



Type what you want to search

Search

12/03/2010



## Vale develops technology to cut water

The Carajás mines account for 36% of the iron ore produced by Vale every year. Once extracted, the ore is screened, which adds value by separating out various products. In order to do this, the use of water has always been fundamental. However, a new technology developed entirely by Vale is revolutionizing the way we arrive at final products: screening using moisture from the mine itself. There are no records of this type of technology having been used before in ore processing. Besides cutting annual water consumption by the equivalent of that used by a city of 430,000 inhabitants (19.7 million m<sup>3</sup> per year), the technology also reduces annual power use by more than 18,000 MW and means that tailings dams do not have to be built.

The innovation will bring other financial benefits for the company, since it will now be able to make use of a large share of high-quality ultrafine ore, which using the traditional method ended up in tailings ponds. Given that people across the world are concerned about water shortages, initiatives like this one by Vale deserve attention.

The new technique was tested for two years, with attentive, continuous observation of the way the system functions. The conclusion was then reached that, with some simple and effective adaptations, it would be possible to eliminate 100% of the water used in the process. "Water was used to transport and separate the ore," explains João Carlos Vasconcelos, plant operations supervisor. "In order to eliminate the use of this natural resource without impairing the process, we made a combination of screens, sieves and accessories that enable us to maintain our production results, but in an even more sustainable way."

### New business for suppliers

Although the solution may look simple to observers, its implementation entailed tough challenges that went beyond the limits of the mining company itself. This is because the market did not offer components that meet the invention's requirements. It was necessary to conduct a lot of research to design new equipment and accessories. "Once we had done that, we commissioned suppliers to make these components to our specifications. In other words, we created a new market niche for mining industry suppliers," says José Anselmo Campos, process engineer at Vale. "We have developed new paradigms and inserted another chapter in the 'art' of mineral processing, as we have managed to prove that it is possible to use natural moisture in the screening process in Carajás. We are still studying and perfecting the process, but we have already made good progress and achieved excellent results."

Screening using natural moisture is already definitively incorporated into iron ore processing in Carajás. Of the 17 production lines currently in operation, eight no longer use water in the process, eliminating the need for equipment and structures such as pumps, cyclones, screens, pipes, tanks and classifiers. In addition to saving water and power, the method cuts operating and maintenance costs, as well as eliminating the generation of waste (ultrafine ore), which is now used to make products rather than ending up in tailings ponds. "In iron ore processing in Carajás, 70% of the water we were using was recycled, and just 30% was new water. This new method has cut water use further and reduced the amount of waste sent to our tailings ponds to such a large extent that we have predicted, by means of simulations, that the ponds' operating lives will now be 10 years longer," says Campos.

### A future without tailings ponds

With the new technology, the construction of tailings dams will be eliminated from Vale's new projects that adopt natural moisture screening. This in turn depends on the ore's physical and chemical properties, among other factors. For example, the new S11D iron ore project in Canaã dos Carajás (Pará) is being planned based on the new system, and as a result, no tailings dams will be built. "This initiative reflects Vale's commitment to the sustainability of its projects, as it enables environmental gains, such as reduction and even elimination of the use of new water in ore processing. It also eliminates the need to remove vegetation to construct traditional control systems, in other words tailings dams," says João Carlos Henriques, general manager for the environment at Vale.

## About Vale

Vale is the world's second largest diversified mining company. Present in more than 30 countries, Vale is the world's largest producer of iron ore and pellets, key raw materials for the steel industry, and one of the largest producers of nickel, which is used to produce stainless steel, batteries, special alloys, chemicals and other products. The company also produces copper, manganese, ferroalloys, bauxite, alumina, aluminium and coal, among other raw materials important to the global industrial sector and present in people's daily lives.

## More information

---



### Mônica Ferreira

monica.ferreira@vale.com

Rio de Janeiro

+55 (21) 3845-3636

### Fatima Cristina

fatima.cristina@vale.com

Rio de Janeiro

+55 (21) 3485-3621

---