For all your rail packaging needs
You think in terms of systems – so do we.

Rail technology is system technology. Rails, points, signals, tunnel technology, vehicle technology – this is a world familiar to Rittal for many years. For every requirement in the field of rail technology, Rittal offers a tailor-made solution. In dialogue with our clients, Rittal develops perfect, efficient products for static and mobile use. Indoors and out.

Comprehensive, individual system solutions, developed from intensive interplay between Rittal’s various different areas of expertise. They provide the foundation for outstanding technical and financial customer benefits. Rittal’s products, expertise and services are at your disposal at more than 150 sites around the globe.

Rittal – System partner for rail technology packaging.

### Static use

**Indoor**
Complete infrastructure solutions for traffic guidance and monitoring, for IT systems, for electricity supply to buildings, and for customer information and service systems. Components for complete system solutions are part of the Rittal portfolio.

### Mobile use

**Vehicle technology**
Power and comfort – whether in locomotives, in sleeper, business or restaurant cars – power supply, control, monitoring and communication must all meet the dynamic requirements placed on “rolling stock”. Rittal components for rail vehicles meet all the necessary conditions.

### Comprehensive service

Consultation, planning, construction of prototypes, comprehensive testing in our accredited laboratories, production-ready development, high quality production, individual configuration, logistical service right through to the point of installation, accompaniment of commissioning, and maintenance and servicing: we do everything to ensure that every solution offers the maximum possible benefits.

High-quality, standardised components and a comprehensive service for the development of comprehensive, individual packaging solutions covering every aspect of rail technology and rail vehicles.
Rittal’s wide-ranging expertise in rail and tunnel technology

Packaging solutions for static use

**Indoor**
- Ticket machines
- Operating housings
- Control room and security management
- Video/platform monitoring
- IT infrastructure
- Distribution enclosures

**Outdoor**
- Axle meter
- Communications (GSM-R)
- Enclosures/cases for controlling the points

**Static individual**
- Point heaters
- Signal controllers
- Barrier controllers
- Platform-free indicators
- Information terminals
- Fuel cells for emergency power supply

**Tunnel technology**
- Emergency power lighting
- Ventilation
- Alarm boxes
- Communication
- Emergency telephone niches
- Wireless monitoring systems

Packaging solutions for mobile use

**Vehicle technology**
- Frames in the engine room
- Enclosures for train safety components
- Consoles in the guard’s cabin
- Control panel in the driver’s cabin
- Electronic enclosure in carriages with information display
- Operating terminals for goods wagons (refrigerated transport, wagons with hydraulic or pneumatic components)
- Underground enclosures
- Roof-mounted enclosures
- Electronic cases for ETCS equipment
- Enclosures for in-train radio service
- Climate control technology for enclosures
Indoor

- Control enclosures in any format, including climate control
- Infrastructures for data and communication centres – from planning through to commissioning
- Distribution enclosures for building supply
- Comprehensive security management (access, climate control, power supply)
Static use

Today’s trains travel at 300 kilometres an hour. They regularly pass one another at high speeds, producing very high suction and compression forces. The technology positioned on the tracks and in tunnels must therefore be packaged in a suitably robust fashion. Be it stainless steel enclosures with an extremely high protection category, or suction- and compression-proof enclosures, Rittal has convincing solutions to suit every application.

Thanks to the sandwich design, outdoor enclosures are particularly resistant to vandalism. A special nano-spray finish allows easy cleaning and therefore ensures effective protection against graffiti. Individual climate control concepts effectively protect controllers against overheating and avoid damage from condensation.

We specialise in offering the best possible solution for your rail packaging task.
Arrive, transfer, board, depart – Where our clients demand a high level of security, punctuality and complete reliability, Rittal has the solution. Rittal offers complete infrastructure solutions for traffic guidance and monitoring, for IT, for emergency power supply to buildings, and for rail customer information systems. With dedicated technical expertise, Rittal offers individual system solutions based on standard modules for every packaging task. **High benefits, low cost** is the clear message here.

Even our fully customised solutions have the technical and financial benefits of Rittal standard products already “built in”. The intelligence of the design basis is reflected in a wide range of projects, for optimum results.

