Air Bearings

IBS Precision Engineering

Frictionless Motion for Vehicle Testing

Testing systems are used extensively in the **automotive industry**. In addition to in-house testing by car manufacturers and first tier suppliers, testing is also done by specialist test houses. Their challenge: **How to prevent friction from affecting test results?**

Frictionless Motion for Vehicle Testing

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Applying the **right bearing technology** in test systems is critical for obtaining uncompromised test readings. **Frictionless motion and positioning** is the solution.

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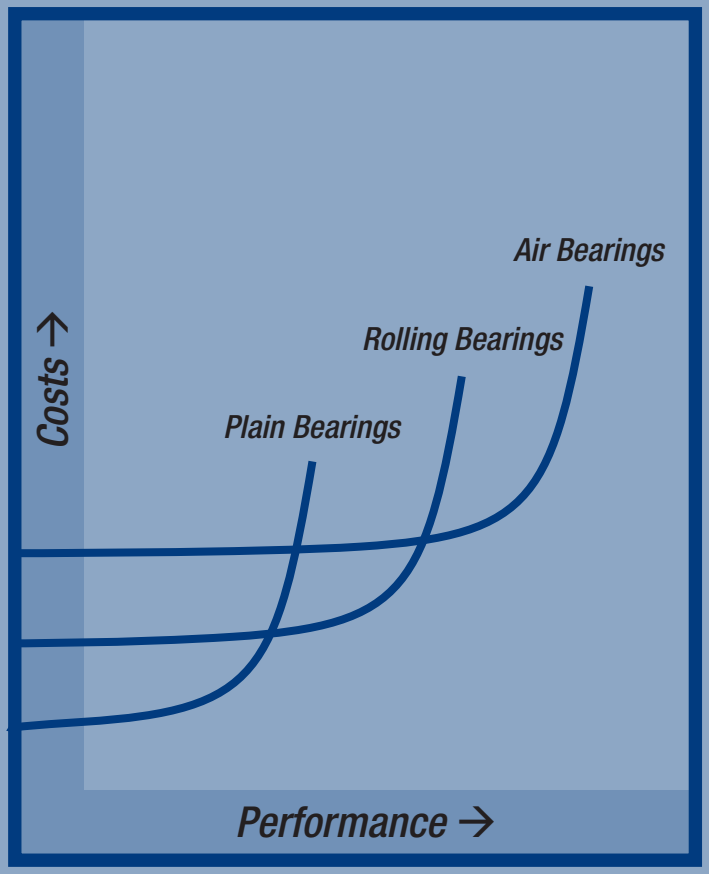
Non-contact air bearings represent the next logical step in bearing design. The many technical advantages such as near **zero friction and wear, high speed and high precision capabilities, and no oil lubrication requirements** are powerful advantages and help test engineers to collect the most accurate test results.



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Examples of **vehicle test applications** in which air bearings are used:

Aerodynamic Test Applications

High pressure air bearings for friction free motion of rolling roads

Drive Train Test Applications

Friction free rotational motion for torque test systems & seal measurement

Air bearings are ideal for vehicle testing applications

Tire Test Applications

Ultra high pressure air bearings for friction free testing under high forces

Acoustic Test Applications

Silent motion systems for noise measurement

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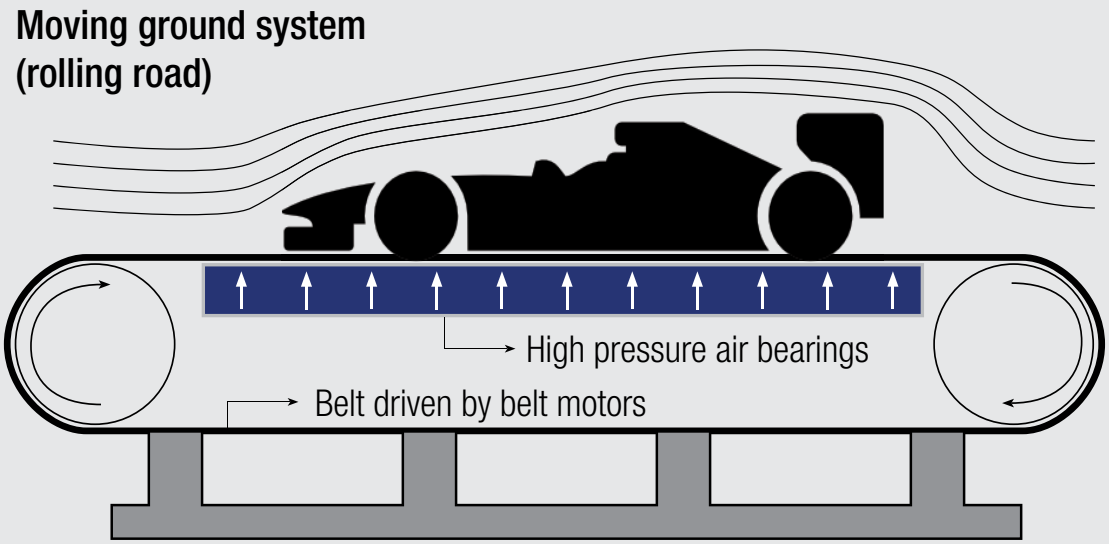
Moving ground system (rolling road) example

High pressure air bearings avoid upward suction of the belt, friction while running, heat generation, and belt wear. The aerodynamic downforce and the weight of the car are easily supported.



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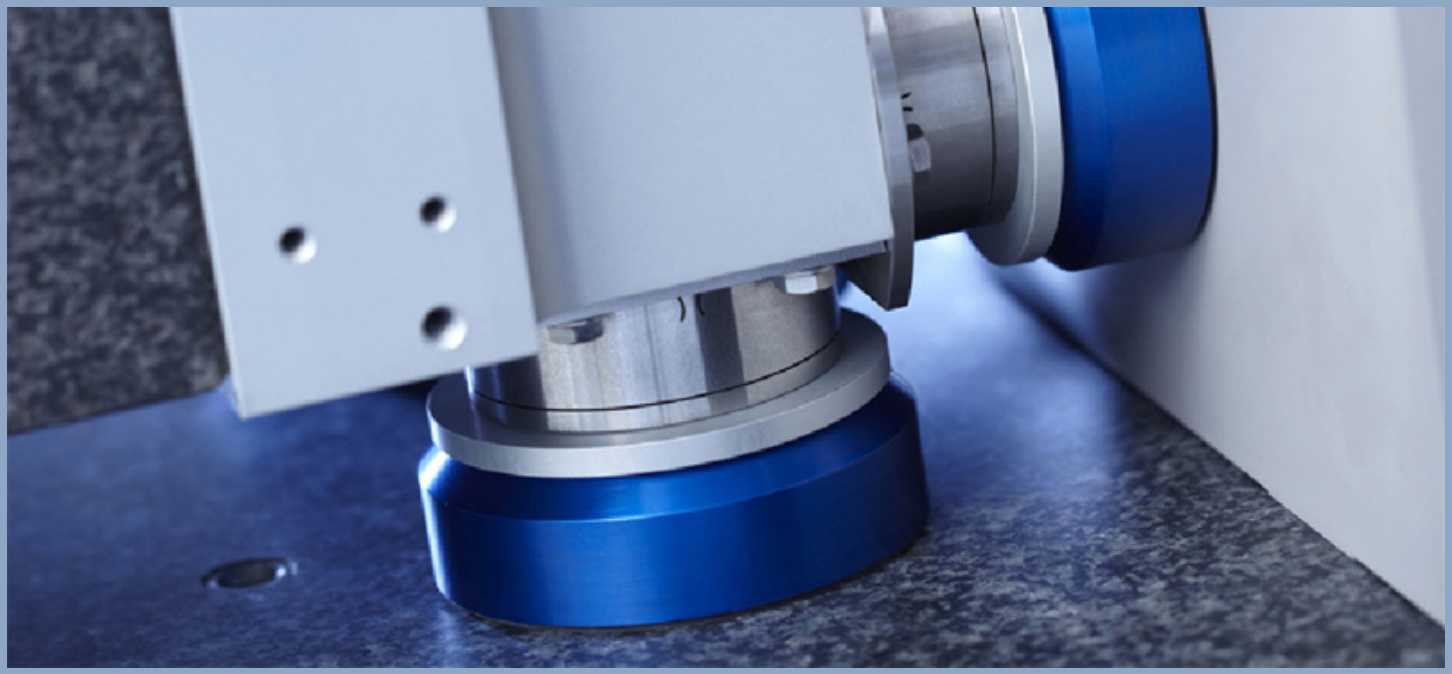
Unlike contact roller bearings, air bearings utilize a **thin film of pressurized air** to provide a **zero friction load bearing interface** between surfaces that would otherwise be in contact with each other.



