

MERCURIO NEWS

ISSUE #3 • OCTOBER 2018



USE OF VEGETABLE OIL ATTESTS TO MERCURIO'S ENVIRONMENTAL AWARENESS



MERCURIO

A company's pioneering nature is also measured by aspects that are not visible. This is why Mercurio is the only conveyor belt manufacturer using vegetable oil in rubber production. Since May 2015, 90% of the petroleum-derived synthetic oil used in rubber production was replaced with soybean by-products.

Vegetable oil is abundant and renewable, and much less harming to nature. This innovation is in line with Mercurio's pursuit of clean technologies and fully consistent with the company's values, which promote respect for the environment and all forms of life.

Mercurio's concern with sustainability required investments in research, and as a result Mercurio's Research & Development Department carried out studies to make vegetable oil compatible with the other chemical elements. The project resulted in the development of specific technologies to enable the use of vegetable oil in the majority of Mercurio's product portfolio.

ESSENTIAL COMPOSITION

The oil acts as a plasticizer in the rubber compound. As such, it enhances the rubber's properties and optimizes the end product's performance. It also makes it easier for cargo to be incorporated and controls the hardness of the com-

ound, in addition to improving processability, since it adjusts the material's viscosity.

Mercurio uses degummed crude vegetable oil extracted from soybean. The oil can also be extracted from other vegetables, such as pine, corn and sunflower. The company chose soybean to replace petroleum-derived aromatic oil because of its abundant supply in the domestic market.

In order to use this oil to make conveyor belts, Mercurio developed a technology to produce degummed crude soybean oil compatible with the elastomeric matrix. As a result, epoxidation is not necessary.

"This technology brought tangible gains, such as higher yield, better performance, less debris in the molds, and very low or no generation of toxic elements from decomposition, as well as intangible gains, such as improved work environment and compliance with international toxicity demands," pointed out Renato Laredo, Mercurio's Quality Assurance & Technology Coordinator.

According to Renato, over the last few years a lot of focus was given to products containing limited-use substances due to the risk they pose to the environment and health. "Mercurio's innovation is fully in line with its sustainability principles and allows its products to enter global markets," he emphasized.

EDITORIAL

INNOVATION TO PROMOTE SUSTAINABILITY

The same message board displaying Mercurio's Mission to transport wealth that builds, transforms and feeds the planet also displays the company's values. These values include a commitment to respect the environment and all forms of life.

As such, it is clear that we understand sustainability as the outcome of development, not its opposite. We also believe that the only way we can reconcile economic growth and socio-environmental balance is through technology.

This is why Mercurio invests heavily in developing innovation to reduce the impact of our activities. This leads to various solutions that allow us, for example, to significantly reduce consumption of non-renewable natural resources in our production process. Guided by the same commitment, we invested in the construction of modern, energy-efficient facilities in the North of Brazil.

We understand the future of Mercurio as the development of society itself. More than just being a part of society, we are committed to promoting its sustainable growth.

Enjoy your reading!
Ivan Zanovello Ciruelos

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MERCURIO SMART

OPTIMIZED YIELD IN YOUR OPERATION

Imagine being able to manage your entire conveyor belt system directly from your smartphone, wherever you are, on-line or offline. Mercurio Smart allows you to do just that!

The tool creates a detailed history of each conveyor belt in operation. All you have to do is enter the date and reason for replacement, and Smart will send you warnings to help with predictive maintenance months before the conveyor belt's useful life comes to an end. This allows Mercurio and its clients to schedule timely replacements.

PREDICTABILITY AND DIAGNOSIS

Reports on average useful life and durability enable the company to make decisions that promote yield gains and optimize results. After all, fluctuation in conveyor belt durability leads to unexpected events. Such events could be related to technical issues with the conveyor belt, for example.

To access Mercurio Smart, download the Mercurio App. The app is free and available for iOS and Android on smartphones and tablets.



