

## Energy saving in lift installations

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## Why?

- Directive 2002/91/EC Energy Performance of Buildings  
(In force since January 4th 2006)
- Electrical energy is financially and environmentally expensive
- Oil is becoming an expensive resource
  - Minimise use as an energy transport medium and lubricant in lifts, escalators...

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## Magnitude of energy waste during use without savings actions

- Swiss Agency for Efficient Energy Use
- Standby proportion of total consumption
  - Small apartments, 6 stops > 83%
  - Office block 8 stops > 40%
  - Large office block, hospital > 25%

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## How

- Minimise the energy cost of:
  - Producing the lift components and the installed lift
  - Running the lift – direct energy consumption
  - Repairs and maintenance requirements
  - End of life removal and recycling

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## How

- Change the drive technology
  - Very few reasons to use hydraulic drive
    - Goods lifts where loading and unloading could cause big levelling deviations
    - As above could cause loss of traction due to misuse
  - Gas accumulators, balance weights, closed loop control to improve energy efficiency

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## How

- Use most efficient technology
- MRL lifts lower construction materials use
  - No machine room
  - Less load on building
- Permanent magnet synchronous motors
  - High efficiency and energy density
  - High power factor under all load conditions
- Roller guide shoes

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## How



- Use most efficient technology
  - Lighter but strong materials
- Traction drive lifts do not need to be counterbalanced around 50%
- Use more efficient group control
  - Double deck lifts
  - Variable group size dependant on traffic conditions
  - Variable acceleration value and door operation dependant on traffic conditions
  - More than one, two lifts in a well..
- Escalators – run on demand

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## How



- Utilize energy losses in HVC design of the building
  - Too many building "contract packages" do not consider energy saving synergies
  - Stand alone Ventilation/AC of lift machine rooms to be carried out by lift supplier...

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## How



- Switch off the car lights
- Use low energy lamps and LEDs instead of halogen spot lamps
- Switch off VF drive
- Controller design to use computer "sleep mode"

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## How to measure and select energy efficient lifts



- ISO TC178 WG10 developing an ISO standard for measurement
  - ISO/CD 25745
  - Energy performance of lifts and escalators
    - Part 1 Energy measurement and conformance
    - Part 2 Energy efficiency
- energy/kg/m travelled
- Standard methods to measure energy consumption

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## Scope of ISO/CD 25745 Part 1



### 1 Scope

This standard specifies

1. Methods of measuring energy consumption of lifts (elevators), escalators and moving walks on a single unit basis.

2. Method to enable verification of energy consumption during operation

3. Tools to predict energy consumption of lifts (elevators), escalators and moving walks for a given building

The standard does consider all energy aspects relating to the normal operation of the elevator, escalator or moving walk, including

- a) Elevating/escalating/moving walk equipment
- b) Car light and fan
- c) Auxiliary heating and cooling equipment.

This Standard does not cover energy aspects that are not directly related to the equipment operation, such as

- a) Hoist way and machine room illumination, heating, ventilation and air conditioning
- b) The effect of group dispatching on energy consumption.
- c) Input power harmonics (harmonics are addressed in the EMC standards).

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## Summary



- Energy efficiency depends on how it is defined
- Functionality of transportation needs to be maintained to suit requirements
- Efficiency definitions and measurements must be consistent, repeatable and applicable to new and existing equipment.

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