

## Escalator Safety Devices

MC Tag : We use escalators as part of our daily lives. They are moving machines, so in order to protect the safety of escalator users, a series of safety devices are incorporated to the design of escalators.

MC Tag : With technology development and enhanced safety requirements, these safety devices are correspondingly under continuous improvement. Now let me introduce each of them to you.

MC VO : Firstly, an escalator must have a structure with sufficient mechanical strength to carry the passengers. For example, the steps of an escalator should have the mechanical strength to carry no less than  $600\text{kg/m}^2$ , the strength of which is equivalent to that a step with about 1m in width should be able to support the aggregate weight of at least 3 adult passengers.

MC VO : Also, the inspection covers and floor plates should be able to support the weight of at least  $500\text{kg/m}^2$ , the strength requirement of which is equivalent to that of supporting about 6 to 7 adult passengers in a  $1\text{m}^2$  area.

MC VO : As for the handrails of public service escalators, the breaking strength must be at least 25,000N in order to prevent the handrails from breakage. The breaking strength of 25,000N is approximately equivalent to 2.5ton in weight.

MC VO : Besides the above-mentioned structural strength requirements, there are many safety devices installed in an escalator. These include the missing step safety device. If any missing step is detected, the device will stop the escalator.

MC VO : In case of sagging of any part of the step so that the meshing of the combs is no longer ensured at the point at which the steps enter the landing,

the step-sagging safety device will stop the escalator, avoiding damage of the steps and combs due to collision.

MC VO : Passengers must pass through the inspection covers and floor plates in order to travel on an escalator. Safety devices are installed beneath these inspection covers and floor plates. If the inspection cover or floor plate is opened, the escalator will be stopped in order to prevent workers from getting injured by the moving parts in entering the machine room for work.

MC VO : There is also the broken handrail safety device. If a broken handrail is detected, the device will stop the escalator to ensure passengers' safety.

MC Tag : The clearance between the step and the skirting and between two consecutive steps shall not exceed 4mm and 6mm respectively, in order to prevent foreign objects being trapped at these locations.

MC VO : The deflector device normally in the form of brush bristles is suitably placed on the skirting to guard passengers' feet from coming into contact with skirting and reduce the possibility of trapping of passengers' shoes between skirting and steps.

MC VO : If foreign object is trapped between skirting and steps, for example a passenger's shoe being trapped between the skirting and the steps, then the skirting safety device will stop the escalator.

MC VO : Besides, in case of foreign objects being trapped at the point where the steps enter the comb, the comb plate safety device will stop the escalator.

MC VO : Similarly, in case of foreign objects being trapped at the handrail inlet, the handrail inlet safety device will stop the escalator to prevent trapping of foreign objects, such as fingers.

MC VO : Every escalator has an overspeed governor to monitor its operating speed. If the operating speed exceeds a certain threshold, the overspeed governor will be actuated to stop the escalator, preventing accidents by overspeeding.

MC VO : Besides, when the deviation of the speed of handrail from that of steps exceeds a certain threshold, the handrail speed monitoring device will stop the escalator to prevent accidents.

MC VO : An escalator is driven by drive chains. If breakage or undue elongation of the drive chains is detected, the broken drive chain safety device will stop the escalator to prevent accidents.

MC VO : Similarly, the steps of an escalator are driven by step chains. If breakage or undue elongation of the step chains is detected, the broken step chain safety device will stop the escalator to prevent accidents.

MC VO : Furthermore, by the time the steps change from the preset direction of travel, the unintentional reversal monitoring device will stop the escalator to prevent accidents.

MC Tag : With regard to braking system, the function of the main brake is to maintain the escalator in a stationary position when the escalator service is normally suspended and to stop the escalator when any of its safety devices is actuated.

MC VO : In order to prevent possible passenger injury on an abrupt stop, the escalator, on actuation of the braking system, will not completely be stopped at once, but will have a stopping distance for buffer before it comes to a complete stop. Depending on the rated speed of the escalator, the stopping distance ranges from at least 0.20m to at most 1.7m.

MC VO : In addition to the main brake, an escalator also has an auxiliary brake. The auxiliary brake will assist in stopping the escalator under failure of the main brake and other specific circumstances.

MC VO : Furthermore, the emergency stopping device is usually installed at the entrance and exit of the escalator, or in other conspicuous and easily accessible positions at or near to the landings of the escalator. The escalator can be stopped by pressing the device button in case of emergency.

MC VO : Besides the above-mentioned safety devices, there are other safety facilities such as the obstruction guard and the machine protective cover. The obstruction guard is to prevent passengers from injury by touching building obstacles and the bottom of an adjacent criss-cross escalator.

MC VO : The machine protective cover is to protect workers from injury by the rotating parts during their work.

MC Tag : Besides safety design of escalator, periodic maintenance and examination for the escalator is equally important to its safe operation.

MC VO : In accordance with the Lifts and Escalators Ordinance (Cap.618), the responsible person for escalator must employ a registered escalator contractor to carry out the periodic maintenance works for the escalator at intervals of not exceeding 1 month and arrange a registered escalator engineer to conduct the periodic examination at intervals of not exceeding 6 months, so as to ensure that the escalators and all its associated equipment or machinery are kept in a proper state of repair and in safe working order.

MC VO : Furthermore, the responsible person for escalator should frequently inspect the escalator and be aware of the conditions of the escalator. The items that the responsible person should be aware of include:

- (1) Whether there are any abnormal noises when the escalator operates;
- (2) Whether the steps, combplates and handrails of the escalator are damaged;

- (3) Whether the inspection covers and floor plates are secure;
- (4) Whether the escalator start, stop and operate in a normal manner;
- (5) Whether the emergency stopping device for use by passengers function effectively; and
- (6) If any passenger is found using the escalator improperly, stop him/her immediately.

MC Tag : If a problem is found, the escalator should be stopped immediately. Place a fence when necessary to avoid passengers from using the escalators and notify the registered escalator contractor for repair.

MC VO : Besides proper daily escalator management by the responsible person for escalator, passengers should also pay attention to the following items when using the escalator...

- (1) Do not overload the escalator;
- (2) Do not interfere with the escalator equipment;
- (3) Hold the handrail and do not walk on the escalator to avoid accidents;
- (4) Do not play or run on the escalator;
- (5) Do not extend your body outside the handrail;
- (6) Keep your feet away from the skirting or yellow stripes;
- (7) Keep trolleys, prams, bicycles or wheelchairs off the escalators;
- (8) Do not play with the emergency button which is to be used only in an emergency;
- (9) Children must be accompanied by adults when using the escalator;
- (10) Lift your foot when stepping on and off the escalator to avoid losing balance and getting the front of your shoes trapped;
- (11) Assist the elderly and those in need. People with mobility problems or carrying large items are advised to use the lifts;
- (12) Do not go beyond or vandalize the obstruction guards;
- (13) When wearing open-toe footwears such as slippers or sandals, be careful of the gaps between the steps or between the steps and the skirting. Keep

clear of the deflector;

(14) Pay attention to the gaps between the steps or between the steps and the skirting when wearing long dresses;

(15) Lift the umbrella up when carrying one. Don't place the tip of the umbrella into the slots or in between the steps;

(16) Pet owners must hold their pets firmly;

(17) Do not go in the opposite direction as the escalator;

(18) Do not sit on the escalator;

(19) Do not climb on the handrail.

MC Tag : Escalators are safe machines. If the responsible persons for escalators properly manage their escalators, the registered escalator contractors and engineers properly carry out the periodic maintenance and examination, the passengers follow the safety guidelines in using escalators, everyone can use the escalators at ease.