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Speed Is the New Green

// Advanced Fundamentals for High-Performance Doors //

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HÖRMANN

Manufacturer of High-Performance Doors

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Speed Is the New Green

// Advanced Fundamentals for High-Performance Doors //

Provider Name

BNP Media

Course Title

Speed Is the New Green

Advanced Fundamentals for High-Performance Doors

Course Number: K1901C



Speed Is the New Green

// Advanced Fundamentals for High-Performance Doors //

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Speed Is the New Green

// Advanced Fundamentals for High-Performance Doors //

Course Description

This course evaluates high-performance flexible and rigid coiling doors as compared to conventional rolling doors. Environmental and physical security factors are examined, short video clips provide examples of quick opening and closing operations, as are safety and ease of repair. Cost, design considerations, and application examples are also reviewed. The course will conclude with a brief question-and-answer session.





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Learning Objectives

At the end of this course, participants should be able to:

Identify several environmental and physical security factors addressed by high-performance flexible & rigid rolling doors.

Explain limitations of conventional sectional and rolling steel doors in terms of cycle-ability and repair-ability/maintenance.

Discuss key features of both high-performance door types in terms of cycle-ability, safety, and environmental control.

List three design considerations required to properly apply a high-performance door.

Properly apply a high-performance door, and identify several appropriate applications.

These learning objectives are specific to this education course and should not be identified out of context of this presentation.

High-Performance Door Solutions

High-Performance Door Solutions to Old Design Problems

Why does a company use a high-speed door?

Benefits:

- Increased energy efficiency of operations due to a reduction in energy costs (heating and cooling).
- Features and actuators enhance protection of people, equipment ,and products around the door opening.
- Workflow enhanced because of fast openings/closing speeds (opening speeds up to 100 inches per second).
- Minimize operational costs.
- Minimize transmission of contaminants.
- High cycle abilities (1 million plus cycles with minimal maintenance).
- Added security because of fast opening/closing speeds.
- Ability to take abuse, breakaway bottom, and self- repairing features.
- Indicates commitment to corporate image of progress and growth.
- Attractive and clean looking.
- Separate one work area from another.
- Aid in protection against harsh conditions, wind, snow, and rain.
- Reduction in sound transfer .

Rolling Steel Door

Side-by-Side Comparison With High-Performance Flexible Door



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Rolling Steel Door

Side-by-Side Comparison With High-Performance Rigid Door



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The Problem

Limitations of Conventional Sectional & Rolling Steel Doors



- Not designed to cycle
 - 130-year-old design
 - High weight-to-strength ratio
 - High friction
 - Slow (increased security risk)
 - 6 to 10 inches per second
 - 12 seconds to open or close a 10-foot-high door
- Not designed for repair-ability
 - High impact/damage cost
 - Time- and labor-intensive repair
- Not designed to seal
 - No seals between slats or sections
 - Gaps at top and side frames

The Problem

Limitations of Conventional Sectional & Rolling Steel Doors

Low cycle. Cycle life of approximately 12,000 cycles.
50,000 and 100,000 cycle springs available.

Slow speeds. 8 to 12 inches opening/closing.

Lost productivity while waiting for door(s) to open/close.

Energy lost due to slow speeds.

Poor sealing around doors equates to lost energy
resulting from poor weather sealing.

Many moving parts that are easily worn and need
replacement.

Doors easily damaged and with no easy turnaround for
repairs.

No self-repairing functions means service is required.
High maintenance costs.

Limited durability in high-traffic areas.



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The Problem

Limitations and Concerns of Air Circulation at Door Systems



Extremely expensive to operate and maintain.

High utility bills.

Expensive replacement parts.

User *unfriendly*, poor aesthetics and noise.

The Problem

Limitations and Concerns of Sectional & Rolling Steel Doors

Limitations

Low cycle. Cycle life of approximately 12,000 cycles.
50,000 and 100,000 cycle springs available.

Slow speeds. 8 to 12 inches opening/closing.

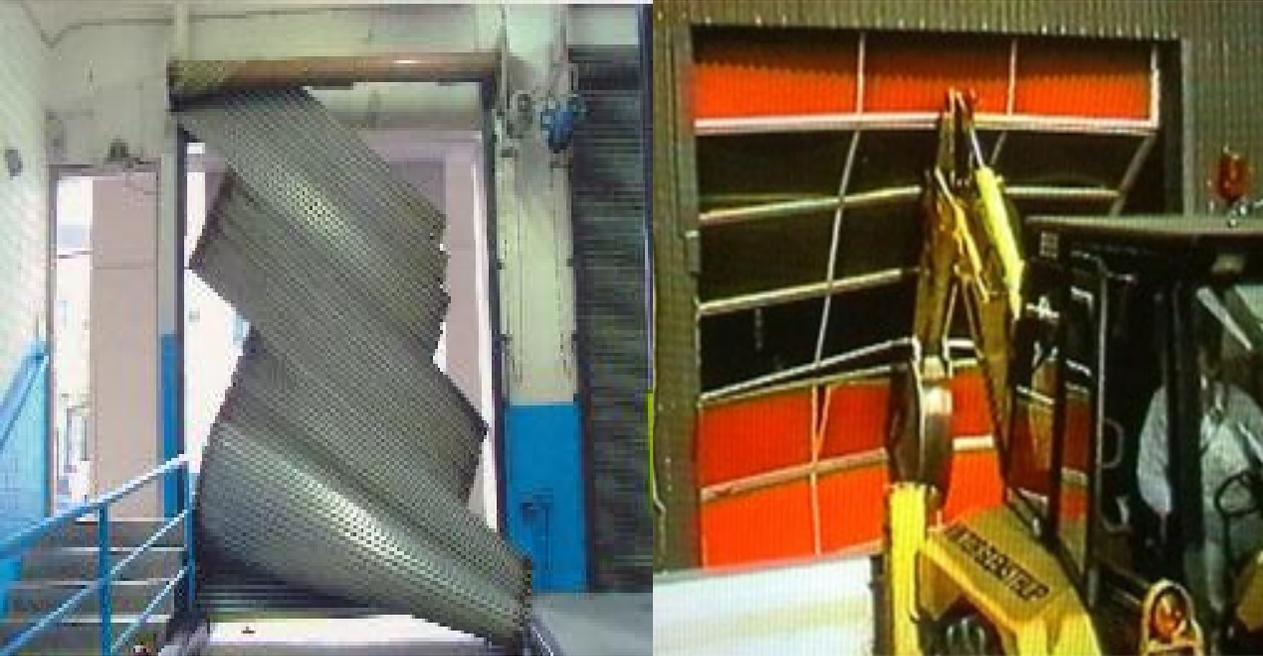
Lost productivity while waiting for door(s) to open/close.



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The Problem

Limitations and Concerns of Sectional & Rolling Steel Doors



Limitations

Poor sealing around doors equates to lost energy resulting from poor weather sealing.

Many moving parts that are easily worn will need replacement.

The Problem

Limitations and Concerns of Sectional & Rolling Steel Doors

Limitations

Doors easily damaged and with no easy turnaround of repair.

No self-repairing function, service required.

High maintenance costs.



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The Solution

High-Performance Flexible and Rigid Curtain Doors

High-performance doors are fast moving and commonly used in commercial and industrial applications. They assist in reducing energy costs, minimizing operating costs, and accommodating high cycles with minimal maintenance.

