

Honeywell

WHEELS AND BRAKING SYSTEMS

Delivering safe and reliable wheels and braking systems with lower lifecycle cost of ownership



High-performance braking products and services

Industry Challenges

Airlines are faced with the challenges of continually reducing operating and maintenance costs while delivering an exceptional passenger experience and uncompromised safety...every flight, every landing, every taxi, and at every gate turn. Simultaneously, operating conditions are becoming more demanding as increasing numbers of aircraft take to the skies – airports get busier, gate turn-times become more rapid, taxiways are more congested, runway exits get shorter, and noise regulations restrict the use of engine thrust reverse. Wheels and brakes serve a critical role in this equation through higher performance at a lower total cost.

Honeywell's Response

As a leader in the Aerospace industry, Honeywell provides a versatile set of products and services to address these concerns. Additionally, we continue to invest significantly in advanced technology and integrated solutions that meet those ever increasing and evolving demands.

Brakes

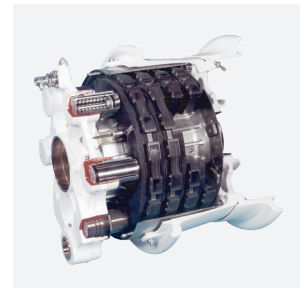
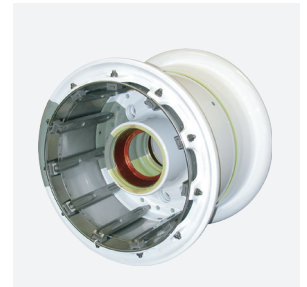
Using Honeywell's Carbinex® friction materials, our range of carbon brakes lowers greenhouse gas emissions and enables higher availability through longer maintenance intervals. They also provide high reliability, improved weight savings and lower overall lifecycle costs.

Ranging from the industry-leading energy absorption on the the world's largest airliner, the Airbus A380, to the demanding military missions of the advanced F-35 Joint Strike Fighter, Honeywell's Carbinex carbon brakes demonstrate reliable performance and industry-leading durability. We continue to advance the development of core carbon-matrix materials and protective antioxidant coatings to provide leading landing per overhaul (LPO) life matched to the versatility of the aircraft service conditions.

Honeywell's Performance Materials Technology (PMT) engineering and laboratories is further advancing the latest in material technology and process development in our brake designs. We have also implemented new generations of automation systems to support the rigorous process control in our modernized manufacturing facilities. In addition, our antioxidant coating technologies have proven to be best-in-class against carbon oxidation caused by de-icing fluids and contaminants.

Honeywell continues to serve as the industry leader in 'steel' or metal-ceramic brake and wheel systems. Our time-tested Cerametalix® brakes provide proven robustness and greater total value than carbon alternatives and are preferred and installed on the largest 737-700/-800 fleets in the world.

Honeywell continues to optimize the Cerametalix friction material family in order to improve thermal capability and wear performance while ensuring the shortest gate turn times in the industry. Honeywell has modernized manufacturing processes and control technologies in order to ensure Cerametalix brakes continue to provide the reliability, performance and excellent maintainability that our customers expect.



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Wheels and Tires

Honeywell's lightweight aluminum alloy main and nose wheels are manufactured for an extended service life, ensuring lower cost of ownership. Our material treatments have demonstrated superior corrosion resistance and serviceability.

Our unique design capabilities have produced rim-retained wheel designs that dependably operate on many military fighter platforms such as the F35 and F18, under extreme mission profiles. This advanced wheel design is available for commercial aircraft platforms – it saves weight, allows for greater brake life and reduces maintenance time and costs.

Honeywell has full capability to integrate, test and certify tire advancements in collaboration with various tire manufacturers to ensure reliability of the wheels and tires as a system to maximized roll life.

Integrated Solutions and Services

More operators are now looking for systematic approaches to maintenance and reliability analysis to lower overall operating costs, linking aircraft usage and condition data to operational cost drivers. Honeywell stands as a collaborative partner with broad experience in predictive and condition-based maintenance, providing real-world benefits through sensing and data connectivity of aircraft systems. Honeywell provides aerospace OEM's with a proven track record in systems engineering to supply a broader range of ATA-32 landing equipment content as integrated system solutions. Our capabilities to successfully manage large complex programs and certified sub-systems result in optimized aircraft performance and platform development timelines.

