

# Things to Consider When Selecting Warehouse Roller Doors

A Warehouse Manager's Selection Guide





## Introduction

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*The range of industrial door options continues to grow as manufacturers and other warehouse-based operations demand doors that deal with a particular task and offer more sophisticated benefits than simply opening and closing.*

*As certain variations become more cost effective, particularly in the area of automatic doors<sup>[1]</sup>, and doors become more specialised, the decision making process becomes a lot more involved.*

*Warehouse doors represent a significant investment and installing a door that doesn't suit your needs will lead to frustration, increased costs and can even be a safety hazard. This guide covers everything you must consider when researching warehouse doors to ensure your final selection is the right one.*

“By focusing on the everyday needs of your operations you are more likely to make a purchasing decision that will enhance operations.”



## Purpose

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Different kinds of warehouses and industrial situations each have different requirements when it comes to doors. A cold-storage facility for a food manufacturer will be concerned with temperature regulation and minimising the amount of time a door is open, which causes temperature fluctuations. Certain kinds of electrical manufacturing are incredibly sensitive to dust, and these facilities will require doors that seal well and minimise the amount of dust that enters<sup>[2]</sup>.

Where it is desirable to keep your warehouse doors closed during operations, this will necessitate a door design and

durability that can withstand multiple openings. This is a very important consideration as not all warehouse doors are created equal, with some types designed to open and close just once a day.

By focusing on the everyday needs of your operations you are more likely to make a purchasing decision that will benefit and enhance operations rather than encumbering them via a choice driven by the wrong motivations, such as whatever is cheapest or most aesthetically pleasing.

## Traffic

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Some warehouses are incredibly high-traffic while others are much less busy. The volume of traffic moving through a warehouse, and by extension, its doors, is a critical factor in determining the right door solution. Poor choice of doors in busy traffic areas can lead to productivity constrictions, asset damages and even safety issues as traffic fights to negotiate doorways.

A door that is used infrequently – say, less than five times per day – probably doesn't require a high-speed, automatic door to be fitted<sup>[3]</sup> as the cost (both initial and on-going) would be disproportionate to how much use the door gets. By contrast, a door designed for 5-7\*\* cycles per day such as an Industrial Roller Shutter, when subjected to higher usage, will increase maintenance and operational costs through stretching and accelerated fatigue of metal parts.

It's also important to consider who and what will be travelling through the door. Will it be employees moving on foot, or will movements usually be made by people in vehicles? Will any vehicles be auto-guided, or a combination of all three?

This is incredibly important due to the frequency with which vehicles bump or crash into doors, and will help determine the best way to activate your doors. If your warehouse traffic is mostly comprised of heavy-duty forklifts, the potential for damage to your doors will be much greater than if it is just people and hand trolley traffic moving through them.



**“Costs to purchase new warehouse doors increase substantially for openings over 4.0m x 4.0m than for smaller doors.”**

## Size

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Where circumstances permit, consideration should be given to altering the size of your doorways to suit the traffic and purpose of the door. Where traffic is relatively fast flowing, such as forklift and other motorized vehicles, it is critical that the size of the door allows ample clearance for the vehicle and its typical load. If traffic is required to turn as it enters or departs the doorway, additional clearance must be given in order to reduce the potential for damage to the sides of your doorway.

Costs to purchase new warehouse doors increase substantially for openings over 4.0m x 4.0m, with structural frame, winding drum, and motor size requirements much higher than for smaller doors. If your traffic does not require a doorway to be as large as what you have, consideration may be given to reducing the opening in return for reduced door installation costs, and less energy loss while the door is open.



## Power Requirements

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The price of electricity in Australia continues to climb, placing significant pressure on businesses to keep costs low in other areas to offset their increased power bills. Costs have risen by nearly 60% in some parts of NSW over the past three years, and a decline is not expected until mid-2015[4]. The cost of power means it is crucial for companies to consider the long-term running costs of an automatic roller door in addition to the upfront purchasing costs.

Companies also need to consider the power supplies available to them in the warehouse. Is there a power source

available to supply the roller door and does it meet voltage requirements?

