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wascosa **infoletter**

Latest news for the freight wagon industry

Connections and connectivity

These days we hear a lot about the digitalisation of freight transport. But what is the current state of play? Many applications for wagon digitalisation and train networking are already available or under development. But where networking is concerned, one of the most important factors is the nature of the connections between a train's locomotive and its wagons.

by Daniel Jobstfinke,
research associate in the Rail Vehicles Department of the Technical University of Berlin.

Train locomotion is only possible through the mechanical connection between the locomotive and wagons, which takes the form of a screw coupling with side buffers. As well as this mechanical link, there are two further connections, namely those carrying energy and communications.

These two connective functions have long been a reality on classic freight trains: the main air pipe of the brake transfers energy for the brakes in the form of compressed air from the locomotive to the wagons, and also transmits control commands. In this case, the energy and communication connection between the locomotive and wagons is realised by means of a compressed air hose.

It is equally possible to achieve communication between the locomotive and wagons using a cable or wireless data connection. Energy is normally supplied via an electrical cable.

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Dear Reader

The First Industrial Revolution towards the end of the 18th century brought greater mechanisation through water and steam power. This was followed by the Second Industrial Revolution and mass production via conveyor belts and electric power at the beginning of the 20th century. The Third Industrial Revolution started in the 1970s, with productivity and automation further enhanced by IT and electronics. Now, in the new millennium, we are witnessing the Fourth Industrial Revolution.

As far as railways are concerned, "Industry 4.0" is not simply a matter of supply chain management and is also more than just a buzzword: it signals a radical transformation of our industry. Logistics 4.0, Railway 4.0, digitalisation – whichever label is applied – the main objective is to link together the virtual and the physical world in the freightwagon industry.

Two years ago, we were the first lessor of freight wagons in Europe to start systematically fitting our fleet with telematics systems. Not a moment too soon, we are convinced. But this is merely the first step of many others to come.

Telematics is the key to optimising and automating the business processes of our own company and our partners. Here the possibilities have yet to be fully exploited. To remain competitive, however, we need to deploy these technologies in a consistent manner. The future is digital. Why not connect with us too? – We are Wascosa 4.0!

Philipp Müller
Chairman of the Board of Directors

Continued from page 1

All three connective functions – mechanical, energy and communications – make the train and wagon functions possible. Traditionally, these simply allowed the train to be formed and the brakes to operate. Thanks to digitalisation, however, other train and wagon functions can now be added which are supported – or indeed made possible – by the connection between the locomotive and wagons.

Telematics on the rise

Numerous telematics and sensor applications are currently finding their way into European freight wagon fleets. These allow wagons to be located and their mileage recorded. So, for example, customers can follow the progress of shipments (track & trace), or position-dependent information can be triggered, such as the train's approach to the destination station (geofencing).

For freight wagon operators, the wagon's actual mileage data provides important information for optimising maintenance. Significantly better use can be made of the mileage limit between two maintenance levels – a method which Wascosa is also using successfully [1].

