



METALLURGY

TRANSPORT SOLUTIONS FOR ALL AREAS OF USE





THE TII GROUP

YOUR STRONG GLOBAL PARTNER

The TII Group moves the world: seventy per cent of all transports over 3,000 tonnes and ninety per cent of all transports over 5,000 tonnes are carried out using TII Group vehicles.

The corporate group with its well-known SCHEUERLE, NICOLAS, KAMAG and TIGER brands has manufacturing facilities in Germany, France and India as well as a production co-operation in North America (Florida). Furthermore, it supports and advises its customers through a global sales and service organization. Heavy-duty vehicles of the TII Group transport complete industrial plant, ships, submarines, oil and off-shore platforms, turbines and construction machinery to the most remote corners of the world; the product range also includes slag pots and foundry ladles.

"For our customers, we have brought to bear the accumulated experience of four companies, with a total of around 400 years of experience in the heavy-duty transport industry, and thus secured their economic success of tomorrow."

Senator E. h. Otto Rettenmaier,
Multi-Entrepreneur and
Founder of the TII Group





TII GROUP AT A GLANCE

PRODUCTS AND MARKETS

As a full-range supplier, the TII Group offers a broad range of vehicles for moving all types of loads ranging from modular, self-propelled transporters (SPMT) for the transport of loads of 17,200 tonnes and more through to vehicles for cargo handling at logistics terminals.



