

A background image showing a blue tractor and a red combine harvester in a field. The tractor is on the left, and the combine harvester is on the right. The scene is slightly blurred and has a dark overlay. An orange triangle is in the top-left corner.

# 6 TIPS FOR CHOOSING A CONVEYOR BELT IN THE AGRICULTURAL SECTOR

**LBS**  
conveyor belts

together we create

# CONTENTS

<b>Introduction</b>	<b>3</b>
What does the agricultural sector consist of?	4
<b>01. High and dynamic load</b>	<b>7</b>
<b>02. Contamination by soil and product residues</b>	<b>10</b>
<b>03. Changing seasons and temperature variations</b>	<b>13</b>
<b>04. Protection of delicate products</b>	<b>15</b>
Ecocleat® cleat	16
TO-cleat	17
Finger cleat	18
Bow belts	19
<b>05. Optimal friction</b>	<b>21</b>
<b>06. Own weight</b>	<b>24</b>
<b>Conveyor belts at LBS</b>	<b>26</b>



## INTRODUCTION

Numerous factors and challenges emerge within the agricultural sector, presenting unique issues for conveyor belts. Effectively addressing these challenges is imperative to ensure the optimal performance of conveyor belts within the production process. Explore our valuable insights in this white paper, drawing from our extensive experience and knowledge gained through addressing specific agricultural sector issues.

**Together we create!**

## What does the agricultural sector consist of?

LBS focuses on the following applications within the agricultural sector:

- Arable farming
- Fruit and vegetable growing
- Forestry
- Stockbreeding

Clients in these sectors have specific and unique requirements for the conveyor belts they use. Choosing the types of conveyor belt, rubber or synthetic, depends on several factors. We cover these factors in this whitepaper:

1. High and dynamic loads
2. Contamination by soil and product residues
3. Changing seasons and temperature variations
4. Protection of delicate products
5. Optimal friction
6. Own weight





Examples of machinery in the agricultural sector are:

**1. Harvesting machines**

Harvesting machines, such as beet harvesters and potato harvesters, employ conveyor belts to transfer crops from the field to the storage area. These machines feature various types of conveyor belts, ranging from rubber to synthetic.

**2. Feed mixers**

Feed mixers are utilized for transporting animal feed, including hay, straw, and silage. Synthetic and sometimes rubber conveyor belts are commonly used in this context. Both synthetic and rubber conveyor belts are made endless using connectors or angle irons in combination with hole patterns, allowing them to be securely connected.

**3. Box fillers**

Box fillers serve a diverse range of applications and enhance efficiency by automatically filling boxes, ensuring maximum product preservation. Box fillers extensively utilize finger belts, enabling the secure transportation of delicate products between the finger cleats without shifting or rolling. This approach minimizes the risk of

damage to the

#### **4. Sorting machines**

Fruit and vegetable sorting and packaging machines often use synthetic conveyor belts. These move products between different stations in the sorting system. Cutting pieces, sheets or sealing strips also come in handy here. For example, as sorting mats or protective sheets.

#### **5. Planting machines**

Conveyor belts can be used to distribute seed potatoes evenly during crop sowing. Sheets, trimmings or sealing strips are also often used at the edge of the machines for even distribution.

#### **6. Storage line**

Whether it involves crops, feed, or materials, these conveyor belts serve as essential components that optimize the utilization of every corner in a storage hall. These machines often feature a combination of synthetic and rubber conveyor belts, including both flat and profiled or cleat types, depending on their position within the entire storage line.

#### **7. Storage loaders**

In the efficient filling of storage areas, storage loaders play a pivotal role. Typically, storage loaders are equipped with rubber conveyor belts featuring profiles. Less commonly, synthetic conveyor belts with profiles may be used. These profiles are designed to transport materials at an angle.

