

Loss Prevention Standard

LPS[®] 1276 : Issue 2.0

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



This Loss Prevention Standard is the property of BRE Global Limited. and is made publicly available for information purposes only. Its use for testing, assessment, or certification must be in accordance with LPCB internal procedures and requires interpretation by BRE Global Limited, LPCB and BRE experts. Any party wishing to use or reproduce this Loss Prevention Standard to offer testing, assessment, or certification must apply to BRE Global Limited for training, assessment and a licence; a fee will normally be charged. BRE Global Limited. will not unreasonably refuse such applications. BRE Global Limited accepts no responsibility for any unauthorised use or distribution by others of this Loss Prevention Standard and may take legal action to prevent such unauthorised use or distribution.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 1 of 26

CONTENTS	Page
PARTICIPATING ORGANISATIONS.....	2
VISION OF LOSS PREVENTION STANDARDS	3
FOREWORD	4
1 SCOPE.....	5
2 DEFINITIONS.....	6
3 REQUIREMENTS.....	7
4 DOCUMENTATION TO SUPPORT APPLICATION.....	13
5 TRAINING	15
6 INSTALLATION AND COMMISSIONING RESPONSIBILITIES.....	16
7 RECORDS OF INSTALLED AND COMMISSIONED TANKS	18
8 ASSESSMENT AND INSPECTION TO SUPPORT APPROVAL.....	18
9 MARKING AND LABELLING	18
10 ON-GOING ASSESSMENT AND AUDIT	19
11 PUBLICATIONS REFERRED TO:.....	21
Annex A – Design Calculation Declaration (Normative)	22
Annex B – Materials of Construction (Informative)	25
AMENDMENTS ISSUED SINCE PUBLICATION.....	26

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 2 of 26

PARTICIPATING ORGANISATIONS

This standard was approved by the BRE Global Governing Body.

The following organisations participated in the preparation of this standard:

BAFSA
Zurich Risk Engineering
CFOA Fire Engineering Technical Standards (FETS)
Tank Manufacturers Association
Fire Industry Association
International Watermist Association

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 3 of 26

VISION OF LOSS PREVENTION STANDARDS

Loss Prevention Standards (LPSs) 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 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.

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 LPSS SHOULD ENSURE THAT THEY POSSESS THE LATEST ISSUE AND ALL AMENDMENTS.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 4 of 26

FOREWORD

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

- 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 certification and listing, including agreement to rectify faults as appropriate;

The responsibility for ensuring compliance with the technical and managerial process and requirements for the product or service lies with the manufacturer, service provider or supplier.

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 BREGlobalEnquiries@bregroup.com.

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 Limited, Watford, Herts. WD25 9XX or e-mail to BREGlobalEnquiries@bregroup.com

Certified products and services appear in the LPCB “List of Approved Products and Services” which may be viewed on our website: www.redbooklive.com

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 5 of 26

1 SCOPE

This standard specifies the requirements for the LPCB certification of above ground suction tanks for use in automatic sprinkler systems. The tanks are required to act as the water supply source for automatic fire sprinkler protection systems in the event of a system activation. This standard addresses the design, manufacture, installation and commissioning of the tank for use as part of an automatic fire sprinkler system.

This standard addresses the following key elements, as a minimum, for the provision of the LPCB approved tanks employed for use as part of an automatic fire sprinkler system:

- Approval of the technical specification
- Control of externally provided processes, products and services
- Requirements for installation
- Requirements for commissioning and labelling of the tank
- Documentation and Record keeping requirements

Installation and commissioning of tanks forms a part of the requirements for this scheme. The supply of tank packs as an ex-works activity is not permitted under this scheme.

Tanks approved under this scheme will meet the requirements for either a single or superior water supply when used in conjunction with the LPC Rules for Automatic Sprinkler Installations and BS EN12845 *Fixed firefighting systems – Automatic Sprinkler systems – Design, installation and maintenance*. Tanks approved under this scheme may also be used with other sprinkler system installation standards for which the scope of this certification is appropriate.

The tank shall be designed such that the need for emptying the tank for first time maintenance shall be a period of not less than 10 years. This period excludes the need for maintenance caused by accidental damage or exceptional circumstances. Tanks should be subject to regular inspection and maintenance of ancillaries in-line with the Approved Companies specifications.

Any warranty or servicing arrangements between parties do not fall within the scope of this approval.

The maximum height covered by this approval, for non-metal tanks, is 4m.