**HEAVY-DUTY TRANSPORTATION
ON PUBLIC ROADS**



WIND ENERGY



PLANT CONSTRUCTION



**BRIDGE & TUNNEL
CONSTRUCTION**



SHIPYARD INDUSTRY



STEEL INDUSTRY



MINING



TERMINAL LOGISTICS



AEROSPACE INDUSTRY



SPECIAL VEHICLES

SLAG POT CARRIER



SCRAP TRANSPORTER



INDUSTRIAL LIFT TRANSPORTER



COIL TRANSPORTER



TRANSPORT SOLUTIONS FOR THE METALLURGY INDUSTRY

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FULL-RANGE SUPPLIER

AREAS OF USE

Slag & Molten Steel Handling



- / Slag
- / Molten steel (foundry ladle)
- / Non-ferrous metals



Scrap Handling



- / Scrap baskets
- / Tiltable scrap containers
- / Pallets



Transport of Semi-Finished & Finished Products



- / Slabs
- / Coils
- / Pallets
- / Sheet metal
- / Girders
- / Billets



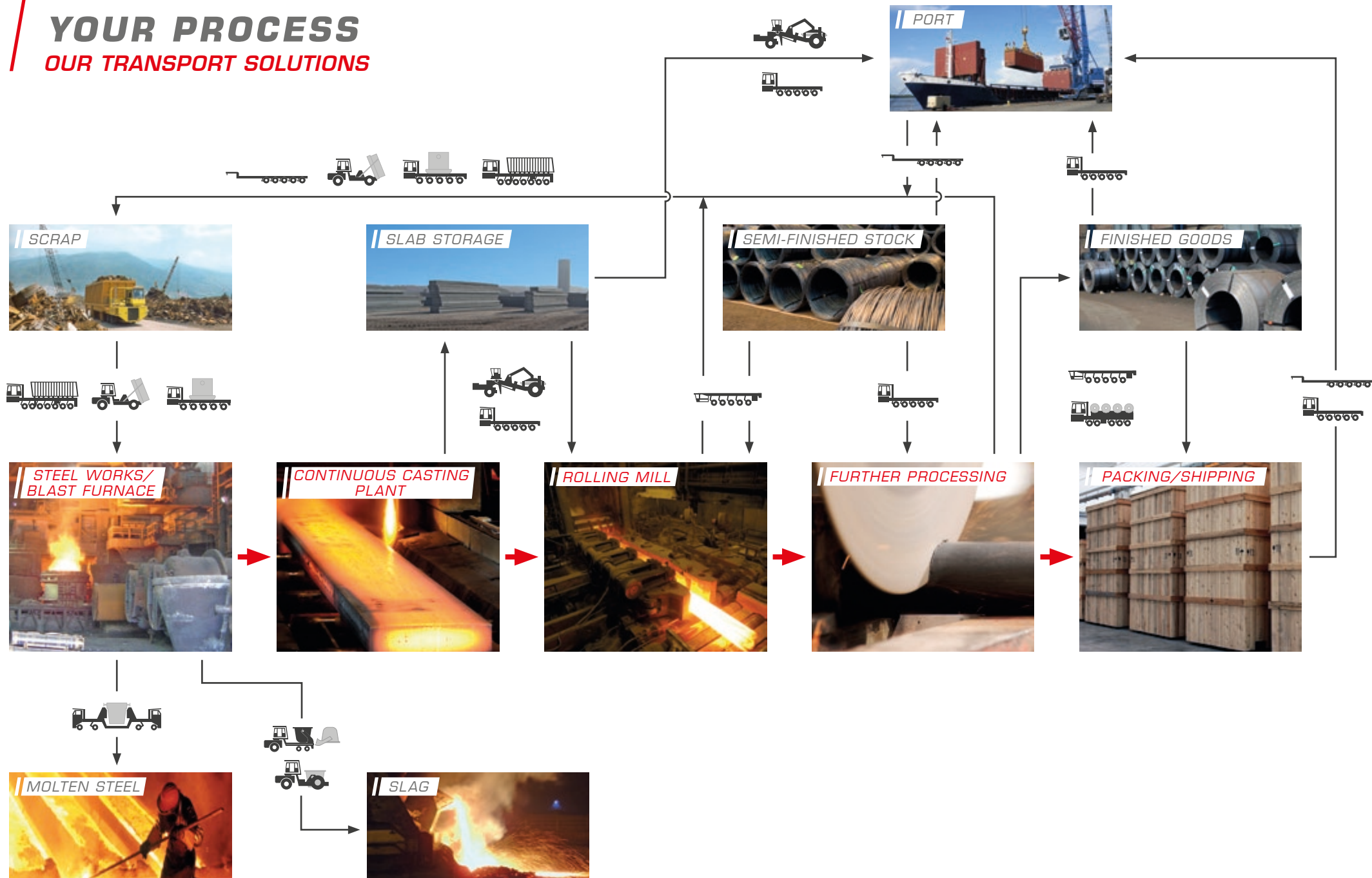
Special Solutions



- / Convertertransport
- / Driverless transport vehicles
- / Non-Cassette Carrier

YOUR PROCESS

OUR TRANSPORT SOLUTIONS



FULL-RANGE SUPPLIER

WE PROVIDE THE ALL-ROUND VIEW

The TII Group's range of vehicles for the metallurgical sector is as broad as the number of different transport assignments in this industry. Scrap management, molten steel, slag or slab transport and semi-finished products: wherever a transportation job is required, we provide the right solution.

Safety and reliability are very much in the foreground. When transporting an extremely heavy slag pot, everything has to function perfectly. Process reliability and work safety go hand in hand with the development of TII Group vehicles.

Efficiency considerations also play an important role for you as an operator – with concepts such as the modular replacements of engine units for our drive units, the TII Group guarantees your competitiveness.

We complement and support your process - with decades of experience! Our expertise in the metallurgical industry allows us to work with you in order to optimize your processes and develop customized solutions.







