

Category 1 Standard

1-085 Fire safety performance of materials



Please read the Written Notices
attached to this standard

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MAYOR OF LONDON



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1 Purpose

- 1.1 The purpose of this Standard is to define the requirements for the fire safety of materials, in terms of flammability, smoke emission and toxic fume emission, installed on the London Underground (LU) network:
- 1.2 The business objective of this standard is to ensure that the risk to which the public and employees are exposed is controlled to a level that is as low as reasonably practicable.

2 Scope

- 2.1 This standard specifies the requirements for materials installed in underground locations with regard to:

- a) Flammability (including the risk of explosion);
- b) Smoke emission;
- c) Toxic fume emission.

Note: This standard does not cover the wider aspects of fire engineering, and it may be necessary to invoke other London Underground, National or European Standards to cover fully all aspects of fire safety for a particular application.

- 2.2 This standard shall apply to installations:
- a) In stations covered by Section 12 of the Fire Precautions (Sub-Surface Railway Stations) Regulations 1989 and 1-086;
 - b) In passenger and engineering trains;
 - c) In running tunnels;
 - d) In other locations that are not effectively separated from locations covered by a) or c) above;
 - e) In all other locations where risks from flammability, smoke or toxic fumes are not controlled to a level as low as reasonably practicable by other means..
- 2.3 Guidance is available in G-085.
- 2.4 Locations will be considered to be 'effectively separated' if they are either:
- a) completely divided from the relevant stations and/or running tunnels by construction complying with Table 5, and there is no personnel access via that construction or;
 - b) configured such that it can be demonstrated that the stations/tunnels are adequately protected by means of fire and smoke control, in accordance with the relevant British Standards. This will require the support of a Fire Strategy, prepared, assured and accepted to be in accordance with 1-080.
- 2.5 This issue of the standard supersedes 1-085 A2

3 Requirements

3.1 General

- 3.1.1 All tests required under 3.2, 3.3 and 3.4 shall be undertaken by test houses accredited by the National Accreditation bodies within the relevant European Union country.



- 3.1.2 A copy of any test reports shall be made available to LU on request.

3.2 Rolling Stock

3.2.1 General

Rolling stock shall comply with BS 6853, Category 1a with the following additions.

3.2.2 Technical liquids

Technical liquids (including electrical components) shall be subject of a risk assessment to quantify the risks associated with fire.

3.2.3 Flammable gas

- 3.2.3.1 Pressurised flammable gas installations shall not be used.

- 3.2.3.2 Battery installations and all other flammable gas installations not covered by 3.2.3.1 shall be the subject of separate risk assessment for every application.

Note: Guidance is given in LU Guidance Document G-085

3.2.4 Flat Surfaces

- 3.2.4.1 Flat surfaces shall be subject to toxic fume test B2 in Annex B of BS 6853. In order to ensure that the amount of toxic gas produced is above the threshold of detection, test samples shall have a mass of combustible material (as opposed to inert substrate) of not less than 5g.

- 3.2.4.2 If the requirement in 3.2.4.1 is not practical (on the basis of low mass per unit area), then the test B1 in BS 6853 shall be used. The resulting mass based R value shall be converted to an area based R value by scaling using the mass per unit area of the combustible material. The pass or fail criteria shall be against the area based R value requirement in the relevant table in BS 6853. The basis for conversion shall be:
Calculated B2 R value = Measured B1 R value x (mass per unit area [g/sq.m.]/1000).
A single sample shall be tested in the tube furnace, representing the percentage components of any composite material.

- 3.2.4.3 If B2 method is used it shall be ensured that samples taken to determine toxicity performance include all gases liberated during the testing process.

Note: An appropriate method to be used could be a fan to ensure all gases are mixed.

3.3 Locations other than Rolling Stock

3.3.1 Vertical & ceiling surfaces and flooring surfaces in tunnels and in stations

- 3.3.1.1 All vertical and ceiling surfaces shall comply with the requirements Classes B, d0, in BS EN 13501-1 or alternatively BS 476Pt 6, ($i_1 < 6$; $I < 12$) and BS 476Pt 7) Class 1.
- 3.3.1.2 All flooring surfaces shall comply with the requirements of Class B_{fl} in BS EN13501-1 or alternatively BS476 Pt 7 Class 2
- 3.3.1.3 All materials shall be tested to replicate their intended application, i.e. a panel or surface to be used free- standing, with no backing or substrate, shall be tested in that manner. Similarly, where a panel or coating is to be used on a particular substrate, that substrate shall be used as backing for the sample to be fire tested.