
First Article Inspection (FAI) and Quality Sign-Off Procedure

1.0 Objective & Quality Standard

The objective of this procedure is to ensure that the first production unit (or first article) from a new setup, tooling change, or material lot is thoroughly inspected against all critical and major dimensional, visual, and functional requirements defined in the engineering drawing and Bill of Materials (BOM). This inspection verifies that the manufacturing process is capable of producing conforming parts before full production begins. The quality standard requires that all critical dimensions (tolerance $\pm 0.1\text{mm}$) and major dimensions (tolerance $\pm 0.5\text{mm}$) are within specification. Any deviation must be documented and resolved prior to sign-off.

2.0 Required Tools & Gauges

- Digital Caliper (0-150mm range, resolution 0.01mm)
- Micrometer (0-25mm range, resolution 0.001mm)
- Set of metric feeler gauges (0.05mm to 1.00mm)
- Height gauge with granite surface plate
- Go/No-Go thread gauges (as applicable)
- Surface roughness comparator or profilometer
- Engineering drawing (latest revision) and BOM
- FAI report form (digital or paper)
- Red tag for non-conforming items
- Calibrated torque wrench (if applicable)

3.0 Safety & Material Handling

- Wear safety glasses and closed-toe shoes at all times in the inspection area.
- Handle the first article with clean, lint-free gloves to prevent contamination or damage to critical surfaces.
- Place the part on a clean, non-marring inspection mat or surface plate to avoid scratches.
- Ensure all measuring instruments are within their calibration validity period; do not use expired gauges.
- Use proper lifting techniques for heavy parts; request assistance for parts over 20 kg.

4.0 Step-by-Step Procedure

1. Obtain the latest revision of the engineering drawing, BOM, and any customer-specific FAI requirements. Verify that the drawing revision matches the production order.
2. Select the first completed unit from the initial production run. Ensure the unit has been fully processed through all required manufacturing steps (cutting, forming, welding, finishing, etc.).
3. Visually inspect the part for any obvious defects such as burrs, scratches, dents, discoloration, or incomplete features. Document any visual non-conformances on the FAI report.

4. Using the digital caliper, measure all critical dimensions (tolerance $\pm 0.1\text{mm}$) as indicated on the drawing. Record each measurement in the FAI report. If a dimension is out of tolerance, stop and flag the part immediately.
5. Measure all major dimensions (tolerance $\pm 0.5\text{mm}$) using the appropriate tool (caliper, micrometer, height gauge). Record each measurement. Verify that all features (holes, slots, radii) are present and within specification.
6. Inspect threaded features using Go/No-Go thread gauges. The Go gauge must thread fully; the No-Go gauge must not thread more than two turns. Record pass/fail for each threaded feature.
7. Verify surface finish on any specified surfaces using the surface roughness comparator or profilometer. Compare the reading to the drawing requirement (e.g., $R_a 1.6\text{ }\mu\text{m}$). Record the value.
8. Check all assembly-related features such as hole patterns, edge distances, and alignment marks. Use the drawing to confirm that all features are correctly positioned and oriented.
9. If the part includes any functional test (e.g., fit check with a mating component, torque test), perform the test according to the engineering specification. Document the result.
10. Compile all recorded measurements and observations into the FAI report. Sign and date the report. If all dimensions and criteria are within tolerance, mark the report as 'PASS' and proceed to quality sign-off.
11. If any dimension or criterion is out of tolerance, attach a red tag to the part with the defect description, date, and inspector initials. Move the part to the designated non-conforming material area. Notify the production supervisor and quality engineer immediately.
12. Obtain final quality sign-off from the Quality Manager or designated signatory on the FAI report. The sign-off authorizes full production release. File the completed FAI report in the project quality folder.

5.0 Verification & Defect Reporting

1. After completing the FAI, the Quality Manager or designee shall review the FAI report for completeness and accuracy. Verify that all required dimensions and criteria have been checked and recorded.
2. If the FAI report shows a 'PASS' status and all measurements are within tolerance, the Quality Manager signs the report and authorizes production release. The signed report is the official quality sign-off.
3. If any defect is identified during the FAI, the part is red-tagged and moved to the non-conforming material area. The defect must be documented in the ShopDocs QA module with a detailed description, root cause analysis, and corrective action plan.
4. The production supervisor and quality engineer shall review the defect and determine whether rework, scrap, or engineering deviation is required. No further production of the affected part is permitted until the FAI is resolved.
5. After corrective action is implemented (e.g., tooling adjustment, material change), a new first article must be produced and re-inspected following the same FAI procedure. The new FAI report must be signed off before production resumes.
6. All FAI reports, red tags, and corrective action records shall be retained in the project quality folder for a minimum of 5 years or as required by customer contract.

Regulatory Disclaimer: This document is a generic quality assurance template. The end-user assumes all liability for validating all dimensional tolerances, testing procedures, and engineering specifications against actual production requirements before deployment.