



Customized solutions for railway vehicles



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Permits, certification and requirements

Note: The customer must submit the required certifications, classifications, tests, and inspections if a quote / an order is submitted.

For your safety:

Tube connections may be exposed to extreme loads under certain circumstances, such as vibrations and uncontrolled pressure peaks.

You can only ensure the reliability and safety of the products and their compliance with the corresponding standards by using original parts produced by Parker and by complying with the appropriate standards.

Any failure to observe this rule can have a significant negative impact on the functional safety and reliability of the products, which may result in personal injury and invalidate your claims under warranty.

Subject to changes

The benefits to you when using customized solutions

+ Reduced weight

+ Cost savings

+ System optimization

We implement customer solutions promptly

The market for railway vehicles continues to develop at a very swift pace

Parker has a huge range of products and numerous combinations of materials on offer. All components from one source and perfectly aligned with each other - available globally. Ordering is easy since as a customer you only have one system supplier: Parker.

The constant pursuit for the highest quality, promotion of innovative ideas and a distinct focus on the customer are all closely interlinked at Parker.

In addition to the standard product range, Parker also supports you in developing individual concepts. Based on your ideas experienced Parker engineers develop the customized products and

system solutions that meet your requirements.

This brochure provides lots of examples of products that have been developed based on the close collaboration between customers from various industries and Parker. Be inspired! We will also be happy to successfully implement your ideas.

Please contact us!

Parker gets you on the rails with added value

Parker is a system supplier

- Extensive product range
- Individual customer solutions
- Industry-specific solutions
- A wide range of material combinations
- Global availability
- Supplementary product portfolio

Pre-sale and after-sale service

- Training sessions
- Technical user support
- Parker Store
- Hose Doctor



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Implementing your connection ideas

From the idea to the finished product.



Parker can implement your individual connection ideas in addition to providing standard fittings.

- Production in accordance with your designs and specifications
- Expert advice and extensive production experience
- Ultra-modern processing center
- Available globally
- You reduce your costs
- You increase your productivity
- You save weight



Jump sizes



Areas of application

- Include compressed air applications

Customer Benefits

- Avoid multiple fittings combinations (reduced weight)
- Reduced assembly time
- Reduction in potential leakage paths and therefore in consequential costs

Extra long fittings (up to 500 mm)



Areas of application

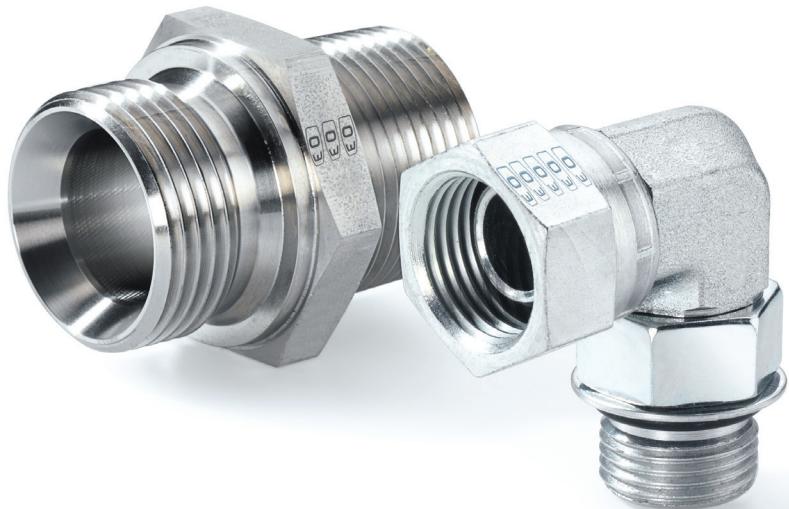
- Include compressed air applications in the under-floor area
- Feed-through from the inside to the outside of the coach in order to secure the pressure resistance

Customer Benefits

- Avoid tube extensions or adapter combinations (reduced weight)
- Reduced assembly time
- Reduction in potential leakage paths and therefore in consequential costs



System-independent connections



Areas of application

- Special solutions for combining different modules, systems and standards
- e.g. DIN to SAE

Customer Benefits

- No need to use standardised modules
- High flexibility
- Avoidance of multiple fittings combinations (reduced weight)
- Reduction in potential leakage paths and therefore in consequential costs

Throttle fittings



Areas of application

- Include compressed air applications (with throttle up to 0.3 mm)
- Adaptation of pressure conditions, including for the protection of sensitive components (e.g. auxiliary equipment systems) from pressure surges

Customer Benefits

- Avoids the need to use a reduction aperture - no additional component
- Simple and safe assembly



