

Loss Prevention Standard

LPS 1258: Issue 1.2

Requirements and test methods for automatic sprinkler glass bulbs with a narrow operating temperature band

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PARTICIPATING ORGANISATIONS

This standard was prepared by Technical Panel C of the Loss Prevention Certification Board. The following organisations participated:

Association of British Insurers	(ABI)
British Automatic Sprinkler Association	(BASA)
Confederation of British Industry	(CBI)
Local Government Association	(LGA)
Risk Engineers Data Exchange Group	(REDEG)
International Fire Sprinkler Association/ National Fire Sprinkler Association	(IFSA/NFSA)
BRE Centre for Fire and Security	
LPC Centre for Risk Sciences	

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 8)

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 Loss Prevention Certification Board (LPCB) evaluation and testing practices for the certification and listing of suitable products. Certification is based on the following criteria:

- i. Satisfactory product performance and construction, in accordance with the requirements of the LPCB and the manufacturer's specifications.
- ii. LPCB Certification of the manufacturer's quality management systems in accordance with ISO 9001, Quality Management Systems - Requirements.
- iii. Satisfactory product service experience.

Products that conform to the published requirements of the LPCB, but the construction of which is considered improper, may be refused certification and listing.

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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1. SCOPE

This Standard defines the LPCB's certification requirements for glass bulbs with a narrow operating temperature band for use in sprinkler heads that are intended for use in automatic sprinkler installations.

2. REQUIREMENTS

2.1 Nominal Release Temperature

The nominal release temperature and liquid colour of glass bulbs with a narrow operating temperature band shall be as specified in Table 1.

2.2 Operating Temperature

Glass bulbs with a narrow operating temperature band shall operate within the temperature range specified in Table 1 when tested in accordance with Clause 3.

Note: The minimum operating temperatures correspond to the requirements of EN 12259-1:1999, clause 4.4.2. The maximum operating temperatures are derived from the equation $t \pm (0.035t + 0.62)^\circ\text{C}$, where t is the nominal release temperature.

Nominal release temperature (°C)	Liquid colour code	Minimum operating temperature (°C)	Maximum operating temperature (°C)
57	Orange	54	59,6
68	Red	65	71,0
79	Yellow	76	82,4
93	Green	90	96,9
100	Green	96	104,1
107	Green	104	111,4
121	Blue	118	125,9
141	Blue	138	146,6
163	Mauve	160	169,3
182	Mauve	179	189,0
204	Black	201	211,8
227	Black	224	235,6
260	Black	257	269,7
286	Black	283	296,6
343	Black	340	355,6

Table 1: Nominal release temperatures, colour codes and operating temperature ranges for glass bulbs with a narrow operating temperature band.

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3. STATIC OPERATING TEMPERATURE TEST

3.1 Test Apparatus

The test shall be carried out in the liquid bath shown in Figure 1.

Glass bulbs having nominal operating temperatures less than 80°C shall be tested in a bath of demineralised water. Glycerine, with properties as specified in Table 2, shall be used for testing glass bulbs with higher nominal operating temperatures.

The test zone is located (40 ± 5)mm below the liquid surface and the temperature deviation within the test zone shall not exceed ±0.25°C.

The glass bulbs shall be located vertically, pip down, with the bulb centre within the test zone.

The operating temperature shall be measured with equipment calibrated to an immersion depth of 40mm and having an accuracy of ±0.25% of the glass bulb nominal operating temperature rating.

Property		Glycerine 99.5%
Viscosity (mPa s)	20°C	1410
	40°C	284
	100°C	14.6
	160°C	3.3
Thermal conductivity (W/mK)	20°C	0.016
	100°C	0.016
Boiling point (°C)	1013mbar	260
Density (g/cm ³)	20°C	1262
Flash point (°C)		177

