

Title:

Classification of Fire
Resistance Performance
In Accordance With
EN 13501-2: 2023

Approved Body No:

0833

Product Name:

"Flame Armour
60/90/120/240"

Report No:

416674

Issue No:

5

Prepared for:

**SSS Industrial Doors
Limited**
Red Earth Farm
Plantation Road
Bolton
BL7 0DD

Date:

16 September 2019

1. Introduction

This classification report defines the classification assigned to the element "Flame Armour 60/90/120/240" in accordance with the procedures given in BS EN 13501-2: 2023.

2. Details of classified product

2.1 General

For classification purposes, the element "Flame Armour 60/90/120/240" is defined as a rolling shutter doorset.

2.2 Product description

The element, "Flame Armour 60/90/120/240", is fully described in the test reports used in support of the Extended Application report, as detailed in Clause 3.1.

Briefly the product comprises a single skin steel rolling shutter, comprising interlocking steel laths and a profiled steel bottom bar. The shutter curtain is connected across its upper edge to a steel barrel housed within a steel headbox. The vertical edges of the shutter curtain locate into steel guides. A full specification of the element is provided in the test report used in support of the Extended Application report referenced below.

3. Test reports/extended application reports and test results in support of classification

3.1 Test reports in support of classification

Name of Laboratory	Name of Sponsor	Report No.	Test Standard
Warringtonfire	SSS Industrial Doors Ltd.	404452 (Issue 3)	BS EN 1634-1: 2014 + A1: 2018
Warringtonfire	SSS Industrial Doors Ltd.	429933/R (Issue 2)	BS EN 1634-1: 2014 + A1: 2018

Extended Application report in support of classification

Name of Laboratory	Name of Sponsor	Report No.	Extended Application Rules
Warringtonfire	SSS Industrial Doors Ltd.	416673 (Issue 3)	BS EN 15269-10: 2011

3.2 Test results

Test Results: WF Report No. 404452 (Issue 3)		
Test Standard: BS EN 1634-1: 2014 + A1: 2018		
Date of Sampling & Reference: 25 th October 2017 - WF Sample Report No. 381978		
Shutter Mounting: Onto fire exposed face of brick wall		
Integrity:	Sustained flaming	260 minutes*
	Gap gauge	260 minutes*
	Cotton pad	15 minutes
Insulation:		1 minutes
Radiation:	Time to exceed 15 kW/m ²	13 minutes
*The test was discontinued after a period of 264 minutes.		
Self-Closing:		C
Ability to Release:		Released
Date of Test:	8 th February 2019	

Test Results: WF Report No. 429933/R (Issue 2)		
Test Standard: BS EN 1634-1: 2014 + A1: 2018		
Date of Sampling & Reference: 24 th June 2020 - WF Sample Report No. 430087		
Shutter Mounting: Onto fire exposed face of timber stud partition		
Integrity:	Sustained flaming	103 minutes
	Gap gauge	132 minutes*
	Cotton pad	9 minutes
Insulation:		0 minutes
Radiation:	Time to exceed 15 kW/m ²	26 minutes
*The test was discontinued after a period of 132 minutes.		
Self-Closing:		C
Ability to Release:		Released
Date of Test:	7 th July 2020	

4. Classification and field of application

4.1 Reference of classification

This classification has been carried out in accordance with Clause 7 of EN 13501-2: 2023.

4.2 Classification

The product, "Flame Armour 60/90/120/240" may be classified according to the following combinations of performance parameters and classes as appropriate.

R	E	I	W		<i>t</i>	-	M	C	S	IncSlow	sn	ef	r
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Classification based upon test referenced WF Report No. 404452 (Issue 3)

Fire resistance classification: E60-C/E90-C/E120-C/E240-C

Classification based upon test referenced WF Report No. 429933 (Issue 2)

Fire resistance classification: E60-C/E90-C

Classification based upon EXAP referenced WF Report No. 416673 (Issue 3)

Fire resistance classification: E60/E90/E120/E240

4.3 Extended Field of Application (BS EN 15269-10: 2011)

As defined within WF Report No. 416673 (Issue 3). The tables detailing the extended field of application are also appended to this report.

5. Limitations

This classification document does not represent type approval or certification of the product.

