# DHF TS 013-3:2021 - Code of practice for the safety of industrial doors, garage doors, powered gates & traffic barriers

## Part 3: Guidance for professional owners and managers

# Contents



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# Foreword

## Code of practice for the safety of industrial doors, domestic garage doors, powered gates & traffic barriers

Documents in this series are:

Part 1: On-site guide

Part 2: Legislation affecting supply, installation & maintenance

Part 3: Guidance for professional owners & managers

This document, **DHF TS 013-3**, Guidance for professional owners & managers, is intended to inform professional owners & managers of their own legal obligations and make them aware of how the legal obligations of their suppliers affect the way that they can provide products and services.

The guidance includes recent changes to the meaning and effect of legislation caused by the UK exit from the European Union. It also reflects the 2016 change to the scope of EN 13241 that has resulted in the need for fire resisting industrial doors to comply with the Construction Products Regulations 2013 since November 2019.

**Part 1** in the series**, DHF TS 013-1** ***On-site guide*****,** details the requirements for safety guidance and draws on applicable legislation and standards to assist all those installing, commissioning, repairing, and maintaining industrial doors, domestic garage doors, powered gates & traffic barrier installations on site. The guidance will also be informative to the managers and supervisory staff of companies engaged in serial manufacture and supply of complete door gate and traffic barrier systems.

**Part 2** in the series, **DHF TS 013-2**, provides guidance on legislation and is intended primarily for managers and supervisory staff of installation and maintenance companies. It is also of relevance to manufacturers and suppliers of complete systems and components. It replaces the legislation guidance that was formerly provided by sections 3 and 4 of DHF COP documents TS 011:2019 and DHF TS 012:2019; these are both now withdrawn.

Compliance with this code cannot confer immunity from legal obligations.

# Scope

The TS 013:2021 package covers all systems within the scope of EN 13241 and EN 12453, which are:

- Industrial doors; horizontally and vertically moving vehicle or goods access doors
- Vertically acting doors over pedestrian access areas
- Powered gates & barriers intended mainly for vehicle access

This guidance does not cover pedestrian doors covered by EN 16005, which are: horizontally acting and revolving automatic door systems for pedestrian access.

Powered pedestrian gates fall between the scope of EN 16005 and EN 12453. Although they are more accurately covered by the automatic pedestrian door standard, the systems and safety devices used for EN 16005 doors are very often not best suited to external perimeter security environments. Where this is the case, designers can quite legitimately use systems and safety devices intended for powered vehicle gates under EN 12453, providing they reach a level of safety comparable with EN 16005.

# Definitions of common terms

## Owner

Any company or person who has legal ownership of doors, gates, or barriers, including landlords.

## Installation company

A company or person who installs a product, whether supplied or manufactured by themselves or a 3rd party.

## Legislation

National or EU law, including directives, regulations, acts and statutory instruments; breaches of many of the requirements of the legislation mentioned are criminal offences, punishable by fines and/or imprisonment.

## Maintenance company

A company or person who provides maintenance services, including inspection, repair, modification, or routine maintenance.

## Manufacturer

A company or person who manufactures a product, either in their own premises or on site in situ.

## Manager

Company or person with responsibilities for doors, gates, or barriers as part of their work, whether employed or self-employed, landlord or managing agent.

## Principal designer

A company or person who is responsible for management of a piece of building works in relation to building regulations.

## Private domestic owner

Person who is the owner/occupier of a private domestic dwelling, including occupiers of rented dwellings with responsibilities for maintaining such systems under their tenancy agreement.

## Responsible company

A company or person who is responsible for compliance with a piece of legislation, including manufacture, re-branding, import, distribution, installation, maintenance, ownership, and management.

## System

Industrial door, domestic garage door, powered gate or traffic barrier within the scope of EN 13241 or EN 12453.

## Supplier

A company or person providing goods or services whether manufactured, imported or distributed themselves or by a 3rd party.

# 1. Procuring new systems for workplaces, businesses, rented property & public premises

This section covers all premises except individual private domestic owner-occupied dwellings, which are dealt with in section 3.

When considering a new powered gate, powered traffic barrier, industrial door, or domestic garage door, it is important for professional owners and managers to understand their role and responsibilities, together with those of their suppliers. The system must be suitable for its intended purpose, legally supplied, and capable of meeting the owner's/manager's own legal obligations in equal measure.

## 1.1. Perimeter security systems

For perimeter security systems such as powered gates and barriers, as there is very little chance that building regulations will apply, it is usually just a matter of ensuring that the system will meet the client's needs and is being legally placed on the market. In terms of specification, this will mean considering what the system must achieve, who will use the system, how it will be operated and what the expected duty cycle is likely to be.

The supplier of the system will be bound by machinery safety legislation and cannot simply provide whatever is requested by the client; the system must be safe in relation to the relevant British and European standards. Machinery safety legislation requires the responsible company (e.g. manufacturer) to consider not only the intended use (e.g. access for vehicles) but also the foreseeable misuse of the system such as pedestrians passing through vehicle gates or under traffic barriers.

Section 1.3.1 explains the basics and what documentation must be provided to the client under machinery legislation.

## 1.2. Industrial doors and garage doors

These products are classified as construction products and, as such, the supplier must ensure that they comply with construction products legislation and, where they are powered, machinery safety legislation as per the perimeter security section above. On top of the supplier's legal obligations, there may also be obligations for the person or company in control of the project under building regulations.

### 1.2.1. Industrial and garage door specification

If the door is for a new building or a renovation of an existing building, there will be responsibilities for the person in control of the project under the building regulations (see section 1.4). The client, architect, or their principal designer (under CDM Regulations) bears the responsibility to define the required specification or performance of the door. This will mean providing the supplier with a specification that includes:

- the required resistance to wind load in Pascals, and
- the required U value (where required)
- the water ingress class (where required)
- air permeability class (where required).

Door manufacturers are required by construction products legislation (see section 1.3.2) to declare the performance of their door against the criteria set out in Annex ZA of EN 13241. The manufacturer does not have to declare a performance for all characteristics, they can, where appropriate, declare no performance determined (NPD). Characteristics that can be declared as NPD by the manufacturer are as follows:

- **Resistance to wind load** – declared as one of classes 1-4 which rate the door between 300 and 1000 Pascals, or, in exceptional cases, class 5, which is for doors with a declared pascal rating over 1000 pascals (the actual figure must be declared). Actual wind speed is not considered; the person in control of the project must calculate the required withstand in pascals using EN 1991-1-4 or any other nationally recognised method, e.g. BS 6375-1 for the UK.

- **Thermal resistance** – declared as a U value for the entire door
- **Resistance to water penetration** – declared as one of 3 classes that rate the door in terms of its ability to rest penetration of water at three pressure/time classifications according to EN 12445
- **Air permeability** – declared as one of 6 classes that rate the door in terms of air flow at designated pressures according to EN 12426

It must be understood that, although a manufacturer can quite legitimately declare any one of these characteristics to be NPD, this does not mean that it will be acceptable for the project in question. The person in control of the building works (principal designer) must determine the required performances and then locate or tender for a supplier who can provide a door with the necessary performances.

There are additional mandatory safety performances that must also be declared by the manufacturer, covering structural integrity, glazing, operating force and, for vertically acting doors only, fall-back protection (safe opening).

It is possible for a door supplier to act as principal designer, particularly for smaller projects but, where this is the case, it must be made clear to the supplier at the outset that they will be fulfilling this role.

### 1.2.2. Fire or smoke resisting industrial door specification

Where the door is required to be fire resisting, the person in control of the project has a responsibility under the building regulations to specify: the required fire resistance (in minutes), any smoke resistance required, and how the door must operate. For example, will it be held open and, if so, what will cause it to close: local heat sensor, central fire alarm, power cut, or fault in the link between the fire detection system and the door controls?

It is important to understand and manage the effect a heavy shutter closing unexpectedly will have on occupants of the building. Most national building regulations limit the use of shutters on emergency egress routes; this is because, unlike conventional swing fire doors, they present considerable additional hazards to occupants during closing and can severely hinder egress in the event of fire. In some circumstances, it may be better to specify a fire resisting curtain rather than a rolling shutter.

