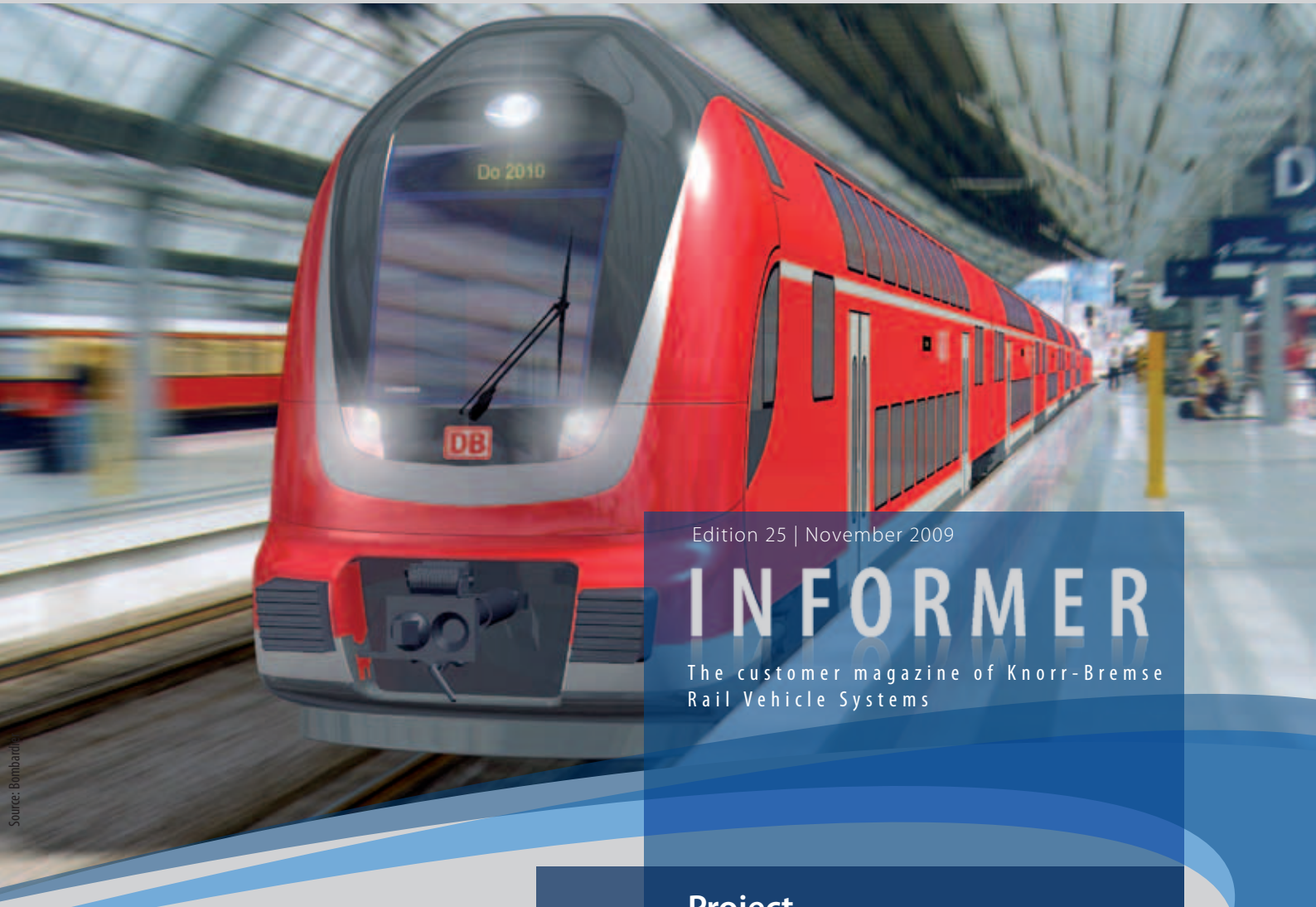

Source: Bombardier

Edition 25 | November 2009

INFORMER

The customer magazine of Knorr-Bremse Rail Vehicle Systems

Project
New generation double-decker coaches

Market
Polish streetcars
First Francilien train delivered

Aftermarket
Rail Services program

Environment
ECCO$_2$ project

KNORR-BREMSE

KNORR-BREMSE

WESTINGHOUSE platform screen doors

IFE Innovations For Entrance Systems

merak

Microelettrica Scientifica

ZELISKO

railservices

Contents

"DoSto 2010" double-decker coach
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Editorial

Dr. Ralf Voß,
Member of the Executive Board,
Knorr-Bremse Systeme für
Schienenfahrzeuge GmbH

We are coming to the end of an eventful year. The financial crisis inevitably had an impact on Knorr-Bremse like on so many other companies. But we reacted rapidly and resolutely to the changing market situation, launching far-reaching cost-cutting programs, postponing investments and adjusting staffing levels. Thanks to these decisions, Knorr-Bremse – despite a drop in demand, especially for freight cars and locomotives – is steering a safe course through turbulent market conditions.

Next year, Knorr-Bremse plans to maintain this course towards sustained, long-term success. The company will continue to offer customers in all markets high-quality products based on compact, lightweight and economical solutions, and it will continue to work on developing more efficient and eco-friendly technologies.

This edition once again covers a range of interesting topics. How, for example, can Knorr-Bremse's huge success in the Polish market be explained? Why does the latest state-of-the-art train on the Paris urban network bear the Knorr-Bremse logo? How did Knorr-Bremse's Austrian subsidiary IFE construct its new technology center? We would also like to give you a glimpse of a new vehicle that is currently due to appear on the German rail network around the middle of next year: Doppelstockwagen 2010 – a double-decker coach with Knorr-Bremse supplying the entire braking system.