Signed:



Co-author:



Approved:



***Thomas Rawstron**
Product Assessor

***Dominic Hankinson**
Technical Manager

***Timothy Benyon**
Senior Product Assessor

* For and on behalf of Warringtonfire.

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Issue No: 1	Issue Date: 16 September 2019
Signed By: D Hankinson – Principal Engineer	Approved By: A Kearns – Technical Manager

Issue No: 2	Re-Issue Date: 22 October 2019
Signed By: D Hankinson – Principal Engineer	Approved By: A Kearns – Technical Manager
- Corrections to tables	

Issue No: 3	Re-Issue Date: 13 January 2021
Signed By: D Hankinson – Principal Engineer	Approved By: A Kearns – Technical Manager
- Update to tables and classifications based upon modifications to 416673	

Issue No: 4	Re-Issue Date: 17 March 2023	
Signed By: T Rawstron – Product Assessor	Co-Author: D Hankinson – Technical Manager – Separating Elements	Approved By: T Benyon – Senior Product Assessor
- Separation of classifications to clarify that C classification relates to the tested design only. - Included Test Result tables (WF Report Nos. 404452: Issue 2 & 429933/R: Issue 2)		

Issue No: 5	Re-Issue Date: 08 May 2024	
Signed By: T Rawstron – Product Assessor	Co-Author: D Hankinson – Technical Manager – Separating Elements	Approved By: T Benyon – Senior Product Assessor
- Update references to WF Test Report No. 404452 (issue 3) and corrected a 'typo' in section 3.3. - Updated classification to the latest revision of the standard EN 13501-2: 2023		

Appendix 1: Summary of Extended Application Provided by WF Report No. 416673 (Issue 3)

The following tables have been derived based upon calculations undertaken in accordance with Annex B of EN 15269-10: 2011. The full calculations are retained in the technical file relating to this report.

60 Minutes Integrity Performance (for E60 classification) - Masonry/Concrete

	2.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.6	101	3.6	16.5	40	250	250	5	10	2	11	0.7
2.4	101	3.6	16.5	40	300	300	5	10	2	14	0.7
7	101	3.6	16.5	40	300	300	5	10	2	30	0.7
10	127	3.2	30	65	400	400	5	10	2	23	0.7

Width (m)	3										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.6	101	3.6	16.5	40	250	250	5	10	2	21	0.7
4.5	101	3.6	16.5	40	300	300	5	10	2	40	0.7
7	127	3.2	30	65	300	300	5	10	2	32	0.7
10	139.7	5	30	65	400	400	5	10	2	23	0.7

Width (m)	3.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.6	101	3.6	16.5	40	250	250	5	10	2	36	0.7
3	101	3.6	16.5	40	300	300	5	10	2	53	0.7
4.8	127	3.2	30	65	400	400	5	10	2	42	0.7
10	139.7	6.3	30	65	400	400	5	10	2	34	0.7

Width (m)	4										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.6	101	3.6	16.5	40	250	250	5	10	2	58	0.7
2.3	101	3.6	16.5	40	300	300	5	10	2	72	0.7
3.8	127	3.2	30	65	400	400	5	10	2	57	0.7
7	139.7	5	30	65	500	500	5	10	2	50	0.7
10	168.3	5	30	65	500	500	5	10	2	38	0.7

60 Minutes Integrity Performance (for E60 classification) - Masonry/Concrete continued

Width (m)	4.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.5	101	3.6	16.5	40	400	400	5	10	2	86	0.7
5	139.7	5	30	65	400	400	5	10	2	60	0.7
8.7	168.3	5	30	65	400	400	5	10	2	53	0.7
10	193.7	5	30	65	500	500	5	10	2	39	0.7

Width (m)	5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.1	101	3.6	16.5	40	400	400	5	12	2	110	0.7
4.2	139.7	5	30	65	400	400	5	12	2	79	0.7
6.9	168.3	5	30	65	400	400	6	12	2	66	0.7
10	193.7	8	40	65	500	500	5	12	2	42	0.7

Width (m)	5.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.2	127	3.2	30	65	400	400	6	10	2	96	0.7
2.8	139.7	5	30	65	400	400	6	10	2	89	0.7
4.8	168.3	5	30	65	400	400	6	10	2	74	0.7
7	193.7	5	30	65	500	500	5	10	2	64	0.7
10	193.7	8	40	65	600	600	8	12	2	61	0.7