FOCUS ON THE CLIENT

ASSEMBLED TO UNDERSTAND TECHNICAL DEMANDS AND DEVELOP CUSTOM SOLUTIONS, MERCURIO'S SALES TEAM PLAYS A PIVOTAL ROLE IN THE ACHIEVEMENT OF AUDACIOUS GOALS



DIVULGAÇÃO MERCURIO

When a company defines its Vision as being the client's preferred partner and establishes values such as to exceed client expectations, it is also determining the importance of its sales team. It is not by chance that Mercurio relies on a highly-qualified sales team, aligned with the principles that guide the company and aware that value is delivered through relationships. This means that the company's salespeople work on the field to develop solutions based on an understanding of client demands. Every week, the sales officer meets with clients in person to listen to their demands. The team not only listens to clients, but also works towards fostering Mercurio's leadership. Leonardo Sales, the company's Sales Officer, commented on this challenge.

What is your history with Mercurio?
When I took over the sales department, at the end of 2013, the company was professionalizing management and the owners were taking up positions in the board. The sales department was restructured so we could take charge of national leadership. We outlined the

profile of people we wanted, so that we would have professionals with sales skills but also capable of interacting with clients on a technical level.

What are the principles of the sales team?
We are aligned with Mercurio's principles. Our vision pointed towards national leadership. Now, our vision is to become our client's preferred partner and a leader in Latin America.

What is the focal point of client interaction?
Ethics and transparency in sales relationships are the most valued aspects in the surveys we carry out. We offer the most appropriate product to meet our client's demand, at the lowest cost per transported ton. You can't do that without comprehensive knowledge of the product and the client's operations.

What are the pros and cons of this proximity?
Maintaining this relationship has costs, because mining activities are, in general, located near big hubs. But that is how we operate to have our client's preference, because they value that.

The sales team gathers information about new demands and interacts with the technical department to provide even better service

Leonardo Sales,
Mercurio's Sales Officer

How does the sales team help the company maintain its leadership?
The market expects the leader to be innovative. Accordingly, the sales department gathers information about new demands and interacts with the technical department to further improve service and create internal actions to reach sale and competitiveness conditions.

What will be Mercurio's next steps?
In 2013, export was incipient and represented roughly 1% of revenue. In 2018, with a team that lives and breathes export, it should reach 15%. To strengthen this team we hired an application engineer, who will focus on the foreign market and is fluent in English and Spanish.

THE EVERYDAY LIFE OF THE SALES TEAM

Luiz Reis, an external salesman at Mercurio, started working for the company at the age of 15. Seven years later, he says it is a privilege to work in a place that enables him to explore his full potential. He shared with us how he develops his work.

What is the sale process like?
Since clients already know the brand, my job is to be close to them. Our goal is to offer solutions that will contribute to

their success. We consider the client's process as a whole.

What are the complexities involved?
Understanding and meeting specific needs with tailor-made solutions. I'm on the front line, but the technical department supports me and, if necessary, works on the field too. We are constantly interacting with the engineers and are sensitive to issues that impact

production and revenue. We always help our clients address the solution.

Do salespeople get involved in the post-sale process?
I monitor the product's performance and the client's satisfaction with frequent visits, and we have satisfaction surveys and the Smart system, which allows clients to control the performance of their conveyor belts.





DIVULGAÇÃO MERCURIO

The challenge imposed by the mining company and surmounted by Mercurio required the development of a conveyor belt that would not rip when subjected to the impact of lamellar stones, and which was capable of mitigating damages and had minimum durability of one year. Otherwise, the client would not pay for the product. Given its surprising result, the equipment is currently operating in four different plants of the mining company.

NO MORE SHUTDOWNS

MERCURIO WAS THE ONLY SUPPLIER TO TAKE ON THE CHALLENGE IMPOSED BY A MINING COMPANY, DEVELOPING A CUSTOM CONVEYOR BELT WITH HIGHER-THAN-EXPECTED DURABILITY

Responsible for the annual production of nearly 30 million tons of iron ore, one of Brazil's major iron ore companies, located at a distance of 100 km from Belo Horizonte, in the city of São Gonçalo do Rio Abaixo, has three ore crushing plants. One of them, the fines plant, accounts for 15% to 20% of all the ore processed at the complex.

