

## AUTOMATIC CONVEYOR BELT FOR WAGONS LOADING

# CB15



**The Automatic Conveyor Belt for Loading Wagons has been designed and made for loading wagons that transport and unload ballast.**

**It can be accommodated to customer specifications.**

The CB15 belt can be placed on the rail wagon and can be easily transported by standard road trailer. The system is composed of a rubber belt having roller supports and driven by a Diesel engine.

The ballast moves from the ballast-cleaning machine at the head of the train. During this ballast transfer, the operator can decide from which wagon he will start the load (generally from the last unit).

The machine can be operated automatically through radio control. The deflector of the trolley descends on the rubber belt, forcing the ballast to fall inside the wagon below (plough effect). With double-powered sensor system, the PLC drives independently the load of the wagon until the procedure is completed. Once the loading process is completed, the PLC installed on every single belt activates the automatic cycle of the preceding belt until the loading of all wagons is completed. After the loading operation, the belt places the trolley at the point of rest and stops. It is possible to keep the engine on if necessary while working during the night. Thanks to this automatic system, one operator is able to manage the load of more than one wagon, following the working operations on the monitor installed on each belt, thus avoiding dangerous maneuvers of climb and descent from the wagons.

An electric board operates the whole system with PLC pushbutton to control 10 belts simultaneously or independently.

### SAFETY

#### Stop devices:

- Bonnet (rear area);
- 1 button for engine stop.

#### Main radio control:

- 1 emergency stop button - for all the belts;
- 1 emergency stop button selected engine.

### Technical characteristics:

#### Technical data WORK MODE (UNFOLDED)

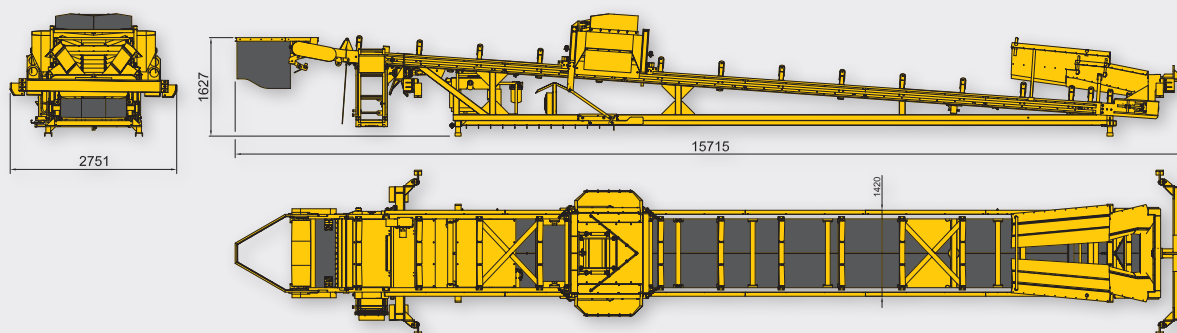
Length Max .....	15.500 mm
Width Max .....	2.740 mm
Height Max .....	2.200 mm
Material flow Max of belt .....	900 m³/h

#### Technical data TRANSFER MODE (FOLDED)

Length .....	13.500 mm
Width .....	2.460 mm
Height .....	2.000 mm
Tare .....	6.000 kg

#### Diesel Engine

Number of cylinders .....	4 in line
Power .....	25 kW



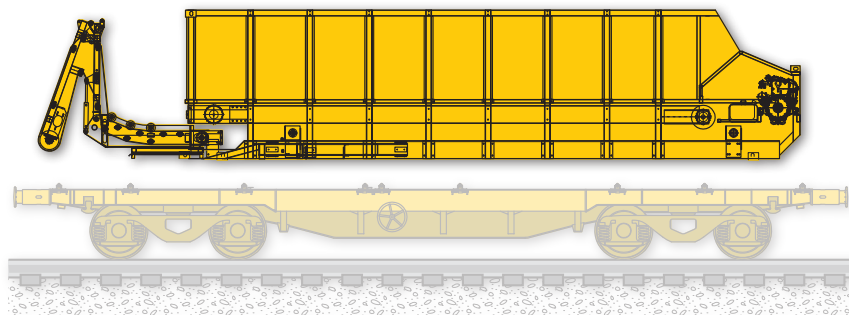
# MODULO 30

# MODULO 40

## BALLAST TRANSPORT SYSTEMS

### Preparation, filling and emptying:

The conveying and silos units for waste material of "Modulo" type, are designed and manufactured as standard containers to be arranged on standard flat wagons.

