

Railway equipment



Railway equipment manufacture

Teräspyörä-Steelwheel Oy is a Finnish locomotive and railway maintenance equipment supplier

Teräspyörä-Steelwheel Oy manufactures a wide range of rolling stock, for example, shunting locomotives and robots, railway maintenance equipment, locomotive shunting couplers as well as stationary wagon moving systems and brake testing equipment. We also provide service, maintenance, and refurbishment work for railway products. Furthermore, we import railway equipment, locomotive components and railway maintenance equipment to Finland.

Steelwheel has own development and design department. In our design work, we use modern 3D modelling, engineering, and computing systems. The majority of our products are designed by us, ensuring the continuity of product development. We are also prepared to engineer customer-specific solutions of high quality and to offer consulting services.

Our product assembly takes place on the company's premises, which allows controlling and testing the products during the production phase. Most of the parts and components are produced by reliable European contract manu-

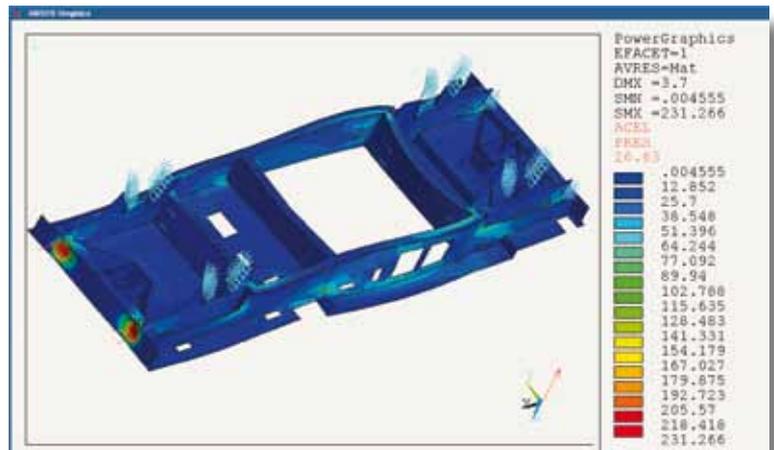
facturers with long-term business relationships.

Our customers are railway operators, railway building and maintenance contractors, industrial plants and mines world-wide. A lot of the production goes into export.

Steelwheel provides long experience in acceptance processes of railway stock in Finland. Our measurement department organises, implements and documents type tests and prepares the approval documents for further processing by the authorities.

Steelwheel performs service and maintenance work for all kind of rolling stock in Finland. It holds an ISO 9001 and 14001 compliant management system and a licence for maintenance work of the rolling stock, issued by the authorities.

The Steelwheel Rail Service Center is located in Kouvola, Finland. In addition to this, we offer maintenance at the customers' premises, and our service cars support customers in all Scandinavian and Baltic countries.





Defining stability of a maintenance trolley, used for personnel lifting, by means of load and lean test.

From past to the present, to product development and research

Steelwheel and railways have gone together for more than 50 years. The company was founded by Mr. Tapio Saalasti after the Second World War in 1945 and was first called "Engineering Office Saalasti". The company received its first assignments related to railways already in the early 1950's. Light, narrow-gauge locomotives that were part of war reparations for Soviet Union stayed for one reason or another in Finland and had to be modified to match the rail gauge used in Finland. Since these locomotives were soon sold out, the company decided to start locomotive manufacturing itself.

This is how the rolling stock manufacture started. The first OTSO locomotive was produced in 1956. In addition to the shunting locomotive manufacture, the company also started producing railroad maintenance trolleys and importing passenger coaches.

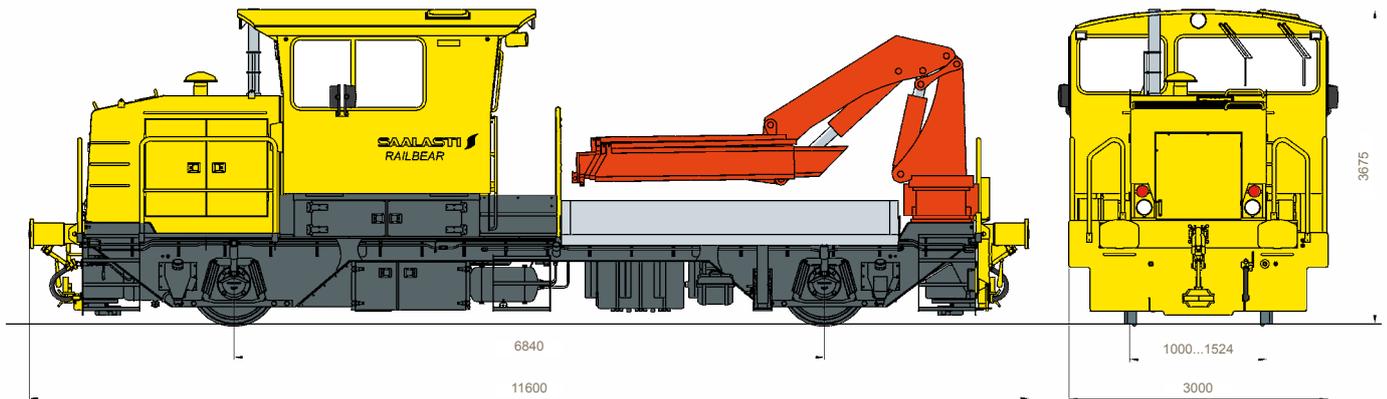
Railroad machinery export started in 1970, when the first locomotives were delivered to Sweden. The first radio-controlled shunting locomotives and robot locomotives without cabins were produced in 1977.

