BITO LEO

BITO
STORAGE SYSTEMS
NORDIC

LEO flow

The self-guided transport system

LEO flow – Your autonomous load carrier system

LEO flow has the same body as the LEO custom transporter and is the perfect space-saving, autonomous transport solution for logistics and production environments.

LEO flow is "roofed" by a loading platform with powered rollers. Bins, cartons and other load carriers can be delivered or picked up either at a 90° angle to the direction of travel or into the direction of travel.

The platform with powered rollers can be adjusted in height, making LEO flow the ideal solution for brownfield applications with existing conveyor systems and roller conveyors with different height levels.

A Smartbox control unit is used for communication between the conveyor system and the LEO system.
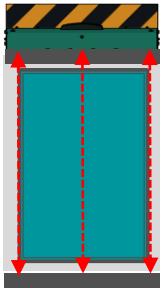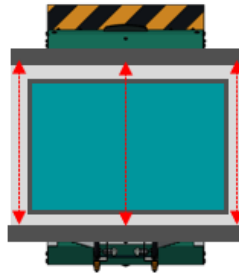
LEO flow on-top constructions

Options:

BITO LEO flow vehicles can transport one or more bins or other load carriers.
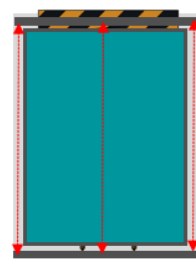Three on-top construction sizes are available initially, each coming in three different variants.
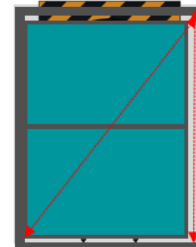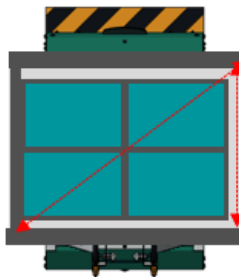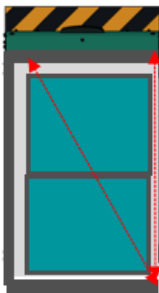
600x400mm	400x600mm	800x600 mm

Variant designed for conveying a single bin with the possibility to pick up loads both on the left and on the right side to the direction of travel.

Variant designed for conveying multiple bins from or to the right side of the direction of travel.
Bins are only conveyed in batches from or to one direction.
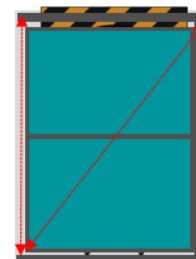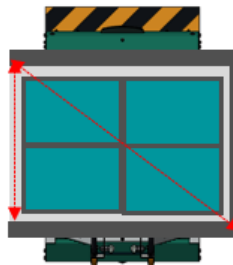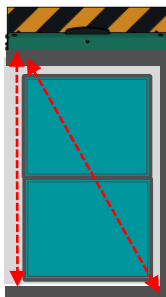
Variant designed for conveying multiple bins from or to the left side of the direction of travel.
Bins are only conveyed in batches from or to one direction.

LEO flow load capacities

On-top construction dimensions	Load capacity "Fixed height" variant	Load capacity "Automatic lift" variant
600x400 400x600	35kg	30kg
800x600	35kg	25kg

LEO flow "Fixed height" variant

The **minimum** delivery height that can be selected is 400 mm measured from the lower edge of the load carrier.

The **maximum** delivery height that can be selected is 1,200 mm measured from the lower edge of the load carrier.

The ideal height is determined individually for each customer project.

The selected height is maintained by a spacer construction. Other body heights require different spacer constructions.

LEO flow "Automatic lift" variant

Customers can also opt for a LEO flow transporter with automatic lift function.
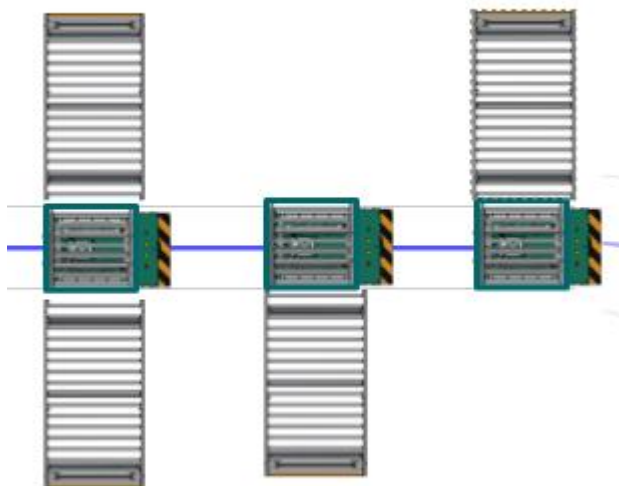
Lift heights vary from 400 mm to 1,200 mm.

Heights can be easily programmed for each delivery/pick-up point and adapted later on, if required.

This also means that LEO flow will perfectly adapt to existing systems.

LEO flow configurations

Pick-up and delivery configurations

LEO flow has been optimised for bin loading and unloading at right angles to the direction of travel.

Bins can be both picked up and delivered from one direction.

