Reduce heat losses through open (industrial) doors and gates

It still often happens that a door or gate is left open while the forklift unloads a truck and transports the goods into the hall. A modern control is the remedy for this problem. It will optimise door opening and minimise heat losses.

Action

Keeping doors and gates open for short periods will minimise heat losses and improve comfort by helping to prevent temperature drops and draughts.

Requirement

You have modern high-speed doors or a sensor-actuated door control (e.g. with a laser scanner).

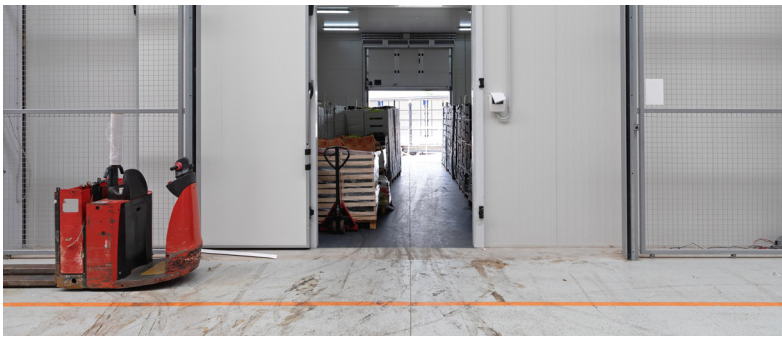
What to do

Intermittent operating mode for high-speed doors

- Check whether your high-speed doors (high-speed spiral doors or foil-coated roller doors) remain open all the time while goods are loaded and unloaded.
- Check whether you can reduce the opening time on the control (e.g. to 15 seconds) so that the door closes after every operation and only opens again when required.

Optimise door opening

- On sensor-controlled doors, check whether the opening height matches the actual requirement. The height of a standard forklift vehicle is about 2,2 metres – so even if the door is 4 metres high, an opening height of 2,5 metres is sufficient.
- Discuss heights with your employees based on their experience and practice, and adjust the door opening height accordingly.



Costs – effort

- To check and adjust one door, you will need between half an hour and one hour.
- Switching over from continuous to intermittent operation reduces heat losses through the door by 10% to 30%, depending on the application and the building.
- Reducing the opening height by 1,5 metres (from 4 metres to 2,5 metres) reduces heat losses through the door by 40% to 60%.

Please note!

- Safety requirements must be met at all times!
- There is no optimal period for doors to remain open. You need a solution that is tailored to your usage (your process).

Additional explanations

Avoid draughts

If two doors opposite each other are open at the same time, heat losses will increase noticeably and comfort will be impaired due to the draught. In situations of this sort involving draughts, the heat demand is 6% to 11% more than when the two doors are not open at the same time.

Slow- and fast-running doors

According to a German study, three types of door – sectional doors, roller doors and high-speed spiral doors – have a market share of over 90% in the industrial construction sector. Sectional doors and roller doors with slats close at an average speed of around 0,25 m/s and are classed as “slow-running” or “low-speed” doors. Fast-running doors include high-speed spiral doors and foil-coated roller doors. Their average speed of about 0,7 m/s makes them around three times faster than slow-running doors.

With their higher speed, fast-running doors can react more rapidly to effective demand. Their opening times are significantly shorter, so the heat losses in winter are correspondingly lower.

For doors that only open infrequently, however, the opening speed is of secondary importance. Good thermal insulation of the doors is the important factor here. In such cases, a less important part is played by heat losses through slow-closing doors whose opening and closing process often takes longer than the time for which the door is open.

Unload trucks inside the building

If your hall is large enough, you can drive trucks into it for loading and unloading. The doors/gates are only opened when the vehicles pass through them, after which they are closed again. This allows you to reduce heat losses through open doors by 70% to 80%, depending on the type of door. Drawbacks of this measure are the additional space required for the trucks and the exhaust gases from them that pollute the indoor air.

Situation analysis

It may well be worthwhile to commission an expert opinion from a door and drive technology specialist (for example: experts working for the supplier) on your doors and the work processes related to them. They can show you actions that you can take immediately:

- Which doors/gates include the necessary safety elements so that their opening time or height can be adjusted without any further interventions?

You will also learn which further actions are suitable in your case:

- Where are refurbishments, additions (such as air curtains and airlocks) or possibly replacements due within a suitable period?

Additional information

- Different door systems in industrial buildings, taking account of energy, building climate control and economic aspects, Technical University of Munich (TUM), Chair for Building Technology and Climate Responsive Design, 2013
- Gates – doors – windows
  FCOS (Federal Coordination Commission for Occupational Safety) information brochure
- Doors and gates
  Specialist documentation on safety,
  Swiss Council for Accident Prevention (BFU)
- You can find specialists in door/gate and drive technology at: Interest group for gate systems, drive systems and door systems (IGTAT)

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