

# Risks to pedestrians from crushing zones on electrically powered gates - 2

## What you need to know and do

These are the things you need to do if you install or modify electrically powered gates in areas that people have access to. They might also apply to you if you maintain gates.

- You need the right test equipment to measure closing/opening forces. If you do not have this equipment, you can't be sure that the gates meet safety standards, then do not install them.
- When they are opening and closing, the force of the gates should be limited to those in the British/European standards. The gates should also reverse if they hit someone or something.
- The gates should have sensors that can stop them if someone has been detected. This could be light beams (photoelectric devices), which stop the gates before they reach an obstacle.
- If there are parts of the gates where someone could become trapped or get crushed while it is moving, these need to be protected. People could get injured, for example, as the bars of the gates pass the gate post.
- The gates must have an emergency release mechanism in case someone gets trapped.

When you have installed the gates safely - and met all of the relevant safety requirements - you should apply a CE Mark, so people can be confident the job has been done properly. You must also keep details of the installation, and of any tests, in a technical file.

More details, further references and the background to this safety alert appear below

## Introduction:

The purpose of this Safety Notice is to reinforce and update previous information ([HSE Safety Notice FOD WSW 1-2010](#)) to organisations and individuals involved in the design, construction, installation and commissioning of electrically powered gates and organisations in control of their use and/or maintenance. It is also relevant to companies carrying out on-going maintenance of these types of gates.

It will be of particular interest to gate manufacturers, gate installers, those involved in the commissioning of electrically powered gates, organisations involved in construction projects (including the installation of gates), and persons or organisations in control of premises where persons other than their own employees may have access to such gates (such as site management and/or lettings agents).

## Background:

Two recent, separate, incidents that both led to the deaths of young children have highlighted a risk of using automatic vehicle access gates. (These incidents are in addition to an earlier fatality, which also involved a young child in 2006, and other recent near misses). Whilst these recent fatalities involved automatic sliding gates, this Safety Notice applies to **all** powered access gates.

In both these cases, the children were trapped between the closing edge of the gate and the gate post at the end of the gates' travel. They were trapped because:

- Their presence in the vicinity of the closing edge was not detected; and
- The closing force of the gate when they obstructed it was not limited to the values specified in Annex A of BS EN 12453:2001.

## Standard:

BS EN 12453:2001 recommends a minimum level of safeguarding against the crushing hazard at the closing edge of the gate depending on the type of environment in which the gate is operating. The Standard defines 3 types of use:

Type 1 - The gate is only used by trained users and there is no intended, inadvertent or unauthorised access to it by members of the public.

Type 2 - A limited group of persons (for example persons sharing a block of flats) are trained to operate the gate and the gate is located in a public area.

Type 3 - Any person is free to operate the gate and the gate is in contact with the general public.

The Standard advises on the minimum levels of safeguarding of the main edge according to its type of use. Type 1 gates are not considered further in this safety notice because they are not located in the vicinity of the general public.

In the case of those powered gates categorised as Type 2 or Type 3 and which have automatic control, the advised level of safeguarding is to:

**Limit forces according to Annex A of the Standard using force limitation devices or sensitive protective equipment**

**AND**

**Provide a means for the detection of the presence of a person or an obstacle standing on the floor at one side of the gate.**

**Alternatively, a means for detection of the presence a person, which is designed in a way that in no circumstances can that person be touched by the moving gate leaf, can be provided.**

**Discussion:**

In a significant number of gate installations, the type of use may not have been taken into account during the design stage, with the consequence that the installations may not comply with the safeguarding measures recommended in the standard.

Those who manufacture, install, use or have control of powered gates should assess the risk to health and safety posed by the gate(s), in particular the circumstances of the installation. Certain circumstances, such as the gate being located in the vicinity of the general public, would be considered to be high risk.

BS EN 12453:2001 advises that adopting one or a combination of measures including creating safety distances, installing guards, shaping the leaf surfaces, operating the gate in hold to run, limiting the forces and installing sensitive protective equipment will achieve a safe state.

It is HSE's view that the force limitation function on its own is unlikely to be sufficiently reliable to prevent a person being trapped or crushed. In accordance with the recommendations of BS EN 12453:2001, where the force limitation technique is used in Type 2 or Type 3 installations with automatic operation, additional safeguarding techniques should be used to reduce the likelihood of hazardous situations occurring.

In some installations, single or twin photoelectric beams have been used as an additional safeguard. However, analysis of their installation and configuration has shown that these do not guarantee person detection and the prevention of crushing. Whereas photoelectric beams, when suitably installed and configured, are a possible safeguarding option, pressure sensitive strips on the closing edge of the gate are more effective when used in combination with force limitation.

An important consideration with the operation of automatic gates is the emergency arrangements to release someone should a crushing, shearing or drawing-in incident

occur and the person remains trapped. Many designs of drive units require the use of a release key and lever to disconnect the drive from the gate and allow it to be moved manually. In such circumstances, access to the release key is critical to the quick release of the gate and so arrangements should be in place to ensure that release keys and release instructions are readily available to all authorised users of the gate.

### Action required:

- All designers and installers of electrically powered gates should ensure that the forces generated by a gate when meeting a person or an obstacle are limited and that they do not exceed the values specified in Annex A of BS EN 12453:2001.
- These forces should be measured in accordance with BS EN 12445:2001. "Industrial commercial and garage doors and gates. Safety in use of power operated doors. Test methods" and the performance of the system validated before the gate is put into use.
- Forces should be periodically re-measured and checked as part of the planned preventative maintenance schedule for the gates.
- In addition to force limitation, additional safeguards, such as pressure sensitive strips on the closing edge and photoelectric sensing devices, should be fitted where the risk assessment identifies the gate as high risk, in that it is operating automatically in a public place where children and other members of the public may be present.
- Persons or organisations in control of powered gates should periodically review their risk assessments to ensure that they identify any changes to the environment or operating conditions and that they have taken appropriate steps to address them. This is particularly important when the responsibility for management of the gate passes from one person or organisation to another.
- Other hazards associated with the opening and closing of the gate should also be addressed - these will include crushing, shearing, impact and drawing-in hazards. Examples of other hazard points are described in BS EN 12453: 2001 and include: the opening edge; gaps in the gate where they pass fixed structures; and at the drive mechanism. (Note: force limitation on its own is also unlikely to be sufficient for these hazards).
- All safety devices and features should be checked on a regular basis and in accordance with the manufacturer's instructions to ensure they continue to function as designed to ensure that safety is maintained. This should be specified in a planned preventative maintenance schedule agreed by persons responsible for the gate's management and their appointed maintenance company.

HSE published a Safety Notice (FOD WSW 1-2010) on 26 February 2010 relating to the death of a nine-year old child.

A number of actions were identified relating to the design, installation and commissioning and the management and maintenance of gates during use. These actions are still valid and can be viewed at [HSE Safety Notice FOD WSW 1-2010](#)