Service work for the railways has been done under the name Teräspyörä-Steelwheel Oy since 2005 and manufacturing since 2010. Steelwheel is a subsidiary of Saalasti Oy.



Railbear track maintenance trolley

Multi-purpose railcar for railway track renewal and maintenance work



Railbear is a multi-purpose railcar that is intended for railway track maintenance, track repairs and renewal work. It can be used for various purposes, such as hauling material wagons and transporting working personnel and equipment to the work site, crane loading and unloading, using hydraulic equipment such as a snow brush, blower or vegetation cutter etc. The crane can also be used with a CE-approved personnel lifting device. The Railbear can be equipped with various auxiliary equipment.

Technical data

Max. speed	80 km/h (100 km/h)
Max. tractive effort	ca. 60–120 kN
Tare weight	20–28 t
Payload	12–14 t
Diesel engine	ca. 200–500 kW
Transmission	Hydrodynamic or hydrostatic



Different versions

Railbear can be manufactured in many different versions and configurations. There are versions for different railway gauges and vehicle profiles.

- Basic railcar
- Service and maintenance trolley for overhead electric line
- Railcar with heavy hydraulic loading crane
- Railcar with personnel lifting device
- Railcar for metro

The axle load of the heaviest version is 20 t with a full load and it can be used, for example, for hauling material wagons and transporting heavy loads with the crane. The lighter version used for maintenance of metro tracks has smaller vehicle profile and its axle load is ca. 10 t.

The cabin is located either at the end or in the middle of the vehicle. The end-cabin version with the personnel lifting device on the cabin can be used, for example, for service and maintenance of electric railways. There can also be cabins at both ends of the wagon, which allows installation of machinery or working platform between them.





Transmission

The transmission is either hydrodynamic or hydrostatic. The hydrodynamic version can be equipped with a separate hydrostatic low-speed constant drive as well. It enables driving of the railcar at very low speeds and, at the same time, using hydraulic equipment, such as a snow brush or vegetation cutter.

Vehicle design

The basis version of the railcar is very simple and practical: the engine is at the front, the cabin is in the middle and the load deck is at the rear. The advantage of this design is easy accessibility of the engine and the transmission for maintenance and service bridges

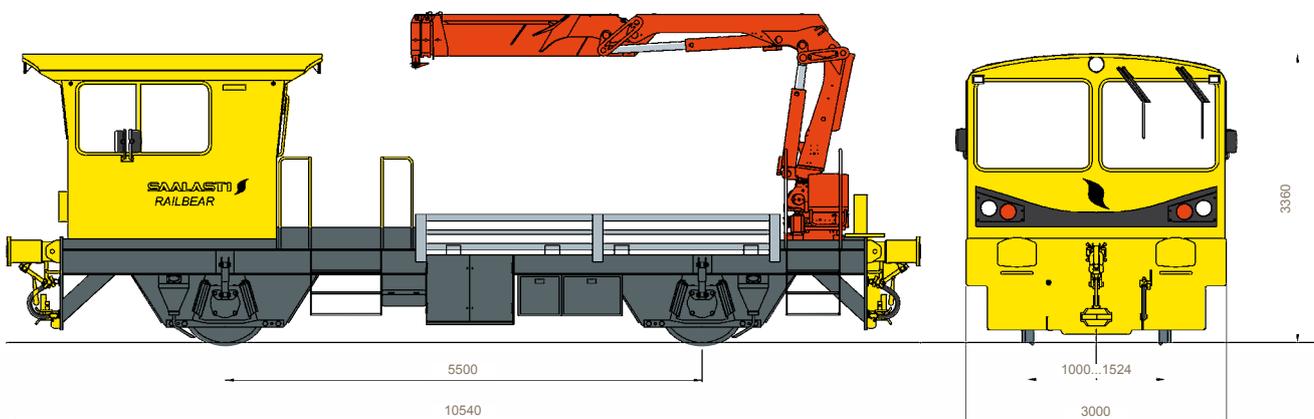
on both sides of the cabin front, allowing access to the cabin also from the front side. In the under-floor engine version the cabin can also be located at the end of the vehicle. The engine is located under the load deck, and it is easily accessible from the top and bottom.

Load deck

The load deck is level for the entire length, and it can be easily loaded. In the versions with the cabin in the middle, it is possible to transport long objects under the cabin. The load deck can be equipped with railing or dropping sidewalls. Depending on the total weight of the vehicle, the load-carrying capacity of the deck is up to 14 t.



