



# Measuring in the Aerospace Industry



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# MAIN MEASUREMENT CHALLENGES

## *for manufacturers in the aerospace industry today*

A few challenges manufacturers in the aerospace industry face when it comes to measurement are:

- Knowing when is the right time in their process to move from contact measurement to non-contact measurement technology.
- Measurement technologies that offer only part of the applications needed in their process, but do not provide a complete solution.
- Measurement software that offers part of the 3D capability needed in their process but does not provide a complete solution.
- Maintaining a qualified workforce that can operate their measurement hardware and software successfully.

### **How to Address these Challenges:**

- Stay watchful for hardware or software innovations that can deliver accuracies with contact measurement processes
- Build strong relationships with Product Management of your choice suppliers. The needs of industry drive innovation and the need for complete solutions. Think of business-to-business relationships in parallel with business-to-customer relationships.
- Perform discovery on software solutions and ensure you engage hardware and software applications together. Develop a set of questions that support your processes and the deliverables you need for your client. Ensure these questions are addressed by software providers and gain consensus by your evaluators on the right solution.
- Always create a core team with the right mechanical experience, competitive salaries, and strategy that shows the core team a succession plan.

# BEST PRACTICES

## *when creating a measurement plan*

A few best practices manufacturers in the aerospace industry should keep in mind, when it comes to creating a measurement plan, include:

- Begin with the end result in mind.
- Ask the question: "What do I want to accomplish with a Measurement Plan (MP) that will be repeatable in my manufacturing process?"
- A safe development process:
  - Metrology engineer to develop MP.
  - Independent review or engineering oversight/review after completion.
  - Allow the end user of the MP to test and make adjustment based on his/her field experience (ask the question: will this really work in the real world?)
  - Once the MP runs through iterations on as-built data collected, perform final reality check to reduce risk of rework.
  - Allow the production team and engineering to gain confidence in the process (consensus).

# QUALITY ADHERENCE

## *How to achieve the highest standards in the industry*

In order to achieve the high quality demands of the industry, manufacturers should implement the following practices:

- Fill their toolboxes with current measurement hardware and software that agrees with their business goals.
- Seek third-party expertise in maintaining efficiency with machine tools and processes (Machine Tool Calibration).
  - OEM may not always be the best resource for keeping production up and running, with success.
- Ensure that training is completed in the field in combination with traditional classroom setting.
- Allow people to fail and create lessons learned from the error. Use the information to train others with real-life case studies.
- Develop training courses on field success and failure using case study methodology.
- Listen to the voice of the customers and create metrics that drive the quality process from both internal business and customer perspectives.
  - If we are all sitting around saying "our quality is increasing" and the customer says otherwise then there is a major problem with the metrics.



# COMMON MISCONCEPTIONS

## *around laser trackers*

A few common misconceptions when it comes to laser trackers are that:

- Laser trackers and manufacturers are a commodity;
- Laser trackers all operate and measure the same way;
- Name recognition through marketing initiatives translates into the best tracker on the market;
- All laser trackers have the same measurement functionality;
- All laser tracker SDK's have the same functionality.
- Not much training is needed to successfully operate a laser tracker and software.



These things are certainly not true. In reality, laser trackers are very accurate and very sensitive instruments.

When laser trackers begin to become part of your business processes, affecting the bottom line, uptime of the tracker is very important to your bottom line. You need an OEM that is committed to your success. Consider investing in a services agreement with your OEM to ensure you receive support that will enable you to receive the maximum operation and uptime of the equipment. The OEM that is committed to support you with calibrations, analysis and an efficient repair process is where end users need to lean.

Adhering to best practices in measuring with the tracker and routine maintenance (personal care) of the tracker is very important. This is recognized with the right training program for your end users. One to two weeks of classroom and field training would be beneficial to end users and worth the investment.

Experience shows that deficient end users will contribute to risk of major rework, loss of schedule and impacts the bottom line for profitability. Improperly trained end users can also cause the business to resort to traditional ways of working that are proven but are not in line with competitors, which limits the growth of your company.

# PORTABLE MEASURING SYSTEMS

## *Observed Outcomes*

- When manufacturers have used a portable measuring system, the common experience has been very positive when utilized the right way and when the end user is properly trained.
- Successful use of portable metrology translates to modifying conventional business practices to current state-of-the-art technologies.
- Savings in using portable measuring systems average **25-30%** of original planned costs, when considering man power and schedules.





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