

Press release

Munich, September 08, 2022

Boosting rail Traffic Flow: Innovative systems for transporting passengers and freight at InnoTrans 2022

- **The aim is to boost transportation capacity on existing rail infrastructure**
- **Knorr-Bremse technologies increase vehicle availability, improve passenger flow, and optimize maintenance**
- **The Digital Freight Train and Evolution of Braking are core Knorr-Bremse projects that respond to rail industry demand for efficiency and sustainability**
- **Digitization of products, subsystems and services is key to an evolving rail sector**

Munich, September 08, 2022 – Knorr-Bremse, the global market leader for braking systems and other rail and commercial vehicle systems, is offering new technologies for boosting the capacity of existing rail infrastructure. Smooth-flowing traffic is an important lever for achieving this aim. At InnoTrans 2022 in Berlin (Main Hall 1.2, Booth 250), Knorr-Bremse will showcase connected solutions for making freight and passenger traffic more efficient and sustainable – not least by digitizing and automating key systems and components.

The capacity of existing rail infrastructure in Europe and many other parts of the world needs to increase if the rail transportation demands of businesses, policymakers and society in general are to be satisfied. “The basic prerequisite is smooth, high-performance transportation of freight and passengers,” says Dr. Jürgen Wilder, Member of the Executive Board of Knorr-Bremse AG and responsible for the Rail Vehicle Systems division. “To meet customer needs, we’re developing solutions that optimize freight traffic, help operators to manage rising passenger numbers, and make rail vehicles more available. All this depends on the digitization, automation and electrification of many different systems. An outstanding example of our progress is the Digital Automatic Coupler (DAC) for the rail freight market.”

Key innovations: Digital Freight Train and DAC with electric contact coupling

The Digital Freight Train is all about high-performance freight traffic, including efficient train dispatching and high vehicle availability. One of the key enablers of manageable, rapid, flexible freight transportation by rail is the **Digital Automatic Coupler (DAC)** or **FreightLink** as it is called at Knorr-Bremse. As well as enabling automatic mechanical/pneumatic coupling and decoupling of railcars, it also supports consistently reliable power and data connections throughout the train. After extensive testing of the **electric contact coupling system (e-coupler)** – the DAC module for making all these connections – Knorr-Bremse has achieved an important milestone: The design is currently the only one that fulfills all customer requirements, especially in terms of complying with DAC dimensions, which are subject to a limit of 200 millimeters from the center of the coupling head. Among other benefits, the system will also enable Knorr-Bremse to bring automated brake testing and condition-based maintenance to the freight segment.

The **UIC compact freight car brake (CFCB)** is another key element in the Digital Freight Train (DFT) concept. This extremely robust, reliable brake unit stands out by virtue of its stability and efficiency, reflected by long overhaul cycles of up to 15 years. It can also be digitally upgraded – which is why it is DFT-compatible.

Just as **FreightLink** (for rail freight cars) and **HybridLink** (for locomotives) streamline train operations in the rail freight business, so do **Automatic Coupling Solutions** in the passenger business. The **AutoLink** automatic center buffer coupler connects traction units to each other, while the **ShortLink** semi-permanent coupler connects together railcars in a trainset. Both components can be equipped with electric contact couplers.

Evolution of Braking

The ongoing “Evolution of Braking” has produced tailored brake controls for multiple units, for optimized braking system performance. The standardized **CubeControl** family of brake control systems includes both electronic and pneumatic elements in a single mechatronic unit. With very little effort, customers can use project-specific software to adapt the different hardware versions to their needs. The **FlexControl** family of brake control systems, on the other hand, takes a more individual approach. By selecting electronic, pneumatic, mechanical and software subcomponents from the flexible, modular FlexControl toolkit, Knorr-Bremse’s systems engineers can configure and program a complete, highly customized system.