There is also a new face on the board of management of Knorr-Bremse Systeme für Schienenfahrzeuge GmbH: Since July 1, 2009, Dr. Ralf Voß has been in charge of the Locomotive/Passenger/Freight segment. Dr. Voß was previously Senior Executive Vice President at Hella KGaA and before that Director of Engineering at Daimler AG. Dr. Wolfgang Schlosser continues to be responsible for the aftermarket.

We want to tailor this Informer precisely to our customers' needs. But to do so we require your feedback – which is why this edition contains a questionnaire that we would kindly ask you to fill in and return to us by fax or e-mail.

We would like to use this opportunity to wish you and your family a peaceful and, above all, relaxing Christmas break and a good start to the New Year

Dr. Frank Gropengießer Dr. Albrecht Köhler Dr. Wolfgang Schlosser Dr. Ralf Voß

New generation double-decker coaches

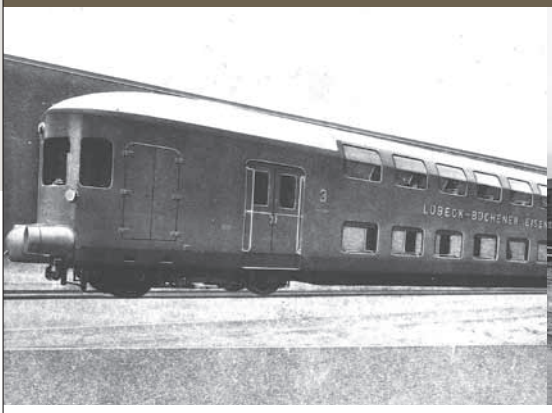
Launching a new era

In the largest commercial agreement ever signed by Deutsche Bahn AG for a single order, the company is to spend some 1.5 billion euros on purchasing up to 800 double-decker coaches built by Canadian conglomerate Bombardier. Knorr-Bremse will be equipping this new generation of double-deckers with braking and door systems.

Soure: Bombardier

Design study for the new "DoSto 2010"

However modern they may look, double-deckers are not a recent phenomenon. They first appeared back in 1868, when the first such bi-level cars were supplied to the Altona-Kiel railway line. Passengers and train enthusiasts were delighted – after all, the view from the top deck was quite something!



1936: Double-decker for the Lübeck-Büchen railway

1957: Double-decker for Deutsche Reichsbahn

1986: Double-decker for Deutsche Reichsbahn

Long and successful history

From 1936 onwards the first double-deckers started shuttling between Hamburg and Travemünde. The "DoSto", as they are known in German (from the word for double-decker: "Doppelstockwagen"), offered passengers real luxury, with upholstered seats even in third class, and air conditioning throughout. Larger items of luggage were stored by service personnel in the luggage compartment. After the Second World War, "DoSto" offering rather less luxury but considerably more transportation capacity went into service.

In the early 1950s, new models were developed in West Germany, and in the GDR they were also commonly used as push-pull trains on regional and urban networks. Following German reunification, double-deckers gained in popularity throughout the country. Since 1992, Knorr-Bremse has been cooperating with Bombardier in the development of double-deckers at its Görlitz plant, and the latest "DoSto 2010" order is the successor to the "DoSto 2003" contract for a total of 298 cars with an option for a further 300, which is due to end this year.

The particular advantage of the latest model – the "DoSto 2010" – is that a powered control car enables the operator – where it makes economic sense – to avoid using a locomotive. With a powered control car more passengers per train can be transported, thereby increasing the economy of operation.

More flexible than ever

In addition to a significant increase in seating capacity, the development engineers have also designed the double-decker on a modular basis, which allows for a range of different trainset lengths. The "DoSto 2010" is designed for a trainset consisting of a maximum of 15 cars. Depending on the particular operational and capacity requirements, operators can choose how to combine a mix of powered control car, center car and unpowered control car or locomotive. They can de-cide on the "DoSto 2010" train concept requirements, which – in terms of operation, braking technology, diagnostics and monitoring functions are the same as for a locomotive-drawn mainline passenger train. It is also designed to allow "DoSto 2003" control and passenger cars or earlier car types to be integrated into the train. Access heights of 600 or 1,150 millimeters enable the cars to match the platform heights in the particular area of operation.

The "DoSto 2010", to be manufactured in Bombardier's Görlitz plant can also continue to operate as a classic push-pull train using locomotives – which is particularly useful for cross-border operators or those who wish to continue using existing locomotives. At a later date these can then easily be replaced by the powered control cars.

Tried and tested double-decker brake equipment from Knorr-Bremse

The new "DoSto 2010" is not the only train in the double-decker segment for which the manufacturers have turned to Knorr-Bremse for braking systems that bring trains of all speed categories to a reliable halt – for example they are also installed on double-decker trains operated by Austrian Railways (ÖBB) and Zurich S-Bahn.

Passenger comfort guaranteed

Apart from the advantages in terms of economy of operation, the design of the new cars has put great emphasis on passenger comfort. The seating areas of the "DoSto 2010" are generously proportioned, with comfortable seats, air conditioning and maximum legroom. The interior design combines modern surfaces and materials, and new passenger information and entertainment systems combined with an innovative internal lighting concept offering passengers a maximum sense of well-being and comfort.

Knorr-Bremse systems on board

With modern double-deckers travelling at speeds of up to 160 km/h, the safety and reliability of their braking systems are of paramount importance. For more than 15 years, Bombardier has relied on Knorr-Bremse products, and the two companies worked closely together on developing this latest generation of double-decker, which has a wide range of Knorr-Bremse systems on board.