Filter fittings



Areas of application

- Compressed air supply for the brake system
- External power supply (air) to prevent failure

Customer Benefits

- Increased safety
- Can be combined with all standard fittings
- Protection for important components from damage caused by contamination

Special solutions (e.g. Y adapter)



Areas of application

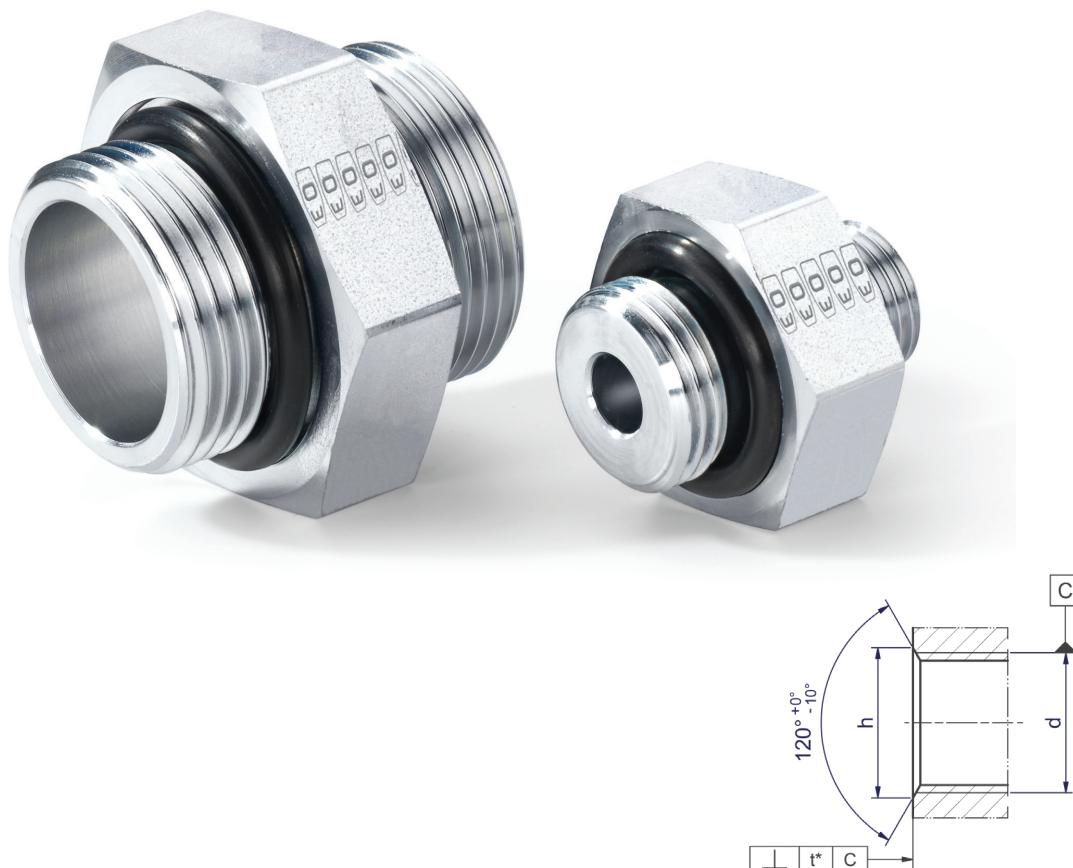
- Main air for the brake line - improved flow characteristics compared with W-fitting in order to guarantee fastest possible braking action in an emergency

Customer Benefits

- Optimized flow characteristics
- Avoidance of multiple fitting combinations (reduced weight)
- Reduced assembly time
- Reduction in potential leakage paths and therefore in consequential costs



Straight stud fitting with special seal (for brake systems)



Areas of application

- Compressed air applications in brake systems
- Straight stud fitting for sealing 120° chamfers (including for connecting valves from different brake manufacturers)

Customer Benefits

- No additional sealing required, e.g. Teflon tape or Loctite
- Elastomer sealing - no sealant required
- Avoidance of multiple fitting combinations (reduced weight)

O-Lok® H2 Hydrogen Fittings (e.g. Y adapter)



Areas of application

- Hydrogen-powered trains

Customer Benefits

- Reliable SAE J1453 O-Ring Face Seal (O-Lok) connection with H2 compatible P5009 soft seals
- Proved compound with temperature capabilities -55°C to +85°C
- Zero clearance for fast and easy plumbing
- Process-safe torque wrench assembly
- Robust design, no risk of tearing out
- Larger tubes sizes on request



Certified products

IRIS[®]
Certification

TÜV SÜD Management Service GmbH

C E R T I F I C A T E

awarded to

Parker Hannifin Manufacturing Germany GmbH & Co. KG
Bahndamm 31-33
33758, Schloß Holte-Stukenbrock
Germany