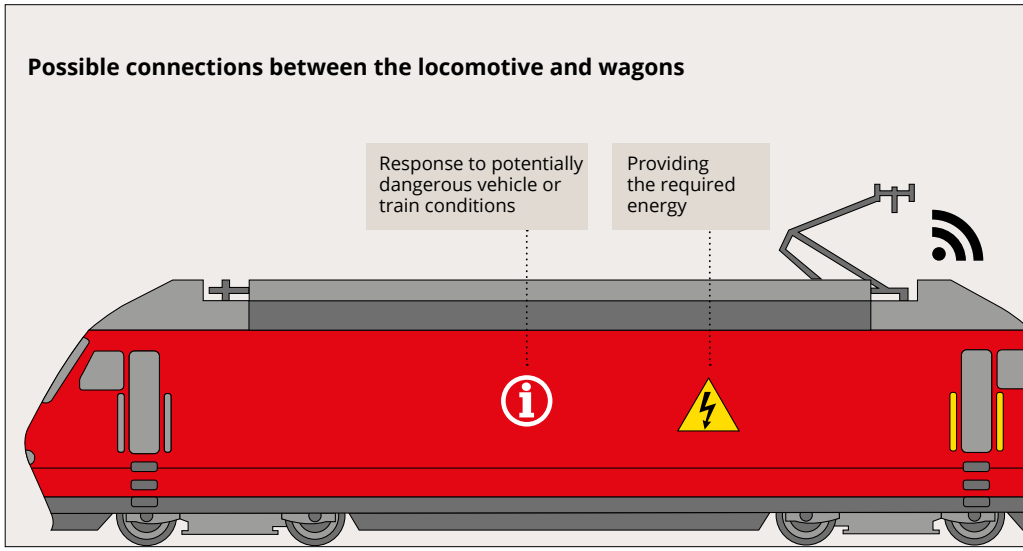
Supplying energy is the difficult part

A connection between the locomotive and wagons is not necessarily required for the described applications. The collected information is only relevant for that particular wagon and can be sent independently of the train's other vehicles via the mobile phone network.

However, the challenge of supplying energy has to be overcome. This can be done either by means of batteries or via axlebox generators. With batteries, the challenge comes from the fact that they must satisfy all the wagon's energy requirements between two maintenance procedures. Applications on the wagon must therefore use energy sparingly and may, for example, send locating information just a few times a day rather than continuously. Axlebox generators have the drawback that they require additional maintenance effort, and energy may only be available to a limited extent if the freight wagon is idle (at least for a prolonged period).

Telematics allow vehicles to be located and the progress of the goods tracked.

Possible connections between the locomotive and wagons



To avoid limitations on the amount of energy available, electricity can be supplied from the locomotive via a cable. This approach is being pursued in the "Innovative freight wagons" research project of the German Ministry of Transport (BMVI) and will be trialled starting in early 2018 [2]. It is mandatory for all vehicles in the train to be equipped with a power line and to have corresponding terminals at the ends of the vehicle. This provides an opportunity to realise more energy-intensive applications using a reliable and robust power supply.

Monitoring the status of wagons and freight

Examples of more energy-intensive applications include status monitoring of components for realising "predictive maintenance" on freight wagons, in other words forecasting the load-dependent life of the wagons. This is among the aims of the European research project "INNOWAG". In addition to status monitoring, this research project also focuses on the monitoring of cargoes, particularly hazardous goods. Here too, the plan is to establish wireless communication between the wagons and locomotive.

Communication between wagons and the locomotive also makes sense for other telematics and sensor applications, such as monitoring of vehicle-side brake locking and hot running, and derailment detection. Brake locking, defective wheelset bearings and derailments are rare events in railway operation. However, because they can have devastating consequences, they must be monitored.

Monitoring of brake locking and hot wheelset bearings is nowadays carried out locally on the track. This has the disadvantage that information is only sporadically available and the damage may have already occurred before it is detected. With spot measurements, it is not possible to detect a fault at the time it occurs.

Failure of reliable communication between wagons and the locomotive can have disastrous consequences.

Damage limitation through continuous monitoring

Nowadays, derailments are often not recognised immediately. The engine driver is frequently unaware of a derailed wagon further back in the train, and the train does not become disconnected. He can only be informed when people outside the affected train become aware of the derailment.

In 2013 the derailment of a wagon in a freight train went unnoticed over a distance of about 12 km – with corresponding damage to the infrastructure. With reliable communication between wagons and the locomotive, the engine driver can be warned of deviations from target values and other abnormalities early on, thus not only limiting damage but also increasing the quality of operation. With continuous monitoring there is time to take preventive action, so that the train does not have to be stopped on the track.

Potential of semi-automatic brake tests

Other train and wagon functions can be implemented if there is cable or wireless communication between the locomotive and wagons, and provided sufficient energy is available. Automatic brake testing and electro-pneumatic braking are worth mentioning in this respect.

Brake testing nowadays is a very time-consuming manual process that must be carried out at least once per train per day. The whole length of the train – up to 750 metres – has to be walked several times, and the condition and release state of the brakes has to be checked on every wagon.