Assembly of the "DoSto 2003"

Both the powered and unpowered control cars use an electrodynamic (ED) brake, a directly controlled electronic electro-pneumatic (EP) brake, a direct-acting auxiliary brake and a spring actuator brake as a parking brake. The unpowered control cars are equipped with a direct-acting auxiliary brake and a screw hand brake. Each car also has an indirect-acting load-adjusted UIC pneumatic and EP brake as well as an electromagnetic track brake. The brakes are controlled via a central brake panel housing all the required equipment, including load-controlled braking. The control car also has a brake control unit for diagnostic functions such as driver brake testing for the entire train.

The unpowered control and center cars use Görlitz IX unpowered pneumatic bogies equipped with Type WZK brake caliper units. For the powered control car a FlexCompact powered bogie (also airspring) is used with Type RZSS caliper units. The cars are equipped with the MGS2 microelectronic wheel flat protection system, which includes the signal-processing function for brake monitoring and diagnostics as well as an MVB interface.

The technology has been developed on the basis of the tested-and-proven braking system of the "DoSto 2003" developed for Germany and currently also in operation in localized versions in Denmark, Poland, Luxembourg and Israel. In addition to guaranteeing reliability, the similarities also offer synergy effects for maintenance operations, as operators do not have to create new warehouse space or provide their employees with lengthy training for an entirely new braking system. The same applies to the door systems, which are being supplied by Knorr-Bremse subsidiary IFE. The sanding system (SDN-31) and the windscreen wiper and wash system (EHS) are also included in the contract.

Polish streetcars

New growth market

For years a lack of money prevented any significant investment being made in the Polish streetcar network – but all this has now changed. A program of modernization is gradually getting under way, with Knorr-Bremse at the forefront – and increasing its share of the Polish market.

One of 15 new streetcars type 120N built by PESA for Warsaw

Streetcars are a common sight in every major Polish city – some 3,500 of them are in operation nation-wide, with about 480 in the capital, Warsaw, 420 in Krakow and more than 200 even in a tranquil town like Szczecin. The vehicles are 20 years old on average, but the fleet is being rapidly upgraded. Above all Poland's accession to the EU, but also the decision to hold the European football championships in Poland and Ukraine in 2012, has provided a considerable boost to the market.

Important contracts secured

Knorr-Bremse has successfully taken part in a number of important tenders in Poland. The most significant contract – for 186 new streetcars for the city of Warsaw – was secured this year by Polish vehicle manufacturers PESA, a company that also has considerable expertise in multiple units. Knorr-Bremse has been successfully collaborating with PESA for some years, and also stands to benefit from this major order.

Supplying the complete brake control system

The hydraulic braking system for the Warsaw contract consists of active brakes on the unpowered bogies, with passive brakes, which also serve as parking brakes, on the power bogies. The tested and service-proven ESRA platform controls the entire system electronically via the brake control unit, which communicates via a CAN bus with the overall vehicle control system.

In addition to supplying complete braking systems, Knorr-Bremse is also responsible for the sanding unit. The sand level sensor is attached directly to the sand reservoir, and the sandbox covers are designed to enable the reservoir to be filled both from above and from the side of the vehicle. Other components are being supplied separately by Knorr-Bremse and installed on the manufacturer's assembly line.

Customized systems

Innovative products from the Knorr-Bremse Group have been chosen for the door systems too: IFE is responsible for developing and manufacturing the electrically operated doors and ramps, all the opening and locking mechanisms, handles and the entire electronic control system. A similar combination of braking systems, sanding units and door systems is also soon to come into operation in Gdansk and the Hungarian town of Szeged – the only difference being that all the bogies will be fitted with passive brakes as these cities have stricter parking-brake requirements.

Broad base ensures a secure future

With its success in tendering for the new Warsaw streetcar system, Knorr-Bremse has established a forward-looking plan to participate actively in this new market. It is collaborating with Bombardier on the streetcar system in Krakow and working with Skoda in developing the braking systems for Wroclaw.

Before the end of the year three further tenders are due for Poznan, Szczecin and Krakow to decide who will build the new streetcars.

186 streetcars for Warsaw

- Door systems
- Sanding systems
- Active brakes
- Passive brakes

Over the next few years Poland's biggest cities plan to replace about 400 old streetcars

First Francilien train delivered

Milestone in France

With the delivery of the first Francilien train to French rail operator SNCF in Paris, new standards of reliability and passenger comfort have been set. These ultra-modern trains for the Paris suburban system bear the signature of Knorr-Bremse, which supplied the doors and braking systems, including air supply and bogie equipment.

Source: Bombardier

Design study for the Francilien

SNCF has placed an initial order for 172 of the trains, which were developed by Bombardier. Full delivery is due for completion by the year 2015, and the French operator has also taken out an option on a further 200.


Source: Bombardier

Inside the Francilien

One year of field testing ensures quality and reliability

A test period of more than a year, involving the evaluation of the full range of parameters on seven prototype trains, preceded the first deliveries in early October. But Parisians eager to try out the new trains will have to be patient for a little longer – a further six have to be delivered before SNCF can put them into operation in mid December.

Development of maintenance infrastructure proceeds apace

In parallel with the delivery of the trains, the necessary maintenance infrastructures to ensure their operational success had to be planned and developed. The Paris-based maintenance service that will go into operation in early 2010 is based on an ambitious goal: Within six hours of any fault in the doors or braking system being reported, the necessary actions to deal with the problem are initiated by Knorr-Bremse and IFE service teams.

Local service for IFE customers

Close cooperation between the French Knorr-Bremse subsidiary and IFE plays a crucial role. For some years, the success of IFE products in France has meant the two Knorr-Bremse companies have been building up specialist teams, and project engineers can now supply a locally based customer service for IFE products. The operators of the Francilien trains in Paris will also benefit from this customer proximity. Training of the engineers has been taking place for several weeks.

Valuable exchange of experience

There are other innovations in the French market that will also benefit from the experience gathered in developing the Francilien train. The next major project involves equipping the "Porteur Haute Densité" (PHD) regional train with products designed to meet the same requirements.

