

Testing laboratory/ climate chamber.

SBB Passenger Traffic Operations –
your partner for the climatic acid test.

www.sbb.ch/en/climate-chamber

Testing laboratory/climate chamber.

Climatic testing for all weathers.

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Rolling stock is subjected to a wide range of weather- and travel-related influences in its day-to-day operations – influences which can have a serious impact on vehicles and components. It is therefore essential to have an understanding of how rolling stock and components will behave in cold, snowy, icy or hot conditions.

Every rail customer appreciates being able to travel in comfortably heated or air-conditioned vehicles – irrespective of weather conditions. Thanks to air-conditioning, good thermal insulation and glazing, a comfortable environment can be maintained in the face of even the most unpleasant ambient temperatures, bright sunshine and high vehicle occupancies, summer and winter alike.

Our services.

What are the options for testing vehicle air-conditioning systems under the influence of cold or heat? The testing laboratory provides a test environment producing reliable data that can be used for optimisation, irrespective of the prevailing weather conditions. Having almost fully controllable ambient conditions allows us to simulate different weather situations – from sunshine to snow. We can also simulate the presence of passengers and typical passenger flows within a vehicle. The combination of these simulation options delivers reliable information and helps us to define realistic requirements in terms of the thermal comfort and the regulation of your rolling stock when it is in use. The testing laboratory also offers the opportunity to carry out mobile measurements during operations.

How you benefit.

The modern technology in our climate chamber in Olten enables you to identify weather-related and operational influences on your rolling stock. The trials and tests we carry out help you to gauge the reactions of your rolling stock and components to environmental conditions. The test results obtained from the Olten climate chamber provide the tools you need to optimise the quality, durability and availability of your vehicles and components and to assess production requirements.

Why choose Operations as a partner?

- Engineering expertise in combination with in-depth testing know-how
- Extensive experience drawn from the purchasing, operation and maintenance of approximately 7,500 air-conditioning systems in daily use
- Accredited by the SAS as a testing laboratory for climatic investigations on railway vehicles under number STS 0614 in accordance with SN EN ISO/IEC 17025:2005
- Options to run tests on individual components or whole vehicles, including double-deck passenger coaches
- Specialised staff with excellent technical expertise
- Regular government inspections of the climate chamber and the testing and measuring equipment used
- ISO 9001 quality management certification
- ISO 14001 environmental management certification
- OHSAS 18001 occupational health and safety management certification
- Regular internal audits carried out by our specialist Safety, Quality and Environment unit
- Regular external audits carried out by the Swiss Association for Quality and Management Systems (SQS) and the Federal Office of Transport (FOT)
- We were awarded the Prix Esprix prize 2014 for the basic concept of 'Managing with vision, inspiration and integrity'



Testing laboratory/climate chamber.

Our full service portfolio at a glance.

The testing laboratory/climate chamber's areas of expertise.

The services provided by our testing laboratory are fully comprehensive:

- Tests carried out in accordance with standard specifications and accredited testing procedures specially developed in-house
- Route tests (testing climate and pressure comfort)
- Creating testing and measurement programmes, conducting tests, and drawing up test and expert reports
- Component and equipment tests
- Optimisation of control and regulation systems
- Execution of type tests and climate tests for vehicles of all types
- Comfort testing
- Efficiency tests and energy consumption optimisation
- Thermography
- Ascertainment of the heat transfer coefficients of complete vehicles or assemblies
- Illumination and noise measurement
- Engineering support
- Consulting services in relation to air-conditioning and heating technology
- Snow tests, both with and without use of the climate chamber
- Functional tests on components and systems
- Testing the freeze protection of water-carrying systems
- Acoustic measurements

Facts and figures.

Key figures: the climate chamber	
Dimensions (length/width/height/width of doorway)	33m/approx. 5 m/5.2m/4.25 m
Volume	1386m ³
Temperature range	-33 °C to +60 °C
Air temperature regulation accuracy	± 0.5 K
Air temperature distribution (vertical/horizontal)	± 2.5 K
Speed of temperature change with/without test object	Adjustable ≤ 10 K/h
Relative humidity	Adjustable up to 98 %
Relative humidity regulation accuracy	± 5 %
Movement of air in the climate chamber	≤ 6 km/h
Test object supply voltages	1000 VDC to 4000 VDC/1500 VAC, 50 Hz/1000 VAC, 16.7 Hz/400 VAC, 50 Hz
Artificial sunlight (frontal exposure to sunlight) Tilt/power adjustable	Up to ≤ 800 W/m ²
Snowmaker, stationary and mobile	Hand-held snow gun for flexible test situations
Testing and measuring equipment	
Measurement data acquisition system	2
Meter flumes	Approx. 500
Temperature sensors (air, surface)	220
Pressure sensors (absolute)	10
Humidity	6
Room airflow velocity	10
Power input to test object	1
Electrical parameters and performance (power meter)	1
Smoke for flow detection	2 device groups
Electrical parameters	Various
Air volume flow, pressures (absolute, relative)	Various
Hand-held measuring equipment	Various
Data loggers (temp., humidity and CO ₂) for mobile off-grid operations	Various
Simulation technology, electronics, illumination, snow making and automation	
Latent load per person	Infinitely adjustable
Sensible load per person	Infinitely adjustable
Artificial sunlight for driver's cabs	Up to 800 W/m ² , adjustable height and tilt
Sun load (as heat equivalent in passenger compartment) Operation, status request, malfunction information	Infinitely adjustable
Snow-making equipment	Mobile, controllable depending on the quality and quantity of snow

SBB Passenger Operations affirms that this testing laboratory operates completely independently from any other organisations. Independence from internal organisational units is also guaranteed.

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