

DHF Guide to Force Limitation for the Safe Use of Powered Garage Doors



This guide, supported by the Health & Safety Executive, details the requirements for the force limitation for the safe use of vertically moving powered garage doors.

Safety of powered garage doors: Force limitation

Background

Powered garage doors are machines and, like all machines, must be safe. This legal requirement is contained in the "Supply of Machinery (Safety) Regulations", which are the UK implementation of the European Machinery Directive. Under this directive, anyone supplying machinery in Europe since January 1995 must formally declare it to be safe and also label it with the European CE mark to confirm compliance.

The hazard

The most obvious potential hazard with any powered door is the door striking or crushing a person using it with sufficient force to cause injury. It has, however, become apparent that some domestic garage doors are not being safeguarded adequately against such a possibility. Cases have arisen in the UK and elsewhere of users of automatic doors and gates, including garage doors, being injured or killed. In some cases, the product had not been properly maintained or the injured party was not using it correctly. In many cases, however, a properly designed product would have prevented or mitigated the injury, even where the user (often a child) was misusing the door.

The standard

As explained above, powered doors must, by law, be safe; this includes being safeguarded against such accidents, including any arising from misuse which is reasonably foreseeable. There is a "harmonised" European standard (BS EN 13241-1) which enables a supplier to prove that a door is safe. The detailed requirements for powered doors are in the supporting standard BS EN 12453. There are two options for protecting persons from powered doors which close automatically * :

1. Preventing any collision with a moving door from occurring;
2. Limiting the force acting on a person if a collision does occur.

In practice, option 1 is inconvenient (and costly) in most situations because it involves positioning sensors both inside and outside the garage to detect a person approaching from any direction in time to stop the door's movement before that person can come in contact with the door. **It must be noted that a single photocell cannot achieve this.** In most cases, the second option is preferred and is readily achievable.

Safety devices

Drive systems for many designs of garage door contain built-in safety devices designed to stop and reverse the motor if the door meets an obstruction (such as a person). However, we are aware of two situations where this feature may not be available or may be rendered ineffective:

1 Canopy Doors

"Canopy" doors are single-piece up and over doors which, when open, project some distance in front of the opening forming a canopy (see fig 1). Although these doors can be fitted with the same types of drive system used on certain other styles of door, including fully retractable doors (fig 2) and sectional overhead doors (fig 3), canopy doors have to be connected to the drive unit using a special linkage called a canopy door adaptor (commonly known as a bow-arm adaptor or convertor). If incorrectly selected, this type of linkage can result in the unit's built-in safety device failing to register an obstruction until the crushing force has reached a dangerous level. It is therefore vital that the door supplier is able to prove that the particular combination of door, drive unit and adaptor has been tested together and found to comply with the standard BS EN 12453.

2 Rolling Shutter Doors

Most rolling shutter garage doors (see fig 4) are fitted with tubular motors; most, if not all, such motors have no inbuilt safety devices to limit the force applied when closing the door. Consequently, additional devices are required to safeguard the doors against impact and crushing. In line with the discussion above, most suppliers can provide a safety edge to give force limitation.

RECOMMENDED CHECKLIST

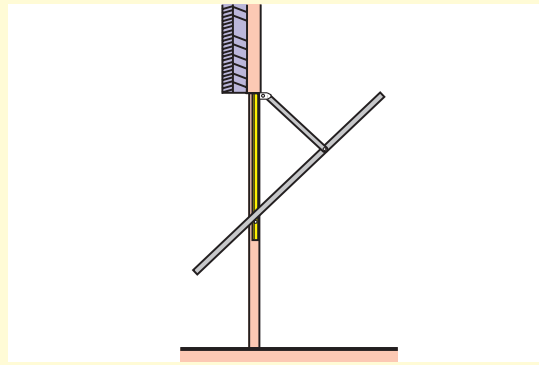
QUESTION	COMMENT	✓ or ✗
Is the powered door CE marked under the Machinery Directive?	This is a legal requirement. Guidance on how to apply the marking is available from DHF.	<input type="checkbox"/>
Does the door comply with BS EN 13241-1 and the supporting standard BS EN 12453?	Compliance permits CE marking under the Machinery Directive. Again, guidance on how to comply is available from DHF.	<input type="checkbox"/>
If the door is a canopy door, is there evidence that the door, drive unit and canopy door adaptor are compatible and have been tested together?	Incorrect selection of the canopy door adaptor can be dangerous. The door manufacturer's recommendations should always be followed. It may not be possible to provide safe power operation in every case.	<input type="checkbox"/>
If the door is a rolling shutter door, is there a safety edge?	Protection against impact and crushing must be supplied as part of the equipment – not as an optional extra. A single photocell is not an adequate substitute.	<input type="checkbox"/>

* A powered door which closes automatically is any door which can close without the user holding in a fixed switch sited in view of the closing door.