Milestones

October 2009

- FAI approval
- Local authority's EPSF approval
- Delivery of first train to SNCF

December 2009

- Start of the commercial service

Magnetic Track Brake Control System

MMBC brake check: Safe and rapid

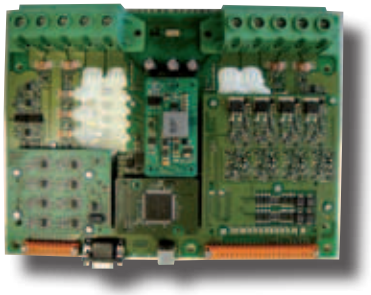
The Modular Magnetic Track Brake Control System (MMBC) launched by Zelisko and Knorr-Bremse is a unique system that for the first time guarantees accurate monitoring of brake functionality – resulting in significant time savings for operators.

A Stadler Flirt-class train equipped with MMBC operating on the Hellweg network

Source: Stadler

Prior to the start of every journey – or after a new trainset has been put together – a brake function test is compulsory. The locomotive engineer applies the brakes and checks that all the electromagnets have been lowered onto the track, the current is flowing and the brakes therefore function properly. Only once he has completed his check he can be certain that the electromagnetic track brakes will contribute to the train's overall braking performance and enable him to drive at high speeds. In the past, the only way of verifying effective contact between the electromagnets and the rails was the visual check carried out as part of the manual brake test.

MMBC now offers a technical solution that completely replaces such visual checks. Even in the case of vehicles for which a manual brake check was hitherto compulsory, it is now possible to carry out an automatic check that includes the electromagnetic track brakes. Time-consuming visual checks are a thing of the past.



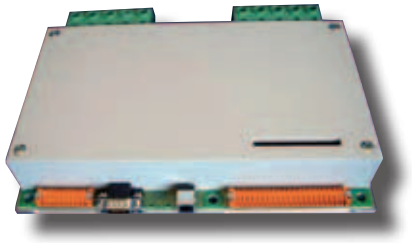
MMBC without casing

Current shows functionality

The secret of the process is based on the fact that the system monitors the electric current while the electro-magnet is being lowered onto the rail. As soon as the magnet makes contact with the rail, the iron mass within the magnetic circuit increases and this causes a typical dip in the current curve. MMBC registers that there is proper contact between the electromagnet and the rail. MMBC software also offers a further advantage – the permanent monitoring of key parameters, such as the rapid identification of cable breaks, insufficient power or excessive current differences between the individual magnets. MMBS also has a permanent self-diagnosis function.

Modular design

Depending on the function concerned, the MMBC accesses various different hardware modules. The input module reads the control signals, for example the brake command, and the output module reports on functionality monitoring or relays error messages to the brake and vehicle control unit. The processor module processes all internal and external information. The required internal supply voltages are provided from the on-board power supply, and the power module contains integrated semi-conductors which, depending on the model, can switch up to 100 amperes.



MMBC with casing

Many examples of applications

MMBC is already in use in various projects based on the Flirt vehicle platform produced by Stadler Deutschland, and also on the new ÖBB railjet high-speed train. And amongst upcoming projects, the control system is to be installed on the "DoSto 2010" double-decker train, future double-decker cars operated by Swiss Railways (SBB) and the new RGV2N2 vehicle generation developed for French national railroad operator SNCF.

MMBC has been developed on the basis of the new European standards EN50126/28/29, for which a positive evaluation has been issued by the TÜV technical inspection body. It has also successfully passed an audit by Alstom and SNCF. Now that MMBC version for a 24V/36V on-board power supply is already in use in a large number of projects, the focus is on the version for use with 72V/110V power supplies.

Software upgrades enable further functions to be added to MMBC. For example, vehicle manufacturers and operators are increasingly calling for functions such as jerk control and heating to prevent electromagnet icing.