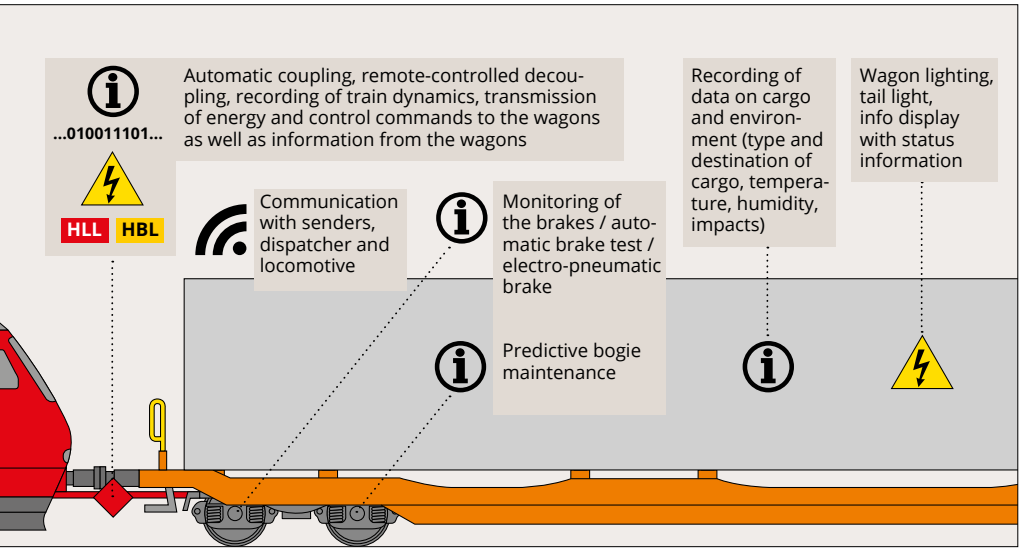
Currently, some manufacturers already offer systems for (semi-)automatic brake testing, and other systems are under development. The goal is to carry out a brake test of the whole train from the driver's cab at the push of a button, similar to what is now a standard procedure on modern passenger trains. Advantages of these systems include not only the time saving, but also greater safety, automatic documentation of tests and the possibility of continuous monitoring leading to early warning of faults.

Advantages of electro-pneumatic brake control

From fully automatic brake testing to electro-pneumatic braking is only a small step. With this method of brake control, compressed air is merely the medium for transmitting energy to the brake. The control commands are conveyed electrically. This system is already the norm in passenger rail transport. It allows higher speeds and longer trains.

The greater sensitivity of this brake allows better interaction with the regenerative dynamic brake of the locomotive, so that more energy is fed back, thereby saving traction costs. It also means reduced and more even brake wear.

Both semi-automatic brake testing and electro-pneumatic brake control are included in the BMVI's "Innovative freight wagons" project. As well as the power line mentioned above, the wagons also have a data bus cable providing communication between the locomotive and the wagons.



Automatic coupling as "enabler"

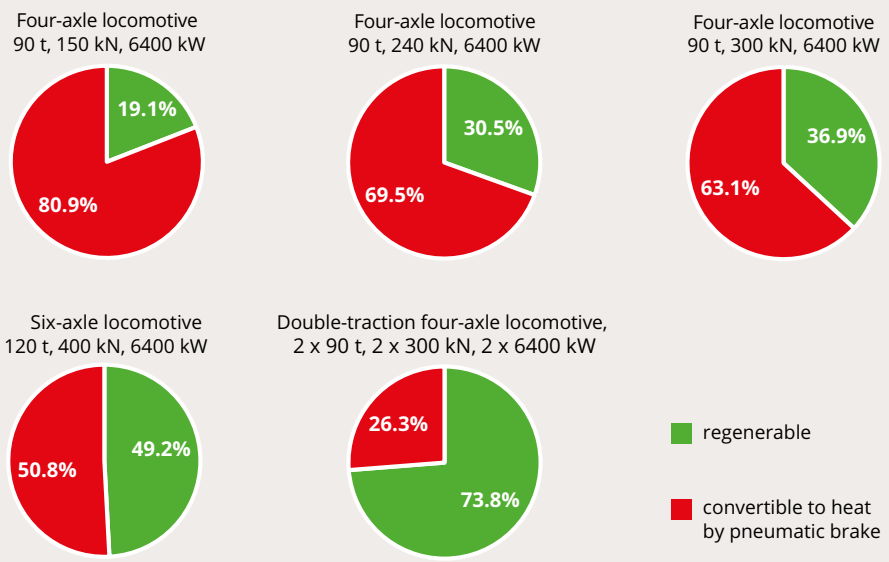
Obviously the energy supply, at least, has to be coupled by means of a cable when the train is formed. The same is true of a communication connection, if it is realised using a data bus cable. While this can be done manually via connectors and couplings, it not only creates more work during the train formation process, but is also incompatible with the idea of a digitalised and (semi-)automated freight wagon.

