

Votorantim Cimentos Hits High Goal for Sustainability

Leading cement company brings green cement to market



Cement Producer	Votorantim Cimentos
GCP Solutions	OPTEVA® TDA 4030
Product Category	Cement additives
Product Type	Performance Enhancement
Solution Type	Energy Efficient Solutions

The Project

The Challenge

As one of the largest cement companies in the world, Votorantim Cimentos has been delivering cement products for almost 90 years. This family-owned business is working to propel the industry toward clean technologies and processes. As part of that goal, the company was looking to grow its portfolio of sustainable solutions with the introduction of a cement product that offered high strength along with lower embodied carbon than traditional cements.

“We are committed to the climate change agenda and communities where we have operations,” said Votorantim Cimentos Research & Development General Manager Silvia Vieira, MSc, PhD. “Our vision for the future is based on the concept of ‘flexible solidity’. We are solid in delivering what we set ourselves to do with excellence, ethics, safety, and global performance. At the same time, we are flexible to adapt to the new needs of society, leveraging trends and technological developments to make better use of resources, evolve processes, and positively impact people’s lives.”

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The Solution

The production of clinker (a main ingredient in cement), accounts for the majority of CO₂ emissions of cement production. To lower its carbon footprint, Votorantim Cimentos set a strategic goal to switch from a limestone base cement to a slag base cement in one of its plants, and to reduce the volume of clinker. This would, also, increase durability and make the resulting cement more resistant to chemical attacks, for example. However, using slag can introduce some operational issues with cement grinding as well as cement performance. "Slag is much harder to grind than limestone, so we needed the right admixture to facilitate the grinding of the slag," explained Vieira. In addition to helping reduce the specific energy consumption, the additive is also meant to boost cement quality, delivering rapid setting, reduced water demand, and high strength.

Over the years, the Technical Services team at GCP Applied Technologies has supported Votorantim Cimentos in continually enhancing the properties of its vast line of cements in cost-effective manner. The company sought GCP's advice for this new endeavor as well. "GCP has been a real partner," said Vieira. "Whenever we have a cement challenge, we call them and discuss the best way forward and we develop solutions together."

Based on its analysis of the desired cement properties, GCP recommended using OPTEVA®TDA®4030 additives, which proved effective for providing sustainability and cost savings. This grinding aid offers set acceleration, water reducing, and strength enhancing compounds that result in superior and more consistent cement quality. The chemical action of the OPTEVA®additive increases the rate of hydration of cement, also improving grinding efficiency. This results in increased mill output and lower grinding costs, as well as in improved cement performance and characteristics.

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The Results

Using OPTEVA®TDA 4030 additives made it possible to significantly lower the volume of clinker needed to produce the new cement product, while increasing its late strength up to 20 percent. Votorantim Cimentos reduced the clinker factor of cement by 8%, which equates to a reduction of 9,000 tons of CO₂ and a savings of roughly half a million reais per year. The company is now able to offer this new cement product, CPlI-E, featuring the same compressive strength as traditional cement with a lower carbon footprint.

This approach can help Votorantim Cimentos secure added market share, as more construction companies seek out greener cement.

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