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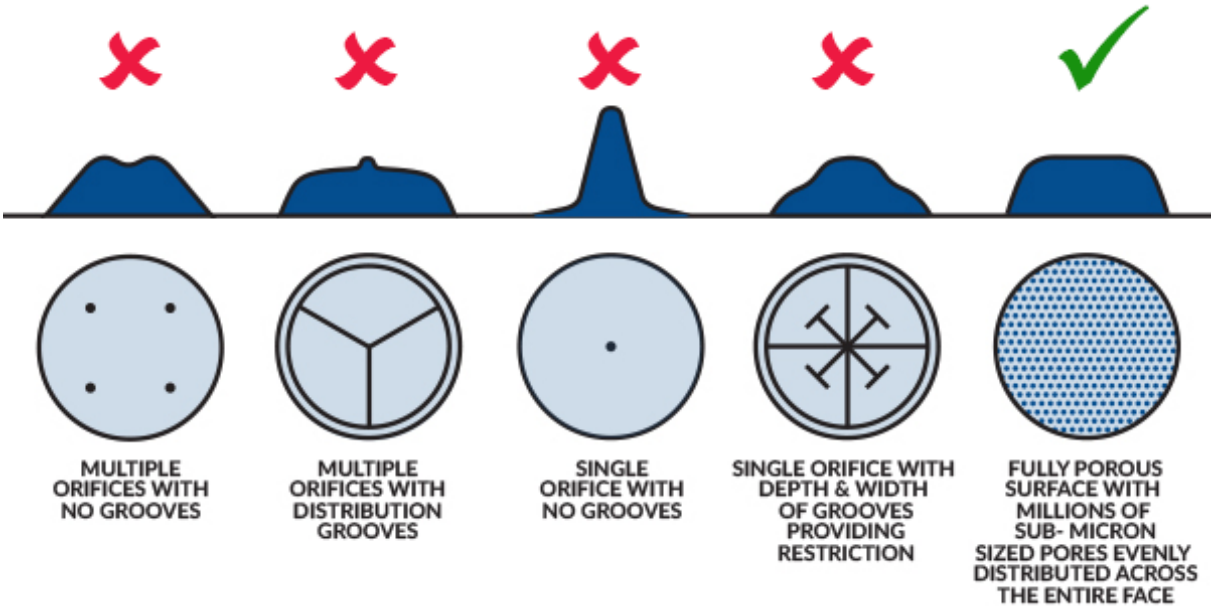
An ideal air bearing supplies air pressure equally across the face of the bearing, while automatically restricting and damping airflow at the same time. Unlike orifice air bearings, **porous media air bearings** check all boxes.



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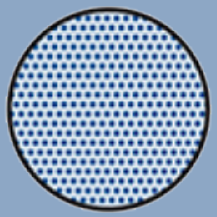
Porous media air bearing:
By diffusing air through millions of sub-micron holes in the carbon, a perfectly even pressure gradient is created, which simultaneously resists changes to the volumetric flow of air, resulting in a damping effect that creates a naturally stable air bearing.