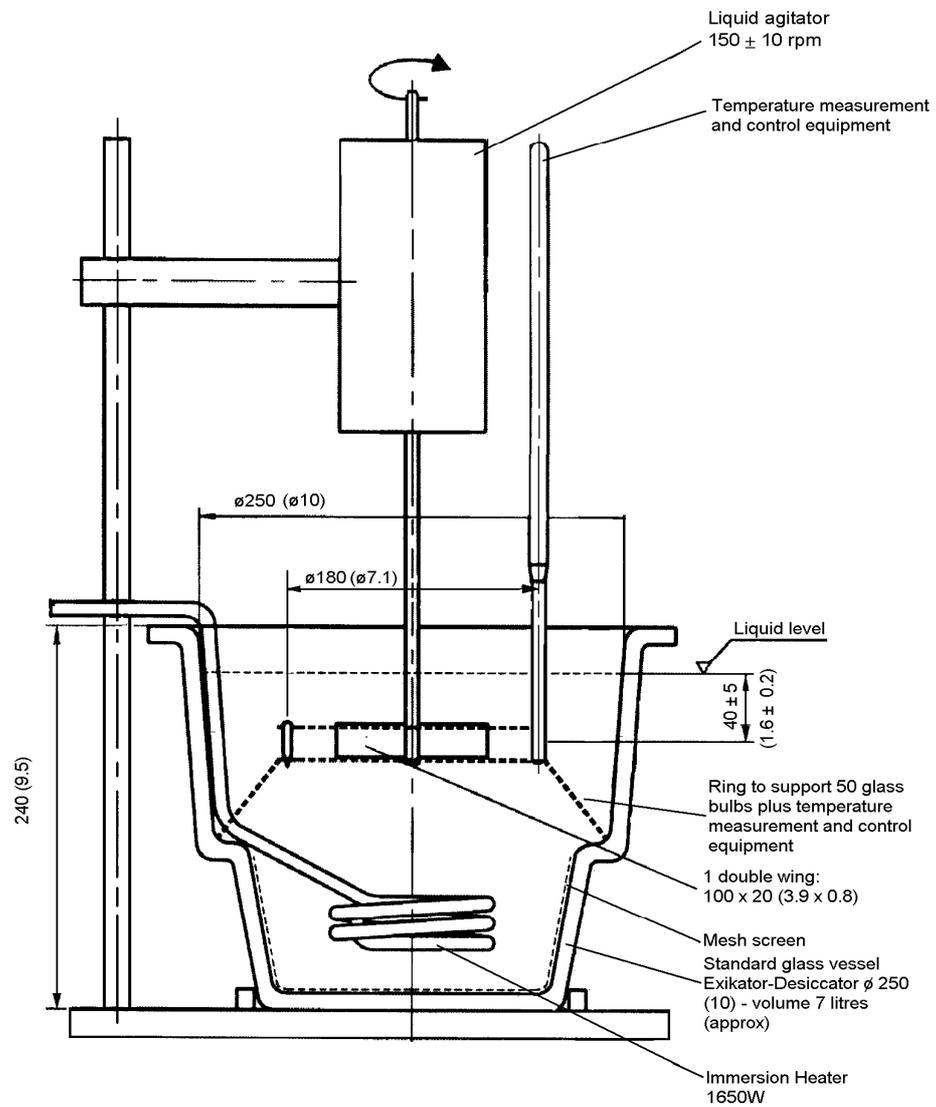
Table 2: Properties of Glycerine 99.5%

3.2 Test Method

A sample of fifty glass bulbs of the same model and nominal release temperature shall be heated from a temperature of (20 ± 5)°C to (20, +2, -0)°C below their nominal operating temperature. The rate of increase of temperature shall not exceed 20°C / minute and the temperature shall be maintained for 10 minutes. The temperature shall then be increased at a rate of (0.5 ± 0.1)°C / minute until the glass bulb operates.

The temperature of operation of each glass bulb shall be measured and recorded.

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Dimensions in mm (inches)

Figure 1
Liquid bath test apparatus

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4. PUBLICATIONS REFERRED TO

<u>Reference</u>	<u>Title</u>
ISO 9001:	Quality management systems - Requirements

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Amendments Issued Since Publication

DOCUMENT NO.	AMENDMENT DETAILS	SIGNATURE	DATE
LPS 1258-1.0	Copyright and address change	CJA	22/10/01
LPS1258-1.0	Further copyright changes	CJA	30/07/02
LPS 1258-1.1	Further copyright changes	CJA	20/09/05
LPS 1258-1.2	<ol style="list-style-type: none"> 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 to copyright information 8. Update of references to ISO 9001 standard (Clauses Foreword & 4) 9. References to ISO 9002 deleted - this standard has been withdrawn and is replaced by ISO 9001 	DC	Jan.2014

Document predecessor: