

# New Modules, Changes to Elevator Portal

Multiple calculations, functions and more supplement counterweight guide-rail calculations.

According to EN 81-20/-50, now in effect in Europe, the tare weight of guide rails for counterweights must be considered: small guide rails may require new brackets during modifications, incurring unnecessary costs. LIWETEC aims to avoid these by an alternative calculation method. According to EN 81-20, guide rails can be calculated according to EN 81-50:2014 or EN 1993-1-1, as well as by the Finite Element Method (FEM).

LIWETEC GmbH's **Elevator Portal** calculates the bending drill buckling of the guide rails using the FEM. As a result, general statements regarding bending crinkle, under-tare weight and additional weights can be made in the construction phase. The online portal is a database-driven system available anytime and anywhere. Continuously updated, it is intended to support planning, configuration selection and calculation of entire elevator systems or main components by using a product and system configurator and making technical calculations. The CompuLift module is the centerpiece of the portal and a calculation program for the following technical calculations, additional functions and tools. All calculations are carried out according to EN 81-20/-50 and EN 81-1/-2/-77.

## Technical Calculations

- ◆ Cars: surface inspection
- ◆ Lifting cylinder: cylinder, cylinder bottom/piston
- ◆ Ropes: rope reliability calculation for steel ropes, plastic-covered ropes and Polyrope
- ◆ Traction sheaves: calculation of the driving ability and (optionally) surface pressure

- ◆ Radial load: verification of the permissible radial load
- ◆ Pullies/axles: calculation of the axles and bearing durability
- ◆ Beams: calculation of the pulley carriers or general carriers for deflection and permissible bending stress
- ◆ Guide rails: for central, eccentric, L-frame and diagonal guided lifts, including earthquake standard EN 81-77 and/or additional load on the rails
- ◆ Supports: calculation of buffer/cylinder supports for buckling
- ◆ Buffer: selection of permitted buffers for normal buffers and service support buffers
- ◆ Overspeed governors: review of the resulting clamping force and calculation of the rope safety for governor ropes
- ◆ Stopping distance calculation (optional): checks the unintended movement of the car in up and down movements for specified distances

## Tools


- ◆ High frame calculation: tool for calculating the wrap angle or axles' distance by known wrap angle
- ◆ Tension weight calculation: calculation of the resulting clamping force
- ◆ Profile calculation: tool for configuring sheet-metal profiles that can be used in support and beam calculation
- ◆ Shaft calculation: simplified shaft calculation for flying/bilateral traction sheaves
- ◆ Car center of gravity: calculation of the car's center of gravity by entering the individual components and associated coordinates

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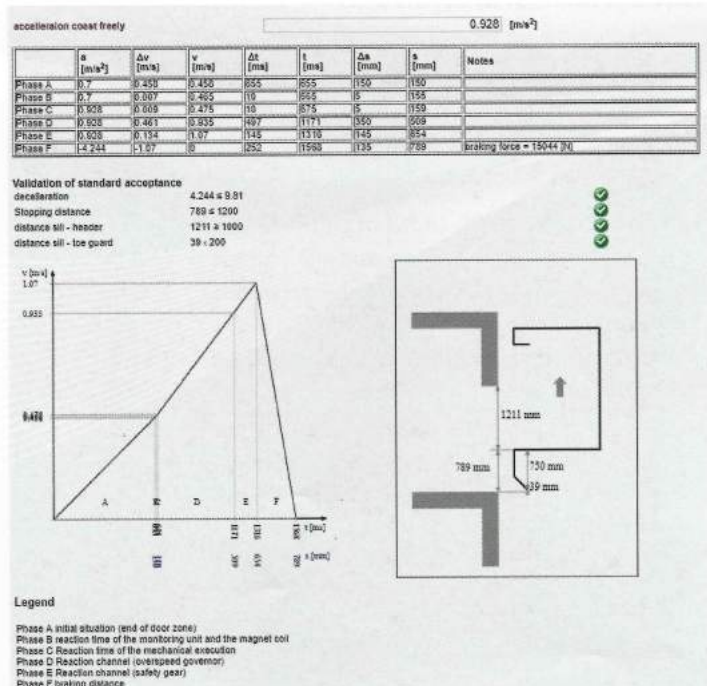
**Computation Results**