It makes far more sense in this context to use an automatic coupling (AC). This can be seen as an "enabler", whereby the establishing of energy and communication connections allows further digitalisation and automation functions which would not otherwise be possible [3].

Automatic couplings developed especially for European freight transport but never used widely include the AK69e, C-AKv und Voith SA3. The special point about these couplings is that they are compatible with the type of coupling used in Russia. They are extremely robust and suitable for very long and heavy trains.

Aside from the mechanical coupling process, however, their ability to meet the demands of automation is very limited. Automatic coupling of air, electricity and data lines is only partially possible and requires a considerable engineering effort. For example, with these couplings the shut-off valves for the air lines still have to be operated manually(!). This is hardly consistent with their role as "enablers" of digitalisation and automation.

Exploiting «heavy freight train» recuperation



The electro-dynamic braking force (recuperation), and hence the amount of energy which is fed back during a stopping process, can be significantly increased using an automatic coupling, thanks to the superior transfer of force to the wagon. Source: [4]

On closer consideration, it is therefore clear that a simplified or adapted passenger train coupling would deliver significantly greater benefits in freight transport. This approach is being followed and tested both in the "Innovative freight wagons" project and in the "5L-Demonstrator" from SBB Cargo AG [2,4,5].

Advantages of automatic couplings

As well as enabling many digitalisation functions, modern automatic couplings offer other advantages:

- The previously entirely manual (de)coupling process is simplified and automated
- Freight trains can be operated more frequently in brake position P at higher speeds
- Wheel wear can be reduced through better transfer of force
- Recovery of braking energy by the locomotive can be increased

Conditions have to be met

Particularly when considering the example of automatic couplings, it is clear that new types of connections between locomotives and wagons call for a migration strategy. Automatic couplings from the passenger sector are not compatible with screw couplings, and a power or data line will only work if all vehicles are equipped with lines that match one another. In fact, the majority of train functions – such as automatic brake testing – will only be effective if all vehicles in the train are equipped with the relevant system.

That being so, it will be fascinating to see which systems emerge victorious from the research projects and experiments. One thing is certain, however: progress towards digitalised rail freight transport depends on realising effective and innovative connections between locomotives and wagons.

Sources:

[1] Saabel, I.: Innovative Güterwagen – Neue Geschäftsmodelle für Wagenverleiher [Innovative freight wagons - new business models for wagon leasing companies]. Presentation to the VDI expert forum "Automatisierung für Schienenverkehrssysteme – Der Weg zum Güterwagen 4.0" [Automation of railway systems - progress towards Freight Wagon 4.0] 1-2/9/2016, Aachen.

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[5] Hüllen, J.: 5L-Test startet [5L test begins]. Rail Business Special: Güterbahnen 4.0 (Freight Railway 4.0), pp. 33 -35. DVV Media Group GmbH, 5/2017.

Rail freight traffic in Switzerland: NEAT is the next chapter in a long success story

Transalpine rail freight traffic is one of Switzerland's great success stories. The next chapter in this story is the Gotthard Base Tunnel and the associated infrastructure projects, while the increase in container traffic from Asia could also make a substantial contribution.

In 2015 the total volume of transalpine freight traffic in Switzerland reached 39 million tonnes, more than doubling in less than 35 years. Since the mid-nineties, the volume of freight transported by rail has also risen steadily, hitting a new record of 26.9 million tonnes in 2015. Rail freight now accounts for 69% of total freight volume.

Switzerland therefore ranks in first place, ahead of France and Austria. Although the increase in goods transported via the Austrian alps was greater, the percentage carried by rail was never more than 34%, and has actually tailed off in recent years. The volume of freight transported by rail in France peaked in the 1990s, and now only stands at 15%.

