Photo title: Marcel Jäckle
Other photos on this page: DB Systemtechnik

DB Systemtechnik: Your expertes

on rail vehicle climate comfort and air conditioning

Accredited testing laboratory
We are recognised by the German national accreditation body (DAkks) according to DIN EN ISO/IEC 17025 as a flexibly accredited testing laboratory working with air conditioning tests on rail vehicles. Our accreditation covers all relevant examination procedures and parameters (according to EN 13129-2, EN 14750-2, EN 14813-2 and UIC 553-1, for example).

Selected projects:

- Bombardier: optimisation of software and hardware for the driver's cab air conditioning system in the ICE 4
- Bombardier: functional testing up to +55 °C in the MEikE climatic chamber for Metro Delhi in India
- Deutsche Bahn AG: investigation of climate failures in ICE 2 intermediate cars and training course on countermeasures in the MEikE climatic chamber
- Faiveley: functional testing of doors/folding steps under winter conditions in the MEikE climatic chamber
- NedTrain: air conditioning and functional testing of a double-deck control trailer and intermediate car in the MEikE climatic chamber following retrofitting of air conditioning
- Voith: MEikE trials of service brake application in Gravita 10 diesel-hydraulic locomotives for optimisation of cold start behaviour
- Siemens: Velaro D trial runs on the Cologne-Rhine/Main high-speed line to examine pressure tightness and CO_2 enrichment

Impressum

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www.db-systemtechnik.de

DB Systemtechnik

Air Conditioning Services

Air conditioning challenges are often part and parcel of the day-to-day work of vehicle operators and vehicle or air conditioning system manufacturers. Energy consumption is also becoming increasingly important.

DB Systemtechnik has decades of air conditioning expertise. Our portfolio includes mobile and stationary measurements, air conditioning simulations and consultancy services. We support you in the procurement of rail vehicles, investigation of operational and availability issues and malfunction and fault analyses.

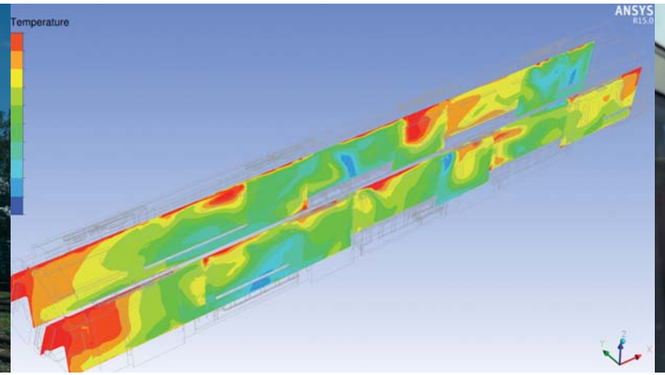
Your benefits

- Development of energy-saving measures
- Minimising risk when developing new assets
- Saving time and money thanks to early identification of sources of faults and problems
- Increased availability of air conditioning
- Introduction and optimisation of predictive maintenance Optimisation of thermal comfort
- Compliance with all environmental restrictions All services from a single source
- Railway system knowledge (we are familiar with all vehicles)
- At your service worldwide

Measurements on the track

Stationary measurements

Air conditioning simulations



Consultancy, support and engineering

Mobile measurements during operation

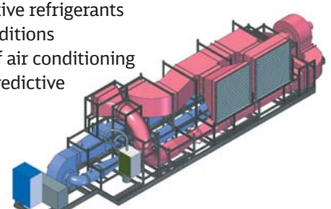
- Measurement of process variables for heating, ventilation, air conditioning and pressure protection systems Trial runs of high-speed trains for measuring, verifying and evaluating pressure comfort and CO_2 enrichment
- Trial runs examining air quality and thermal comfort
- Long-term data acquisition (e.g. operating states, interference behaviour, energy consumption) with data loggers and remote data transmission
- Damage analysis and repair

Stationary measurements in the MEikE climatic chamber

- Functional tests on vehicle components and infrastructure
- Climate type tests for rail vehicles under test conditions in accordance with relevant standards
- Thermographic examinations
- Determination of the heat transfer coefficient (k value) Energy consumption tests (duty cycle) Temperature range in the test chamber from -20 °C to +45 °C Snowmaking and icing possible
- Controlled humidification of chamber air at temperatures above +10 °C
- Test chamber size up to 75 m x 5 m x 5 m (LxWxH)

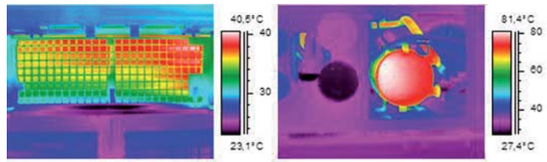
Stationary measurements on the Ludek climate test bench

- Mobile test bench for rail vehicle air conditioning systems
- Functional testing of refurbished or repaired air conditioning systems (incl. driver's cab and galley systems)
- Tests up to 45 °C at variable relative humidity
- Asset energy consumption measurement ("stand-alone")
- Investigation of new and alternative refrigerants
- Stress testing under extreme conditions
- Long-term behaviour and wear of air conditioning systems, and determination of predictive maintenance parameters



Simulations

- Dynamic simulation of the process circuit for all air conditioning systems with conventional and new refrigerants
- CFD simulations (Computational Fluid Dynamics) to investigate thermal comfort
- Simulation of parameters such as air and surface temperatures, relative humidity, differential pressures and air velocity, internal and external loads
- Simulations and measurements from a single source
- Drafting of parameter studies under any operating conditions
- Parameter variations possible
- Forecasts of system behaviour at an early stage of development



Consultancy, support and engineering

We are happy to advise you on all topics such as:

- Air conditioning, air conditioning systems and galley cooling systems
- New procurement, add-on air conditioning and redesign of standard and special vehicles
- Performance, robustness, suitability for railway use and availability of air conditioning systems
- Air hygiene, filters, cleaning, maintenance
- Energy saving -> "Energy saving" product sheet)

Take advantage of our air conditioning expertise and receive all the services you need from a single source. DB Systemtechnik is there for you. Anywhere in the world!

Concentrated expertise
for inspection, testing and optimisation of
air conditioning technology

Your air conditioning
technology experts at
DB Systemtechnik

Photo left side: DB AG / Claus Weber
Other Photos: DB Systemtechnik, Kai-Uwe Nielsen