

# Cumbria Fire & Rescue Service



## Calculating Occupancy in Places of Assembly

As escape routes need to be adequate for the number of people likely to use them, you will first need to consider the largest number of people, such as staff, public and outside contractors that may be present at any one time. For some events the maximum numbers of people likely to be present will be known, e.g. where the event is ticketed or limited by seating. If occupant numbers are not known or a suitable limit required for your fire risk assessment, a simple calculation can be performed in order to determine the maximum operating capacity using the formula below (see table for appropriate occupant density).

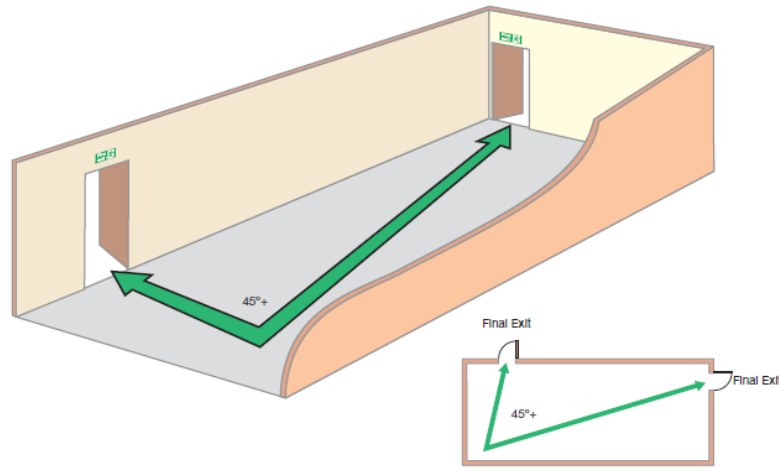
$$\text{Number of people} = \text{Occupied area (m}^2\text{)} / \text{Occupant density}$$

Occupied Area Type	Typical Occupant Density m <sup>2</sup> /person
Standing spectator/audience area or bar area	0.3
Assembly area, public house, dance floor or hall etc	0.5
Dining area or restaurant	1.0
Sports area	2.0
Shop sales area	2.0
Display, production or workshop area	5.0
Office	6.0
Shop (bulky goods) sales area	7.0

Bar area is usually within 2m of a serving point. Further from the bar the occupancy for the main use of the room should be used eg assembly area.

## Alternative Escape Routes

For a normal risk premises if more than 60 people are present, or an exit cannot be reached in 18m from anywhere in the room, then a minimum of two separate exits are required. For two exits from a room to be considered alternative they should be located at least 45° apart. This prevents having to walk directly towards a fire when there are large numbers of people present or long escape routes.



NB Ideally all doors on escape routes should open in the direction of escape, this is particularly important if more than 60 people are intended to use them.

## Calculating Escape Route Capacity

Once you have calculated the occupancy for the use and size of the premises you must check that this is below the maximum numbers the escape routes can accommodate. Reasonable escape times are 2½ minutes for normal risk premises. Most places of assembly fall into this normal risk category. The following guide can be used to determine the general capacities of escape routes within this time:

A width of at least 750mm can accommodate up to:

- 100 people in normal risk premises.

In most places of assembly the minimum width of an escape route should ideally be 1,050mm but in any case not less than 750mm (unless it is for use by less than five people in a separate part of your premises). A width of at least 1,050mm can accommodate up to:

- 200 people in normal risk premises.

An additional 75mm is required for each additional 15 persons (or part of 15).

NB Where wheelchair users are present then the minimum width should not be less than 900mm.

As a general rule stairways should be at least 1,050mm wide and their capacity, calculated as above, should be sufficient to accommodate the number of people on the floors using them.

When calculating the overall available escape route capacity for premises that have more than one way out you should assume that the widest exit is not available, because it has been compromised by fire. The maximum occupancy should then be limited to that accommodated by the aggregate width of the remaining escape routes.

## Seating & Gangways

Seating should be arranged to allow free and ready access direct to the exits. In fixed seating there should be a clear space of at least 305mm between rows. Gangways should be adequate for the number of seats served (see previous escape route capacity) and at least 1,050 mm wide. In general, no seat should be more than seven seats away from a gangway. If temporary seating is provided these should be secured in lengths of not fewer than four seats and not more than twelve.

## Further Help & Advice

The Government has produced the following guides that further explain the risk assessment process and give some advice on what arrangements may be suitable to protect your premises.

**Small & Medium Places of Assembly** :This guide is intended for premises where the main use of the building or part of the building is as a small (i.e. premises accommodating up to 60 people) or a medium (i.e. premises accommodating up to 300 people) place of assembly. These usually include public houses.

**Large Places of Assembly**: This guide is intended for premises accommodating more than 300 people.

Both guides can be downloaded for free from:

<https://www.gov.uk/government/organisations/department-for-communities-and-local-government/series/fire-safety-law-and-guidance-documents-for-business>