# 01. HIGH AND DYNAMIC LOAD

## SMALL PULLEY DIAMETER, HIGH BELT SPEED

### 1. Pulley diameter

With a smaller pulley diameter, the stress on the conveyor belt increases because the curve around the pulley becomes sharper. This can lead to increased stress on the joint, the belt itself, or the components on the conveyor belt, such as cleats, resulting in increased wear and stress.

### 2. Belt speed

Higher belt speeds lead to faster movement of the conveyor belt. This can result, for example, in more stretching and twisting between the flights and the pulley, increasing the dynamic load. The components used must be robust and stable to cope with these increased speeds.

## Challenge

In the agricultural sector, the transportation of products like crops, feed, and manure via conveyor belts is indispensable. The substantial weight of these products, along with the typically confined installations, emphasizes the necessity for robust conveyor belts. After all, they must efficiently handle significant material quantities.

## Solution

To address this challenge, the solution lies in applying appropriate conveyor belts tailored to the specific application and installation requirements. Regular maintenance and inspections are essential to mitigate wear and tear effectively.





## Conveyor belt types

When dealing with high and dynamic loads, both rubber and synthetic conveyor belts are suitable. Rubber conveyor belts are often used for transporting raw materials directly from the land. They offer excellent grip and durability, allowing them to withstand heavy loads and harsh conditions.

On the other hand, in more advanced stages of the production process, such as food processing and packaging, synthetic conveyor belts become invaluable. Typically crafted from materials like PVC and PU, these conveyor belts feature smooth surfaces that are easy to clean and disinfect. They are hygienic and, therefore, well-suited for applications where strict hygiene standards are required, particularly in the food industry. These conveyor belts often come with food safety requirements approval.



## 02. CONTAMINATION BY SOIL AND PRODUCT RESIDUES

### Challenge

The presence of manure, silage, sand and other natural materials and impurities can cause blockages in the conveyor. This causes contamination and unnecessary wear on the conveyor belts.

### Solution

Regular cleaning, preventive measures and proper maintenance can help reduce contamination and extend the life of conveyor belts.

## **Conveyor belt types**

Rubber conveyor belts are known for their durability and resistance to wear and tear. They possess high tensile strength and excel in handling heavy loads. Rubber conveyor belts are well-suited for applications where larger pieces of soil and product residues are commonly encountered. The rubber surface provides excellent grip and helps prevent debris from becoming trapped between the rollers and the bottom cover. Additionally, high-quality rubber conveyor belts often exhibit resistance to various materials, including oils and fats such as MOR (vegetable and animal oils and fats) and FOR (synthetic oils and fats). This makes them suitable for environments where aggressive materials are present.

Synthetic conveyor belts are typically lighter in weight and feature a smooth surface. This makes them ideal for applications where fine soil and product residues are prevalent. The smooth surface inhibits residues from adhering to the belts covers, facilitating easy removal during the cleaning process. Synthetic conveyor belts offer the advantage of being low-maintenance and easy to clean. Additionally, like rubber belts, they can also possess antistatic properties, which can be advantageous in environments where the prevention of electrical discharges is necessary.

Opting between rubber and synthetic conveyor belts depends on the specific conditions and requirements of the conveying process. It is important to take these factors into account:

- the nature and size of the soil and product residues;
- the load on the conveyor belts;
- the presence of various materials;
- the required cleaning and maintenance procedures.

In certain scenarios, a combination of both types of conveyor belts may also prove to be optimal. For instance, utilizing a rubber conveyor belts at the outset of the process, where larger residues are prevalent, followed by a synthetic conveyor at a later stage, where finer residues are produced, can enhance the efficiency of the conveying process and minimize the risk of contamination.



## 03. CHANGING SEASONS AND TEMPERATURE VARIATIONS

### Challenge

The agricultural sector encounters fluctuating temperatures as a result of seasonal shifts and diverse processing stages.