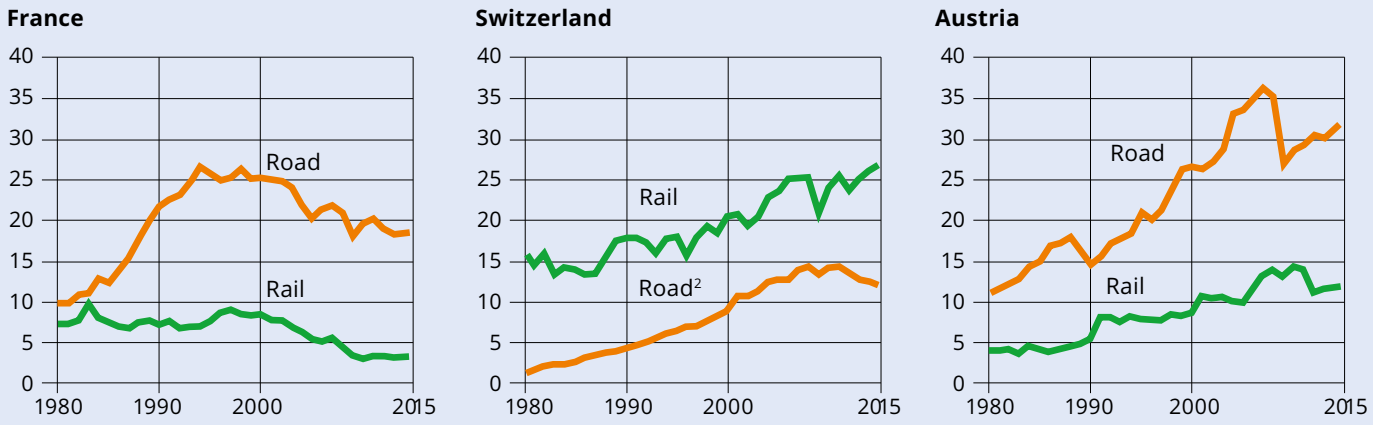
Gotthard as a platform for the next growth spurt

The next chapter in Switzerland's success story has already begun: the new Gotthard Base Tunnel opened for freight and passenger traffic in December 2016. Together with the Ceneri Base Tunnel due to be completed by 2020, freight transport routes through Switzerland will not only be shorter, but will also be available as a continuous "flat-rail" link. Trains with a total weight of 2,000 tonnes will be able to transit through Switzerland, compared with the previous 1,400 tonnes limit. The calculated tunnel capacity of 260 freight trains (and 65 passenger trains) will bring a huge boost to the efficiency of the north-south rail axis. The latest federal government estimates anticipate an increase of around 25% in transit traffic by 2030.

Possible change of direction: Asian freight traffic coming from the south

In addition to freight traffic within the EU, growth on the alpine routes is likely to be boosted by the rising volume of freight traffic from Asia to North Europe. Since 2010, mega container ships have been sailing up the Suez Canal into the Mediterranean. At present they still head straight for the big northern European ports in Antwerp, Rotterdam or Hamburg. But in future their destination is increasingly likely to be the Italian ports, whose infrastructure is being significantly expanded. Shortening the sea trip by five days and reducing the rail journey through Switzerland saves a lot of time and money, as well as being better for the environment. A number of Swiss companies have already started to gear their logistics chains to this development. Others could follow, providing additional momentum to Switzerland's success story in transalpine freight traffic.

Trends in transalpine[1] freight transport volumes (in million net tonnes)



1) *Alpine section from Mt. Cenis/Fréjust to Brenner*
2) *Method for calculating road freight traffic changed in 2010 to the control station data of the heavy vehicle tax (LSVA). Prior to that, data came from the Swiss Automatic Traffic Census network.*
Source: BVA, ASTRA – Alpenquerender Güterverkehr / © BFS, Neuchâtel 2016

Wascosa Production Module – the service package for procurement and quality assurance

Projects to procure new wagons can soon be derailed unless they are consistently supported by a comprehensive risk management system. The Procurement and Quality Assurance service – one of the products in the Wascosa Production Module – is a unique package for verifying the procurement and quality assurance of new wagon projects. Wascosa has just overseen the development, manufacture, commissioning and delivery of 44 innovative Uacns powder products wagons for the aluminium manufacturer Trimet, ensuring conformity with all contractual conditions.