FIGURES

1 One-piece canopy door

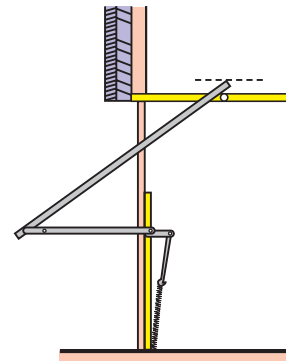
This requires a canopy door adaptor to connect it to a drive unit. **INCORRECT SELECTION OF THE CANOPY DOOR ADAPTOR CAN BE DANGEROUS – ALWAYS FOLLOW THE DOOR MANUFACTURER'S INSTRUCTIONS.**



2 One-piece retractable door

(note the horizontal track above the opening)

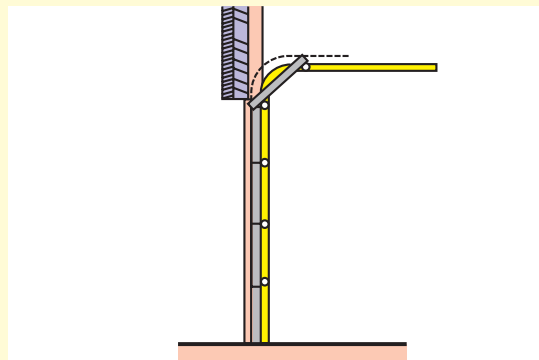
Drive units normally include a safety device, which, if properly adjusted and maintained, will prevent excessive force being exerted.



3 Sectional overhead door

(note the horizontal track above the opening)

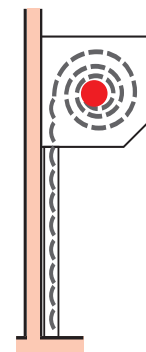
Drive units normally include a safety device, which, if properly adjusted and maintained, will prevent excessive force being exerted.



4 Rolling shutter door

(note the separate laths or slats of which the door curtain is made)

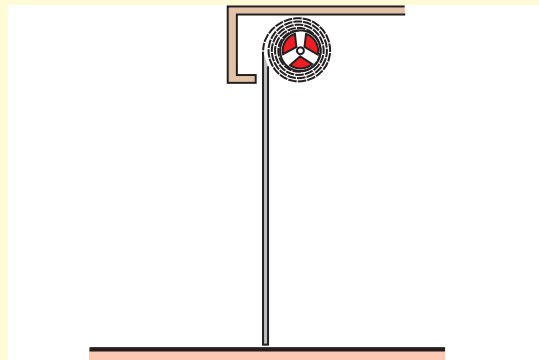
Tubular motors do not generally include safety devices to protect against impact and crushing; a safety edge on the bottom rail of the door is required. **A SINGLE PHOTOCELL IS NOT AN ADEQUATE SUBSTITUTE.**



5 Continuous sheet roller door

(note that the door curtain is made of a continuous sheet of metal rather than separate slats)

Drive units normally include a safety device which, if properly adjusted and maintained, will prevent excessive force being exerted.





Statement from the Health & Safety Executive

“HSE believes that following this industry guidance will help manufacturers and suppliers to comply with the relevant product safety regulations, leading to the prevention of serious accidents involving powered garage doors. I am therefore pleased to support its publication.”

Nick Ratty
Head of HSE's Services, Transportation and Safety Unit

The Door and Hardware Federation

The Door and Hardware Federation represents the interests of manufacturers and installers of industrial, commercial, pedestrian and garage doors as well as manufacturers of locks and building hardware. It provides professionals in all sectors of the building industry with a single source for technical expertise. It has the ultimate aim of assuring progress and maintaining standards throughout the industry.

The DHF Garage Door Group represents the UK's leading garage door manufacturers. It is dedicated to improving technical standards and raising quality within the garage door industry. It advises on technical issues to other bodies, including European standards agencies, health and safety professionals, as well as UK-based customer groups.



**Door & Hardware
Federation**

raising standards

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