The client, via their principal designer, has a responsibility to define the required door specification. This will mean providing the supplier with a specification that includes:

- Resistance to fire period
- Smoke control class (where required)
- Self-closing behaviour (where the door will be held open)

Door manufacturers are required by construction products legislation (see section 1.3.2) to declare the performance of fire or smoke resisting doors against the criteria set out in EN 16034:

- **Resistance to fire** – duration declared in minutes – can be no performance determined (NPD) for purely smoke control doors
- **Smoke control** – can be NPD for doors without smoke control
- **Ability to release** – the ability of a held open door to be released for closing – can be NPD for doors that do not need to be held open
- **Self-closing** – the ability of the door to close fully once it is released – can be NPD for doors that do not need to be held open
- **Durability of ability to release** – reliability of system to release at fire detection, power cut, and fault detection in the link between the fire detection panel and the door controls – can be NPD, indeed it may not be desirable for doors in many locations.
- **Durability of self-closing** – declared number of cycles - can be NPD

Most fire tests are conducted in rigid supporting constructions such as masonry. Consequently, the principal designer should be careful when considering a fire resisting door for use in a more flexible construction such as timber or steel

stud partitions. Doors for use on flexible constructions must have certification that covers this specialised application – the specifier should ask the supplier for evidence of certification for use on flexible walls.

## 1.3. UKCA/CE marking product safety legislation

This legislation applies to manufacturers, importers and, to some degree, distributors of new door, gate, and barrier systems. There are no responsibilities for the client, owner, or manager under this legislation. It will however make sense for them to ensure that systems they procure are being legally placed on the market. Reasonable checks in this regard would include making sure that the appropriate documentation is being provided and that the system is appropriately UKCA/CE marked.

As a result of Brexit, in GB (England, Scotland & Wales), CE marking will gradually be replaced by UKCA marking. Currently, the two marking systems can coexist in GB but, by 2023, only UKCA will be recognised, with the exception that CE marked products from Northern Ireland will continue to be accepted under "unfettered access" rules for NI businesses.

In the Republic of Ireland and in Northern Ireland (under the NI Protocol), CE marking will continue.

In some limited circumstances, products on the NI market may bear a CE+UKNI marking where the product is CE marked under a UK based conformity assessment. On the same terms, this marking can also be used by NI manufacturers when placing CE marked products on the GB market under the Brexit "unfettered access" agreement.

UKCA/CE marking legislation falls broadly into two groups: machinery safety and construction products.

### 1.3.1. Machinery safety legislation

The Supply of Machinery (Safety) Regulations 2008 apply in the UK, and the European Communities Machinery Safety Regulations 2008 apply in the Republic of Ireland. Both regulations enforce the European Machinery Directive 2006/42/EC.

Compliance with the regulations is mandatory for the company or person who places on the market, or brings into service for the first time, a powered door, gate, or barrier. The regulations only apply to new powered systems; they do not apply to simple renovations, parts replacements, safety upgrades or minor modifications. They might apply where a 'significant' modification is made to an existing system but, for this to apply, the modification would need to significantly change the way the system operates.

The regulations require that the system is safe in terms of what they describe as the current "state-of-the-art"; this is in fact the current standard – EN 12453 (BS EN 12453 in the UK or IS EN 12453 in the Republic of Ireland).

Professional owners and managers of powered doors, gates & barriers do not have any responsibilities under the regulations, but they should check that they are receiving the relevant documentation and that the system is correctly marked.

The responsible company must ensure compliance and issue:

- a Declaration of Conformity
- an operation and maintenance manual.

They must also UKCA/CE mark the system (example documents can be found in TS 013-2).

### 1.3.2. Construction Products Legislation

The UK Construction Products Regulations (CPR) enforce the European Construction Products Regulation 305/2011 in the UK. In the Republic of Ireland, the EU Regulation applies directly. The CP Regulations cover a very wide range of construction products, from sand and cement through things like lintels, joists, cement, bricks, and plasterboard through to entire steel frames; doors and windows are also included. For the purposes of this guidance, we are dealing with industrial doors and domestic garage doors.

The regulations apply to any construction product within the scope of a CPR harmonised/designated standard. Since Brexit, the UK Government refers to "designated" standards whilst the EU continues to refer to "harmonised" standards; currently, these are one and the same thing. Under the CPR, the designated/harmonised standard must be used.

The requirements for compliance are set out in Annex ZA of the relevant designated/harmonised standard(s):

- EN 13241 covers the main essential characteristics applicable to all industrial and garage doors
- EN 16034 covers the fire and smoke resisting essential characteristics of a wider range of doors, including industrial doors.

From July 2013, CPR compliance and the associated marking became mandatory for all doors within the scope of EN 13241:3003 +A1:2011. At this time, doors with fire and smoke resisting characteristics were excluded from the scope of the standard. This had the effect of excluding fire and smoke resisting doors from the need for CPR compliance and associated marking; the CP Regulations only apply where all relevant essential characteristics are covered by a designated/harmonised standard. Although industrial doors were in scope of EN 16034, the lack of coverage by EN 13241 for their main essential characteristics prevented CPR compliance.

In 2016, the scope of EN 13241 was amended to include doors with fire and smoke resisting characteristics. At this point, a voluntary co-existence period began, whereby CPR compliance and CE marking was possible for fire and smoke resisting industrial doors but not mandatory. In November 2019, the coexistence period expired. CPR compliance and the associated CE marking became mandatory for all doors within the scope of EN 13241:2003 +A2:2016.

Most industrial and garage doors are subject to mandatory 3rd party conformity assessment (apart from micro enterprise manufacturers) and all fire or smoke resisting doors are subject to mandatory certification by an approved/notified 3rd party certification body.

As with machinery safety legislation, owners and managers of industrial doors and garage doors do not have any responsibilities under construction products legislation, but they should check that they are receiving the relevant documentation, that the door has the performances they require, and is correctly UKCA/CE marked.

The manufacturer, importer or, in some cases, the distributor of an industrial door or domestic garage door must comply with the CPR. This will mean arranging for type testing (and certification for fire/smoke resisting doors) and issuing:

- a Declaration of Performance (declaring the door's performances), and
- user instructions

They must also UKCA/CE mark the door (example documents can be found in TS 013-2).

## 1.4. Building regulations

National building regulations dictate what is acceptable for new buildings and renovations of existing buildings. Building regulations cover buildings, for this reason, it is unlikely that perimeter security systems such as gates and traffic barriers will be affected.

Responsibility for compliance with building regulations lies with the person or company responsible for the building work; this can include the agent, designer, building company or, in very limited circumstances, an installation company. Responsibility for the specification of doors for building works lies with the principal designer.

In general terms, it is the client's responsibility, via their principal designer, to provide the required door specification; the door supplier's responsibility is to deliver that specification. It is possible for a door supplier to act as principal designer, particularly for small projects but, where this is to be the case, it should be made clear at the outset.

Building regulations are national, they differ from nation to nation. Different rules apply in England, Wales, Scotland, Northern Ireland, and the Republic of Ireland. This section provides a summary of the main sources of guidance; principal designers should check the specific requirements as they apply to a particular project.

### 1.4.1. Materials and workmanship

Requirements for materials and workmanship in building works differ depending on the nature of the building and the nation it is in.

Guidance is available as follows:

- England and Wales - Approved Document 7 (there are differing documents for England & Wales, and dwellings and other buildings)
- Scotland - Technical Handbook Section 0.8 (there are handbooks for domestic and non-domestic buildings).

- Northern Ireland - Technical Booklet B
- Republic of Ireland - Technical Guidance Document D

### 1.4.2. Energy efficiency

Energy efficiency building regulations differ depending on the nature of the building, its use, and the nation it is in.

Guidance is available as follows:

- England and Wales - Approved Document L (there are differing documents for England & Wales, and dwellings and other buildings)
- Scotland - Technical Handbook Section 6 (there are differing handbooks for domestic and non-domestic buildings)
- Northern Ireland - Technical Booklets F1 (dwellings) and F2 (other buildings)
- Republic of Ireland - Technical Guidance Document L

### 1.4.3. Access to buildings

Building regulations affecting access to buildings differ depending on the nature of the building and the nation it is in.

Guidance is available as follows:

- In England and Wales - Approved Document M (there are differing documents for England & Wales, and dwellings and other buildings)
- Scotland - Technical Handbook Section 4.2 (there are differing handbooks for domestic and non-domestic buildings)
- Northern Ireland - Technical Booklet R
- Republic of Ireland - Technical Guidance Document M

### 1.4.4. Security

Security building regulations differ depending on the nature of the building and the nation it is in.