In the first stage of crushing, the stones have a granulometry of up to 300

mm (boulders), which need to be fragmented to reach the desired granulometry. For this purpose, the ore is taken to a jaw crusher, which carries out the first step of fragmentation. This piece of equipment is crucial for the operation, because the rest of the line is prepared to work with lower granulometry.

RECURRING ISSUE

The mining company was facing problems in this area, which happened

when the lamellar stones passed directly through the maximum opening of the jaw crusher. When this happens, some of the boulders hit the conveyor belt hard.

The cargo concentration on the contact area was ripping the belt. To make matters worse, some of the stones got stuck in this position. With the drive continuously moving the conveyor belt, the rip would spread uncontrollably.

Since the affected conveyor belt is only 30 meters long, in some cases there was no time to stop the operation before the conveyor belt was completely lost. And don't think this was a rare thing to happen. "There were times when we had this problem up to three times in one month," the engineer in charge recalled.

This means that the operation had to be shut down, leading to production losses, maintenance costs and the risk of accidents involving workers. "Crushing plants are sequential. When a conveyor belt stops working, the entire process stops," he pointed out.

TEAMWORK

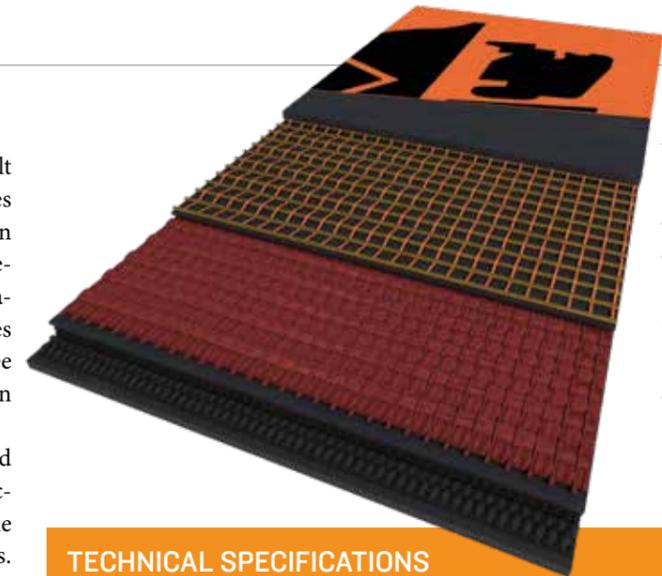
With over a decade's experience in this operation, the maintenance team was aware of the severity of the application of a replacement conveyor belt. "A traditional conveyor belt would not solve our problem," he explained. They didn't exactly need a product that would never rip, but rather one that could prevent the damage from spreading. It was also vital that it could undergo cold splicing.

In light of the peculiarity of this case, the client contacted its suppliers, but only Mercurio accepted the challenge. "Mercurio's engineering team came to the plant to identify the problems and characteristics of the operation," told the engineering in charge. In a fully client-oriented process, the development of this solution involved Maintenance Engineering, the client's Conveyor Belt Supervision Team, and Mercurio.

"We joined forces to develop something different, because I'm aware of the technical capacity we have, as well as Mercurio," stated the engineer.

CUSTOM SOLUTION

On the first try, in addition to using the MercoRip cover, which is more resilient and resistant to impact and ripping, a steel mesh (Rip Proof) was added to the top cover. The mesh aims to make the cover more resistant to move-



The carcass, which used to be made of PN (Polyester / Nylon) fabric, was changed to NN (Nylon / Nylon), which is more resistant to impact. The rubber compound was changed from EAS to MercoRip, which is more resilient and resistant to impacts and ripping. Furthermore, two breakers (aramid and steel mesh) increased the product's resistance to cutting

TECHNICAL SPECIFICATIONS

RUBBER COMPOUND: MERCORIP
COVER THICKNESS: THICKNESS INCREASED FROM 10X3 TO 12X4 MM
CARCASS: FROM 3PN3000 TO 3NN1800, MORE RESISTANT TO IMPACT
ACCESSORIES: ARAMID BREAKERS AND RIP PROOF TOP COVER

ment, if a boulder happens to pierce it. A sensor alerts to overload on the conveyor belt and disables the drive, preventing the rip from spreading.