The **Reproducible Braking Distance (RBD)** development program is also groundbreaking. The technology contributes to higher utilization of the rail infrastructure by significantly reducing the variance and spread of braking distances. To make this possible, Knorr-Bremse has combined the innovative Deceleration Control (DCC) system with the improved WheelGrip Adapt wheel slide protection system and SandGrip sanding system. The company’s **electromechanical brake (EM brake)** also aims to increase track capacity by reducing braking distances, based on improved dynamics. Instead of transferring braking signals and energy pneumatically, the system does so electrically using brake-by-wire technology. The low-noise EM brake, which has fewer – and simpler – mechanical and electrical interfaces, is one of the key enablers of the “airless train”. Its smart diagnostic and monitoring capabilities further improve vehicle availability. During extensive field trials involving 200 braking maneuvers at speeds of up to 160 km/h and braking forces of up to 36 kN, Knorr-Bremse has already collected much valuable performance and operating data.

IFE and Evac continue to develop proven subsystems

LIFEDrive for metro entrance systems was designed by IFE, Knorr-Bremse’s world-leading brand for train door systems, to enable passengers to enter and exit trains faster. LIFEDrive (*Linear motor IFE Drive*) is a space-efficient, retrofittable system which controls the entrance system’s two door leaves independently – an industry first. Even if one door is blocked, the flow of passengers can continue, significantly reducing any boarding or alighting delays and avoiding disruptions to tight metro timetables. The **compact toilet system produced by Evac**, a Knorr-Bremse brand since 2021, makes a similar contribution to passenger comfort. Equipped with integrated fault detection and rectification functions, the system is also quick and easy to replace for maintenance purposes, minimizing train downtime.

Digitized subsystems for predictive maintenance

Knorr-Bremse's **electrohydraulic Flat Floor Design** for Light Rail Vehicles can accept the most compact, space-saving hydraulic braking system on the market – the **HydroControl Smart** electrohydraulic supply and control unit with integrated electronic brake control system. By using condition-based maintenance (CBM), the system enables engineers to take a highly targeted approach to servicing braking equipment. The flexible power electronics in the **System Integrated Functional Unit (SIFU)** developed by Knorr-Bremse brand Microelettrica Scientifica also uses CBM to improve vehicle availability. The modular SIFU integrates a very large number of train control and diagnostic functions in a single, compact enclosure, and can reduce overall cabling requirements by more than 70 percent.

Where to find Knorr-Bremse: Main Hall 1.2, Booth 250

“Get into the Flow” is the banner under which Knorr-Bremse will be taking InnoTrans visitors on an all-embracing tour of connected solutions for sustainable, efficient rail transportation. At the company's central booth in Main Hall 1.2 (Booth 250), Knorr-Bremse has packaged its solutions and systems into four solution spaces. Each space is based on key customer and market imperatives: Ecological Footprint, **Traffic Flow**, and Train Operations & Maintenance. The fourth solution space – Smart Solutions & Application Landscapes – is the all-pervasive loop that runs through and brings together all the other spaces.

Captions:

Knorr-Bremse technologies increase vehicle availability, improve passenger flow, and optimize maintenance | © Knorr-Bremse

At InnoTrans 2022 in Berlin, Knorr-Bremse will showcase connected solutions for making freight and passenger traffic more efficient and sustainable. | © Knorr-Bremse

Knorr-Bremse (ISIN: DE000KBX1006, ticker symbol: KBX) is the global market leader for braking systems and other systems for rail and commercial vehicles. Knorr-Bremse's products make a decisive contribution to greater safety and energy efficiency on rail tracks and roads around the world. About 30,500 employees at over 100 sites in more than 30 countries use their competence and motivation to satisfy customers worldwide with products and services. In 2021, Knorr-Bremse's two divisions together generated revenues of EUR 6.7 billion. For more than 115 years, the company has been the industry innovator, driving developments in mobility and transportation technologies with an edge in connected system solutions. Knorr-Bremse is one of Germany's most successful industrial companies and profits from the key global megatrends: Urbanization, Sustainability, Digitalization and Mobility.

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