Guidance is available as follows:

- In England and Wales - Approved Document Q (dwellings - there are differing documents for England and Wales)
- Scotland - Technical Handbook Section 4.13 (there are differing handbooks for domestic and non-domestic buildings)
- Northern Ireland - there are no government building regulation guidance documents that relate to security
- Republic of Ireland - there are no government building regulation guidance documents that relate to security

### 1.4.5. Electrical safety

Electrical safety building regulations differ depending on the nature of the building and the nation it is in.

Guidance is available as follows:

- England and Wales - Approved Document P (dwellings - there are differing documents for England and Wales)
- Scotland - Technical Handbook Section 4.6 (there are differing handbooks for domestic and non-domestic buildings)
- Northern Ireland - there are no government building regulation guidance documents that relate to electrical installations
- Republic of Ireland - there are no government building regulation guidance documents that relate to electrical installations

### 1.4.6. Fire safety

Fire safety building regulations differ depending on the nature of the building, its use, and the nation it is in.

Building regulations will generally allow use of fire resisting doors tested to the older BS 476 standard. However, UKCA/CE marking legislation now dictates that new fire resisting doors within the scope of EN 13241 must comply with the Construction Products Regulation when placed on the market. This will mean that they must now be tested to the newer EN 1634 and be certified to EN 16034 – see section 1.3.2 for more details.

Below are a few of the main points in national building regulations guidance:

- In England and Wales, the relevant Approved Document B (there are differing documents for England and Wales and for dwellings and non-dwellings) includes sections on:
  - the requirements for escape route doors that can limit the viability of powered systems on escape routes in many buildings, and
  - fire shutters, in particular shutters over escape routes which should only be operated by a heat sensor at the door (eg fusible link)

  The theory being that the shutter will only close when the temperature at the door has reached a level where all possibility of life has been lost. The shutter is however permitted to close partially for the control of smoke.
- In Scotland, Technical Handbook Section 2 advises that shutters are not permitted on escape routes unless they are a security shutter over a shop front and do not close automatically in the event of fire.
- In Northern Ireland, Technical Booklet E does not mention shutters on escape routes specifically but does place limitations on the use of powered doors and turnstiles, opening direction and fastenings.
- In the Republic of Ireland, Technical Guidance Document B does not mention shutters on escape routes specifically but does place limitations on the nature of doors, opening directions and fastenings.

Where doubt remains, the client or their principal designer should check the national building regulations guidance which should provide helpful information.

# 2. Managing workplaces, businesses, rented property & public premises

When moving into new build premises or taking possession of existing premises, the company or manager who will be responsible for safe operation of the premises should ensure that sufficient information is available to build an asset register and enable safe operation and maintenance of the site. If the premises are rented, the occupier should check with the landlord or managing agent to clarify who will be responsible for maintaining the doors, gates, and barriers.

## 2.1. New premises

Where the premises are new, operation & maintenance manuals for all powered gates & traffic barriers, industrial doors and garage doors should be made available by the developer or builder.

If these systems are powered, they should be appropriately UKCA/CE marked and be supported by a machinery legislation declaration of conformity. Additionally, for industrial doors and garage doors, a construction products legislation declaration of performance should be made available to support the required UKCA/CE marking.

*Note: In England and Wales, Regulation 38 of Building Regulations makes a specific requirement that the person carrying out the work, for example the builder or developer, shall provide all relevant fire safety information to the responsible person (owner/manager) no later than the date of completion of the work.*

Should any relevant information not be available, it should be requested from the builder or developer.

## 2.2. Existing premises

Where the premises are existing, evidence of compliance and operation & maintenance manuals for all doors, gates, and barriers should be on file or available from the previous occupier, managing agent or landlord. If this information is not available, the company or person who will be responsible for safe operation of the site should request it.

Evidence of compliance for non-fire resisting systems would be:

- A manufacturer's machinery Declaration of Conformity (see 1.3.1) or a maintenance company certificate of compliance (see 2.11) for all powered systems
- A construction products Declaration of Performance (see 1.3.2) for all industrial or garage doors supplied since July 2013.

Evidence of compliance for fire resisting industrial doors would be:

- For doors supplied before November 2019 - a machinery Declaration of Conformity for powered systems, and any one or a combination of the following:
  - A certificate from the manufacturer's fire certification body
  - A copy of the manufacturer's fire test report - for doors of a similar size to that which was tested
  - A copy a fire engineer's assessment of the manufacturer's fire test report - for doors of a significantly different size to that which was tested
- For doors supplied post November 2019 - a machinery Declaration of Conformity and a construction products Declaration of Performance.

Without evidence of compliance from the manufacturer, it cannot be known if the door will resist fire as required.

## 2.3. Asset register and records

Where the required documentation is not in place, it should be requested from the manufacturer, previous owner, or occupier. Failing this, it may be possible to arrange for a specialist company to make compliance assessments of all affected assets, generate suitable maintenance schedules and user instructions.

**Note: It is not possible to create retrospective fire resistance evidence, see 2.2 above. Where no evidence from the manufacturer exists, it cannot be known categorically that the door will in fact resist fire as intended.**

With all the necessary records in place, an owner/manager can then assemble an asset register and begin the process of managing and maintaining systems in a safe condition.

All assets should be subject to a site and user specific risk assessment considering who will be affected by the asset, how they will know how to use it safely, what to do in the event of fault or damage, how to use any manual controls, and how it will affect emergency egress and fire safety.

Once the asset register is up and running, maintenance records should be kept. The records should be able demonstrate that all systems are safe, that faults can be reported, that a system of maintenance is in place, and that the maintenance is being conducted by competent persons.

## 2.4. Maintenance frequency and content

The law does not specify a particular maintenance period, it relies on terms like reasonable, practicable, suitable, and sufficient. Manufacturer's operation and maintenance manuals are significant in this regard and should be the first point of reference when assessing the maintenance requirements of a system in use. Where manuals are not present, they should be requested from the system manufacturer in the first instance. Failing this, or where existing manuals have proven deficient, perhaps due to changes of use, upgrade or modification, a replacement could be commissioned from a competent maintenance company.

Planned maintenance should cover at least the following areas:

- structural integrity
- fall-back protection of vertically acting doors
- adjustments, cleaning, and lubrication
- electrical safety
- operating and safety system function
- safety system performance tests
- warning devices, signage, and markings
- user documentation

Safety system performance (hold-to-run, force limitation and non-contact presence detection) should be tested at least annually but need not be tested at every maintenance visit throughout the year (providing that function is checked), unless changes are made that might alter performance.

### 2.4.1. Fire resisting door maintenance

Maintenance of fire or smoke resisting doors should be conducted strictly in accordance with the manufacturer's operation and maintenance manual. In the absence of any maintenance instructions, owners/managers should contact the door manufacturer for copies of the required manuals.

Where the manufacturer of the door cannot be identified or contacted, an experienced fire door maintenance company could make an educated guess at the required maintenance and maintenance frequency. However, without the required documentation, it cannot be known categorically what the maintenance requirements are or that the door will resist fire as intended; a degree of doubt will exist.

## 2.5. General health and safety legislation

Various pieces of criminal legislation apply to professional owners, managers and maintenance companies depending on the nature of the site and the nation it is in. Broadly, from an owner or manager's perspective this means that doors, gates, and barriers need to be safe, but also that the maintenance company must leave them in a safe condition following maintenance.

### 2.5.1. England, Scotland, and Wales

Sections 2 & 3 of the Health and Safety at Work Act 1974 place a responsibility on all people who, as part of their work, have a responsibility for doors, gates, and barriers to take reasonably practicable measures to ensure they are kept in a safe condition. This legislation applies to owners, workplace managers, facilities managers, landlords, managing agents and maintenance companies. Section 7 places similar responsibilities on employees.

### 2.5.2. Northern Ireland

As per 2.5.1. above, except that the Health and Safety at Work Act 1974 and its sections are replaced by the Health and Safety at Work (NI) Order 1978 and its corresponding articles.

### 2.5.3. Republic of Ireland

If a system is controlled by a person engaged in a trade, business, or other undertaking (whether for profit or not), then that person will have duties under the Safety, Health and Welfare at Work Act 2005. This may, for example, include landlords, managing agents, workplace owners or managers, and facilities managers. Landlords of rented houses will additionally have duties under the Housing (Standards for Rented Houses) Regulations 2008.