SLAG & MOLTEN STEEL HANDLING

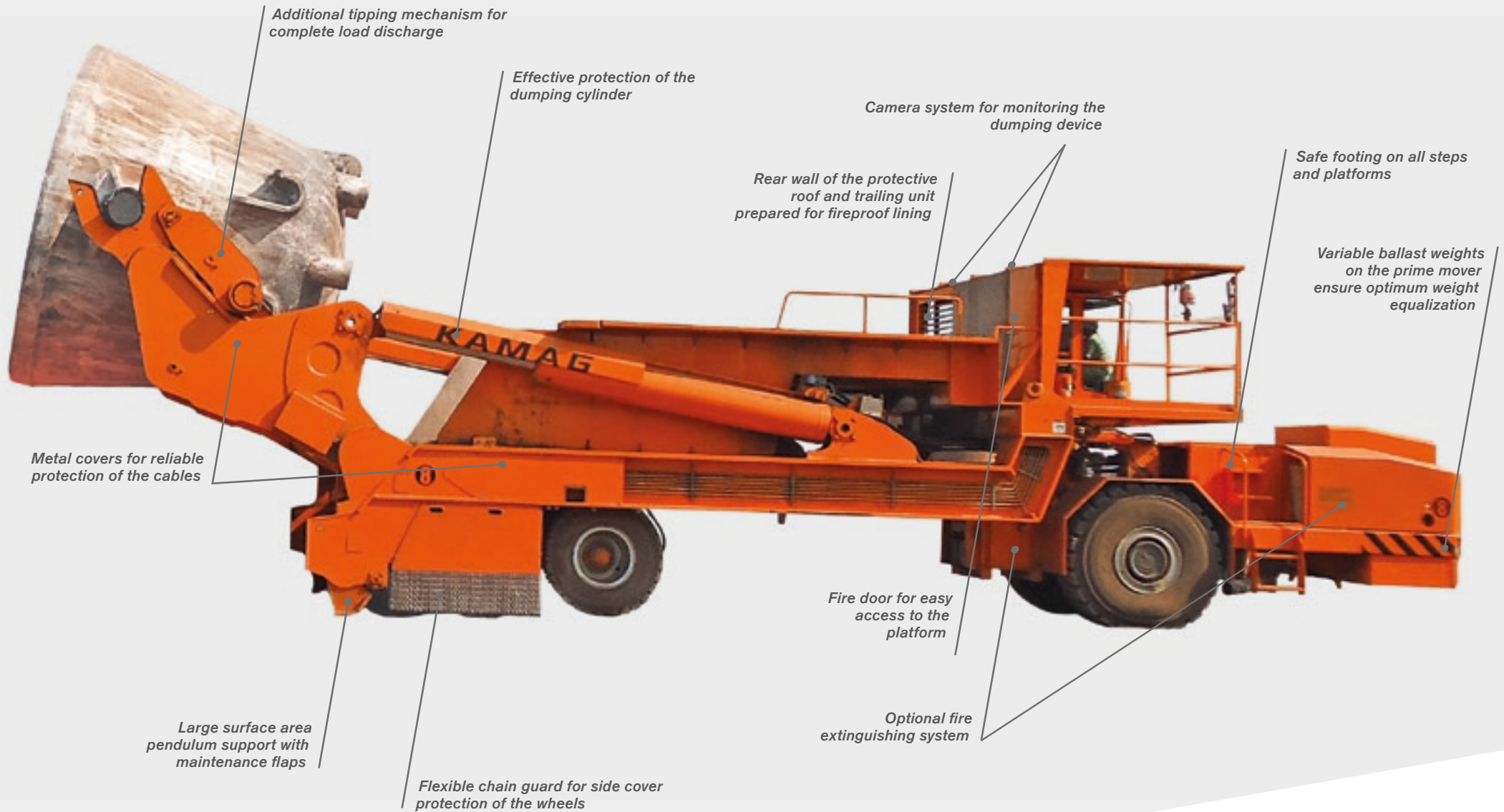
FOR THE HARDEST JOB IN THE WORLD

Transporting molten steel and slag is among one of the most difficult and dangerous assignments in a steel plant. The use of task-specific transport containers requires individual concepts for the pick-up device on the vehicle as well as the handling. Slag pot weights up to 160 t and molten steel ladles up to 500 t are safely and reliably handled with vehicles from the TII Group. Speeds of up to 35 km/h and gradients up to 15.0 % can easily be mastered depending on the individual concept. Depending on the payload, drive units up to 548 hp are available to the customer. These prime movers are comprised of a diesel engine, automatic power shift transmission and a rigid axle with central differential and planetary gears arranged around wheel hubs. In all vehicles of this product group, the driver's cab is well protected with massive, usually heat-resistant material being fitted on the roof and behind the cab. Molten steel transporters as self-loaders, offset platform versions as well as traditional pallet solutions are integral elements of this product segment.



ADVANTAGES

SLAG POT CARRIER - PLATFORM VERSION





Camera system



Safe footing on all steps and platforms



Door and mesh for lining of refractory concrete



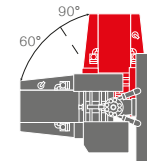
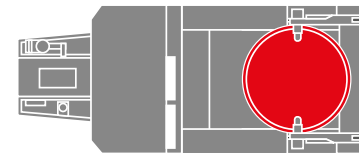
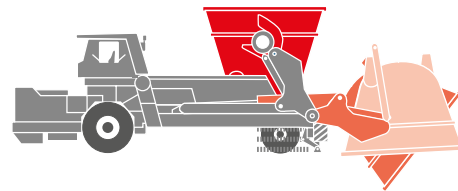
Access to the rear axle through removable rear covering