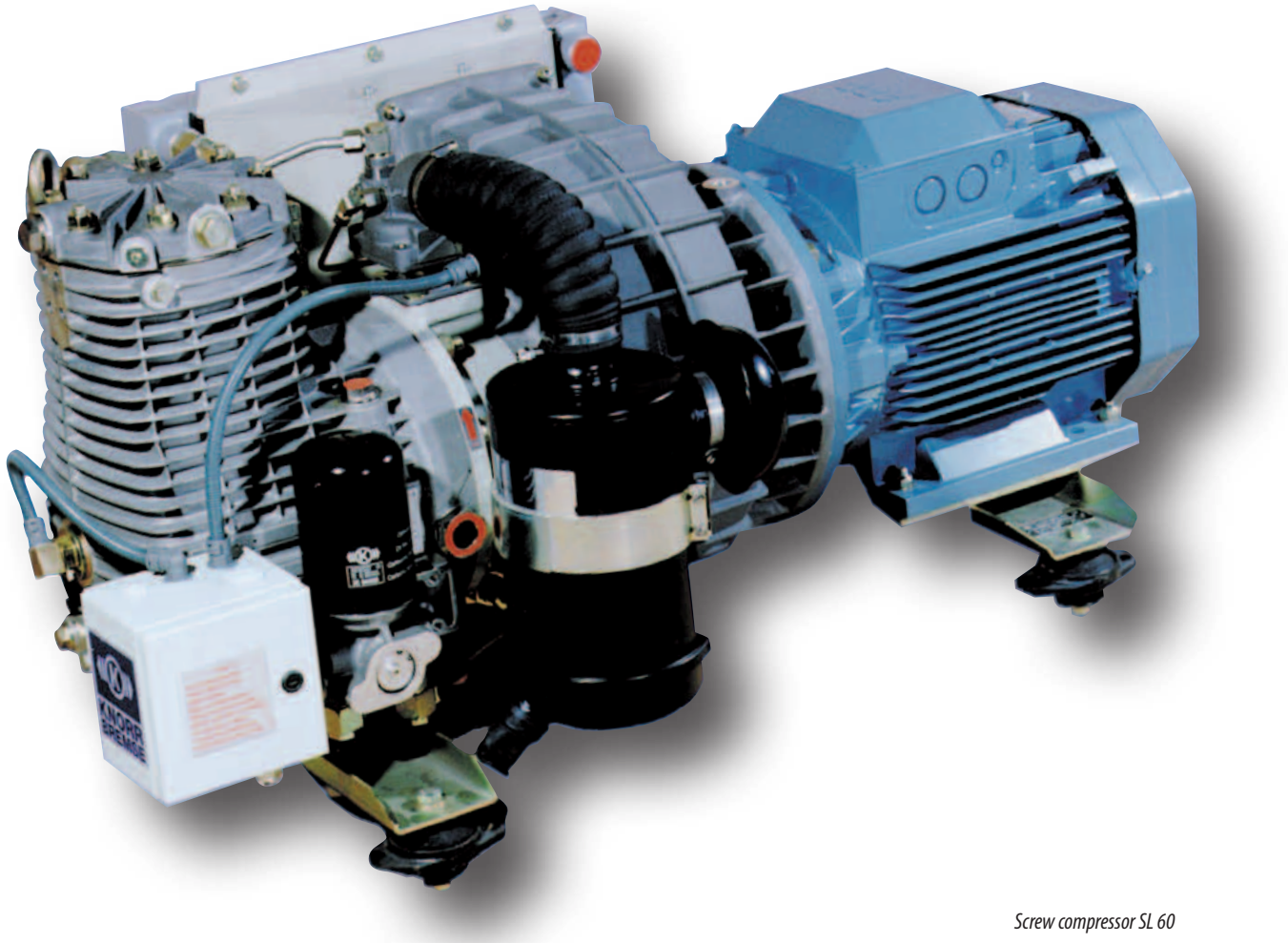
Zelisko offers a range of products

- Traffic management systems, e.g. ticket printers, ticket machines, passenger information systems
- Power transformers for various applications
- Signaling systems for rail and road

railservices program

Flexible service – for the entire product life cycle

Reliability is a priority for all rail customers. In response, Knorr-Bremse has developed Rail Services – a program that ensures that products maintain their performance levels throughout their life cycle.



Screw compressor SL 60

Rail systems only offer value if they remain fully functional throughout a long service life. Knorr-Bremse's Rail Services program offers support during a product's entire operating life, providing precisely the right service for each stage in its life cycle.

Local competence

A key feature of the Rail Services program is that it makes Knorr-Bremse service standards available at the local level. In virtually all the European countries it offers service centers and engineers located in the vicinity of the customer. This enables the company to support the introduction of new vehicles and ensure operators and their service engineers are familiar with the functioning and day-to-day maintenance of their systems.

Reliable maintenance and overhaul

To maintain the reliability of system components it is essential for them to be properly serviced. Smaller fleet operators in particular can benefit from having tasks requiring a high level of systems competence carried out on the spot by Knorr-Bremse's specialist aftermarket engineers. The system is kept running while at the same time the customer is freed up for other activities and training costs are reduced.

In the case of a major vehicle overhaul, Knorr-Bremse engineers can also remove the relevant units and components, take them to a Knorr-Bremse service center for overhaul, and then reinstall them. An additional advantage is that systems serviced on this basis can be returned with a warranty similar to that available on a new system.

Using full potential

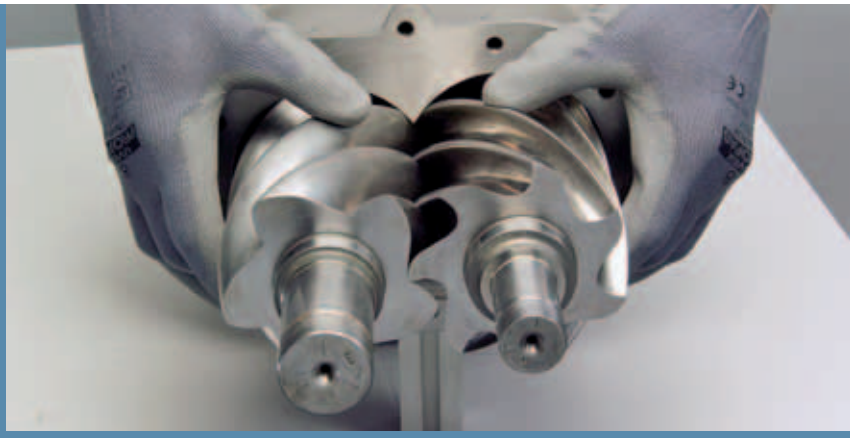
Another aim of the Rail Services program is to support owners of older vehicles by prolonging their system operating life and/or cutting life cycle costs. This can be achieved, in some instances, through modifications to ensure compliance with new emissions regulations or by installing oil-free compressors, thus avoiding the need for lubrication and the disposal of oil after use.

Flexible service

Some 10,000 screw compressors manufactured by Knorr-Bremse are currently in operation throughout Europe. Rail Services offers operators a maintenance program for these components that can be flexibly adapted to their needs.

In response to operators' desire for lean structures and maximum reliability of the air supply system, complete maintenance can be carried out at Knorr-Bremse, with top quality guaranteed by modern assembly and testing processes combined with the exclusive use of OEM components.

If, however, the operator wishes to utilize his own repair shop capacity, he can also carry out part of the overhaul. To safeguard quality standards, Knorr-Bremse offers original part kits for reassembly of the compressor unit. They are designed for replacement of components displaying normal wear patterns, and all parts are identical to those used in Knorr-Bremse workshops.