In appropriate cases, a charge of reckless endangerment under the Non-Fatal Offences Against the Person Act 1997 may be considered.

## 2.6. Workplace legislation

In England, Scotland and Wales, Regulations 5 and 18 of the Workplace (Health, Safety and Welfare) Regulations 1992 require that doors, gates, and barriers at workplaces are safe, and subject to a suitable and sufficient system of maintenance. This legislation applies to owners, managers and facilities managers who have responsibility for systems in workplaces.

In Northern Ireland, the Workplace (Health, Safety and Welfare) Regulations (Northern Ireland) 1993 have the same effect.

In the Republic of Ireland, workplace safety is dealt with by the Safety, Health and Welfare (General Applications) Regulations 2007.

## 2.7. Electricity at work legislation

In England, Scotland and Wales, the Electricity at Work Regulations 1989 require that electrical systems are safe and maintained to prevent electric shock and fire due to electrical faults.

In Northern Ireland, the Electricity at Work Regulations NI 1991 require that electrical systems are safe and maintained to prevent electric shock and fire due to electrical faults.

In the Republic of Ireland, the Safety, Health and Welfare at Work (General Applications) Regulations 2007 require that electrical systems are safe and maintained to prevent electric shock and fire due to electrical faults.

These pieces of legislation apply to owners, workplace managers, facilities managers, landlords and managing agents. They require that the fixed electrical supply to powered systems is safe and subject to periodic inspection and test appropriate to the location and use of the site or building.

This legislation also applies to maintenance companies, not only to ensure that electrical systems are maintained safely, but also in regard to safe isolation; live working must be avoided wherever possible. It will be necessary to electrically isolate powered systems for safety inspection and maintenance.

## 2.8. Fire safety legislation and guidance

Virtually all buildings, places, and structures other than individual private dwellings are covered by fire safety legislation. The responsible person (eg owner or manager) must have a fire safety risk assessment carried out by a

qualified person, implement its findings, and maintain fire safety equipment and systems in a safe condition. This responsibility clearly includes regular inspection and maintenance of fire resisting and escape route doors.

### 2.8.1. England and Wales

The Regulatory Reform (Fire Safety) Order 2005 (RRFSO) requires that any person who has some level of control in premises (other than private domestic householders) must take reasonable steps to reduce the risk from fire, make sure people can safely escape if there is a fire, and make sure that equipment provided for fire safety is subject to a suitable system of maintenance and maintained in an efficient state.

Detailed guidance for UK Government on fire risk assessments in a wide range of settings is available for download here: https://www.gov.uk/workplace-fire-safety-your-responsibilities/fire-risk-assessments

Some important points taken from this guidance are shown below:

- Doors on escape routes should open in the direction of escape and ideally be fitted with a vision panel. This is particularly important where more than 60 people will use them, or if they provide an exit from an area of high fire risk (eg a kitchen).
- Loading or goods delivery doors, rolling, folding, sliding or up and over, are not normally suitable as a final exit. However, they may be suitable for escape from areas of normal risk by small numbers of staff as long as they are not likely to be obstructed and can easily and immediately be opened manually, even if the door is normally power-operated, and the staff are familiar with the escape route.
- Whilst a building is not occupied, vertically acting doors can be used as a final security measure, providing building management procedures are in place to ensure they are never closed until the building is empty.
- It may be possible to reduce the number of exit routes available when the building has reduced occupancy (eg security staff or during opening up and closing), providing all staff that are present are safe and fully aware of the restrictions in place and their effect on emergency egress during these times.

As the above examples are just a snapshot of the type of information the guidance provides, the appropriate guidance for the site in question should be identified and used in its entirety.

### 2.8.2. Scotland

The Fire (Scotland) Act 2005 and the Fire Safety (Scotland) Regulations 2006 impose duties on employers, persons in control of premises and others in relation to the carrying out of fire risk assessments, putting in place fire safety measures found to be necessary, and obliging them to review the fire risk assessment.

Detailed guidance from the Scottish Government on fire risk assessments in a wide range of settings is available for download here: https://www.firescotland.gov.uk/your-safety/for-businesses/your-duties.aspx

Some important points taken from this guidance are shown below:

- An escape route should not be by way of a fire shutter which closes automatically in the event of fire, or a revolving or automatic door, unless arranged to fail safely in the outward opening position, or a manual sliding door, other than one to which the general public does not have access.
- It is important that doors necessary for escape be easily openable while the premises are occupied. Where a door across an escape route has to be secured against entry, it should be fitted with a fastening which is readily operated without a key, from the side approached by people making their escape. Where a door is operated by a code, combination, card, biometric data or similar means, it should be capable of being manually overridden from the side approached by people making their escape. The potential for persons having to retrace their route during an evacuation to use an alternative escape route should also be considered.
- Electrically powered locks should not be installed on a door which provides the only route of escape for persons, or which serves a room or storey with more than 60 persons, or a door on a fire-fighting shaft.
- Electrically powered locks should return to the unlocked position, on operation of the fire warning system, on loss of power, and on actuation of a manual door release unit positioned at the door on the side approached

by people making their escape (where the door provides escape in either direction, a unit should be installed on both sides).

As the above examples are just a snapshot of the type of information the guidance provides, the appropriate guidance for the site in question should be identified and used in its entirety.

### 2.8.3. Northern Ireland

The Fire and Rescue Services (NI) Order 2006, Fire Safety Regulations (NI) 2010, impose duties on the 'appropriate person' (eg an employer or premises manager) to carry out a fire risk assessment of the premises.

They must provide appropriate equipment and alarms, provide clear emergency exit routes and ensure that provisions or systems in place are subject to a suitable system of maintenance and are maintained in an efficient state, in efficient working order and in good repair.

Detailed guidance from the NI Government on fire risk assessments in a wide range of settings are available for download here: https://www.nifrs.org/home/staying-safe/business-fire-safety/fire-safety-guides/

Some important points taken from these guides are shown below:

- Loading and goods delivery doors, shutters (roller, folding or sliding), up-and-over doors and similar openings are not normally suitable for use as a final exit. However, they may be suitable for escape from areas of normal risk by small numbers of staff as long as they are not likely to be obstructed and can be easily and immediately opened manually, even if normally power-operated and the staff are familiar with the escape routes.
- Sliding doors are not normally suitable on escape routes unless they are for the sole use of members of staff. Where provided, a notice with the words 'slide to open' with an arrow pointing in the direction of opening, should be permanently displayed at about eye level on the face of the door.
- Final exit doors should be quickly and easily opened without a key or code in the event of a fire. Where possible, there should be only one fastening.
- Any device that impedes people making good their escape, either by being unnecessarily complicated to manipulate or not being readily opened, will not be acceptable.

As the above examples are just a snapshot of the type of information the guides provide, the appropriate guidance for the site in question should be identified and used in its entirety.

### 2.8.4. Republic of Ireland

The Safety, Health and Welfare at Work (General Application) Regulations 2007 impose duties on the 'person in control' to prepare and revise adequate plans, procedures, and risk assessments to prevent fire and provide the necessary measures for firefighting and evacuation.

Guidance from the Health and Safety Authority on fire safety in a wide range of settings is available here: https://www.hsa.ie/eng/Topics/Fire/#gui

Some important points taken from this guidance are shown below:

- Escape routes should be kept clear of all obstructions
- Doors on escape routes must always be available for use without the use of a key
- Depending on the risk, push pads or panic bar devices should be used
- Security should never take precedence over safety
- Where there are roller shutters or security grills fitted on an escape route, these must be kept open when persons are on the premises

As the above examples are just a snapshot of the type of information the guidance provides, the appropriate guidance

for the site in question should be identified and used in its entirety.

## 2.9. UK LOLER and PUWER clarification

Vertically acting doors are excluded from the scope of the Lifting Operations and Lifting Equipment Regulations (LOLER). They are not lifting equipment; they do not lift loads or people.

The Provision and Use of Work Equipment Regulations (PUWER) do not apply to doors, gates, and barriers, unless they are part of a larger machine or system (eg the doors on a powder coating line).

The safety of doors and gates in workplaces is covered by workplace legislation whilst, at rented property *and* workplaces, there are responsibilities under general health and safety legislation.

