LPCB®

Loss Prevention Standard

LPS 1208: Issue 2.2

LPCB fire resistance requirements for elements of construction used to provide compartmentation

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REVISION OF LOSS PREVENTION STANDARDS

Loss Prevention Standards will be revised by issue of revised editions or amendments. Details will be posted on our website at www.redbooklive.com

Technical or other changes which affect the requirements for the approval or certification of the product or service will result in a new issue. Minor or administrative changes (e.g. corrections of spelling and typographical errors, changes to address and copyright details, the addition of notes for clarification etc.) may be made as amendments. (See amendments table on page 14)

The issue number will be given in decimal format with the integer part giving the issue number and the fractional part giving the number of amendments (e.g. Issue 3.2 indicates that the document is at Issue 3 with 2 amendments).

USERS OF LOSS PREVENTION STANDARDS SHOULD ENSURE THAT THEY POSSESS THE LATEST ISSUE AND ALL AMENDMENTS.

FOREWORD

Loss Prevention Certification Board Certification schemes are supported by the Association of British Insurers (ABI) and Lloyd's.

This standard was originally published in July 1995 and was limited to cover fire performance requirements for metal-faced fire resisting panels intended for providing compartmentation in food processing factories.

This revised standard now covers all applications for compartmentation and directly supports the requirements in both the LPC Design Guide for the Fire Protection of Buildings and building regulations. It is also applicable to all types of systems; not just metal faced insulated panels.

NOTES

Compliance with this LPS does not of itself confer immunity from legal obligations. Users of LPSs should ensure that they possess the latest issue and all amendments.

LPCB welcomes comments of a technical or editorial nature and these should be addressed to "the Technical Director" at enquiries@breglobal.co.uk.

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Listed products and services appear in the LPCB "List of Approved Products and Services" which may be viewed on our website: www.redbooklive.com or by downloading the LPCB Red Book App from the App Store (for iPhone and iPad), from Google Play (for Android devices) or from the Windows Store (for Windows 8 Phones and Tablets from 2014).

1. SCOPE

This standard defines the methods of tests and performance requirements in order to satisfy the fire resistance requirements for compartmentation given in the LPC Design Guide for the Fire Protection of Buildings. Products certified to this standard should also meet the relevant requirements of building regulations in relation to fire resistance. It does not cover other performance requirements that may be needed to satisfy regulatory documents.

The standard is applicable to the following elements of construction:

Loadbearing compartment walls
Non-loadbearing compartment walls and partitions
External walls
Curtain walls
Cavity barriers
Roofs where fire resistance is required (loadbearing and non-loadbearing)
Loadbearing compartment floors
Insulated panels used for enclosing production and storage areas in food factories

This standard is applicable to any type of construction system used for the above applications.

2. DEFINITIONS

For the purposes of this standard, the following definitions are applicable when fire resistance is required:

2.1 Cavity barrier

A fire-resisting barrier, not less than 100mm high, installed in a ceiling void or roof space, or providing horizontal separation in a vertical void, that is able to provide the required fire resistance.

2.2 Compartment floor

A floor that has the required fire resistance given in Table 2.2 of the LPC Design Guide for the Fire Protection of Buildings or as specified in building regulations and is intended to act as a barrier to fire.

2.3 Compartment wall

A wall that has the required fire resistance given in Table 2.2 of the LPC Design Guide for the Fire Protection of Buildings or as specified in building regulations and is intended to act as a barrier to fire.

2.4 Curtain wall

Typically a partially glazed screen used externally in a multi-storey building designed to provide vertical fire separation when exposed to fire from either inside the building or from outside the building.

2.5 Direct field of application

Rules in a published standard that allow for slight changes to the tested product without the need to apply an expert judgement. Simple assessments can be assumed to fit within this definition.

2.6 Extended field of application

An expert technical evaluation of the likely performance of an element of structure if it could be subjected to a standard fire resistance test. Such an assessment would be undertaken using established engineering principles. Complex assessments can be assumed to fit within this definition.

2.7 External wall

A non-loadbearing wall designed to provide vertical and/or lateral fire separation on the external face of a single storey building when exposed to fire from either inside the building or from outside the building.

2.8 Insulated enclosure

An enclosure, comprising walls and ceilings, normally but not exclusively constructed within a building, surrounding a food production or food storage area designed to assist in maintaining strict control of temperature and facilitating the prevention of cross-contamination, such as may be utilised to surround a food production or food storage area.