Any tank supplied under this scheme shall not exceed a maximum capacity of 1300m³. Duplicate sub-divided tanks may have a total capacity not exceeding 2600m³, 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 1300m³.

The LPCB reserve the right to:

- Reject an application to join a LPCB approval scheme.
- Appoint an independent expert, at the applicant's expense, to review any data submitted as part of the application.
- Require additional information and/or site visits to support the certification process.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 6 of 26

2 DEFINITIONS

Definitions are taken from EN12845 where appropriate and in addition:

2.1 Earthquake Load

Applied load arising from a potential seismic event based on; geographic location, frequency and severity.

2.2 Ex-works

Supply of tank packs and/or associated components direct from the factory or place of manufacture without installation and commissioning via the approved company

2.3 Approved Company for the Tank

The Approved Company may subcontract various aspects of their activities but shall remain responsible for the overall provision of the LPCB approved tank including but not limited to the design, manufacture, installation, commissioning, ongoing record keeping for the LPCB approved product and the release of the associated marking (rating plate)

2.4 Maximum Effective Capacity

The volume of water, in cubic metres available for the fire sprinkler system. It is calculated in accordance with the requirements of EN12845.

2.5 Nominal Capacity

The maximum water storage capacity, in cubic metres of the tank.

2.6 Commissioned Tank

The tank shall have demonstrated through filling and in-situ operational testing, that all LPS 1276 requirements have been met and that a fully operational tank has been provided. Only after it has been demonstrated that the 'above ground suction tank for automatic pumps for use in automatic sprinkler systems' is fully functional can the rating plate be issued for the specific tank by the Approved Company and the LPCB approval to this scheme be declared.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 7 of 26

3 REQUIREMENTS

The tank design, associated ancillaries, installation and commissioning documentation and product realisation shall be reviewed to confirm that they meet the requirements of the scheme and are suitable for use as a source of water for automatic fire sprinkler systems for the environmental conditions in which they are installed.

Compliance with the requirements of the scheme shall be determined through:

- 1) Documented Information review against the requirements of the standards cited and LPCB Scheme document 037.
- 2) Witnessed audits of new and existing installations and commissioning activities in all relevant territories.
- 3) Factory Production Control (FPC) audit of all relevant suppliers in accordance with PN111-15.

Testing of the tank system operation and/or components may also be required if deemed necessary by the LPCB.

3.1 Design Requirements

3.1.1 Design Calculations and Declaration

For the complete range of tank volumes and geometries covered by the application a completed *LPS 1276 Design calculation verification form* (Annex A of this standard) shall be provided as part of the application for review.

The declaration shall be verified by an independent competent person such as a chartered engineer with at least 5 years' experience of designing load bearing structures. The CV and evidence of professional standing shall be included with the submission for information.

3.1.2 Design Options

Design options available under this scheme are:

- a) The Approved Company has a fixed range of pre-engineered tank designs which specify volumes and geometries. The verified design calculations will need to cover the complete range of specified design options.
- b) The Approved Company has a methodology or software package which enables the design to be bespoke for each application. In such cases the verification of the design calculation must identify all limitations in design detail and show that the scope of the calculation method and functionality of the software package has been fully verified. Where this option is employed the software version will be listed as part of the approval.

3.1.3 Design Factors

The review of the design requirements shall include, but not be limited to:

- a) The intended scope of design including implementation and control of design drawings and associated algorithms.
- b) The limits of design geometries such as:

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 8 of 26

- Tank shapes,
 - Panel configurations,
 - Panel designs,
 - Range of tank heights (maximum permissible height for non-metal tanks is 4m),
 - Range of tank volumes (maximum permissible volume for a single tank unit is 1300m³).
- c) The limitations on environmental applications such as:
- Wind loading (empty and filled states), as applicable to territorial applications. Minimum design load accepted for a single unit is 45 m/s.
 - Operational temperature ranges (limits of movement, expansion of tank joint details etc)
 - Snow load (both roof and side loading), where appropriate.
 - Seismic design details, where appropriate.
- d) The requirements for the tank supporting structure shall be provided to enable the design and specification of the tank foundation to be undertaken based on typical details such as:
- Water load imposed on the tank structure and foundations at maximum water capacity
 - Empty and filled state for imposed loads including wind and snow as applicable
 - Installation tolerances (e.g. surface finish, levels, base oversizing)
 - Bolt fixing requirements and associated pull-out strengths for the foundation based on the anticipated imposed loads
 - Water retention requirements for the tank base/foundation where this forms part of the water retaining envelope of the tank.
- e) All tanks shall be provided with a roof which shall:
- Be rigid;
 - Exclude direct daylight;
 - Prevent water from becoming contaminated with extraneous matter;
 - Be fitted with a lockable access hatch of minimum 600mm x 600mm size.
 - Be designed to withstand wind uploads and snow loadings for the region in which the tank is to be installed (a minimum snow loading of 0.75 kN/m²); and
 - Be designed such that any part is a minimum of 50 mm above the highest water level (including supporting structures, with the exception of central support pillars).