**The Rittal product portfolio includes components for complete system solutions.**
Rittal Rail Expertise

IT infrastructure
- Infrastructure for data and communication centres
- Racks including cooling, power, security and monitoring management
- Complete support, from planning through to commissioning

Rittal offers complete IT infrastructures under the RimatriX® brand.

Power distribution
- Distribution enclosure for building supply
- Enclosures and cases with ISV modules and SV components
- Redundant IT power supply including full UPS equipment
- SV enclosure systems with low-voltage distributors, including Form separation

Security in the control room
- Individual consoles and command panels with TFT screen, membrane or stainless steel keyboards, and efficient climate control
- Server racks with redundant climate control and power supply
- Comprehensive security management (access, climate control, power supply)

Terminal systems
- Round-the-clock information
- Individual developments
- Comprehensive testing at our own laboratories
- Complete configuration with hardware and software
- Delivery to the point of installation, including commissioning

Signal and points controllers
- Controller housings in any format with individual configuration from the Rittal range of system accessories
- Efficient system climate control for any ambient condition or heat loss
- Power distribution for low voltages up to 5500 A, switchgear with Form separation

Overview of benefits
- Individual solution and service concepts, see page 22
- Certified production sites, see page 20
- In-house research and development laboratories
- Identical product quality and service standards worldwide
- "Modular system" as the basis for individual, top quality system solutions that offer outstanding value for money
Wind and weather, cold and heat, snow and ice – every day, the particular demands placed on enclosures, equipment and climate control systems used outdoors are met to perfection by Rittal standard products.

High-quality materials (aluminium or stainless steel), decades of experience in perfect enclosure production and our particular expertise in climate control technology provide the basis for outdoor enclosure systems that combine an extensive range of benefits with exceptional cost-efficiency.

Many of the requirements placed on outdoor enclosures in the rail environment are met by our standard Catalogue range.

Climate control with cooling units and heat exchangers is also tailored specifically to outdoor use. Separate air circuits (protection category IP 55) mean that ambient air is unable to penetrate the enclosure. The main emphasis is on optimum protection of the built-in components thanks to safe dissipation of the heat loss, the avoidance of condensation, and preventive remote monitoring.

Individual solutions from our modular system boast exceptional cost efficiency.
Individuality ex works

- Individually machined enclosures (cut-outs, drilled holes)
- Spray-finished in your preferred colours
- Configured according to your requirements (mechanical equipment, earthing, power and emergency power supply, climate control, safety and monitoring equipment)
- System integration up to Level 4

Protection against vandalism

No visible screw connections, no leverage points for tools, and compact louvre openings provide effective protection from vandalism.

- Protection levels above and beyond the standard properties may be individually defined (e.g. resistance classes to DIN ENV 1627)
- An optional nano-coating offers protection against graffiti and facilitates easy cleaning.

Standard solutions set signals

For a great many applications in the rail environment, wall-mounted, pole-mounted and floor-standing enclosures are available directly off the shelf.

- The basis for security and a long service life: Single-walled enclosures (CS New Basic), and twin-walled enclosures (CS modular enclosures, CS Toptec) made from aluminium with a high-quality powder coating
- The decisive signal: Rittal mass-produced quality is tailored to meet individual requirements with other Rittal system modules, available directly off the shelf.
- The result: Exceptional quality and an optimum range of configuration options, thanks to the infinite possibilities of Rittal system accessories.

Your fast track to maximum benefits at a low cost.

Overview of benefits

CS Outdoor enclosures

- Standard enclosures, available directly off the shelf
- Modular systems offer enormous diversity based on standard solutions
- Accessory compatibility, with the same system platforms as our indoor range
- Individual installation service, assembly and connection of CS Outdoor climate control components
Static use

Static individual

It is often the small details that add a decisive advantage when planning enclosure technology. “Bit by bit”, everything is added together: An innovative climate protection concept, a site-specific, optimised materials mix, an unusual design, and the configuration of power supply and distribution inside the enclosure. Standard technology and a wealth of experience derived from countless projects are incorporated into our system solutions. Rittal is also fast and convincingly cost-efficient, thanks to the use of platform strategies for enclosures and climate control components. Topics such as emergency power supply to signalling or radio equipment with modern fuel cell technology, protection against vandalism or an anti-graffiti nano coating are among Rittal’s typical package solutions. However, Rittal firmly believes that its exemplary service also extends to customer support throughout all project phases; from the initial concept, via qualification of the products, through to logistical concepts with a global service network.