RAILVAC TRAIN is a railway vacuum system for cable jobs, reballasting, sleeper renovation, excavation work among many other permanent way jobs, build in co-operation with Disab Vacuum Technology in Sweden.



Cabin

Depending on the needs of the customer, the cabin can be manufactured in different sizes, having seats for 6–10 people. The driving compartment is ergonomic and can be used for driving in both directions. The cabin is thermo-insulated, soundproof and equipped with air conditioning.

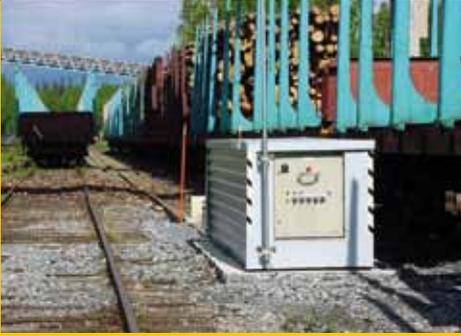
Cranes and auxiliary equipment

The vehicle can be equipped with various auxiliary equipment, such as

- loading crane 10–30 tm, CE-approved
- personnel lifting device with radio controller
- hydraulic-driven generator or diesel generator with necessary outputs
- auxiliary compressor
- hydraulic output for tools etc.
- snow brush, blower or plough



Wagon moving equipment and shunting locomotives



Steelwheel is specialised in producing shunting locomotives and wagon moving equipment. We can deliver all rail-related wagon moving and shunting solutions from a winch system for moving a couple of wagons up to shunting heavy trains under demanding conditions with a six-axle shunting robot. The product range includes OTSO-winch moving winches, OTSO-robot shunters and OTSO shunting locomotives.



OTSO-winch wagon mover

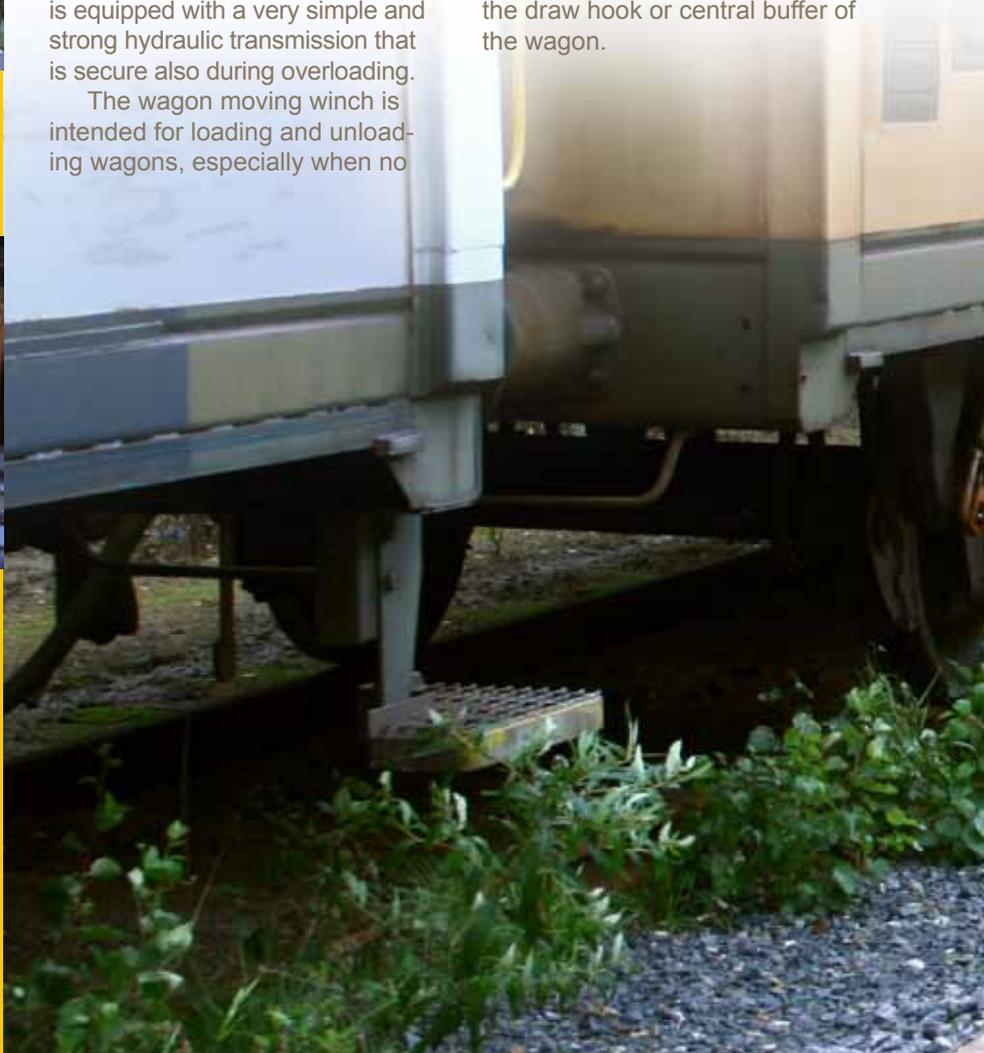
The train can be moved easily and securely using the wagon moving winches. The winch also brakes the train, ensuring additional safety. Using radio remote control makes the work easier and faster. The tested design is based on our expertise in building wagon winches over decades. The winch is equipped with a very simple and strong hydraulic transmission that is secure also during overloading.

shunting is needed during the loading. The hauling length of the winch is max. 300 m, but it can be used for moving longer trains as well, if the pulling point is changed during the work. Normally, the cable is coupled to the wagon using a chain triangle and its hook. It is also possible to use an adapter wagon as well, coupling directly to the draw hook or central buffer of the wagon.

