



Your Formula for Success
RESINS | GEL COATS | COLORANTS

CASE HISTORY



Resin Demand Is High in Mining

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| Market Segments: | Mining |
| Composite Applications: | Resin Cartridges for Anchored Rock Bolts |
| Resin: | B729-MBX-00 polyester |
| Cartridge Diameter: | 23 to 88 millimeters |
| Cartridge Length: | 300 to 600 millimeters |
| Location: | Southern Argentina |



Workers walk safely through the Cerro Negro mine with rock bolts fortifying the tunnel.



The two-component polyester resin cartridges are critical to anchoring rock bolts to the surrounding strata in underground mines.

The Cerro Negro mine in southern Argentina is one of the largest gold mines in the world, with estimated reserves totaling 5.26 million ounces at the end of 2014. The mine spans nearly 135 square miles and includes many high-grade gold and silver veins. Safely accessing the underground reserves requires many steps, including anchoring rock bolts to the underground tunnels. For both safety and performance, rock bolts at Cerro Negro are anchored with resin cartridges manufactured by IVS Chile, specialists in underground mining support, ventilation, technical support, and machinery. IVS' mine bolt cartridges are made with a polyester resin from AOC.

Polyester resins are key to anchoring bolts

More than 90 percent of the global underground mining industry uses rock bolts to fortify the roofs and sides of tunnels, making it safer for personnel working in the mines and facilitating the use of mining equipment. The bolts transfer load from the unstable exterior to the much stronger interior of the rock mass. There are several methods to anchor rock bolts, including mechanical, friction and grouted anchoring. The latter – in particular resin grouted anchoring – is quickly becoming the method of choice for many mines.

“Resin cartridges allow an immediate commissioning, faster operation, a clean and homogenous operation, fewer personnel required for the fortification process, and better safety and performance,” says Cristian Giani Barros, CEO with IVS.

Resin Demand Is High in Mining, continued

For those reasons, IVS uses AOC's B729-MBX series polyester resin for all of their resin cartridges. "The resin provided by AOC matches all the desirable properties to obtain a functional and competitive cartridge," says Barros. "This includes low viscosity, stability, good reactivity, and excellent mechanical properties and homogeneity. On top of that, we receive great customer service from AOC."

How resin cartridges work

Each resin cartridge has two sections, one containing a polyester resin paste and the other a chemical catalyst. The sections are encapsulated together in a plastic tube. At the mine site, a hole is drilled into the rock, the cartridge is placed in the hole, and the bolt is inserted. When the bolt is inserted, the cartridge ruptures and the two components mix. This, in turn, initiates a hardening reaction, transforming the resin paste to a solid anchor.

"Anchoring with resin bolts is the single definitive element in fortification of a mine," says Barros. "It not only strengthens the support system, but it also protects the embedded element from corrosion." With resin-grouted bolts and anchors, the load is distributed over a larger area, which reduces stress in any one place. The bolts and anchors can withstand blast vibrations, which enhances safety.

IVS supplies rock bolts and resin cartridges to several underground mines throughout Argentina and Chile, including Cerro Negro, Toqui, Gualcamayo, Peñon and the new Chuquicamata. The company also is expanding into Peru, Colombia and Ecuador. IVS customers use hundreds of thousands of polyester resin cartridges, with consumption varying from mine to mine. This year, AOC partnered with IVS to assist the company in opening a new resin cartridge facility in Santiago, Chile. With a production capacity of 320,000 cartridges per month, the facility allows for expansion to other mining areas. IVS also plans to open another resin cartridge plant in San Juan, Argentina.

The relationship that IVS has with AOC is equally important as the resin itself. "We are very grateful that AOC has given us their full support," says Barros. "The direct involvement of the AOC team has enabled us to improve the costs and benefits of our products. It's vital for IVS to maintain that relationship."

About IVS

IVS was founded in 2009 to meet the high demands in the Latin American underground mining industry. Its mission is to develop, produce, market and distribute products for ventilation and rock mass media. Its vision is to become a world leader in mining, engineering, ventilation and support.

About AOC

AOC is a leading global supplier of resins, gel coats, colorants, additives and synergistic material systems for composites and cast polymers. For more information on AOC technology, quality and service, e-mail sales@aoc-resins.com, phone (866) 319-8827, or go to AOC-RESINS.com.