

External environment

Wirubo-inPEX[®] serves as 'charging hose' in Swedish mine



"We call it hose - not pipe." The quote comes from Torbjörn Naarttijärvi, Chief Development Engineer at Kimit AB in Kiruna, which is a subsidiary of LKAB - Sweden's largest mining company.

The company's keenest competitors are open cast mines. So mining ore one kilometre below the ground surface must be extremely efficient. Unmanned trains wend their way to tipping shafts and discharge their loads into fully automatic hoists.

In spite of the high degree of automation, blasting is crucial to competitiveness. So Kimit developed its own blasting method and a special vehicle for the purpose. The days of dynamite rods are over - holes are now drilled in the rock and are filled with pumpable emulsion explosives. The 115 mm holes are drilled in a fan-shaped pattern. A hose is then inserted into the hole, which is filled with the explosive whilst the hose is being withdrawn. The length of the hole has steadily increased, and 40 to 45 metres is not uncommon.

We asked whether the Wirubo-inPEX[®] pipe had a part to play in this development. "It certainly has," says Torbjörn and

describes the problems they faced before using Wirubo-inPEX[®].

A double hose from the USA was used in the past. The outer of the hose was made of rigid polyethylene to withstand abrasion, while the soft hose on the inside was intended to withstand the pressure.

The first task was to thread one of the hoses into the other. They sometimes jammed in the hole, or else one of them became longer than the other when it was being withdrawn. In those days, the holes were a mere 18 metres long.

Wirubo PEX was discovered when concrete was being cast in the mine, having long been used in casting concrete. An ordinary standard diameter hose was tried first and was found to perform better than the earlier double hose. But a stiffer arrangement was needed, and cooperation with Wirubo-inPEX[®] was set up in 1990. Joint trials on different wall thicknesses resulted in a special dimension being developed.

Stiffer hose was then needed because of the increasing lengths of boreholes. The lengths have so far increased from 20 to 40 metres.

The durability of the material is exceptional. The hose can be used for one to two months. During this period, it will have conveyed 300 000 kg of emulsion explosive at a pressure of 18 - 20 bar. In addition, it will have travelled a total of 50 kilometres into and out of boreholes. All this is according to Torbjörn Naarttijärvi. As a result of increased hole-diameter and length as well as an increased burden, the boreholes yield more ore after every blasting operation. In addition, the cost is only one-third of that of the earlier procedure, and the useful life of the pipe has been doubled.

Those in the know at Wirubo-inPEX[®] wrinkle their nose a little at the word 'hose', particularly when used for the Kimit design which is more rigid than other arrangements.

But according to Torbjörn: "You couldn't very well coil a length of pipe. And many more people would realise the opportunities it offers if it weren't called 'pipe'..."