High-performance doors include safety features and activations that make the doors safer for people, equipment, and products to pass through. They are designed with breakaway and self-repairing features for minimal maintenance. Many companies integrate high-performance doors for a progressive growth-oriented corporate image.

Robotic Fabrication

State-of-the-art machinery improves efficiency, precision, and quality production



Modern Factories

A lot can be said for the use of the latest technologies in the fabrication of high-performance doors.

With high speeds comes greater demand for longevity of products. Modern factories make the processes for fabrication possible on larger-scale interventions.

Automation is key to moving components along an assembly line. Human workers assist the process with inputs to the machinery that allow high-quality results in a consistent manner. In this way, much of human capital is free to manage higher-level processes, executing decision-making along the line. High-performance doors benefit greatly from the advantages of this production course. Tolerances can be met with great precision for even further advances in the product design that would not be possible in a traditional manufacturing setting.

The Solution

High-Performance Flexible & Rigid Doors

Designed to Cycle...

High-performance door:

A power-operated rolling, folding, or sliding nonresidential door, generally characterized by either 100 or more cycles per day or 40 or more inches per second opening speed, and typically made to order and/or designed for higher durability and/or to break away due to equipment impact.

High-speed door:

A subcategory type of high-performance door; a non-swing door used primarily to facilitate vehicular access of material transportation, having an automatic closing device, with a minimum average opening rate of 32 inches per second and a minimum closing rate of 24 inches per second.



Understanding this will help your clients achieve proper balance in product selection among performance features and project requirements.



The Solution

High-Performance Flexible & Rigid Doors

Designed to cycle.

Up to 1 million cycles with proper maintenance.

Fast!

24 to 100 inches per second.

3 to 5 seconds to open or close a 10-foot-high door.

Low friction, low wear.

Designed for repair-ability.

Minimal or no damage from impact.

Simple repair.

Designed to seal.

Full perimeter seals.



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The Solution

High-Performance Flexible & Rigid Doors

Protection features and actuators make the doors safe for people, equipment, and products to pass through.

Attractive/clean appearance.



High-Performance Doors

Determining Useful applications

Certain project types naturally lend themselves for the use of high-performance doors. These building types are enhanced by the many benefits and features offered by HPDs.



Project Need Analysis

Possible Reasons for Specifying High-Performance Doors

Environmental security

Temperature, humidity

Heating, air-conditioning

Cooler, freezer

Contamination

Food preparation, USDA

Process control

Protection of employees, patrons

Odor (on-site refuse disposal or adjoining property conditions)

Wind, dust (high particulate count)

Sound, acoustic isolation

Working conditions



Project Need Analysis

Possible Reasons for Specifying High-Performance Doors



Physical security

Traffic flow and control

Restricted access

Periodic access

Theft and trespass prevention
(30 percent of all business failures are due to theft)

Terrorism and homeland security

Delivery method

Biological, chemical, explosive

Project Need Analysis

Possible Reasons for Specifying High-Performance Doors

High cycle requirements

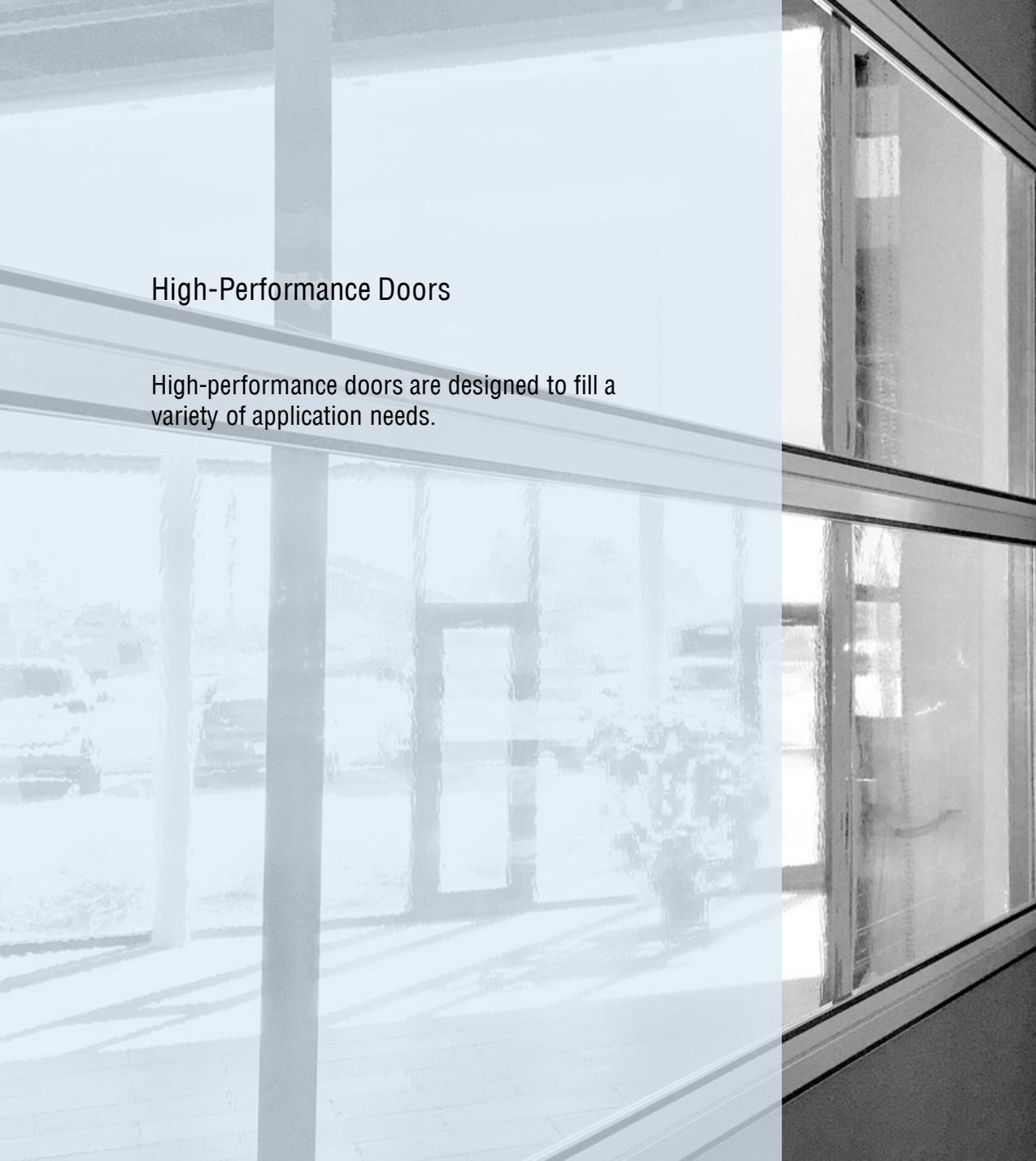
High demand access requirements

Reliability

Door must function

Critical access requirements





High-Performance Doors

High-performance doors are designed to fill a variety of application needs.



Fast moving:

Accommodate high traffic volumes with fast cycle times.

Commercial Applications:

Built for lasting operation in demanding environments.

Improve Energy Performance:

Often as the largest opening in a building, HPDs can seal a space quickly, conserving conditioned air and reducing system loads.

Reduce Operating Cost:

Lower energy demands and increased productivity equal tangible savings.



High-Performance Doors

High-performance doors are designed to fill a variety of application needs.



