Mining Equipment and Operations
Engineered Filtration and System Solutions for Severe Service Applications
Parker Hannifin Corporation
The Global Leader in Motion and Control Technologies

We engineer the success of our customers around the world, drawing upon nine core motion and control technologies. These technologies enable virtually every machine and process to operate accurately, efficiently and dependably.

As the global leader in motion and control, we partner with our distributors to increase our customers’ productivity and profitability by delivering an unmatched breadth of engineered components and value-added services.

We continue to grow with our customers by creating application-focused products and system solutions. A key to our global expansion has been to follow our customers and establish operations, sales and service wherever they are needed. No single competitor matches Parker’s global presence, which includes:

<table>
<thead>
<tr>
<th>$12 Billion in Revenue</th>
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<tbody>
<tr>
<td>839,000 Products Sold</td>
</tr>
<tr>
<td>471,000 Customers</td>
</tr>
<tr>
<td>55,000 Employees</td>
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<tr>
<td>13,000 Distribution/MRO Outlets</td>
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<tr>
<td>1,100 Markets</td>
</tr>
<tr>
<td>139 Divisions</td>
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<tr>
<td>312 Manufacturing Plants</td>
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<td>46 Countries</td>
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Corporate Headquarters in Cleveland, Ohio.
Parker’s Quality Filtration Solutions

Together, with our customers, we break new ground to provide innovative design, reducing costs in various areas such as new build systems maintenance, energy consumption, disposal and weight. Our patented filter solutions and innovations are adopted by leading global equipment manufacturers and end users.

Important aspects of Parker Filtration Solutions

Improves System Productivity & Controllability
- Stable removal efficiency of the filter media during flow & pressure fluctuations
- Low pressure drop across the filter media & housing for improved system response

Ecology & Economy
- Parker green elements reduce waste by over 50% compared to conventional solutions
- System-matched filter element lifetime

Reliability & Safety
- Guaranteed quality of filtration
- System-matched filter element lifetime
Parker’s Mine Tough Solutions

Parker Filtration Technologies

Compressed Air Treatment
Fuel, Oil and Crankcase Filtration
Hydraulic Filtration
Natural Gas Filtration
Nitrogen Generation
Process Filtration
Compressed Air Filters
Parker provides the best air filtration solution for contaminants in harsh environments such as mines.

Compressed Air/ Special Gas Filters
Parker’s stainless steel speciality gas filters are perfect for high pressure applications in the most corrosive working environments.

Racor Filters
Parker Racor provides the best in class fuel & air filters to meet the toughest conditions.

Racor Hydrocarbon Filters
Parker hydrocarbon filters are renowned in handling diesel fuel for high power engines in mining fields.

Focused Application Solution
In response to the needs and requirements of surface mining, Parker provides focused solutions to tackle the harshest situations faced by our customers.

Wherever the mine is Parker is there with the people, products and services needed to address your concerns and keep you running.

Compressed Air – Breathing Air Filters
A cost effective solution to eliminate compressed air contamination.

Haul Truck

Drill Rig

Compressed Air Exhaust Filters
Parker exhaust filters are made to eliminate oil mist and smoke in hazardous and corrosive applications.

Photo: Atlas Copco
The Parker Advantage

Increased safety in and around the mine
Reduces downtime of machines and vehicles
Increases the overall productivity of all the equipments
Reduces the maintenance cost of all the equipments
Lowers the overall mine’s cost

Compressed Air Desiccant Dryer
An extremely compact and reliable system to dry and clean compressed air

Compressed Air Refrigeration Dryer
These systems provide dry, cool air to keep your machines cool under tough mining conditions

Nitrogen Membrane Modules
SmartFluxx Series
OEM Nitrogen Modules are available for system integration which can provide nitrogen purity between 95% to 99.5%

Racor Bypass Oil Cleaners
The most efficient way of filtering the oil and keeping the engine safe and sound

Hydraulic High Capacity Pressure Filters
Maximum pressure 6000 PSI. With a high quality Microglass III glass fiber element, these high pressure filters are best fit in surface mining applications

Hydraulic Return Line Filters
Maximum pressure 30 PSI. A high performance and low cost return line filter that meets stringent demands for environment friendly filtration

Nitorgen Generator – TruckTyreSaver
Eliminate the hidden hazards of fires and explosion of internal tires on mining sites

Hydraulic Tank Top Mounted Filters
Maximum pressure 145 PSI. Parker hydraulic TPR series works best in mine drilling equipment because of the patented technology used

Hydraulic Filtration Mobile Triceptor
Maximum pressure 5 PSI. A heavy duty desiccant breather with breather check valve adapter, suitable for miners, bolters, haulage & shuttle cars
Parker Filtration – Underground Mining

Compressed Air Filtration Solutions
Parker's compressed air filters are the best solution to remove contaminants in harsh environments such as mines.

Focused Application Solution
Parker equips our customers with the right services and solutions. Our effort in providing our customers with clean and efficient technology is the key driver to their success.

Globally, major mining giants rely on Parker technologies to provide them with innovative engineered solutions.

Underground Membrane
Nitrogen Gas Generator Skid
Parker nitrogen products for mine inerting applications are also uniquely created for Long-wall "Low clearance Mining Sites".

