

# MoveInspect HR

## Measuring of carriers

3D quality control in engineering industry



MEASURE THE ADVANTAGE



### The task: Control and optimization component carrier assembly

Modern production lines utilize extensive automation including the use of robots to pick and place components into larger assemblies. This is made possible by utilizing customized carriers with component-compatible mountings that hold the parts. The proper positioning of the carrier to the robot relies upon holes on the bottom of the carrier that match with locating pins on the floor near the robot and guide the carrier as it is placed. To ensure that parts can be removed by the robot without a collision, the carrier geometry must correspond exactly with the construction specifications (CAD-nominal data).

The geometry must be measured at the end of the carrier manufacturing process, during the final inspection. With a simple control cycle - adjusting the carrier, measuring, correcting - the specified positions (CAD zero-point position) of all mountings, mounting faces and locating holes should be quickly achievable. The mountings have to be positioned within  $\pm 2$  mm tolerance. Moreover, the relative accuracy of the distance between the carrier locating holes on the bottom must be lower than  $\pm 0.5$  mm, to guarantee an exact position to the robot later.



Assembled carrier

### The solution

Measurement of carriers is accomplished with AICON's measuring system MoveInspect HR and the hand-held probe MI.Probe. The system can easily be transferred to the part (on-site measurement), or it can be installed in a dedicated measurement station. In a mobile measurement, the carrier is aligned manually with the help of alignment points and MI.Probe. Afterwards, relevant points are measured and compared to nominal data.

In a stationary measurement setup, the measuring station can be prepared in such way that the carrier to be measured is placed on a fixture with known alignment points (RPS). These points define a reference system that is signalized with markers. Therefore, the carrier doesn't have to be aligned manually and the measurement (nominal-actual comparison) can start immediately.

The measuring results indicate the deviations of the carrier parts from the required positions. Mechanical correction of the carrier can be applied directly during the measuring process. The mobile 3D industrial measurement system MoveInspect HR is well suitable for the measurement of carriers and has been proven in practice.



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### Advantages

- **Cost-saving**
  - High process reliability; thus, less waste
  - Faster build and inspection progress
  - Applicable for further measuring tasks
- **High reliability**
  - Measurement in instable production environment, i. e. vibrations by vehicles and machines
  - Robust measurement process; no problems with dirt, dust, vibrations, dull and glossy surfaces, etc.
- **Fast measurement process**
  - Quick mechanical correction of the exceeded tolerances during measurement
  - Measurement right on-site at the component
- **Simple usage**
  - Automated measurement process according to inspection plan
  - Graphical analysis of tolerances
- **Flexibility**
  - Portable CMM
  - Modular system, applicable for a vaste range of measuring tasks, inspections and motion analyses
  - Simple adaptation to various carriers, variable reporting, transferability to other locations etc. for adjustment, testing and geometric dimensioning and tolerancing (GD&T)
  - Extendable



• Inspection of a carrier



• Camera bar MoveInspect HR



• AICON's MI.Probe

### Configuration

- MoveInspect HR: highly precise portable CMM for inspection of components and CAD comparison
- Flexible software solution: adaption to individual requirement
- Different probe tips to reach all alignment points and comparison points