Note: Buildings where the external walls and roofs are constructed from insulated panels to meet the objectives given above are deemed to fall within this definition.

2.9 Partition

A non-loadbearing wall designed to provide vertical fire separation when exposed to fire from one side.

2.10 Protected opening

An opening in a compartment wall or floor that contains a door, shutter or service penetration which provides the same fire resistance in terms of integrity as the wall or floor in which it is installed.

2.11 Protected zone

The sections of the roof, external walls and supporting frame of single-storey buildings (and where applicable, multi-storey buildings), adjacent to and within a specified distance on each side of a compartment wall, that meet the fire resistance requirements of the LPC Design Guide for the Fire Protection of Buildings and this standard.

3 PRODUCT SPECIFICATION

It is important that all relevant information is supplied so that the maximum field of application can be accommodated. The information given below is provided for guidance and will need to be adapted for each particular system:

3.1 The range of heights, widths and thickness that the system can be supplied.

3.2 The type of insulation used and details of its important physical characteristics. In respect to reaction to fire properties, appropriate test data shall be supplied. For cellular plastic insulants this should be BS 4735:1974 and for mineral wool insulants either BS 476:Part 4:1970 (1984) or BS 476:Part 11:1982. In addition, other relevant reaction to fire data may also be supplied so as to provide well-documented evidence on the materials behaviour under fire conditions.

3.3 Details of the lining material, including thickness, density and any facing/coating specification. The method of fixing the lining material shall be fully described and detailed.

3.4 For stud or joisted systems, the material and cross-sectional dimensions and their spacing.

3.5 Fully dimensioned details of the panel joint system, including a full specification of the individual components. Where alternative joint systems are available, these should be separately detailed.

3.6 For compartment wall applications, recommended installation details relating to the fitting of doors or fire resisting glazing into the wall shall be supplied by the manufacturer. Also, recommended details for maintaining integrity when service installations pass through the wall or partition. Manufacturers of walls and partitions may wish to take advice from door, glazing or penetration seals manufacturers to arrive at suitable detailing. The basic objective is to ensure that neither element have their fire resistance impaired.

3.7 For concrete compartment floors, details of the reinforcement, whether pre-stressed or plain reinforcement, diameter, spacing and minimum cover. Density of concrete, type of aggregate etc.

3.8 Details of any supporting structure required for extended height/span applications.

3.9 Any known features of the product or system which may affect, or be affected by, adjoining or supporting elements of construction in buildings under fire conditions, particularly when such elements will not feature in the fire tests.

4 TEST AND REQUIREMENTS

To satisfy the fire resistance requirements of this standard, the element that is the subject of LPCB certification shall be tested to the test method appropriate to its intended application.

4.1 Applicable fire resistance test.

The fire resistance tests that are applicable for each element of construction covered by this standard are given in Table 1.

TABLE 1 APPLICABLE FIRE RESISTANCE TEST				
ELEMENT	**APPLICATION**	**BS TEST METHOD**	**CLAUSE OF BS TEST**	**EQUIVALENT EN METHOD**
Loadbearing wall	Compartment wall	BS 476:Part 21:1987	Clause 8	EN 1365 Part 1
Non-loadbearing wall/partition, vertical cavity barriers	Compartment wall	BS 476:Part 22:1987	Clause 5	EN 1364 Part 1
External wall	Protected zone Protected area	BS 476:Part 22:1987	Clause 5	EN 1364 Part 1*
Curtain walls	Protected zone Protected area	BS 476:Part 22:1987	Clause 5	EN 1364 Part 1*
Roofs (1), horizontal cavity barriers	Protected zone (non-loadbearing)	BS 476:Part 22:1987	Clause 9	EN 1364 Part 2
Roofs (2)	Part of means of escape route	BS 476:Part 21:1987	Clause 7	EN 1365 Part 2
Loadbearing floors	Compartment floors	BS 476:Part 21:1987	Clause 7	EN 1365 Part 2
Insulated enclosure	walls	BS 476:Part 22:1987	Clause 5	EN 1364 Part 1
Insulated enclosure	ceiling/roof	BS 476:Part 22:1987	Clause 9	EN 1364 Part 2

* More specialist tests are being developed in CEN. However, tests to these standards will be acceptable to meet the requirements of this standard for these specific elements.

The test shall be carried out fully in accordance with the appropriate standard specified above.