"In practice, when the conveyor belt was hit by a lamellar stone 30 days after installation, it only stopped working after 17 meters," recalled Alexandre Lacerda, an engineer at Mercurio. "The damage was considerable and the conveyor belt had to be fully replaced," he told. In addition, "the client needed more resistance and durability of at least one year," he said about the time they accepted the challenge.

After the problem was identified and a solution was developed, the second test began, once again compromised by ripping. This time it was on the edge, because the conveyor belt was wider than the Rip Proof. "We started over and further improved the conveyor belt," said Lacerda. This time, in addition to the steel mesh covering the entire width, they added an aramid canvas to work as a breaker. This increased the product's resistance to ripping and, if the conveyor belt did end up ripping, Rip Proof would reduce the extension of the damage. "We made a very robust conveyor belt, appropriate for this type of application," celebrated the client.

SURPRISING RESULT

The conveyor belt was installed in January 2017 and was extremely successful, even with the crusher working at maximum opening and allowing more boulders to pass through. The equipment worked for 13 consecutive months, until February 2018. "It didn't rip, but it worked so much that the superficial cover just wore down," pondered the engineer in charge.

As a consequence of intense client-oriented engineering work, developed in partnership with the client, the result was disseminated. "We replicated the concept in other conveyor belts and mines," said the maintenance manager, who presented the case in internal seminars promoted by the company.

Its success is so evident that the 40% to 50% higher cost, compared to the conventional solution, is absorbed by the plant's higher reliability. "People on the field are surprised by its durability. We found a concept that works," celebrated the client. Lacerda believes this is the most resistant conveyor belt currently offered by Mercurio, and therefore the most cost-efficient. "It pays for itself when compared to the number of conveyor belts that would have to be acquired to avoid shutdowns," he explained.

TYPES OF CONVEYOR BELTS

CHARACTERISTICS OF THE OPERATION AND TRANSPORTED MATERIALS DETERMINE THE CONVEYOR BELT SPECIFICATIONS

From cereals to crude ore and incandescent materials, Mercurio's conveyor belts are present in a variety of operations in the mining, steel, agribusiness, civil construction and other industries.

To operate in such specific markets and applications, the products are designed according to each industry's need. After all, the specificities of the final application determine the conveyor belt's properties.

PRODUCT DEVELOPMENT

The development and recommendation of a conveyor belt begins with three different processes, always fully supported by Mercurio's technical team.

► **CLIENT SPECIFICATION:** the client requests a product quote, informing all desired properties - i.e. carcass type, rubber cover thickness, length and width, and any other special features.

► **APPLICATION INFORMATION:** when the client doesn't know which properties the conveyor belt should have, but informs the application and strengths involved when

requesting a quote. In this case, Mercurio's technical department is responsible for determining the conveyor belt.

► **MERCURIO'S SPECIFICATION:** when the client does not provide sufficient information, and Mercurio's technical department contacts the client to understand the operation and then recommend and determine the right product. In some cases, Mercurio's technicians need to visit client locations several times to collect information.

In every case, the full specification of the conveyor belts is included in the purchase order.

MAIN PROPERTIES

The type of rubber and cover thicknesses are determined based on the material's properties (abrasion, temperature, presence of oil, etc.), as well as the operation's configuration. These include the height and frequency of material falls and the conveyor belt's cycle. The ratio between the top and bottom covers is usually 3:1.