Effective design and use of your doorways is a significant contributor to improving your energy efficiency. Open or poorly protected doorways can be the single biggest contributor to air-conditioning or heating loss, so ensuring your warehouse doors are equipped with properly designed and functional equipment can quickly repay the investment required in energy cost savings.

“Companies must consider the long-term running costs of an automatic roller door, as well as the upfront purchasing costs.”



## Safety

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The three main factors that affect warehouse safety when it comes to roller doors are: training, visibility and environmental conditions.

Forklift drivers and other vehicle operators must be trained in how to approach and travel through roller doors so as to avoid collisions. While high-speed roller doors can certainly move quickly – some models open and close at up to 3 meters a second[5] - drivers still need to be conscious that they do not approach the door too quickly and ensure that it is fully open before proceeding. Automatic doors may close without warning, thereby increasing the risk of accidental collision. Some of the new high speed doors, such as the Movidor by Remax, have an integrated traffic warning system that alerts the forklift driver, via flashing LED lights, when a door is about to close.

The importance of training is highlighted by a 2008 case where a West Australian worker was left with an amputated leg after an incident involving a forklift colliding with a roller door[6]. The man was operating the forklift despite having little training and no qualifications when the mast of the forklift struck the roller door,

causing the forklift to tip which trapped the man's leg between the machine's rollover protection structure and the concrete floor. The host employer and labour hire company involved were fined \$120,000 as a result.

Visibility is an important factor, especially in high-traffic warehouses. While PVC-strip doors were seen to be a good option for applications requiring visibility, they are highly subject to metal contact – such as that from trucks or forklifts – and their vulnerability to scratching means they lose this visibility[7]. Roller doors fitted with clear, scratch-resistant panels within the door structure itself allow vehicle operators to see if there are any potential hazards or people in their path.

It is good practise – though not mandated by OH&S regulations - to segregate pedestrian traffic away from your warehouse roller doors. If this is not achievable, possible warehouse door selections must be carefully risk assessed for the consequences of accidental contact with a pedestrian. Many warehouse doors have heavy metal bottom bars and close with force, meaning that pedestrian contact injury and crushing is a real concern.

## Durability

It is inevitable that, at some point, your roller door will suffer a collision, whether with forklift, truck or person. To avoid lengthy downtime which can compromise the productivity of your entire operation, you need to be aware of what will be involved with repairing your door in the event of an accident.

M.C. Herd, a large family-owned meat processing facility, began the process of selecting new doors after experiencing frustration with how long it took to get their current doors repaired. The time it took to get repairs done on the doors slowed the speed and ease of operations, and led to significant periods of downtime and production loss, whilst also exposing operations to the risk of contamination.

Obviously the ideal scenario would be for doors to never need repairs in the first place. Some options available in the market feature self-correcting technology which sees the roller door able to effectively repair itself after a collision. Movidor high-speed doors from Remax utilise a unique curtain relocation system that inserts the door curtain back into its guides in the event of accidental impact.

Frequent damage to doors, and frequently needing to repair them, shortens the life span of the product and drives up the total cost of ownership.

Complexity of door design, particularly in the field of high speed doors, can incur significant on-going preventative maintenance costs to keep equipment in peak operating condition. Doors fitted with counter-balance springs, pulleys and wire cables, may require more on-going maintenance than those without. Manufacturers should be able to advise the average cycle-life of their equipment, allowing buyers to be informed about on-going cost of ownership.

You also need to consider whether your door will be exposed to any extreme or unusual weather conditions that may affect its operation. For example, winds in parts of Western Australia can reach speeds of 150km/hr, which causes doors to buckle[8]. Doors located in high-wind but it is important to be aware of this requirement during the research and door selection process.

You must also take into consideration whether your operations are sensitive to temperature or moisture, as your door requirements may be different to someone without these concerns. Doors should have sealing features that adequately address these concerns, and improvements in door seal technology have also areas may need to be reinforced, or your supplier may recommend a more heavy-duty model, contributed to reduced energy costs[9].



**“Maintenance costs, for one door alone, can cost between \$5000-\$8,000 per annum.”**

## Cost

The experiences of many warehouse and distribution companies have proven that the Total Cost of Ownership (TCO) for operating and maintaining a high traffic-use door for its workable life is significantly higher than the purchase cost.