4.2 Design of test specimen

The design of the test specimen shall take into account the field of application required (direct and extended) and the necessity to provide sufficient data to allow for the assessment to cover the range that cannot be tested, for example restrictions imposed by the size of the furnace. Reference should be made to clause 6.2 for guidance on extended field of application.

4.3 Appropriate criterion

The appropriate criterion for each element is shown in Table 2 below. To satisfy the requirements of this standard, the fire resistance shall be given as the lowest value achieved against the appropriate criterion. Hence for a test report giving the following result:

Loadbearing capacity (R): 120 minutes
Integrity (E): 120 minutes
Insulation (I): 90 minutes

The element would be certified as having 90 minutes fire resistance, and would be graded as FR90 (see table 3).

TABLE 2 APPROPRIATE CRITERION FOR COMPARTMENTATION APPLICATIONS

ELEMENT	APPLICATION	LOADBEARING CAPACITY R	INTEGRITY E	INSULATION I
Loadbearing wall	Compartment wall	✓	✓	✓
Non-loadbearing wall/partition and vertical cavity barriers	Compartment wall	✖	✓	✓
External wall	Protected zone Protected area	✖	✓	✓
Curtain walls	Protected zone Protected area	✖	✓	✓
Roofs(1) and cavity barriers	Protected zone (non-loadbearing) Cavity barriers used horizontally	✖	✓	✓
Roofs (2)	Part of means of escape route	✓	✓	✓
Loadbearing floors	Compartment floors	✓	✓	✓
Insulated enclosure	walls	✖	✓	✓
Insulated enclosure	ceiling/roof	✖	✓	✓

4.4 Grading system

The grading system shown below uses the European classification system and can be used to provide an indication of construction products compliance with the recommendations given in the LPC Design Guide for the Fire Protection of Buildings and building regulations. Table 3 covers both loadbearing and non-loadbearing applications for compartmentation. Elements that are designed only to accommodate wind loading only may be tested as non-loadbearing (e.g. external walls).

TABLE 3 GRADING AND CLASSIFICATION SYSTEM FOR COMPARTMENTATION FIRE RESISTANCE

CRITERIA	GRADE FR240	GRADE FR120	GRADE FR90	GRADE FR60	GRADE FR30	GRADE FR15*
REI	REI 240	REI 120	REI 90	REI 60	REI 30	30/30/15
EI	EI 240	EI 120	EI 90	EI 60	EI 30	30/15

Note: An integrity only rating is not acceptable to meet the requirements of this standard except for glazing in curtain walling systems

*** REI 15 and EI 15 are not acceptable as the minimum requirement is 30 minutes integrity and for loadbearing elements 30 minutes loadbearing capacity.**

Guidance on the applicability of the above grades in relation to the LPC Design Guide for the Fire Protection of Buildings requirements are contained in appendix A.

5 TEST REPORT

The test report shall detail the information required in the appropriate test standard. The LPCB shall verify that this corresponds to the information supplied under clause 4 of this standard.

6 ASSESSMENT PRINCIPLES

6.1 Direct field of application

For rules on direct field of application of the fire resistance test result, reference may be made to the appropriate CEN standard.

6.2 Extended field of application

For extended application, the LPCB shall verify that the assessment is carried out in accordance with LPS 1243, requirements for undertaking assessments of building products, (currently for internal use by LPC). It is important to cover in the assessment report:

- any restrictions imposed on height or span. Where the system requires additional support, this shall be assessed for its ability to maintain the intended function of the compartment wall or floor. Deflections measured during the fire tests have a vital role to play in establishing an extended field of application.

- The ability of the product to accommodate deflection of adjacent structural elements

- the ability of compartment walls to allow for doors, glazing and services to be incorporated without reducing the fire resistance. Any restrictions imposed on size of protected openings shall be clearly stated

- the ability of compartment floors to allow for services to be incorporated without reducing the fire resistance

7 MARKING

Any system approved to this standard shall be permanently marked with the following:

7.1 The name or identification mark of the manufacturer
7.2 The grading as defined in clause 4.4
7.3 A statement that the product meets the requirements of LPS 1208

The marking may either be undertaken at the factory for pre-assembled products or applied on site by an approved installer.

8 PRODUCT AUDIT

The LPCB shall carry out at least one product audit a year.

9 INSTALLATION

The LPCB shall examine the manufacturer's recommendation for installation and verify the quality of installation.

10 MAINTENANCE

The manufacturer shall have documented recommendations for maintenance.