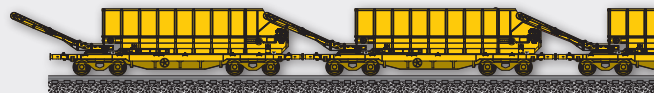


Big quantities of waste material that must be correctly disposed result from the renewal of ballast and different tracks. In the past, such waste material was usually deposited along the track; nowadays, stricter rules require transporting it to a suitable place for discharging and disposal. In particular cases, such as stations, tunnels or trenches, the only possible solution is to load the waste material on wagons.

A rapid and flexible way to transport new ballast is a task that requires a feasible and convenient solution.

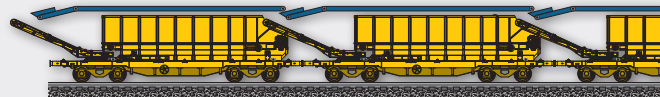
### MODULO meets following requirements:

- Full automation of loading, conveying, accumulation and discharging operations;
- Adaptation to the site conditions or to the specific task, without any problems;
- Optimization of the Ballast Cleaning Machine performances;
- Reduction of labour costs;
- Each "Modulo" has its individual power supply.



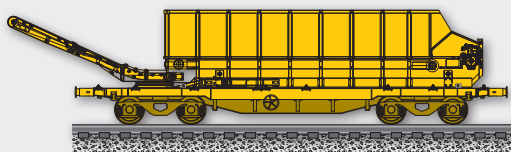
### Load and transport of the waste material from the Ballast Cleaning Machine:

The conveyor belt on the front side of "Modulo" is designed in such a way that it can slew on the 3 axes (x, y and z). The conveyor belt transports the waste material to the next "Modulo" during loading operations. By rotating the conveyor belt it is also possible to discharge the waste material or ballast on the side of the track, both to the left and to the right, or on other wagons and road vehicles. A certain number of "Modulo" units, positioned on railway wagons, can be used to transport any kind of material and travel in train compositions of the required length.

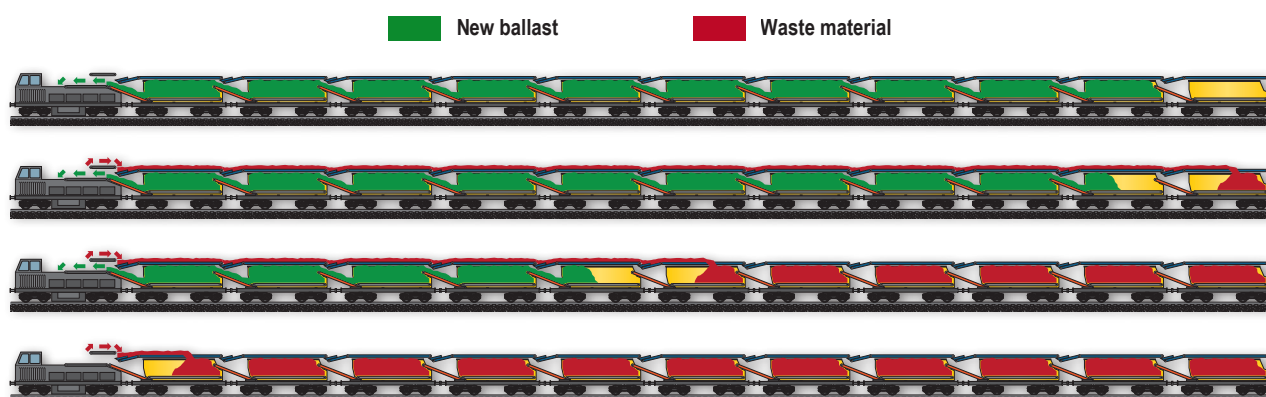


### Load and transport of new ballast from working site and waste material from ballast cleaning machine

This can be done by positioning a further conveyor belt on the upper part of each "Modulo" unit. By attaching the wagons to the Ballast Cleaning Machine in the opposite direction, it is possible to reach the working site with a new train composition consisting of a certain number of wagons – all loaded with fresh ballast, but one empty wagon.