Damage from forklifts and other vehicles dramatically increases the TCO of the door. Where a steel roller shutter may cost \$4,000-5000\*\* to have installed, costs to repair or replace bent metal slats, wind-locks etc, can amount to \$500-1000 per instance, not including downtime or production loss while the door is inoperable.

With some high speed doors, the costs can be significantly higher. Where a conventional high speed door may cost

\$12,000-\$14,000 to install, costs to repair bent bottom bars, replace cables, springs or sensors, can easily amount to \$2000-2500 per visit. In some situations, it is not uncommon for companies to spend \$5000-\$8,000 per annum for maintenance and repair costs for one door alone.

This need not be the case with proper evaluation of door design and activation options. Some high speed door equipment such as the Movidor range by Remax, while costing 10-15% more to install initially, have been designed to accommodate the accidental impact from forklifts, and will operate for millions of cycles, with minimal maintenance required. The Total Cost of Ownership of these doors is significantly lower, which quickly outweighs initial cost considerations.



## Consideration Checklist ✓

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### ✓ What is the main purpose of the door?

- Cold/Heat loss or gain prevention
  - How well does the door insulate?
  - What is the airtightness of the door?
  - How long will the door be open per cycle?
- Keep dirt, dust, vermin, insects and other contaminants out
  - What is the leakage through the door when closed?
  - How long will the door be open, per cycle?
- Keep internal pollutants, noise, fumes in
  - What is the acoustic rating of the door?
  - What is the leakage through the door when closed?
- Improve traffic flow and productivity
  - How quickly will the door open?
  - What is the door's typical duty cycle?
  - How does the door communicate to/from traffic?
- Separation of process areas
  - How well does the door withstand washdown, chemicals
  - How well does the door seal to floor, perimeter when closed?
- Security
  - Will the door deter customer or public access?
  - Will the door restrict burglar access?
- Other

### ✓ Who and what will be using the door?

- Employees on foot
- Employee-driven vehicle (trucks, forklifts etc)
- If trucks, consider
  - Will the vehicles have trailers?
  - Will the vehicles be stopping, reversing while in the doorway?
  - How will the driver know when the door is fully open?
- Automated vehicles
- How many times a day will the door need to open and close (1 cycle)
- What will be the best way to operate (activate) the door?
  - Automatically (ie sensor detects vehicle)
  - Manually (ie push button, remote control)
- How is the door required to close?
  - Manually. Operator to close after use?
  - Automatically. (After elapsed time? Once vehicle reaches all-clear point?)

### ✓ What size door do I need?

- What size are the vehicles that will use the door?
- What is the highest vehicle/load, what is the widest vehicle/load accessing this door?
- Is the traffic turning in/out of the door, or approaching straight through?



### ✓ Power requirements

- Have I got power available?
- What voltage is required?
- How much energy will they consume?

### ✓ Safety

- Are all vehicle operators fully trained and accredited?
- Can you provide training on optimal roller door practices?
- Do I need to be able to see through the door?
- Is there any visual or audible warning system for the door's operation?
- What is the risk to pedestrians/personnel?
  - Can the door injure if contacted?
  - Can the door close while a pedestrian is in the doorway?
  - Can the door fall/close in event of power/brake/cable/spring failure?

