

First article inspection

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A **First Article Inspection** (FAI) consists of measuring the properties and geometry of an initial sample item to see if it conforms with specifications, for example in distances between edges, positions of holes, diameters and shapes of holes, weight, density, stiffness, color, reflectance, and so on. Despite the name, the inspected article is not always or necessarily the 'first' in any sense. First article inspection is typically called for in a contract between the producer and buyer of some manufactured article, to ensure that the production process can and does reliably produce what is intended.

Depending on the type of product and the governing specification, a first article inspection may be conducted by a dimensional inspection laboratory (DIL) using a variety of tools such as coordinate-measuring machines (CMM), cmm/vision systems, and programmable 3-axis measurement systems.^[1]

Not all manufacturers are required to perform first article inspections, but they are commonplace for military subcontractors. Indeed, first article inspections are now expected in most fields of manufacturing, in particular aerospace, automotive, and medical manufacturing.^[2]

Manufacturers delivering products to government entities typically must meet more stringent requirements. The subcontractor may perform First Article Testing (subcontracting the work out to a DIL), or the government entity may perform the tests itself.^[3]

Standards which apply to first article inspection are produced by the ISO (International Organization for Standardization), the IEC (International Electrotechnical Commission), the IAF (International Accreditation Forum) the ILAC (International Laboratory Accreditation Cooperation), etc.^[4]

Dimensional inspection laboratories are certified by such independent organizations as the American Association for Laboratory Accreditation (A2LA).^[5]

First article inspection is only one part of a more comprehensive quality management system which is able to assure continuing conformance with applicable specifications.

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Types of First Article Inspections

- To verify the accuracy of drawings and ensure that they reflect any changes made to parts design during the prototype design.
- To verify the production process in every parameter, rather than just concentrating on “critical” dimensions.
- To verify all tooling used to produce a part, to ensure that it is capable of producing parts to specifications.
- To verify the ability of the manufacturer to meet the needs of production.

Enhanced First Article Inspections

With the use of modern computers in the manufacturing environment, First Article Inspections are no longer being used with the traditional three form layout on paper but instead recorded digitally and stored on servers for easy access and organization. Recording the first article digitally eliminates errors with the help of software that keeps tracks of the FAIs and generate reports (FAIR) immediately after successful completion of an FAI.

First Article Inspections By Industry

Aviation and Aerospace

AS9102 is the Aerospace Standard for First Article Inspection Requirements. First Article Inspection Report (FAIR) can be documented on Forms 1 (Part Number Accountability), 2 (Product Accountability), and 3 (Characteristic Accountability, Verification and Compatibility Evaluation).

In general this is the aerospace equivalent of the automotive PPAP, Production Part Approval Process. PPAP requires larger quantity of components than would be typically manufactured for aircraft components.

Many large aerospace companies including Bombardier Aerospace, and Spirit AeroSystems have recently switched to enhanced first article inspections in order to keep track of the numerous first articles received by different companies within the company's supply chain. Suppliers to these companies, including Machine Shops, are also turning to enhanced first article inspections to improve manufacturing productivity and throughput by eliminating the manual process of creating FAIs.^{[6][7]} Customers who perform such inspections are recommended to identify this in the contract, and to use specific forms to document the results.^[8]

References

1. ^ First Article Inspection Tools (<http://www.faro.com/measurement-solutions/applications/first-article-inspection>) Faro.com
2. ^ First Article Inspection (http://www.discussoftware.com/solutions/first_article_inspection.html) Discus Software
3. ^ First Article and Production Lot Testing (<http://guidebook.dcmam.mil/226/226-2/index.cfm>) Defense Contract Management Agency
4. ^ Regulatory Bodies (<http://nelpretech.com/first-article-inspection/regulatory-bodies/>) NelPretech
5. ^ [<http://www.a2la.org/inspweb/inspbody.cfm> Applying for Accreditation] American Association for Laboratory Accreditation

6. ^ Cappels, Thomas M. (1999). *Financially focused quality* (http://books.google.com/books?id=w90b1U0h_wkC&pg=PA108). CRC Press. p. 108. ISBN 978-1-57444-248-9. Retrieved 15 March 2010.
7. ^ Bowman, Daniel R.; Daniel R. Bowman (1996). *Procurement specification guidelines for mass transit vehicle window glazing* (<http://books.google.com/books?id=wDBvcmxEyJ8C&pg=PA37>). Transportation Research Board. p. 37. ISBN 978-0-309-05720-2. Retrieved 15 March 2010.
8. ^ Pennella, C. Robert (2006). *Managing Contract Quality Requirements* (<http://books.google.com/books?id=tcFy9lBOuMcC&pg=PA48>). American Society for Quality. pp. 48–49. ISBN 978-0-87389-694-8. Retrieved 15 March 2010.

External links

- Modern Machine Shop - Software Speeds Inspection Documentation (<http://www.mmsonline.com/articles/software-speeds-inspection-documentation->)
- Quality Magazine - Enhanced First Article Inspection (http://www.qualitymag.com/Articles/Aerospace_Features/BNP_GUID_9-5-2006_A_10000000000000136318)
- Quality Magazine - Case Study: Take the Heat Out of the Problem (<http://www.qualitymag.com/articles/88181-case-study-take-the-heat-out-of-the-problem>)
- CADALYST - InspectionXpert First Article 2010 (<http://www.cadalyst.com/collaboration/file-sharing-publishing/inspectionxpert-first-article-2010-13148>)
- Quality Digest - DISCUS Annotating first article inspection requirements (http://www.qualitydigest.com/feb08/departments/quality_software.shtml)

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