### Solution

Rubber conveyor belts are predominantly employed in outdoor environments with extremely low outdoor temperatures. Synthetic conveyor belts, on the other hand, are more commonly utilized indoors under a roof or in situations with limited exposure to low outdoor temperatures. Rubber conveyor belts exhibit greater resistance to ozone and UV radiation compared to synthetic conveyor belts. Both rubber and synthetic are suitable for accommodating varying product temperatures. The choice between rubber and synthetic depends on these temperature conditions and the specific properties required for the conveyor belt's performance.



## Conveyor belt types

In colder outdoor temperatures, rubber conveyor belts are the preferred choice. These belts can be designed to withstand temperatures around  $-20/-25^{\circ}\text{C}$ . Rubber belts also exhibit superior resistance to ozone and UV radiation. They are frequently selected for transporting raw food products harvested from the land, given their resilience against weather, dirt, and stones that may be carried during harvesting. As the processing becomes cleaner, adjustments are made to the conveyor belts accordingly.

In agribusiness, synthetic conveyor belts are effective for applications that involve processing fresh produce, where hygiene is of paramount importance. For processes that require a higher level of cleanliness, such as washing vegetables or slicing potatoes into chips, synthetic conveyor belts are the preferred option.

## **04. PROTECTION OF DELICATE PRODUCTS**

### **Challenge**

Maintaining the quality of delicate products, such as fruit and vegetables, during transport is essential.

### **Solution**

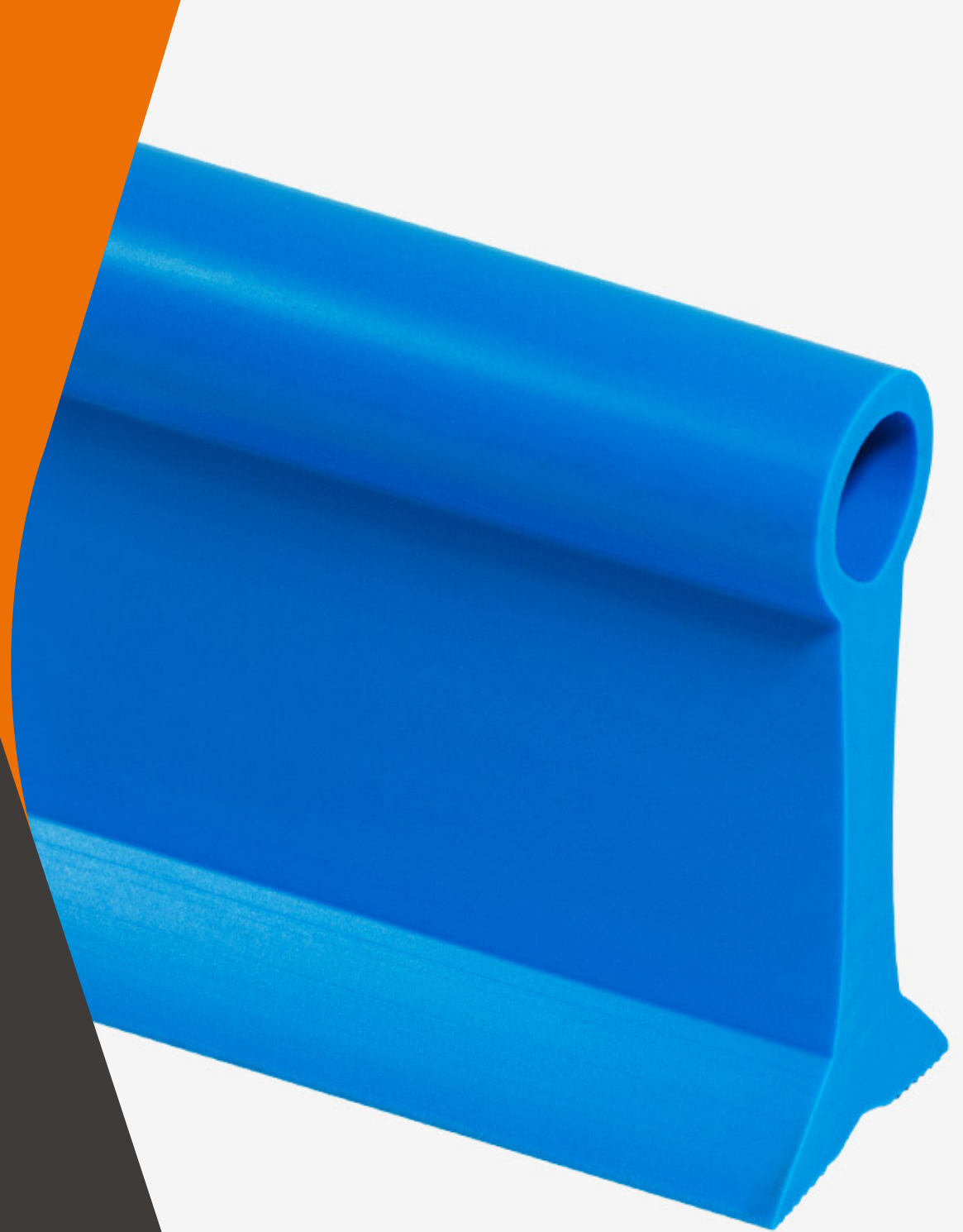
Synthetic and rubber conveyor belts have the ability to soften the landing of the product using various components. This minimises the risk of damage to delicate products.

