

Elevator Guide Rails – Frequently Asked Questions

What difference is there between cold-drawn and planed guide rails?

The process for cold-drawn involves stretching the material thus modifying its structure. Planing involves machining the guide rail by stripping the edgings.

Why can't the cold-drawn guide rails be used at speeds over 1.6 m/sec?

Because the cold-drawn process produces short bends caused by the variations in the raw material thickness rolled along the section. These bends make the lateral acceleration rates high

Are the speed limits for the different qualities precise?

No, the calculations for comfort are carried out using a mathematical model validated with practical tests, hence the speed limits set are approximate.

Why is it important to choose the right clip?

The clip must be capable of supporting all the stresses produced when the lift moves and must also be capable of allowing the guide rail to slide if necessary.

Why is slight cyclic jolting felt in some elevators?

Jerking at the joints of guide rails that do not have the right quality produces this jolting movement.

Is it necessary to clean the tectyl before the assembly?

Yes, because although the tectyl is compatible with the oils used, it must be cleaned so that the guide-shoe or roller will function properly.

Do the guide rails wear out?

No, guide rails under normal working conditions do not wear out because both the guide-shoes and the rollers are softer than the guide rails. The guide rail may only be damaged through the action of the safety gear.

Why are guide rails made of steel?

Guide rails carry out functions of both guiding and safety, since they are the structural member on which the safety gear works. Steel is currently the cheapest material that perfectly meets these two requirements.

Why are there machines that are mounted on the guide rails?

This eliminates the need for a machine room and no loads are therefore placed on the building. Since the guide rails are supported on the ground, they act as perfect support for holding up the machinery and other elements.

Why are the guide rails 5 meters long?

The guide rails are 5 meters long because it is the appropriate manufacturing length and allows the parameters for straightening to be checked properly.

How do movements in the building affect the riding path?

They do not affect low-rise elevators, but for elevators covering numerous floors building contraction or differences in temperature may cause warping in the guide rails.

Why is the assembly of the riding path so important?

The greatest problems for comfort are caused by the joints between guide rails on the riding path, therefore it is extremely important to have good quality guide rails and to obtain accurate alignment.

Do the guide rails have any surface treatment?

No, the guide rails do not have surface treatments. On cold-drawn guide rails the cold-drawn process modifies the mechanical features of the material.

Does the riding path for the counterweight influence comfort?

Yes, but to a lesser extent than the one for the car. The vibrations from the counterweight are sent along the cable and may affect comfort somewhat. For the counterweight a lower quality may be used than that for the car.

How should the fishplates be calculated?

The fishplates should be calculated with the same restrictions for deflection as the guide rails, providing that joint plates are not placed near a bracket.

What does the roughness level of the guide rails affect?

The roughness level of the guide rails affects the wear of the guide-shoes or rollers. It also affects the friction factor and the behavior of the safety gear. One extremely important point is to maintain a uniformity of roughness in order to provide consistent behavior of the guide rail.

What measures should be taken into account in areas subject to earthquakes?

- The guide rails must be larger than the ones that are normally used.
- The clips or the brackets must be sliding.
- The fishplates must be especially rigid so there will be no possibility of slipping of the guide rail over the fishplate.

What is the concept of the continuous guide rail?

Ideally, a guide rail should be manufactured to match the required length for the installation, but since this is not possible we replace it with the "continuous guide rail". This means that several guide rails are mounted, and the joints are guaranteed to maintain the same parameters as the rest of the guide rail.

How can comfort be ensured?

The way to ensure comfort is to choose the right components right from the design stage. To do so, the necessary parameters must be defined for all the elements that affect comfort. When comfort is not achieved the first time, the cost escalates up because it is difficult to detect which element is the one at fault.

Which is better, using a larger guide rail or using a shorter distance between brackets?

It depends on each individual case. Sometimes the distance is determined by the building, but when this limitation does not exist, it is necessary to analyze the cost of installing more brackets as compared to the cost of a larger guide rail.

In a high-speed lift, is it sufficient to use a good roller?

In a high-speed lift, everything down to the smallest detail is important. The roller should be a good one, but as is the case with cars, the suspension may be good but if the road is not, the result will not be the best possible. At present, the trend for obtaining comfort at high speed is to use rollers with low-stiffness springs so that they better filter the acceleration rates. However, it may be very dangerous since large movements of the rollers over the car may cause contacts with the safety systems and other mechanical elements. In our opinion, the stresses for the springs must always be higher than the maximum stresses that arise from the calculation for the lift.