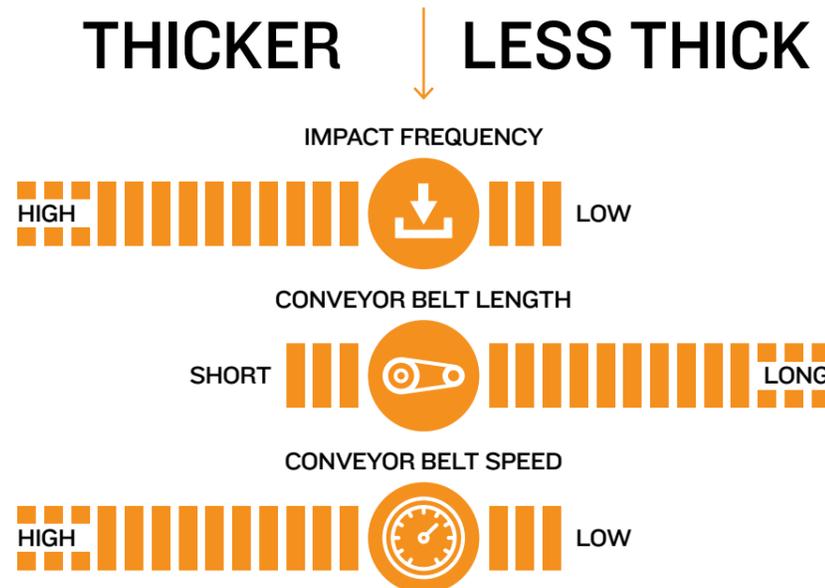
Carcass thickness, on the other hand, is determined by the type and number of canvases or the diameter of steel cords.

MERCURIO PRODUCTS

Mercurio has a comprehensive portfolio of solutions, with products that serve a wide variety of applications. The company's portfolio includes the following conveyor belts:

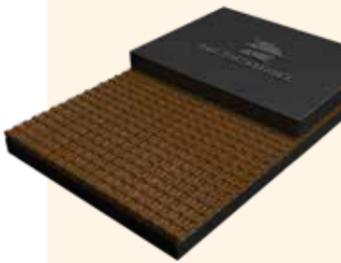
- Carcass made of PN (Polyester/Nylon) and NN (Nylon/Nylon) canvas
- Aramid carcass
- Steel Cord carcass
- Canvas Tube (PN / NN) and Steel Cord
- Rolled
- Non-smooth cover (rough corrugated, corrugated wave, Rebitomerco)
- Straight cleats, V-shaped cleats and V-shaped diagonal cleats
- Cover Conveyor Belt
- Weigh Feeder
- Mercoflex
- Cabomerco
- Jatomerco
- Intermediate Milling and
- Lifting with PN (Polyester/Nylon) canvas carcasses

COVERS



TECHNICAL SPECIFICATIONS

CHECK OUT THE PROPERTIES OF THE MAIN TYPES OF CONVEYOR BELTS MANUFACTURED BY MERCURIO:

TIPO DE CORREIA	INDUSTRIES	MAIN APPLICATIONS	CONSTRUCTION	ACCESSORIES
 <p>ARAMID</p>	Primarily Mining and Steel	Transporting materials with high granulometry or temperature and high level of impact, cutting and ripping	With Aramid/Nylon carcass, it can be manufactured using all types of cover rubber: AB, EA, EA PLUS, EAS, EAS PLUS, X-EAS, MERCORIP, EAR, AC, AC PLUS, TG, TGS, OAN, REACTION AB, AT, ATS and ATS PLUS	RIP PROOF and Shock Absorbing Fabric
 <p>STEEL CORD</p>	Primarily Mining, Steel and Cement	Transporting materials across long distances (LDCB) or when resistance to high tensile strength is needed	With steel chord carcass, they can include the following covers: AB, EA, EA PLUS, EAS, EAS PLUS, X-EAS, AC, AC PLUS, AT	RIP PROOF, RIP STOP, RIP SCANNER and Shock Absorbing Fabric
 <p>NN (NYLON / NYLON) CARCASS</p>	Primarily Cement, Ashing, Quarries, Fertilizers, Mining, Pulp & Paper, and Steel	Replacement conveyor belts, primary crushing, applications that require shock absorption, reaction conveyor belts, log transportation, transportation of materials with temperature exceeding 200°C	Manufactured with two to six canvases and the following covers: AB, EA, EA PLUS, EAS, EAS PLUS, X-EAS, MERCORIP, REACTION AB, AC, ATS and ATS PLUS	RIP PROOF and Shock Absorbing Fabric
 <p>PN (POLYESTER / NYLON) CANVAS</p>	Primarily Cement, Calcination, Quarries, Fertilizers, Mining, Pulp & Paper, Steel, Ports and Sugar & Alcohol	It is versatile and has a wide variety of applications, such as vertical and horizontal transportation or material lifting (conveyor lifts)	Manufactured with two to six canvases and the following covers: AB, EA, EA PLUS, EAS, EAS PLUS, X-EAS, MERCORIP, EAR, AC, AC PLUS, TG, TGS, OAN, OAT, AT, ATS and ATS PLUS	RIP PROOF and Shock Absorbing Fabric
 <p>CANVAS TUBES AND STEEL CORD</p>	Primarily Mining, Steel, Pulp & Paper, and Ports	Enclosed transportation of materials, including curvilinear, with weather protection and avoiding spilling	Manufactured with two to five canvases and/or steel cords, with the following covers: AB, EA, EA PLUS, EAS, EAS PLUS, X-EAS, AC, AC PLUS, AT, ATS* and ATS PLUS* *only textile carcass	No accessories added