The loading platform of "Modulo" is offered with a conveyor belt system to load and transport the waste material to the following "Modulo" units.



When the Ballast Cleaning Machine starts working, the waste material is transferred to the upper conveyor belts and conveyed to the last “Modulo” unit, which was purposely not loaded. At the same time, the new ballast is transferred to the Ballast Cleaning Machine by means of the lower conveyor belt of “MODULO” unit: in this way, while the new ballast is discharged, the newly available space is filled with the waste material. Given the limits of the working site lengths, using this system we are able to double the production capacity. As a matter of fact, the two traditional working trains, one for the transportation of new materials and one for loading the waste material, are no longer required. Provided that the loading system is controlled automatically, the number of workers shall be reduced; only one person is required to control both loading and unloading operations, contrary to the traditional system which required two workers, one for loading and one for unloading operations.

**Technical characteristics of “MODULO”:** Innovative system for the transportation and disposal of ballast utilising a 30 ft., or 40ft, container. It can be positioned on any type of flat wagon, provided with twist-locks, equipped with blocks for the twist locks and transportable by a container carrying truck, according to the allowed dimensions.

- Load compartment with rubber belt for a rapid and easy evacuation of the ballast;
- Walls coated with wear resisting material (Polizene);
- Back conveyor belt, foldable to facilitate the transport, with adjustable vertical and transversal inclination and side oscillation;
- Available to fit customer specifications, and for all rail gauges;
- Hydraulic unit, provided with endothermic Diesel engine of 100 kW approx., quickly interchangeable;
- Closed circuit hydraulic system for driving the conveyor belt, hopper and discharging belt;
- Open circuit hydraulic system for all other services;
- Hydraulic safety sockets, in case of failure, for the adjustment to gauge of Modulo;
- Capacity (volume): Modulo 30: 30 m<sup>3</sup> – Modulo 40: 40 m<sup>3</sup>;
- Empty weight: Modulo 30: about 10 t, Modulo 40: about 12 t;
- Length (in transport position): Modulo 30 12.500 mm – Modulo 40: 13.500 mm;
- Length (in work mode): Modulo 30: 16.000 mm – Modulo 40: 19.500 mm;
- Width (in transport/work mode): Modulo 30 and Modulo 40: 2.550 mm;
- Height (in transport position): Modulo 30= 2.550 mm – Modulo 40= 2.860 mm;
- Radio control unit to operate up to 20 Modulo units;
- Spare remote control unit, one for each Modulo, in case of failure of the radio control unit.

#### **“MODULO” in combination with a Ballast Cleaning Machine:**

- The wagons on which the “Modulo” units have been positioned are attached to the Ballast Cleaning Machine;
- The transport capacity of the conveyor belt, from the Ballast Cleaning Machine to the “Modulo” units, is up to 900 m<sup>3</sup>/h of waste material/ballast;
- The train for the transportation of the material is loaded in a continuous way, starting from the last unit to the first;
- Once the rear half of the “Modulo” train is loaded, those wagons are attached to a locomotive and transferred to the discharge place;
- In the meantime, the “Modulo” units which remained attached to the Ballast Cleaning Machine have been loaded;
- After having attached the wagons to the “Modulo” units loaded with ballast, the accumulated material is quickly transferred to the last half of the train just emptied;
- Working cycle can start again as soon as the first half of the “Modulo” train units is loaded again.

In this way, the Ballast Cleaning Machine can work without interruptions.

The number of “Modulo” units used depends, among other things, on the quantity of material that will be handled, on the distance between working site and discharge site and on the speed of the Ballast Cleaning Machine.