TECHNICAL DATA

SLAG POT CARRIER – PLATFORM VERSION

Type	Length	Width	Height of protective roof	Payload	Pot capacity	Speed unloaded (limited)	Speed loaded (tech. permissible)
2702-40	10.6 m	4.4 m	4.25 m	40,000 kg	8 m ³	25 km/h	20 km/h
2702-50	10.6 m	4.4 m	4.25 m	50,000 kg	12 m ³	25 km/h	10 km/h
2702-60	11.0 m	5.2 m	4.55 m	60,000 kg	15 m ³	25 km/h	10 km/h
2703-70	11.7 m	5.2 m	4.55 m	70,000 kg	16 m ³	25 km/h	15 km/h
2703-80	12.1 m	5.2 m	4.55 m	80,000 kg	18 m ³	25 km/h	15 km/h
2703-90	12.6 m	5.2 m	4.55 m	90,000 kg	20 m ³	25 km/h	15 km/h
2703-100	13.2 m	5.5 m	4.55 m	100,000 kg	23 m ³	25 km/h	15 km/h
2703-110	13.4 m	5.5 m	4.55 m	110,000 kg	25 m ³	25 km/h	10 km/h
2703-120	13.9 m	5.5 m	4.55 m	120,000 kg	30 m ³	25 km/h	8 km/h

Customer-specific payloads ranging from 25,000 kg to 150,000 kg on request.



ADVANTAGES

SLAG POT CARRIER - U-FRAME VERSION



Rotary feedthrough for hydraulic lines

Rear wheel protective covers for minimizing the influence of heat on the tyres and thus significantly extending the service life

Low-maintenance wet multi-disc brakes on front and rear axles

Sturdy vehicle frame, trailing unit and dumping device for handling the toughest operating conditions











Parallel installation of the hydraulic lines via the oscillating beam

Driver has complete access around the cabin for maintenance and cleaning

Electro-hydraulic operated engine hood for optimum accessibility to the engine due to a tipping angle of approx. 90°

TECHNICAL DATA

SLAG POT CARRIER – U-FRAME VERSION

	Payload	
30 t	to	160 t
	Speed	
15 km/h (loaded)	to	35 km/h (unloaded)
	Pot capacity	
6 m³	to	50 m³
	Gradients	
0 %	to	15 %
	Engine performance	
200 kW	to	400 kW

Vehicle dimensions (length, width, height) are dependent on customer-specific requirements and can be adapted to accommodate these.

ADVANTAGES

THE NON PLUS ULTRA IN SAFETY

More safety when transporting molten slag: transportation of molten slag is one of the most demanding tasks in metallurgical operations. No transport job requires so much concentration and attention from the operating personnel as this one does. In the process, there is always one thing that is the number one priority: safety. Safety for the transport procedure and safety for the operating personnel.

IMPROVED ERGONOMICS

- / Inclined prime mover for optimal overview
- / Double operating panel in the driver's cabin
- / Conveniently-positioned access steps – for even more safety
- / Sealed special glass panel in a lamellar window
- / Walkway with guardrails behind the driver's cab canopy
- / Driver's cab canopy with border strip
- / Closed prime mover cover
- / Electronics-independent emergency operation

EVEN MORE CONVENIENCE

- / Heating easily accessible under the driver's seat
- / All main functions are operated via joystick
- / Refuelling on the side of the prime mover
- / Engine hood with maintenance flaps
- / Weighing device in standard scope of delivery



KAMAG

KAMAG



SCRAP HANDLING

OPTIMAL LOGISTIC SOLUTIONS

The transport of steel scrap materials takes place under extreme site conditions frequently with dumping body and scrap container pallets. Regardless whether having to deal with dust, heat and dirty road surfaces, SCHEUERLE, NICOLAS and KAMAG industry transporters with dumping devices have proved themselves time and time again.

Depending on customer preferences, the vehicles are configurable with a hydrostatic or hydromechanical drive system. The vehicle concept accommodates payloads of approx. 60 t up to 250 t (including pallets). This applies for speeds of up to 20 km/h when loaded and up to 40 km/h for empty runs. The diesel engines in the power trains range from 130 kW (180 hp) to 440 kW (600 hp) depending on the size of the transport. Gradients up to 15 % can be handled without any problems.