WITH A DISTRIBUTION CENTER IN JUNDIAÍ, MERCURIO OFFERS IMMEDIATE SERVICE FOR LIGHT CONVEYOR BELT DEMANDS



DIVULGAÇÃO MERCURIO

THE INFRASTRUCTURE OF ITS LOGISTICS CENTER EXPANDED MERCURIO'S DELIVERY TIME AND CAPACITY FOR THE DOMESTIC AND SOUTH-AMERICAN MARKETS

An important part of the company's growth plan, the Mercurio Distribution Center (CDM) inaugurated in March 2016 is unparalleled in the domestic conveyor belt market. Located in Jundiaí, the initiative helped Mercurio become the first manufacturer in Brazil to have such an infrastructure. The company consolidated itself as the only manufacturer prepared to directly meet a variety of demands.

After all, the CDM has the largest inventory of light conveyor belts in Brazil. This expedites the purchase process after specification, since the client doesn't have to wait for the conveyor belt to be manufactured, which could extend delivery time.

LIGHT CONVEYOR BELTS

The type of conveyor belts readily available at the CDM is light conveyor belts. This means that they have a rupture strength of 1,000 kgf/cm or higher. This product type usually applies to less aggressive operations, such as transportation of light or less abrasive materials.

OPERATION

The CDM has what we call the "mother coils", which are long conveyor belts with common carcass and cover specifications, at maximum width. They are versatile and can be cut into the desired sizes.

Therefore, after the order is received, the CDM technical team receives the coordinates for the products through the system and uses mother coils to make the necessary cuts along its width and length, as requested by the client.

Consequently, the shipping process is very fast. It takes less than 30 minutes for the product to arrive at the truck, be loaded and released.

EXCELLENT LOCATION

The CDM is strategically located at a 15-minute drive from the Bandeirantes and Anhanguera highways, within the Industrial District of Fazenda Grande in the city of Jundiaí, state of São Paulo. This location enables fast shipment to any location in Brazil and Latin America.

MERCURIO DEVELOPS SPLICING KITS

Always focusing on partnership and hoping to make the operations of its clients more practical, Mercurio is working on two new kits for cold and hot splicing.

Expected to launch in the next few months, Mercurio's kits will optimize client operations, granting quality and reliability to the most sensitive part of any conveyor belt. The kits were designed in accordance with Mercurio's capacity for technological research and development, making repairs reliable.

WHAT HAPPENS AT MERCURIO



RENATO SOARES

MERCURIO PAYS TECHNICAL VISIT IN MOZAMBIQUE

IN ADDITION TO OFFERING TRAINING TO IMPROVE SPLICING PROCESSES, MERCURIO IDENTIFIED OPPORTUNITIES TO IMPROVE OPERATIONAL EFFICIENCY

Focusing on promoting the success of clients and optimizing their operations, Mercurio often visits client locations, no matter where they are. Valuing its partnership with clients more than anything else, these visits allow Mercurio to check on the performance of conveyor belts and make sure the clients are satisfied. In this context, the Application Engineering team went to Mozambique last month. The team paid a visit to a mining company located in the Moatize district, with two purposes: one of them was training local teams to perform hot-splicing in textile conveyor belts. The other one was to inspect the installed conveyor belts. Since Mercurio is constantly worried about its clients' operations, the inspection aimed to identify possibilities of improvement and make the necessary changes to the specifications.