Aluminium – a highly versatile industrial metal – is a core business of Trimet, a family-owned business with 3,000 employees and eight European locations. Trimet is Europe's biggest independent aluminium producer. As an environmentally aware company, it is keen to make sure not only that aluminium is manufactured with as little environmental impact as possible, but that the raw materials used in production are also delivered to plants in an environmentally responsible manner. Here Trimet makes a conscious choice for rail transport and its decision to procure 44 new and highly innovative Uacns powder products wagons reflects a clear commitment to reducing its ecological footprint.

Invitation to tender for 44 Uacns powder products wagons

In June 2015 Trimet launched a tender for 44 wagons for the transport of aluminium to supply their aluminium smelter in Saint-Jean-de-Maurienne, France. These aluminium transports are strategically important to Trimet because the raw materials logistic chain is tightly optimized and requires on-time deliveries. From an early stage it was clear that Trimet would purchase the rail wagons and therefore needed to find a reliable partner to support this innovative procurement project.

"We are delighted to have completed this project with Wascosa's support. And knowing that our wagon fleet will now be maintained by Wascosa gives us peace of mind."

Nicolas Archenault,
Procurement & Supply Chain Manager,
Trimet

Trimet opted for Wascosa's "Procurement and quality assurance" service package. Trimet's requirements were crystal clear right from the project kick-off: to develop an innovative powdered products wagon with maximum load capacity and minimal discharge times. But for Trimet, innovation is not an end in itself: the aim was to achieve major efficiency gains in the form of a bigger payload, lower transport costs and faster discharging of the cargo, thereby optimising all operational procedures.

Obvious solution: the use of lightweight aluminium

The key to success was to design an extremely lightweight powdered products tanker made of pure aluminium, as the use of lighter material for wagon construction allows a higher payload and thus a bigger loading volume.

Working closely with the company Feldbinder, Wascosa made sure the technical specification was implemented correctly during the project development phase and made many proposals for optimisation. For example, Wascosa's experts also cast a critical eye over the analysis of the wagon's technical design through an FEM-supported calculation of its stiffness, in order to detect and rectify potential weaknesses as early as the development stage.

Test discharge, measuring the time taken to empty the tank

Part of the Wascosa service package: monitoring of prototype construction and series production

Wascosa started monitoring the procurement process while the prototype was still being built. At this juncture, initial adjustments for series production were already made so as to achieve the high quality standard demanded of the wagon. After completing the prototype, the charge and discharge performance was assessed on site at Trimet with the involvement of experts from the wagon manufacturer Feldbinder. Thanks to specially selected compressors, the wagon service technicians managed to cut the discharge time from the specified 27 minutes to just 22 minutes, comfortably beating the rapid discharge time stated in the technical specification.

The prototype wagon also underwent exhaustive inspection by Wascosa to ensure full compliance with the wagon's specification. At the same time, everything was done to keep the life cycle costs of series production as low as possible and to assure maximum operational safety, as well as good availability of the wagon in normal service.

Wascosa's three-stage production monitoring concept proves its worth

A three-stage process was followed to monitor procurement.

The first stage involved active support in the fabrication of the prototype by the project manager and an external welding specialist. This ensured that conformity with the norm was already verified during the prototype development phase and any problems arising could be identified and addressed in collaboration with the manufacturer. Material issues were recorded in the Wascosa Survey Book®.

The second stage began with the acceptance procedure for the prototype, which was carried out by the project manager. At the same time, the procurement inspector was instructed in the acceptance procedure to allow him to process the series wagons more efficiently later on.

In the third stage, each wagon was approved by the procurement inspector, who reported all findings systematically to the project manager. These feedback reports were also logged in the Wascosa Survey Book®. All feedback on deviations was assessed for relevance while the acceptance phase was in progress, and the appropriate corrective measures implemented immediately so as to avoid potential problems arising during series production.

Relieving the client of project management tasks and minimising risks

Wascosa's "Procurement and quality assurance" service package enabled a complex and cutting-edge procurement project to be successfully completed both on schedule and on budget.

Not only was Trimet relieved of most of the required project management tasks for this challenging procurement project: the project risk was minimised thanks to Wascosa's specialist expertise and support. The end result is clear: operational excellence in the rolling stock used, and efficiency gains through a bigger payload and faster discharge time.

