.262	3.862	3.500	3.278	3.069	2.778	2.344	1.965
175					4.343	3.938	3.572	3.347	3.135	2.839	2.400	2.015
180					4.422	4.013	3.642	3.414	3.199	2.900	2.454	2.063
185					4.499	4.085	3.710	3.479	3.262	2.958	2.506	2.110
190					4.574	4.156	3.777	3.543	3.323	3.016	2.558	2.157
195						4.225	3.842	3.605	3.383	3.072	2.609	2.202
200						4.292	3.905	3.666	3.441	3.127	2.658	2.246
205						4.358	3.967	3.726	3.498	3.181	2.706	2.289
210						4.422	4.028	3.784	3.554	3.233	2.753	2.332
215						4.485	4.087	3.841	3.609	3.285	2.800	2.373
220						4.546	4.144	3.896	3.662	3.335	2.845	2.414
225						4.606	4.201	3.951	3.714	3.384	2.889	2.454
230							4.256	4.004	3.765	3.432	2.933	2.493
235							4.310	4.056	3.815	3.479	2.975	2.531
240							4.363	4.107	3.864	3.525	3.017	2.568
245							4.415	4.156	3.912	3.570	3.058	2.605
250							4.465	4.205	3.959	3.615	3.098	2.641
255							4.515	4.253	4.005	3.658	3.137	2.677
260							4.564	4.300	4.050	3.701	3.175	2.711
265							4.611	4.345	4.094	3.742	3.213	2.745
270								4.390	4.138	3.783	3.250	2.779
275								4.434	4.180	3.823	3.286	2.812
280								4.477	4.221	3.862	3.322	2.844
285								4.520	4.262	3.901	3.357	2.875
290								4.561	4.302	3.939	3.391	2.906
295								4.602	4.342	3.976	3.425	2.937
300									4.380	4.012	3.458	2.967
305									4.418	4.048	3.491	2.996
310									4.455	4.083	3.523	3.025

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Table 31/cont: Nullifire SC901/902 Circular Hollow Sections – 75 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
315									4.491	4.118	3.554	3.054
320									4.527	4.151	3.585	3.081
325									4.562	4.185	3.615	3.109
330									4.597	4.217	3.645	3.136
335										4.250	3.674	3.162
340										4.281	3.703	3.189
345										4.312	3.731	3.214
350										4.343	3.759	3.240
355										4.373	3.786	3.264
360										4.402	3.813	3.289
365										4.431	3.840	3.313
370										4.460	3.866	3.337
375										4.488	3.892	3.360
380										4.515	3.917	3.383
385										4.543	3.942	3.406
390										4.569	3.966	3.733
395										4.596	4.461	4.461

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Table 32: Nullifire SC901/902 Circular Hollow Sections – 90 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
40	3.587	2.797	2.214	1.767	1.616	1.413	1.234	1.126	1.025	0.888	0.688	0.642
45	3.587	2.797	2.214	1.767	1.616	1.413	1.234	1.126	1.025	0.888	0.688	0.642
50	3.963	3.116	2.488	2.004	1.840	1.619	1.424	1.306	1.197	1.047	0.829	0.642
55	4.320	3.420	2.749	2.231	2.055	1.818	1.608	1.481	1.363	1.201	0.965	0.763
60		3.709	3.000	2.449	2.261	2.009	1.785	1.649	1.523	1.350	1.097	0.880
65		3.986	3.240	2.658	2.460	2.193	1.955	1.811	1.678	1.494	1.224	0.993
70		4.251	3.470	2.860	2.652	2.370	2.120	1.969	1.827	1.633	1.348	1.104
75		4.504	3.692	3.055	2.837	2.542	2.280	2.120	1.972	1.768	1.468	1.211
80			3.904	3.242	3.015	2.707	2.434	2.267	2.112	1.898	1.585	1.315
85			4.109	3.423	3.187	2.868	2.583	2.409	2.248	2.025	1.698	1.416
90			4.306	3.597	3.353	3.022	2.727	2.547	2.379	2.148	1.807	1.514
95			4.496	3.765	3.514	3.172	2.867	2.681	2.507	2.267	1.914	1.609
100				3.928	3.669	3.317	3.002	2.810	2.631	2.383	2.018	1.702
105				4.085	3.819	3.457	3.133	2.935	2.751	2.495	2.118	1.792
110				4.237	3.965	3.593	3.260	3.057	2.867	2.604	2.216	1.880
115				4.384	4.105	3.725	3.384	3.175	2.980	2.710	2.312	1.966
120				4.527	4.242	3.853	3.504	3.290	3.090	2.814	2.404	2.049
125					4.374	3.977	3.620	3.402	3.197	2.914	2.495	2.131
130					4.502	4.097	3.733	3.510	3.301	3.012	2.583	2.210
135					4.627	4.214	3.843	3.616	3.403	3.107	2.668	2.287
140						4.328	3.950	3.718	3.501	3.199	2.752	2.363
145						4.438	4.054	3.818	3.597	3.289	2.833	2.436
150						4.546	4.155	3.915	3.690	3.377	2.913	2.508
155							4.254	4.010	3.781	3.463	2.990	2.578
160							4.349	4.102	3.870	3.547	3.066	2.646
165							4.443	4.192	3.956	3.628	3.140	2.713
170							4.534	4.280	4.040	3.707	3.212	2.779
175							4.623	4.365	4.123	3.785	3.282	2.843
180								4.448	4.203	3.861	3.351	2.905
185								4.530	4.281	3.935	3.418	2.966
190								4.609	4.358	4.007	3.484	3.026
195									4.432	4.078	3.548	3.084
200									4.505	4.147	3.611	3.141
205									4.576	4.214	3.673	3.197
210										4.280	3.733	3.252
215										4.345	3.792	3.306
220										4.408	3.850	3.358
225										4.470	3.906	3.410
230										4.530	3.961	3.460
235										4.589	4.015	3.510
240											4.068	3.558
245											4.120	3.606
250											4.171	3.652
255											4.221	3.698
260											4.270	3.743
265											4.318	3.787
270											4.366	3.830
275											4.412	3.872
280											4.457	3.914
285											4.502	3.955
290											4.546	3.995
295											4.588	4.034
300											4.631	4.073
305												4.111
310												4.148