# STI20 BALLAST HANDLING SYSTEM



The system COLMAR STI 20 allows the loading, transport and unloading of the aggregates (crushed stone), with a considerable reduction of costs and time compared to conventional transport systems.

## ADVANTAGES OF COLMAR'S MATERIAL HANDLING SYSTEM:

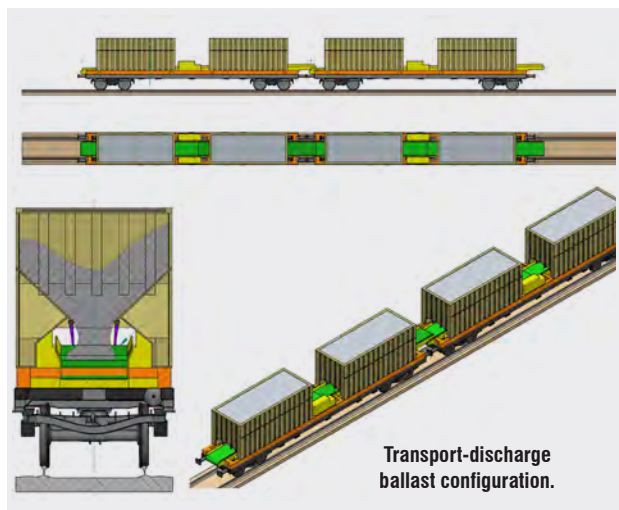
- Reduction of ballast handling costs, of front loaders use;
- Reduction of ballast loss (about 20% of the total);
- Better preservation of the ballast, which can be piled up for, long periods;
- Less environmental pollution due to lower material dispersion;
- Reduction of the maintenance costs.
- Reduction of investment costs (Wagon Purchase);
- Reduction of the labour costs for unloading operations;
- Possibility to use the discharging belt, after having positioned said discharging belt on the top of the containers, to load debris. In case of handling harmful material (asbestos), such harmful material can be loaded directly into the containers, hermetically sealed and transported to the disposal sites.
- Increased stability: the ballast is unloaded to the center of the track (even when ballast is discharged on a curved track).

### Technical characteristics

Empty Weight (approx.)	t	15
Max belt flow rate	m <sup>3</sup> /h	900

COLMAR STI 20 includes two parts: The first part consists of n. 2 standard 20 ft containers being modified in the lower part only. The capacity of such container is 20 m<sup>3</sup>. These containers can be fastened to the standard flat wagon and they are also transportable by truck, even in full load conditions. The second part consists of a conveyor belt, mounted on a steel structure to be fastened to the standard flat wagons. This structure is provided with an independent Diesel engine with hydraulic and electric unit for lighting. Everything is remote-controlled, only one transmitting unit may control up to 39 Inert Material Handling Systems.





During the transportation phase, the unloading structure is capable to withdraw itself in an automatic way allowing getting length and width sizes similar to a 40 ft. container. To facilitate this phase, this equipment can be stacked with a maximum of five pieces when empty.

The ballast can be transported by using our 20 ft. containers, which can be transported, both on rail and on road, directly from the ballast pit.

To distribute the ballast on the ballast bed, standard flat wagons for container transport can be used on which the automatic unloading system will be positioned; on the top of the automatic unloading system the two 20 ft. modules, full of ballast will be then positioned and fastened by means of twist locks, so the working train will be formed by a certain number of wagons.

At the end of these ballast-handling operations, the operator, by using the radio-control, may control the opening of the discharge outlets of the different containers as needed. The ballast will be transferred on the different conveyor belts until it reaches the end part of the train; now the ballast can be:

- Dropped on the ballast bed between the two rails;
- Distributed by using a radio-controlled ballast distributing/profiling device, both in the middle and on the track bench;
- Unloaded on the adjacent track or on the pathways both left and right, by using a radio-controlled conveyor capable to turn both to the right and to the left.

Once the distribution of the ballast is finished, the working train can go back to the depot and quickly replace the empty containers with the containers full of ballast.

**Optional:** Upper conveyor belt.