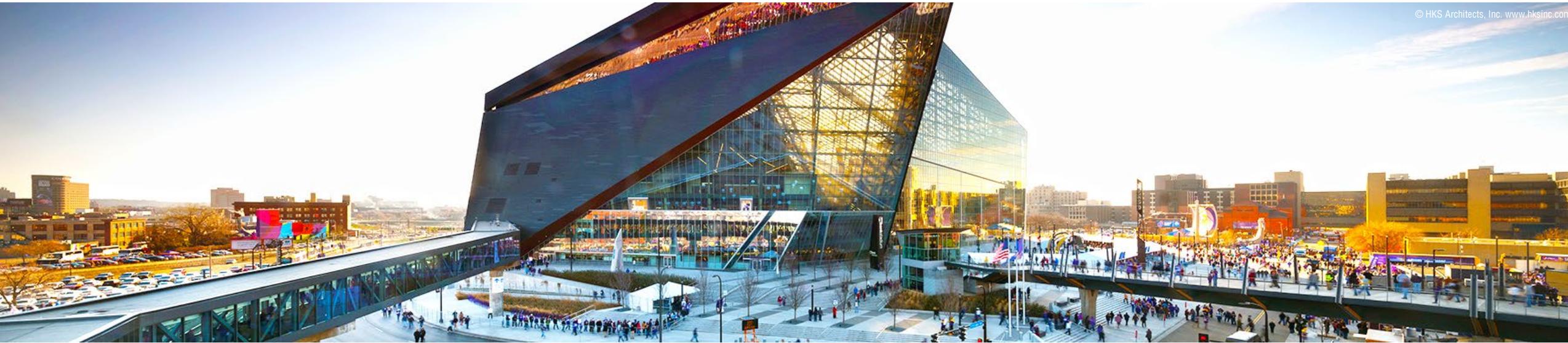
High Cycle-ability:
HPDs are engineered for lasting performance.

Advanced Safety Features:
Using the latest IR, radar, and laser sensing technology keeps vehicles, equipment, and pedestrians safely moving.

Rugged and Self-Repairing:
Designed with breakaway and self-repairing features. Flexible HPDs can include crash-detection components and can self-align and reset should an impact occur with the curtain.

High-Performance Doors

Designed to Fill a Variety of Needs and Applications



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Real Working Solutions

High-performance doors offer access solutions that outperform conventional rolling steel doors.

Multiple Configurations

Guide tracks can be configured to accommodate a wide range of opening conditions, from low headroom clearance to narrow side room and beyond.

High-Performance Doors Designed to Fill a Variety of Needs and Applications

Food Processing

Capable stainless steel and food-grade components



Retail Automotive

RAM markets HPDs serve critical roles in daily business functions



Pharmaceuticals & Clean Rooms

Flexible high-speed doors control sensitive environments



High-Performance Doors Designed to Fill a Variety of Needs and Applications

Manufacturing, Shipping, & Distribution

High-speed, high-cycle doors move vehicles and equipment quickly and safely



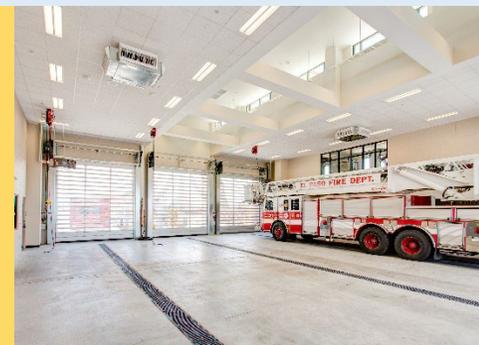
Transportation

Regional transit authorities including airports and bus terminals for securing openings



First Responder & Emergency Services

Fast, secure, and reliable, HPDs can be counted on to get the job done



High-Performance Doors Designed to Fill a Variety of Needs and Applications

Multifamily Housing, High-Rise Apartments

Provide luxury amenity for ease of access and security



Parking

Move high traffic volumes and control vehicular access



Arenas & Stadiums

Provide security to access tunnels for field operations that quickly prepare for game-day activities



High-Performance Doors Designed to Fill a Variety of Needs and Applications

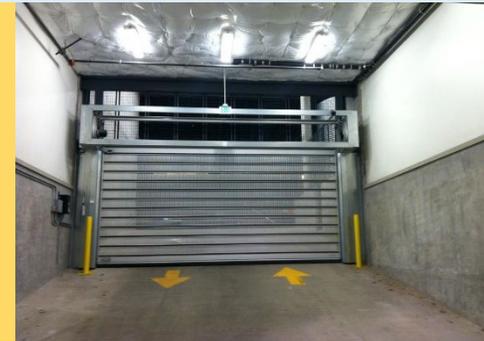
Industrial, Mining

Rugged, tough rubber panels for fast-paced heavy industrial operations in large openings



Government, Justice, Banking

Secure large opening with fast moving, reliable, and safe HPDs



Breweries & Wineries

Control temperatures and humidity in sensitive environments



Environmental Solutions: Design Considerations and Applications

Designers should consider the following three primary door application principals.

Productivity at Risk:

Selecting a standard door where a high-performance door should be used can have direct negative consequences on productivity, affecting timing and delays from maintenance. Clients may not detect those impacts easily, but they exist, and they have an expensive cost.

Choosing a high-performance door, and critically one that's thermally isolated, can significantly enhance energy cost savings over and above insulation alone for the entirety of the door's service life.

Considering maintenance downtime, if standard rolling steel doors are operated more than recommended, severe mechanical damage to the motor and springs can render those doors useless, affecting customer and employee operations.

In contrast, HPDs can open up to 10x faster and are built to endure demanding operation. Fewer moving parts remove potential points of failure. Differences in cost are recovered through reliable operation, increasing productivity.

Lost Revenues:

Choosing the wrong overhead door affects client's bottom line! Simply stated, a business operating in a temperature-controlled environment that chooses a standard door may as well be throwing money away every time the standard door cycles.

The wrong door can cost time and money!

An opening speed of 8 inches per second can permit 20 seconds of unconditioned air into a space. Choosing a high-performance door paired with the right actuator can significantly enhance the energy performance of a building's HVAC system. To reiterate, these cost impacts aren't apparent to most clients during the design phase, but they will feel them once their facilities are open for business.

Carefully pairing the right actuator for the intended door operation ensures the full benefits of the HPD are realized, limiting false cycle runs and potential accidental impacts to the doorway.

Safety Matters

If losses of a client's profits due to an underperforming building aren't convincing enough to keep HPDs from being "value engineered," how about sacrificing safety and security of the building occupants? Springs on a standard OHD can fail, causing the door to slam shut and risking serious injuries.

High-performance doors come with enhanced safety features. Standard doors use photo-eyes at the threshold to stop the door from coming down, while HPDs include a light curtain up to 8 feet tall, preventing the door from closing if *anything* interrupts the plane of the door curtain.

Remember when a standard door is installed where a high-performance one is needed, your client can lose time and money throughout the life cycle of the door. It can be the very meaning of the idiom of being penny wise and pound foolish.

“

Light curtains can save thousands in cost of repairs to damaged goods and vehicles as well as the door itself.

”

Design Considerations

Designers Should Consider the Following Door Application Principles

Designs with high-speed doors can:

- Be appealing with contemporary, modern aesthetics
- Be physically secure
- Be environmentally secure
- Provide rapid operation (many, many times per hour)
- Be very reliable and designed for convenient, timely repair
- Offer enhanced safety with light curtain sensors

Commonly used when there is a need to minimize the transmission of building climate or contaminants between two areas.

Rapid opening and closing speeds for added building security.

