



Vibrac[®]

PRECISION TEST SYSTEMS

Technology Transfer: From Aerospace to Industrial Bearing Testing

A Revolution in Low-Speed, High-Resolution Testing



Speaker Overview

Thomas C.H. Rogers

President & CEO | Vibrac Precision Test Systems

Background and Credentials

- ✓ President and CEO of Vibrac LLC
- ✓ Substantial growth, while continuously introducing new and unique make Vibrac a trusted name in low-speed high-resolution bearing performance testing.
- ✓ Leadership positions: Vice-Chair of the ASTM International Rolling Element Bearing Committee, Advisory Board Member for The Bearing Show
- ✓ 22 years of experience in the bearing industry including a tenure with KAMAN Corp.
- ✓ Widely known for innovative approaches in precision torque test systems



Torque Matters

Bearing Testing Has Changed!

Vibrac has created a new roller element bearing test system with accompanying methodology, using low-speed high-resolution torque testing to examine and detect flaws within highly sensitive bearings.

Through testing, our goal is to increase global bearing reliability, leading to safer travel, exploration, and mechanical and technical development.

- ✓ Repeatable and accurate results.
- ✓ Identifies specific types of bearing flaws
- ✓ Industries' only non-destructive test solution



Development in Aerospace & Defense

Accuracy & Consistency

We developed our system in partnership with NASA due to their need for incredible precision & Accuracy

Non-destructive Examination

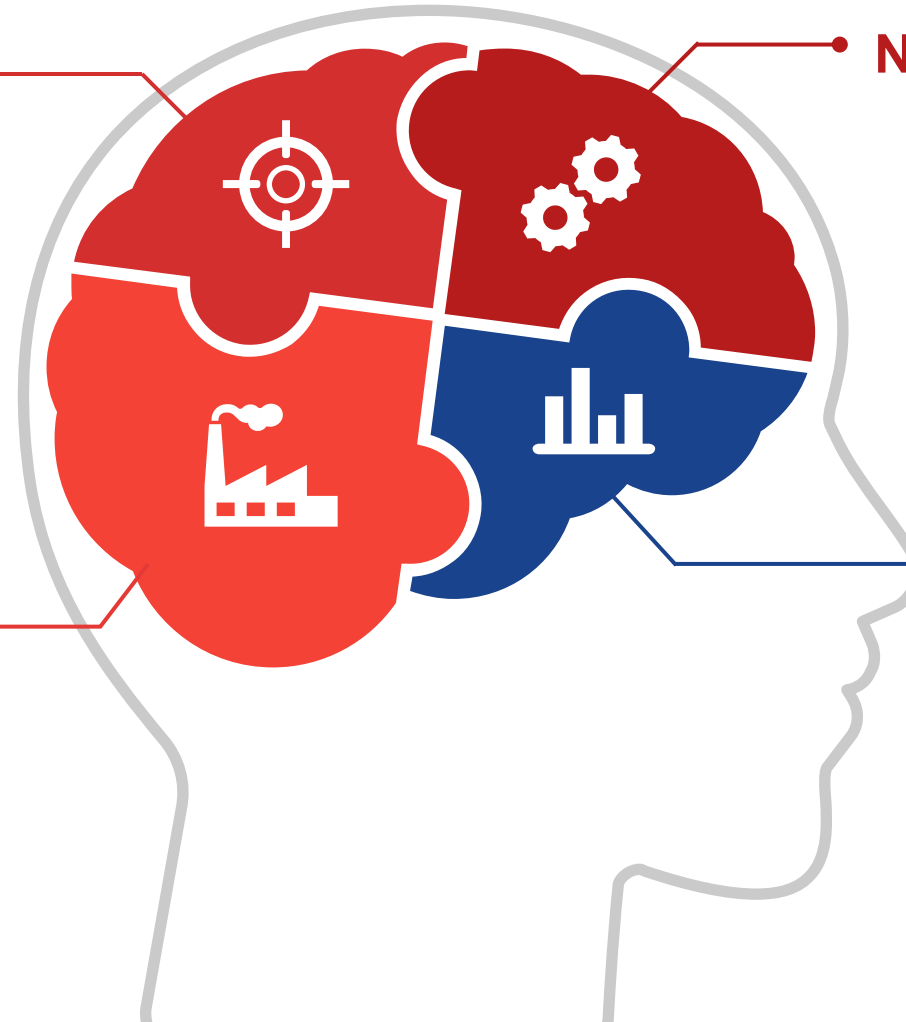
Vibrac systems allow bearing testing without compromising its integrity, allowing tests on bearings selected for installation

