

Specification for

# Lifts, escalators, passenger conveyors and paternosters —

**Part 4: General requirements for  
escalators and passenger conveyors**

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| Federation of Wire Rope Manufacturers of Great Britain | National Association of Lift Makers      |
|                                                        | General Post Office                      |
|                                                        | Retail Trading Standards Association     |

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# Foreword

1. This British Standard, prepared under the authority of the Mechanical Engineering Industry Standards Committee, revises, and supersedes, the 1958 edition, which was entitled BS 2655, “*Electric lifts*”.

2. The new title reflects the extension of the scope of this British Standard. Amendments to Parts 1, 2 and 3 of this standard have been published, and implement the change in title. The revised Part 1 and additional new parts will be published separately and, together with Parts 2 and 3, are as follows.

*Part 1. General requirements for electric, hydraulic and hand-powered lifts.* This part is basically a revision of the 1958 edition of BS 2655-1, without the building requirements and list of definitions, and extended to cover the engineering and safety requirements for new hydraulic and hand-powered lifts as well as for new electric lifts.

*Part 2. Single-speed polyphase induction motors for driving lifts.* This part covers the type of electric motor specially designed for driving lifts. It should be used in conjunction with BS 2613<sup>1)</sup> and gives additional requirements including the class of lift rating and special limits of temperature rise.

*Part 3. Arrangements of standard electric lifts.* This part gives standard dimensions for lift wells and machine rooms in relation to lift capacity and platform sizes, for seven classes of lifts.

*Part 4. General requirements for escalators and passenger conveyors.* This part specifies engineering and safety requirements for escalators and passenger conveyors. The latter may be described as machines in which the passenger carrying surfaces remain parallel to the direction of motion and are uninterrupted.

*Part 5. General requirements for paternosters.* This part specifies engineering and safety requirements for paternosters which may be described as machines where series of cars are continuously running in closed loops, and are characterized by the car floors remaining substantially horizontal when the direction of motion is reversed at the extremities of car travel.

*Part 6. Building construction requirements.* This part specifies structural and fire resistance requirements for the equipment covered by Parts 1, 4 and 5.

*Part 7. Testing and inspection.* This part specifies tests, examination and certification of new and modified equipment covered by Parts 1, 4 and 5.

*Part 8. Modernization or reconstruction of lifts.* This part specifies engineering and safety requirements.

*Part 9. Definitions.* This part gives definitions of terms used in the remainder of the standard.

*Part 10. General requirements for guarding.* This part specifies requirements for the guarding of moving parts and protection against hazards from electrical equipment. It relates to equipment covered in Parts 1, 4 and 5.

CP 407:1972, *British Standard Code of Practice for electric, hydraulic and hand-powered lifts*.

This code gives general information and guidance for planning, purchasing, installation and maintenance of passenger, goods and service lifts.

3. In case of difficulty in classifying any equipment in accordance with the headings of Parts 1, 4 and 5, reference should be made to the relevant definitions in Part 9.

4. Part 4 of this standard applies to the engineering and safety requirements for escalators and passenger conveyors.

<sup>1)</sup> BS 2613, “*The electrical performance of rotating electrical machinery*”.

5. In covering the requirements for escalators it has been borne in mind that, apart from their use by public transport undertakings, they are finding increasing application in shops and department stores. In the latter case they are frequently supplied by the manufacturers as complete units, with such items as machinery and control compartments forming an integral part of the escalator. This contrasts with the former case in which a machine room is usually provided.

6. The passenger conveyor was introduced only a few years ago as a method of transportation for moving persons over a horizontal distance with or without a change in level, and therefore as yet only limited experience is available on this form of transport. No doubt types other than those given in this part of the standard will be developed, and it is not the purpose of this part to preclude other types from being incorporated, providing they satisfy the safety standards required, giving particular attention to the movement of very young children and infirm or elderly persons who may use the facilities in shopping centres, airports, railway terminals, etc.

7. Throughout this standard the metric and imperial systems of units are used side by side, but it is important that each contract shall either use the imperial system throughout or the metric system throughout. A mixture of the two may lead to complications. It should be noted that in general, units have been converted from imperial to the metric system and then rounded off by increasing or reducing after taking into account the practical problems involved, and current Continental practice.

8. This Part of this standard is rendered obsolescent concurrently with the publication of BS 5656:1983 "*Safety rules for the construction and installation of escalators and passenger conveyors*" under the conditions stated below.

1) This standard is no longer applicable to all new escalators and passenger conveyors installed in such new buildings as are designed after the date of publication of BS 5656 (31 October 1983).