U-Frame Dumper:

Combines the function of bulk cargo transfer with that of pallet transportation. Depending on the profile requirements, hydromechanical or hydrostatic drives are fitted to best suit the situation. For special operations, extremely compact and manoeuvrable smaller U-frame trucks with hydrostatic drives are available.

Articulated Scrap Basket Transporter:

This vehicle system has been specially designed for transport operations in scrap management. The Scrap Basket Transporter complete with articulated pendulum prime mover is available with a 50° steering angle on both sides with a 2–3-axle trailing unit and 90° with a 1-axle unit, and can handle payloads up to 200 t. The large lateral pendulum angle of approx. 10° to 12° allows optimal power transmission and prevents any frame torsion when moving on uneven surfaces.

Industrial Lift Transporter:

Two possible options have been realized through the scrap container dumping system and the scrap basket system. Based on the proven Industrial Lift Transporter, a logistics solution to handle the toughest of operating conditions was created especially for the transportation of steel scrap.

SCRAP HANDLING

TRANSPORT SOLUTIONS AND CONCEPTS



Scrap Basket Transporter for moving scrap materials in a steel plant.



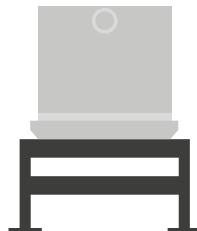
The swap body and generous dumping angle up to 60° ensure complete emptying during the handling of scrap materials thus providing yet another advantage.



The steering is dimensioned to ensure that tyre wear is kept to an absolute minimum.



U-Frame Dumper: the hydraulic dumping device facilitates a dumping angle of min. 45°.



Scrap basket



Scrap container

PAYLOADS

/ Up to 250 tonnes

AVAILABLE VERSIONS

- / Dumper Truck
- / Articulated Dumper
- / Industrial Lift Transporter

ADVANTAGES

- / Steering angles from 60° to 90° allow easy access in restricted loading positions.
- / Containers with integrated support legs can be set down and picked up in next to no time.
- / During the time one container is being loaded, the other is driven under and picked up, securely locked in position on the transporter by means of two hydraulically-operated cylinders, hydraulically lifted and then driven to the designated unloading site.
- / The driver's seat with all control elements can be swiveled for enhanced operational capabilities. The cab itself can be raised to a higher position if required in order to provide the driver with a better view at all times during loading and unloading operations.
- / One transport operation corresponds to 12 truck loads.





TRANSPORT OF SEMI-FINISHED AND FINISHED PRODUCTS

In order to ensure unrestricted transportation in the metallurgy industry of up to 200 t of half-finished or finished products, such as slabs, coils, billets, sheet metal or steel profiles, transporters from the TII Group provide effective solutions. The transport of semi-finished and finished products takes place for the most part using palletized goods. For guaranteeing high turnover rates, high speeds must be realized when vehicles are both loaded and unloaded.

The hydrostatic drive – developed by the TII Group – has been installed in the vast majority of these transporters and easily ensures that the required speeds of up to 25 km/h in loaded and up to 45 km/h in unloaded condition respectively are achieved. For payloads up to 200 t, SCHEUERLE, NICOLAS and KAMAG Industrial Lift Transporters with their 15" bogies have become leading players in the industry due, above all, to their performance, reliability and long service life.

This transport concept features 2- to 8-axle line versions with payloads of 50 t up to 200 t. For payloads more than 160 t, transporters with 20" bogies are frequently used (as already found in the Scrap Container Transporters). Due to the larger-sized wheels, their off-road capabilities increase.

PAYLOADS

/ Up to 230 tonnes

AVAILABLE VERSIONS

/ Industrial Lift Trailer with 2, 4, 6 or 8 axles

ADVANTAGES

- / Can be coupled with a standard port truck tractor.
- / The Industrial Lift Trailer is equipped with an electronic steering system thereby facilitating the use of a wide range of steering programmes, e.g. four-wheel or diagonal steering.
- / An automatic positioning aid (Pathfinder) for driving under pallets is available as an option.
- / Lift axles (optional)
During empty runs, depending on the model, up to two bogie units can be raised in order to reduce rolling resistance, minimize tyre wear and increase the fifth wheel load.
- / LED lighting
All lighting on the trailer is standard LED.
- / Control with emergency operation function
The control system with redundant sensor technology provides a high level of safety at all times.
- / Lower-positioned gooseneck
Provides the best visibility when manoeuvring.
- / Torsion-free hose routing
Protects the hydraulic hoses against damage when steering.
- / Pneumatic brake system
The purely pneumatic brake system, featuring standard components taken from the truck sector, guarantees low operating costs and high spare parts availability.

