

Press Release

Munich, July 2, 2015

High-speed rail in Japan: systems for 300 km/h and over

Bringing high-speed trains safely to a standstill from speeds of over 300 km/h calls for expertise and experience. Knorr-Bremse has been braking fast trains for more than 50 years. From July 7-10, 2015 the company will be showcasing and providing insight into the relevant products and systems at the 9th World Congress on High Speed Rail in Tokyo. This premium international expert forum is being organized by the worldwide association of railways, UIC, and East Japan Railway Company.

For the over 1,000 delegates expected to attend, the event provides an opportunity to review the development of high-speed rail systems over the past 50 years and to discuss the challenges that the next 50 years will bring. The accompanying exhibition will showcase the latest developments in high-speed rail systems from around the world. As a leading worldwide supplier of braking systems for high-speed trains, at the congress Knorr-Bremse will be presenting not only the Shinkansen brake disc and high-performance brake caliper, but also a brake control module for high-speed trains and the non-wearing eddy-current brake that is used in Velaro Deutschland trains. Also on show will be the latest entrance system from Knorr-Bremse subsidiary IFE and the iCOM vehicle diagnostics system. Through three expert papers presented at the event, the company also will be providing an overview of the state of the art at Knorr-Bremse where product development, maintenance and passenger comfort are concerned.

High-speed trains are safe and on-time: Japan was where it all began

The Shinkansen high-speed fleet is today one of the largest in the world with over 400 trains. The first high-speed route was opened in October 1964 between Tokyo and Osaka, making the Shinkansen the world's oldest high-speed rail link. Shinkansen trains are known for their schedule compliance, a performance explained by the separation of the high-speed network from the mass transit and freight lines, with almost the entire network fenced off, and by the robust engineering and good maintenance of the trains.

Success stories on the Japanese high-speed rail market

Knorr-Bremse first accessed the Japanese market in 1992 through a German-Japanese joint venture that led to the founding of Knorr-Bremse Rail Systems Japan Ltd. Initially, the company supplied a range of products including screw-type compressors and control systems for multiple units. Knorr-Bremse's debut on the Japanese high-speed rail market came in 2010, when operator East Japan Railway Company ordered new E5-generation Shinkansen trains for an extension of the Shinkansen line. To be competitive with the airlines, the trains had to complete the journey within three hours, which meant raising their top speed to 320 km/h.

Speeds of this order called for a much more powerful braking system. After tests spanning several years, East Japan Railway Company chose Knorr-Bremse to supply the braking components for the power bogies of the 23 trains on account of the company's technical expertise and the low life cycle costs. To this end a special compact and low-weight brake caliper was developed, while the brake discs and flexible ISOBAR sintered brake pads were designed to meet the extreme demands of possible emergency braking in the event of an earthquake.

Two years later the company received a follow-up order for the next Shinkansen platform, the E6. Then, in the fall of 2012, Knorr-Bremse further reinforced its position in the Japa-

nese high-speed rail segment by supplying the braking equipment for the E7 generation. Since then, West Japan Railway Company and Hokkaido Railway Company have also equipped their latest-generation trains with braking systems from Knorr-Bremse.

Participation in Japanese export orders

Knorr-Bremse also benefits from export orders won by Japanese railway engineering companies. The company supplies numerous braking and on-board systems to Japanese manufacturers for metros in Dubai, Los Angeles, Beijing or Singapore, for example. The company also received orders from Japanese vehicle manufacturers for Washington DC and Kiev, covering complete braking systems for the refurbished trains, including controls, bogie equipment and air supply with oil-free compressors.

You will find Knorr-Bremse on booth B-01 at the 9th World Congress on High Speed Rail in Tokyo from July 7-10, 2015; www.uic-highspeed2015.com

Caption: Knorr-Bremse has been an established player on the Japanese railway market for more than 30 years, not least as a supplier of brakes for trains operated by East Japan Railway Company. © East Japan Railway Company

The **Knorr-Bremse Group** is the world's leading manufacturer of braking systems for rail and commercial vehicles. For more than 110 years now the company has pioneered the development, production, marketing and servicing of state-of-the-art braking systems. In the rail vehicle systems sector, the product portfolio also includes intelligent entrance systems, HVAC systems, power conversion systems, control components, and windscreen wiper systems, as well as platform screen doors, friction material, driver assistance systems and control technology. Knorr-Bremse also offers driving simulators and e-learning systems for optimum train crew training. In the commercial vehicle systems sector, the product range includes complete braking systems with driver assistance systems, as well as torsional vibration dampers, powertrain-related solutions and transmission control systems for enhanced energy efficiency and fuel economy.

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