## 2.10. Managing non-compliance and unsafe systems

Almost universally, the legal test for compliance with health and safety, workplace, electrical safety, and fire safety legislation is whether "reasonably practicable" measures and "suitable and sufficient" maintenance have been provided for safety. This is generally accepted to be the levels of safety described in the applicable British and European standards, which have been in existence without significant change since 2001. One common misconception is that older systems, manufactured before standards were introduced, do not need to be safe. This is not so!

The law has required systems to be safe since at least 1974 via the inception of health and safety at work legislation, whilst workplace legislation made those general requirements more explicit from 1992 onwards. The publication of standards in 2000 simply clarified what that might look like in more detail. As an example, a vertically acting door that could guillotine closed in a manner that would kill a person who was under it has never been acceptable in health and safety legislation.

Health and safety legislation means that maintenance companies must leave systems in a safe condition following maintenance. Depending on the nature of the defect, this could mean securing against collapse, leaving closed, reverting to manual use, leaving a powered system in hold-to-run control, or leaving a system electrically isolated.

To assist with leaving systems in a safe condition, in consultation with UK HSE, DHF has created a traffic light system that splits non-compliances up into two groups: safety critical and requiring improvement. Safety critical (red) is applied to defects that could cause immediate serious harm to people, whilst requiring improvement (amber), is applied to less serious issues or those that are not immediately lethal but could easily develop into something more serious, or situations that are less likely to occur. Safe and compliant systems (green) are those that comply with the relevant standards.

Maintenance companies are advised that safety critical defects should be left in a safe condition, whilst systems with requiring improvement defects could be left in service, providing the owner/manager or client is made aware of the risks involved and agrees. Maintenance companies are also advised to issue their client with an unsafe system notice, regardless of whether the defects in question are rated as safety critical or requiring improvement.

The DHF traffic light system is designed to keep all stakeholders in the maintenance process within the applicable health and safety legislation. The system does not deny an owner manager access to their asset but it does mean that, where the defects in question are rated as safety critical if they do elect to continue using it, it will have to be at their own volition and legal liability. Of course, DHF would strongly advise owners/managers not to take this course of action, but the main point is that they should not expect or coerce a maintenance company to place themselves in potential breach of criminal legislation.

Past prosecutions indicate quite clearly that prosecuting authorities and the courts consider that following the appropriate standard and leaving in a safe condition would be reasonably practicable. Prosecutions of owners & managers and maintenance companies where systems have been left in an unsafe condition have attracted fines of up to £500,000.

## 2.11. Certificate of compliance

When any necessary repairs and safety upgrades are complete, and the asset is deemed to be safe, a certificate of compliance can be issued to the client. A certificate of compliance is a DHF-inspired document designed to inform the

client that the asset is safe and compliant. It is intended for use in situations where issuing a machinery declaration of conformity and/or supplying a new conformity mark (UKCA/CE) are not appropriate; this is primarily where the maintenance company has not created a new door or gate system (example documents can be found in TS 013-2).

## 2.12. Disclaimer documents

A lot of time and expense has gone into obtaining good solid legal advice on this subject; there is no legal precedent for such a document in this environment. Even if the client agrees to take responsibility, the maintenance company's criminal liability cannot be avoided in this way. Such a document would be attempting to transfer the *criminal* responsibilities of one party (the maintenance company) to another (the client) by means of a *civil* contract; this is not possible in criminal law.

On both sides, the emphasis should be on creating a safe environment rather than avoidance of liability. The use of disclaimer documents is not recognised nor recommended.

# 3. Private domestic premises

This section covers owner-occupied private domestic dwellings and some rented dwellings where the tenant has responsibilities for safe upkeep of doors, gates, and barriers via their tenancy agreement. All other premises are covered by section 1. In situations where private domestic owners share ownership of a system, if anyone is paid to manage its safety or upkeep, that person will have responsibilities under health and safety legislation in the same way as a landlord or managing agent does - see section 1.

Private domestic owners do not have responsibilities under product supply UKCA/CE marking regulations or health and safety legislation, but those providing products and services to them are bound to comply with the relevant legislation. The only exception is where a private domestic householder creates a new powered system themselves. Under these conditions, they do have a legal responsibility to comply with the machinery safety legislation in section 1.3.1.

Although private domestic owners do not generally have criminal responsibilities under health and safety legislation, they are, along with everybody else, subject to the ever-present possibility of civil action for negligence if anything they do or fail to do results in injury or damage to property. Whilst civil risks are usually covered by household insurance, it must be understood that insurers may not provide cover where a material fact has been withheld from them, such as the fact that a competent contractor has declared the system in question to be unsafe or non-compliant.

Companies carrying out work for private domestic householders must comply with all applicable legislation. In this way, although the legislation usually does not apply to the householder directly, the level of safety and compliance required at domestic households is the same as in any other setting.

## 3.1. New private domestic systems

The supplier of a new powered door or gate system will be bound by the UKCA/CE marking legislation in section 1.3. They cannot simply provide whatever is requested by the client; the system must be safe in relation to the relevant national legislation and standards. Machinery safety legislation requires the responsible company (eg manufacturer or, in some cases, the installation company) to consider not only the intended use but also foreseeable misuse of the system like the presence of children playing on or near the system.

Depending on the proposed works, private domestic owners may have responsibilities under national building regulations. Powered perimeter gates and garage doors are not usually covered by building regulations, but the electrical supply to them may well be covered.

Where a private domestic owner is considering small works that are covered by building regulations, for example the electrical supply to a new powered gate or garage door, the easiest way to achieve compliance is to use the services of a company that is a member of a relevant competent person scheme who will be able to self-certify the work and deal with any building notice that might be required.

More information on building regulations compliance for domestic owners can be found here:

- England and Wales: https://labcfrontdoor.co.uk/
- Scotland: https://www.gov.scot/publications/building-standards-customer-journey/
- Northern Ireland: http://www.buildingcontrol-ni.com/advice-and-guidance
- Republic of Ireland: https://www.gov.ie/en/publication/3e711-building-control/

When considering a new garage door or a powered gate system, it will be important for the householder to first consider their requirements:

- what is it required it to achieve?
- what appearance is required?
- what space is available?
- what is the available budget?

On top of these important questions, a householder should also consider safety. Sadly, in the UK, there are quite a few rogue operators happy to supply unsafe and non-compliant systems.

Although domestic householders do not have responsibilities under product safety and UKCA/CE marking legislation, those who provide these systems clearly do. Suppliers cannot simply provide whatever is requested, the system must comply with the relevant legislation and safety standards.

When planning a powered gate system, it is best to plan it as such from the beginning. Getting piers and gates installed by one company and then employing another to automate it, or having existing gates automated, can create complex safety and compliance issues.

As an example, it is common for builders and fencing contractors to position gate hinges in the centre of the piers or posts, but this then creates a real problem when attempting to make the resulting reducing gap safe and compliant when the system is automated. Safe design from the start can eliminate many of these legal compliance issues and improve the appearance and reliability of the system by reducing the number of safety devices required.

If a householder does have an unsafe or non-compliant system installed, it could put the safety of family members, visitors, and passers-by at risk, not to mention the reliability and fitness for purpose problems that commonly coincide with illegal, non-compliant or unsafe supply.

Before purchasing, householders are advised to check the credentials of the company:

- Are they are covered by accident and personal liability insurance?
- How will they manage waste; are they or will they use a waste carrier registered with the Environment Agency?
- Are they qualified to do this work?
- Who will provide the electrical supply - are they qualified and a member of an electrical competent person scheme?
- Will they provide the legally required compliance documentation?
  - Powered garage door = Declaration of Performance (construction products legislation)
  - Powered gates and garage doors = Declaration of Conformity (machinery safety legislation) and an operation and maintenance manual
  - Electrical supply = Electrical Installation Certificate (EIC) or Small Works Certificate (SWC)
  - UKCA/CE marking

## 3.2. Existing private domestic systems

When a domestic owner takes ownership of a new property that has powered garage doors or gates installed, the builder or developer should make the relevant compliance documentation available:

- Machinery Declaration of Conformity – all powered doors and gates
- Construction Products legislation Declaration of Performance – garage doors
- Operation and maintenance manual

Upon taking possession of an existing property that has powered gates or garage doors installed, it is important to have them assessed for safety and compliance by a competent contractor. This is necessary for the safety of passers-by, visitors, and family members, and because there remains the possibility of legal action for negligence in the civil courts should an incident result in injury or damage to property.

