



ALL WRAPPED UP

Panu Kantosalo, Cross Wrap, outlines how automatic bale wrappers and bale openers could improve the way cement manufacturers handle, transport and store alternative fuels.

The cement industry has consistently been investing in the use of alternative fuels to be more sustainable and to cut back on the use of virgin fuel materials. These alternative fuels such as RDF and SRF are being manufactured and delivered to end-users in the cement industry from many internationally operating companies.

Some of the larger cement companies have their own means of alternative fuel manufacturing. These alternative fuels consist of high calorific value shredded materials that



LafargeHolcim Spain invested in an automatic Cross Wrap Bale Opener to improve its waste fuel infeed-operation capacity and process automation.

are often transported and stored in baled form to keep the logistical costs down. Wrapping the baled fuel material is the most efficient way to enable transporting across roads, rails, and seas.

Finland-based Cross Wrap Oy has over 25 years of experience in manufacturing automatic bale wrappers and bale openers for different industries. There, the Cross Wrap bale wrapping method has become the industry standard in wrapping the waste- and waste-fuel material bales. The waste-to-energy sector is now the biggest customer sector for the company including MRFs, waste-fuel manufacturers and traders, waste-to-energy plants and cement kilns.

The majority of 500 delivered Cross Wrap machines are used in the waste-to-energy industry and the patented cross wrapping method has gained status in the industry as a leading method of wrapping baled waste materials. The method offers gentle and effective bale movement during the

Table 1. LafargeHolcim's Villaluenga cement plant project.
<p>Company background</p> <p>Global operator and one of the world's largest building materials manufacturers, LafargeHolcim, operates in four different business areas: Cement manufacturing, Aggregates, Ready-Mix Concrete and Solutions & Products. The company has operations all around the world in 80 different countries and has over 75 000 workers. The company's growth is based on global population growth, urbanisation and improving living standards and sustainable constructions.</p> <p>The company was founded in 2015 when companies Lafarge and Holcim merged and created LafargeHolcim. With its headquarters based in Switzerland, the company reached a combined net sale of CHF26 billion in 2017.</p>
<p>Villaluenga cement plant</p> <p>LafargeHolcim's Villaluenga, Spain, cement manufacturing plant updated its alternative fuel (WtE) infeed system by purchasing a fully automatic Cross Wrap BO 3600 Bale Opener machine. The purchase was made in 2018 and the machinery was installed in April of 2019. The investment prework was conducted by LafargeHolcim company, Geocycle, which is responsible for all the waste management activities at LafargeHolcim.</p> <p>By shifting to the Cross Wrap Bale Opener, the customer wanted to automate its alternative fuel infeed, where baled and wrapped SRF is used as alternative fuel in the cement manufacturing process. The CW Bale Opener opens the bales automatically, separates the wrapping film and bale wires. This helps to steady the infeed process and maintain a higher quality fuel stream.</p> <p>The cement kiln alternative fuel infeed system is dependent on steady fuel handling. The CW Bale Opener removes the wrapping film from the bale content and moves the baled material forward to the process. With the help of CW bale opener, no bale tying material will be mixed in among the fuel.</p>
<p>Benefits of the CW Bale Opener</p> <p>One of the biggest benefits of the CW Bale Opener is its operation, which opens both the square and round bales. For this, it was a good choice for LafargeHolcim, as it allowed the company to receive all types and shapes of alternative fuel bales, and store them wrapped on their premises for use depending on process needs.</p> <p>As the CW Bale Opener operates automatically, the loader only needs to place the bales at the feeding conveyor and the machine does the rest. The bale opening cycle speed is automatically adjusted according to the fuel infeed line speed or the bale loading speed, if material is continuing on to a bunker.</p> <p>The option to choose feeding conveyor length helps to set a comfortable and safe pace for bale loading. A longer feeding conveyor helps to buffer the feeding, slow down loading speed and helps the operator to work without hurry, which increases safety and operational precision.</p>

wrapping cycle. This keeps the bale structure unstressed during wrapping and helps to maintain a clean operation. The method also keeps the machinery layouts, bale tracks and conveying lines simple and adaptable, as well as flexible for different needs.

By using baled and wrapped alternative fuel materials, cement manufacturers can improve their fuel handling, transportation, and storage. The use of wrapped material enables more flexible operation as the wrapped waste fuel bales are easy to transport and they can be stored outdoors with no littering, fire hazard or problems with odours and leakages.

Getting more from RDF and SRF

Bale wrapping helps to maintain the alternative fuel calorific value. The airtight wrapped package does not allow the baled material to be composted with air. This keeps the fuel's calorific value as high as it was when baled. The plastic wrap keeps any moisture away from the baled RDF and SRF. It also prevents combustion when transporting or storing and reduces the risk of fire.

These benefits keep the stored fuel in good condition. This is an important

feature as the process efficiency and product quality are dependent on the quality of the raw materials used in the process, including the alternative fuel.

The WTE concept

The alternative fuel wrapping and the whole alternative fuel lifecycle in baled form has been conceptualised by Cross Wrap. This WTE



CW Bale Opener.

concept is developed to simplify and generate operational benefits for alternative-fuel users and manufacturers.