Buckling length [a<sub>0</sub>] 1200 [mm]  
 Cross Section Area [A] 32296.0 [mm<sup>2</sup>]  
 Min. Moment of inertia [J] 62701138 [mm<sup>4</sup>]  
 Min. section modulus [W<sub>y</sub>] 3532458 [mm<sup>3</sup>]  
 Min. gyration radius [i] 44.06 [mm]  
 Thickness ratio [λ] 27.2 AS260  
 Buckling factor [α] 1.070  
 Buckling stress [σ<sub>b</sub>] 0.0 [N/mm<sup>2</sup>]  
 Existing Safety [v<sub>vorh</sub>] 6187.55

Max. perm. stress [σ<sub>max</sub>] 205.0 [N/mm<sup>2</sup>]  
 Min. Safety [v<sub>min</sub>] 2.00



**Supports**



**Unintended car movement**

Side I, Side II, Side III, Side IV

Local type: Safety-gear, Instantaneous safety gear, Impact (k<sub>1</sub>) 3, Impact (k<sub>2</sub>) 1.2

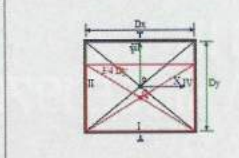
Lever arm: Center of gravity, x, y, p, q, s, D<sub>x</sub>, D<sub>y</sub>

Car: Depth D<sub>x</sub> 1200 [mm], Width D<sub>y</sub> 1000 [mm]

Distance: D<sub>BS</sub> 1100 [mm], Central

Show graphics in new window No graphics displayed?

Comment

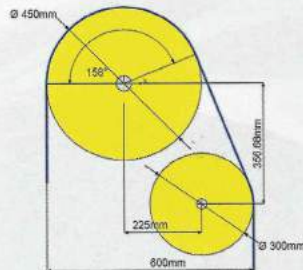


**Guide rails**

Apply this data

Wire: single, single  
 No. of collection pulleys: 1  
 Traction sheave-Ø [D<sub>1</sub>]: 450 [mm], 450mm  
 Pulley diameter: 300 [mm], 320mm  
 Distance between ropes: 600 [mm]  
 Wire angle [α]: 155 [°], 154°  
 Ropes: 6 × 6 mm  
 Ropes type: Bekant HV Draht CSR Flat

Computation Results  
 author/axial distance between wires: 225 [mm]  
 y/vertical distance between axes: 356.66 [mm]  
 This calculation is using data from your current order!  
 Radial load traction sheave: 6017 [N]  
 Radial load axle: 5 [N]



Save calculation to the current order  
 Computation Results

**Computation of machine frames**

- ◆ Safety-gear calculation: total permissible weight check (range of ±7.5%) for modernization
- ◆ Bearing durability: calculation of bearing durability for rolling bearings of rope pulleys

**Additional Functions**

- ◆ Item list module: output of a list of parts of the calculated components and accessories
- ◆ Railplan module: review of a collision between connectors and brackets
- ◆ Force diagram module: automatic output of all forces in the pit and shaft wall
- ◆ Shaft sketch module: simplified sketch for the shaft cross-section
- ◆ Counterweight fillers selection: interpretation of the counterweight based on a maximum filling height and distance between rails
- ◆ Screw calculation: simplified calculation for transverse loads or tensile load of screws

**Other Benefits**

- ◆ Customizable
  - ◆ Security validated annually by TÜV SÜD
  - ◆ Automatic plausibility checks of selection after changes
  - ◆ Saves time in the planning process through immediate validation and traceability
  - ◆ Direct paperless transfer to Notified Bodies
  - ◆ Personal onsite training with an expert available
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