

Loss Prevention Standard

LPS 1195 Part 1: Issue 4.1

Fire test and evaluation requirements for the LPCB approval and listing of temporary buildings for use on construction sites

This document specifies the test and performance requirements for temporary buildings for use on construction sites used at locations less than 6m from buildings under construction/refurbishment

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PARTICIPATING ORGANISATIONS

This standard was prepared by Expert Group D. and approved by the LPC Fire and Security Board of BRE Global Ltd. The following organisations participated in the preparation of this standard:-

Association of British Insurers / Lloyd's
 Association of Chief Police Officers
 Association for Specialist Fire Protection
 British Fire Protection Systems Association
 British Rigid Urethane Foam Manufacturers' Association
 British Security Industry Association
 Chief Fire Officers' Association
 Door & Hardware Federation
 Electrical Contractors Association
 EURISOL UK Mineral Wool Association
 Glass and Glazing Federation
 Health & Safety Executive
 Heating, Ventilating and Air Conditioning Manufacturers' Association
 Intumescent Fire Seals Association
 Modular & Portable Building Association
 National Council of Building Material Producers
 Office of the Deputy Prime Minister
 Risk Engineering Data Exchange Group
 Royal Institution of Chartered Surveyors

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 12)

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.

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FOREWORD

This standard identifies the evaluation and testing practices undertaken by LPCB for the purposes of approval and listing of products. LPCB listing of life safety products for inclusion in the “Red Book” is based on the following

- i. Satisfactory product performance during testing and audit testing by LPCB
- ii. Satisfactory product construction
- iii. Satisfactory installation
- iv. Satisfactory manufacturing processes
- v. Satisfactory product system or service experience
- vi. Satisfactory verification by the LPCB of the establishment and maintenance of the manufacturers or service providers quality management system.

This document should be read in conjunction with scheme document SD 061.

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.

The BRE Trust, a registered charity, owns BRE and BRE Global. BRE Global and LPCB (part of BRE Global) test, assess, certificate and list products and services within the fire and security sectors. For further information on our services please contact BRE Global, Watford, Herts. WD25 9XX or e-mail to enquiries@breglobal.co.uk

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).

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1. SCOPE

This document specifies the test and performance requirements for temporary buildings for use on construction sites at locations less than 6m from buildings under construction/refurbishment. The basic objective is to prevent a fire which has started in a temporary building from spreading to adjacent combustible materials, other temporary buildings or to the building under construction. A temporary building tested and approved by LPCB to this standard can be regarded as meeting the appropriate requirements of "The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation".

The requirements of this LPS do not apply to units or buildings specifically designated for storage of hazardous substances that needs to comply with the appropriate HSE requirements.

The requirements and scope of this LPS do not include temporary accommodation.

In order to deter arson and theft of property, consideration should be given to the security of the temporary buildings. LPCB recommends that temporary buildings be also approved to LPS 1175 "Requirements and Testing Procedures for the LPCB Approval and Listing of Burglary Resistant Building Components, Strongpoints and Security Enclosures".

2. DEFINITIONS

Temporary Building(s)

Temporary structures for use on construction sites including pre-fabricated cabins, site huts, cargo containers, caravans, tool stores etc. The structure of the temporary building is independent from the structure of the building under construction. A temporary building may be positioned inside or outside the building under construction.

Temporary Accommodation(s)

Areas that are segregated within the building under construction or undergoing refurbishment that may be used as site offices, stores, workshops etc. during the course of the works. Part of the structure of the temporary accommodation may be formed by the structure of the building under construction.

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3. REQUIREMENTS

3.1 General documentation

The manufacturer of the temporary building shall supply LPCB with a comprehensive specification of ALL the materials used in the construction, a complete set of fully dimensioned drawings showing the assembly and all individual components of the temporary building. In addition, the following information should also be supplied:

3.1.1 Structural data

Where the temporary building is intended to support other temporary buildings, a set of loading calculations shall be provided to the LPCB to justify the manufacturer's recommended load bearing capacity for the temporary building. The components of the temporary building that are designed to support the weight of other temporary buildings must be clearly identified on the drawings. The information must clearly state the weight (kg/m²) of the building being tested together with the allowable floor loading (i.e. the weight of buildings that can be supported).

3.1.2 Range of products

The manufacturer shall provide the LPCB with information on any variations (e.g. sizes, materials, number/size/location of windows, doors etc.) to the construction that are available so that LPCB can select the most appropriate specification/configuration to test.

3.2 FULL SCALE FIRE TEST

3.2.1 General

In situations where a range of options are available that affect the construction specification, the LPCB shall advise the manufacturer what specification should be tested so as to obtain the broadest scope of approval from the test, but taking into account the required configuration in 3.2.2, this is normally interpreted as the selection of the specification that is anticipated to achieve the poorest level of performance. (See Clause 3.1.2)

3.2.2 Test Building

The test building shall be prepared with its intended internal and external finishes but not with carpet or furnishings. The building shall have nominal dimensions as near as possible to 7.5m long by 3m wide or the nearest specific size available in the manufacturer's range (to be decided by LPCB).