Width (m)	6										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1	127	3.2	30	65	400	400	6	10	2	122	0.7
2.8	139.7	6.3	30	65	400	400	6	10	2	109	0.7
4	168.3	5	30	65	400	400	6	10	2	91	0.7
6	193.7	5	30	65	500	500	5	10	2	80	0.7
10	219	6.3	40	65	600	600	8	12	2	69	0.7

Width (m)	6.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.8	139.7	6.3	30	65	500	500	6	10	2	121	0.7
4.2	193.7	5	30	65	500	500	6	10	2	87	0.7
6.7	193.7	8	30	65	500	500	6	10	2	88	0.7
10	273	6.3	40	65	600	600	8	12	2	51	0.7

60 Minutes Integrity Performance (for E60 classification) - Masonry/Concrete continued

Width (m)	7										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
3.7	193.7	5	30	65	500	500	6	10	2	107	0.7
5.7	193.7	8	30	65	500	500	6	10	3	106	0.7
6.5	219	6.3	30	65	500	500	6	10	3	94	0.7
10	273	6.3	40	75	600	600	8	12	3	68	0.7

Width (m)	7.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.7	168.3	5	30	65	500	500	6	12	2	139	0.7
4.2	193.7	8	30	65	600	600	8	12	2	117	0.7
9	273	6.3	40	65	600	600	8	12	2	82	0.7
10	273	10	40	65	600	600	8	14	2	67	0.7

Width (m)	8										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
3.15	193.7	8	30	65	500	500	6	12	2	132	0.7
4	219	6.3	30	65	500	500	6	12	2	119	0.7
7	273	6.3	40	65	600	600	8	12	2	90	0.7
10	273	10	40	65	600	600	8	14	2	86	0.7

Width (m)	8.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.9	219	6.3	30	65	500	500	6	12	2	130	0.7
6	273	6.3	40	65	600	600	8	12	2	104	0.7
9.3	273	10	40	65	600	600	8	14	2	104	0.7

Width (m)	9										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.5	219	6.3	30	65	600	600	8	12	3	152	0.7
5.2	273	6.3	40	65	600	600	8	12	3	121	0.7
7	273	10	40	65	600	600	8	12	3	112	0.7

60 Minutes Integrity Performance (for E60 classification) - Masonry/Concrete continued

Width (m)	9.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.2	273	6.3	40	65	600	600	8	12	3	105	0.7
7	273	10	40	65	600	600	8	12	3	138	0.7

Width (m)	10										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
3.4	273	6.3	40	65	600	600	8	12	3	149	0.7
5.3	273	10	40	65	600	600	8	12	3	149	0.7
7	323.9	10	50	75	600	600	8	14	3	109	0.7

120 Minutes Integrity Performance (for E120 classification) - Masonry/Concrete

Width (m)	2.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.6	101	3.6	16.5	40	250	250	5	10	2	20	0.7
2.4	101	3.6	16.5	40	300	300	5	10	2	25	0.7
5.3	127	3.2	30	65	300	300	5	10	2	24	0.7
7	139.7	5	30	65	400	400	5	10	2	16	0.7
10	139.7	6.3	40	65	500	500	5	10	2	18	0.7

Width (m)	3										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.6	101	3.6	16.5	40	250	250	5	10	2	37	0.7
1.8	101	3.6	16.5	40	300	300	5	10	2	40	0.7
3	127	3.2	30	65	300	300	5	12	2	31	0.7
6	139.7	5	30	65	400	400	5	10	2	28	0.7
10	168.3	5	40	65	500	500	5	12	2	24	0.7

Width (m)	3.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.9	127	3.2	30	65	300	300	5	10	2	41	0.7
4	139.7	5	30	65	300	300	5	10	2	37	0.7
6.9	168.3	5	30	65	400	400	5	10	2	32	0.7
9.5	193.7	5	50	75	400	400	5	12	2	27	0.7
10	193.7	8	50	75	500	500	5	12	2	21	0.7

Width (m)	4										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.2	127	3.2	30	65	300	300	5	10	2	54	0.7
2.7	139.7	5	30	65	300	300	5	10	2	48	0.7
4.5	168.3	5	30	65	400	400	5	10	2	39	0.7
6.9	193.7	5	50	75	500	500	5	12	2	35	0.7
10	193.7	8	50	75	500	500	5	14	2	34	0.7