Householders who have existing powered door or gate systems that have not been recently assessed and are not currently being maintained by a competent contractor, are advised to have their systems assessed for safety and arrange for regular maintenance.

A competent contractor will not be able to provide the legal declarations mentioned above retrospectively; these can

only be issued by the responsible company (eg manufacturer) at the point of placing on the market or putting into service for the first time. In any case, the presence of an historically-issued legal declaration is no guarantee that the system is safe today. A maintenance company will however be able to report on safety and compliance and, where the system is safe and compliant, they will be able to provide a certificate of compliance.

## 3.3. Maintenance of private domestic systems

For the safety of family members, visitors, or passers-by, and to maintain the protection afforded by warranties, it is important to keep garage doors and powered gates maintained in accordance with the operation and maintenance manual that should have been supplied with the system. Where operation and maintenance manuals are not available, the supplier (if they are known) may be able to provide copies, or a competent maintenance company may be able to provide advice on the maintenance needs of an existing system.

Various pieces of criminal health and safety legislation apply to maintenance work but do not usually apply directly to private domestic householders, who are neither providing a new system nor doing work themselves. However, companies doing work for private domestic householders must comply with all applicable health and safety legislation. In this way, although the legislation does not usually apply to the householder directly, the level of safety and compliance required at domestic households is the same as any other setting.

If a maintenance company does work on an unsafe system, they must leave it in a safe condition to comply with health and safety legislation. This means that, although they can do whatever work a domestic private householder requires, if the result is a safety critical system, they will be unable to leave it in service in that condition within the law. Depending on the nature of the defect, leaving in a safe condition could mean securing against collapse, leaving closed, reverting to manual use, leaving a powered system in hold-to-run control, or leaving a system electrically isolated.

To assist with leaving systems in a safe condition, in consultation with UK HSE, DHF has created a traffic light system that splits non-compliances up into two groups, safety critical (red) and requiring improvement (amber). Safety critical is applied to defects that could cause immediate serious harm to people, whilst requiring improvement is applied to less serious issues or those that are not immediately lethal but could easily develop into something more serious, or situations that are less likely to occur.

Maintenance companies are advised that safety critical defects should be left in a safe condition, whilst systems with requiring improvement defects could be left in service, providing the client is made aware of the risks involved and agrees. Maintenance companies are also advised to issue their client with an unsafe system notice, regardless of whether the defects in question are rated as safety critical or requiring improvement.

The DHF traffic light system is designed to keep people safe and ensure that maintenance companies are operating within the applicable health and safety legislation. The DHF system does not deny an owner access to their system, but it does mean that, where the defects in question are rated as safety critical, if they do elect to continue using it in that condition, it will have to be at their own volition and legal liability. Of course, DHF would strongly advise owners not to take this course of action, but the main point is that they should not expect or coerce a maintenance company to place themselves in potential breach of criminal legislation.

Past prosecutions indicate quite clearly that prosecuting authorities and the courts consider that following the appropriate standards and leaving in a safe condition would be reasonably practicable (the test for legal compliance with H&S law). Past prosecutions of maintenance companies where systems have been left in an unsafe condition have attracted fines of up to £110,000.

# 4. Standards overview - requirements for safety

Standards referred to in this section are primarily European standards, prefixed EN (European Norm). These standards are in turn implemented in the UK by BSI who pre-prefix the EN with BS (British Standard) and by NSAI in the Republic of Ireland who prefix them with IS (Irish Standard). For example, EN 12453:2000 becomes BS EN 12453:2001 (due to a delay in UK publication); the content of the EN and BS versions are identical except for the national foreword.

Some standards are granted 'harmonised' or 'designated' status. This means that following the standard as indicated in the relevant annex confers a presumption of conformity with a particular piece of legislation. Since Brexit, the EU continues to refer to 'harmonised' standards, whilst the UK Government now refers to these as 'designated' standards; currently the contents are identical. Some standards, or parts of standards, have 'effective' harmonised or designated status by being referenced directly by a clause of a harmonised or designated standard.

There are problems with some of the standards applicable to systems covered in this guidance. In 2011, the UK Health and Safety Executive (HSE) lodged a formal objection with the European Commission (EC) in regard to the package of standards covering these systems. After consultation and consideration, in July 2015, the Commission issued a warning that the harmonised standard (EN 13241-1:2003+A1:2011) did not, by reference to the other standards in the package (primarily EN 12453:2000 and EN 12604:2000), achieve a level of safety that would comply with the Machinery Directive (MD) 2006/42/EC which is implemented in the UK by the Supply of Machinery (Safety) Regulations (SMSR) 2008. In 2015, those who were relying on EN 12453:2000 and EN 12604:2000 by reference from EN 13241 for MD/SMSR compliance were advised to review their risk assessments to ensure that their systems did in fact meet the required level of safety for legal compliance.

There followed a period of standards revision, culminating in the publication of EN 12453:2017 (the European version). The UK version has been published in the UK as BS EN 12453:2017. Sadly, it has not achieved the level of safety required for Machinery Directive compliance. A standard does not actually confer compliance with the Directive until it has been listed in the EC Official Journal. Thus far, the European Commission has declined to list EN 12453 in its 2017 form. BS EN 12453:2017 contains a foreword warning users not to rely entirely on the standard (or by reference BS EN 12604:2017) for compliance with the Machinery Directive.

The UK Health and Safety Executive has also issued a warning.

http://www.hse.gov.uk/safetybulletins/revision-standards-powered-doors.htm

Harmonised or designated standards represent the **minimum** level of safety acceptable in law (variously the "state-of-the-art" or "reasonably practicable" measures depending on legal jurisdiction). Where these standards are not followed, an equal or improved level of safety must still be achieved. Account must be taken of the fact that, in some areas, the original 2000 versions and the revised 2017 standards are not deemed adequate for legal compliance and hence additional measures must be taken.

Where existing standards have been proven to be defective, or where industry experience or legal precedent has indicated there are common misinterpretations, DHF guidance documents provide workable methods of mitigating the resulting physical and legal risk.

As there were no standards available prior to 2000, systems installed before that date may not in fact be safe enough for current health and safety legislation compliance, whilst many systems installed historically may never have complied at all.

Some elements of hazard control apply to doors, gates, and barriers equally, others apply exclusively to doors; this is explained in the relevant sections. What follows is an overview of the applicable standards, more precise technical details are available in DHF TS 013-1.

## 4.1. Hazards and hazard control strategy

Hazards are the things that could potentially cause harm; all systems have hazards regardless of how safe they are. Hazards do not represent what is wrong or deficient with a system, they are the things that *could* go wrong and hence need to be prevented or controlled. Missing or defective safety systems or devices are not hazard themselves, they are

missing or defective hazard control measures.

The first step in any compliance assessment is always to identify and list the hazards, this then indicates the areas of the system that must be considered for adequate hazard control

The main hazard groups for manual *and* powered systems are:

- failure of the building, foundations, or other supporting structures
- failure of fixings, hinges, guides, rolling gear and travel stops
- failure of the door, gate, or barrier (the moving part)
- fall-back of vertically acting doors due to suspension or balancing system failure
- structural failure due to wind load.

The following hazard groups apply additionally to powered systems:

- electrical and control system faults
- crush and impact hazards at the main closing edge
- crush and impact hazards in the swept area
- shear and draw-in hazards where the leaf passes lintels, structural supports, or other leaves, etc
- other reducing gaps producing crush, shear, or draw-in hazards.

Door, gate, and barrier systems should be designed to eliminate or reduce hazards wherever reasonably practicable, rather than use sensitive devices or systems to control hazards created by the design.

Hazards should be controlled by one or more of the four main strategies in EN 12453 and EN 12604:

- safe design - structural integrity, fall-back protection, safety distances, guards & enclosures, electrical safety, and control system reliability
- human visual control - hold-to-run (powered systems only)
- safe contact - reversal of movement on contact with people within allowed force and time limits (powered systems only)
- non-contact presence detection - ensuring that hazardous movement cannot make contact with people (powered systems only).