INDUSTRIAL LIFT TRAILER

THE VERSATILE ONE

The Industrial Lift Trailer is a semi-trailer complete with gooseneck and hydraulically controlled lifting platform specially developed for demanding steel plant operations. It is used for transporting heavy-duty pallets. The trailer is pulled by a tractor unit with a hydraulically-liftable fifth wheel. In order to ensure increased turnover rates, the trailer is equipped with

electronically-hydraulically steerable bogies which automatically follow the tractor and can be steered independently if necessary. This makes it easier to drive into the pallets. Dimensions and lifting heights are virtually freely selectable according to customer requirements.



SLAB CARRIER

THE MANOEUVRABLE ONE

For use in metallurgical plants, the TII Group has developed a special vehicle for the transportation of slabs. The slabs can be picked up directly from the ground to be re-positioned and stacked at the designated unloading site. This process is realized due to the height-adjustable grippers that are available in different versions. Cold as well as hot slabs can be transported.



PAYLOADS

/ Up to 150 tonnes

ADVANTAGES

- / Extremely manoeuvrable - the articulated pendulum prime mover with a 90° steering angle on both sides.
- / Robust steel construction for use in smelting works and steel mills.
- / User-friendly control technology for ensuring safe handling by the operating personnel.
- / Faster handling times as slabs which are not exactly stacked one above the other do not have to be re-aligned before moving the vehicle in over the slabs.
- / No special pallets are required nor the associated pallet transport logistics.
- / The slabs can also be stacked and stored on uneven ground.
- / Slabs can be stacked even higher than the payload of most pallets allow. This means that more cost-effective storage space utilization is possible.
- / Transport of hot and cold slabs.



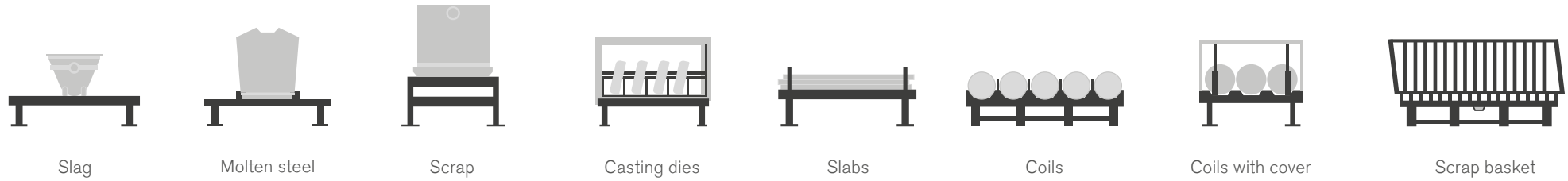
The compact design, high degree of manoeuvrability through the all-wheel steering, hydraulic axle compensation and a wide variety of variants allow simple integration of modern-day logistical operations in steel plants. The Industrial Lift Transporter is extremely manoeuvrable and high-performance transportation equipment which, depending on requirements, can be equipped with many different kinds of additional devices, such as:

- / Cover for Coil Transporter
- / Dumping device for bulk material pallets
- / Weighing device
- / Loading crane
- / ...and much more.

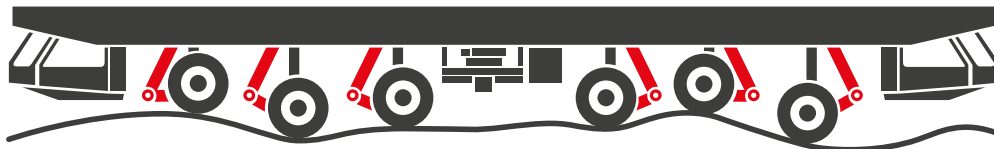
INDUSTRIAL LIFT TRANSPORTER

THE ALL-ROUNDER

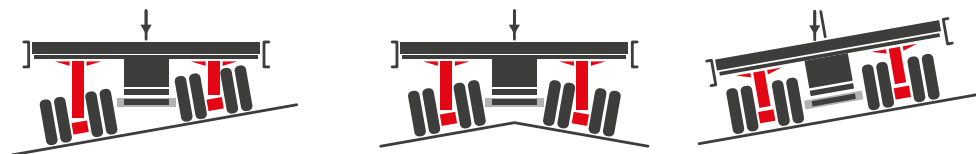
Transport possibilities



Axle compensation



The use of pendulum axle technology has also set new standards with this vehicle. With driving on uneven ground surfaces, the axle compensation automatically ensures uniform load distribution on all wheels.



