

# ***DB Systemtechnik***

Our Knowledge:  
**Your Success**



.....  
We have decades of experience in railway

We offer all services from a single source

We know each vehicle

We test each vehicle

We manage your approval process: anytime, anywhere

We are RU (incl. test trains and locomotive drivers)

We master the railway system  
.....

# International Railway Expertise: **DB Systemtechnik**



**Hans Peter Lang**  
Managing Director



**Christoph Kirschinger**  
General Manager Sales



**Stefan Schneider**  
General Manager  
Finance/Controlling,  
Human Resources

As a highly capable and customer-focused service provider, DB Systemtechnik not only serves as an expert partner to support Deutsche Bahn with its expertise, but is also increasingly active in the international railway market.

DB Systemtechnik guarantees its customers

- Independence
- Neutrality
- Confidentiality

regarding their work.



# The **DB Systemtechnik Group** at a glance



**930** employees

Revenues of **136 Mio. €** in 2019

**Sites located** in Germany,  
Austria, France and UK

13 accredited **laboratories**

50 technology **centres**

Our **product groups**

- Engineering
- Engineering design
- Consulting
- Testing
- International approvals
- Maintenance services
- Metrology



Europe's largest  
competence centre  
**for railway technology**

**DB Systemtechnik**

**DB ESG**



DB Systemtechnik offers a complete range of railway engineering and test services at 19 locations in Germany.

Together with DB ESG, the subsidiary of DB Systemtechnik, they are a powerful engineering service provider on the English market. The sister company, Railway Approvals is working as a Notified Body in Great Britain, while in Germany they are supported by the Railway Approvals Germany. The distribution and project office in Paris is responsible for the customer relation management in France and South Europe.

## Vehicles

### General vehicle

- ICE
- IC
- Locomotives
- DMU, EMU
- Freight wagons
- Passenger coaches

### Module, component, part

- Battery technology
- Bogies
- Brake technology
- Buffing and draw gear
- Coating systems and corrosion protection
- Coupler
- Data bus systems (train bus) for passenger traffic
- Diagnosis
- Energy supply
- Fatigue strength
- Fire protection
- Glue assembly
- Heating, ventilation and air-conditioning
- Lubricants, oils
- Materials engineering
- On-board electrical systems
- Pantograph
- Passenger information systems
- Running technology
- Tilting technology
- Traction technology
- Vehicle software
- Welding technology
- Wheelsets

We offer you  
**technical expertise**  
from a single source

## Interfaces

- Acoustics and vibrations
- Aerodynamics
- Electromagnetic compatibility
- Electromagnetic fields (EMF)
- Safety
- Telecommunication
- Interaction of
  - Pantograph/Catenary
  - Vehicle – Vehicle
  - Vehicle – Infrastructure
  - Vehicle IT with stationary IT

## Infrastructure

- Battery technology
- Lubricants, oils
- Maintenance shops
- Maintenance technology
- Materials science
- Passenger information systems
- Systems engineering
- Infrastructure monitoring



Our Knowledge: Your Success  
***DB Systemtechnik***

Testings  
Engineering  
Maintenance technology  
Consulting

## **DB Systemtechnik**

### Testings: from Minden to Mumbai

The 250 employees of the Business Line Testing support you with their comprehensive knowledge of systems, suitable test methods and tools, along with well-founded technical trial expertise.

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#### **Testings**

- Vehicles
- Infrastructure
- Components

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#### **Approval**

- Approval of vehicles
- Approval management
- Expert assessors
- TSI certifications (NoBo)
- AsBo/DeBo
- Partial approvals for infrastructure

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#### **Measurement technology**

- Measurement and diagnostic systems
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## References

# Testings

### Testing with the ICE S in the Gotthard Base Tunnel:

DB Systemtechnik supports AlpTransit Gotthard AG on this outstanding project.