Note: OEM Nitrogen membranes are available for system integration

Racor Bypass Oil Cleaners
The most efficient way of filtering the oil and keeping the engine safe and sound

Compressed Air BioEnergy Solutions
Parker BioEnergy solutions for coal bed seam gas harvesting are the best available products for such applications

Compressed Air Breathing Air Filters
The most cost effective means of arranging for perfect breathing solutions in one of the most corrosive environments as such in underground mines

Long-Wall Mining Machinery
Long Wall Shearer

Photo: Atlas Copco
The Parker Advantage

Meets rigorous global standards and requirements
High operating efficiency
Lower power consumption
Long lasting and reliable technologies
Integrated system solutions
Easy to service and repair
Lowers the overall mine’s cost

Compressed Air

Breathing Air Filters
The most cost effective means of arranging for perfect breathing solutions in one of the most corrosive environments as such in underground mines

Desiccant Dryers
An extremely compact and reliable system to dry and clean compressed air

Exhaust Filter
Parker exhaust filters are made to eliminate oil mist and smoke in hazardous and corrosive applications

Compressed Air

BioEnergy Solutions
Parker BioEnergy solutions for coal bed seam gas harvesting are the best available products for such applications

Focused Application Solution
Parker equips our customers with the right services and solutions. Our effort in providing our customers with clean and efficient technology is the key driver to their success.

Globally, major mining giants rely on Parker technologies to provide them with innovative engineered solutions.

Containerized Nitrogen Systems
Parker containerized nitrogen systems function to extinguish coal mine fires by reducing the oxygen content of the combustive gases below the lower limit of explosion (LEL)

Note: OEM Nitrogen membranes are available for system integration

Conventional Mining Machinery
Shuttle Car

Photo: JOY
Hydraulic Medium Pressure Filters
- 500 PSI MAOP
- Flows to 400 GPM
- Bowl up design
- Bypass with o-ring for zero leakage
- Coreless design option
- Duplex & quadplex available
- Best suited in long-wall pumping stations

Hydraulic High Pressure – World Pressure Filters
- 7000 PSI MAOP (6000 PSI fatigue)
- Flows to 150 GPM
- Reverse flow standard
- Patented element
- Coreless Ecoglass III element
- Parker's World Pressure Filters are best suited in bolters & miners

Hydraulic Suction Return Filters
Maximum pressure 145 PSI.
An innovative green filter, this particular series uses patented technology to filter both open and closed loop oil circuits through one filter

Parker Replacement Filter Elements
Parker’s replaceable elements are easily available and provides continuous performance
Racor Crankcase Ventilation Filters and Fuel Filters
Parker Racor filters meet the latest stringent industrial standards in fuel and crankcase ventilation filtration.

Hydraulic Filtration Mobile Triceptor
- Maximum pressure 5 PSI
- Heavy duty desiccant breather
- Colour indicating silica gel
- Breather check valve adapter available
- Parker's pressure filters are best suited in miners, bolters, haulage and shuttle cars

Hydraulic High Pressure Filters
- 5000 PSI MAOP (3500 PSI fatigue)
- Flows to 120 GPM
- Bowl up design
- Manifold option
- 50PR reverse flow option
- Parker's pressure filters are best suited in miners, bolters, haulage and shuttle cars
Compressed Air – Twin Tower Desiccant Dryers
Parker industrial dryers provide clean and dry air for various applications.

Hydraulic Fluid Bottle Sampler
A next generation product from Parker in fluid particle analysis and monitoring program.

The Parker Advantage
- High dirt holding capacity and water removal efficiency from oil and fuels
- High flow equipment filtration
- Improves assembly time
- Reduces development time and expenses
- All systems are fully compatible with all Parker products

Railway Filtration Solutions
Parker railway air dryers and filters provide the best solutions in any climatic conditions ensuring constant optimum performance.

Hydraulic Fluid Condition Monitoring
Parker particle detectors represent the most up to date technology in particle detection.

Compressed Air BioEnergy Solutions
Parker BioEnergy solutions for coal bed seam gas harvesting are the best available products for such applications.

CNG Gas Filters
On-board CNG gas filters completely remove solid particles, condensed water and oils to protect fuel injections and other precision components.
Compressor Room & Nitrogen Generation

**KEY:**

1. Air Compressor
2. Wet Air Receiver
3. Condensate Drain
4. Water Separator
5. Coalescing Filters
6. Modular Absorption Dryer
7. Dust Filter
8. Condensate Drainage
9. Oil / Water Separator
10. Dry Air Receiver
11. Oil Vapor Removal
12. Sterile Air Filter
13. On-site Nitrogen Gas Generator
14. Analytical Gas Generator
15. Breathing Air Purifier

**Mobile & Stationary Compressed Air Filtration**
Parker's compressed air filters provide optimum solutions by removing contamination.

**Process Liquid Filtration**
Parker's process liquid filtration provides absolute retention ratings for critical applications.

**Hydraulic Portable Purification System**
This portable purification system by Parker draws out the water contaminated fluid out of the system & flushes it back after filtration.

**Racor Bulk Fluid Filtration**
Parker hydrocarbon capabilities provide high filtration capabilities combined with high efficiency rates.

**Process Filtration**
Parker ParMax™ Filter
Vessels are widely used in processing and refining industries as they deliver high contaminant retention rate.

**Membrane Nitrogen Gas Generator Skid**
Generate nitrogen in your own process per your required purity ratings.
Parker's Motion & Control Technologies

### Key Markets

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

**Climate Control**
- Agriculture
- Air conditioning
- Construction Machinery
- Food & beverage
- Industrial machinery
- Life sciences
- Oil & gas
- Process
- Refrigeration
- Transportation

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

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

**Key Products**

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

**Filtration**
- 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

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 1 800 C-Parker (1 800 272 7537)
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
- Hydraulic 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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