Able to sustain more use/abuse because of features like:

- High-efficiency motors
- Non-contact rollup of the door curtain
- Panel breakaway systems
- Easy single-panel repair capabilities



Design Considerations

Designers Should Consider the Following Door Application Principles

Select the high-performance door type (model) according to the location of the door opening:

- Interior to interior
- Exterior to interior

Study and determine the traffic patterns that will exist where the door will be installed and select an activation method for the opening based on this information. This will minimize risks of injury to personnel and damage to goods.

Consider the advantages and disadvantages of incorporating additional alert-warning equipment and choose what is best for the facility.

Submittals are not the place to catch mistakes with the design, door order, or site conditions.

It's important to require safe delivery storage and handling of the door, as the warranty may not cover damages while waiting to be installed on-site.

Crushed panels from stacked boxes or parts that go missing happens on-site!



Design Considerations

Designers Should Consider the Following Door Application Principles

Performance design criteria are a great way to confirm the product you are designing for will meet expectations once installed.

Each manufacturer's products may have slightly different tolerances. Its important to verify these with your basis of design early enough in the planning stages should you need to make adjustments.

Important areas to note are:

Life-Safety Performance: Is the door part of a planned egress? Some flexible high-speed doors will be acceptable in the upcoming edition of the IBC as egress doors, particularly in uses where there may not be enough space for a separate adjacent man-door. Example applications are:

- ✓ **Pharmaceutical Facilities:** Flexible HPDs keep rooms clean, separating environments.
- ✓ **Manufacturing Facilities:** Transporting goods and materials through a high-volume opening.
- ✓ **Large Coolers/Freezers:** Control temperature-sensitive spaces, segregating critical-conditioned spaces.



Design Considerations

Designers Should Consider the Following Door Application Principles



Fire-Resistance Performance:

Most high-performance doors are not designed for use in fire-resistive assemblies. Be sure to confirm for your application.

Ballistics and Blast Resistant Requirements:

Most high-performance doors are not capable of compliance with ballistics and blast-resistant qualities. Areas such as mining and high-security applications sometimes require this.

Structural Loads:

A good understanding of how the door you are specifying supports its weight is important when planning for structural framing the door opening.

External forces transferred from the door to the building are lateral loads from wind (+/- pressures) with some lesser loads from the operation of the door during the open/close process.

Design Considerations

Designers should consider the following door application principles.



Tandem Door Strategies:

Pair a high-performance door with a rolling steel shutter to comply with wind requirements in hurricane storm zones.

Hurricane-Rated Doors:

Hurricane-rated high-performance doors are tested rigorously against high wind loads and, in some cases, missile impact to verify their safety in severe storm conditions.

Structural Loads:

Some guide track configurations such as low headroom and high lift can place additional loads on walls and structure above the door opening.

Along with special wind-zone requirements for your project, it's also important to understand acoustic/vibrational and seismic requirements that may need special accessories for mounting and activation/operation for the HPD.

For example, it may be necessary to use a tandem door strategy in hurricane zones. This option allows for the deployment of a separate protective shutter during storms, while still using a fully glazed door for aesthetic and design purposes in the door opening.

Design Considerations

Designers Should Consider the Following Door Application Principles

Operating Speeds:

It's important to understand how the high-speed door you are specifying works to ensure proper opening speeds for your application. Some doors operate with a variable speed motor/operator that will throttle up speed on start of the open cycle, reach its peak speed over the distance the door curtain is to travel (the height of the door opening, typically), and then decelerate before achieving its fully open position. This pattern is repeated during the closing phase, at a slower speed for safer operating conditions since most emergency stops and interruptions occur during door closing. That completes one cycle of the high-performance door operation.

Cycle-ability and Resilience:

Not all doors require *only* fast opening speeds, but inherently, a door capable of a high number of cycles over daily operations. Often times, these openings are critical to the efficient flow of vehicles, equipment, and people. Low maintenance requirements and reliable operation are what make high-performance doors ideal for such facilities.

Many HPDs are designed capable of 120,000 cycles with only light maintenance, such as checking tolerances in springs. Doors can be up and running again after quick repairs in just hours thanks to sectional designs, which allow only individually damaged parts in the door curtain to be replaced and not the entire assembly. This reduces overhead costs with lower parts storage inventories and keeps critical openings functioning when it counts.

Flexible high-speed doors feature the ability to self-reset their door curtains into the guide tracks after an accidental impact. Soft bottom edges or crash-capable bottom bars include electronic components that sense an impact has occurred and dislodge the curtain, initiating an automatic process that rewinds the door curtain and corrects its position smoothly in the guide tracks, all with zero downtime.

Remember, the quality of an HPD is going to be evident in its warranty!

Design Considerations

Designers Should Consider the Following Door Application Principles

Thermal Performance:

Most flexible high-speed doors have minimal thermal resistive qualities due to the nature of their curtain materials (nylon-reinforced PVC sheet).

Rigid high-performance doors can have reasonable thermal-resistive qualities depending on panel construction and thickness. Expect most HPDs will average a U-value of 1.2 for the entire door assembly.

Look for designs that are fully thermally isolated (broken) to further improve resistance to thermal bridging.

DASMA recommends neglecting R-values if listed for HPDs in favor of U-values because of the comprehensive nature of this value's measurement of the entire door assembly as opposed to just the cross-sectional value of the door curtain only, as given by R-values.

Fitting Clearances:

Low installation costs are begotten by sound-planning practices. Now that we have covered some initial requirements for our door opening, its time to check for fit!

Its important to understand the HPD's fitting clearance requirements as early as possible in the design process. Door component sizes will vary by manufacturer. Critical dimension areas are the door headroom and side room. Headroom is the area directly above the door opening at the head/lintel. Side room is the area adjacent to the two door jambs measured from the door opening.

Carefully locate obstructions in these areas, including columns, beams, joists, conduit, piping, and sprinkler lines.

When a design calls for HPDs to be placed in a series, it's important to note the location of the motor/operator as manufacturer specific aspects may increase one jamb's clearance width requirement.

Design Considerations

Designers Should Consider the Following Door Application Principles



Air Infiltration:

Modern energy codes set limits for air infiltration through building assemblies. These numbers are often higher than what is directly possible for most HPDs.

DASMA advocates for greater recognition in the building and energy codes. The building code recognizes this via two methods of compliance.



- ✓ **Trade-off Method:** An exception for HPDs is available through the COMcheck Building Energy Codes Program, which makes it possible for trading-off via C402.1.5: Component Performance Alternative for the Thermal Envelope.



- ✓ **Alternative Materials Method:** Compliance as an Approved Alternative Material per IECC-2015 Section C102 and IBC-2015 Section 104.11, both titled Alternative Materials – Method of Construction, Design, or Insulating Systems.

Design Considerations

Designers Should Consider the Following Door Application Principles



U-values:

DASMA Technical Data Sheet #405: High Speed Doors and Energy Conservation through a Building Envelope notes that ASHRAE 189.1 prescribes a higher U-value requirement of U 1.2 (imperial units) with a minimum average of 75 cycles per day.

Unlike ASHRAE 90.1's U-value requirement of U 0.5, which can be traded-off, this higher value cannot.

Its up to the designer to determine which path to present to the authority having jurisdiction on each individual project for approval of products specified.

Design Considerations

Designers Should Consider the Following Door Application Principles

Entrapment Protection:

High-performance doors must comply with safety regulations such as Underwriters Laboratories safety standard UL325. Some doors offer advanced features, such as light curtain entrapment protection.