## **Ecocleat® cleat**

For the transportation of potatoes and onions, we offer our rubber Ecocleat® cleat. Its distinctive design, featuring a rounded top, minimizes the risk of product damage. Ecocleat® undergoes the same unique vulcanization process as our Hotcleat® cleat, ensuring durability and reliability.

## **TO-cleat**

These are soft, flexible cleats attached to the conveyor belt. Material lands on the round hollow top. Due to this design, the product lands softly and reduces the impact on delicate products.





## Finger cleat

Finger belts are synthetic conveyor belts where finger cleats in various sizes and colours are attached. These finger cleats ensure that the products are positioned accurately and safely on the conveyor belt. They prevent products from rolling and falling during transport, preventing damage and waste. Designed for handling delicate products, these conveyor belts provide a stable grip, preventing products from sliding or falling.



## **Bow belts**

These are conveyor belts designed in the shape of waves or arcs. They are used to gradually land delicate products. The undulations or arcs of arch belts help to make the landing of the product as gentle as possible, thus preventing damage to the products.

## **Conveyor belt types**

Synthetic conveyor belts are generally the preferred choice for handling delicate products in the agricultural and food industries. The accessories and components associated with these belts offer several advantages in terms of product protection. It is crucial to ensure that delicate products are not damaged during transportation from point A to point B in the production process.

Safety is of utmost importance in the food industry, and our synthetic conveyor belts meet all food safety requirements. They adhere to the standards set by organizations such as the USDA and the EU. Furthermore, all our products comply with the REACH regulation. Additionally, we uphold our own quality standards, which are even higher than the industry standard.



## 05. OPTIMALE FRICTION

### Challenge

Friction between conveyor belts and products is a crucial aspect of transporting goods efficiently and safely in various agricultural applications. There are different types of friction that are important in preventing slippage and spillage:

- Such as the form of friction between the top cover of the conveyor belt itself and the product being conveyed on it. This friction is crucial for preventing products from slipping on the conveyor belt. The conveyor belts must provide sufficient grip to ensure that products can be transported safely without sliding, this ensures minimal product impact.
- There is also the way of friction that involves the bottom side of the conveyor belt interacting with the cover it's installed on. The conveyor belt can generate friction on the bottom side with the installation surface. When selecting a conveyor belts, it is imperative to consider both its installation and usage to ensure optimal friction levels.

## **Solution**

### **Fabric on the bottom side of the conveyor belt:**

Both with synthetic and rubber conveyor belts, fabric on the bottom side of the belt can be selected to reduce friction with the surface it interacts with. This reduced friction results in quieter operation and alleviates the load on the belt drive.

