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Mining exploration drives diamond tool consumption by 200%

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Diamond tool manufacturer Diamond Products reports a 200% increase in consumption of its fixed and mobile diamond tools in exploration initiatives in Africa over the past six to nine months, says Diamond Products director **Brian Clark**.

"Diamond Products had consistent growth as the demand for commodities increased," adds Diamond Products codirector **Darryl Gray**.

Hand-held sampling saws, which are used by geologists to cut into reefs in underground mines, specifically on gold and platinum mines, before samples are taken for analysis, have seen an increase in use as exploration projects on the continent increase.

The company has also improved its diamond saws and drills to meet the demand from clients for the improved life span of diamond tools. The even distribution of the synthetic diamonds throughout the segment of the diamond sawing or drilling tools improves the speed, consistency and life span of the tools, he says.

The company supplies the blades to gold and platinum mines in South Africa, as well as in Zimbabwe, he adds.

Diamond blades fitted to table saws are also used in exploration works to cut sample cores after geologists have drilled out the samples to test for mineral and metal deposits.

Synthetic diamonds used in circular saws and in drills are embedded in the metal tip of the tool. The metal wears away during use to expose the diamonds that are used to cut hard materials. However, embedded diamonds often form clusters in the diamond matrix, causing the consistency of the cut or drill to change as the bond wears away, he explains.

With the diamond-array technology, each diamond carries the same workload as the others throughout the segment. As the segment wears down, the usable life of the tool extends from the cutting edge up to the welded seam, increasing its usefulness, unlike conventional diamond blades, he explains.

"The blades previously used to cut banded iron-ore required the use of cutting additives. However, using the new diamond array technology, the mine no longer uses cutting additives, which has reduced the environmental impact of the process," he says.

These fixed blades are supplied throughout Africa, including the Democratic Republic of Congo, Ghana, Mali and Zimbabwe, he adds.

Another important feature of the company's blades is that they are laser-welded at the seam between the diamond-bearing segments and the steel blanks that form the core of the disc. This improves the safety of people using the blades because the diamond-bearing segments cannot break off from the blank.

Diamond Array Technology

Meanwhile, Diamond Products has converted to a diamond array technology, called Arix.

The Arix technology arranges the diamonds in an evenly distributed matrix throughout the metal to ensure speed of cut, the extended life span of the blade and consistency of effect throughout the life span of a blade or drill bit.

The company manufactures diamond drills from 12 mm up to 1,2 m in diameter and in lengths of 200 mm to 3 m.

One of the benefits offered by diamond cutting, drilling or sawing technologies is significantly less vibration

than percussion tools, such as jackhammers or blasting. This means that diamond tools are well suited to partial demolition and expansion projects on mines, where the remaining concrete structures must not be damaged or cracked.

The company’s diamond wire cutting tool is well suited to such tasks. Typically, two intersecting holes are drilled through the piece of stone or cement that must be removed and a diamond-bearing wire (which is a series of diamond-bearing beads between rubber spacers) is passed through the holes where the two ends are connected to a machine. The machine spins the wire at about 28 m/s and automatically tensions the wire as it slices through the structure or rock, Clark concludes.

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