Technical data

	With hydrostatic drive		With hydromechanical drive	
Tyres	20"	15"	20"	24"
Payload range	90–660 t	50–300 t	60–175 t	70–220 t
Possible number of axle lines	10	10	8	8
Max. axle line load	56/64/76 t	28/32/48 t	28 t	36 t
Vehicle width min.	4.0 m	2.5 m	3.0 m	3.15 m
Steering	Electronic or mechanical	Electronic or mechanical	Mechanical	Mechanical
Lowered platform height + lift	1,600 + 700 mm	1,400 + 600 mm	1,430 + 600 mm	1,430 + 600 mm



SPECIAL SOLUTIONS

THE PERFECT SOLUTION FOR EVERYONE

The TII Group is the global full-range supplier for the metallurgical industry.

In order to be able to provide the perfect solution to each of our customers, we rely on flexible and efficient transport systems which are realized on the basis of specific customer requirements.

We support customers when designing efficient logistics processes and provide heavy-duty logistics solutions that can successfully tackle all transport assignments along the value-added chain.



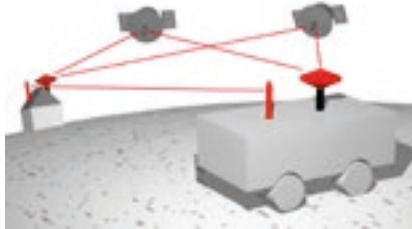
STRADDLE CARRIER WITH A 55 T PAYLOAD AND FLEXIBLE LOADING AREA - UP TO 5 M STACKING HEIGHT. THE GRIPPERS CAN BE MOVED LEFT / RIGHT AND UP / DOWN.



COPPER CONVERTER ON A SLIDING PALLET SYSTEM.

DRIVERLESS TRANSPORT VEHICLES

THE FUTURE



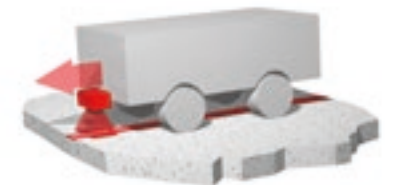
Satellite navigation (e.g. GPS)



Transponder positioning system



Inductive track guidance system



Optical track guidance system

The worldwide trend towards automation does not stop at transports in the metallurgical industry. Driverless transport vehicles (also known as Automated Guided Vehicles - AGVs) have been successfully used in in-company logistical operations for many years now, especially in warehouses. These vehicles can be controlled through various navigation systems such as transponders embedded in the ground, inductive guide coils or GPS.

TII Group vehicles with optical track guidance systems are already in use in steel plants. Here, the vehicles travel along, for example, a coloured line on the ground which is detected by means of a camera and is automatically tracked by the transporter.

In addition, there are driver assistance systems, for example, which facilitate driving under of transport pallets in a central position through the aid of acoustic signals (ultrasonic). It is based on a technology similar to the parking aid used in the automotive industry in order to considerably ease the day-to-day work of the driver and, in particular, to avoid accidents as well as damage to the transport equipment.

For all questions and projects concerning driverless transport vehicles, we would be pleased to provide you with a customized solution!



NON-CASSETTE CARRIER

OPERATING SAFETY GUARANTEED

24 steered axles, 48 tyres, and around 25 metres long: the SCHEUERLE Non-Cassette Carrier has a remarkable appearance. But not just this, even more impressive is the versatility of the vehicle in use: the SCHEUERLE Non-Cassette Carrier not only moves stacks of steel plates during in-company operations

without requiring any pallets, but it can also be effectively used in combination with a transport vessel as part of a roll-on / roll-off concept.

PAYLOADS

/ Up to 250 tonnes

ADVANTAGES

/ Handling and moving of sheet metal packages up to 250 tonnes without pallets possible

/ The Non-Cassette Carrier can pick up sheet metal packages directly from the ground and set down again in the designated place

/ Load securing system – load cannot slip or slide

/ Flexibility when selecting the pair of prongs as they can be selected separately

/ Prongs are width-adjustable

/ Electronic steering system



TII SALES

ENSURING CLOSE CUSTOMER PROXIMITY

Available for you 24/7

SCHEUERLE, NICOLAS, KAMAG and TIIGER have combined their customer service activities for all brands and locations and formed one joint sales company: TII Sales GmbH & Co. KG. With a wide network of representatives and its own sales support locations, the TII Sales workforce is at your disposal as contact partners worldwide. This ensures that your on-site consultation is available right from the start.