120 Minutes Integrity Performance (for E120 classification) - Masonry/Concrete continued

Width (m)	4.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.7	139.7	5	30	65	400	400	5	12	2	60	0.7
2	139.7	6.3	40	65	400	400	5	12	2	58	0.7
3.2	168.3	5	30	65	400	400	5	12	2	49	0.7
4.8	193.7	5	50	75	500	500	5	12	2	43	0.7
7.8	193.7	8	50	75	500	500	5	12	2	44	0.7
10	273	6.3	60	85	600	600	8	14	2	23	0.7

Width (m)	5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.3	139.7	6.3	40	65	400	400	5	12	2	73	0.7
2.2	168.3	5	30	65	400	400	5	12	2	61	0.7
3.5	193.7	5	50	75	400	400	6	12	2	53	0.7
5.5	193.7	8	50	75	400	400	6	12	2	53	0.7
6.3	219	6.3	60	85	500	500	5	14	2	47	0.7
10	273	6.3	60	85	600	600	8	14	3	34	0.7

Width (m)	5.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.3	168.3	5	30	65	400	400	6	12	2	71	0.7
2.4	193.7	5	50	75	400	400	6	12	2	64	0.7
4	193.7	8	50	75	400	400	6	12	2	64	0.7
4.7	219	6.3	60	85	500	500	5	14	2	57	0.7
8.8	273	6.3	60	85	600	600	8	14	3	45	0.7
10	273	10	70	85	600	600	8	16	2	38	0.7

Width (m)	6										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.2	193.7	8	50	75	500	500	6	12	2	71	0.7
3.3	219	6.3	60	85	500	500	6	12	3	67	0.7
6.6	273	6.3	60	85	500	500	6	12	3	53	0.7
10	273	10	70	85	600	600	8	14	4	52	0.7

120 Minutes Integrity Performance (for E120 classification) - Masonry/Concrete continued

Width (m)	6.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.1	219	6.3	60	85	500	500	6	14	2	76	0.7
4.8	273	6.3	60	85	500	500	6	14	2	61	0.7
7.8	273	10	70	85	600	600	8	16	3	62	0.7
10	323.9	10	70	85	600	600	8	16	3	45	0.7

Width (m)	7										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
3.7	273	6.3	60	85	500	500	6	14	2	72	0.7
5.8	273	10	70	85	500	500	6	14	3	72	0.7
7	323.9	10	70	85	500	500	6	16	3	50	0.7
10	335.6	10	70	85	600	600	8	16	3	54	0.7

Width (m)	7.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.7	273	10	70	85	500	500	6	14	2	65	0.7
4.2	323.9	10	70	85	600	600	8	14	3	54	0.7
5	335.6	10	70	85	600	600	8	16	3	53	0.7

Width (m)	8										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.6	273	10	70	85	500	500	6	14	3	91	0.7
5.9	323.9	10	70	85	500	500	6	14	4	78	0.7
6.9	335.6	10	70	85	600	600	8	16	4	76	0.7
10	406.4	12.5	70	85	600	600	8	18	5	50	0.7

Width (m)	8.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
4	323.9	10	70	85	500	500	6	14	4	86	0.7
5	335.6	10	70	85	600	600	8	16	3	85	0.7
7	406.4	12.5	70	85	600	600	8	18	4	55	0.7

120 Minutes Integrity Performance (for E120 classification) - Masonry/Concrete continued

Width (m)	9										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
3	323.9	10	70	85	600	600	8	14	4	99	0.7
3.5	335.6	10	70	85	600	600	8	14	4	94	0.7
7	406.4	12.5	70	85	600	600	8	18	5	69	0.7

Width (m)	9.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.2	335.6	10	70	85	600	600	8	16	3	104	0.7
7	406.4	12.5	70	85	600	600	8	18	4	85	0.7

Width (m)	10										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
5.5	406.4	12.5	70	85	600	600	8	18	5	96	0.7
6.3	457	16	80	85	600	600	8	20	5	71	0.7