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 9 of 26

- f) Lined tanks shall:
- Not be fitted with tank liners manufactured from fibreglass.
 - Be protected to prevent damage to the liner on installation.
 - Be protected to prevent damage to the liner from bolt heads and panel edges during use.
 - Be provided with a generic tank design for approval with detailed design calculations for all stresses of the liner. The design calculation must show that the fixing details of the liner and the liner itself are capable of taking both the applied load of the empty liner during tank construction, filling or maintenance and the loading during normal service.
 - Be supplied with a Certificate of Conformity from the liner manufacturer to confirm that the liner meets the following:
 - the range of required ambient temperature applications and any additional protective measures necessary such as the provision of matting bags.
 - that the liners` maintenance free period is in-line with that of the tank body (clause 3.2 (b)).

3.2 Operational requirements

- a) The tank shall provide water for automatic fire sprinkler systems.
- b) The tank shall be designed such that the need for emptying the tank for first time maintenance shall be a period of not less than 10 years. This period excludes the need for maintenance caused by accidental damage or exceptional circumstances. Tanks should be subject to regular inspection and maintenance of ancillaries in-line with the Approved Companies specifications.
- c) The tank shall be fitted with an outlet pipe to feed the sprinkler suction pumps. An LPCB approved (LPS 2070) Vortex Inhibitor shall be fitted to the inlet of the outlet pipe.
- d) The control of the filling of the tank from an external source, shall be provided by an LPCB approved (LPS 2083) control valve.
- e) Where required, LPCB approved (LPS 1185) stop valves shall be used.
- f) Additional ancillary equipment required to ensure the effective operation of the tanks shall also be provided as detailed in Clause 4.5.

3.3 Durability Requirements

Applications shall include relevant details to demonstrate the requirements of Clause 4.2 (b) have been met.

It shall consider the required service conditions applicable to the tank and associated ancillaries when used as part of an automatic fire sprinkler system covering the applicable environmental, geographical and geometric design considerations.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 10 of 26

Where additional design considerations are required such as those related to the local Regulating Authorities Having Jurisdiction (AHJ), these shall not reduce the performance characteristics of the approved tank design required under this Scheme and are subject to separate approval reviews by BRE Global.

3.4 Material Performance Requirements

The material specifications and durability details for all critical components including the tank shell, liners (where applicable) and associated ancillaries shall be provided. For all materials and components, the applicable material characteristics, specifications, sizing details and associated tolerances shall be detailed.

Annex B provides informative details of current materials of construction.

3.4.1 Structural Metals

All structural metal specifications shall detail the grade (where appropriate), physical, chemical and dimensional properties of the element and be supported by an EN 10204 3.1 certificate and EN 1090 – *Structural Steel specifies the requirements for conformity assessment of the performance characteristics for structural steel and aluminium components* declaration. The conformity assessment in EN 1090 covers the manufacturing characteristics, and where appropriate the structural design characteristics.

All steel shell tank panels shall have a minimum material thickness of no less than 1.8mm prior to the provision of external and/or corrosion protective finishes such as galvanising. A thickness of less than 1.8mm may be considered subject to provision of evidence of strength and durability in line with the requirements of 3.2.(b).

3.4.2 Corrosion Protection of Metal Tanks

Tanks shall be protected against corrosion in order to meet the requirement of 3.2.(b). Where alternative corrosion protection options to those cited in this section are proposed, suitable equivalence data shall be provided to demonstrate the suitability of the approach.

3.4.2.1 Galvanising

Where galvanising is used to provide corrosion protection it should be in accordance with BS EN 10346 and/or EN ISO 1461, as appropriate:

- Unlined tanks should be coated to a thickness of 600 g/m² per side (1200 g/m² of galvanising in total),
- Lined tanks should be coated to a thickness of 300 g/m² per side (600 g/m² of galvanising in total)

All galvanised panels shall be supplied with Certificates of Conformity for the galvanising thicknesses.