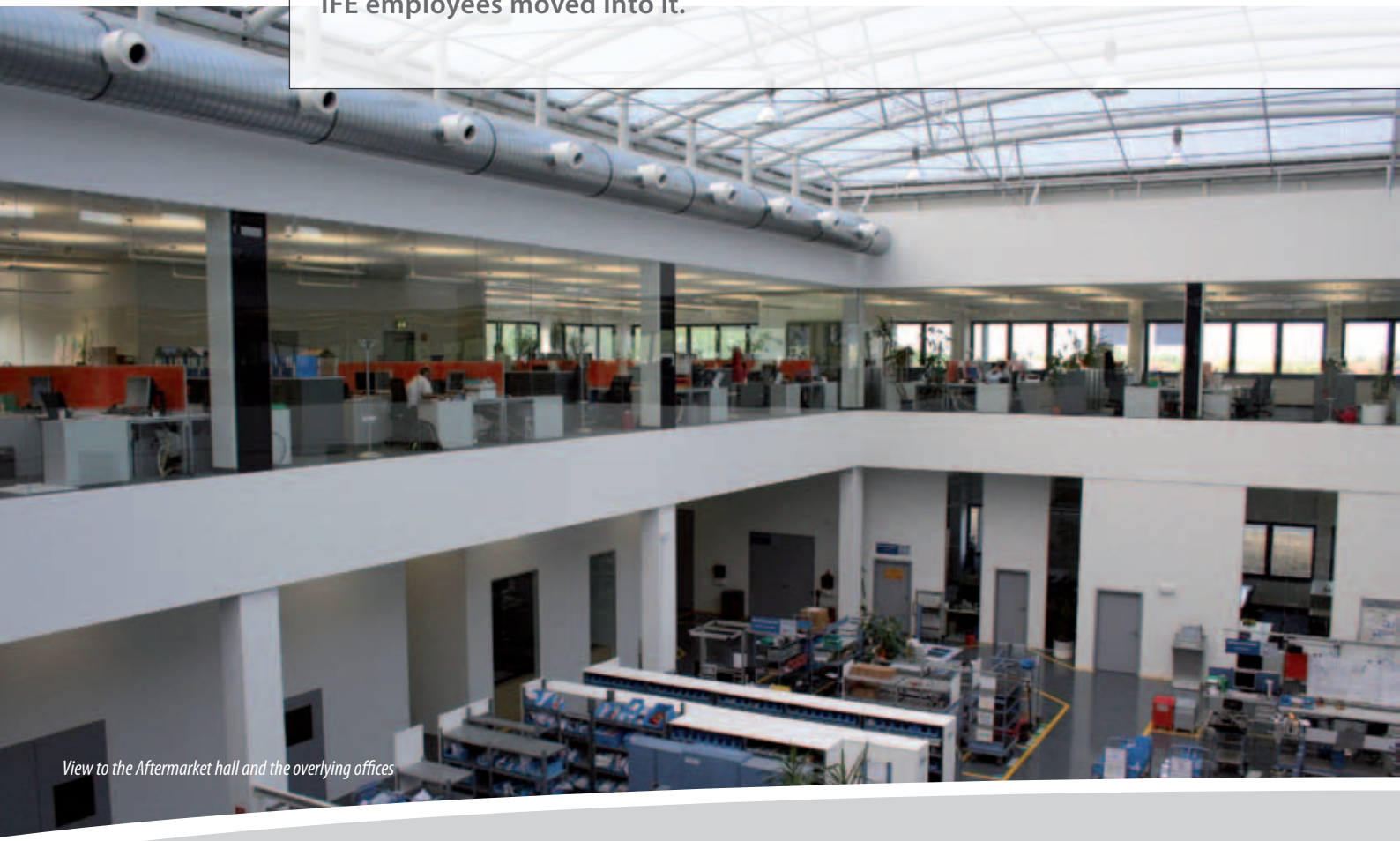
The heart of the compressor: Screws for air compression

In connection with these original spare part kits, Knorr-Bremse also offers a general overhaul of the heart of the compressor – the screw block. A service has been set up that enables the screws to be adjusted to tolerances measured in µm, ensuring long running times and low noise levels. Combined with the spare part kit, this means a high level of reliability can be achieved.

New IFE technology center

Planned, constructed and operational in record time

40 years on, the design of the Waidhofen facilities was no longer adequate for the needs of the global leader in automatic train access systems. If the company was to continue to perform at the highest level, it needed to find a new home.The IFE technology center in Kematen was built in record time, and in April of this year, IFE employees moved into it.



View to the Aftermarket hall and the overlying offices

The underlying principle for the planning of the new IFE technology center was that all "know-how" should be close at hand, with better communications and a greater degree of transparency. That was the problem with the old building in Waidhofen: An unfavorable spatial separation of offices combined with an unsatisfactory situation on the factory floor had resulted in inefficient processes.

Preserving existing expertise

The decision was made to construct a new building near Kematen to retain the existing workforce and preserve the expertise that had been built up over the years. Within the space of less than eight months, what emerged was a state-of-the-art technology center that brings together the company's activities in R&D, prototype construction, aftermarket, project management, sales, purchasing, controlling, quality management and human resources. The 30,000 m^2 site enables all these functions to be integrated, as befits a globally operating company.

Optimum process support

Covering a total of 8,300 m^2 of floor space, the new structures take the form of a modern, custom-designed building offering optimum support for business processes and internal communications. It encourages collaboration between departments, facilitates concentrated project work and increases the efficiency of customer service.

Focus on maximizing interfaces

All departmental heads are, for example, located close to the offices of the company management. And the configuration of the rooms for operational employees has also been planned to maximize efficiency and minimize interface losses: Departments that regularly work together have been located close to each other.

