LPCB®

Loss Prevention Standard

LPS 1276: Issue 1.2

Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems

This standard stipulates the requirements for the certification of above ground suction tanks for automatic pumps for use in automatic sprinkler system installations.

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PARTICIPATING ORGANISATIONS

This standard was approved by the LPC Fire and Security Board and Expert Group C.

The following organisations participated in the preparation of this standard:-

Association of British Insurers
Association of Chief Police Officers
Association for Specialist Fire Protection
British Automatic Fire Sprinkler Association
British Fire Protection Systems Association
British Security Industry Association
Confederation of British Industry
Chief Fire Officers' Association
Door & Hardware Federation
Electrical Contractors Association
Fire Sprinkler Association
Health & Safety Executive
International Fire Sprinkler Association
London Fire and Civil Defence Authority
Local Government Association
National Fire Sprinkler Association
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 13)

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

This standard identifies the evaluation and/or testing practices undertaken by LPCB for the purposes of approval and listing of products and services. LPCB listing and approval of products and services is based on evidence acceptable to LPCB:-

- that the product or service meets the standard
- that the manufacturer or service provider has staff, processes and systems in place to ensure that the product or service delivered meets the standard

and on:-

- periodic audits of the manufacturer or service provider including testing as appropriate
- compliance with the contract for LPCB listing and approval including agreement to rectify faults as appropriate

This standard stipulates the requirements for certification of above ground suction tanks for automatic pumps for use in automatic sprinkler systems conforming to BS EN 12845:2003.

This standard supersedes LPS 1254-1.1 and should be read in conjunction with LPCB Scheme Document SD037

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 stipulates the requirements for certification of above ground suction tanks for automatic pumps for use in automatic sprinkler systems.

The following types of tanks can be approved for use as pump suction tanks in conjunction with the LPC Rules for Automatic Sprinkler Installations (2nd edition) and BS EN12845 – Fixed firefighting systems – Automatic Sprinkler systems – Design, installation and maintenance. These tanks can also be used with any other sprinkler system installation standard that has a requirement for certificated tanks:

- Single supply tank
- Superior supply tank

In accordance with the LPC Rules and BS EN 12845 the following combination of single and superior supply tanks are acceptable for a duplicate water supply:

- Two single supply tanks;
- Two superior supply tanks; or
- One single and one superior supply tank.

Each type of tank may be sized such that it may be independent of inflow, i.e. full capacity, or dependent on inflow, i.e. of reduced capacity subject to the requirements of BS EN 12845 Clause 9.3.

Note: Whilst not part of the LPCB certification process, applicants are advised to seek approval/acceptance of the tank design from the appropriate national water authority.

2 DEFINITIONS

In accordance with the requirements of BS EN 12845, the following definitions are derived:

Single supply tank:	A water storage tank which shall be designed and protected against corrosion such that the need for emptying the tank for maintenance is reduced to a period of not less than 3 years. (BS EN 12845 clauses 9.6.1 & 20.3.5.2)
Superior supply tank:	A water storage tank which shall be designed and protected against corrosion such that the need for emptying the tank for maintenance is reduced to a period of not less than 10 years. (BS EN 12845 clauses 9.6.2)

* Note: These periods exclude the need for maintenance caused by accidental damage, exceptional environmental conditions and exceptional water conditions.

3 REQUIREMENTS

3.1 Capacity

Each tank supplied under this approval scheme must not exceed a maximum capacity of 1300m^3.

Duplicate sub-divided tanks may have a total capacity not exceeding 2600 m^3, provided the dividing wall is structurally capable of supporting either compartment full of water whilst the other is empty, and the maximum capacity of each compartment does not exceed 1300 m^3.

Note: Authorities having jurisdiction may accept single supply, multi-level tanks or sub-divided tanks in excess of these maximum capacities, provided that an independent verification of the tank's design and integrity is submitted by professionally qualified consultants. Such tanks will not be eligible for listing within the LPCB List of Approved Products and Services.

3.2 Performance

3.2.1 Single supply tanks

Each single supply tank shall be designed and installed such that the need for emptying of the tank for maintenance is reduced to a period of not less than 3 years. Applications for approval must be supported with independently verified evidence, including evidence of field experience, of the design, materials and construction.

Note: LPCB reserve the right to reject and/or appoint an independent expert to review the data submitted. LPCB will provide justification for its decision to reject and/or appoint an independent expert if required.

3.2.2 Superior Supply Tanks

Each superior supply tank shall be designed (based upon best practice and technical information relating to corrosion protection and design considerations) and installed such that the need for emptying of the tank for maintenance is reduced to a period of not less than 10 years.

Applications for approval must be supported with independently verified evidence, including field experience, of the design, materials and construction.

