BRITISH STANDARD

Fusible plugs for steam boilers and compressed air applications – Specification

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Contents

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 4, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard was published by BSI and came into effect on 20 July 2006. It was prepared by Technical Committee PVE/12, *Safety devices*.

Supersession

It supersedes BS 1123-1:1987, which is withdrawn.

Information about this document

It has been prepared to:

1) consolidate requirements for fusible plugs from BS 759-1:1984[1)] and BS 1123-1:1987 into one standard;
2) remove potential overlap with BS EN ISO 4126-1:2004.

This British Standard provides requirements for the design and guidance on the installation of fusible plugs for the steam boiler and compressed air industries for which a European or international standard does not currently exist.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1) At the time of publication BS 759-1:1984 is being revised and the new edition will not cover fusible plugs.

1 Scope

This British Standard specifies design requirements for fusible plugs for use in steam boilers and compressed air installations.

Guidance on installation is included in Annex A.

NOTE Fusible plugs do not provide protection against excessive pressure, i.e. they do not remove the requirement for a safety device(s).

2 Normative references

The following referenced document is indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 21, *Specification for pipe threads for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions)*

3 Terms and definitions

For the purposes of this British Standard, the following term and definition apply.

3.1 fusible plug

temperature-activated non-closing pressure relief device, containing fusible metal designed to melt at a pre-determined temperature

4 Construction

4.1 Steam boiler applications

Fusible plugs for steam boiler applications shall consist of an outer body with a central passage, which may be either parallel or conical. The smallest diameter of the central passage shall be not greater than 13 mm for plugs suitable for pressures up to 7 bar, and be not greater than 10 mm for pressures exceeding 7 bar. The passage shall be closed with a central core secured by an annular lining of fusible metal, designed to allow the core to drop clear if the lining melts.

NOTE A portion of the body carrying the fusible metal may be detachable from the base to allow easy replacement without removing the whole fitting from the boiler.

4.2 Compressed air applications

Fusible plugs for compressed air applications shall consist of a holder with a central passage closed by fusible metal. The outlet shall be provided with a diffuser cap capable of arresting and containing the ejected metal. The inlet connection of the holder shall be threaded not less than R3/8 in accordance with BS 21.

5 Materials

5.1 General

The manufacturer shall take into account the full details of the application in order for the correct materials to be selected.

NOTE Details may include:

- *temperature;*
- *pressure;*
- *fluid;*
- *pressure vessel material.*

5.2 Non-fusible components

Non-fusible components of the plug shall be of copper alloy, except where this is incompatible with the application criteria in **5.1** eg. fluid chemical compatibility.

5.3 Fusible component

For steam boiler applications the fusible component of the plug shall be of a metal which melts readily at a temperature not less than 90 °C and not greater than 200 °C in excess of the saturated steam temperature at the design pressure of the boiler.

For compressed air applications the fusible component of the plug shall be of metal with a melting point to suit the application.

6 Marking

The melting temperature or temperature range in °C shall be permanently marked on the fusible plug.

NOTE Where the fusible plug is too small to permit the temperature to be marked, a suitable traceable code may be used.

7 Instructions

The manufacturer shall provide clear written instructions relating to the installation of fusible plugs and their safe use.

NOTE Guidance on the installation and safe use of fusible plugs is given in Annex A.

Annex A (informative) Installation and safe use

A.1 General

Discharge through fusible plugs should not be used to provide over pressure protection i.e. they do not remove the requirement for a safety device(s).

Consideration should be given to the positioning of the fusible plug to ensure that the discharge does not cause damage or injury to persons and property.

It is essential that fusible plugs are installed the correct way round, otherwise during operation the core could jam in the passageway and render the device useless.

A.2 Steam boiler applications

Fusible plugs should be fitted at a sufficient height and in such a position as to give an early warning in the event of shortage of water to all parts of the boiler liable to damage by the direct application of furnace heat.

Fusible plugs should be installed so that their discharge is directed onto the source of heat. However, they should also be installed so that as far as practical they are shielded from the path of direct flames.

It is essential that fusible plugs are installed the correct way round. A fusible plug may be designed to be installed from the “fire-side” or may be designed to be installed from the “water-side”. It needs to be installed in the attitude it was designed for i.e. with the pressure on the appropriate side of the fusible plug.

A.3 Compressed air applications

Fusible plugs should be fitted between the compressor and the after-cooler (if any), or between the compressor and the receiver. They should be fitted as close to the compressor outlet as practicable, and situated so that the discharge from the plug cannot cause injury or damage to persons or property.

On compressed air vessels the fusible plug should be fitted at or near the top of the vessel.

A.4 Safe use

Fusible plugs should be cleaned and inspected regularly to assure continued protection, for example fusible plugs on steam boilers can be affected by scale and other deposits and should be cleaned and replaced as necessary.

Bibliography

Standards publications

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN ISO 4126-1:2004, *Safety devices for protection against excessive pressure – Part 1: Safety valves*

Further reading

BS EN ISO 4126-2, *Safety devices for protection against excessive pressure – Part 2: Bursting disc safety devices*

BS EN ISO 4126-4, *Safety devices for protection against excessive pressure – Part 4: Pilot operated valves*

BS EN ISO 4126-5, *Safety devices for protection against excessive pressure – Part 5: Controlled safety pressure relief systems (CSPRS)*

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