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Table 32/cont: Nullifire SC901/902 Circular Hollow Sections – 90 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
315												4.185
320												4.221
325												4.257
330												4.291
335												4.326
340												4.360
345												4.393
350												4.425
355												4.458
360												4.489
365												4.520
370												4.551
375												4.581
380												4.611

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Table 33: Nullifire SC901/902 Circular Hollow Sections – 105 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
40	4.318	3.418	2.754	2.244	2.072	1.840	1.636	1.513	1.398	1.241	1.013	0.819
45	4.318	3.418	2.754	2.244	2.072	1.840	1.636	1.513	1.398	1.241	1.013	0.819
50		3.789	3.074	2.522	2.336	2.085	1.863	1.728	1.604	1.433	1.184	0.972
55		4.143	3.380	2.790	2.590	2.320	2.081	1.937	1.803	1.618	1.350	1.120
60		4.480	3.673	3.047	2.834	2.547	2.292	2.138	1.994	1.798	1.510	1.263
65			3.954	3.294	3.069	2.765	2.495	2.332	2.180	1.971	1.665	1.403
70			4.224	3.532	3.295	2.976	2.692	2.520	2.359	2.139	1.815	1.538
75			4.483	3.761	3.514	3.179	2.882	2.701	2.533	2.301	1.961	1.669
80				3.982	3.724	3.376	3.065	2.877	2.701	2.458	2.103	1.797
85				4.194	3.928	3.566	3.243	3.047	2.863	2.611	2.240	1.920
90				4.400	4.124	3.749	3.415	3.211	3.021	2.759	2.373	2.041
95				4.598	4.314	3.927	3.581	3.371	3.174	2.902	2.503	2.158
100					4.497	4.099	3.742	3.525	3.322	3.042	2.629	2.272
105						4.265	3.899	3.675	3.466	3.177	2.751	2.382
110						4.426	4.050	3.821	3.606	3.309	2.870	2.490
115						4.583	4.197	3.962	3.742	3.436	2.986	2.595
120							4.340	4.099	3.873	3.561	3.099	2.698
125							4.479	4.232	4.002	3.682	3.208	2.797
130							4.614	4.362	4.126	3.799	3.315	2.895
135								4.488	4.247	3.914	3.419	2.989
140								4.611	4.366	4.025	3.521	3.082
145									4.480	4.134	3.620	3.172
150									4.592	4.240	3.716	3.260
155										4.343	3.810	3.346
160										4.444	3.902	3.430
165										4.542	3.992	3.512
170										4.637	4.080	3.592
175											4.165	3.670
180											4.249	3.747
185											4.331	3.822
190											4.410	3.895
195											4.488	3.967
200											4.565	4.037
205											4.640	4.105
210												4.172
215												4.238
220												4.303
225												4.366
230												4.428
235												4.488
240												4.548
245												4.606

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Table 34: Nullifire SC901/902 Circular Hollow Sections – 120 Minutes

A/V (m^{-1})	Thickness (mm) required for a Steel Temperature (°C) of:											
	350	400	450	500	520	550	580	600	620	650	700	750
40		4.038	3.293	2.720	2.527	2.267	2.038	1.899	1.771	1.595	1.339	1.120
45		4.038	3.293	2.720	2.527	2.267	2.038	1.899	1.771	1.595	1.339	1.120
50		4.462	3.660	3.041	2.832	2.550	2.301	2.151	2.011	1.819	1.540	1.301
55			4.011	3.349	3.125	2.822	2.555	2.393	2.242	2.036	1.735	1.477
60			4.347	3.645	3.406	3.085	2.799	2.627	2.466	2.245	1.923	1.647
65				3.930	3.678	3.337	3.036	2.852	2.682	2.448	2.106	1.812
70				4.203	3.939	3.581	3.264	3.071	2.891	2.644	2.283	1.972
75				4.467	4.191	3.817	3.484	3.282	3.094	2.834	2.454	2.128
80					4.434	4.044	3.697	3.486	3.289	3.018	2.621	2.279
85						4.264	3.903	3.684	3.479	3.197	2.782	2.425
90						4.476	4.103	3.875	3.663	3.370	2.939	2.568
95							4.296	4.061	3.841	3.538	3.092	2.706
100							4.483	4.240	4.014	3.701	3.240	2.841
105								4.415	4.182	3.859	3.384	2.973
110								4.584	4.344	4.013	3.524	3.100
115									4.503	4.162	3.660	3.225
120										4.308	3.793	3.346
125										4.449	3.922	3.464
130										4.587	4.048	3.579
135											4.170	3.691
140											4.290	3.801
145											4.406	3.908
150											4.520	4.012
155											4.631	4.114
160												4.213
165												4.310
170												4.405
175												4.498

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