11 QUALITY

The manufacturer shall demonstrate to the satisfaction of the LPCB that the quality management system under which the products are manufactured and installed is in accordance with ISO 9001. An appropriate number of surveillances shall be carried out by the LPCB every year.

12 POST INSTALLATION INSPECTION

The LPCB reserves the right to make inspections of installed approved products. Any approved products found not to comply with the specification agreed with the LPCB shall be investigated and may result in loss of approval**.**

13 COMPLAINTS

Complaints about LPCB approved products may be investigated by the LPCB. Where complaints are not resolved to the satisfaction of the LPCB, the LPCB may withdraw approval. The manufacturer is able to appeal against such a decision.

14 CERTIFICATE

The manufacturer shall be issued with an LPCB approval certificate stating the scope of approved products and their approval reference numbers. The certificate shall clearly state any restrictions imposed by the assessment report (see clause 6.2)

15 LISTING

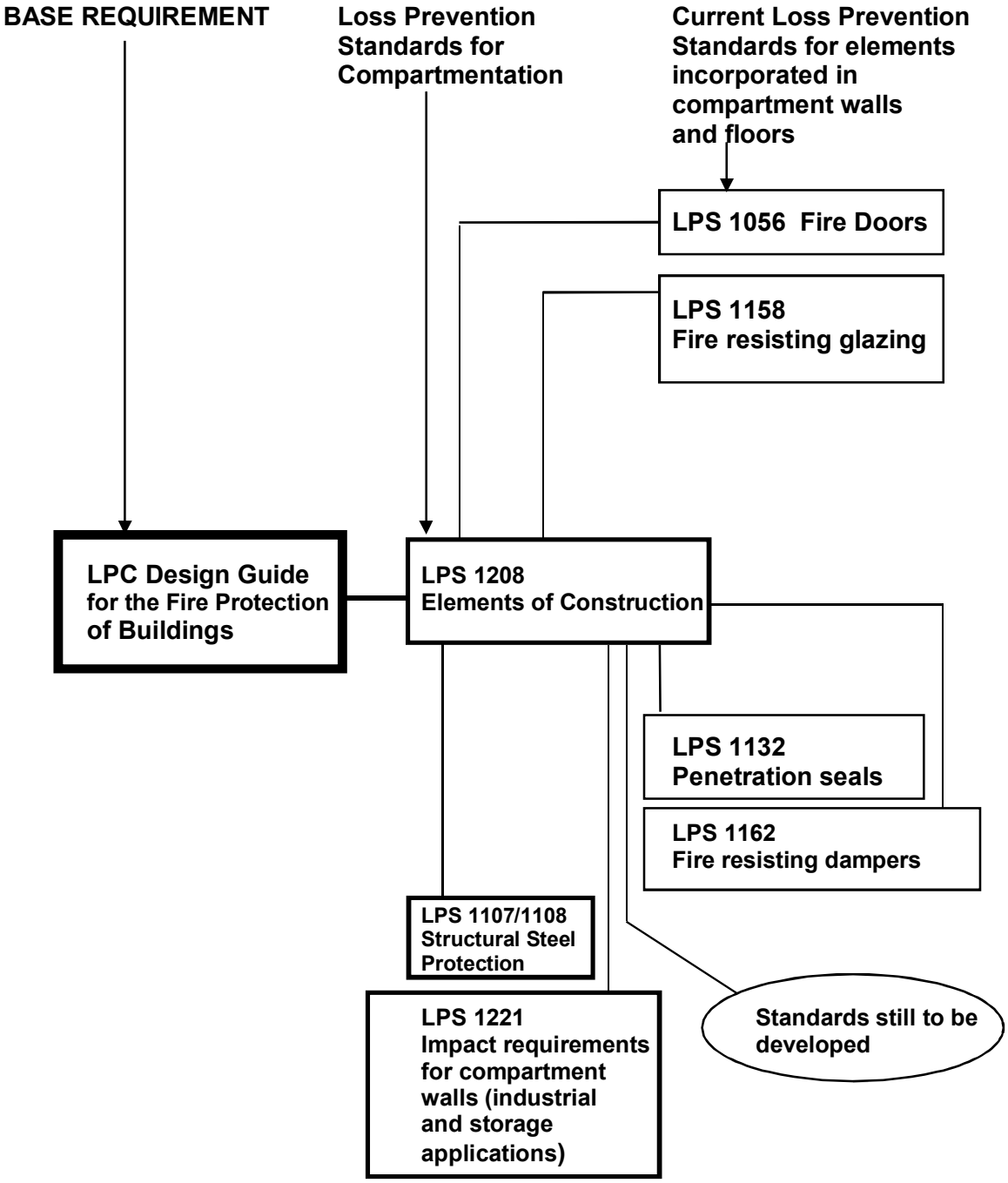
Approved products will be listed in the LPCB's annual *List of Approved Fire and Security Products and Services.*