Additionally, impregnation treatments safeguard the fabric against moisture or sand exposure, preventing issues like shrinkage.

### **Adjustment of conveyor belt speed:**

Modifying the conveyor belt speed can significantly impact the friction between the belt and the transported products. Finding the right speed level contributes to stable and efficient transport.

### **Choice of cover bottom side of the conveyor belt (bottom side cover):**

Important is the choice in bottom side cover of the conveyor belt or cover layer underside conveyor belt. This covering layer may consist of a layer of synthetic, with or without a profile. This structure can provide extra grip or prevent the installation from getting dirty and reduce friction. This is often applied in damp conditions.

### **Product alignment:**

Ensuring proper alignment of products on the conveyor belt is essential to minimize damage between products and prevent unnecessary wear and tear on the belt.

## Conveyor belt types

When selecting the appropriate type of conveyor belt in the agricultural sector, where optimal friction is essential, both rubber and synthetic conveyor belts can be viable options. As the process advances and cleanliness becomes more critical, the preference shifts towards synthetic conveyor belts. Rubber conveyor belts are chosen, for instance, when harvesting potatoes from the field or when soil is present due to their ability to withstand dirt and outdoor conditions during product transport. Conversely, when the products undergo cutting, cleaning, or preparation for packaging, synthetic conveyor belts are the preferred choice. In the agricultural sector and food industry, synthetic conveyor belts are generally favored for delicate products, primarily due to food safety concerns. These belts exhibit a low friction coefficient. In a clean operating environment, selecting fabric on the underside of the conveyor belt is a well-thought-out option, as it also minimizes friction. However, it is crucial to bear in mind that fabric can absorb moisture and dirt, leading to quicker shrinkage. Therefore, choosing impregnated fabric is imperative.

## 06. OWN WEIGHT

### Challenge

The own weight of conveyor belts can have a significant impact on machines and overall efficiency. A conveyor belt that is excessively heavy can overload the machine. Machines are designed with specific limits in mind, including their capacity to carry and transport materials. When the conveyor becomes overloaded, it can result in excessive wear on machine components, heightened energy requirements, and even structural damage to the machine.

### Solution

Considering weight is essential when selecting conveyor belts, with synthetic conveyor belts being lighter compared to their rubber counterparts. Ensuring that the conveyor stays within the appropriate weight limits will contribute to maintaining the machine's efficiency and safety.





## Conveyor belt types

When selecting the appropriate conveyor belt, it is crucial to consider the load's weight and the specific application requirements. In this context, we will explore the choice between rubber and synthetic conveyor belts, while also taking their own weight into account.

Rubber conveyor belts have a long-standing presence in the agricultural sector due to their durability and flexibility. They can handle substantial weight and endure heavy loads effectively. Rubber conveyor belts excel in shock and impact resistance and are highly resistant to wear and tear, ensuring extended service life even in challenging conditions. These qualities make them ideal for transporting heavy loads in agriculture. However, it's essential to consider their overall weight.

Synthetic conveyor belts offer distinct advantages that render them suitable for particular applications. They are lighter than rubber conveyor belts, simplifying handling and installation. However, this consideration is closely tied to the type of product being conveyed. Synthetic conveyor belts are employed for lighter products, such as washed or pre-packaged items, resulting in reduced overall weight. Consequently, smaller pulleys can be chosen more easily. Additionally, synthetic conveyor belts boast a low coefficient of friction, enhancing energy efficiency.

The design of the conveyor belt, encompassing its length, width, and configuration, can impact its weight-bearing capacity. A well-designed conveyor belt can evenly distribute weight and minimize the strain on the structure.



## CONVEYOR BELTS AT LBS

At LBS, we fully comprehend the complex needs of the agricultural sector. We offer expertise and support in choosing the ideal conveyor belt for each application. Our belts are specially designed to perform reliably and efficiently in agricultural conditions.

**Contact us now for a customised conveyor solution!**

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