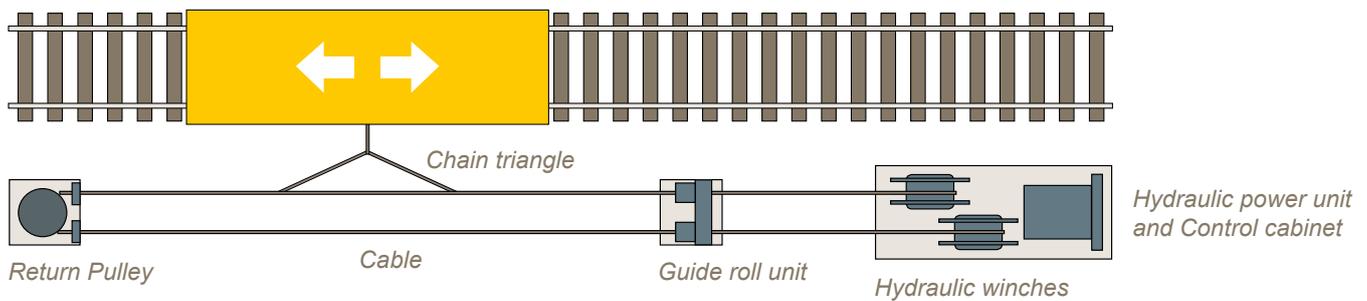
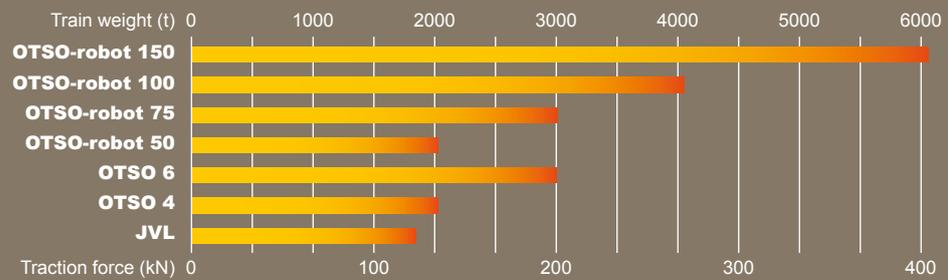
The wagon moving winch is intended for loading and unloading wagons, especially when no



OTSO-winch wagon mover can be connected to a safety switch that prevents moving the wagons while loading.



Train weight and traction force of wagon moving equipment and shunting locomotives



The wagon moving winches can also be installed on curved tracks. If there are barriers in the rail yard, they can be passed by means of the guide rolls.

A wagon moving winch is fast and easy to install, because hydraulic power unit, cable drums with hydraulic motors and control cabinet are all delivered as one unit. In addition to this, only guide rolls and return pulley, through which the cable runs, are needed. All above components are assembled on precasted foundations.

The winch installation takes less than a couple of days. The winch system has low maintenance requirements, and the operating life of the cable is long.

There is also a possibility to connect warning buzzer or warning lights to the wagon moving system to warn personnel when moving the wagon. There are also interfaces for safety switches that block the moving, for example, during loading.

Technical data OTSO-winch

Max. moving speed	45 m/min (2,7 km/h)
Max. tractive effort	95–120 kN
Electric motor	15 kW
Transmission	Hydrostatic
Control	Radio/Manual control



OTSO-robot shunters

New technology for moving wagons

OTSO-robot is a versatile multi-purpose shunting robot. It moves wagons on loading and unloading sites, in maintenance or bogie changing depots, harbour areas, factories, shunting yards, on inclines, and in many other places requiring the repeated moving of wagons, even over longer distances. It is more versatile than the winching systems, since it is able to access all areas with rails. The transfer distance is not limited, and it allows moving across switches and crossings, as well as in curves. Weight or length of the train is no limitation either. The heaviest trains transferred with the OTSO-robot have been heavy iron ore trains.

The transmission of the shunting robot has been optimised for moving wagons slowly. It allows for easy positioning of the wagons on the shunting area or transferring wagons, for example, using low constant speed. Compared with a conventional manned locomotive, the OTSO-robot is significantly less expensive to purchase and use, and its engine power and maximum speed are lower.