Small areas of galvanising damaged by welding, cutting, rough treatment or erection shall be made good by the use of at least two coats of zinc rich paint to BS 4652 -*specification for zinc rich priming paint*.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 11 of 26

3.4.2.2 Coating of Metal Tanks

Relevant standards may include:

- 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;

3.5 Ancillary Equipment

As part of the submitted tank design details of the following ancillary equipment shall be provided. The commissioning process (Clause 7.2) shall demonstrate, log and record the operation of this equipment. Full maintenance details shall be included as part of the Handover Documentation.

3.5.1 Ladders and Access Platforms

To enable personnel access for the maintenance and/or test of float or ball valves and other ancillary equipment, whilst keeping both feet on the platform, a permanently attached access ladder shall be provided for all tanks, (including slave tanks), which incorporates a platform and guard-rail. The ladder and access platforms shall conform to BS 4211.

Note: Where alternative access provision is required this will require separate approval by BRE Global.

3.5.2 Internal Access Ladders

To enable personnel to enter the tank, internal access ladders, where fitted, shall be designed to be corrosion resistant.

3.5.3 Ball or Float Valve

A ball or float valve for maintaining the required level of water in the tank shall be installed. The valve shall be LPCB listed to LPS 2083 *The Requirements and Test Procedures for the LPCB Approval of Automatic Water Level Control Valves for use in Above Ground Suction Tanks for Sprinkler Systems*.

An access opening in the tank cover shall be provided. This shall be 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 hinges or other means. It shall be securely latched when closed and be capable of being opened by hand.

3.5.4 Tank Level Indicator

The tank shall include a device to show the total amount of water present 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. The primary gauge shall be fitted to the external face of the tank at a height not greater than 1.75m from the tank base. Any additional remote readouts shall be suitable for use in the location in which they are placed.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 12 of 26

Note: "cat and mouse" type indicators are not accepted.

3.5.5 Immersion Heaters

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 or float valves from freezing, to maintain the operational function of the tank. Each element shall be capable of being maintained or removed without draining the tank;

The provision of an immersion heater can be omitted only were the ambient water tank temperature around the ball or float valve can be maintained or shown not to drop below 4°C.

Where an immersion heater is not fitted there shall be a statement included in the Commissioning and Handover Documentation stating that:

'An Immersion Heater has not been fitted to this tank (OEM unique reference) as ambient conditions do not fall below 4°C, if this operating condition changes the requirement for a heater should be considered'

3.5.6 Drain down facility

The tank shall be fitted with a drainage facility that will enable the tank to be emptied for maintenance and inspection purposes.

3.5.7 Vortex Inhibitor

The tank shall be fitted with an outlet pipe to feed the sprinkler suction pumps. An LPCB approved (LPS 2070) Vortex Inhibitor shall be fitted to the inlet of the outlet pipe.

3.5.8 Overflow / Vent

An overflow arrangement in compliance with the relevant water authority requirements shall be installed.

3.5.9 Manway

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

3.5.10 Stop Valves

Where required, LPCB approved (LPS 1185) stop valves shall be used.

3.6 Pump connection

Sealing arrangements shall adequately seal the pump test return pipes into the tank structure to prevent ingress of extraneous matter.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 13 of 26

3.7 Balance pipes

Where balance pipes are installed between primary and slave tanks, stop valves shall be fitted to enable isolation of each tank for maintenance. These valves shall be monitored.

4 DOCUMENTATION TO SUPPORT APPLICATION

The applicant shall provide the LPCB with a comprehensive information pack, (where not provided in printed format only PDF documents will be accepted). All documents shall be provided in English, dated, with a unique reference number, issue status and title.

A complete set of design drawings shall be provided. Each drawing shall be uniquely marked with a drawing title and reference number showing the revision level, revision history (including authorisation details) and date of issue. These drawings shall be listed as controlled documents as part of the LPCB Document Register (Clause 4.2).

Verified calculations (Clause 3.1.1 & Annex A) shall also be submitted for the complete range of tanks to be included in the approval.

Installation and Commissioning Manuals shall also be included as part of the documentation pack and shall be listed as controlled documents as part of the LPCB Document Register (Clause 4.2).

