

Vladyslav Sudoplatov
A.V. Yavorsky, research supervisor
L.O. Tokar, language adviser
State HEI “National Mining University”, Dnipro, Ukraine

New Techniques to Support Mine Workings with the Help of Swellex Rock Bolting

As it is known, safety is one of the fundamental problems in the process of roadheading.

Rockbolts Swellex™ by Atlas Copco Company is a new type of a rockbolt meeting all requirements. The rockbolt type provides 100% of stated bearing capacity being more than 10 tons.

Swellex™ rockbolt applies hydraulic thrust device of a pipe which ends are blanked off.

Profile of the pipe is of specific form helping the rockbolt increase its diameter up to 40%. In this context, special pump is used to inject water. The water is delivered into the rockbolt under pressure of 300 atm. When water puts pressure on internal walls of rockbolting body, it opens up throughout the length. While opening up, the roof bolt installed within a blast-hole, delivers water pressure to rock mass giving it extra compaction. Such a peculiarity of installing several roof bolts in line makes it possible to have compacted arch of amine working which thickness is comparable with the length of roof bolt.

Another important peculiarity of Swellex™ roof bolts is the material they are made from. That is specific steel grade allowing a roof bolt to extend when rock pressure acts on it. A value of the steel plastic deformation is not less than 20%.

Owing to the above peculiarities, it is impossible to install Swellex™ roof bolts improperly; moreover, their installation procedure need not participation of skilled workforce. The roof bolts may be installed both by hand and automatically.

Swellex™ roof bolts are high-technology product of current technology to support mine workings; it is somewhat more expensive to compare with traditional supporting.

Taking into consideration the fact that the innovative design of roof-bolting is able to provide fast reinforcement of roof and walls of any mine working then as a whole expenditures connected with Swellex™ product purchase will be paid off by means of cutting down of labour costs for a mine working supporting as well as owing to durability of a support. Average time to install one roof bolt with 2m length is 25 seconds.