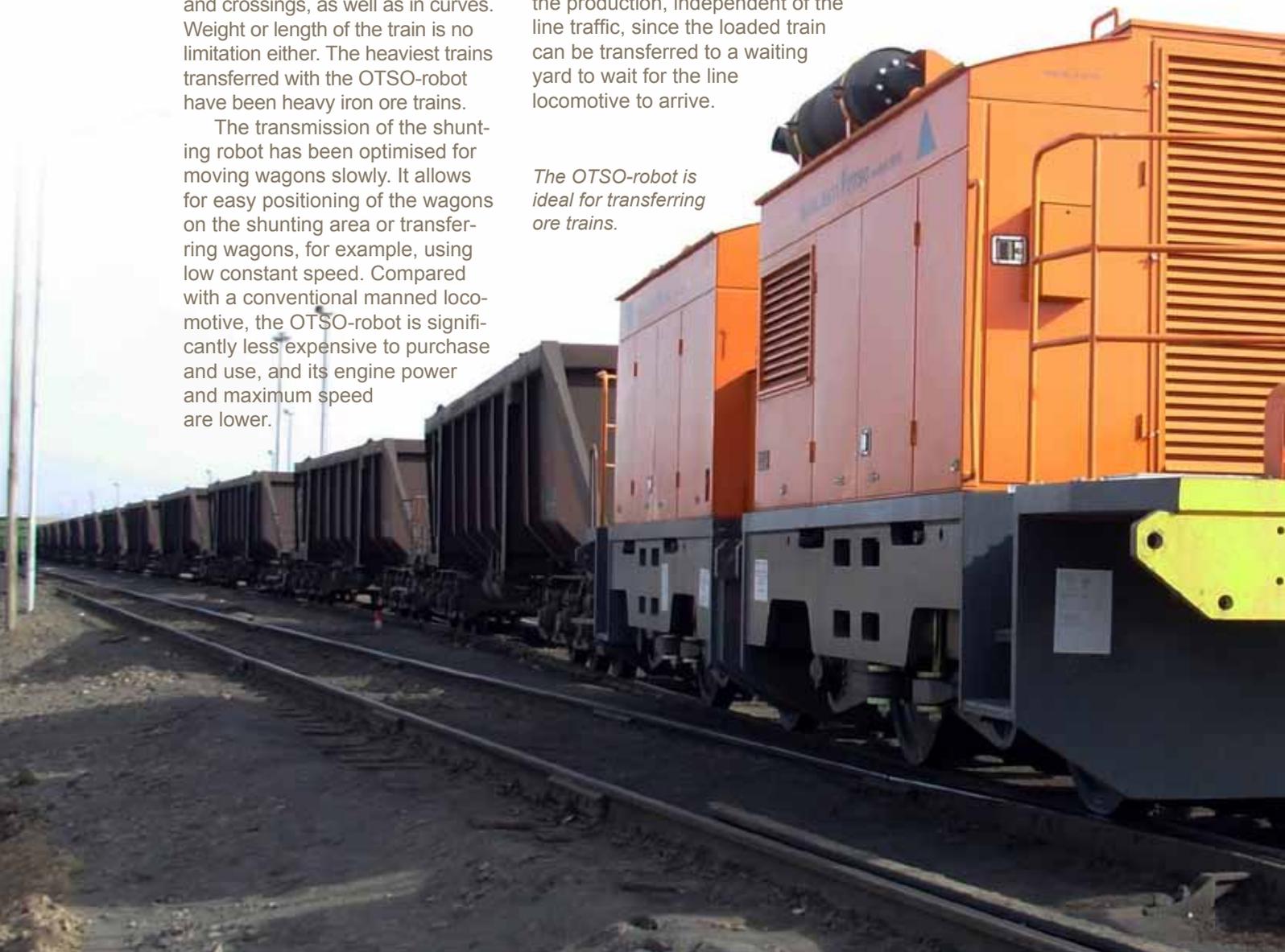
Flexible working

Pendeling trains are a cost-efficient alternative in freight traffic. The requirement for using them is that the whole transport chain works seamlessly without waiting periods. When using OTSO-robot in the industrial shunting, the production process can go on independently from the line traffic. Minor malfunctions in the production process do not have an instant impact on the transport chain. With the OTSO-robot the personnel can perform the transfers at the time best suitable for the production, independent of the line traffic, since the loaded train can be transferred to a waiting yard to wait for the line locomotive to arrive.

The OTSO-robot is ideal for transferring ore trains.

Radio control, automation and auxiliary equipment

The OTSO-robot can be controlled either by portable radio unit or control devices on the robot itself. Its movements can be automated, making it possible to link shunting to the production process. A radio-controlled or an automated robot reduces work and allows personnel and cost savings. The person who is unloading the train is also able to transfer the wagons all the way to the waiting track, as all operating functions are radio controlled.





The OTSO-robot has low maintenance requirements, and all maintenance points are easily accessible.



The OTSO-robot can be utilised in many different areas in the chemical and mechanical wood processing industry, for example, in loading and unloading of raw wood and sawn timber, pulp and paper products, chemical wagons, etc.