4.1 General Documentation Requirements

The documentation pack shall include, as a minimum to demonstrate compliance with the requirements of this scheme as detailed in Clause 3:

- Document Register detailing all documents included in the submission.
- Design calculation pack containing all information and independent approvals as detailed in Clause 3.1
- Documentation to demonstrate compliance with Clause 3.2, 3.3 and 3.4.
- General assembly drawings containing all component and ancillary equipment arrangements including materials and finishes.
- Identification of critical components and full material specifications for these elements including component drawings, manufacturers details and associated designations as part of the Quality Plan (PN111).
- Detailed drawings of the panels/plates including material specifications and finishes.
- Details of sealing and jointing products including material specifications, manufacturers and details of any specialist tooling and procedures. Details of any material compatibility issues.
- Details and drawings of the pump connection requirements, Clause 3.6.
- Technical drawing of the marking/name plate, Clause 9.
- Installation and Commissioning Manual(s), Clause 4.2

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 14 of 26

4.1.1 Tank Liners

Where liners are used as part of the tank design the following information as part of the requirements of 3.1.3 (f) shall be supplied, as a minimum:

- Technical drawings of the tank liners for the complete range of sizes included in the application.
- Detailed design calculations and validated methodology for the design algorithms for the range of liner materials and sizes used; including eyelet type, spacings, reinforcements, support rings etc.
- Methodology for the selection of liner materials (where material options exist; such as EDPM/PVC/Butyl) and the associated tank liner protection materials such as matting bags.
- Lifespan declaration for each liner type together with supporting evidence of liner durability confirming that the liner durability is in line with the design life of the tank shell.
- Details of the liner material, including Technical Specification/Technical data sheet and Inspection Certificate.
- Physical sample of each liner and matting material for reference.
- Details of the liner welding requirements, e.g. welding instruction, weld test method and associated records.

4.1.2 Tank Ancillaries

Technical details and drawings (including materials, specifications and finishes), for all ancillary equipment, shall be provided to demonstrate compliance with the requirements of Clause 4.5 and in addition:

- Diagram of the overflow arrangement, in accordance with water authority requirements. For UK application details of the Type A/(AB) air-gap design is required. Evidence of any alternative local AHJ requirements shall be provided.

4.2 Installation and Commissioning Manuals

Installation and commissioning manuals shall be controlled through the Document Register and will form part of the approval listing. The Manual(s) shall be provided in English, translated versions for local operations shall also be referenced as Controlled Documents. The manual shall be provided in printed format as part of each tank installation package. The manual(s) shall clearly detail all installation and commissioning activities. The manual shall contain, as a minimum, details of:

- a) Health and Safety details and practices
- b) Details of any specialised tools or equipment required and applicable working practice and training requirements,
- c) Initial site inspection prior to installation covering the acceptance criteria for the tank support structure including level tolerances, slab size specifications and tolerances.
- d) Preservation of tank components and ancillary devices prior to and during installation.
- e) Installation and build methodology addressing all arrangements for ensuring that the installation complies with all requirements of this Scheme and include:

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 15 of 26

- Tank supporting structure,
 - Tank shell erection,
 - Tank panel fitting patterns,
 - Fitting requirements such as panel tightening torques, anchor bolt fitting details etc.
 - Installation of tank roof,
 - Installation of all ancillaries and components, including clearly identified sections for each piece of ancillary equipment,
- f) For tank liners, details of site handling and installation requirements including:
- Delivery and site preservation requirements.
 - Unpacking instructions for the liner.
 - Site repair instructions for the liner.
 - Evidence/details of the base protection (to prevent damage to the liner on installation)
 - Details of the protection of the bolt heads and panel edges.
- g) Contact details for nominated Approved Company's representative for technical support.
- h) Methodology and contact details for reporting site issues and / or missing or faulty components.
- i) Details and requirements for the completion of the Installation Report.
- j) Details, methodology and check list for the completion of the tank filling, commissioning and hand over.
- k) Requirements for the Completion of the Commissioning Report including the Approved Company check list.
- l) Completion Certificate for retention by the Approved Company.

5 TRAINING

Suitable procedures shall be in place within the Approved Company's Quality Management System (QMS) to ensure adequate training of personnel involved in the design, manufacture, installation and commissioning of tanks.

These procedures shall include details of training delivered for both in-house and externally sourced service providers. The records shall include training records for individuals and training matrices of the competencies achieved.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 16 of 26

6 INSTALLATION AND COMMISSIONING RESPONSIBILITIES

The Approved Company shall be responsible for the control of the installation and commissioning process of all tanks approved under this scheme. The installation and commissioning activities shall be undertaken only by service providers controlled and monitored by the Approved Company.