Your precise requirements are met using know-how, combined with individual engineering.
For special sites
Rittal enclosures offer outstanding security standards and options for even the most extreme requirements.
- Twin-walled CS enclosures
- Stainless steel/aluminium materials mix for exacting demands in terms of corrosion protection, stability and protection against vandalism
- Cleaning-friendly surfaces (anti-graffiti nano-coating)

In situations where particular rail-typical pressures on the track (e.g. high wind speeds, compression, suction from high-speed trains or aggressive ambient air due to brake dust) play a decisive role in the enclosure concept, we devise customised project solutions.

Interactive terminal systems – also for outdoors
Information and shop systems for outdoor siting or the semi-outdoor sector.
- Made from high-quality materials
- Fitted with outdoor-ready hardware
- Vandalism-proof
- Noise-reduced, weather-tested climate control components
- Complete security management built-in

Reliability with an emergency power supply
For critical high-availability applications or to supply power to sites with no infrastructure.
- Fuel cell systems are suitable for universal use as a primary or emergency power supply (scalable autonomy).
- In many cases, wind power and/or photovoltaic systems are used to supplement fuel cells, or can operate efficiently as stand-alone emergency or regular power supplies.

Overview of benefits
Outdoor with added extras
- Sustainable energy concepts using fuel cells either as an emergency power supply or as a primary power supply
- Integral solutions: Enclosures with customer-specific interior installation, efficient climate control, power and emergency power supply, security and system monitoring – System integration up to Level 4
When it comes to finding the shortest rail route between two points, any topographical obstructions are overcome via the use of bridges and tunnels.

The technical system components used in tunnels are expected to produce maximum performance in the face of extreme temperatures, humidity, corrosion, exhaust fumes and pressure wave fluctuations. The sensitive electronics for controllers, communication equipment, emergency and escape route systems must be protected with robust, intelligent enclosure technology in order to ensure smooth, reliable tunnel operation. Technology packaging experts Rittal offer specialist solutions for this exceptionally demanding application area. Rittal components are distinguished by their outstanding protection levels, assembly-friendly design, stability and durability.

We research and test new safety equipment at our test house, housed in a former mine. The doors to Rittal’s “underground world” are always open to customers, so we can work together to develop innovative tunnel technology.
Pressure wave-proof enclosure
The ability to withstand suction and compression is pivotal in a railway tunnel. Vehicles travelling and passing at high speeds exert extreme pressures on the enclosure systems inside the tunnel.

To this end, Rittal has developed special pressure wave-proof enclosures:
- Compression and suction resistance of +/-10 kPa
- Stainless steel enclosure, available in various sizes
- Protection category IP 65
- Extremely corrosion-proof and weather-resistant

Reliability with wireless monitoring systems
The wireless CMC-TC monitoring system from Rittal ensures added reliability:
- Airflow, smoke generation, access and vandalism are all monitored by this system
- Thanks to the long battery life, the sensors are virtually maintenance-free

Rittal research goes one step further: A technology is currently under development for the localisation and monitoring of persons, machines and materials. Objective:
- To make tunnel rescues faster
- To log biometric data (e.g. heartbeat)
- To send emergency signals in case of a deviation from the set limits
- To make it much easier to locate missing persons or individuals facing an emergency

Emergency niche front F 90
A fire inside the tunnel could end in disaster. Emergency telephone and fire extinguisher niches can save lives.

