Advanced blasting techniques with extraordinary approaches for extraction of dimension stones in rock-cladding industry

Nadezhda Krasimirova Stoycheva, Petar Krastev Shishkov

University of mining and geology “St. Ivan Rilsky”, Sofia, Bulgaria  
[nandy\_f@abv.bg](mailto:nandy_f@abv.bg) ; [sfxman86@yahoo.com](mailto:sfxman86@yahoo.com)

**Abstract.**

In the extraction of rock-cladding materials, the blasting activities are applied both to the removal of poor layers of soil, as well for primary separation of the lamella from the main rock-body and its cleavage into smaller blocks suitable for transportation and post-processing to finished products. A major problem when working with high-speed explosives to produce large blocks of expensive stone is the brisance impact on the solid environment. The impact energy of the detonation shatters the rock directly around the blast-hole and can cause cracks in undesirable directions. Under complicated conditions, a pre-interruption of the rock environment is required to screen the propagation of pressure waves caused by the detonation of larger charges. The authors discuss techniques that combine the simultaneous use of explosive and mechanical methods to separate rock blocks from massif. When commercial explosives turns to be not enough safe for the surroundings due to the generated fly-rocks, air-blast, toxic fumes, seismic waves and vibrations, the industry initiates researches focused on low-velocity explosives. The samples of different cartridge casings, filled with non-detonating propellant mixtures, or flash-powder compositions was investigated by field tests.

***Key words:*** *non-detonating blasting cartridges, propellants, cautious blasting, dimensional stone extraction.*