6.1 Installation

The Approved Company shall provide a copy of the controlled Installation and Commissioning Manual(s) with each tank project together with all relevant drawings.

6.1.1 Externally Sourced Providers (EP)

Where the Approved Company uses externally sourced providers for the installation of their tanks, two options are available.

6.1.1.1 Option 1 - Externally Sourced Providers (EP)

The Approved Company shall have procedures in place to:

- a) Control the installation of the tank systems to ensure they are compliant with the requirements of the approved tank design.
- b) Where the Approved Company uses EPs they shall maintain and make available a list of trained providers.
- c) Ensure the design, install and commissioning of the tanks are undertaken in accordance with the Approved Company's requirements and take appropriate action if this is not carried out.
- d) Adequately train personnel. This training shall be carried out by a competent representative of the Approved Company and shall be refreshed at least every 2 years or as required following changes to the Approved product.
- e) Keep EPs apprised of product updates and critical issues.
- f) Report and record failures in service together with remedial actions.
- g) Ensure EPs have competency to carry out investigations, report and take the necessary actions after products in service are found to fail or experience issues. The Approved Company may carry out this investigation and action.
- h) Make regular checks of installations carried out by EPs. At least one new and one existing system shall be inspected per year for each EP and territory covered by the approval. Reports from these inspections shall be made available as part of the FPC audit process.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 17 of 26

6.1.1.2 Option 2 – Cross-listing

The Approved Company may choose to have an Externally Sourced Provider listed as part of the product approval. This will be undertaken solely as a Type 2 cross-listing as detailed in BF406.

6.1.2 Technical Competency Requirements for all Installation activities

These requirements are applicable to all installers whether in-house or externally sourced.

- a) The training programme provided to the installer by the Approved Company, shall be provided in document form to BRE Global.
- b) Training records for all candidates who have successfully completed the training course to show installer competence shall be maintained and provided to BRE Global as part of the audit programme.
- c) Certificates should be provided to all successful candidates.
- d) The methodology for update programmes and the frequency of refresher courses shall be documented and evidence of attendance and effectiveness of any courses shall be made available. The Approved Company shall keep installers apprised of product updates and critical issues. This will form part of the audit requirements for both the Approved Company and associated installers.
- e) Records of all approved installations shall be maintained, and the information shall be available from the Approved Company and provided to BRE Global as part of the audit programme.
- f) Reports of complaints and in-service failure records shall be maintained and shared with the Approved Company to ensure control of approved systems is maintained. Details of installation failures and corrective actions will be audited at both the Approved Company's and installer audits as applicable.

6.2 Commissioning

The rating plate for the tank shall not be issued by the Approved Company or affixed to the tank until a Commissioned Tank (see 2.6) has been provided. This shall be confirmed by the Approved Company through receipt of the Commissioning report.

Commissioning of the tank shall be performed by the Approved Company or their nominated deputy as either a stand-alone activity or as part of the fire protection system commissioning.

Full details of the tank commissioning shall be recorded, and the records maintained by the Approved Company as part of the project files. These shall be reviewed as part of the FPC audit activities.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 18 of 26

7 RECORDS OF INSTALLED AND COMMISSIONED TANKS

For each tank system installed and commissioned under this Scheme, the Approved Company shall retain records of, as a minimum:

- a) The companies unique project reference.
- b) Site location
- c) Copy of client agreed tank design and drawings
- d) Copy of as built tank drawings
- e) Copy of design change history
- f) Record of identification numbers for the installed LPCB approved ancillaries:
 - Vortex Inhibitor
 - Float / Ball Valve
- g) Copy of the Installation Completion Report
- h) Details of the installation team
- i) Copy of the Commissioning Completion Report and check list
- j) Copy of the completed rating plate drawing or photographic record.

8 ASSESSMENT AND INSPECTION TO SUPPORT APPROVAL

As part of this scheme, BRE Global will select appropriate examples of tanks to address the range of designs within the application.

To confirm conformity to the technical documentation supplied by the applicant against the requirements of the Scheme:

- Filled and operational tanks not less than three years old will be selected and inspected.
- A tank under construction will be witnessed.

The applicant shall demonstrate control of the tank installation and commissioning processes. They shall provide documented procedure for training, monitoring and auditing these processes as detailed in this scheme.