By making optimum use of space, the area required has been reduced by 40% compared with the Waidhofen site

One challenge for the architects was to achieve full transparency between the office workplaces, production processes and test rigs. This has resulted, for example, in aftermarket production processes being housed in a well-lit internal courtyard surrounded by 245 office workstations. In addition to creating a transparent, flexible space, the planners were also concerned to create scope for any future extension of the building. In a specially created showroom, visitors are able to find out about the wide range of IFE products and view specific examples of their application.


Testing and presentation area


External view


Entrance area

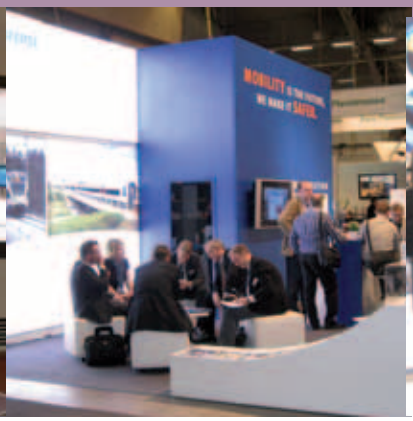
Knorr-Bremse at world trade fairs

Solutions worldwide

Exciting innovations, excellent service and outstanding systems competence: As a global player, Knorr-Bremse once again attended the world's leading trade fairs and exhibitions in 2009, presenting its responses to the challenges of urbanization, safety and environmental protection.

London, Shanghai, Busan, Lille – or Gdansk. The Munich-based brake specialist, together with its various brands, once again attended important trade fairs at home and abroad this year. Wherever the agenda is set for the future of rail transportation, Knorr-Bremse can be found presenting its products to manufacturers, operators and specialists alike.






Some highlights of the year:

Railtex in London

The UK's biggest rail technology event once again drew visitors from the domestic and international rail industries. Great interest was shown in Knorr-Bremse's EP1001 wheel flat protection system.

Sifer in Lille

This year's Sifer was an important showcase for the French rail market. Knorr-Bremse and IFE presented products such as the oil-free compressor, the brake caliper, KE valve and the IFE doors. The success of Sifer means that it is increasingly regarded as an important forum for exchanging ideas and expertise.

Rail & Logistics Fair 2009 in Busan

At this important international trade fair held in Korea in early June, Knorr-Bremse presented a wide range of innovations including the EP2002 brake control system, EP Compact and the oil-free compressor.

Modern Railways in Shanghai

This exhibition has become one of the most important forums for rail vehicle manufacturers to present their products and technologies. Knorr-Bremse Asia Pacific, IFE, Merak and Microelettrica exhibited the PEC7 block brake unit, the WZK compact pneumatic brake caliper, the EP2002 brake control system, doors and HVAC systems for high-speed trains and power supply components.

Nordic Rail in Jönköping

Countless rail specialists used the opportunity offered by Nordic Rail to find out about Knorr-Bremse products such as the new MMBC Modular Track Brake Control System, the EDT101 freight train derailment detector or the SDN15 sanding system.

Trako 2009 in Gdansk

As one of 420 companies attending this event, Knorr-Bremse Poland used the opportunity to provide information on products relevant to the Polish market such as the EP Compact Lite, the VV 180-T oil-free compressor or the SDN31 sanding system.

In 2010 we will be attending the following trade fairs and exhibitions:

10 –12 March	Rail Solutions Asia	Taipei, Taiwan
11 –14 April	39th Conference on Modern Rolling Stock Technology	Graz, Austria
8 –10 June	EXPO Ferroviaria 2010	Turin, Italy
21–24 Sept.	Innotrans	Berlin, Germany

We look forward to seeing you there!

Queen's Award

Royal honor

The annual Queen's Award is the most prestigious business award in the UK. The latest winner in the "Innovation" category is Knorr-Bremse's EP2002 decentralized braking system.

The EP2002 represents a new generation of brake control systems for metros and multiple units. Instead of distributing the braking force equally along the length of the train, the modular EP2002 adjusts braking on the individual bogies according to a wide range of variables such as passenger weight distribution. This makes EP2002 the first system specially designed to take train dynamics into account – optimum braking of the train as a whole can only be achieved through optimum braking of the individual bogies.

Combined functions

Installed on each individual bogie, the cube-shaped EP2002 weighs about 20kg and incorporates all the required functions such as load-related braking, service brake, emergency brake and parking brake as well as the pneumatic suspension. Piping and cabling between the various modules are not required, and neither are the traditional brake equipment panels and ZGE component subframes – resulting in weight savings averaging some 100 kilograms per car.

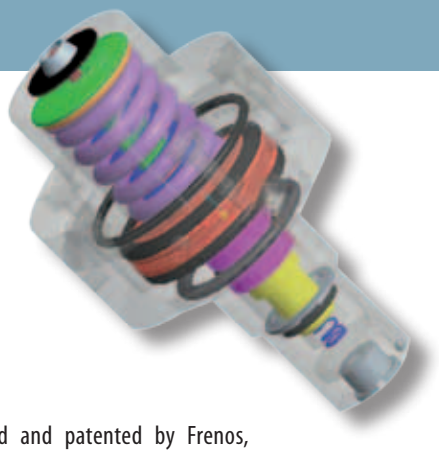
Above all, EP2002 offers greater reliability: If the control system on one of the bogies fails, the remaining modules compensate by increasing the braking force. The train can therefore continue to operate despite the defect.

RENFE Award

Valve prevents fires

Knorr-Bremse's Spanish subsidiary Frenos received an innovation award for sustainability and environmental protection from Spanish train operator RENFE Operadora for developing a valve that helps prevent forest fires caused by rail vehicles.

In Spain, sparks from locking brakes frequently cause forest fires, resulting in devastating environmental consequences as well as considerable financial losses and damage to the train operator's public image. In the last three years alone, damage caused by such fires amounted to 390,000 euros. In addition, there are costs for repairing the damaged rolling stock as well as compensation payments for train cancellations and delays.



