



AIMS

**ADVANCED
INDUSTRIAL
MEASUREMENT
SYSTEMS**



**CMM APPLICATIONS
IN AEROSPACE**

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INTRO

In the 1951 film *No Highway in the Sky*, James Stewart plays an aeronautical engineer charged to discover the reason an airliner crashed.

He believes metal fatigue caused structural failure in the ship's tailplane when it reached 1440 flight hours.

During his investigation he discovers he is flying aboard the same type of airplane and that it also is nearing the point of failure he predicted.

In a bold move to save passengers he sabotages the airplane after it lands. Aircraft production backlogs, new materials, big data and demand for fuel and cost-efficient, right-sized planes make accurate, fast part inspection more important than ever. A closer look at market trends reveals why the demand for coordinate measuring machines is also growing.

This Ebook will cover:

- Market Outlook
- Part Categories
- Examples of Specific Parts
- Best Practices for Part Inspection

MARKET OUTLOOK

A growing passenger base is the primary driver behind the uptick in commercial aircraft; particularly single-aisle planes. Backlog orders stand at 14,000 with 38,000 airplanes estimated to be produced over the next two decades.

Despite record outputs, Boeing and Airbus missed 2018 jet delivery targets, hampered by production problems that included shortages of fuselages, engines and other parts.

To help primes meet global demand for air travel, suppliers must solve shortterm production problems to meet aggressive timetables without compromising quality.

To bust up bottlenecks, manufacturers need to strengthen the supply chain, manage programs more effectively and harness technology advances to boost throughput.

Coordinate measuring machines offer one tool that can help suppliers overcome systemic problems in parts shortages, re-work, defects, out-ofsequence activity and unplanned overtime; variables that contribute to delivery delays and higher costs.

PARTS

Part Types

- Turbine Blades
- Airframe Structures
- Wing Spans
- Plastic Parts
- Leading and Trailing Edges
- Anti-locking brake housings

Prismatic part features are best suited to a simple stylus configuration capable

of maintaining accuracy and shortening inspection time.

These include:

- Circles
- Holes
- Slots
- Plain Line Points

Fasteners are a staple of commercial and military aircraft.

They include screws, bolts, rivets, nuts, hi-locks and pins. The market is expected to grow at a CAGR of 7.85 percent from 2019 to 2023. Titanium fasteners in particular meet demands for light weighting parts and are compatible with carbon fiber reinforced composite structures.



MATERIALS

Like other industries, the aerospace market has been actively pursuing ways to increase energy efficiency, reduce fuel consumption and achieve a greener profile. Light weighting structures reduces a plane's mass and requires less lift force and thrust.

Current structural materials include:

- Aluminum
- High-strength steels
- Titanium alloys
- Composites

Production rates and costs for carbon fiber and composites initially made the materials less attractive for use in narrow-body [single aisle] aircraft.

But time is shifting this view point as manufacturers see significant savings in maintenance and replacement costs for carbon fiber components.



INSPECTION & MEASUREMENT

The Revolution LM is a multi-sensor solution that can be equipped for touch or noncontact inspection. Unlike other vision systems on the market, the LM features the industry's most advanced scanning probe:



INSPECTION & MEASUREMENT



The RVP provides non-contact vision measurements on a 5-axis platform with Infinite positioning. The RVP supports non-contact inspection of parts with small features and delicate or flexible components.

The RVP can also be used for a wide range of applications including scanning measurements and surface analysis finish.

Its 5-axis motion, from part features to real-time image processing, significantly raises data collection rates.



INSPECTION & MEASUREMENT



The Revolution HB fitted with Renishaw's PH20 5-axis technology offers a robust option for portability as the only mobile 5-axis CMM on the market.



CONCLUSION

Parts production for the aerospace industry is being subjected to stricter quality standards, but demand for quicker turnarounds and greater cost efficiency is rising.

Reliable, flexible, multi-solution CMM technology is critical for manufacturers in these markets.

Consider one source for all your 5 - axis needs – lab-grade CMM, mobile CMM, or combination of gauges... AIMS Metrology.

RESOURCES

EBOOKS:

Let's Talk Technology: The Software Side of a CMM Purchase

The Hardware Side of a CMM: What's under the hood?

TOOLS:

REVO Challenge Savings Calculator

VIDEOS:

RVP in Action

Surface Finish Probe

BLOG:

Stay up to date on all the latest CMM news here

ABOUT AIMS METROLOGY

When it comes to metrology, you need a team with decades of combined engineering, field, programming and service experience. AIMS Metrology is that company.

We design, build and assemble our shop floor and laboratory CMMs right here in the U.S. We engineer our machines around Renishaw 5-axis technology. And, we support our CMMs with QC-CALC and MODUS software. We're equipped to guide our customers because there are very few market brands that members of our team haven't sourced, serviced or programmed at one time or another.

The intelligence we've gained from years of hands-on experience qualifies us to help guide our customers' choices today. Let us provide you with a turnkey solution that eliminates the guesswork for both the software and the hardware.

AIMS Metrology

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