GEYSEN
CLEAN CONVEYOR BELT

A SPILL-FREE INTERNAL BULK TRANSPORT SYSTEM

Problem statement: Why traditional transport systems slow down your production

Conveyor belts for bulk transport – whether enclosed or not – often have to deal with material falling off the belt. This triggers a chain of unwanted effects. The underlying drive mechanism becomes contaminated, which can cause it to jam or even derail. Additionally, any contamination or buildup on the bearings increases friction and/or misalignment, leading to accelerated wear and tear. Spilled material ultimately ends up in the production environment, resulting in product loss and cleaning costs.

The consequences are well-known in production settings with many conveyor systems: unexpected downtime and time-consuming preventive and corrective maintenance. Depending on the transported materials, belts can be out of operation for up to 20% of the time due to cleaning, maintenance, and repairs. Naturally, this is a major frustration for operators and production managers in the industry, as it costs both time and money.

Solution: a spill-free transport system

Geysen Group, through its subsidiary Clean Conveyor Belt (CCB), has developed a solution that tackles the problem of wear—and thus the need for additional maintenance or repair—at its source. The patented CCB design ensures that there is no product contamination of the mechanisms. Nothing is spilled above, below, beside, or between the belts, and therefore not inside the casing or into the surrounding environment either. With this, the CCB belt innovatively returns to the core principle of bulk transport: moving bulk from A to B without spillage or downtime.

CCB is more than just a replacement for traditional open or enclosed transport systems. It is an innovative, all-in-one concept developed with a focus on maximum uptime and minimal wear.

This also results in a **lower Total Cost of Ownership (TCO)**, thanks to:

- Greatly reduced cleaning hours
- A clean, safe, and pleasant working environment
- Significantly lower maintenance
- Process stability
- Maximum productivity of your installation (maximum uptime)

Clean Conveyor Belt is an attractive alternative to traditional transport systems. Moreover, it is the only spill-free transport system with a **patented design** that is **wear-resistant** and requires **minimal maintenance** and **downtime**.

In which sectors can CCB be used?

CCB is applicable in a wide range of sectors, particularly in the **transport of bulk materials** where spillage or contamination is a major challenge. The CCB solution is especially well-suited for the food industry, the recycling sector, (chemical) manufacturing companies, and industry in general. The CCB concept is particularly valuable in production environments where downtime for maintenance or repairs must be minimized (e.g., continuous operations).

The development was carried out in co-creation with partners from the recycling and chemical sectors, as well as suppliers. Some of the materials that can be transported include:

- **Dusty products** such as cement, lime, grain, fertilizers, ...
- **Light materials** such as paper, wood shavings, plastic pellets, ...
- **Recyclable materials** such as metal, PVC, PET, glass shards, ...
- **Sticky materials** such as sand, clay, ores, ...
- **Hazardous materials** such as chemicals, toxic substances, ...

A smart patented design with smart advantages

Thanks to the patented design of the enclosed conveyor belt with cords, no material can enter the drive or belt mechanism. This results in:

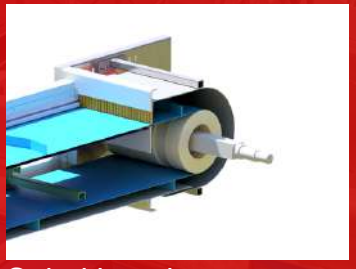
- **Minimal material loss and spillage**
- **No misalignment (belt tracking issues)**
- **Reduced wear and tear**
- **Less maintenance and fewer repairs**
- **Less downtime and a cleaner production environment**

Depending on the type of material and the specific context or application, we select one of the patented engineering options that ensures the belt remains spill-free. By using various types of seals and cords on the belt, it can be tailored to the bulk material being transported – from coarse pieces to fine powders.

Cleats + return sealing

Labyrinth seal

Flap seal



Spiral housing

- Only one bearing (return roller): virtually no wear
- High-grade plastic belt (extremely durable)
- Stainless steel (INOX)

Closed transport systems: a smart choice or not?

- ⊕ **PRO**: no spillage, no airborne material, product protection, increased safety, lower maintenance costs, and fits perfectly in a zero (pellet) loss environment.
- ⊖ **CON**: in maintenance-intensive designs (due to contamination), inspection and repair can be more difficult.

Thanks to CCB, the choice for a closed system becomes a no-brainer. It combines smart engineering with low maintenance costs and an optimal Total Cost of Ownership (TCO).

Closed system? Think CCB - the smart solution

When selecting a transport system, a production supervisor has several concept options. Depending on the application, material type, environment, and the length of the system, some concepts may be more suitable than others.

For bulk applications—where spillage is a major issue—closed systems are often the go-to solution. However, traditional closed systems make visual inspection difficult and require time-consuming maintenance and repair. And that's exactly where CCB makes the difference. It combines all the advantages of a closed system with an innovative design that minimizes downtime. This enables you to get the most out of your installation with maximum reliability.

From CAPEX to OPEX – the TCO approach

Today, investment in a transport system is primarily CAPEX-driven, with the focus mainly on the purchase price of the system. In complex production environments, the implementation plan and the estimated impact on production processes also influence the decision. However, it's far more insightful to look at the Total Cost of Ownership (TCO). This approach takes into account not only the purchase cost (CAPEX) but also the many costs incurred during operation (OPEX).