Currently, trial runs are being conducted in the 57 km long Gotthard Base Tunnel under the direction of the Swiss construction project management. TSI energy tests on the overhead line are being carried out with the ICE S high-speed train from DB Systemtechnik. In these successful trips, the maximum speed of 275 km/h was also attained. After several months of trial operations, the Swiss railroad SBB was able to begin operation of the Gotthard Base Tunnel on schedule on 11<sup>th</sup> of December 2016.

#### Further references:

- TSI testing of the overhead contact line in Denmark
- Shock wave test in a light rail train station in Munich
- Occupational noise exposure during shunting work
- Approval of the Velaro Eurostar
- Service life examination of the ICE 1 bogie frame
- Climatic measurements of internal flows of the Delhi Metro



## DB Systemtechnik

### Engineering: from wheel set to IT

With a total of 350 employees at various locations the Business Line Engineering support you in all topics of construction, engineering and digitization for vehicles and components.

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#### Engineering design

- Engineering design support for new vehicles
- Refurbishment of existing vehicles
- Engineering design for components/type modifications
- Accident and damage analyses and repair

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#### Engineering

- Type support
  - Service of assets
  - Fleet management
  - Procurement support
  - Supplier/product qualification
  - Carrying out studies
  - Rules & regulation and committees
  - Obsolescence management
  - IT usage & diagnostics
  - Software
- 



## References

# Engineering

### DB Systemtechnik optimises air-conditioning system of the ICE 2

The HVAC section of DB Systemtechnik was tasked by DB Fernverkehr with the analysis of failure causes and was given a project to upgrade ICE 2 trains.

Numerous technically possible upgrade measures were put together following a thorough analysis of the causes of failure. Various measurement campaigns performed on an ICE 2 intermediate car in the climate chamber run by DB Systemtechnik in Minden indicated weaknesses in the software control unit in the air-conditioning systems. The defined package of measures that resulted was enthusiastically implemented in the DB Fernverkehr plant in Rummelsburg by the summer of 2013.

#### Further references:

- Intelligent platform for train to stationary communication
- New IGBT rectifiers for the ICE 2
- LED signal lighting for locomotives
- Hybrid drive for the Westfrankenbahn railway: the ECO Train
- Refurbishment of class 474 in Hamburg
- Consulting for new batteries for existing vehicles



## **DB Systemtechnik**

### Maintenance technology: from basic to predictive

Our 150 employees of the Business Line Maintenance Technology are pleased to advise and support you in all engineering services for design, construction and optimization of all maintenance system elements in the field of railway technology and infrastructure.

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#### **Maintenance**

- Development and support of maintenance concepts
  - Depot planning and intralogistics
  - Testing services and maintenance procedures
  - Testing and diagnostics equipment
  - Metrology/calibration systems
  - Non-destructive testing
  - Materials engineering
  - Welding and adhesive bonding
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## References

# Maintenance Technology

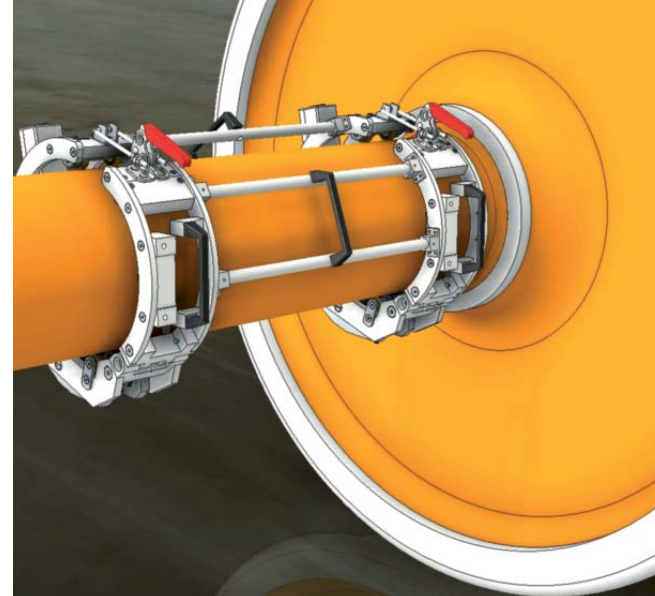
### Non-destructive testing of axle shafts in their mounted state

Technically innovative solid shaft testing system (VPS) makes upgrading of the complete wheelsets unnecessary in the case of freight wagons.