Benefit from our experience and expertise!

Regardless whether you are converting an existing fleet or solving individual transport problems – TII Sales provides the necessary expertise in order to find the ideal solution. It recognizes specific requirements, discusses them with you and then promptly offers you the most appropriate vehicles. In doing so, the joint focus is always directed to the future. How will the market develop, how can you change your existing fleet if required, which accessories and enhancements are suitable for you in

order to expand your business? To answer all these questions, TII Sales will advise you and provide you with the collected know-how of all four companies.



Hand-in-hand engineering

In close collaboration with developers and designers, project engineers of the TII Group develop application-specific solutions. Through this fruitful exchange of information and ideas, the respective requirements are first determined and then analyzed. Subsequently, assessments are made regarding those modifications which have to be made on existing models or how a new development should look so that all requirements can be fulfilled.

Always with you throughout all project phases

You are also continuously supported by competent sales personnel during order processing. Starting with the offer and project realization through to the delivery, you will be well looked after by a designated staff member of TII Sales. Members of the sales organization are regularly traveling around the globe. They have a high level of industry expertise and have a particular eye for realizing individual solutions. They are there for you to provide help and support whenever and wherever it is needed.

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TII GROUP SERVICE

LIFELONG PARTNERSHIP

The service offered by the TII Group provides you with worldwide support throughout the entire operating time of the vehicles. Service personnel are available 24 hours a day via a free hotline. From the approval of new vehicles, instruction and training on the vehicle, conversions and overhauls through to repairs and delivery of spare parts, the TII Group maintains a comprehensive range of services that is instantly available to ensure the use of the vehicles for you around the world. These services are enhanced by numerous accompanying services for custo-

mers. This includes, in particular, offering assistance for the financing, arranging the sale of your old vehicles to interested buyers, providing advice regarding planned transports as well as customized service packages. Based on specific product data, documentation and operating instructions, training measures are carried out on the product itself which are exactly matched to suit individual requirements. An essential element of the service portfolio includes conversions and overhauls. By means of targeted measures, you can ensure the exten-

ded use of the purchased vehicles. If quick support is required, this is guaranteed through the worldwide collaboration with service partners as well as the use of our own team of expertly trained mechanics. Well-stocked spare parts facilities support immediate repair work operations. The TII Group guarantees reliability and security regarding the supply of spare parts and accessories for the entire product range and the normal life cycle of a product thus ensuring operational safety for the user.



Contact Service

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CAREERS

AT THE TII GROUP

TII as an employer

The TII Group offers opportunities for its employees which would not normally be the case in large corporations. The internationality of the business with heavy-duty vehicles – more than 70 % is exported to countries around the world – brings a cosmopolitan flair into day-to-day life. A steelworks vehicle for Oman, a modular transport solution for Colombia, mining equipment for Australia. At the TII Group, new employees notice right from the beginning that they move the world both literally and figuratively. The way into the company is open at all stages of life – the TII Group offers opportunities for apprentices, students, job starters and experienced employees.

Vocational training

The TII Group provides training in all typical industry apprenticeships at the company's own training centre. Prospective construction mechanics, mechatronics technicians, product designers, industrial clerks and office administrators are taught not only solid basic knowledge but also specialist know-how. Through insights into related disciplines such as design or project planning, trainees at the TII Group are already looking ahead at the big picture.

Dual study programmes, internships or dissertations

Regardless whether it is engineering, business administration or computer science: the TII Group offers dual study programmes in cooperation with renowned universities (DHBW). Furthermore, students often take the opportunity to gain practical experience at the TII Group through internships.

Entry with and without work experience

The TII Group offers attractive career opportunities for qualified skilled workers, young professionals and those with many years of professional experience. Whether as a skilled worker in the production, an engineer in the design department or as a sales manager in sales and marketing, commitment and performance is always rewarded at the TII Group. Our global presence offers an interesting working environment, not just for sales and service employees who travel around the world. Flat hierarchies and open structures ensure independent working practice.



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