Emergency Escape Chutes For Mining Equipment

The application of Emergency Escape Chutes to provide emergency egress for fixed and mobile mining equipment was first initiated in the Hunter Valley of New South Wales, Australia in 1998.

The momentum to apply the chute for mining equipment is increasing, particularly after a recent incident where a Hydraulic Shovel caught fire and the operator escaped injury by use of "The Ingström Escape Chute"® to get down alive. Today, along with other safety measures, providing quick emergency egress of mobile mining equipment is one of the safety systems requirements in compliance to the Mining Equipment Safety.

This document provides specifications and standards of the Ingström Escape Chute® used in the mining equipment that has been applied to:-

- Electric Shovels
- Hydraulic Shovels
- Coal Loading Facility

Installations on mining equipment require tailor making of the Chute and the container itself to suit the particular machine in question. The design of mining equipment of different manufacturers may differ in its height and in its working platform of the machine, hence, Mobiltex custom design the Chute and the container as a complete unit to fit well that particular machine itself.

Generally, the major components of Ingström Escape Chute® used in the mining equipment can be classified as (1) the compositions of the chute tube, and (2) the chute container for holding and storing the escape tube.

(1) The specifications and compositions of the chute tube of Ingström Escape Chute® consist of three separate layers of specialised fabrics:
Inner Layer: The inner layer is made up of two materials. Twaron is applied along the length of the chute, and Flexible Rohvyl yarn based on PVC chlorofibre is used across the chute. This hybrid fabric is extremely strong, very flexible and is also 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.
Middle Layer: The centre layer is made up of a very elastic 'spun cell' - made of Lycra and Modlacrylic fibres - and can easily increase three times in size. It is this layer, comparable to an elastic knee supporter, which 'holds' the evacuee as soon as the arms and legs are pressed against the chute.
Outer Layer: The outer layer of the chute, made of flexible E-glass fibre, provides protection against fire, heat, and smoke, and can resist temperatures of up to 800°C. When firemen spray the chute with water, it can even be used at higher temperatures than that.

(2) Mobiltex's experience with installations on mining equipment has emphasized its importance in the way the Chute is housed in the container. A Chute in a mining machine needs to be able to withstand the harsh conditions of the mining environment. We have developed a specific method to store the Chute within its container, to protect it from penetration by water, dust and to minimise damage from general mechanical vibration. Mobiltex custom-design and supply the Chute unit complete to meet these demanding conditions. It is fitted with a dust seal to ensure that the unit continues to be fully operational for the initial 6 months period after installation. This 6 months also gives the owner time to organise training of relevant personnel to carry out regular maintenance of the system.

Safety Recommendation:

Due to the demanding conditions experienced by such units, it is important and strongly recommended to have the Chute inspected every 6 months to ensure that the dust protection is replaced at every service. Mobiltex recommend that the 6 months be the longest time frame that the unit is left without replacement of the dust seal as our trials have shown that after this period, the vibration of the machinery will wear the dust protection seal and may commence to damage the outer [fire-protective] layer of the Chute itself. It has taken Mobiltex many years of research into different ways to arrive at an inexpensive method (that works!) to solve the problems of dust penetration and vibration damage in the mining situation.