Photo beam eye sensors are also used to protect door traffic.

A safety light curtain is a photoelectric presence sensors specially designed to protect personnel from injuries related to hazardous machine motion. Light curtains offer optimal safety and allow for greater productivity.



Design Considerations

Designers Should Consider the Following Door Application Principles

Accessories:

High-performance doors require accessories to complete their operation.

Electrical power disconnect (one per door)

Transformers

Push-button activators

Motor and door curtain cover (hoods)

Motion and presence sensing activator



Design Considerations

Designers Should Consider the Following Door Application Principles

Accessories:

Designers should consider the HPD control box, also called a controller or control panel. Sizes and options vary by manufacturer. Required one per each door.

Be sure to provide adequate power! Confirm requirements during design. It's always recommendable to be well within manufacturer tolerances for proper functioning.

Distance from the door can be limited (wire run length). Typically 50- to 100-foot radius.

Modern control boxes include remote diagnostic features, USB compatibility for on-site maintenance, as well as features like M2M, allowing facilities personnel to be aware of each door's operational status and crash events.

Wiring connections are not all equal and can greatly impact installation cost. Some jurisdictions may require a registered electrician in addition to the door technician to install control boxes with hardwired connections, adding time and cost to the door installation. Controllers with smart or plug-and-play connections can be installed by the door tech only and take only a moment to complete. Amplify this across a series of HPDs, and this becomes a detail not to be overlooked!

Activations:

Activations can have an often overlooked significance on the opening design. Pairing the right activator for the desired operation is something the manufacturer's representative can assist with. Options include state-of-the-art laser-motion and infrared-presence sensors.

It's important to consider traffic flow, security, and safety needs in proportion to take full advantage of a high-performance doors' benefits.

Operating an HPD directly from its control box may void its warranty. It's often required because of this to include an activation method. Both automatic and manual options are available.

Automatic activations include touchless (hand-wave) activation switches, motion sensors, presence sensors, motion/presence sensors, ground loop induction modules, RF card/fob sensors, and access card readers.

Manual activations include one, two, and three push button stations, emergency stop mushroom push-button stations, and pull cords.

Design Considerations

Designers Should Consider the Following Door Application Principles

Other features:

Sloped bottom bars are available on some HPD models to accommodate door openings on sloped elevations. Without proper (additional) headroom clearance, this may impact the clear opening height of the door, as these custom panels may not coil completely into the door head assembly.

Next Steps:

Now that a high-performance door solution has been selected and checked for fitting clearances and design criteria, activations, and accessories, we can discuss the next steps: on-site operations.

- Site preparation and examination for suitable installation conditions
- Installation
- Systems startup
- Adjusting and final cleaning
- Protection
- Training and maintenance.

High-Performance Doors

Flexible Doors



Flexible high-speed doors have available options developed in accordance with pharmaceutical industry regulatory environmental constraints. Their ultra-tough reinforced fabric door curtains and heavy-duty metal components stand the test of time and can be used in even the most corrosive areas!

Flexible high-speed curtain panels are engineered to resist damage, including tearing, twisting, and denting. Their color is integral and can also be specified to be more anti-corrosive than stainless steel.

Door curtains are designed to seal into the guide tracks while operating with minimal friction, making them fully capable of clean environment requirements,

High-Performance Doors

Flexible Doors

And their high operating speeds efficiently contain sensitive areas and airborne contaminants.

Flexible high-speed doors can be made fully pressure washable, and Food & Drug Administration (FDA) compliant reinforced fabric panels can ensure sanitary conditions are easily maintained.

When specified with in-line light curtain entrapment protection equipment, flexible HPDs can reliably avoid accidental damages to equipment, goods, and personnel.

“

High-speed flexible fabric doors are an excellent solution for parking and other high-traffic applications.

”

High Performance: Flexible Doors

Commonly used in applications where it is necessary to minimize the transmission of environmental contaminants.

Provide acoustical isolation and noise reduction.

Increase workflows between segregated spaces.

Flexible HPDs also reduce maintenance and costs associated with traditional overhead doors.

Flexible high-performance doors are ideal for openings that otherwise may have used impact doors, PVC strip doors, sliding, sectional, or rolling doors.



“

Flexible HPDs can be versatile, help quiet a space, protect from contaminant infiltration, and reduce costs.

”

High Performance: Flexible Doors

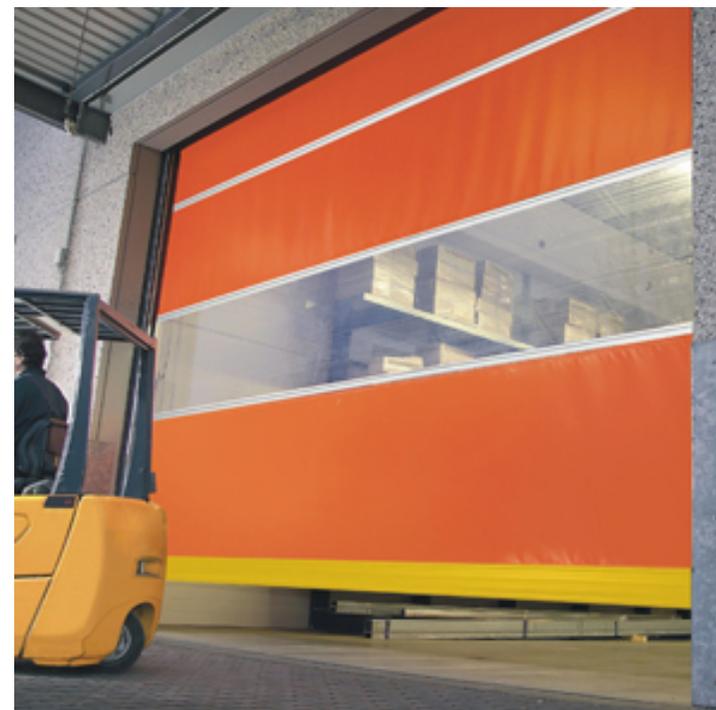
Lightweight, strong door panels (seamless woven polyester monofilament imbedded in PVC).

Designed for interior and exterior openings, with wind reinforcement at the panel edges/jamb.

Breakaway bottom edge allows panels to safely disengage from the guide tracks upon accidental vehicular impacts and automatically resets the door curtain in tracks.

Entrapment protection features include photo eye detectors, reversing bottom edges (upon contact), or light curtains, with most being UL 325 compliant.

UL 325 is an entrapment protection standard for door, gate, and window operation systems.





Flexible doors incorporate sectional panels that allow for replacement of damaged sections.



High Performance: Flexible Doors

Almost all high-speed flexible doors have an electromechanical drive.

Other mechanical features may include:

- Clutch/brake
- Programmable logic controller (PLC) with variable frequency drive (VFD)
- Soft start, soft stop
- Some have counterbalance systems

Doors will operate at rapid speeds from 40 to 100 inches/second. This can be up to 10 times faster than conventional overhead coiling doors.

Flexible HPDs are designed to be impact tolerant, with accumulating high operational cycles making them incredibly reliable.

Designs include fully sealed curtain panels, which can secure areas from contamination, winds, dust, and odors. Also a solution for humidity and temperature control.

“

Enhanced safety: light curtains, photo eye sensors, and reversing bottom edges allow compliance with regulation UL 325.

”



High Performance: Flexible Doors

Note: Flexible HPDs are not a physical security solution (can be paired in tandem with a rolling steel shutter for after-hours security).