## 4.2. Structural integrity

Doors, gates, barriers, and their supporting structures should be designed (new systems) or assessed as being able to resist (existing systems) permanent deformity, ultimate structural failure or derailment in normal use, manual use or under foreseeable misuse. Any deformity that does occur in use should not be detrimental to safety or function.

### 4.2.1. Design strength

EN 12604 specifies the required design safety factors for foundations, supporting structures, fixings, suspension elements, fixings, door & gate leaves, and travel stops. The system should be structurally sound when used in powered or manual mode and in windy conditions. The entire system structure should prevent any movement that could cause misalignment or disengagement. It should be possible to secure swing and folding doors or gates against wind action in the fully open and fully closed position, particularly when used in manual mode.

### 4.2.2. Resistance to wind load

All systems should be designed to withstand their expected wind load, although the principal designer or architect in control of the project should provide the required specification.

Since July 2013, construction products legislation (see section 1.3.2) has required that, before new industrial or garage doors are placed on the market for the first time, the design must first be type tested for RESISTANCE TO WIND LOAD (amongst other characteristics).

Wind load testing provides a withstand to differential pressure in Pascals; this does not equate to wind speed in mph, kph or metres per second. Calculating the required withstand for a given door at a given location is a complex and specialised process based on local average wind speed data, altitude, local topography and surrounding building shape and proximity. It should be declared by the principal designer or architect responsible for the project and is essentially a client responsibility.

Manufacturers are required to declare the performance of their industrial and garage doors against one of the classes listed in EN 13241.

| Class | Performance | Class | Performance |
|---|---|---|---|
| 0 | No performance determined (NPD) | 3 | 700 Pascals |
| 1 | 300 Pascals | 4 | 1000 Pascals |
| 2 | 450 Pascals | 5 | Exceptional (Pascal rating declared by the manufacturer) |

Before procuring doors for the outer skin of a building, the client's architect or principal designer should provide the required resistance to wind load figure in Pascals. With this information, a door with the correct class for that geographic location and position can be specified.

### 4.2.3. Vertically acting door fall-back protection

EN 12453 and EN 12604 require that vertically moving door leaves should be protected against failure of vulnerable components in the hold-open system.

Some components can be deemed resistant to failure provided they achieve the design strength described in 2.2.1 above. Components that can be protected in this way include fixings & supporting structures, panel hinges, door panels & lath sections, guides, rollers & tracks, shafts, barrels, bearings & key steels.

Other more vulnerable wearing components, such as springs, cables, drives, drive or suspension chains, should be provided with a backup system. The protection should remain effective even when the manual override is used and ensure that, at the point of failure of any one vulnerable component, one or other of the following should be achieved:

- the door leaf must not exert a static weight of more than 20kg (200N) with any one vulnerable balancing component failed (very light doors), or
- the door leaf must not drop out of control more than 300mm, and further use of the door must be prevented.

The required fall-back protection can be achieved by an inherently safe design system, or by using devices; hence, doors with an effective fall-back protection system will not need to be fitted with fall-back protection devices. For this reason, assessing adequate fall-back protection cannot commonly be achieved at a glance. Older systems may need detailed analysis to determine safety. The fall-back protection should be effective in normal use and when the door is being used in manual.

User instructions should explain how to identify when a fall-back protection device or system has activated and what the user should to do in response; usually this is to not use the door and call for expert assistance.

Fall back protection should not be taken lightly. Fall-back incidents occur very regularly in the UK. In many cases, it is a near miss but, if a person is present under the door, death or very serious injury is the most likely outcome.

## 4.3. Safety distances and guards

EN 12453 identifies that reducing gaps in powered door, gate and barrier systems produce various impact, crush, shear, and draw-in hazards. These can be protected by a range of measures that include safety distances, guards, and safety

enclosures. Where these measures are being relied upon, they must prevent reaching into and over the protection such that hazards are protected between ground (or any other permanent access level) and 2.5m.

These measures may also apply to some manual systems in areas with high levels of children or vulnerable adults present. Whilst reducing hinge gap control is usually a powered system issue, some owners have been prosecuted where children have been injured by manual gate and door hinge gaps.

## 4.4. Hold-to-run

Hold-to-run is a system where a trained user operates the system with a control that is designed or placed such that it can only be used when the person is in the immediate vicinity of the moving leaf and has full sight of all hazards being protected in this way. The system should only move whilst pressure is being applied to the control; when it is released, movement should cease immediately. This should not be achieved with a portable device unless the device will only function in the immediate vicinity of and in full sight of the door.

**Note: This is an area of widespread non-compliance in the UK garage door market. UK Trading Standards has provided DHF with assured advice that to supply a garage door system that does not comply with this requirement would constitute a breach of construction products and machinery safety legislation.**

## 4.5. Force limitation - powered system safety by safe contact

Force limitation is a system that allows the moving door, gate, or barrier to contact a person but will sense the resistance and reverse movement. It can be achieved by use of touch sensitive strips known as safe edges, or by means of sensitive drive units. Both force and time must be controlled, simply reducing force is not enough. EN 12453 provides limits on peak force (400N/40kg), the time force takes to reduce to 150N/15kg (0.75 seconds), and the time force takes to reduce to 25N/2.5kg (5 seconds).

Testing is done with a specialist calibrated force and time meter.

Force limitation should be supplemented with at least one horizontal photo beam wherever automatic closing is in use and wherever untrained persons might reasonably encounter the system. Fixed position “supplementary” beams have never been permitted as the sole protection for the closing edge; they have only ever been specified to supplement force limitation.

**Note: This is another area of widespread historic non-compliance in the UK door, gate and barrier market. Supplementary beams are too easily defeated by standing astride or leaning/reaching over to be a primary safety measure.**

## 4.6. Non-contact presence detection technology

Non-contact presence detection is technology that can prevent contact with hazardous movement.

There is no need for force limitation with this technology.

The device(s) can be used in any one of three ways:

- installed directly within the movement plane of the leaf (eg within the guides of a rolling shutter), or
- installed to set up an exclusion zone to either side of the movement plane of the leaf (shutters, sectional doors, gates, and barriers), or
- installed set up exclusion zones that move with the leaf (eg swing and folding doors)

These systems can be subject to nuisance tripping due to adverse environmental conditions (heavy rain, snow, wind-blown debris or animals and birds).

Testing is done with specialist test objects that are presented towards the moving leaf in various orientations depending on the type of system, and the positioning of the device.

## 4.7. Lifting hazard - vertically acting powered doors

EN 12453 requires that, wherever possible, vertically acting powered doors should be designed so that there are no useable hand or foot holds that might give rise to a person being carried aloft by the door either by accident or misuse. Rolling grilles are particularly vulnerable to a lifting hazard due to the apertures inherent in the design. Where lifting potential cannot be achieved removing potential hand/foot holds, a control measure should be implemented to prevent lifting of persons; the available options are one or a combination of:

- operate the door in hold-to-run (providing the person would be visible to the user)
- limit torque such that the door cannot lift a test weight of 20kg (domestic) or 40kg (industrial), mounted centrally on the lower edge of the door
- install high-level fail-safe photo electric beams that will detect a person before they reach a hazardous height and/or location
- install non-contact presence detection that can prevent movement when a person is present on the leaf.

Lifting hazard potential is not to be taken lightly; children and adults have been killed in this way in recent years.

## 4.8. Powered door & gate imprisonment hazard control

EN 12453 requires that imprisonment hazards must be prevented whenever a powered door or gate prevents people from exiting a potentially hazardous location in the event of a fault or power cut.

Imprisonment hazards and the inconvenience caused when automated systems suffer faults or power cuts can be controlled by providing a manual override in the potential imprisonment area. Where untrained users might need to use a manual override, instructions on its use should be provided in the immediate vicinity.

### 4.8.1. Fire safety – escape routes

EN 12453 describes what manufacturers are permitted to place on the market, depending on the location and use. Fire safety regulations may require additional escape means that are less restrictive to use than a manual override - eg push bar swing doors. Very few automated doors or gates covered by this guidance could achieve the ease of use required for an emergency escape route door in a multi occupancy building.

Owners, managers, and principal designers should consult the relevant building regulations for new developments and renovations or the appropriate government advice for existing buildings (see section 2.8) to see what would be acceptable in specific locations and environments.