LEO flow can be designed to allow bins to be picked up and dropped off from either side, depending on the requirement and destination.

LEO flow multiple configurations

Pick-up and delivery points can be placed immediately one after the other/next to each other to create multiple buffer lanes / a large amount of buffer space in a small floor area.
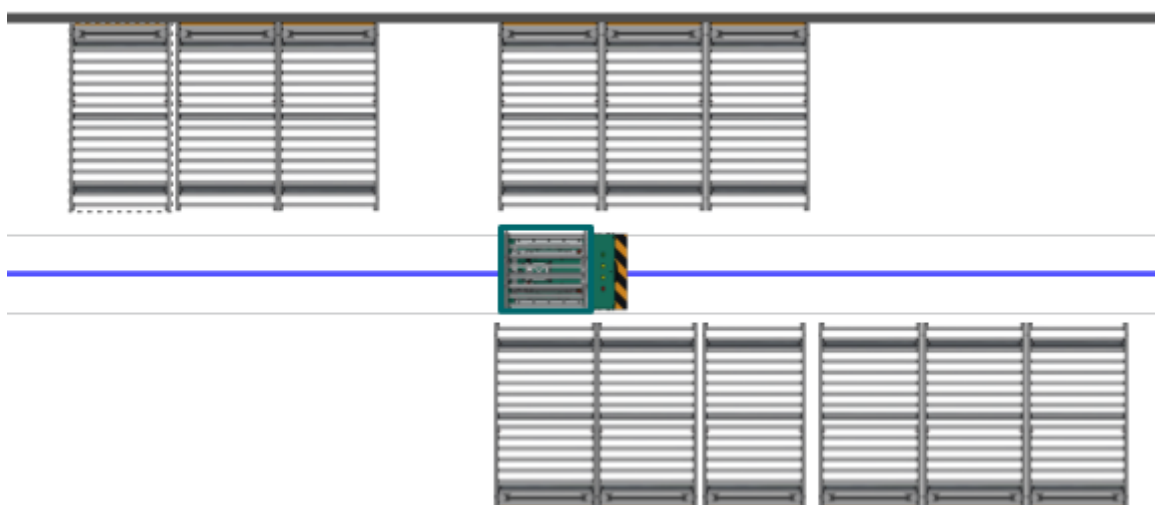
Routing configurations

LEO flow is able to turn on the spot and drive very short distances in reverse.

To do so, the system uses the differential drive on the rear axle. Consequently, the centre of rotation is at the rear of the vehicle.

This also enables loading and unloading in narrow, difficult-to-reach areas.

The Smart Box enables route sections to be blocked off to use a section for driving in both directions.

(1) 90° turn in front of a wall
(2) 180° rotation in a dead end
(3) 90° rotation in two directions if space to the right and left of a pick-up/drop-off station is very limited
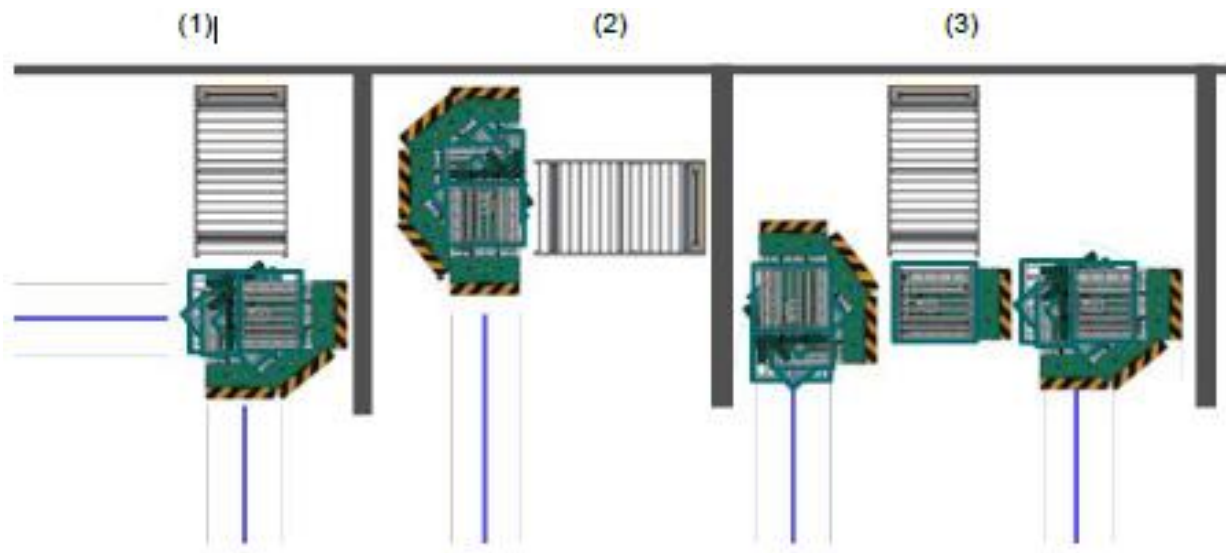
Application example in a logistics setting

Conveyor systems are widely used to support workflow in logistic settings. Their advantage is primarily in conveying a large amount of material over long distances in a very short time.