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Unless not part of the manufacturer's normal range, each of the longer two sides shall contain two windows approximately 1m by 1m each. For each shorter side, a door shall be provided. The doors and windows shall be fitted with the normally supplied furniture. Any intended service penetrations through walls or roof shall be present for the test so that fire stopping arrangements can be assessed.

The test shall be conducted with one door open, and all windows shut. This will provide a ventilation area of approximately 3% of the total internal wall surface area of the building. The additional door will remain closed throughout the test (see 3.2.8.2).

Note: if a larger test building than specified above is used, additional ventilation may need to be provided to achieve the 3% ventilation area, this will be defined by LPCB when specifying the test building in line with the manufacturer's range.

3.2.3 Fire load/Ignition Source

The fire load for the test comprises a number of softwood timber cribs distributed uniformly on the floor of the unit. Each crib shall comprise a number of sawn lengths of kiln dried rough-sawn Type V Redwood/Scots Pine timber sticks, each 50mm x 50mm x 650mm long. The timber sticks shall be laid in alternate layers arranged mutually perpendicular in criss-cross fashion. The timber sticks shall be spaced 50mm apart in each layer. The moisture content of the crib shall be between 7 and 13%.

The cribs shall provide a fire load of 25kg/m² distributed so there is an average of one crib per 2m² of floor area.

Each crib shall be ignited by strips of paraffin-soaked fibre insulation board (12mm x 12mm section) positioned between the sticks of the bottom layers.

3.2.4 Temperature Measurements

3.2.4.1 Internal air temperatures shall be measured 100mm below the ceiling of the temporary building using 1.5mm diameter stainless steel sheathed thermocouples (or equivalent in terms of time response) with at least one per 2m² of ceiling area.

3.2.4.2 Temperatures on the outer surfaces of the building shall be measured by thermocouples of the type specified in BS 476: Part 20: 1987 (Method for determination of the fire resistance of elements of construction) for measuring the temperatures of the unexposed surface of walls/roofs. They shall be positioned on the external surface of each wall and on the roof with at least 5 on each wall and roof element to measure mean temperatures, these thermocouples shall be positioned within 300mm of each corner and the centre of each wall and roof element, taking account of the excluded zones detailed in 4.3. Additional thermocouples shall also be placed on each type of joint, e.g. panel laps, wall/roof joints and vertical corners. Areas of the building being heated directly or indirectly

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by hot-gases issuing from the open door/windows shall not be included in these measurements. A roving thermocouple as defined in BS 476: Part 20: 1987 can be used to monitor potential hot spots.

3.2.4.3 The temperatures of structural steel elements of the building which are intended to support upper units in a stack shall be monitored throughout the test using thermocouples of the type specified in BS 476: Part 20: 1987 distributed over the height/lengths of the structural elements, with at least 3 thermocouples on each structural element, to determine both mean and maximum temperature rises.

3.2.5 Irradiance Measurement

Radiometers of the type specified in BS 476: Part 20: 1987 shall be used to monitor irradiance levels adjacent to the windows to enable the assessment of safe distances for combustible materials and meet the limits specified in this standard.

The radiometer shall be placed perpendicular to the centre of the one window, in a position such that the centre of the radiometer's view coincides with the centre of the window. The radiometer should be located at a distance of 2m from the window.

3.2.6 Video record

A photographic record and video recording of the fire test shall be provided by the test laboratory.

3.2.7 Loading

Where it is intended that in practice the temporary building will support other buildings e.g. stacked arrangements, then the temporary building shall be loaded in the fire test. This may be achieved either by:

- a) applying the appropriate load by dead weights or hydraulically.
- b) actually testing a stacked arrangement (with fire in the bottom unit).

The load should be applied at least 15 minutes before the start of the test and maintained until the end of the test.

Alternatively, appropriate measurements can be made while testing a single unit to permit an assessment of the load bearing capacity in a fire, e.g. measurement of temperature of the steel supporting structure, or measurement of charring of timber elements (See 4.6.2).

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3.2.8 Procedure

- 3.2.8.1 The test shall be conducted indoors to avoid variations caused by the weather. Ambient temperatures shall be between 5°C and 30°C.
- 3.2.8.2 One door shall be left fully open to create an opening equal to approximately 3% of the total internal surface area of the building (or a clear opening provided to achieve that opening area). The test shall be started by igniting the timber cribs simultaneously or in succession, provided the overall lighting procedure does not exceed 90 seconds. The door shall be wedged open to provide and maintain the required area of opening. If additional ventilation is deemed necessary to aid lighting of the cribs the other door may be open during the lighting period. However this door must be closed within 2 minutes of the lighting period commencing.
- 3.2.8.3 Air temperatures shall be recorded continuously or at intervals not exceeding 5s. Surface or component temperatures shall be recorded at intervals not exceeding 1 minute.
- 3.2.8.4 Integrity failure shall be monitored throughout the test using the cotton wool pad as defined in BS 476: Part 20: 1987. With respect to the glazed windows, observations will be made of the time to cracking of the glass and time to the glass falling out of the window frame.
- 3.2.8.5 The crib fires shall be allowed to burn out and the test continued until conditions have stabilized. Any flames on the building may be extinguished at this time and any applied load be removed.