Lampertz, a Rittal subsidiary, offers fully preconfigured emergency telephone niches:
- Front panelling in fire protection category F 90
- For suitable niches built into the structure
- The F 90 niche front protects the electronic equipment behind it for at least 90 minutes

Overview of benefits
Tunnel technology
- For tunnel control desks and control rooms e.g. network enclosures, consoles, command panels. CMC-TC (Computer Multi Control) for monitoring open- and closed-loop control systems.
- Precise-fit niche products (emergency telephone niches, SOS alarm boxes)
- Low-voltage distributors for lighting, ventilation, signalling systems and emergency equipment
- Ex enclosures made from stainless steel and plastic
- Stationary enclosure systems with special tunnel equipment for all lighting, communication and safety requirements

Innovative: Fuel cells for emergency power supply
RiCell fuel cells (5 kW) from Rittal are ideal for emergency power supply to the control and monitoring systems and to the lighting systems inside the tunnel.
- Low hydrogen consumption
- Only 200 watts in standby mode
- Very service-friendly, modular mechanics, and easy access

Accessible emergency telephone cabins
Rittal has taken tunnel safety a step further with state-of-the art emergency telephone cabins.
- Accessible, sealed, modular units
- Self-supporting frame structure
- Twin-walled side elements
- Stainless steel 1.4571
- Fire extinguisher compartment, distribution enclosure and door with glazed window
Mobile use

Delays for rail travellers are to be avoided. Speed, safety, punctuality and comfort are key requirements when it comes to persuading customers to travel by train. Whether in locomotives, in sleeping, business or restaurant cars, or in freight transport, the power supply, control, monitoring and communication must all meet the exacting dynamic requirements placed on “rolling stock”. Rittal offers a complete range of packaging solutions for all the technology used here, including climate control:

From the components, to technical expertise, right through to engineering. We rate quality above everything else. For this reason, we insist that many of the specific application tests (such as EMC protection, climate control and IP) are carried out in our own, certified laboratories.

When it comes to components for railway tracks and rail vehicles, we leave nothing to chance.

Solutions for special requirements

- All the components used, such as train protection and communication systems, have optimum mechanical protection, perfect climate control, and effective monitoring.
- The international transportation of passengers and freight across European borders with four different voltage networks (15 and 25 kV AC and 1.5 and 3 kV DC) is not a problem for Rittal components.

Rittal – Strengths in customer-specific systems

Technical, financial and timing benefits, thanks to:

- Support with planning and project management
- Simple, reliable development thanks to the use of standard, tested designs
- Infinite individual options based on an extensive range of system accessories
- Extensive testing of enclosure solutions at our in-house laboratories

Recent reference examples

1. Double-decker regional train, Germany
2. World record locomotive Rh 1216, Austria
3. Coradia Nordic, Sweden
4. Talgo 250, high-speed train, Spain
5. TRAXX locomotive for freight, Spain
High-voltage frames, equipment cabinets, low-voltage frames, electronic cases, subracks – everything is produced to practical specifications. In close collaboration with the customer, Rittal sets its sights on quality from the very outset. We use a variety of different materials, such as sheet steels, aluminium-zinc alloys, stainless steel and fibreglass-reinforced plastic. Primed, spray-finished or brushed – everything is possible.

As well as outstanding quality, Rittal also offers a number of specialities, such as compact enclosures for the brakes in the bogies and plastic enclosures for current collectors. The system accessories are pre-installed, and the system is prepared for plug & play installation of special components and equipment boards. Rittal also ensures excellent cooling performance in rail applications. Rittal climate control systems cool heat-sensitive controllers and other specific technical components in the engine room. They may be designed as an interior module, roof container or under-floor component.

Whether as a new construction or for retrofitting, our solutions are installed as complete packages, tailored to your requirements.
Climate control components for applications exposed to dynamic stresses

- Rack-mounted fans
- Heaters
- Fan-and-filter units and outlet filters

For locomotives of series 189 for Railion:

- Train fuse box 2 for retrofitting ETCS (European Train Control System)
  - Customer: Alstom Transport Belgium
  - Train fuse box 2, based on PS 4000
  - W x H x D: 600 x 1600 x 1000 mm
  - Material: aluminium zinc, surface finish textured RAL 7032
  - Interior installation with punched sections without mounting flanges and punched rails, with a special 482.6 mm (19”) level for the installation of electric modules, control units and train fuse units by the customer
  - Specially designed for the high dynamic stresses in the rail sector
  - Installed in the engine room of the locomotive

For locomotives of series 189 for MRCE:

- Train fuse box 2 for the installation of ETCS
  - Customer: Alstom Transport Belgium
  - Train fuse box 2, based on PS 4000
  - W x H x D: 1200 x 1600 x 1000 mm
  - Material: aluminium zinc, surface finish textured RAL 7032
  - Interior installation with punched sections with mounting flanges and punched rails, with swing frames on both sides and prepared to accommodate miniature circuit-breakers and circuit elements; with two special 482.6 mm (19”) levels for the installation of electronic modules, control units and train fuse units by the customer
  - Specially designed for the high dynamic stresses in the rail sector
  - Installed in the engine room of the locomotive

List (excerpt) of projects already delivered or currently ongoing with Rittal components for mobile rail vehicle use:

- **Alstom LHB**
  - Coradia Duplex X40
  - Coradia LINT 41
  - Coradia Lirex X60
  - Coradia Lirex XCC
  - Regio Citadis
- **Alstom Locomotives**
  - BR 203
  - BR 214
  - SNCF T18
- **Alstom Tansport**
  - BR 189 retrofitting of ETCS for Railion
  - BR 189 retrofitting of ETCS for Mitsui
  - ICE 3 retrofitting of ETCS 4000
- **Adtranz**
  - VT 611
- **Vossloh Electrical Systems**
  - Pratos
- **Vossloh Locomotives**
  - G 1000, G 1700 and G 2000
  - Prototype G 12-6 C
  - Bombardier Transportation
    - ALP 46 (New Jersey Transit)
    - Blue Tiger
    - BR 145, BR 146
    - BR 185.1
    - BR 185.2
    - BR 424-426
    - Docklands
    - Double-decker control cars
    - Flexity Outlook
    - Flexity Swift
    - LVS Marschbahn
    - Metropolitan Re 484
    - Talgo 350 (AVE S-102)
    - Talgo 250 (AVE S-130)
    - TRAXX 2E for ATC
    - TRAXX MS
    - TRAXX F140 DC RENFE Mercancias
    - TRAXX DE for LNVG
    - TRAXX F140 DE
    - VT 612
- **Deutsche Bahn**
  - EL 2 (LAUBAG)
  - VT 605 conversion for Danish transport
- **Siemens TS**
  - Metro Mailand Line 3
  - EG 3100 DSB
  - Desiro VT 642
  - Series 8000 for KCRC
  - BR 189
  - ES 64 U4 – World record locomotive
  - ES 64 U4 – Rh 1216, SZ 541
  - ES 64 F4
  - ES 64 F4 – Re 474
  - ES 64 U2 – Rh 1016, Rh 1116, Rh 2016 LE 4700
- **Siemens TS and ThyssenKrupp Transrapid Systems**
  - Transrapid TR07, TR08 and Shanghai Transmashholding
  - Kolomna EP2K
  - Balfour Beatty
  - Crankcase
  - Special earthing concepts are supported.
  - RF shielding guaranteed, thanks to the use of special materials and components.
  - Installation of equipment boards, swing frames, 482.6 mm (19”) rails etc.
  - Planning, design and calculation to customer requirements and railway standards.

Air/air heat exchangers

Air/air heat exchangers in various sizes

Voltages 24 V DC and 110 V DC

- We use enclosures (KL, AE, special) and cases (PS 4000, ES 5000, frames, special) in sheet steel, AlZn and stainless steel. Surface finishes may be primed, spray-finished or unpainted.

- Rittal also supplies climate control components such as special “rail-proof” air/air heat exchangers, e.g. in special sizes, with special voltages 24 V DC and 110 V DC, and in a prepared RF-shielded version. Rack-mounted fans and heaters, and in some cases fan-and-filter units and outlet filters.
Dynamic loads on the track, static loads in a stationary situation – Rittal allows for every eventuality, and subjects everything to comprehensive testing and checks. In every area, and in every case, Rittal quality management ensures observance of the regulations and standards, and compliance with individual requirements.

Frames, enclosures and cases produced for mobile railway technology are project planned and manufactured in accordance with European standards and guidelines. Project-planning of enclosures with dynamic loads is implemented in such a way that all requirements on the final system are met in full.

All Rittal factories in Germany (Herborn, Rittershausen, Haiger, Burbach and Wissenbach) are certified according to welding permit DIN 6700. Mindful of the extreme pressures they are exposed to, our welding seams and screw connections meet the highest quality standards on a daily basis. What is more, our spray-finishing quality reflects Rittal’s discerning overall image: We have official confirmation in the form of certificate DB TL 918340.