Wheels and Braking Systems Benefits

- Product innovation is driven by advanced capabilities in design and systems engineering
- Leader in performance materials and process engineering
- Broad portfolio of products to meet value needs
- Long-life, lighter weight Carebenix carbon or trusted, low-cost Cerametalix brakes
- Smooth braking performance for passenger comfort
- Strong product safety track-record and certified quality assurance
- Best-demonstrated fleet gate turn-times and improved dispatch reliability using brake thermal capability
- Repair and overhaul excellence including asset logistics services; recognized service quality and turn-times
- Easy maintenance and serviceability by design
- Superior oxidation performance and technology advancement in anti-oxidant coatings
- Reliability under diverse and extreme conditions
- Advanced wheel design for greater than 10,000 cycles and/or 50,000 mile roll life

Today as Honeywell, our wheels and braking systems are equipped on a broad portfolio of commercial and military aircraft, spanning over 200 customers and over 8,000 aircraft around the world, including:

Commercial

Airbus: A330-200/-300, A340-200/-300, A340-400/-500, A380

Boeing: 717, 737 Classic, 737-600/700/800/900/900ER, 747-400, 777-200/-300, 767-300, 767-200, 747-100/-200, DC8, MD-11, MD80

Embraer: E130/145

COMAC: C919

Military

Boeing: F-15, F-18, KC-46A, B-52, KC-135

Lockheed Martin: F-22, F-35

Northrup Grumman: B-2

Eurocopter: AS332



Why Honeywell?

- Aerospace wheels and braking system design and manufacturing experience since the 1920s
- Delivering excellence to the aviation industry through manufacturing, distribution, product support, repair and overhaul, and asset management services
- Global Repair and Overhaul reach with facilities in North America, Europe and Asia and licensees around the world
- The superior support and global service reach of Honeywell's R&O network ensures that every day, hundreds of airline customers provide safe, on-time and reliable transportation to thousands of passengers in diverse conditions
- Advanced design capabilities including structural, thermal and dynamic analysis
- Complete validation and test capabilities, including 75K lb, 307M ft-lb, 350 mph road wheel dynamometers
- Effective Tier 1 systems integration, engineering and program management for large, complex programs
- Integrated solutions encompassing brake control and landing gear systems
- Collaborative design practices and 3D model competencies for aircraft integration
- Leading materials technology R&D, non-destructive scanning and advanced laboratories

- Sustained quality improvement driven by Six Sigma and Honeywell Operating System (HOS) foundations
- Low CO₂ technologies – lightweight carbon brakes and Electric-Green-Taxi-System (EGTS) integration
- Health monitoring and preventive maintenance systems with data connectivity across the range of aircraft equipment

Global Network of Support Services

Honeywell's comprehensive support network, spanning the Americas, Europe, Middle East, Africa, Asia and the South Pacific, delivers fully integrated service solutions and 24/7/365 support to meet the needs of the aerospace industry.

As a world leader of aviation aftermarket services, Honeywell provides the knowledge and resources to take care of all your service needs – whenever and wherever you require maintenance and repair services.

Our comprehensive global services provide industry recognized service support including repair, overhaul, and asset logistics with unmatched turn-time and quality performance supported by the Honeywell Operating System (HOS).

Our History

Founded by Vincent Bendix and enhanced by his rich legacy in the history of aviation technology and air racing, research into braking systems began under the Bendix name as early as 1923. Charles Lindbergh used Bendix wheels on his Ryan Brougham aircraft.

Manufacturing at our main facility in South Bend, Indiana, USA was started in 1943 to support the WWII war effort.

The first Carbenix carbon-matrix brake was produced in 1988, after Bendix became AlliedSignal. Knowing that they serve a vital function in thousands of daily cycles and critical missions of aircraft landing, taxi and take-off, our employees take pride in designing, manufacturing and servicing aerospace wheels and brakes.

Honeywell Aerospace

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