



# TB013 – Inflatable Evacuation Times

<b>Document Number</b>	TB013-100		
<b>Release Date</b>	20-02-2026	<b>Version</b>	1.00
<b>Title</b>	TB13 – Inflatable Evacuation Times		

<b>Version</b>	<b>Date</b>	<b>Notes</b>
V1.00	20-02-2026	Initial Release – Authorised by CWW
	tbc	Next review due date

## 1) Overview

A critical risk related to inflatables is deflation of the device due to loss of power to the blower fan. This has been reference in the standard BS EN 14960-1, section 4.2.3 which states:

*“In the event of a power supply failure, the deflation time shall be sufficient to allow users of the inflatable to be evacuated safely”.*

The standard has never provided a test method to help inspectors of inflatable devices determine what the sufficient inflatable time should be. This technical bulletin has been created in an attempt to standardise the approach inspectors must adopt to assess the deflation time of an inflatable.

This technical bulletin has been created to address evacuation times of any inflatable, including those outside of BS EN 14960-1. The data it uses has been gathered from published articles on evacuation from different scenarios.

## 2) Scope + Purpose

This technical bulletin has been created to cover all constant air inflatable devices, including those not currently within the scope of the PIPA scheme. It considers evacuation considerations, assessment, failure to evacuate, controller's responsibilities, and a risk assessment which can be used as part of the inspection process to determine an outcome.

Whilst the technical bulletin attempts to cover all considerations with the evacuation of users from inflatable devices, it is not possible to cover every eventuality as designs continue to become more complex. The inspector who is carrying out the initial or annual inspection should have provide an overriding judgement in principle.

## 3) Operational Considerations

The following are examples of what users face and needs to be considered as part of the evacuation of users.

- 1) Loss of pressure
  - a. The loss of power will cause the blower fan to cut out.
  - b. The cut-out of the fan will mean pressure is slowly lost from the unit, which makes movement more difficult.
  - c. As time increases, the loss of pressure will continue, slowing movement even further.
  - d. Any user who is located on a platform, such as a slide, are at greater risk of becoming 'enveloped' inside the inflatable material.
  - e. Devices which have inflatable elements to support the roof structure are heavier, and prone to collapse in the event of loss of air pressure.
- 2) Number of users on the inflatable
  - a. The evacuation time needs to consider when the maximum number of users are on the device.
  - b. The volume of people evacuating from the unit may cause a delayed evacuation time due to distractions, congestion, and social pressure (e.g. distancing from other users).
  - c. There will be a 'sweet spot' with the number of users, as having others nearby may help to raise awareness about an evacuation, causing a positive effect.

- 3) Distance from egress point
  - a. Smaller units, or those without walls or roofs, will have a positive impact on the evacuation time needed.
  - b. Larger units with a long distance from the egress point, or units which may be semi-enclosed (such as obstacle courses) will have a negative impact and require a greater evacuation time.
  - c. As distance from the egress point increases, the longer it will take, which as the device begins to collapse may cause greater distraction and require a greater evacuation time.
  - d. The longer the distance a user has to travel in a situation which may be physically exertive, the more tired they get slowing their speed of travel.
  
- 4) Line of Sight
  - a. Users who can see the point of egress will directly move towards it without great delay.
  - b. Users who cannot see the point of egress, or are not stood up, will be delayed before moving directly towards the point of egress.
  - c. Large devices, enclosed units, devices with play bed features/obstacles, may prevent users from seeing the point of egress, causing additional delay.
  - d. Poorly illuminated locations/sitings of inflatables will make the line of sight to the point of egress more difficult, causing additional delay.
  - e. Over crowdedness may contribute to delays due to impact on the line of sight. Please see point 2 – number of users on the inflatable, regarding this consideration.
  
- 5) Operational Elements
  - a. Devices which are not at the correct minimal operating internal pressure will deflate quicker.
  - b. Devices which are overcrowded, and have more users than stated on the label, will stifle evacuation and cause delay.

When applying the above considerations, it is clear that smaller and uncomplicated devices would be considered 'lower' risk, e.g. a small A-Frame or H-Frame. This is because users do not have far to travel to evacuate from an exit which is always in sight, and there are usually no features which could risk users becoming enveloped.

In comparison, large devices which put users at a further distance from the egress point, put obstacles in a user's path, or may risk users becoming enveloped, would be of greater risk.

These considerations allow a risk model to be created which can assist inspectors in their judgements.

#### **4) Considerations as part of the Evacuation Time Assessment**

The standard requires users to be able to evacuate devices safely where there is a power failure. The following provides further considerations to section 3, which affect the ability of users to evacuate.