## 4.9. Reduced levels of safety for powered domestic garage doors

EN 12453 states that, where a vertically moving domestic garage door is provided for the use of a single domestic household, it is possible to protect only the leading edge of the moving door, providing:

- it does not open directly onto a public highway (road or footpath), and
- it does not use automatic closing (closing automatically after a pre-set time delay) or remote activation, and
- the drive unit is in full conformity with EN 60335-1 and EN 60335-2-95.

Under these conditions only, other draw-in, crush and shearing hazards may be disregarded, but structural integrity, fall-back protection and electrical safety cannot ever be disregarded.

## 4.10. Controlling residual hazards on powered systems

A residual hazard is the hazard that remains once the legal minimum level of safety (EN 12453) has been achieved, for example, the effects of being subject to 400N (40kg) for 0.75 of a second. For very young or infirm people, the effect of a residual hazard could in fact be significant. Hence, the residual risk assessment should attempt to reduce the degree of harm possible where a high-risk level exists (eg at a school or other public building) by specifying non-contact solutions over force limitation or reducing operating force even further than is permitted by EN 12453.

Protection of vehicles should be considered and provided for at this stage. EN 12453 is primarily concerned with the safety of people, not vehicles.

Residual hazards should be addressed by applying suitable measures, eg one or a combination of the following, shown in order of merit for the protection of vulnerable users:

1. non-contact presence detection
2. even lower force than 4.3.2
3. additional photo beams
4. warning lights
5. LED warning strips
6. audible warning devices
7. activation devices
8. pedestrian railings
9. signage
10. zone lighting
11. hazard tape
12. ground markings
13. reflective materials
14. written user warnings
15. safe use instructions
16. user training
17. traffic lights
18. ground loop (vehicle detection)
19. traffic calming

Selection of appropriate residual hazard controls should be arrived at based on a local site-specific risk assessment.

Unlike the main body of hazards dealt with by EN 12453, where the focus is on the potential degree of harm, the control of residual hazards can be weighted more on likelihood of occurrence. The need for additional protection systems and warning devices reduces as the likelihood of contact with a residual hazard diminishes on a given site. As the residual risk assessment is a site-specific issue, it is more a role for the installation company rather than the manufacturer.

Great care is required none the less as, in the event of an incident, the findings of the residual risk assessment will be brought into judgement to some degree at least. Written user warnings, safe use instructions and user training should be provided and are an important aspect of residual hazard control.

Owners and managers should liaise with their installation or maintenance company to ensure that appropriate and sufficient residual controls are in place.

# 5. Frequently Asked Questions

A wealth of guidance material, including this document and the others in the TS 013 series, is freely available on the DHF website at: www.dhfonline.org.uk

Below, we have provided some frequently asked questions and their answers.

Technical enquires can also be sent by email to: technical@dhfonline.org.uk

## 5.1. Do existing systems need to be brought up to current standards?

Yes, all systems should be judged against the standards.

Standards for industrial doors, garage doors, powered gates and traffic barriers have not changed significantly since 2000. Before that, there were no standards for these systems, therefore it is reasonable to judge existing systems against these standards. Although there is no requirement for *manufacturers* to re-call previously manufactured systems in line with changes to standards, health and safety and workplace legislation requires that owners and managers keep up with current levels of safety. For example, the levels of safety allowed in the 1970s would not be tolerable in a modern workplace.

## 5.2. Is compliance with standards mandatory?

By the letter of the law, no, but the following points must be accommodated to achieve legal compliance.

Health and safety legislation is generally performance setting in nature but not technically specific; in virtually all cases, the technical detail on how to achieve compliance is left to standards. Very often, by the letter of the law, compliance with a standard is voluntary but reaching or exceeding the levels of safety described in the appropriate standard is not. For example, in the UK, BS 7671 – IEE Wiring Regulations - is a British standard. The word regulation in the title does not make it law; electricity at work legislation and building regulations are the appropriate law. No one in the UK construction industry or the building management industry would consider BS 7671 compliance as being optional in practice; the same applies to EN 12453 and EN 12604 compliance for doors, gates, and barriers.

Legal precedent in serial door, gate, and traffic barrier incident prosecutions has proven that using or failing to use the appropriate standard has been central to the court deciding if reasonably practicable steps had been taken to achieve legal compliance.

## 5.3. Are maintenance companies allowed to leave an unsafe system in service following repair, maintenance, or modification work?

No, to do so would leave them potentially in breach of health and safety legislation.

If the work the client has requested or agreed to would result in there being safety critical defects present, maintenance companies cannot legally leave the system in service in that condition. The client is of course at liberty to make their own decision once they are in possession of the facts; it is after all their system and their legal liability and the safety of users that is at stake. Where a maintenance company find themselves in this situation, they will explain the safety defects to the client, provide a solution proposal, leave the system in a safe condition, show the client how this has been done, and issue the client with an unsafe system notice.

This is not an attempt to dictate or influence policy on a system owner/operator; it is simply a measure to protect the maintenance company's criminal obligations and ensure that all stakeholders in the process are informed and able to make reasoned and informed decisions.

## 5.4. Do doors, gates and traffic barriers need safe edges?

No, but all reachable moving parts hazards must be protected.

Standards require that any system not operated in hold-to-run mode must have accessible moving parts hazards protected either by limiting the exerted force or providing a non-contact solution. A safe edge is one way of providing force limitation, the other equally viable method for some crush and impact hazards is inherent force limitation, where the drive unit can sense an obstruction and retract the moving leaf before crush or impact force becomes too high.

## 5.5. Do all vertically acting doors need fall-back safety devices?

No, but all vertically acting doors must be protected against falling back.

Failure of any one spring, cable, drive chain, drive gear, or internal gearbox must be protected such that, at the point of the failure, the door will not fall back more than 300mm, and be prevented from further use. Some door designs do not need safety devices to achieve this. In the case of automatically operating doors, it is acceptable for the door to close at normal speed and under full control, and then be prevented from further use by use of fault sensing systems.

The question to be answered for compliance and safety is: will the door be prevented from dropping more than 300mm, and will further use be prevented when there is a fault?

The only relaxation of these rules is where the out of balance weight of the door after the failure will be 20kg or less.

## 5.6. Is BS 476 fire testing and certification still valid for industrial doors and shutters?

Fire resisting industrial doors and shutters placed on the market since November 2019 must be tested to EN 1634 and be certified and UKCA/CE marked to EN 16034. After that date, manufacturers could no longer rely on BS 476 testing or certification for new doors.

Fire test and certification evidence based on BS 476 testing is still perfectly valid as evidence of compliance for existing industrial doors placed on the market prior to November 2019.

# 6. Bibliography of standards

Standards prefixed by BS only are British Standard and apply solely to the UK:

- BS 476-22: Fire tests on building materials and structures - Method for determination of the fire resistance of non-loadbearing elements of construction
- BS 63751-1: Performance of windows and doors - Classification for weathertightness and guidance on selection and specification
- BS 7671: Requirements for Electrical Installations. IET Wiring Regulations

Standards prefixed by EN are standards with a European origin that have been adopted by various countries, in the UK they are prefixed by BS (BS EN) and in the Republic of Ireland they are prefixed by IS (IS EN):

- EN 13241: Industrial, commercial, garage doors and gates. Product standard, performance characteristics
- EN 12453: Industrial, commercial and garage doors and gates. Safety in use of power operated doors. Requirements and test methods
- EN 12604: Industrial, commercial and garage doors and gates. Mechanical aspects. Requirements and test methods
- EN 12489: Industrial, commercial and garage doors and gates. Resistance to water penetration. Test method
- EN 12426: Industrial, commercial and garage doors and gates. Air permeability. Classification
- EN 16034: Pedestrian doorsets, industrial, commercial, garage doors and openable windows. Product standard, performance characteristics. Fire resisting and/or smoke control characteristics
- EN 1634: Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Fire resistance test for door and shutter assemblies and openable windows
- EN 16005: Power operated pedestrian doorsets. Safety in use. Requirements and test methods
- EN 60335-2-95: Household and similar electrical appliances. Safety - Particular requirements for drives for vertically moving garage doors for residential use
- EN 60335-1: Household and similar electrical appliances. Safety - General requirements

# Notes:

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## Contact us for more information

Email: info@**dhf**online.org.uk

Telephone: (0)1827 52337

Address: **dhf** The Barn, Shuttington Fields Farm, Main Road, Shuttington, Tamworth B79 0HA