Note: Current industry experience shows that the following designs may be suitable for achieving the above criteria for superior supply tank design:

- Concrete tanks designed and constructed in accordance with BS 8007 (Code of practice for the design of concrete structures for retaining aqueous liquid) with a cover of concrete, metal or glass fibre reinforced plastics are suitable;
- Steel tanks galvanised with 600 g/m2 of galvanising in total (i.e. 300 g/m2 per side) plus a suitable interior rubber liner such as butyl or EPDM;

- Steel tanks galvanised with 1200 g/m2 of galvanising in total (i.e. 600 g/m2 per side)
- Glass reinforced plastic tanks; and
- Glass lined (vitreous enamel) steel tanks with a minimum internal coating of 0.25 mm.

Note: LPCB reserve the right to reject and/or appoint an independent expert to review the data submitted. LPCB will provide justification for its decision to reject and/or appoint an independent expert if required.

3.3 Inspection regime

It is recommended that tanks be subjected to an inspection regime as detailed by the manufacturer. Such inspection regimes to include, but not be limited to inspection of:

Tank exterior – to be performed annually

- Compliance with BS EN 12845 Clause 20;
- All safety and information related signs & decals for legibility;
- Overflow pipes, and pipe terminations to ensure that they will perform their design function;
- Tank ventilation systems, including screens designed to prevent birds, insects and debris from entering the tank, for signs of blockage;
- Galvanised coating thickness which shall include galvanised coating thickness measurement at a minimum of 5 locations on two tanks sheets;
- The tank exterior for possible damage and signs of corrosion; and
- Ladders, locks, platforms, ladder cages etc for corrosion and/or damage that may have safety implications.

Tank interior – to be performed at least once every 3 years for single supply tanks and 10 years for superior supply tanks or earlier if an inspection of the exterior of the tank shows possible damage or signs of corrosion.

- Internal sheet and roof coating integrity, particularly in areas where external damage or internal corrosion may have occurred;
- Tank/roof coating, particularly at all fastener locations and at sheet edges for signs of damage or corrosion;
- If the tank is a mastic sealant design then inspect the condition of the sealant used on all joints, at the tank wall to floor junction, in the area of sumps, and other tank or floor penetrations for signs of degradation;
- If the tank is a lined design then inspect the condition of the liner particularly in the area of joints, gaskets, eyelets etc for signs of premature degradation;
- The galvanised coating on all parts for signs of degradation/corrosion;
- Other interior tank components such as vortex inhibitor, ball valve, heater etc for proper functionality; and
- Floor as appropriate for signs of degradation.

When an inspection is undertaken, an inspection report shall be produced after each visit and a copy kept by the manufacturer for a period of not less than 5 years. An example inspection report is provided in Appendix A.

3.4 Design Calculations and Declaration

3.4.1 Initial application

Each generic tank design for approval shall be submitted with detailed design calculations for all stressed parts of the structure, verified by a competent person such as a chartered engineer with at least five years' experience of designing load bearing structures.

All design calculations shall cater for a minimum wind loading in an empty state of 45 m/s.

3.4.2 Individual tank design

The manufacturer's internal procedures shall be such that each tank design (for outdoor use) shall be able to withstand a minimum wind loading in an empty state of 45 m/s.

3.5 Pump connection

Sealing arrangements shall adequately seal the pump test pipes into the tank structure so that it shall prevent ingress of extraneous matter.

3.6 External protection

Pump suction tanks shall have all external steelwork protected against corrosion.

Note: Current industry experience shows the following options may be suitable:

- Coating in accordance with BS EN ISO 12944 (Paints and varnishes – Corrosion protection of steel structures by protective paint systems),
- Coating in accordance with BS 5493 (Protective coating of iron and steel structure against corrosion), or equivalent; or
- Galvanising of the exterior with a minimum of 300g / m^2

3.7 Tank cover

All tanks shall be provided with a cover which shall satisfy all of the following:

- Is rigid;
- Excludes direct daylight;
- Prevents water from becoming contaminated with extraneous matter;
- Is designed to withstand snow loadings for the region in which the tank is to be installed (a minimum of 0.75 KN / m^2); and
- Shall be designed such that any part is a minimum of 50mm above the highest water level (including supporting structures, with the exception of central support pillars).

3.8 Lined tanks

3.8.1 Tank liners shall not be manufactured from fibreglass. This applies to liners, not GRP tanks.

3.8.2 The base of all lined tanks shall be protected in such a way as to prevent damage to the liner on installation.

3.8.3 Bolt heads and panel edges shall be protected internally to prevent damage to the liner.

3.9 Ancillary Equipment

All tanks shall be provided with all of the following:

- A permanently attached access ladder to BS 4211 (Ladders for Permanent Access) which shall incorporate a platform and guard-rail from which a person shall be able to test and/or maintain the ball valves whilst keeping both feet on the platform.

- A ball or float valve for maintaining the required level of water in the tank;

- An access opening in the tank cover of such size and location to enable the testing, maintenance and replacement of the ball valve equipment. The cover of this opening shall be permanently attached by hinged or other means and shall be secured in such a manner as to be capable of being opened by hand;

- A device which shall show the total amount of water present in the tank, and which monitors the quantity of water down to below the suction pipe outlet to the pumps. This device shall be capable of being maintained without draining the tank. It may be possible for the gauge and associated fittings to be supplied separately to the tank for fitting in the pump house if required. If such an arrangement is provided, the gauge shall be suitable for use in suction conditions or be protected from such.