The concept focuses on maintaining good material and operational quality throughout fuel wrapping, transport and storage operations. As the fuel bales are wrapped, the material quality remains unchanged, but the concept reveals other beneficial factors deriving from wrapping.



CW 2200 Bale Wrapper.



The Cross Wrap Bale Opener can open both cubical and round bales. The machine's feeding conveyor gives the loader more time.

One of the biggest benefits of wrapping is that the baled and wrapped material can be easily transported and stored. The cubical bale form is the most efficient shape to be transported, and the balers that produce cubical bales are the most common industrial balers around the world. Also, the bale densities and weights are the best when using industrial channel- or two-ram balers.

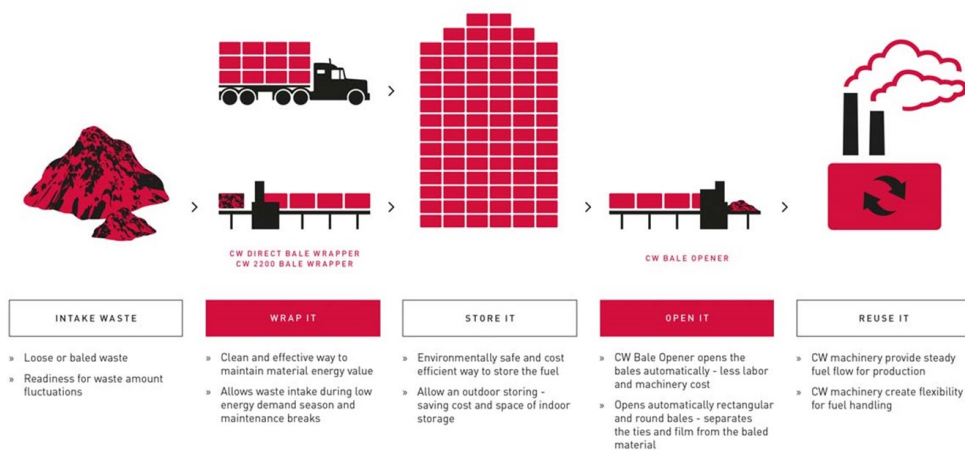
By crosswrapping, the bale structure and content are secured, and the bale handling is safer and cleaner.

Wrapped bales can be stored outside safely, which helps to minimise storage expenses and the storage footprint. This enables the possibility of efficient and safe buffer storages with minimal costs or effects on the material. These storage benefits apply to all positions on the fuel materials' logistical journey.

Offering both wrapping and bale opening machines for the job

Cross Wrap's bale wrappers represent the company's long line of industrial wrapping machines. These machines use the latest automation programmes and sophisticated user interfaces that are easy to use and to learn. The machines offer an efficiency boost with high automation, accurate programmability and tailored wrapping programmes to suit the needs of a variety of customers.

There are two of the company's bale wrapper models that both use the same wrapping method. The most used bale wrapper is the CW 2200, which can be paired with any baler. Another wrapper model, the CW Direct wrapper, wraps the bale directly from the two-ram-balers chamber. This direct



Cross Wrap waste-to-energy concept.

wrapping method only needs the wrapping film to wrap the bale, with no additional bale ties needed. The bale wrapper customers are most commonly MRFs and alternative fuel producers.

To handle the wrapped bales at their end location, the CW Bale Opening machine has been developed. This machine automatically opens the bales and removes the wrapping film together with possible bale ties from the bale. These CW Bale Opener machines are used by Waste-to-Energy plants and cement kilns. The CW Bale Opener machine offers high automation and optimal fuel flow for processes and it helps to keep the material quality high.

Worldwide projects

Cross Wrap has delivered machines to over 55 countries during its history, and the company is constantly working to develop the machine's capabilities, finding new solutions and options for customers. The company's approach to gentle bale conveying and single-stage wrapping with adjustable programming and modular line design has proven to be successful in industries such as waste handling, recycling, and board manufacturing.

Nowadays there are hundreds of Cross Wrap bale wrappers around the globe and numerous Cross Wrap Bale Openers operating in cement manufacturing facilities and in Waste-to-energy plants. The latest of the Bale opener deliveries has introduced the automatic CW bale opening machine to major cement manufacturers in Spain and in Turkey (Table 1).

Investments to enhance the operation

Cross Wrap's CW Bale Opener has become the choice for many cement kilns and waste-to-energy plants. The company works to offer solutions that become the industry standard and provide more operational efficiency and competitive advantages to their users. ■

About the author

Panu Kantosalo (M.A. & B.A.) has been Cross Wrap Oy's Marketing Manager for the last two years and is a 37 years old M.A. of Organisational Communications from the University of Jyväskylä, Finland, and a Bachelor of Media Design from JAMK University of Applied Sciences, Jyväskylä, Finland.

Today, the author's work consists of gathering the latest information regarding waste-to-energy, circular economy, packaging, and logistical solutions and compiling them to an understandable form.



Wrapped RDF bales stored outside.



LafargeHolcim cement mill in Villaluenga, Spain, uses a Cross Wrap Bale Opener.



CW Bale Opener machine automatic operation.