Note: The laboratory reserves the right to end the test at any time if there is considered to be any threat to the health and safety of people or the test facility.

3.2.9 Test report

The test report shall provide the following information:

- A full description of the building tested together with drawings.
- Loading calculations as appropriate.
- Graphs and tabulations of all temperatures measured.
- Observations and photographs made during the test.
- Results in terms of the requirements of clause 4 of this LPS.
- Moisture content and load of each crib used for the fire test

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4. CLASSIFICATION AND DESIGNATION

4.1 Minimum acceptance requirement

The temporary building shall satisfy the integrity, insulation, stability and irradiance criteria for a minimum of 30 minutes. Where the 30 minute minimum criteria are satisfied, the actual integrity and insulation time will be stated by LPCB.

4.2 Integrity criteria

The Integrity of the temporary building shall meet the criteria as defined in BS 476: Part 20:1987, with respect to cotton wool pads and exterior flaming.

4.3 Insulation criteria

The temporary building shall meet the insulation criteria as defined in BS 476: Part 20:1987, with respect to surface temperatures.

There are no insulation requirements for the windows. An area 300mm wide around the perimeter of the open door or any other opening used to provide an air supply is exempt from these requirements.

4.4 Stability criteria

The loadbearing capacity of the temporary building shall meet the criteria as defined in BS476: Part 20:1987, with respect to the retention of structural strength sufficient to support other units above, if appropriate.

4.5 Irradiance criteria

The potential hazard of radiation from a window will depend on the distance from the temporary building to the construction works or other combustible materials. For the purposes of this standard, the temporary building shall be deemed to have met this requirement if the radiation measured as described in clause 3.2.5 does not exceed 12.5 kW/m² (irradiance level at which volatiles from wood may be ignited by a pilot flame after prolonged exposure).

4.6 Field of application of test results

4.6.1 General

The results of the test can generally apply only to the specification tested. However, when a valid technical argument that the test result represents a worse case in the context of the full scale fire test specified in clause 3 of this LPS, the validity may be extended.

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Limitations and comments, as appropriate, shall be placed on the product's certificate and listing that will define constraints on use.

4.6.2 Stacking of Temporary Buildings

The test data is not directly applicable to this situation if no load was applied to the temporary building during the full-scale real fire test. However, in the case of a steel structure, provided the temperature of all structural elements are monitored throughout the test, then using available data applicable to the strength of the steel at elevated temperatures, it is possible to calculate the maximum load that the structure can support based on the recorded data. In this respect, reference will be made to BS 5950: Part 8: 1990 - Code of Practice for fire resistant design. For a timber structure, provided sufficient off cuts can be taken after the test to determine the cross-section of the uncharred timber, it is also possible to determine the load bearing capacity, using BS 5268: Part 4: 1978 Section 4.1 - Recommendations for calculating fire resistance of timber members.

5. MARKING AND LABELLING

The manufacturer of LPCB approved temporary buildings shall provide appropriate marking, labelling and packaging for the safe transport and subsequent use of the temporary building as well as any other relevant safety requirements.

The manufacturers name shall be clearly displayed, along with their contact address and the unique identifier for the temporary building.

The temporary building shall be supplied along with accompanying clear instructions to the user relating to the defined limits of the LPCB approval.

The requirements for the LPCB marking or labelling of a temporary building are described in the accompanying scheme document (SD061) and in the BRE Publication PN103 "Use of the Certification Mark(s)".

6. PUBLICATIONS REFERRED TO

BS 5950: Part 8: 1990 Code of Practice for fire resistant design

BS 476: Part 20: 1987 Fire tests on building materials and structures. Method for determination of the fire resistance of elements of construction. (General principles)

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BS 5268: Part 4:
Section 4.1: 1978

Recommendations for calculating fire resistance of timber members.

PN103

Use of the Certification Mark(s)

SD 061

LPCB Scheme document for temporary buildings.

LPS 1175

Requirements and Testing Procedures for the LPCB Approval and Listing of Burglary Resistant Building Components, Strongpoints and Security Enclosures.

The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation, Fifth edition: January 2000, FPA

For undated references, use the latest issue.

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Amendments Issued Since Publication

DOCUMENT NO.	AMENDMENT DETAILS	SIGNATURE	DATE
LPS 1195-2.0	Copyright and address change	CJA	12/08/02
LPS 1195-3.0	Reformatting to standard template	CJA	20/05/04
LPS 1195 Part1-4	<ol style="list-style-type: none"> 1. Irradiance requirements for windows 2. Reformatting of text 3. Fire resistance test option removed 4. Changed to latest standard template 	TB	26/10/05
LPS 1195-4.1	<ol style="list-style-type: none"> 1. New front cover 2. Title added to header 3. Contents page moved to Page 1 and updated page numbers 4. Revision of Loss Prevention Standards added to Page 2 5. Notes amended on Page 3 6. Repagination 7. Update to copyright information 	DC	Jan. 2014