16 PUBLICATIONS REFERRED TO

LPC	Design Guide for the Fire Protection of Buildings
LPS1056	Requirements and tests for firedoors, lift landing doors and shutters
LPS1107	Requirements, tests and methods of assessment of passive fire protection systems for structural steelwork
LPS 1108	Quality schedule for the certification of passive and active (intumescent) fire protection products for structural steelwork
LPS1132	LPC approval procedures for wall and penetration seals
LPS1162	Requirements and tests for fire dampers
LPS1158	Requirements and tests for fire resistant glazing systems
LPS 1243	Requirements for undertaking assessments of building products
LPCB	List of Approved Fire and Security Products and Services.
ISO 9001:	Quality management systems – Requirements

APPENDIX A LPS 1208 and the LPC Design Guide for the Fire Protection of Buildings

A.1 RELATIONSHIP BETWEEN LPC DESIGN GUIDE FOR THE FIRE PROTECTION OF BUILDINGS, LPS 1208 AND OTHER LOSS PREVENTION STANDARDS



NOTE: THIS DIAGRAM INTENDS TO ILLUSTRATE THE COMBINED ROLE OF PASSIVE FIRE PROTECTION SYSTEMS TO MAINTAIN COMPARTMENTATION

A.2 LPS 1208 GRADING AND THE LPC DESIGN GUIDE FOR THE FIRE PROTECTION OF BUILDINGS

A.2.1 Compartment walls separating buildings in different occupancies (ownership)

Only walls graded as either FR240 or FR120 are permitted for this application, regardless if sprinklers protect one or both the buildings. In addition, for industrial and storage applications, the wall shall demonstrate adequate resistance to impact. *(LPS 1221 being developed to meet this requirement)*

A.2.2 Compartment walls and floors separating different occupancy types(different purpose groups) or walls restricting compartment areas

Only walls and floors graded as FR240, FR120 or FR90 are permitted for this application.

A.2.3 Compartment walls used to contain areas of special risk

The minimum requirement is to use a wall graded as FR60, but depending on the risk, FR90 or FR120 may be recommended.

The above give the applications for compartment walls and floors. These and other applications for compartmentation in the LPC Design Guide for the Fire Protection of Buildings are summarised below:

FIRE RESISTANCE REQUIREMENTS FOR COMPARTMENTATION OF LPC DESIGN GUIDE FOR THE FIRE PROTECTION OF BUILDINGS							
ELEMENT	**APPLICATION**	**FR240**	**FR120**	**FR90**	**FR60**	**FR30**	**FR15**
Compartment walls	separating buildings in different ownership						
Compartment walls and floors	separating different occupancy types						
Compartment walls	used to restrict compartment areas						
Compartment walls	Contain areas of special risk						
External wall	Protected zone, single storey buildings						
Curtain walls	Protected zone, multi-storey buildings				*	*	*
Roofs	Protected zone, single storey buildings						
Cavity barriers	Vertical and horizontal applications	①	①	①	①		
Insulated enclosure for food factories	walls		♦	♦			
Insulated enclosure for food factories	ceiling/roof		♦	♦			

♦ **May be required if risk assessment indicates exceptional potential for loss**
* Glazed part of curtain wall may only have an "E" rating
① Cavity barriers are not normally recommended for these levels of fire resistance
Not applicable

Amendments Issued Since Publication

DOCUMENT NO.	AMENDMENT DETAILS	SIGNATURE	DATE
LPS 1208-2.0	Copyright and address change	CJA	23/10/01
LPS 1208-2.0	Further copyright change	CJA	30/07/02
LPS 1208-2.1	Further copyright changes	CJA	20/09/05
LPS 1208-2.2	1. New front cover 2. Title added to header 3. Contents page moved to Page 1 4. Revision of Loss Prevention Standards added on Page 2 5. Notes added on Page 3 6. Repagination 7. Update of references to ISO 9001 standard (Clauses 11 & 16) 8. References to ISO 9002 deleted - this standard has been withdrawn and is replaced by ISO 9001 9. Repagination 10. Update to copyright information	DC	Jan. 2014