They're also not fire rated or an egress component.

High-Performance Doors

Rigid Doors

Rigid high-performance doors now feature innovative designs that eliminate the need for extraneous moving parts, belts, cables, extension springs, and other costly, high-wear components and provide reliable operation for hundreds of thousands of cycles.

Their inherent qualities make them ideal for securing large openings. Sleek, modern designs offer attractive aesthetics with customizable finish options to meet the highest standards.

“

High-speed rigid doors are available with a variety of panel types from solid to vision and also perforated metal.

”

High Performance: Rigid Doors

Commonly used at both exterior and interior applications.

Rapid operating speeds typical of 80 to 100 inches/second.

Low-friction operation for high cycle demands.

Dependable security with rigid metal door curtain.

Rigid high-performance doors when insulated are ideal for reducing heat loss, improving acoustics as a value add.

Provides long-lasting, ultra-quiet operation.



“

Rigid HPDs can be versatile, help quiet a space, protect from contaminant infiltration, and reduce costs.

”

High Performance: Rigid Doors

Typically specified to...

- Minimize downtime, maintenance, and repairs
- Reduce systems energy consumption and losses
- Increase traffic flows and movement
- Regulate interior environments

Most recommended for applications with many potential cycles per day.

Replaces sectional, rolling steel, and sliding doors as well as PVC strip doors.



“

Rigid HPDs are ideal for reducing energy costs and heating/cooling loads. They also minimize the transmission of environmental contaminants between spaces.

”

High Performance: Rigid Doors

High-speed rigid doors have an electromechanical drive.

Other mechanical features may include:

- Clutch/brake
- Programmable logic controller (PLC) with variable frequency drive (VFD)
- Soft start, soft stop
- Many have counterbalance systems or springs

Doors will operate at rapid speeds from 40 to 100 inches/second. This can be up to 10 times faster than conventional overhead coiling doors.

Rigid HPDs are designed to be physically secure and tight sealing, making them ideal for many applications.

Designs include fully ventilated curtain panels, which can permit high-vehicle-traffic areas to receive ventilation.

“

Rigid HPDs are physically and environmentally secure, offering safe and reliable operation day in and day out.

”



High Performance: Rigid Doors

High speed, high cycle, high reliability

Minimal opening time means more security (cycle between every entry)

Counterbalance assists drive, reduces brake and clutch wear

Easily repairable, safe, aesthetically pleasing, clean, modern lines

Insulated panels of varied thicknesses available

Low headroom and narrow guide track options available

Note: HPDs are non-conforming exits and not typically fire rated

“

In the event of a malfunction or interruption to power, rigid HPDs incorporate safety features to ensure the opening can be secured manually.

”

High Performance: Rigid Doors

Emergency egress/access:

A chain fall is typically provided to allow the door to be opened in an emergency, power outage, or malfunction



High-Performance Doors

Heavy-Duty Rubber Doors



Window slats, also called vision panels, in rigid door curtains may be configured with perforations to allow for ventilation to spaces while still providing security and modern aesthetics.

Vision panel designs can incorporate single-, double-, or even triple-pane construction. Window materials are typically synthetically glazed, commonly Plexiglas or Lexan. Options feature a variety of tints.

“

High-speed
Heavy-duty rubber
doors are an excellent
solution for industrial
applications.

”

High Performance: Heavy-Duty Rubber Doors

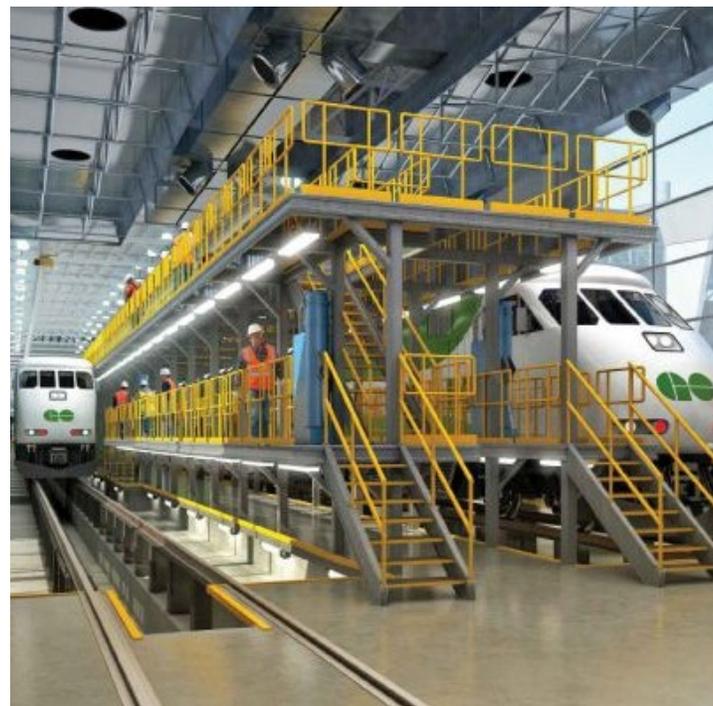
Commonly used in applications where it is necessary to minimize the transmission of environmental contaminants.

Provide fast operating and access to large openings.

Perfect solution for industry and transportation.

Rubber HPDs also reduce maintenance and costs associated with traditional large bay doors.

Rubber high-performance doors are ideal for openings that require security, reliability, and durability.



Drive System

High-Performance Door Motor/Operator Principles



© GFA Elektromaten Inc.

Electric Door Operators:

The current state-of-the-art drive systems incorporate direct-drive motors that are self-monitoring, have built-in safety brake, and are designed to be maintenance free.

- ✓ **Planning for Power:** A high-performance door's power supply should be sized to accommodate the door control panel and not the motor! It's the control panel that sends electrical power to the motor.
- ✓ **Remember the Disconnect:** High-performance doors require an electrical disconnect device (switch) at each door to control power service to the door. This takes up wall space and will need to be "near" (within a 50- to 100-foot radius) for wire run.
- ✓ **Low Supply Power:** It's important to consider power requirements for the consistent and safe operation of the high-performance door. If supply power at the building is near low or high limits for the door, it may be necessary to include transformer equipment at each door to accommodate these conditions.

Maintenance Considerations

Life-Cycle Factors

Repair-ability:

High-speed doors offer very low maintenance schedules to run at peak performance. Reduced wear, few moving parts, and quiet operation are all inherent benefits.

Damage – The Speed Factor:

Setting the proper leading-edge approach distance to the door:

Safe approach distance to door = X

Vehicle approaching door at 5 mph = V_T

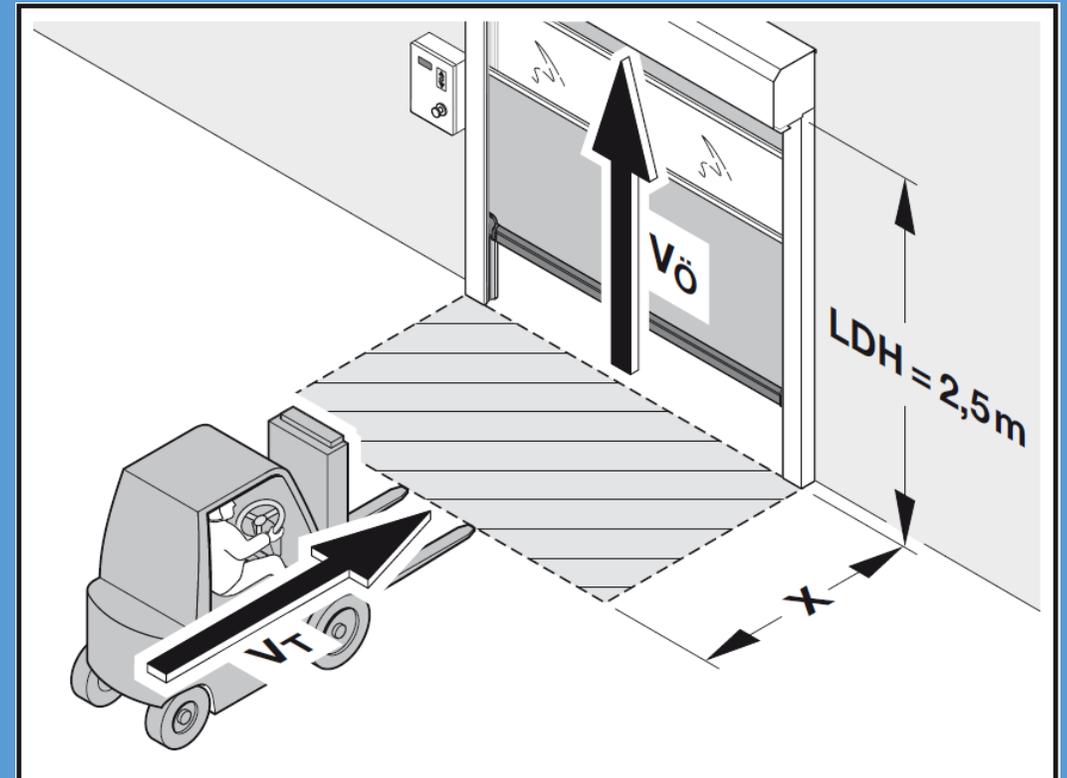
High-performance door opens to height of 10 feet = LDH

High-performance door opening speed of 80 inches/second = V_0

$$\frac{LDH}{V_0} \cdot V_T = X$$

Less likely to contact door at higher operating speeds.

Approach distance to a conventional overhead rolling steel door = 88 feet



High-Performance Doors

Determining Options and Accessories

Window slats, also called vision panels, in rigid door curtains may be configured with perforations to allow for ventilation to spaces while still providing security and modern aesthetics.

Vision panel designs can incorporate single-, double-, or even triple-pane construction. Window materials are typically synthetically glazed, commonly Plexiglas or Lexan. Options feature a variety of tints.

Dual-pane vision panels offer a more substantial construction to the door curtain.

Options and Accessories

State-of-the-Art Technology Improves
Efficiency and Precise Operation

High-Performance Doors:

A lot can be said for the use of the latest technologies in the operation of high-performance doors.

With high speeds comes the demand for precision products. Modern HPDs require careful consideration with accessories to realize the door's full benefits and potential. Working closely with a manufacturer's representative in the early stages of design and planning helps reduce potential changes during construction activities.

State-of-the-Art Activation Features:

Properly selected activation ensures efficient traffic flows and avoids damage to the door from accidental impacts.

Methods of activation include secure and reliable technologies:

- Remote activation and monitoring
- RFID card systems
- Remote keypad for secure PIN entry
- Biometrics capabilities: finger print and facial recognition

Facial Recognition Software



Fingerprint ID



RFID Card System



Options and Accessories

State-of-the-Art Technology Improves
Efficiency and Precise Operation

High-Performance Doors:

Many high-performance door controllers cannot be operated directly from the control panel itself without voiding the manufacturer's warranty.

Rather it is important to understand the activation options that must be specified with the door for reliable operation.

Push button stations are a typical requirement to operate the door.

Common Activation Features:

Properly selected activation ensures efficient traffic flows and avoids damage to the door from accidental impacts.

Methods of activation include reliable but non-secure technologies:

- Remote control (transmitter/receiver)
- Motion + presence detection
- Laser sensors
- Pull-cord actuators
- Magnetic induction floor loops (one or two sides of the door)
- Touchless "wave" activation switches

Mushroom Push-Button Station



Triple- and Double-Button Stations



Pull-Cord Actuator



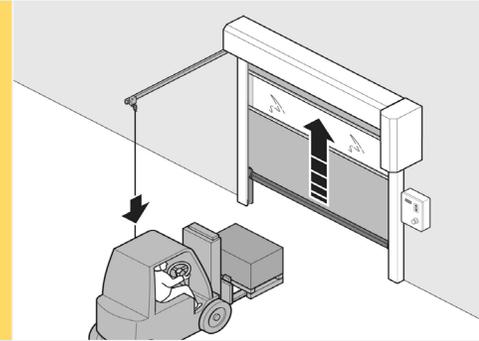
Activation Options

Ensure efficient traffic flows and avoid door, equipment, and vehicle damages from both interior and exterior sides.

Pull Cord

Activation from location of PC drop.

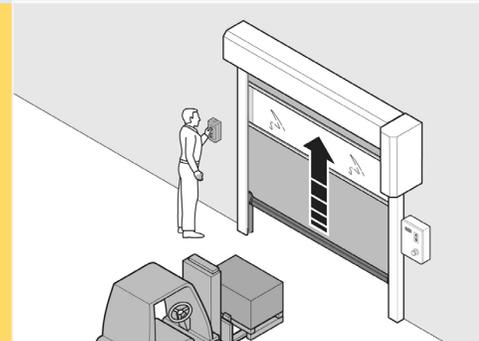
Pull-cord activation are typically overhead and can be mounted to extension arms from walls or directly to ceilings.



Push Button

Activation from location of PB station.

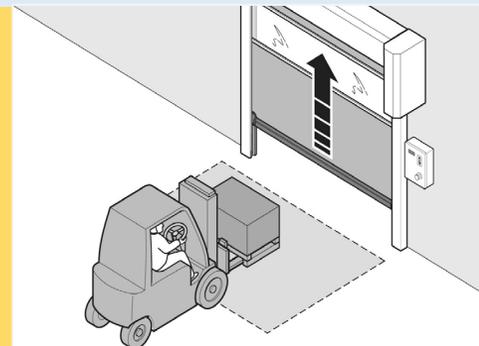
Push-button stations are available in multiple button configurations from single to triple as well as mushroom-head-style emergency-stop variations. This accessory may be necessary for manual operation of the door per the requirements of the control panel the manufacturer uses.



Induction Loop Vehicle Detector

Maximum Detection Range: 30ft x 30ft

Consists of three components, a wire loop (by others), preformed or saw-cut recess in the floor, a loop extension cable, and a card activator module at the door control panel. A loop wire field is installed below the surface and generates a magnetic field that is sensitive to large metal objects like forklifts and vehicles. Can be single sided (loop on one side) or double (loop on both sides).

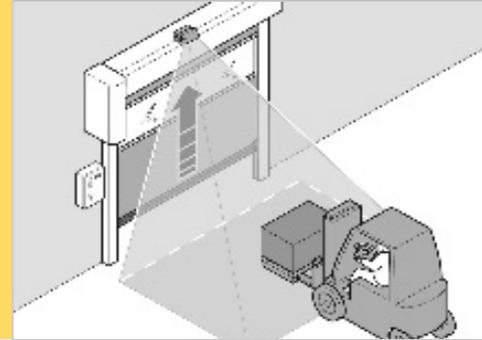


Activation Options

Ensure efficient traffic flows and avoid door, equipment, and vehicle damages from both interior and exterior sides.