Note: "cat and mouse" type indicators are not adequate;

- An immersion heater or other means to prevent the ball valves and the water in the vicinity of the ball valves from freezing. Any immersion heater provided must be of a type which shall not burn out when exposed to the air, e.g. when the water level in the tank is lowered below the immersion heater. The heater shall be of the dual element type. Each element shall be capable of operating independently and preventing water in the vicinity of the ball valves from freezing and capable of being maintained or removed without draining the tank;

- A drainage facility that can completely drain the tank;

- An LPCB approved Vortex inhibitor, with upper and lower flanges;

- An efficient overflow arrangement in compliance with the relevant water authority requirements; and

- An access hatch at the base of the tank with a minimum opening of 600 x 600 mm or 600 mm diameter.

3.10 Environmental Conditions

All tanks shall be designed to meet the requirements of Clause 3.2.1 or 3.2.2 in all expected UK water and UK external environment conditions. Where special designs are required for exceptional conditions, these shall not be supplied as LPCB approved unless submitted to LPCB for evaluation.

3.11 Training

Suitable procedures shall be in place within the manufacturer's quality management system to ensure adequate training of personnel involved in the design, manufacture and installation of storage tanks.

4 ASSESSMENT AND INSPECTION

An inspection of a filled tank of similar design and being not less than three years old may be conducted by the LPCB such that conformity with technical documentation supplied by the applicant and the requirements of Section 3 of this standard can be assessed.

Notes:

- The tank need not necessarily be installed in a sprinkler installation;
- Where inspection of all ancillary items is not feasible, review of specifications may be sufficient;
- LPCB reserve the right to inspect an empty tank, or a tank in the process of construction where deemed appropriate;
- LPCB reserve the right to involve independent qualified structural and corrosion specialists to examine the specification and tank (either empty or full) to verify compliance with this standard; and
- Where appropriate, tests may also be carried out as part of the evaluation.
- The three-year period may be extended, should this be considered appropriate by the LPCB.

5 MARKING AND LABELLING

Only pump suction tanks which are approved by the LPCB as complying with the requirements of LPS 1276 may be described directly, indirectly or by implication by reference to Loss Prevention Standard 1276 or LPS 1276.

Marking requirements are given in LPCB Scheme Document SD037.

6 ON-GOING ASSESSMENT AND AUDIT

Requirements for the on-going approval and LPCB Red Book Listing of pump suction tanks are given in LPCB Scheme Document SD037.

7. REFERENCED PUBLICATIONS

LPCB Red Book	List of Approved Fire and Security Products and Services
WIS 4-25-01	Water Industry Specification for the use of steel tanks in the water industry
BS 4211	Ladders for Permanent Access
BS 5493	Protective coating of iron and steel structure against corrosion
BS 8007	Code of practice for the design of concrete structures for retaining aqueous liquids
BS EN ISO 12944	Paints and varnishes – Corrosion protection of steel structures by protective paint systems
PN103-5	BRE Global: Use of the BRE Global Mark(s)
LPC Rules	LPC Rules for Automatic Sprinkler Installations
BS EN 12845	Fixed firefighting systems – Automatic Sprinkler systems – Design, installation and maintenance
SD037	LPCB Scheme Document 037 - suction tanks for fire pumps for automatic sprinkler pumps.

Appendix A – Example Inspection Report Form

INSPECTION REPORT

Customer (name, address & location of tank)	
Date Of Inspection:	
Inspected by:	

Tank Details

Manufacturer							
Date of erection		LPCB Ref. No.					
Tank Type	Mastic		Lined				
Capacity		m^3	Height		m		
Material	Galvanised		Glass		Other		

Inspection Type	Internal		External	

Tank Condition - External

General appearance (signs of corrosion etc)	
Thickness of galvanising (microns) (where applicable)	Top row (4 locations at 2 nearest corners each side of ladder) TR | BR | TL | BL Bottom row (5 locations each corner & centre of 1 bottom plate) TR | TL | BR | BL | Centre
Evidence of leakage?	

Tank Condition - Internal

General condition	
Lining present Y/N	Condition:

Recommendations

The following recommendations are made based on the inspection carried out

Health and Safety Significant Damage or Corrosion Minor

Assessor signature: Date:

Amendments Issued Since Publication

DOCUMENT NO.	AMENDMENT DETAILS	SIGNATURE	DATE
LPS 1276-1.1	1 year maintenance free period changed to 3 years. In line with prEN12845 > BS EN 12845:2003		01/07/06
LPS 1276-1.2	1. New front cover 2. Title added to header 3. Contents page moved to Page 1 4. Amended notes on Page 3 5. Repagination 6. Update of copyright information	DC	Jan.2014