240 Minutes Integrity Performance (for E240 classification) – Masonry/Concrete

Width (m)	2.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.4	101	3.6	16.5	40	300	300	5	10	2	41	0.7
3.8	127	3.2	30	65	300	300	6	10	2	32	0.7
7	139.7	5	30	65	400	400	5	10	2	27	0.7
9.7	139.7	6.3	30	65	500	500	5	10	3	30	0.7
10	168.3	5	30	65	500	500	5	10	3	21	0.7

Width (m)	3										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.1	101	3.6	16.5	40	300	300	5	10	2	52	0.7
2	127	3.2	30	65	300	300	6	10	3	41	0.7
4.3	139.7	5	30	65	400	400	5	12	3	37	0.7
7	168.3	5	30	65	400	400	5	10	3	31	0.7
10	193.7	5	40	75	500	500	5	12	3	27	0.7

Width (m)	3.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.2	127	3.2	30	65	300	300	6	10	2	55	0.7
2.7	139.7	5	30	65	300	300	6	10	2	50	0.7
3.5	139.7	6.3	40	65	400	400	5	10	3	51	0.7
4.7	168.3	5	30	65	400	400	5	12	3	41	0.7
7	193.7	5	50	75	500	500	5	12	3	37	0.7
10	193.7	8	50	75	500	500	5	12	3	34	0.7

Width (m)	4										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.7	139.7	5	30	65	400	400	5	12	3	65	0.7
3.2	168.3	5	30	65	400	400	5	12	3	54	0.7
4.8	193.7	5	50	75	400	400	5	12	3	47	0.7
7	193.7	8	50	75	500	500	5	12	3	45	0.7
10	273	6.3	60	85	500	500	6	14	3	25	0.7

240 Minutes Integrity Performance (for E240 classification) – Masonry/Concrete
continued

Width (m)	4.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.2	139.7	6.3	40	65	400	400	5	12	3	81	0.7
2	168.3	5	30	65	400	400	5	12	3	66	0.7
3.2	193.7	5	50	75	400	400	5	12	3	58	0.7
5	193.7	8	50	75	500	500	5	12	3	57	0.7
6	219	6.3	60	85	500	500	5	12	3	52	0.7
10	273	6.3	60	85	600	600	8	14	3	39	0.7

Width (m)	5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.2	168.3	5	30	65	400	400	5	12	3	81	0.7
2	193.7	5	50	75	400	400	5	12	3	69	0.7
3.4	193.7	8	50	75	400	400	6	12	3	70	0.7
4.1	219	6.3	60	85	400	400	6	12	3	62	0.7
7	273	6.3	60	85	500	500	5	14	3	46	0.7
10	273	10	70	85	600	600	8	14	4	44	0.7

Width (m)	5.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.3	193.7	5	50	75	400	400	6	12	3	85	0.7
2	193.7	8	50	75	400	400	6	12	3	83	0.7
2.8	219	6.3	60	85	400	400	6	12	3	75	0.7
6	273	6.3	60	85	500	500	5	14	3	61	0.7
9	273	10	70	85	600	600	8	14	4	59	0.7
10	323.9	10	70	85	600	600	8	16	4	40	0.7

Width (m)	6										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
4.2	273	6.3	60	85	500	500	6	12	3	71	0.7
6.1	273	10	70	85	500	500	6	14	3	68	0.7
7	335.6	10	70	85	500	500	6	16	4	43	0.7
10	406.4	12.5	70	85	600	600	8	18	5	28	0.7

240 Minutes Integrity Performance (for E240 classification) – Masonry/Concrete
continued

Width (m)	6.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
3	273	6.3	60	85	500	500	6	14	3	83	0.7
4.8	273	10	70	85	500	500	6	14	3	84	0.7
9	335.6	10	70	85	600	600	8	16	4	65	0.7

Width (m)	7										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
3	273	10	70	85	500	500	6	14	3	95	0.7
6	323.9	10	70	85	500	500	6	16	3	79	0.7
7	335.6	10	70	85	500	500	6	16	3	77	0.7

Width (m)	7.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.7	273	10	70	85	500	500	6	14	3	108	0.7
4.2	323.9	10	70	85	600	600	8	16	3	90	0.7
5	335.6	10	70	85	600	600	8	16	3	88	0.7