- 1) Manufacturer's information and Design Risk Assessment
  - a. Manufacturers are required to ensure that risks have been reduced to 'as low as reasonably practicable', which can be achieved during the design phase as of a design risk assessment.
  - b. Manufacturer's assessments take precedence as they hold the legal duty to meet the above requirements. This guidance is to be used in the absence of evacuation time data or information.
  - c. In the presence of manufacturers evacuation time data, inspectors are expected to validate the data by assessing the time taken for a device to collapse.
- 2) Device Features
  - a. Devices which enable users to access platforms higher than the main bed of the device may delay the time required to evacuate, and must be considered.
  - b. Slides must be observed to how they collapse and if the slide element remains usable as a means of evacuation.
  - c. Obstacle courses may contain 'up and over' obstacles, or climbs, which when partially inflated, may stifle some users during their evacuation.
  - d. Devices with roofs may alter the ability of users to evacuate positively or negatively, depending on how well supported the roof is and the weight of the material used.
  - e. Devices with enclosed areas create additional risks. These include users becoming trapped and enveloped between fabrics, and the congregation of users.
- 3) User's development
  - a. Whilst inflatables consider the user height for the suitability of its use, the age and ability of users must be factored in when assessing evacuation times. This is to capture how that user would act in the event of an evacuation.
  - b. Mature users are risk aware and are at a development stage whereby at the first sign of danger, they will seek safety by evacuating the device.

- c. Immature users are risk naïve, and at the first sign of danger, will seek instruction from a supervising adult. This causes a delayed response in the user evacuating the device.
- 4) Number of users
  - a. The manufacturer's label usually states a maximum number of users associated with the available play area of the device. It is not known whether the number of users has been stated in consideration of the evacuation time.
  - b. For larger devices, which can handle more than 12 users, the evacuation time needs to be relevant to the number of users. Do not assume that all users will evacuate at the same time.
- 5) Human Factor
  - a. Humans are not robotic or computer driven, and the 'human factor' must be considered. This is a natural delayed response due to human processing time which is considering what the best response is.
  - b. Humans do not always get their response correct. Whilst it is difficult to factor in every eventuality, evacuation times must never 'round down' the evacuation time or the assessment must not give the benefit of doubt if the evacuation time is substandard.
- 6) Safety Factor
  - a. As evacuation times need to consider human behaviours, the exact science and data is variable, and a safety factor must be added in to compensate for this variability.
  - b. Safety factors may be an additional multiple factor of the time calculated, or an arbitrary time added to the final calculation.
- 7) Process
  - a. The evacuation time is a calculation which needs to be determined, prior to assessment.
  - b. Conducting the assessment after calculation develops a safety threshold, which if met is assessed to be adequate.

As the standard does not provide a specific test method for evacuation, the judgement of deflation time has largely been based and tested against time due to the reference of deflation time. In the absence of a robust test process, even calculating the deflation time does not provide a useful value as part of the inspection. Therefore, a risk based approach would be most suited to address the purpose of this requirement within the standard, which is the requirement to ensure that users can evacuate safely.

## 5) Failure to Evacuate

It must be accepted that on larger and more complicated devices, not all users will successfully evacuate the device before the structure collapses. Therefore, the inspection judgement must produce an outcome which assesses the overall risk of injury to users – this will be covered in more detail under section 8.

### 1) Failure of users to evacuate

- a. When observing the collapse of an inflatable, inspectors should consider whether there is a risk of users becoming trapped, enveloped, or crushed by other users above them.
- b. As part of the assessment, inspectors need to review if users can be safely recovered from all parts of the device.
- c. In the event of any locations which may result in users becoming trapped, and potentially unrecoverable, the inspector needs to ensure that the deflation time is sufficiently long enough to allow users to vacate these locations and avoid this situation.

### 2) Emergency procedures

- a. The controller must have sufficient procedures in place to assist users in the event of an unexpected deflation.
- b. Those supervising devices must have sufficient training in evacuation procedures. Poor training or ineffective supervision may be detrimental to evacuation times.
- c. Controllers need to consider how to achieve these requirements when devices are 'dry hired'. This risk is compounded for devices which are larger and more complex.

### 3) Recovery

- a. The controller must have a user recovery procedure, which is implemented following the failure of any users to evacuate during the given evacuation time.
- b. Forms of recover vary depending on the type of unit. They include (but are not limited to):
  - i. Providing clear verbal instructions, to guide users to crawl out of the device on their hands and knees.
  - ii. Operators and attendants entering the device to assist users by lifting collapsed sections of the inflatable, and helping to the egress point.
  - iii. In extreme cases where users are trapped, and there is a risk of suffocation due excessive time trapped, the controller must cut open the device to recover the user.

## **6) The Evacuation Process**

The following is the expected evacuation scenario due to sudden power loss or failure of the blower fan:

1. Loss of power to fan, a short delay before the operator supervising the inflatable becomes aware.
2. Operator alerts users, and attendants, using a whistle, to evacuate the device.
3. A short delay before users become aware of the situation and the operators instructions.
4. Users begin to evacuate the device.
5. Operator completes final checks the device is completely clear, or begins recovery procedures in the event of a deflated device.