Procedural Standardization

Vibrac hopes to facilitate a standard of inspection and safety across the industry

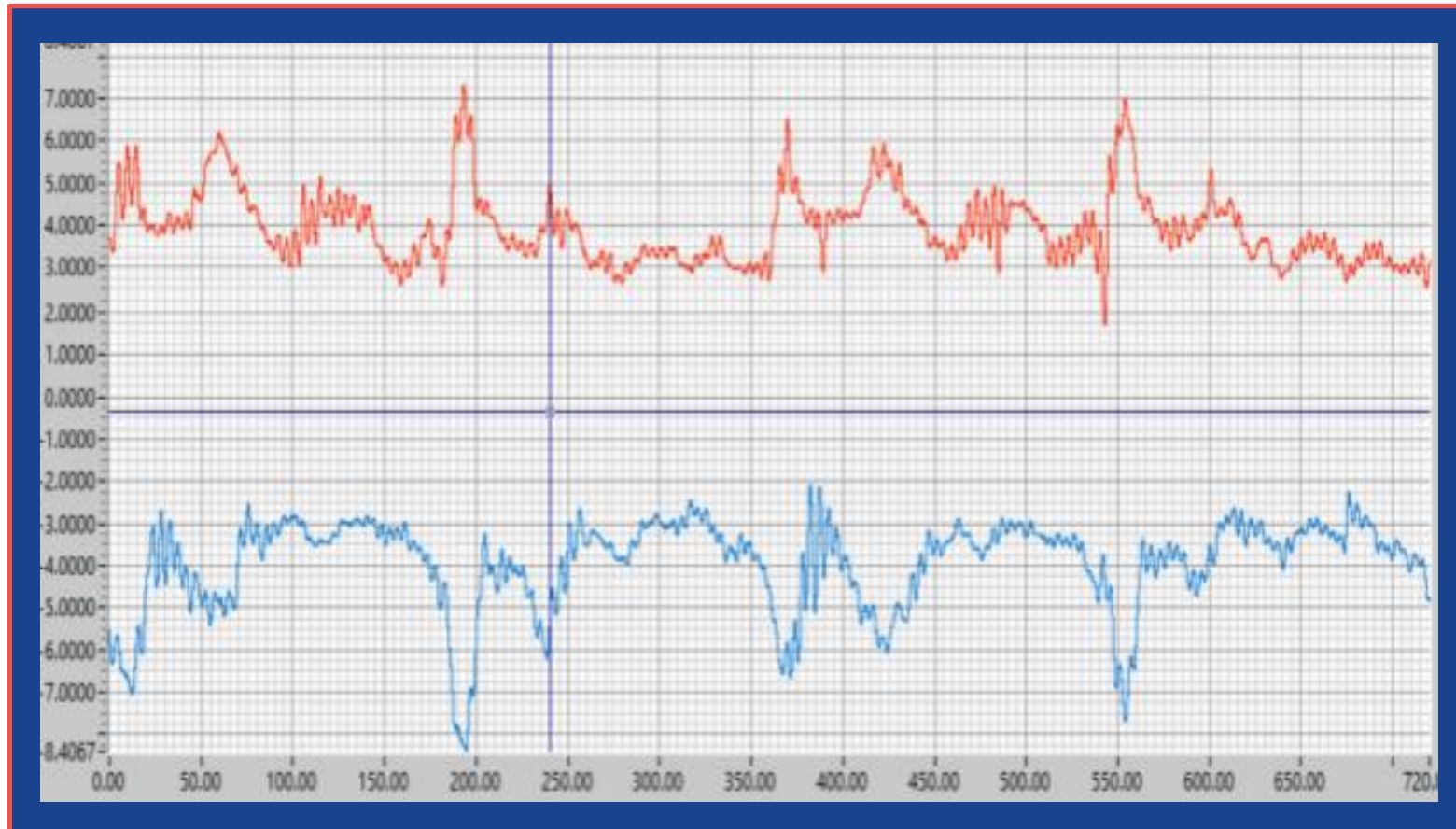
Data Collection & Analysis

Our systems provide the ability to visualize data effectively and log decades of data



Low-Speed High-Resolution Testing Explained

Test Results:

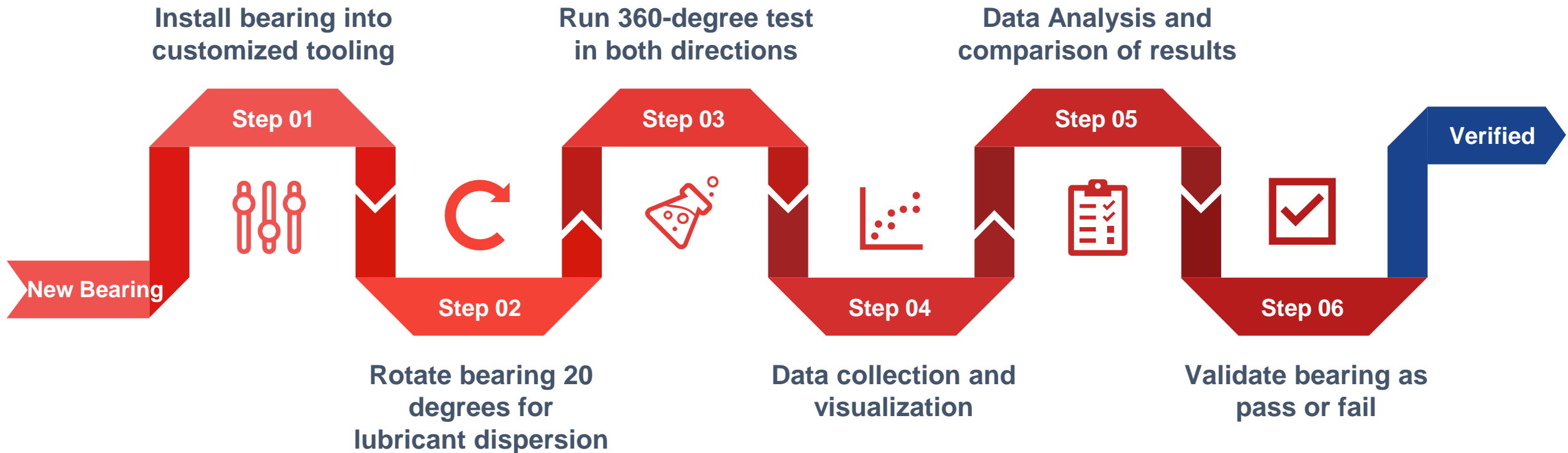


These results are a combination of contamination and possible pitted raceway

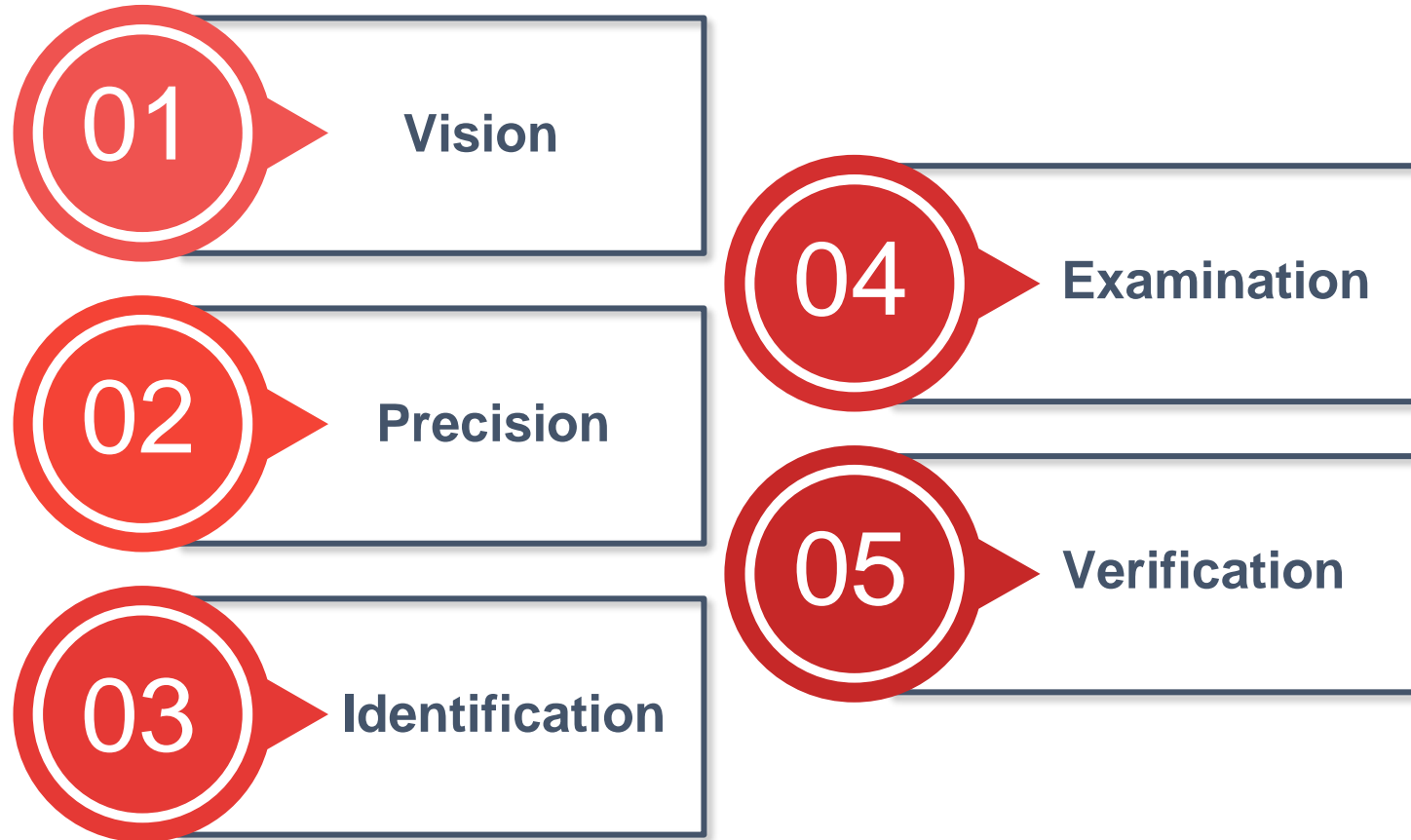


Testing Methodology:

Developing a Reliable Process



Benefits of **Low-Speed High-Resolution** Testing



LSHR Testing leads to safer and more reliable bearings



Non-destructive testing is the only way to know 100% that a perfect bearing is installed

Traditional lifetime and other vibrational tests destroy the bearing, forcing batch testing.

Testing a bearing for multiple flaw types without destroying it and logging the test to its serial number or serialized application, increases accountability for each part.

