



TECHNICAL GUIDANCE NOTE No. 18rev1

Risk of falls from escalators and moving walks

Introduction

Escalators and moving walks move vast numbers of people safely every day. However, there have been accidents related to people falling over the side of such machines into open voids. This is primarily due to a trend to install escalators/moving walks in open atria and other similar locations where one or both sides of the unit are adjacent to an open void. Such designs look aesthetically pleasing, but do introduce two areas where the presence of voids gives a risk of falling:

- **Escalator and moving walk landings** where there is a risk for people to come into contact with the outer edge of a handrail and be drawn into the void.
- **Escalator and moving walk balustrades** where there is a risk for people to trip or accidentally over balance and topple into the void.

Those responsible for the safe operation of escalator/moving walks in open locations are most strongly advised to conduct a detailed risk assessment to determine if additional safety measures need to be provided. This assessment should take account of the location of the unit, typical users of the unit (adults, children etc), including previously reported incidents or known misuse. This note provides more detail and includes some of the control measures described in the current standard.

BS EN 115-1:2017 – harmonised standard for new escalators and moving walks

BS EN 115-1:2017 sets out a number of building interface items which need to be agreed between the customer and the supplier/installer and has the following guidance:

The risks arising from the configuration of escalators and moving walks within a building (e.g. obstructions or voids adjacent to escalators) should be risk assessed according to methodology of the ISO 14798 by the building designer/owner at the building design stage and measures identified to eliminate hazards or reduce risk to an acceptable level.

Escalator and moving walk landings

BS EN 115-1 includes the following in **Annex A (normative) – Building Interfaces**

A.2.7 *Where it is possible for people to come into contact with the outer edge of a handrail at a landing and can be drawn into a hazardous situation, such as toppling over a balustrade, appropriate preventative measures shall be taken (for an example, see Figure A.2).*

Some examples are:

- *prevention of entry into the space by the placement of permanent barriers;*
- *increasing the height of the building structure of the fixed balustrade in the hazard area by at least 100 mm above the handrail level and positioned between 80 mm and 120 mm from the outer edge of the handrail.*

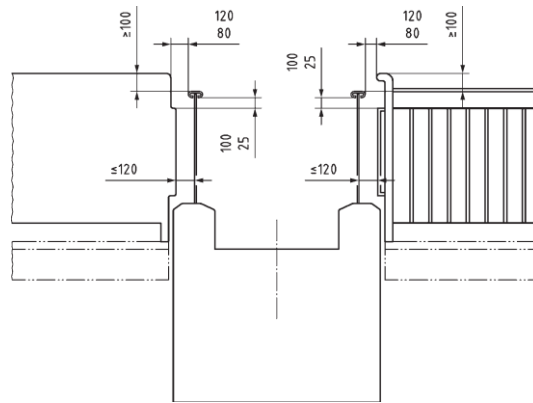


Figure A.2 of BS EN 115-1:2017 — Example of barriers at landings

Consideration should also be given to the risk of passengers, particularly children, who may be drawn into a hazardous situation by the moving handrails at the ground floor landing of an upwards travelling escalator. Raising the height of the anti-climb device so that it is 100 mm higher than the moving handrail is a common solution to deflect persons off the moving handrail before they reach a significant height, but installing “anti-surfing” guards at the balustrade newel ends is a more effective solution as it prevents passengers being drawn onto the handrail in the first place.



Escalator and moving walk balustrades

The balustrade height needs to balance the risk of falling (where this exists) with the need for passengers to be able to guide themselves onto the machine with a firm grip. The normal height of the handrail may therefore not be adequate to address the risk of falling, particularly the lower allowed balustrade heights when in combination with a 35 degree escalator in the down direction.

BS EN 115-1, clause 5.5.2.1 requires the balustrade height to be between 900 mm and 1100 mm. The use of 900 mm high balustrades is unusual on new escalators, but still common on older existing units. 1000 mm high balustrades have tended to be the standard balustrade height in the UK for the past 20 years or so, but 1100 mm high balustrades are becoming much more common. Empirical evidence suggest that 1100 mm balustrades offers a firm handhold for most passengers whilst offering better fall protection than lesser heights.

To mitigate the risk of falling, the risk assessment carried out by the building designer/owner (see introduction above), might consider three measures:

- Avoid the use of voids, which effectively removes the falling hazard.
- Where the hazard is not removed, utilise 1100 mm high balustrades to reduce the risk of accidental falls.
- Where the hazard is not removed and the use of 1100 mm high balustrades may not prevent falls due to misuse or other site specific hazards, fitting of additional guard rails or screening beyond the moving handrails (see picture to the right) is preferred as these generally prevent passengers from sitting or “surfing” on the handrails. BS 5656-2:2004, clause 7.3 provides some guidance on this issue



Note: The retro-fitting of external guarding should not be undertaken without professional consultation to ensure the integrity of the escalator truss or balustrade is not compromised.