Trimet's Uacns powder products wagon on display at transport logistic 2017 in Munich

Wascosa presents its flex freight system® for transporting chemical products at transport logistic 2017

Wascosa exhibited for the eighth time from May 9th to 12th, 2017 at the transport logistic trade fair in Munich – this year under the motto “Flexibility has a name”.

This year, Wascosa presented the Wascosa flex freight system® for the transport of chemical products. As well as Wascosa, BASF, van Hool (the Belgian maker of commercial vehicles) and the Dutch VDL Group were involved in the project. This flexible logistics solution combines tank containers, rail transport and autonomous driving on the first and last mile.

Exhibitors joining the Wascosa stand included the project participants as well as Bertschi, Hoyer, Knorr-Bremse, Magyar, and the software firm Sternico.

Carrying frame offers extra flexibility

The tank container has roughly the same load capacity as a tank wagon but can be removed from the wagon. A carrier specially developed for this container makes it possible to transfer the container to a driverless transport vehicle. As a result, the transport processes on the factory premises can be automated.

The tank containers can be temporarily parked in a container depot. Since the containers can be transported both on rail and road, delivery times between the railway terminus and loading points can be reduced. This releases the rail car for other transport tasks during this period.

Events generate interest and high attendance

On Wednesday, 10 May 2017, Wascosa and BASF presented this innovative concept in detail to more than 60 interested visitors to the Wascosa stand, inviting everyone to a finger buffet lunch afterwards.

On Thursday, 11 May 2017, the Dutch Minister of Economics Henk Kamp visited the Wascosa stand as part of the German/Dutch regional development partnership between the federal state of Bavaria and the Dutch provinces of Brabant and Limburg. During his visit, Henrik Kamp was keen to find out more about examples of successful collaborations between German and Dutch companies and was very interested in the Wascosa flex freight system® for transporting chemical products.

Informal networks also featured in the trade fair: on the first evening, Wascosa invited selected customers and business partners to dinner, followed by 10-pin bowling at the Dreambowl Palace. Overall, everyone who attended transport logistic 2017 was very pleased with its success, as confirmed by the positive feedback of co-exhibitors and Wascosa itself.

"We have been talking about driverless vehicles for a very long time and we have also been active in this area for a long while. But it is only at transport logistic 2017 that we have the impression that the market and the technical possibilities are coming together now."
Karel Smits, Manager VDL Automated Vehicle

"Wascosa and BASF show impressively how to create a vehicle concept with innovative power and passion that boosts the competitiveness of rail transport. We are very pleased that we were able to contribute to the success of this cutting-edge project with our innovative, light brake disc."
Matthias Cordes, Sales Freight Cars Europe UIC Knorr-Bremse

"We especially liked the fact that many visitors interested in our concept were here. Our new logistics solution brings more flexibility and makes rail transport more competitive and innovative for companies. Working with Wascosa and the other partners is a lot of fun."
Holger Schmiers, Project Manager BASF
Miriam Walter, Manager Rail & Site Services BASF

"From my point of view, the trade show has been very interesting. The participation in the Wascosa stand is a great opportunity for us to present the team collaboration."
Elmar Fähndrich, Sales and Product Management Sternico

"It is a great pleasure for us to be present at transport logistic with these innovative and new tank containers. Our customers are very interested and want to know as much as possible about them."
Walter Ulrich, Strategic Business Solutions Bertschi

"We are very satisfied so far. Compared with the last time, we had far more visitors and interesting conversations. This makes us very positive for the future. We are very pleased to be able to present this year innovative and trendsetting solutions to the visitors together with our co-exhibitors."
Peter Balzer, CEO of Wascosa

New addition to Wascosa's wagon fleet: Hopper wagon, 60 m³, Fanps for transporting gravel and ballast

Wascosa has expanded its fleet with another 200 Fanps type hopper wagons with a volume of 60m³. These wagons have shown themselves to be particularly suited to transporting gravel and ballast with stones bigger than 6 mm. One of the main features of the Fanps hopper wagon is its highly efficient, flexible and robust unloading system. This allows cargoes to be discharged from the centre or side, with calibrated dispensing, and also has three valves that can be operated independently.

The wagons can be fitted with a telematics systems as an option. Sections of the wagon can be leased in short terms.