Case Studies and Commercial Partners

NASA

Was an instrumental partner in the development of this technology

Timken

Together we continue to learn and test the cutting edge of bearing sciences

Haliburton

Innovations in torque testing across new fields



US Defense Dept.

Has trusted Vibrac for 30+ years to keep people safe

Honeywell

Innovating new technologies and pushing the boundaries of what we think is possible

Pepsi Co.

Vibrac also helps improve user experience with consumer products

Aerospace Industry Applications



Rockets & Missiles



Commercial Aviation



Satellites



Jet Engine Propulsion



Rovers, Telescopes & Space Stations



Helicopters & Drones



Aerospace Technology in Other Industries



Industrial
Automation

Advanced Motion
Control

Automotive

High-Speed Rail

High Speed
Conveyor Belts

Medical
Industry

Cost of Production:

Financial Impact of LSHR Testing



**Preventative
Maintenance**



**Lost
Production**



**Consumer
Safety**



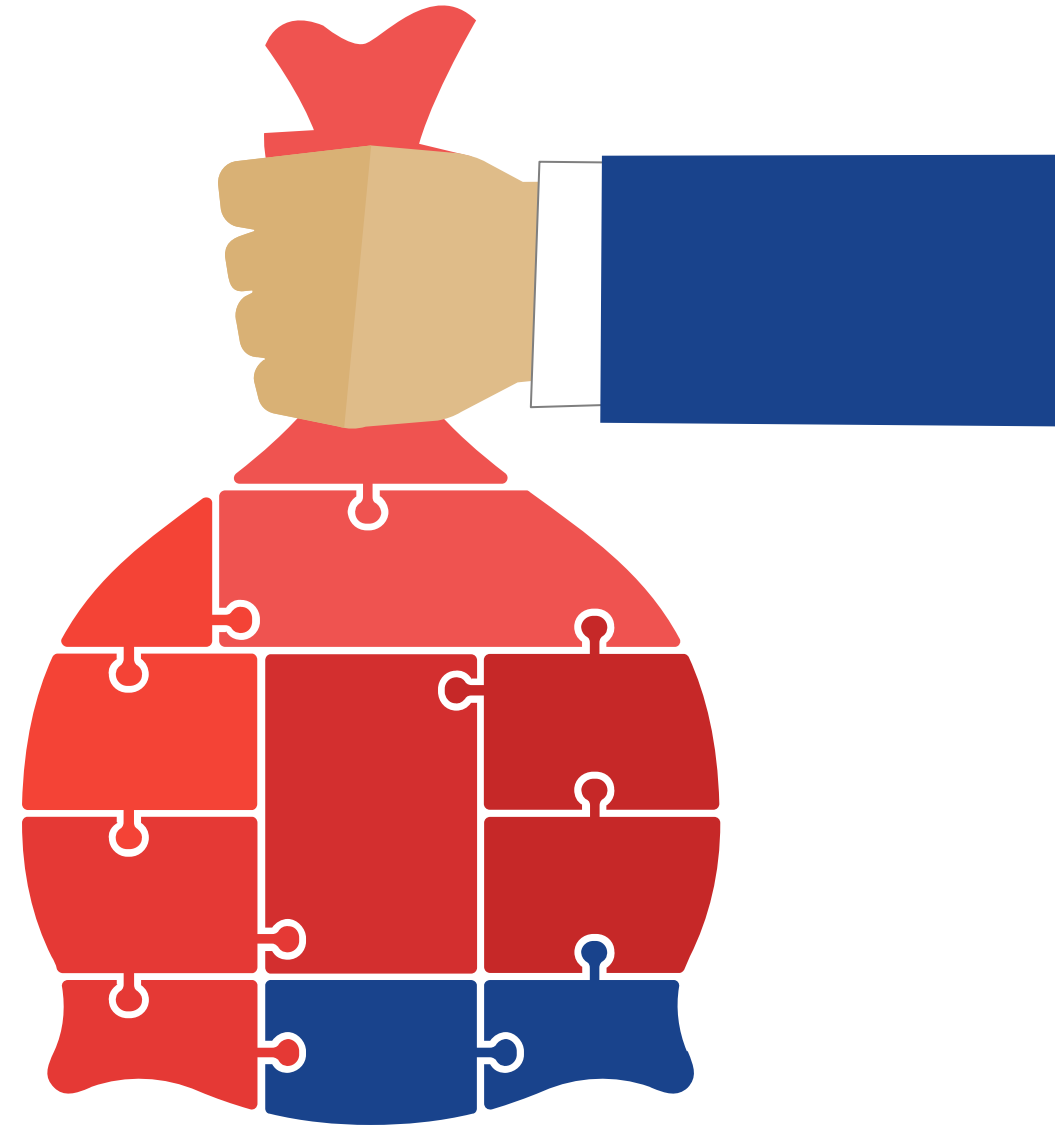
**Speed &
Efficiency**



**Domino
Effect**



**Product
Lifetime**



The Human Element

Employee Safety

Reducing workplace hazards



Passenger Safety

Decreasing bearing related incidents

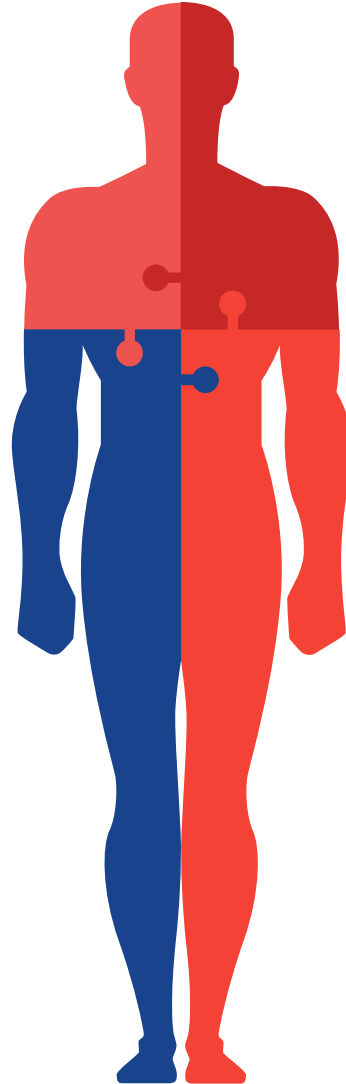
Liability

Stored test results produce documented responsibility

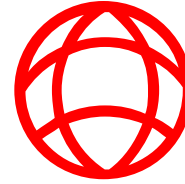


Consumer Confidence

Improved safety and reduced incidents



The Cost of Losing Business



Brand Perception & Quality

Creating more reliable and safer bearings improves the overall quality



Avoiding Downtime and MRO Expenses

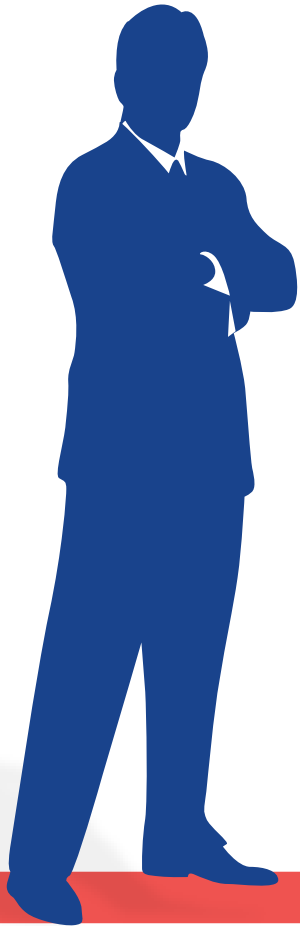
When airplanes, helicopters, satellites and more cannot function properly there are missed revenue opportunities



Maintaining Customer Satisfaction

From bearing manufacturers to the end consumer, a better bearing is a better experience

Conclusion and Next Steps





Thank You