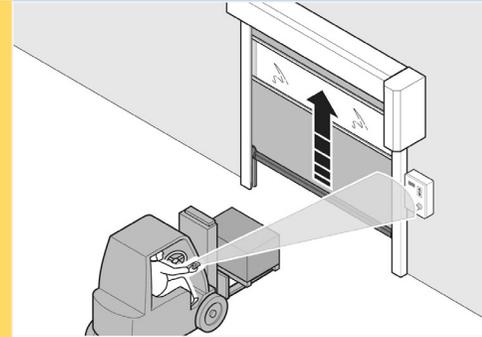
Radar/Motion Detector

Motion-detection devices sense moving objects, particularly vehicles and pedestrians, and use this input from a set area near the door to activate its operation automatically.



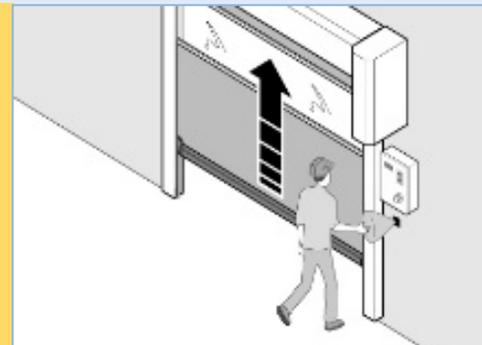
Remote Control

Relies on user input at a remote distance from the door via transmitter and is not an automatic means of activation.



Touchless Entry (Wall Plate)

Ideal activation solution for areas of high sanitation, including food processing, medical, and pharmaceutical clean rooms. Activation is by a touchless, near-field waving motion at sensor wall plate location. Sensors are typically best suited for pedestrian traffic.

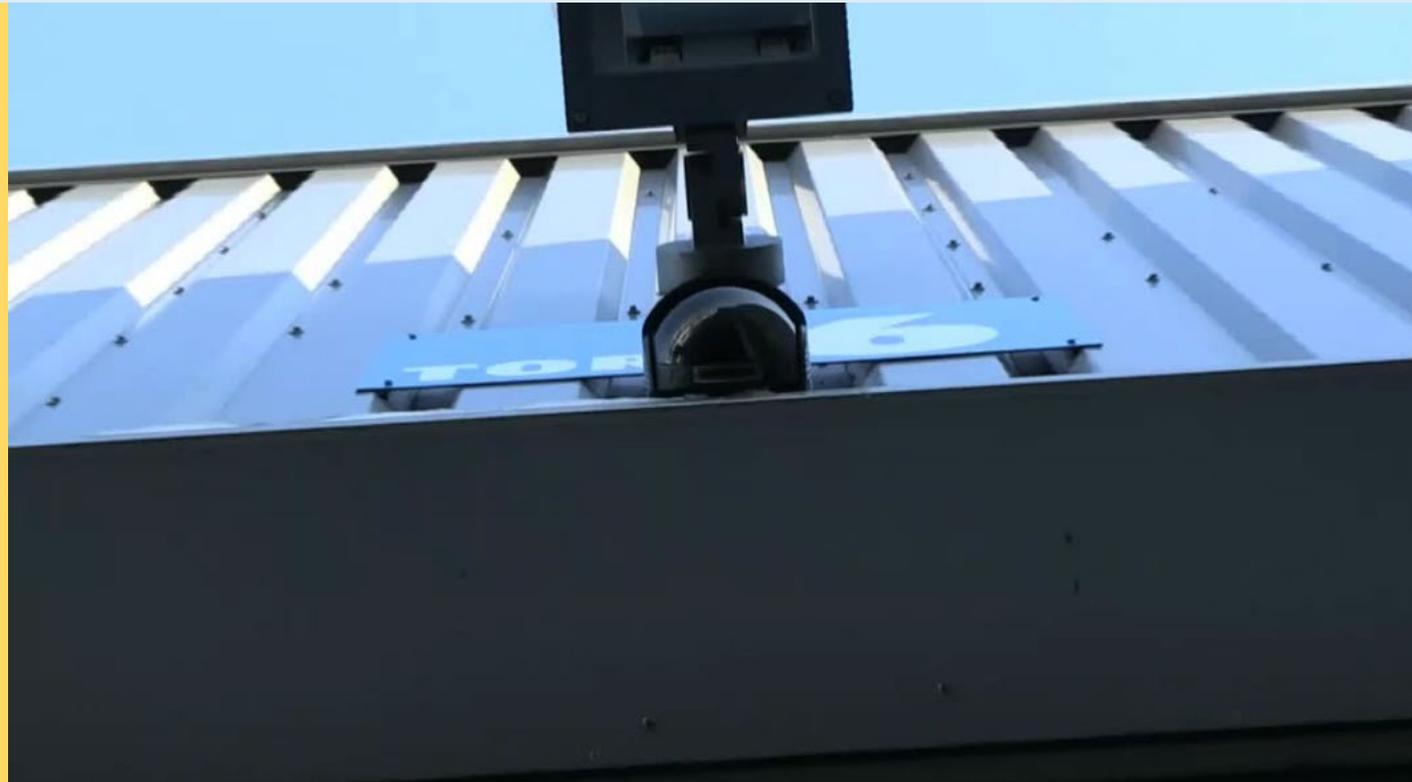
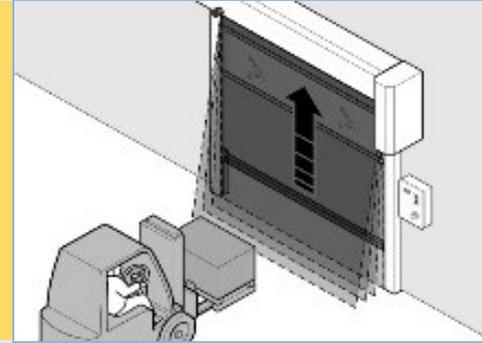


Activation Options

Ensure efficient traffic flows and avoid door, equipment, and vehicle damages from both interior and exterior sides.

Laser Sensor

Presence-detection devices sense objects, particularly vehicles and pedestrians, occupying a certain area near the door and use this input to activate its operation automatically. Laser sensors are the most advanced activation accessory that can leverage benefits of high-performance doors.





The Right Look: Designed with Aesthetic Appeal

Designers can feel free to customize high-performance doors to blend seamlessly or stand out and make a bold statement on their projects.

RAL Colors:

Many manufacturers use the RAL color-matching system for powder coating and varnish applications. There are more than 2,300 colors to choose from in total. RAL is involved in the definition and standardization of color shades.

Tinted Glazing:

Choosing a shaded window panel (rigid HPDs) can add even further sophistication to a building's appeal. Options from white obscure, allowing subtle glowing light through the door, to smoked grey for sleek contemporary facades can also accommodate further privacy and security needs.





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Course Summary

Participants should now be able to:

Identify several environmental and physical security factors addressed by high-performance flexible and rigid rolling doors.

Explain limitations of conventional sectional and rolling steel doors in terms of cycle-ability, and repair-ability/maintenance.

Discuss key features of both high-performance door types in terms of cycle-ability, safety, and environmental control.

List three design considerations required to properly apply a high-performance door.

Properly apply a high-performance door, and identify several appropriate applications.

Sponsored by:

HÖRMANN

Manufacturer of High-Performance Doors

Quality Without Compromise

This concludes the accredited portion of this course.

Thank you for your participation!

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Questions?

Any questions, comments, or for further discussion of these topics may be emailed to Hörmann's architectural support manager at j.harter@hormann.us.





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