Reducing overpressure

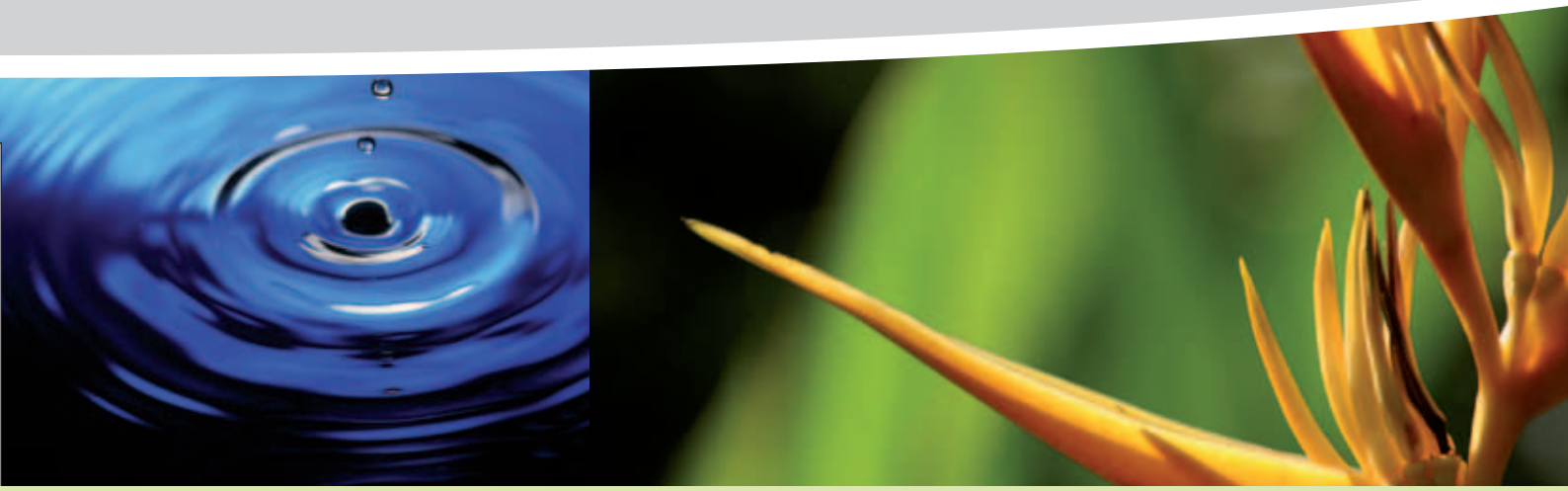
In 2007 RENFE Operadora approached Frenos with a list of requirements and asked the company to develop a system for preventing freight vehicle brakes from locking. Frenos took up the challenge and started to work on a specially designed valve that is installed on the KE distributor valve control chamber. Its purpose is to eliminate overbraking on wagons following an unsuitable operation such as rapid brake release by the driver after emergency braking or the coupling of locomotives with brake control pipes at levels different from the nominal brake release level – or indeed any other factor related to brake control pipes.

The overflow valve developed and patented by Frenos, which is currently undergoing field testing, is officially approved not only for Spanish rail operations but also – in modified form – for Deutsche Bahn AG. Designed for use with the Knorr-Bremse KE distributor valve, it can also be adapted to other types.

Efficient Cut in CO_2 – $ECCO_2$

$ECCO_2$ aims to save energy and protect the environment

By continuously improving its ecological balance sheet and developing innovative, energy-efficient products, Knorr-Bremse is able to secure and strengthen its competitive position. The company recently launched the $ECCO_2$ project – a new initiative for saving energy and resources that promises to cut costs in the long-term and make an important contribution to the environment.



Even small-scale energy savings can make a difference. All it would take to save a ton of CO_2 over the course of a year would be for 35 employees to switch off their computers at the end of the day. And turning off the photocopier overnight would save enough energy to make 1,500 photocopies. Such unnecessary use of the standby mode in private homes and offices in Germany is estimated to cost some four billion euros every year.

The name says it all

In early 2009 Knorr-Bremse launched the energy- and resource-saving project "$ECCO_2$", which stands for "Efficient Cut in CO_2". The name also contains the Italian exclamation "Ecco!" ("Look here!") – a call for people to take an active part in this exciting investment.

Knorr-Bremse hopes that $ECCO_2$ will not only help save costs but also enable it to make decisions to improve its own ecological balance sheet. It is not just the government, through stricter regulations, that is calling for innovative ways of saving energy and resources – customers and society as a whole also expect companies to make constant improvements in this field.

The 20/20/20 formula

The easy-to-remember 20/20/20 formula, based on the climate targets agreed by the EU at the beginning of 2008, is designed to show the way. It means, firstly, improving energy efficiency by 20 per cent in order to achieve a 20 per cent reduction in carbon dioxide emissions by the year 2020. Another goal is to reduce water consumption and waste production. And in the long term $ECCO_2$ will be supplemented by an energy-management system that will bring together and coordinate activities from all Group sites.

The new project requires all Group sites and operations around the world to carry out a systematic assessment of their processes to find suitable ways of improving energy and resource efficiency, and to define and implement appropriate measures. By the end of the project, all company energy chains and processes will have been optimized to avoid every form of wastage.

Knorr-Bremse Global Care e.V. was set up in January 2005 following the South-East Asia tsunami disaster on December 26, 2004. The charitable association is dedicated to providing long-term aid to individuals who are in need as a result of environmental catastrophes, accidents, armed conflict, poverty or disease. Practical implementation of projects is actively supervised by members of Knorr-Bremse staff. The association receives an annual donation of one million euros from the Knorr-Bremse Group. Additional information about Knorr-Bremse Global Care e.V. can be found at: www.global-care.knorr-bremse.com.

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