Technical data	OTSO-robot			
	50	75	100	150
Model	50	75	100	150
Weight	30–50 t	60–75 t	80–100 t	120–150 t
Max. tractive effort	135 kN	200 kN	270 kN	400 kN
Max. speed	15 km/h	15 km/h	15 km/h	15 km/h
Engine power	ca. 150 kW	ca. 200 kW	ca. 330 kW	ca. 400 kW
Transmission	Hydrostatic			

The controlling system of the robot is based on CAN bus control. The radio controller can also be designed to comply with security class SIL3.

Low maintenance requirements

The maintenance of the shunting robot is easy and is mostly limited to the diesel engine oil as well as hydraulic oil and filter change. All maintenance points are easily accessible and the engine room has doors on three sides and on the top.

OTSO-robots are built according to the local railway specifications.

For example, the wheel sets are equipped with solid steel axles and monoblock steel wheels. The transmission is designed for heavy-duty railway work.



The OTSO-robot can also be equipped with a snowplough or hydraulic devices such as a sweeper, and auxiliary hydraulics allow opening and closing the wagon roofs etc.

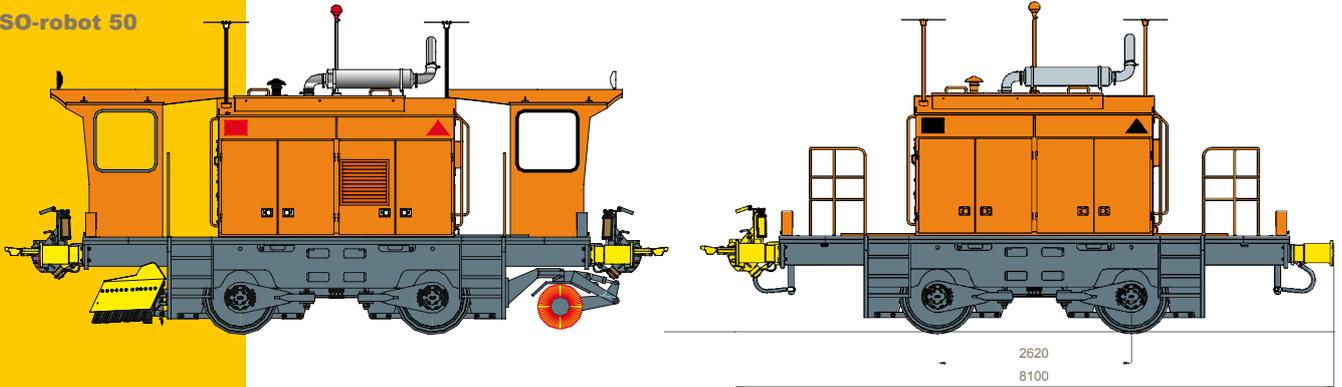


OTSO-robot can be used also in port terminals and incline work.