### ✓ Durability

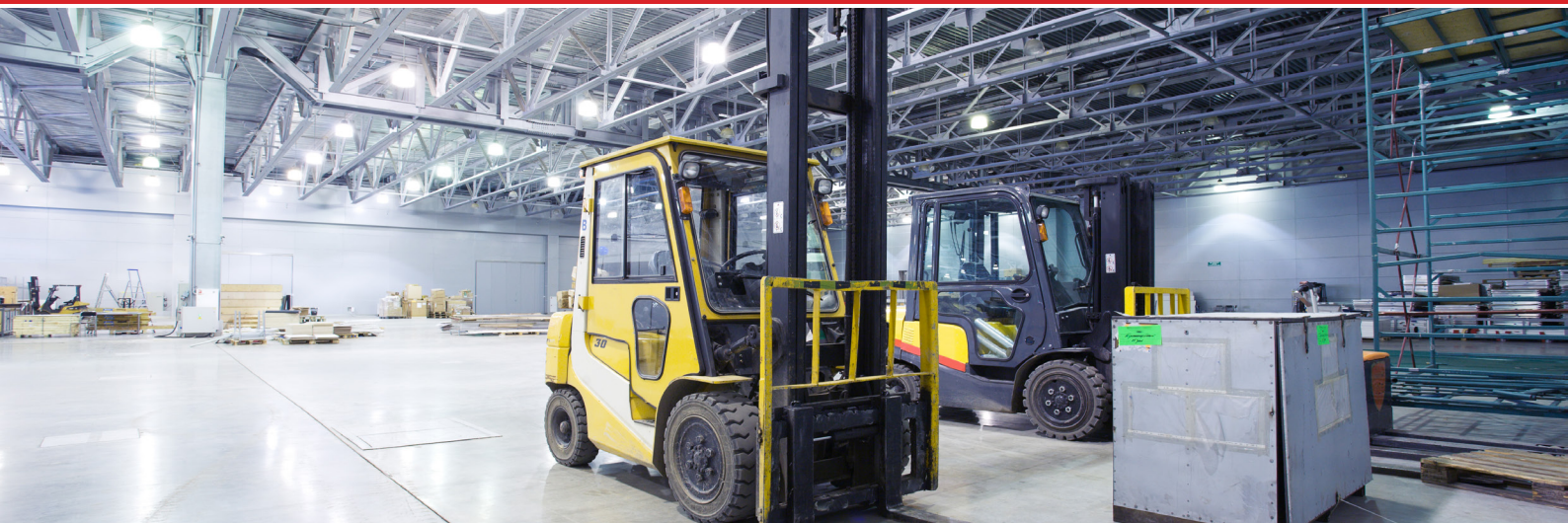
- How will downtime affect your productivity?
- What will happen if a forklift collides with the door while its closing/opening?
- What are the repair procedures like for products you are considering?
  - What parts of the door are most prone to damage?
  - How quickly can they be repaired?
  - Can I fix it myself, or do I need a technician?

- How often will the door require maintenance?
- Are there any environmental factors that could affect the door's operation?
  - eg high wind, low temperatures, wet weather, wet environment, chemical washdown
  - What parts may be subject to corrosion? Is there an option for stainless steel?

### ✓ Cost

- What will the door cost, including installation, electrical requirements, activation sensors etc?
- What will it cost to maintain? How often?
- What parts will be required if door is damaged by forklift? How much will they cost?
- What will be cost to business if door is inoperable? Eg awaiting parts, repairs





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3 Mobbs, Emily, "Behind closed doors", *Manufacturers' Monthly*, 2 August 2010, <http://www.manmonthly.com.au/news/behind-closed-doors>

4 Robins, Brian, "Electricity prices set to drop as European links come into play", *Sydney Morning Herald*, 24 April 2013, <http://www.smh.com.au/business/electricity-prices-set-to-drop-as-european-links-come-into-play-20130423-2icz4.html>

5 Dang, Annie, "High-speed doors dominate the market", *Manufacturers' Monthly*, 24 August, 2011, <http://www.manmonthly.com.au/features/high-speed-doors-dominate-the-market>

6 Tra, Margaret, "Lack of forklift training leaves worker with amputated leg", *Safe to Work*, 12 May 2011, <http://www.safetowork.com.au/news/lack-of-forklift-training-leaves-worker-with-amput>

7 Mobbs, Emily, "Behind closed doors", *Manufacturers' Monthly*, 2 August 2010, <http://www.manmonthly.com.au/news/behind-closed-doors>

8 "Opening doors to energy savings", *Manufacturers' Monthly*, 21 December 2008, <http://www.manmonthly.com.au/news/opening-doors-to-energy-savings>

9 "Opening doors to energy savings", *Manufacturers' Monthly*, 21 December 2008, <http://www.manmonthly.com.au/news/opening-doors-to-energy-savings>

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