Naturally, it's not always easy to clearly map out all the operational costs that arise during the use of a system. However, past experience with other systems and the analysis of various cost components make it possible to estimate the Total Cost of Ownership (TCO) with reasonable accuracy. This approach often reveals valuable insights into the impact of maintenance, repair, and downtime costs.

CCB is designed to optimize the TCO. We can simulate models based on customer-specific data that transparently calculate this approach (see box). We don't just offer a transport system or off-the-shelf solution — **we deliver a system that is fully optimized to your needs!**

A lower Total Cost of Ownership (TCO) for an optimal transport system

Total Cost of Ownership (TCO) plays a key role in budget planning. CCB makes the TCO transparent using a set of parameters defined together with the customer.

TCO = Cic + Cin + Ce + Co + Cm + Cp + Cs + Cenv + Cd + Cind

- Cic = Initial costs (purchase price)
- Cin = Installation and commissioning costs (including training)
- Ce = Energy costs (estimated operational energy, control systems, and any additional services)
- Co = Operating costs (labor for standard supervision)
- Cm = Maintenance and repair costs (cleaning, routine and expected repairs)
- Cp = Product loss due to spillage
- Cs = Downtime costs (loss of production)
- Cenv = Environmental costs (waste disposal, emissions)
- Cd = Decommissioning/removal costs
- Cind = Indirect costs (overhead/general costs)

Study of the University of Antwerp

CCB responds to a market need

In collaboration with the Faculty of Business and Economics (University of Antwerp), a study was conducted in April and May 2021 on issues related to maintenance and wear in conveyor systems. The participants were production and maintenance supervisors or managers from manufacturing companies in sectors such as food, chemicals, and recycling. The study confirmed the challenges of wear and tear, excessive maintenance, unexpected repairs, and downtime.

Key findings from the study:

50% of respondents use both open and closed conveyor systems.

The average system lifespan varied greatly, with **66%** reporting a lifespan of less than 10 years.

The transported materials included food, fertilizers, recycling materials, bulk goods, dusty, sticky, or chemical substances.

In **92%** of companies, production pressure was high or operations were continuous, making unexpected maintenance or downtime a significant issue.

58% reported material spillage, leading to contamination and increased wear.

In **67%** of companies, maintenance was performed by in-house personnel. The remaining 34% relied on external parties (suppliers or manufacturers).

Sustainability is more than just a buzzword for the respondents. Key priorities include:

- Use of sustainable materials (**71.5%**)
- Low energy consumption (**38%**)
- Circular design (**38%**)

The primary concern among respondents was the cost impact of contamination, particularly related to downtime, maintenance, and repairs.

The top three causes of issues with conveyor systems are: (1) belt misalignment/tracking, (2) bearing issues and (3) belt breakage.

Other commonly reported defects include:

- Wear on the belt due to rubbing against guides
- Jamming caused by buildup of dirt or material
- Contamination from dust combined with belt lubrication
- Damage (fraying, cuts, degraded top layer), often leading to belt breakage
- Drive failure (often caused by dirt interfering with lubrication)
- Wear on the running surface
- Chain or belt elongation
- Wear on idler wheels and drive wheels
- Wear on components due to abrasiveness and impact of transported materials
- Wear on the chain, drive or return wheels, chain pushers, and bearings

The table below provides an overview of the key decision-making criteria when selecting and purchasing new transport systems.

Purchase price of the conveyor system	82%
Cost of maintenance and repairs	65%
Installation cost	59%
Cost of replacing worn parts	59%
Cost of replacing broken parts	59%
Service costs	47%
Downtime cost due to maintenance (production loss)	41%
Downtime cost due to breakdowns (production loss)	41%
Cleaning cost	35%

When all key factors are taken into account—and not just the initial investment cost—the Clean Conveyor Belt offers the most robust total solution in terms of Total Cost of Ownership.

University of Antwerp
Faculty of Business and Economics

Our 4-step approach

1. Analysis of your needs
Together, we assess your transport challenges, technical specifications, operational context, and investment horizon (with a focus on TCO). Would you like to test your material on our demo setup? That's absolutely possible and completely without obligation.

2. Proposal of (technical) solution
Based on your specific situation and requirements, we provide a tailored proposal and technical design.

3. Engineering and production
The new transport system is built and fully assembled.

4. Installation of your Clean Conveyor Belt
Our experienced installation team ensures seamless integration of the CCB system into your production environment, so you can immediately start with spill-free and efficient bulk transport.

Conclusion

Choosing CCB means choosing a superior transport concept. It delivers maximum production efficiency at the lowest Total Cost of Ownership (TCO), thanks to:

- Greatly reduced cleaning time
- A clean, safe, and pleasant working environment
- Significantly lower maintenance requirements
- Enhanced process stability
- Maximum productivity and uptime of your installation

Interested in testing your product in our test setup without any obligations? Feel free to contact us – no commitments, but visible results you can see for yourself.

Boris Ackx
boris.ackx@geysenccb.be
014 56 42 72
www.geysen.be/en/ccb

Geysen Clean Conveyor Belt
Snelwegstraat 1A
BE - 2260 Westerlo