Previously, non-destructive testing could only be performed on wheelsets with a solid axle after they were removed, which – in addition to high idle times for the vehicles – entailed intensive amounts of time and labour. The use of VPS-Mobil makes it possible to reduce these cost factors and increase the quality of the maintenance services. The VPS-ring is expected to be in operation in workshops end 2017.

#### Further references:

- Welding construction support for railway vehicle bodies
- Fire protection tests for equipment and accessories
- Refurbishment and extension in the rail work pit in Kassel
- Inspection of track and track switch damage in Frankfurt
- Development of measuring equipment for trams
- Construction of a new washing and de-icing facility for suburban trains in Berlin



# DB Systemtechnik

## Consulting: from strategic to technical

DB Systemtechnik is the only provider of consulting services to be born of an overarching rail operator. We analyse your problems and design solutions just for you within the rail system as a whole, covering areas such as rolling stock, components and infrastructure. In doing so, we always keep your economic success in mind and have a laser-like focus on the financial aspects of the overall rail system.

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### Systemconsulting

- Strategy and controlling
- Qualification
- Quality and management
- Environmental dimension
- General system issues
- Operations planning and implementation

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### Technical consulting

- Optimisation of the entire life cycle of rolling stock and components
  - Procurement of rolling stock
  - Vehicle maintenance
  - Workshops
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## References

# Consulting

### Optimising the brake system on a high-speed train.

A high-speed train in Korea kept experiencing serious malfunctions when running, caused by excessively high consumption of compressed air and locking wheels.

During consultation with the rolling stock manufacturer, the control behaviour of the wheel slide protection system was identified as the cause of this fault and a simulation tool developed especially for this project was used to highlight potential solutions to the problem. Training was given to development engineers on site to ensure the solution would be a sustainable one.

#### Further references:

- Technical consultation on operation and maintenance of double-deck wagons (Luxembourg)
- Consultation on air conditioning concepts for metro trains in Delhi (India)
- Technical review of bid documents for metro trains in Taiwan
- Consultation on establishing maximum speeds on falling gradients under ETCS Level 2
- Master agreements for technical consultation with two European rail operators



# Test equipment and accredited inspection areas



## Test trains

- High-speed reference train ICE-S
- VT 612 for tilting technology
- Measurement vehicles and locomotives



## Test rigs

- Pantograph test rig
- Strength test rig
- Wheel-rail contact
- Friction test rig
- Various other

## Laboratories

- Climatic chamber
- IT testing laboratory
- Tribology
- Materials testing
- Various other



## Accredited inspection areas

- Running dynamics
- Material science and damage analysis
- Fatigue testing
- Brake technology
- Various other



# DB Systemtechnik is a railway undertaking **certified and accredited**



Our certification, accreditation and recognition as an independent railway undertaking ensure the success of your projects.

## DB Systemtechnik:

- Is certified in accordance with DIN EN ISO 9001
- Is an associate partner of EBC
- Provides the German Federal Railway Authority (EBA) with administrative support for ECM
- Has its inspection centre accredited in accordance with DIN EN ISO/IEC 17 020
- Is accredited in the inspection area safety assessment according CSM-RA
- Is recognised by the EBA with the test laboratories and the inspection body, which perform without any disciplinary instructions
- Has over 40 EBA-recognised expert assessors as well as other technical expert assessors
- Is accredited according to DIN EN ISO/IEC 17 025 in 13 testing laboratories
- Has over 200 accredited testing procedures according to DIN EN ISO/IEC 17 025 in 27 competence areas
- Has RAL as an integrated NoBo
- Is Interim-DeBo in Germany and DeBo in Luxembourg

# Your **contacts for sales** at DB Systemtechnik



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# An excerpt from our **list of customers**





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Subject to change without notice  
Errors and omissions excepted  
Last revised: January 2020