Whether the installation and commissioning of the tank is an outsourced or in-house activity additional review and auditing to monitor the control of these activities will be required when the scope of the Approved Company covers multiple regions and territories.

BRE Global 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, additional tests or assessments may also be carried out as part of the evaluation at the expense of the applicant.

9 MARKING AND LABELLING

The rating plate for the tank shall not be affixed until the final Commissioning Report for the tank has been signed off by the Approved Company. A copy of the Commissioning Report and release of the rating plate shall be maintained by the Approved Company as part of the project documentation (Clause 7).

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 19 of 26

Each approved tank shall be fitted with a rating plate which is non-detachable, non-flammable, permanent and legible, carrying the following details:

- Approved Company's name or trademark
- Approved Company's address
- Product Name
- LPCB Mark (PN103)
- LPCB Certificate Reference Number (PN103)
- Date of erection
- Date of Commission
- Installer's name (if different from certificate holder)
- The maximum effective capacity in m³
- The maximum capacity in m³.
- Lining details (type and ID/Batch)
- Reference number
 - Tank
 - Vortex Inhibitor
 - Ball or Float Valve

Notes:

- Multi-supply tanks shall indicate the capacity for the automatic sprinkler system separately.
- The plate shall be fixed to the tank not more than 1.75m above the base.
- It is not acceptable for the above details to be shown on ancillary equipment (e.g. height gauge) in lieu of a rating plate. Any changes to uniquely numbered ancillaries (Vortex Inhibitors, Float or Ball Valves) shall be updated on the rating plate.

10 ON-GOING ASSESSMENT AND AUDIT

Requirements for the on-going approval and LPCB Red Book Listing of pump suction tanks are given in the relevant LPCB Scheme Documents:

- SD037,
- SD0228,
- SD003

and will follow all applicable clauses of both ISO 9001 and PN111 (FPC).

The purpose of the FPC audit shall be to determine that the Approved Company has control of the design, manufacture, installation and commissioning of the tank. It will also be determined through audit that the procedures, and quality controls are maintained to produce a product of the same quality and construction as originally Approved. Such audits shall be conducted at a minimum biannual frequency and will include site installation visits. The regions for site installation visits will be determined based on the company's sales profile and previous audit history. Additional audits may be conducted based on jurisdictional requirements or at the sole discretion of BRE Global and may be conducted as unannounced visits.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 20 of 26

Where live installations cannot be audited in an audit cycle, for the listed company to retain approval BRE Global may accept an LPS 1276 tank less than two years old for a single audit cycle. BRE Global reserve the right to withdraw approval if the company cannot demonstrate sales and live tank installations within two audit cycles.

10.1 Record Keeping

The listed company shall maintain a database of all LPS1276 installed tanks. This database will be used to direct the ongoing audit inspection programme and to provide details of the tank locations, design specifications, drawing references, listed ancillaries, location and installers as detailed in Clause 8.

This list will also be made available to the relevant AHJ as required.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 21 of 26

11 PUBLICATIONS REFERRED TO:

For undated references please refer to the latest published issue.

BF406	Application for Alternative marking or Cross-listing of Product and Red Book Listing
BS 4211	Ladders for Permanent Access
BS 5493	Protective coating of iron and steel structural against corrosion
BS 8007	Code of practice for the design of concrete structures for retaining aqueous liquids
BS EN 1090	Structural Steel specifies the requirements for conformity assessment of the performance characteristics for structural steel and aluminium components
BS EN 12845	Fixed firefighting systems – Automatic Sprinkler systems – Design, installation and maintenance
BS EN ISO 12944	Paints and varnishes – Corrosion protection of steel structures by protective paint systems
LPCB Red Book	List of Approved Fire and Security Products and Services
LPC Rules	LPC Rules for Automatic Sprinkler Installations, Incorporating BS EN 12845
LPS 1185	Requirements and testing methods for remote monitored gear operated butterfly stop valves
LPS 2070	Requirements and testing methods for Vortex Inhibitors
LPS 2083	The Requirements and Test Procedures for the LPCB Approval of Automatic Water Level Control Valves for use in Above Ground Suction Tanks for Sprinkler Systems.
PN 103	BRE Global: Use of the BRE Certification Mark(s)
PN 111-15	Factory Production Control
SD 003	LPCB Scheme Document 003 – Scheme Document for Quality Management Systems
SD 037	LPCB Scheme Document 037 – Suction tanks for fire pumps for automatic sprinklers pumps
SD 228	LPCB Scheme Document 228 – Scheme Document for Fire Suppression Products