On the other hand, conveyor technology requires a significant investment. Operating costs as well as space requirements are also considerable.

LEO flow is your ideal solution if the following applies:

+ Working time is 8 to 16 h/day
+ Transport volume of less than 100 load carriers per hour
+ Travel distances are longer than 25 metres
+ Travel routes must remain unobstructed in order not to limit lift truck operation
+ Your energy costs are a relevant factor in your overall production calculation
+ You wish to reduce your maintenance and service costs
+ You no longer want a "single point of failure"!

LEO flow solution:

- LEO flow is either loaded directly by the operator or receives goods from an existing conveyor system.
- LEO bridges a distance of 100 meters, for example.
- LEO flow delivers materials to a conveyor belt or a standard roller lane.
- In our example, the entire assignment is completed in less than 3 minutes.
- A LEO flow vehicle can complete up to 20 assignments per hour or 380 assignments per day (incl. loading time).

Application example in a production setting

In production environments, human work and space are always in short supply. Automation concepts for transport tasks are often complicated, expensive and require long implementation times.

LEO flow is your ideal solution if the following applies:

+ LEO flow has been designed for operating in confined spaces. On-the-spot turning and covering short distances by reversing enable many drop-off and pick-up points to be approached.
+ The height-adjustable design makes the system very easy to integrate into an existing infrastructure.
+ The simple BITO LEO principle with optical track guidance, standardised command markers and the decentralized control unit (Smart Box) opens up the possibility of more complex applications without integration into the IT system.
+ Since no WLAN is required, LEO flow can be guided by simple input media such as barcode readers, push-button operation or tablet control.
+ All these measures help to reduce investment costs and implementation time. In addition, independent adjustments can be made that allow you to quickly react to changes in your processes.

LEO flow solution:

- A production machine must be supplied with empty bins, bins with finished products must be carried away.
- The machine is connected with a conveyor belt and has been fitted with a LEO Smart Box.
- LEO flow vehicles pick up empty bins and move along the production lines. As soon as a demand is reported by the Smartbox, LEO flow is there to meet the demand.
- In the next step, LEO automatically looks for finished goods that need to be collected and transported for example to the central warehouse.

Spritzgussmaschine
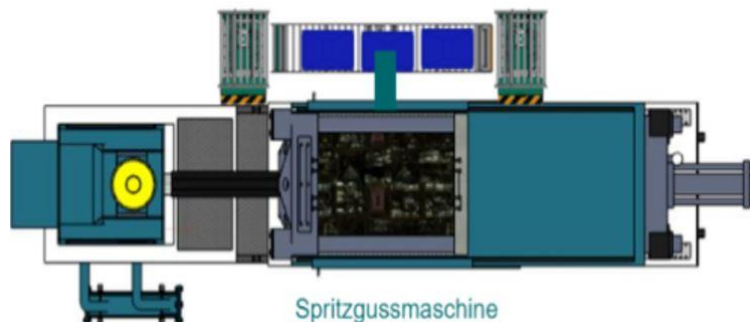
LEO flow accessories

Conveyor technology & roller lanes

BITO offers a wide range of roller tracks, roller conveyors and material handling options to match the system

such as BITO carton live storage which has been tried and tested for decades.

Roller tracks

Full-width roller lanes

Sensors & Communication options

To integrate existing conveyor systems or roller lanes into a LEO flow configuration, the BITO LEO modular system provides a number of solutions:

- Space monitoring with light barriers (one or two light barriers)

- Communication between the conveyor system and the

  LEO transporter is carried out with the BITO Smartbox.

BITO Smartbox

LEO configuration via tablet

The BITO Smartbox combined with the BITO LEO app on a tablet allows to configure pick-up and drop-off points:

- What is the purpose of a station?

- Where should load carriers be picked up and delivered?

- Should load carriers be held in waiting?

- Should LEO only stop when a load carrier is available?

Code tapes determine LEO halts accurate to the millimetre

A code tape enables LEO vehicles to stop with pinpoint accuracy for pick-up and drop-off tasks.

The LEO engine controls the travel movement and prevents fluctuations due to loading differences.

LEO flow data sheet*

LEO flow transporter

Maximum speed	0.7 m/s
Minimum speed	0.3 m/s
Voltage:	24V
DC Power supply:	40W
IP code (Ingress Protection Code):	21 IP
Noise emission:	<60dB

LEO battery

Dimensions (W × L × H)	370 × 80 × 225 mm
Battery type	LiFePo4
Weight	7 kg
Capacity	20 Ah
Service hours (battery fully charged)	12 – 16 h
Charging time	6 – 8 h

BITO LEO charger

Dimensions (W × L × H)	120 × 190 × 70 mm
Primary voltage	230 V / AC 50 Hz
Charging current	4 to 5 A
IEC Protection class	III

*The effective dimensions of the system vary depending on the

type of on-top construction and the requested construction height.

The required track widths also vary.

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