For more information, please contact vertrieb@wascosa.ch

Payload

Load limits

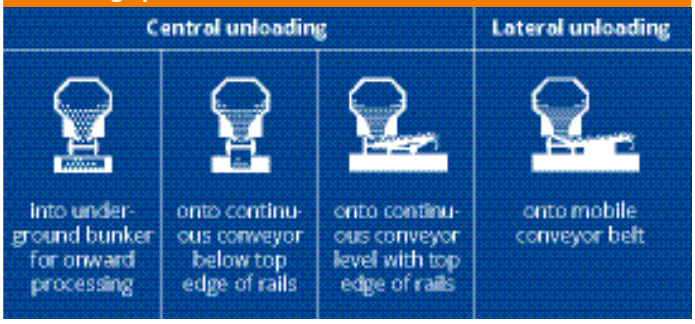
	A	B	C	D	
S	42.0 t	50.0 t	58.0 t	69.0 t	**
120	00.0 t				

Tare weight	21,000 kg +/- 2%

Dimensions and eqiupment

Length over buffers	15,640 mm
Axle load	22.5 t
Volume	60 m³
Number of discharge outlets	3
Flaps operation	manually individually over square

Unloading options



Calendar of events

Date	Event	Location	Website
2017			
06.12.2017	Intermodal Forum	Düsseldorf, DE	http://www.hupac.ch/EN/Intermodal-Forum-62a58f00
06.12.2017	Workshop: Unlocking finance for railways – capacity building for sustainable PPPs	Paris, FR	www.uic.org
06. – 07.12.2017	Rolling Stock Maintenance Conference	London, UK	http://www.rolling-stock-maintenance.com/
07.12.2017	RailNetEurope: 4th EU, Rail Freight Day	Vienna, AT	http://www.rne.eu
2018			
08.01.2018	VPI New Year reception	Hamburg, DE	www.vpihamburg.de
09.01.2018	VPI Symposium	Hamburg, DE	www.vpihamburg.de
30.01.2018	UIRR Intermodal Exhibition followed by ELP's Intermodal Conference (ELP = European Logistics Platform)	Brussels, BE	www.uirr.com
31.01.2018	CER/SBB Data Science and Mobility Conference	Lausanne, CH	www.cer.be
20.02.2018	CER & UNIFE European Railway Award 2018	Brussels, BE	www.unife.org www.cer.be
20.02.2018	CER & UNIFE Annual Reception	Brussels, BE	www.unife.org www.cer.be
13.03.2018	VPI Austria General Assembly	Vienna, AT	www.vpirail.at
20.03.2018	2. CER Digital Fair: Digital railways: present technologies, future trends	Brussels, BE	www.cer.be
20. – 23.03.2018	SITL Europe, trade fair for transport and logistics	Paris, FR	www.sitl.eu
20. – 23.03.2018	Intertraffic, trade fair for traffic and transport	Amsterdam, NL	www.amsterdam.intertraffic.com
04. – 05.04.2018	3rd Track Acces Charges Summit	Netherlands	www.railtech.com
12. – 13.04.2018	IBS Spring Conference	Lübeck, DE	www.ibs-ev.com
16. – 19.04.2018	TRA Transport Research Arena 2018	Vienna, AT	www.traconference.eu/
01.– 03.05.2018	Infrarail, 12th International Railway Infrastructure Exhibition	London, UK	www.infrarail.com/2018/
17.05.2018	UIRR General Assembly	Brussels, BE	www.uirr.com
24.05.2018	UIP General Assembly	Vienna, AT	www.uiprail.org
19. – 21.06.2018	UNIFE General Assembly	Warsaw, PL	www.unife.org

Impressum

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Our current wagon fleet

Container wagons for transporting mineral oil, chemical products and liquid gases

Intermodal wagons for transporting semi-trailers, containers and swap bodies

Powder products wagons for transporting powdery goods

Hopper wagons for transporting bulk materials that are sensitive (or insensitive) to moisture

Covered wagons for transporting weather-sensitive, large-volume and palletised cargoes

Innovations

Wascosa flex freight system® –
modular freight wagon with flexible superstructures to adapt to different cargoes, now for tank containers as well

Wascosa euro tank car® – cross-border compatibility thanks to multiple connections in the dome and floor area

Wascosa safe tank car® – the new standard for safety in the transport of hazardous goods by rail

Wascosa tank car 3000® –
the first ladderless tank wagon in Europe