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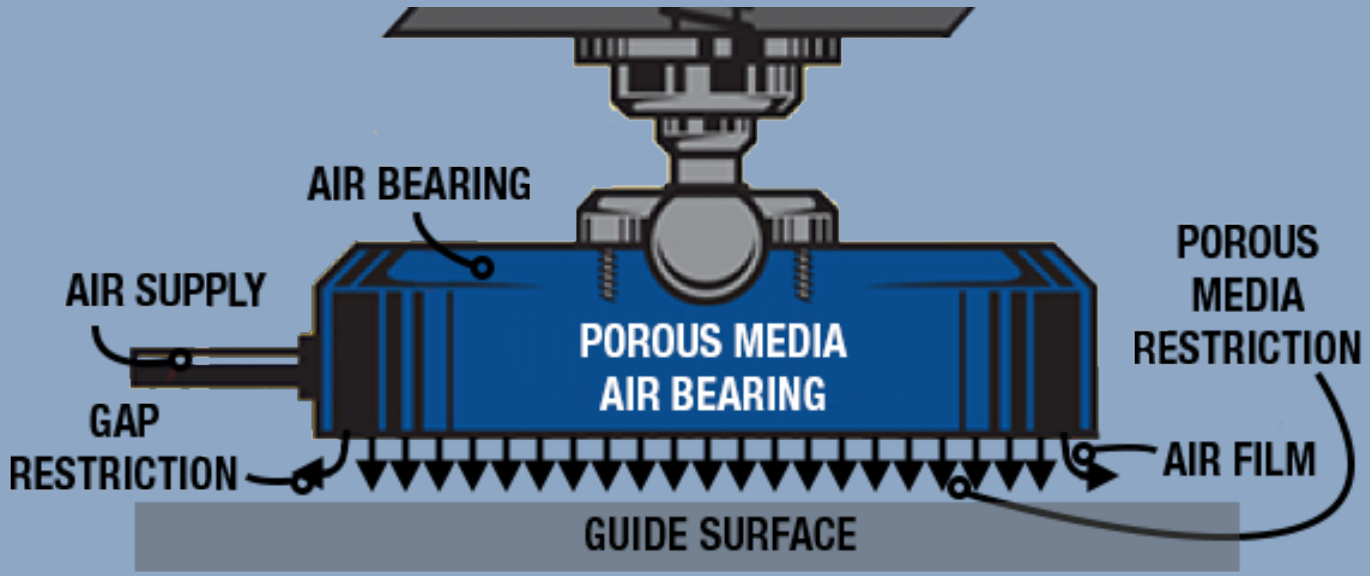
To reduce flying height and air consumption and to obtain a higher stiffness, air pressure is supplied to the **gap with restriction**. This air bearing compensation is used to optimize the bearing with respect to lift, load, and stiffness for particular applications.



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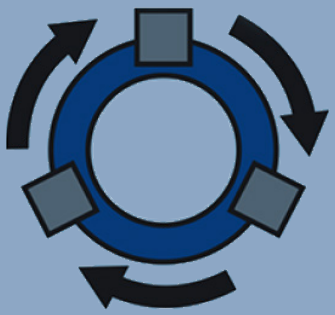
Air Bearings can be used for various **precision motion and positioning applications** in vehicle testing:

Linear Motion

- Flat air bearings
- Air bushings
- Air slides
- Vacuum preloaded air bearings



Rotary Motion

- Air bushings
- Air spindles
- Radial air bearings
- Spherical air bearings

Click on the links to visit the product pages on-line for more information.

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Further reading

Air Bearing solutions for vehicle testing applications
Find out where and which air bearings are used in the automotive testing process.

Visit our website to see the range of air bearings we offer:
www.ibspe.com/air-bearings

For more detailed information about air bearings, how to choose the right type for your application and how to design with them, download our ***Air bearing design and application guide*** from our on-line Technical Resources.