2) All new escalators and passenger conveyors ordered after 31 October 1983, for installation in such buildings as have not yet been commenced but for which final plans existed before 31 October 1983 should be constructed preferably in accordance with BS 5656 or in accordance with this standard. If, however, such installations are scheduled for commissioning after 31 October 1987, the requirements of BS 5656 only are applicable.

3) All new escalators and passenger conveyors ordered after 31 October 1983, for installation in such new buildings as were under construction or completed before that date, are permitted to be constructed in accordance with either this standard or BS 5656. If, however, such installations are scheduled for commissioning after 31 October 1987, the requirements of BS 5656 only are applicable unless it can be shown that compliance is not reasonably practicable.

4) Such new replacement escalators and passenger conveyors and major modifications to existing escalators and passenger conveyors as are commissioned before 31 October 1987, for use in existing buildings that were built before 31 October 1983, are permitted to be in accordance with either this standard or BS 5656. After 31 October 1987, the requirements of BS 5656 only are applicable unless it can be shown that compliance is not reasonably practicable. Special provisions are permissible to meet certain site conditions often present in buildings that have been in use for many years. It is intended that the use of new equipment should not automatically be restricted because certain site conditions are now more rigorous than formerly.

The relevant requirements of this British Standard remain current only for the future maintenance and inspecting of existing installations constructed in accordance with this British Standard.

9. In addition to the requirements specified in this standard and in BS 5656 readers should note that the Health and Safety Executive have published Guidance Note PM 34<sup>2)</sup> “*Safety in the use of escalators*” which describes some of the inherent hazards and areas of risk experienced in the use of escalators and recommends certain precautions that should be taken to alleviate those hazards on both existing and new machines.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

#### Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 14 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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<sup>2)</sup> Obtainable from HMSO.

## 1 General

### 1.1 Scope

This part of the standard applies to the engineering and safety requirements for escalators and passenger conveyors.

The requirements for escalators are based on the steps being connected and driven by means of chains. Other types of construction may be adopted provided that the same standard of safety is achieved throughout.

The requirements for passenger conveyors are based on the use of two distinct types of treadway:

- 1) Platforms interconnected by chains or other suitable means, and provided with grooves on the tread surface in the direction of travel (these conforming to the specified requirements for escalators).
- 2) Continuous endless belts with longitudinal grooves formed on the tread surface.

Such aspects as limits of speed, width and angle of inclination are covered, together with methods of assessing contract loading. Also specified are requirements for guarding, handrails, steps or belts, driving machinery and safety devices.

Diagrams of a typical cross section and details of comb teeth and tread grooves are shown, containing limiting dimensions where applicable.

The subject of potential hazards to users is discussed in Appendix A .

## 2 Escalators

### 2.1 Design requirements

**2.1.1 Limit of speed.** The speed of an escalator measured along the line of inclination shall not exceed 150 ft/min or 0.75 m/s.

**2.1.2 Angle of inclination.** For escalators having a vertical rise which does not exceed 20 ft or 6 m and whose speed does not exceed 100 ft/min or 0.50 m/s the angle of inclination shall not exceed 35°. For all other escalators the angle of inclination shall not exceed 30°.

**2.1.3 Width.** The width is specified at two points (see Figure 1):

- 1) The width measured at the tread surface shall not be less than 24 in or 600 mm nor greater than 41 in or 1 050 mm.
- 2) The width between the balustrades, measured at a point just below the handrails, shall not be more than 50 in or 1 250 mm, and shall not exceed the tread width by more than 10 in or 250 mm. The width between the balustrades shall at no point be greater than the width between the handrails. The width between the inner faces of the handrails shall not exceed the width between the balustrades (at a point just below the handrails) by more than 4 in or 100 mm.

#### 2.1.4 Loads

**2.1.4.1 Contract load.** The contract load shall be based on a passenger load of 60 lb/ft<sup>2</sup> or 290 kg/m<sup>2</sup> of the total area of exposed step treads. This load shall be used in the design of brakes, step drives and power transmissions.

**2.1.4.2 Structural load.** For structural design purposes a static load rating of 90 lb/ft<sup>2</sup> or 440 kg/m<sup>2</sup> of the total area of exposed step tread shall be used.

**2.1.4.3 Step load.** Each individual step shall be designed to support a static load of 120 lb/ft<sup>2</sup> or 580 kg/m<sup>2</sup>.

### 2.2 Steps

The surface of the steps shall be horizontal at all positions exposed to passengers. The step frames and treads shall be of non-flammable material. The exposed surface of the risers shall be smooth, and have a low coefficient of friction, or be provided with vertical grooves.

The length of any step tread in the direction of travel shall be not less than 15.7 in or 400 mm and the rise between treads on the incline shall not exceed 9.5 in or 240 mm.