

Press release

Munich, November 04, 2020

Sustainability by rail: Knorr-Bremse drives forward solutions for even greater eco-friendliness and efficiency in rail vehicles

- **Trend towards sustainable mobility calls for eco-friendly, economical and attractive rail transportation**
- **Knorr-Bremse is systematically aligning its systems portfolio with the future needs of rail vehicle manufacturers, operators and passengers**
- **The global market leader is driving forward the implementation of eco-efficiency measures designed to boost rail vehicles' energy efficiency and improve their ecological footprint**

Munich, November 04, 2020 – Knorr-Bremse, the global market leader for braking systems and other systems for rail and commercial vehicles, is presenting a wide range of system solutions aimed at further boosting the environmental compatibility and economic efficiency of the rail sector as a key future mode of transportation – including technologies for wear-free and low-noise braking and for reducing rail vehicles' energy consumption.

“Sustainability is a global megatrend and will be a decisive factor in shaping the future of passenger and freight transportation worldwide,” says Dr. Jürgen Wilder, Member of the Executive Board of Knorr-Bremse and responsible for the Rail Vehicle Systems division. “Against the backdrop of climate change, the prospect of growing numbers of passengers and the systemic significance of the rail sector, Knorr-Bremse is forging boldly ahead with the development of technologies for sustainable, available and attractive rail transportation.”

“Given that the transportation system of the future will be expected to deliver environmental compatibility, Knorr-Bremse is systematically gearing its operations to the needs of rail vehicle manufacturers and operators,” says Dr. Nicolas Lange, Chairman of the Management Board of Knorr-Bremse Rail Vehicle Systems. “As a result of our systematic EcoDesign activities, our innovations are playing a decisive part in reducing wear, noise, energy consumption and carbon dioxide emissions in the rail sector and thus in further improving the operational efficiency, economy and ecological footprint of trains.”

Innovative braking technologies: Avoiding wear and noise

Through intelligent brake management, Knorr-Bremse enables priority to be given to wear-free and low-noise braking systems such as eddy current or electrodynamic brakes, helping to prolong the service lives of the brake pads. Even when the friction brakes have to be applied in braking maneuvers involving more rapid deceleration, the process known as blending enables the intelligent distribution of braking forces to keep wear to a minimum. As a result, all available adhesion is exploited to optimize the braking distance even under adverse track conditions. In [high-speed trains](#) for example, using the eddy current brake based on the principle of induction can reduce wear in the friction brake by as much as 90 percent.

Along with technologies that reduce wear in brake pads and blocks, Knorr-Bremse is helping to realize the quieter rail services increasingly demanded by society through its new generation of [organic brake pads](#) (“whisper brakes”) supplied as original equipment for freight cars. These Problock J816M brake blocks help to reduce braking noise by up to 10 dB(A) compared to conventional gray cast iron blocks – meaning that the noise is only half as loud to the human ear. In addition, the company’s upgraded intelligent Air Supply Unit (iASU) for multiple units and locomotives, complete with new big-data functionalities, delivers a low-

noise air supply for pneumatic braking systems, making for even quieter standby operation of commuter rail trainsets, for example, in urban settings. People who live close to rail freight routes and rail depots are among those who will benefit from these two system solutions.

Energy-efficient climate control systems with advanced refrigerants

Knorr-Bremse subsidiary [MERAK](#) develops energy-efficient heating, ventilation and air conditioning (HVAC) systems for rail vehicles, and with some 120,000 units installed in fleets around the world is a leading supplier of integrated climate control solutions. "These modular system solutions available with several expansion stages and optional data transmission get by on up to 30 percent less energy than conventional systems, which means that they make a decisive contribution to improving the vehicles' ecological footprint," explains Dr. Peter Radina, Member of the Management Board of Knorr-Bremse Rail Vehicle Systems and responsible for Onboard Systems business.

At the same time, MERAK uses environmentally compatible refrigerants in its systems, while still delivering a thermal performance comparable with that of conventional refrigerants in normal operations. "Climate control systems are also considered an important factor in improving on-board comfort in rail vehicles," says Dr. Radina. "As such, they help to boost the attraction of traveling by rail. The more people opt to take the train, the more person-kilometers will be covered by rail as opposed to other means of transportation, and the greater the positive impact on the climate will be."

LEADER® driver assistance system: Reducing trains' energy consumption

In addition, in the shape of the LEADER® driver assistance system, Knorr-Bremse offers operators valuable assistance in ensuring the energy-efficient and more eco-friendly operation of their trains, taking account of timetable, topography and, where available, information about the current traffic situation. LEADER® uses information about the configuration of the train, as well as the route, timetable, current speed and position as determined by GPS to calculate an energy- and/or fuel-efficient driving style. The recommended driving profile appears on a display in the driver's cab. Knorr-Bremse has demonstrated the energy-saving potential of LEADER® in a pilot project with DB Cargo, for example.

Hybrid trains: Technologies of the future for low-emission drive systems

Knorr-Bremse has developed a technology for converting conventional diesel multiple units into energy-efficient hybrid trains by equipping them with traction battery systems with battery management and sophisticated energy management of the on-board systems. Not least on non-electrified regional routes, which together make up around 40 percent of the network in Germany, this innovation prepares the ground for saving almost one quarter of the trains' operating energy and for carbon-neutral operation. Modernization measures of this kind can be undertaken without interrupting fleet operations and while maintaining or even improving on existing performance and comfort parameters.

Overhauling: Conserving resources through recycling

Through the systematic overhauling of used products including braking systems, doors and climate control systems, Knorr-Bremse is helping to extend the useful lives of its products in the interests of resource conservation. "As early as the innovation stage, Knorr-Bremse designs rail vehicle products for eventual overhauling," says Stefan Bräuherr who is in charge of Corporate Responsibility at Knorr-Bremse. "The aim is to re-utilize products for their original purpose, which results in a positive impact on our overall ecological footprint."

Overhauling has become a substantial branch of Knorr-Bremse's business. In 2019, the company's Berlin Service Center alone overhauled some 66,500 products for rail vehicles. Also in 2019, brake equipment for more than 5,500 high-speed train cars and almost 18,000 product units for metro trainsets were overhauled in China.

Captions:

Figure 1: With a series of innovative system solutions designed to boost the efficiency and economy of rail vehicles, Knorr-Bremse is aligning its systems portfolio with the future needs of rail vehicle manufacturers, operators and passengers. | © Getty/Westend61

Knorr-Bremse (ISIN: DE000KBX1006, Ticker symbol: KBX) is the global market leader for braking systems and one of the leading suppliers of other rail and commercial vehicle systems. Knorr-Bremse's products make a decisive contribution to greater safety and energy efficiency on rail tracks and roads around the world. About 29,000 employees at over 100 sites in more than 30 countries use their competence and motivation to satisfy customers worldwide with products and services. In 2019, Knorr-Bremse's two divisions together generated revenues of EUR 6.9 billion (IFRS). For more than 115 years the company has been the industry innovator, driving innovation 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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