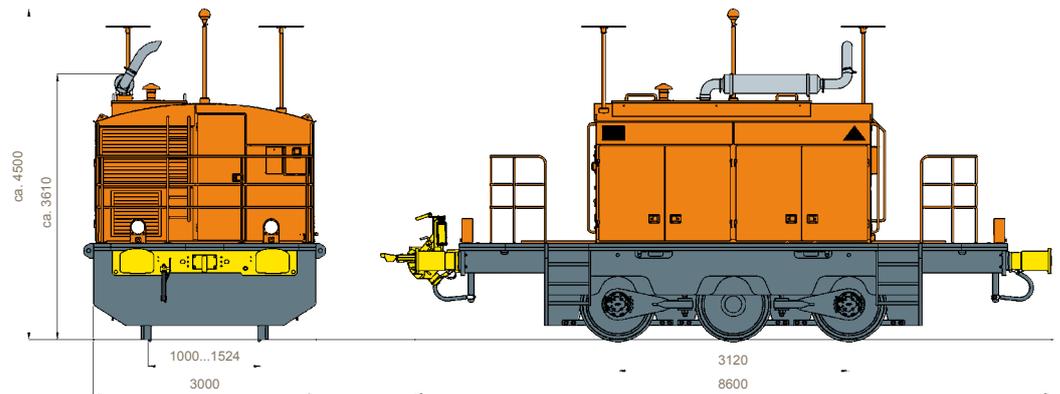


Dimensions of **OTSO-robot** shunters

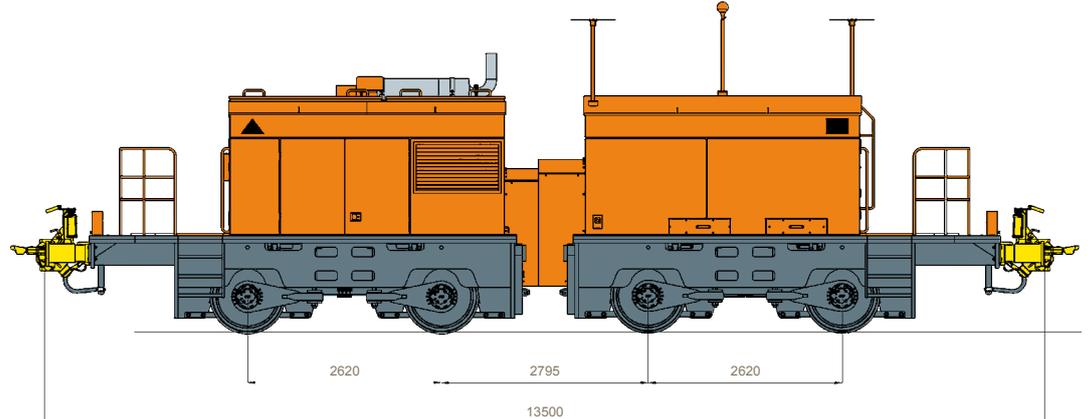
OTSO-robot 50



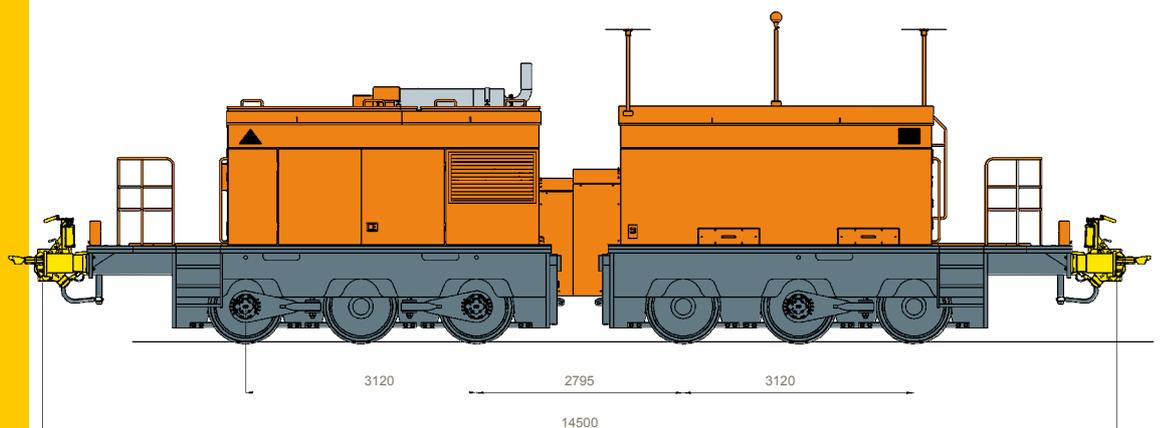
OTSO-robot 75



OTSO-robot 100



OTSO-robot 150



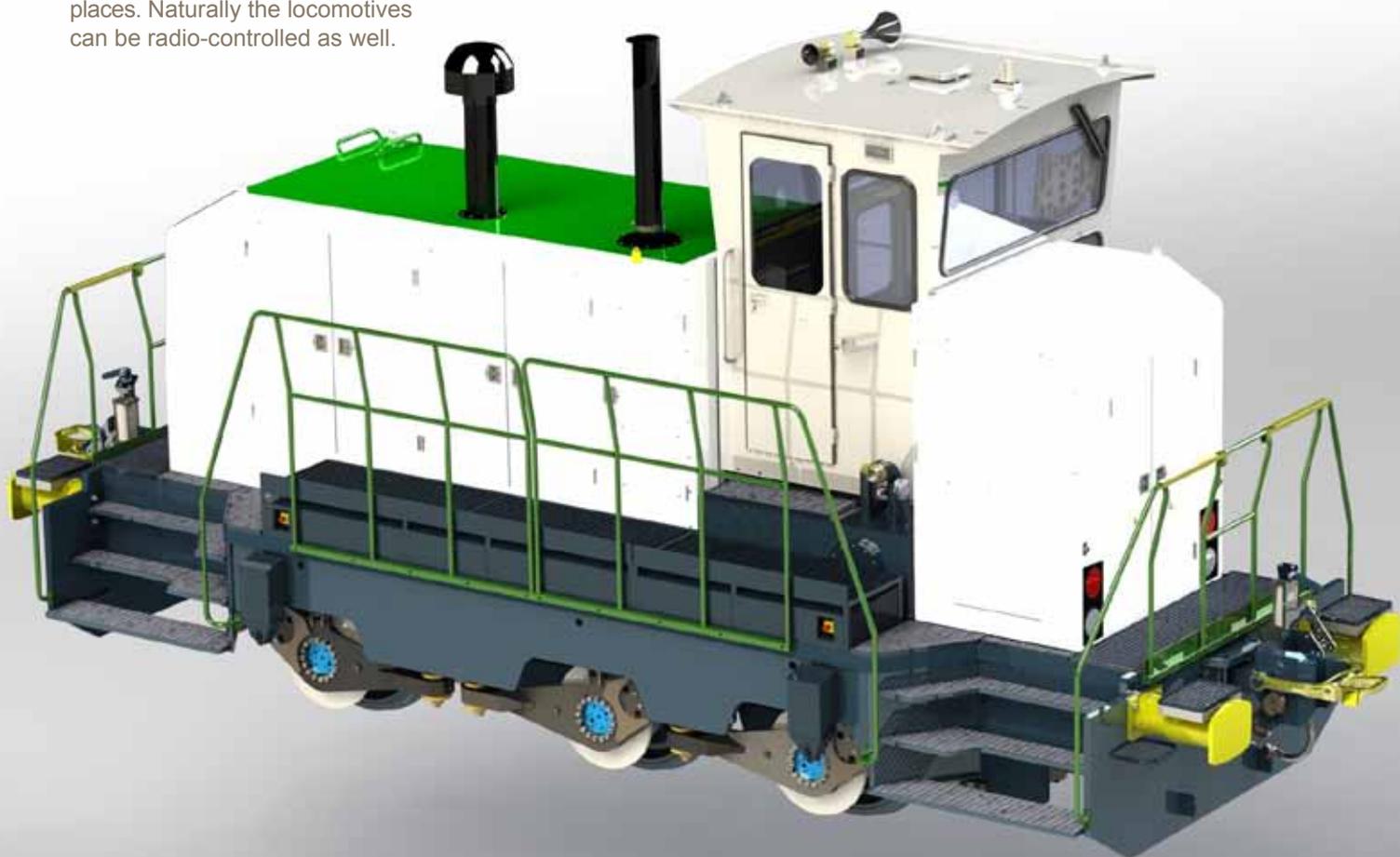
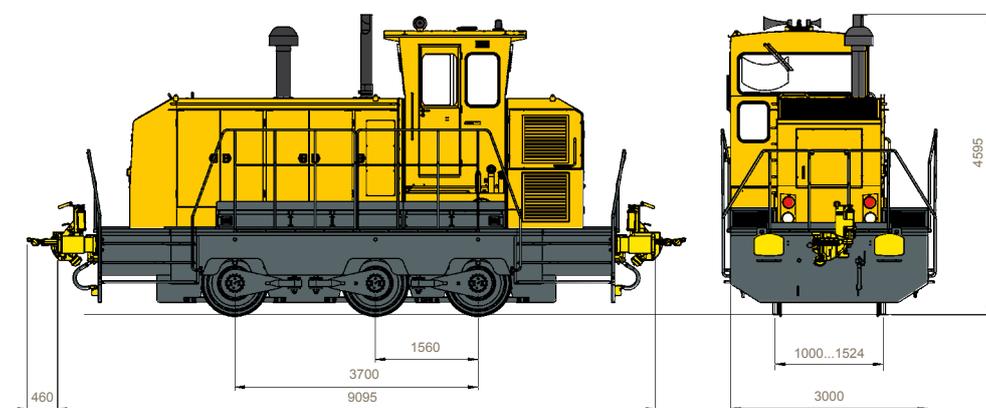
OTSO shunting locomotives