## **7) Controller Responsibilities**

1. Operations Manual
  - a. Manufacturers are best placed to provide an evacuation time, as it will be one of the main risks considered as part of the devices design risk assessment.
  - b. Controllers are responsible for ensuring any equipment they own, which is used by members of the public, is safe to use. An operations manual will provide information about the evacuation time and procedures of your device. The manufacturer may provide this information in a different format, such as a key specifications sheet.
  - c. Controllers should obtain a copy of an operations manual in the absence of possessing one for the device.
2. Risk assessment
  - a. The controller's risk assessment for the device should include loss of power/deflation as a key risk with suitable measures put in place to manage the risk.
  - b. The risk assessment should consider familiarity with the location, and power source, and if there have been previous incidents involving loss of power to the blower fan.
3. Safe Systems of Work
  - a. Alongside risk assessments, controllers are required to ensure they have a safe system of work which includes evacuation.
  - b. The controller should have procedures and training for operators to ensure they have the knowledge and skill to handle situations where evacuation is necessary.

- c. The controller should also have similar procedures and training addressing the recovery of users, and emergency situations.
- d. The controller needs to consider what information and how it is delivered to people ‘dry hiring’ inflatables, as the operator is required to have been provided with sufficient instruction to enable them to safely operate the inflatable device.

## 8) Assessing Evacuation and Deflation Times

### a) Where evacuation and deflation times have been provided by the manufacturer.

As part of the design and manufacture of an inflatable, the manufacturer should have considered the evacuation of users and deflation time as part of their design risk assessment. Information may have been provided by the manufacturer, which should be utilised first and verified as part of the inspection.

### b) Where evacuation and deflation times are not available

The inspector should first consider the level of risk presented by the type of unit. A risk table has been created below with inspection assessment considerations, and pass/advisory/fail outcomes. It is not possible to create a table which captures all devices and associated risks, and inspectors should consider recording their assessment on the notes section of the inspection report for future reference.

Risk Category:	Lower	Medium	Higher
<b>Example Device Types</b>	A-Frame, H-Frame, Flat Bed, Bouncy Castle, Combo Bounce & Slide, Slides, Bouncing Pillow, Disco Dome, Toddler Playzones	Obstacle Courses, Slides, Enclosed Domes,  Larger devices listed in lower risk category, or complicated designs	Obstacle Courses, Slides, Enclosed Domes,
<b>Device Size*</b>	10m or less. Slides with a platform height of 4m or less.	10m – 24m. Slides with a platform height 4m – 8m.	Greater than 24m. Slides with a platform over 8m.
<b>Number of Users*</b>	Up to 18 users	Up to 30 users.	Over 30 users.

<b>Design Features</b>	Minimal obstructions, access/egress points greater than 1m.	Egress points less than 1m. Obstacles on play bed impacting line of sight or slowing egress.  Devices with emergency exits.	Only one egress point with width less than 0.6m.  Fully enclosed areas or tunnels.  Obstacles which must be climbed over to escape.  Distances over 15m to an egress point without emergency exits.
<b>Pass</b>	Users are able to evacuate safely without risk of injury.	There are sufficient mitigations in place which enable users to evacuate safely without risk of injury. For example, emergency exits, or the structure retains sufficient shape.	
<b>Advisory</b>	The structure of the device does not retain its shape long enough to enable users to evacuate so it should be noted on the inspection report for the controller to ensure there is a robust operational risk assessment and evacuation procedure in place.	Users are likely to evacuate safely as there are mitigations in place. But some of the features on the device means it should be noted on the inspection report for the controller to ensure there is a robust operational risk assessment and evacuation procedure in place.	
<b>Fail</b>	In a blower fan failure, the structure presents an immediate risk to users which results in a high chance of users suffocating due to enveloping or physical injury due to falling from height, or other users falling on top of others.		

\*Figures are indicative examples, and are not meant to be restrictive in choosing risk categories.

## 9) Inspection Process

1. The device must be assessed at each inspection due to degradation. Switch off the power and begin timing using a stopwatch.
2. Observe the device, considering the guidance provided above and which risk category the device falls into.
3. Assess whether:
  - a. The device retains a degree of its structural integrity, to enable users to crawl out of the device.
  - b. There are no serious concerns with users enveloping, or suffocating when trapped.
  - c. There are no risks with users at height falling on top of other users.
4. Note whether the device is a pass, advisory, or fail. You may wish to include additional notes on the inspection report.

It is no longer a requirement to record the deflation time, however you may wish to include it within any explanation if you consider it necessary.

The standard advisory note to be given to controllers is: “The time for users to evacuation from this device has been assessed during the inspection. Due to some of the features present on this device, it is imperative the controller maintains a robust operational risk assessment and evacuation procedure for the operator to execute in the event of a blower failure.”