TÜV SÜD Management Service GmbH
confirms, as an IRIS Certification[®] approved certification body, that the Management System of the above organization has been assessed and found to be in accordance with the

**IRIS Certification[®] Conformity
assessment:2020
and based on
ISO/TS 22163:2017**

for the activity of Manufacturing
for the scopes of certification: 19 (Single railway components),
20 (Components related to special process work)
Production of high pressure hydraulic fittings, functional fittings and high pressure hydraulic fittings, functional fittings made of stainless steel for railway application

Certificate valid from: 17/09/2021 Certificate valid until: 27/11/2022*

Phil Deul
Current date: 06/01/2022
Certificate-Register-No.: 12 113 59549

* Providing that the subsequent surveillance audits are successful before the validity date of the previous audit.
Certification body address: Ridlerstr. 57, 80339 München, Germany

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TÜV SÜD Management Service GmbH • Zertifizierungsstelle • Ridlerstrasse 57 • 80339 München • Germany
www.tuev-sued.de/certificate-validity-check

IRIS is a reliable global supplier evaluation system in the area of railway technology. IRIS intends to implement the internationally recognized quality management standards ISO9001.

For technical approval test purposes Parker offers customized tests such as low temperature, loading and shock tests. E.g.:

- EN 45545-2
- EN 61373

All certificates are available for download at www.parker.com/hpce "Support"

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Long-term low-temperature test for stainless steel fittings

Stainless steel connectors withstand temperatures of up to minus 60°C in a 1000 h test.

Anyone who travels on the world's longest rail route, the Transsib, covering 9000 km between Moscow and Beijing experiences intense changes in temperature.

The heaviest December frosts for 50 years were experienced in 2012, when temperatures fell down to minus 57°C. Ground frosts generally last into June and temperatures of more than 30°C are possible in the July/August period.

Russian railway standards have not permitted the use of elastomer sealing elements up to now under these climatic conditions.

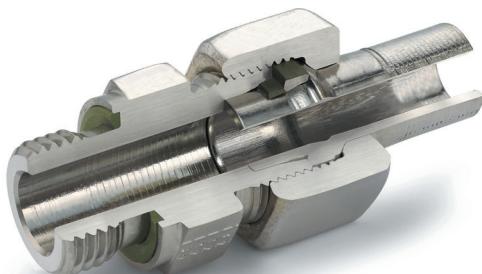
Parker engineers wanted to know the situation exactly and developed a series of tests for which there has been no previous example till now. They designed a 1000 h long-term low-temperature test for the soft sealing fittings Form E/Form F*. Evidence was provided of the reliability of the NBR material used as standard in conjunction with the DIN fitting systems EO cutting ring, EO-2, EO2-FORM and 24° DKO sealing cone.

All the tube connector mentioned above proved successful in the low temperature test. Both the metallic cutting ring connection as well as the soft sealing systems EO-2/EO2-FORM withstood the worst-case conditions simulated. The O-rings and ED seals used



on the screw-in side proved their absolute reliability.

This project was pioneered by Parker and has set new guidelines for future standards. Parker is a reliable partner for further developments in the transportation sector with its high-performance product program.



*Form E: ED seal metric: ISO 9974-2
Form F: O-ring (retaining ring) metric: ISO 6149-2/3 UN/UNF: ISO 11926-2/3





Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 00800 27 27 5374



Aerospace

Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes

Climate Control

Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO₂ controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves

Electromechanical

Key Markets

Aerospace
Factory automation
Life science & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery & converting
Primary metals
Semiconductor & electronics
Textile
Wire & cable

Key Products

AC/DC drives & systems
Electric actuators, gantry robots & slides
Electrohydraulic actuation systems
Electromechanical actuation systems
Human machine interface
Linear motors
Stepper motors, servo motors, drives & controls
Structural extrusions

Filtration

Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & systems



Fluid & Gas Handling

Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings

Hydraulics

Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydrostatic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors

Pneumatics

Key Markets

Aerospace
Conveyor & material handling
Factory automation
Life science & medical
Machine tools
Packaging machinery
Transportation & automotive

Key Products

Air preparation
Brass fittings & valves
Manifolds
Pneumatic accessories
Pneumatic actuators & grippers
Pneumatic valves & controls
Quick disconnects
Rotary actuators
Rubber & thermoplastic hose & couplings
Structural extrusions
Thermoplastic tubing & fittings
Vacuum generators, cups & sensors

Process Control

Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/ controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves

Sealing & Shielding

Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening

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