If there is a lot of shunting work on an industrial plant, it is wise to purchase a shunting locomotive. It improves the quality and availability of shunting services, especially in comparison with outsourced shunting services. OTSO shunting locomotive is designed for industrial use, and its purchase price and maintenance costs are low.

The OTSO locomotive has two or three axles. Engine output of the diesel motor is 300–600 kW, and the locomotive is equipped with a hydrodynamic or hydrostatic transmission. The power is transmitted from the transmission to the axle gears by means of cardan shafts. The locomotive can be equipped either with disc brake or thread brake units.

Depending on the needs of the customer, the cabin can be equipped with one or two driving places. Naturally the locomotives can be radio-controlled as well.

Technical data	OTSO 4	OTSO 6
Max. speed	30–80 km/h	30–60 km/h
Max. tractive effort	90–135 kN	135–200 kN
Weight	35–45 t	45–67,5 t
Diesel engine	300–400 kW	400–600 kW
Transmission	Hydrodynamic or hydrostatic	



VAPITI and OTSO shunting couplers



More efficient shunting work and safer line driving

Shunting work can be made more efficient and safety at work can be improved by using VAPITI and OTSO shunting couplers.

The driver of the locomotive does not need to go between the locomotive and the wagon; but he can couple or uncouple the train quickly and comfortably from his cabin or by radio remote control.

Using OTSO and VAPITI couplers saves time and improves safety at work. They are ideal for radio-controlled locomotives. There are fewer accidents as it is not necessary to go between the moving locomotive and wagon. The only manual step needed is coupling and decoupling of brake line.

VAPITI coupler

The patented VAPITI coupler can couple to wagons equipped with SA-3 or draw hook. It enables handling wagons equipped with both kinds of couplers without adapters or intermediate wagons.

- two models, one for industrial use and one for line driving
- fast coupling to draw hook or SA-3 central buffer
- decoupling and coupling pneumatically
- safe, cannot release itself from the hook accidentally
- can be applied to one-man-driving and line driving
- can be used with radio-controlled locomotives
- max. tractive effort 450 kN with draw hook and does not limit tractive force of SA-3.



OTSO coupler

- for wagons with UIC draw hooks
- easy and fast usage
- enables also utilisation of an ordinary screw coupler during line driving
- couples easily also in curves
- can be used with radio-controlled equipment
- an extreme strong coupler link withstands also heavy trains
- decoupling and coupling pneumatically
- enables tractive effort of 450 kN with draw hook

Agencies

Steelwheel acts as an agency for the following companies in Finland:



Riftek

Measurement equipment
of wheel profiles
Measurement devices
for wheel diameter



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