MODERN MINING IS TRANSITIONING TO SUPPORT MANUFACTURING'S NEED FOR NEW MATERIALS

Technological strides have changed many lives the world over, from just making life more convenient, to radically changing industries and landscapes. Manufacturers are tasked with making new products that take advantage of these technological advances, which often require new materials or advanced production processes. This transformation changes supply chain requirements, including the mining methods needed to accommodate.

The mining of metals, coal, and limestone began back in the Stone Age when people used crude tools to gather precious metals and minerals. As technologies advanced, and more uses were discovered for metals in the earth, mining became a powerful industry. It created jobs throughout the world and was a large part of developing towns and new inventions. Over the years, modern technologies and techniques have been developed to utilize resources fully and today the world of mining has been improved and refined to an amazing degree with these new techniques and technologies.

Image #1: Mine Blasting and Explosives

Mine Blasting and Explosives

This technique has been used and developed in order to go further into mines and blast apart rock and debris to get closer to minable minerals through the use of an accurate amount of explosive.

It is used in both open pit and underground operations depending on the metal situation underneath. Ammonium nitrate is by far the most commonly used type of explosive, although an excess application of this explosive may cause havoc to the environment.

Machines such as the excavators and crushers are used to lift the ores from the drills made from the blasts. Before these machines human labor was used, which was less efficient and effective.

Image #2: Strip Mining

Strip Mining

In the strip mining case, laborers use huge earthmoving equipment such as power shovels and bulldozers used to scoop off layers of rock and sand covering a coal seam. See Image #2.

This type of mining is done in elongated strips whereby miners create strip after strip until they get to the ore. When the process is complete, the previously extracted strips are covered back in order to fill the gaps initially evacuated. This technique is used on one third of America's coal mines in Appalachia and has been criticized for its many negative effects on the surrounding environment.

Water has been contaminated with chemicals, and the surrounding ecology devastated by the increased erosion used in Strip mining. While the coal industry is ongoing, laws and projects have been initiated to slow the effects of strip mining on the environment.

Image #3: Underground Mining

Underground Mining

Underground mining techniques include the digging of deep tunnels into rock near where coal or copper is located. Tunnels are constructed so miners can get the ores and load them into vehicles hence long steel bolts are erected to prevent the underground tunnels from collapsing. See Image #3.

The ores are then crushed by heavy machines in order to extract the final elements. New technologies in ceramic fabrication and mineral process equipment have been improved here as well. Now companies like Ceramic Technology Inc are able to processes minerals easier than ever and get the goods to more suppliers in less time. In the past, these types of mines can be extremely dangerous with cave-ins and ventilation issues injuring and killing workers. With new technology today however, there is more area ground support used to help support tunnels and hold the ground together.

Open Pit Mining

This process entails digging a huge hole and extracting the desired ore openly. The pit is further widened until the ore is entirely utilized. Until then, the pit is abandoned. Copper, iron, diamond, and coal are mostly extracted through this method. The waste rock is piled near the edge of the open cut so as to lessen degradation. This technique has been further improved with the use of large bulldozers, drills, blasters and earth moving machines. The advances in these trucks has helped make mines in America, Chile and countries all over profit from more mineral removed than ever before.

Despite the lag in adaptations of the new techniques of mining, the advancement has seen a rise in the economy generally. Although negative effects such as land degradation and environmental pollution have been witnessed, countries are striving to control it, and at the same time make proper use of the resources available.

Today the need for new mines is increasing. In recent years investments have been made in Latin America, Africa, and parts of Asia for new mines to be started. Demand for minerals increases. These new mines will need to take into account the past technologies and today’s recycling efforts to make mines a profitable resource.

Open pit mining will probably dominate since it decreases risks and opens up more minerals to be mined. New technologies will also need to be utilized to make lower grade ores more valuable through efficient mineral processing equipment. It will require a larger up front cost for recycling and processing equipment that will make a mine last longer through the years.

Source: http://www.apriso.com/blog/2015/05/modern-mining-is-transitioning-to-support-manufacturings-need-for-new-materials/