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 22 of 26

Annex A – Design Calculation Declaration (Normative)

Applicant / Tank Approved Company details	
Applicant / Tank Approved Company:	
Applicant / Tank Approved Company address:	
Existing LPCB reference numbers, if applicable:	

Details of tank sizes and geometries covered by the application prior to verification (Applicant / Tank Approved Company Initial Application)	
Nominal range of Tank capacities (m³):	
Nominal range of Tank sizes (m):	
Details of any geometry limitation such as maximum height, width, L/D ratios etc.:	

Table 1 – Scope of Design Applied

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 23 of 26

Requirements for verification of design calculation

I) Verifier:

In accordance with the requirements of LPS 1276: Issue 2

Each generic tank design for approval shall be submitted with detailed design calculations which has been independently verified.

- The verifier shall be a chartered engineer or equivalent who is independent of the design and approval activities related to this project.
- They must have at least 5 years experience of designing load bearing structures

II) Verification:

Verification statement	
<p>I confirm that the design calculations and drawings detailed in Tables 2 & 3 below meet the following requirements:</p> <ul style="list-style-type: none"> ○ The tank Approved Company design procedure have been followed in the production of the design specification, details and drawings referenced in this statement and verified by me. ○ The design of the tank and calculation methods used are compliant for the range of Tank applications (sizes and geometries) detailed in this statement against the requirements of LPS 1276 : issue 2 and explicitly addresses the following details: <ul style="list-style-type: none"> ○ The holding-down arrangement and design for the tank is suitable for LPS1276 : issue 2 applications ○ The tank design meets the performance requirements of LPS1276: issue 2 at a minimum wind loading of 45m/s (in an empty state) and a minimum snow loading of 0.75kN/m² based on UK ambient conditions. ○ Where local wind/snow loadings exceed the minimum values stated in LPS 1276 Issue 2 they have been assessed to confirm that where they suitable for use in these applications as detailed in this statement. ○ Where additional local environmental conditions have been included as part of the design caluculations details have been reviewed and included. 	
Name:	
Signature:	
Position:	
Date:	

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 24 of 26

Contact details of the verifier person/company: (Address, website, email, phone number)	
Confirmation/Evidence of Professional Standing (CV/Professional Standing/ Experience)	

Details of referenced documents	
Approved Company design procedure:	
Document name:	
Document reference number:	
Issue/revision:	
Date:	

Table 2 – Documents covered by Verification

Note:

Use additional sheets for Table 1 and Table 2 if necessary.

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 25 of 26

Annex B – Materials of Construction (Informative)

Current industry experience shows that the following materials may be suitable for achieving LPS 1276 tank designs:

- Steel Tanks
 - Galvanised steel sheet
 - Unlined 1200 g/m² of galvanising in total; 600 g/m² per side.
 - Lined 600 g/m² of galvanising in total; 300 g/m² per side
- Liners such as:
 - Butyl Rubber, PVC or EPDM where suitable durability data is available to demonstrate the performance of lining material.
 - Glass lined (vitreous enamel) steel tanks with a minimum internal coating of 0.25 mm.
- Aluminium Tanks
- Polymeric Tanks
 - Glass reinforced plastic (GRP)
 - Contact Moulded
 - Hot Press (SMC)

Issue: 2.0	LOSS PREVENTION STANDARD	LPS® 1276
July 2019	Requirements for the LPCB certification and listing of above ground suction tanks for sprinkler systems	Page 26 of 26

AMENDMENTS ISSUED SINCE PUBLICATION

DOCUMENT NO.	AMENDMENT DETAILS	SIGNATURE	DATE
LPS 1276-1.1	i. 1 year maintenance free period changed to 3 years. In line with prEN12845		01/07/06
LPS 1276-1.2	i. New front cover ii. Title added to header iii. Contents page moved to Page 1 iv. Amended notes on Page 3 v. Repagination vi. Update of copyright information	DC	01/2014
LPS 1276-2.0	i. Major review and redrafting ii. New front cover iii. Revision of loss prevention standard iv. Scope revised v. Definitions revised vi. Requirements revised vii. Addition of documentation section viii. Addition of installation and commissioning sections ix. Marking and labelling revised x. Design calculation record form added to Annex A xi. Annex B added providing guidance on materials	SAC	12/2018
	Pass for comment		Jul 2019