Width (m)	8										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.9	323.9	10	70	85	600	600	8	16	3	104	0.7
3.6	335.6	10	70	85	600	600	8	16	3	101	0.7

**60 and 90 Minutes Integrity Performance (for E60/E90 classification) –
Timber Stud Partition**

Width (m)	2.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.6	101	3.6	16.5	40	250	250	5	10	2	20	0.7
2.4	101	3.6	16.5	40	300	300	5	10	2	25	0.7
5.3	127	3.2	30	65	300	300	5	10	2	24	0.7
7	139.7	5	30	65	400	400	5	10	2	16	0.7

Width (m)	3										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.6	101	3.6	16.5	40	250	250	5	10	2	37	0.7
1.8	101	3.6	16.5	40	300	300	5	10	2	40	0.7
3	127	3.2	30	65	300	300	5	12	2	31	0.7
6	139.7	5	30	65	400	400	5	10	2	28	0.7
7	168.3	5	40	65	500	500	5	12	2	24	0.7

Width (m)	3.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.9	127	3.2	30	65	300	300	5	10	2	41	0.7
4	139.7	5	30	65	300	300	5	10	2	37	0.7
6.9	168.3	5	30	65	400	400	5	10	2	32	0.7
7	193.7	5	50	75	400	400	5	12	2	27	0.7

Width (m)	4										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.2	127	3.2	30	65	300	300	5	12	2	54	0.7
2.7	139.7	5	30	65	300	300	5	12	2	48	0.7
4.5	168.3	5	30	65	400	400	5	12	2	39	0.7
6.9	193.7	5	50	75	500	500	5	12	2	35	0.7
7	193.7	8	50	75	500	500	5	14	2	34	0.7

**60 and 90 Minutes Integrity Performance (for E60/E90 classification) –
Timber Stud Partition continued**

Width (m)	4.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.7	139.7	5	30	65	400	400	5	12	2	60	0.7
2	139.7	6.3	40	65	400	400	5	12	2	58	0.7
3.2	168.3	5	30	65	400	400	5	12	2	49	0.7
4.8	193.7	5	50	75	500	500	5	12	2	43	0.7
7	193.7	8	50	75	500	500	5	12	2	44	0.7

Width (m)	5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.3	139.7	6.3	40	65	400	400	5	12	2	73	0.7
2.2	168.3	5	30	65	400	400	5	12	2	61	0.7
3.5	193.7	5	50	75	400	400	6	12	2	53	0.7
5.5	193.7	8	50	75	400	400	6	12	2	53	0.7
6.3	219	6.3	60	85	500	500	5	14	2	47	0.7
7	273	6.3	60	85	600	600	8	14	3	34	0.7

Width (m)	5.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
1.3	168.3	5	30	65	400	400	6	12	2	71	0.7
2.4	193.7	5	50	75	400	400	6	12	2	64	0.7
4	193.7	8	50	75	400	400	6	12	2	64	0.7
4.7	219	6.3	60	85	500	500	5	14	2	57	0.7
7	273	6.3	60	85	600	600	8	14	3	45	0.7

Width (m)	6										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.2	193.7	8	50	75	500	500	6	12	2	71	0.7
3.3	219	6.3	60	85	500	500	6	14	3	67	0.7
6.6	273	6.3	60	85	500	500	6	16	3	53	0.7
7	273	10	70	85	600	600	8	16	4	52	0.7

**60 and 90 Minutes Integrity Performance (for E60/E90 classification) –
Timber Stud Partition continued**

Width (m)	6.5										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
2.1	219	6.3	60	85	500	500	6	14	2	76	0.7
4.8	273	6.3	60	85	500	500	6	14	2	61	0.7
7	273	10	70	85	600	600	8	16	3	62	0.7

Width (m)	7										
Height (m)	Barrel		Axle diameter (mm)	Max axle length (mm)	End Plate Height (mm)	End Plate Width (mm)	End Plate Thickness (mm)	Endplate Bolts		Barrel Deflection Allowance (mm)	Curtain thickness (mm)
	Diameter (mm)	Thickness (mm)						Size (mm)	Number		
3.7	273	6.3	60	85	500	500	6	14	2	72	0.7
5.8	273	10	70	85	500	500	6	14	3	72	0.7
7	323.9	10	70	85	500	500	6	16	3	50	0.7