

SPECIFICATION / DATA SHEET

Ingström Escape Chute®

General Information:

Equipment:	Escape Chute
Brand:	Ingström
Manufacturer:	Mobiltex Evacuation Systems
Factory:	Sweden
HQ-Sales Office:	Sweden
Regional Office for East Asia:	Singapore

Technical Data:

Chute Tube:

This unique chute has a 3-separate layer of specialized materials in its construction of the fire resistant chute tube that protect users from flame, heat, smoke:

1. Inner Layer: The inner layer is made up of two materials, aramid/rhovyl. Twaron is applied along the length of the chute, and Flexible Rohvyl yarn based on PVC chlorofibre is used across the chute. Its coefficient allows smooth sliding inside chute and the friction is low enough that no serious injuries are caused. This hybrid fabric is extremely strong, very flexible and is also of heat resistant. The inner layer bears the load of the total chute, able to withstand approximately 10,000 kilos or a maximum load of 5,600 kilos per metre width of fabric, and keep chute in place and connects to the storage deployment device.
2. Middle Layer: The middle layer is made up of modacryl/elastomer fabric a very elastic spuncell material. This is the braking layer, comparable to an elastic knee supporter that has braking power to arrest free fall. When unused or not stretch, the braking chute is about 250mm in diameter, and easily open up when users pass through and can increase three times in dimensional capacity to 750mm when fully outstretch. This layer 'holds' the evacuee as soon as the arms and legs are pressed against the chute.
3. Outer Layer: The outer layer of the chute is made of flexible 100% E-glass fiber fabric. It is a flame and heat resistant layer that capable of withstanding continuous usage at 550-600 degree Centigrade without any deterioration and can resist temperatures of up to 800°C. A free space of about 15cm between the outer layer and the middle layer reduces the radiated heat from being transferred to the middle layer provides protection to the chute against flame, heat, and smoke. When firemen spray the chute with water, it can even be used at higher temperatures than that.

When the chutes are regularly used for drills, this means they have to be retrieved, folded out and up a lot after each use. The materials used for the construction of this unique chute are excellently suited for that purpose.

Installation: Permanent installed for emergency exiting

External Solution: The single-entry type mounted on the rooftop, balcony or corridor, and window, allows people trapped in higher elevations to bypass impassable floors or blocked stairways when building under fire (or damaged by explosions) to escape safely to the street. The 3-

protective layers chute tube is folded and stored in container with the platform. Platforms shall be custom-designed to fit the installation site. The materials for the platform shall be of Steel/Aluminium material with anti-corrosion protected paint.

The portable-entry type mounted on the bucket of the hydraulic aerial ladder. This is used by the Fire Department, letting people slide down the chute from window, balcony, and rooftop instead of carrying/lifting them down to safety. Additional sections may be easily hooked on to the chute depending on the length requirements.

Internal Solution: The multi-entry type is permanently installed in a shaft within the building and it allows occupants gain access to the chute at each floor where several levels can be simultaneously evacuated inside. These multiple-chutes are located inside the enclosed fireproof shaft, with doors that automatically close after use. One segment of 2-layers chute per floor, from the highest floor to the ground floor on the same vertical line, no restriction of length or height.

Materials: All materials used for the construction of escape chute are of EU standards.

The fabrics employed in the manufacture of the chute respond to the technical characteristics of mechanical resistance, elasticity capacity and fire resistance obtained from official laboratories, so as to fulfill its function of allowing controlled descent of persons through it.

Performance Data:

1. The escape chute shall be ready to use within a few seconds from releases.
2. The standard size for entry point of chute is 530mm diameter.
3. Average speed for evacuee with right behaviour is about 2.5 m per second.
4. It would take approximately 35 – 40 seconds to descend a chute of up to 50 metres length.
5. A maximum of 30 persons a minute can be evacuated at height from fire or danger.
6. The multiple protective layers of chute protect evacuee passing down the chute from flame, heat, and smoke.
7. No power source is required.
8. The vertical gravity descend system relies solely on body weight, and test proved that all evacuees regardless of body size, shape and weight, injured on stretcher and unconscious people, once inside the chute tube will arrive at ground level quickly and relatively safely.
9. Can transport a continuous flow of evacuees.
10. Require little or no instruction for use.
11. Require little physical exertion in sliding down the chutes.
12. Users have the ability to self-control the speed of own descends and also allow external means to control the speed of one's descend from the outside at ground.
13. Suitable for all ages and physical conditions of evacuees, including disabled people.
14. Enable rescue personnel to control the evacuation process.

Life span of the chute:

Chute installed inside the building, with regular maintenance by appointed distributor and if unused is about 15 years, or 3,000 jumps, whichever is the greater.

Chute installed outside the building, with regular maintenance by appointed distributor and if unused is about 10 years, or 3,000 jumps, whichever is the greater.

Chute used by the Fire Department for rescue, with regular maintenance by appointed distributor is about 5 years depending on its conditions or 3,000 jumps, whichever is the greater.

Inspection by factory or its appointed distributor is required when the chute is used for each actual emergency evacuation/rescue.

Recommendations:

1. Recommended users for industrial applications to comply with NFPA 101 Chapter 40 recommendation: "Industrial Occupancies", allows slides (chutes) to be used for 100% of the emergency exiting capacity of high-hazard occupancies, but only when potential evacuees are regularly trained in their use.
2. Recommended users for aiding building evacuation to comply with NFPA's recommendation for high-rise external chute devices for evacuation of persons when primary evacuation routes to a safe zone are unavailable.
3. NIST recommends that the full range of current and next generation evacuation technologies should be evaluated for future use, including protected/hardened elevators, exterior escape devices, and stairwell navigation devices, *which may allow all occupants an equal opportunity for evacuation* and facilitate emergency response access.