Everything at a single stroke: Rittal quality management.
Test techniques
Thermography produces a heat image while the system is operational. Hot spots are identified immediately.

Project planning
Rail-friendly specifications also include calculation of the enclosure and all principal components in an FEM program, enabling an assessment of mechanical strength.

EMC
Electromagnetic compatibility (EMC) plays a crucial role in today’s highly complex applications. Whether for power supply, communication or safety equipment, all protection is adequately dimensioned and tested at our EMC laboratory.

Rittal quality means:
● Around 1500 patents worldwide
● Over 300 registered designs
● Product-specific national and international approvals
● Certification to ISO 9001
● Environmental certification to ISO 14001
● Pioneering design

Accredited Rittal test laboratory:
● Simulation of climatic conditions
● Mechanical load tests
● 3D measurement
● Testing of particle density to EN 60 529, IP 54 and IP 64
● Hosed water tests to EN 60 529 or UL 50
● Testing of PE conductor connection and insulation resistance to EN 50 298

Overview of benefits
Rittal supports rail operators, vehicle manufacturers and the accessories industry from the outset:
● With the project planning of technical specifications
● With prototype production, tests and simulations
● With manufacturing and assembly
● With a warehousing service and prompt delivery
● Expert contacts throughout the entire project ensure smooth operation
A complete service chain

Every purchase decision is driven by high expectations. With this in mind, we do everything in our power to ensure that every solution offers you the maximum possible benefits. Customer satisfaction from the outset is our guiding concept. We see and hear every one of your “signals” very clearly. Thanks to many years of experience, we know that packaging solutions for rail technology, with its extremely varied conditions, not only demands a specific knowledge of the technical requirements, but above all specialist know-how and a particular sensitivity for this issue.

After all, the customer’s desire for optimum service begins well in advance of purchasing a product, and does not end when that product is commissioned. **Fascinating solutions** based on many years of experience, combined with extensive research and development work – all offered by Rittal for rail technology.

Reserved for you: The Rittal service chain.
Project planning

The first step is to conduct a precise analysis of your requirements based on relevant factors such as location, function and technical status. The complete picture obtained in this way provides the basis for expert selection of suitable rail-compatible components and solutions.

Application engineering

You outline your requirements to our application consultants, and we show you ways of achieving them. In order to develop the most efficient rail-compatible products, we will seek to clarify all key questions relating to systems and components as well as specific circumstances and developments, e.g. in standardisation.

Prototyping

Once a suitable concept has been agreed with you, we produce a prototype. By working very closely with you, any optimisations required can be implemented quickly and easily, and the prototype is manufactured to your precise requirements.

Testing

The prototype undergoes an extensive series of trials and tests in a Rittal test laboratory. General requirements such as mechanical load capacity and protection from dust and humidity are tested, together with specific requirements such as dynamic stresses or extreme climatic conditions. Your advisor will notify you immediately of the outcome of all these tests and checks. Any optimisation requirements are defined, implemented and then subjected to retesting.

Mass production

As soon as the prototype satisfies the functional reliability requirements, mass production will begin. Prior to delivery, every system undergoes further functional and safety tests in accordance with a specified plan, and is then given a test seal which guarantees Rittal quality.

After-sales service

We remain at your service with on-site advice and support in your railway application field. This means that you can take advantage of our expertise and receive answers to any questions about the systems we supply – at any time.
From:
Surname / first name
Company / customer no.
Department / function
Address
Telephone
E-mail

Catalogue 32
IT Catalogue
System climate control
Fuel cell systems
Tunnel technology

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More than 60 Rittal subsidiaries worldwide

With more than 200 locations worldwide for a truly global service.

Five global service support points in all the world's economic hubs, more than 60 subsidiaries and over 200 partners worldwide – these figures sum up the global service from Rittal. Because when it comes to service, nothing is more important than customer proximity, peace of mind and reliability.

From Europe, to the USA and South America, to China and India: Wherever you are using a Rittal product, we will take care of it. Rittal service engineers around the world are all trained to the same high standards of performance and quality, and are at your service 24 hours a day.