



**AN AS9100 REGISTERED COMPANY**

## Electroimpact Supplier Inspection Documentation

1. Inspection documentation may be submitted using one of two methods:
  - a. Preferred method - Electronic - Submitting a complete document set by email or using <https://qualitydocs.electroimpact.com/>
  - b. Include a complete document set on paper with the product shipment. Use pen or highlighter only, do not use pencil.
  - c. Details for each method are below.
2. Inspection documentation consists primarily of the following documents:
  - a. A copy of the PO
  - b. A marked up drawing
  - c. A CMM report (if appropriate)
  - d. An Inspection Record documenting:
    - i. actual measurements of instances of all features where tolerances tighter than +/-0.0045" (0.114mm) (CMM reports are acceptable, see below) (An inspection record may not be required if no tolerances are closer than 0.0045" (0.114mm))
    - ii. Non-conforming features (May not be required if no non-conformances are present.)
    - iii. Critical dimensions if stated (An inspection record may not be required if no critical dimensions are present.)
  - e. Weld inspection documentation. (As required by PO or other contract documents)
  - f. Other process documentation (stress relieve, heat treat, coating/plating if required by PO)
  - g. Material certs (If required by PO)
  - h. Dispositions of all non-conformances
3. The following information must be on all inspection documentation:
  - a. Part Number
  - b. Revision number (drawing and part revision, if different)
  - c. Job#\Assy# (from PO)
4. Sampling and/or 100% inspection
  - a. Sampling is acceptable unless otherwise specified (i.e. on PO or drawing)
  - b. Use the following table to determine sample size :

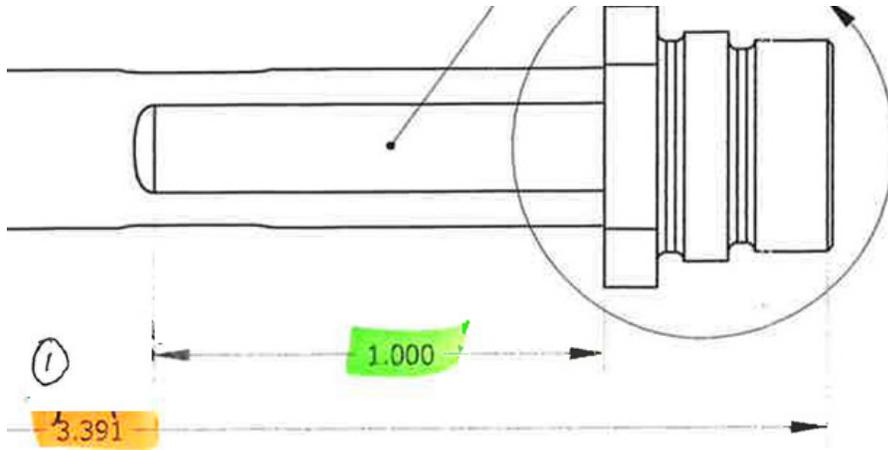
This is modified from ASQ Z1.4-1993 for level II, AQL 4.0		
Normal Sample size		Normal Sample size
From	To	Sample Size
4	25	3
26	90	13
91	150	20

151	280	32
281	500	50
501	1200	80
1201	3200	125
3201	10000	200
10001	Over	315

- c. 100% inspection is required if:
  - i. Stated on PO or drawing
  - ii. For all features where any non-conformance is identified in the sample.
  - iii. For all features marked “critical feature”
  - iv. For all features marked “Inspection Record Required” (except if “Sampling Permitted” is also stated)
5. Inspection Drawing – Mark up a drawing of the product by doing the following:
  - a. Any feature for which all inspected pieces are conforming, highlight the feature callout on the drawing green.
  - b. Any feature for which any nonconformance is identified:
    - i. Highlight the feature callout red.
    - ii. Number the feature callout on the drawing.
    - iii. Uniquely identify each piece in the lot (e.g. temporarily numbering each piece)  
Do not write on parts. Blue masking tape is easily removed and does not leave residue or damage the parts.
    - iv. Fill out an “Inspection Record” spreadsheet
  - c. Any feature which has been inspected and is acceptable but is intentionally not in tolerance (e.g. grind stock is left) highlight yellow.
  - d. Any feature which is not inspectable by your company highlight yellow and treat as a non-conformance, that is, contact the engineer listed on the PO, identify the features which are not inspectable and ask for a disposition (Do not inspect or inspect at Electroimpact)
  - e. Identification of the inspector by stamping or printing inspector name and signing.
6. Items to inspect. Inspection instructions have the following precedence:
  - a. Inspection instructions on the face of the drawing
  - b. Inspection instructions on the PO
  - c. Inspect all dimensions on the face of the drawing and callouts
  - d. All drawing notes (heat treat results (hardness), coating/plating)
  - e. All features called out in the title block. (E.g. finishes, edge breaks, fillets etc.)
  - f. If there is any conflict between these (e.g. drawing requires specific inspections, but PO requires different inspection or a difference between the drawing and the model) contact the project engineer.
7. CMM reports are acceptable in lieu of or in addition to Inspection Drawings
  - a. A CMM report is sufficient inspection documentation if:
    - i. It includes:
    - ii. Part Number
    - iii. Revision number (drawing and part revision, if different)

- iv. Job#\Assy# (from PO)
    - v. It clearly identifies what features were inspected. The preferable method for identifying features and data is an image of the part which shows feature numbers (a road map of the part).
  - b. A CMM report which does not clearly identify features can be submitted with a marked up drawing which clearly identifies which features are measured. This can be done by putting the feature number from the CMM report in a bubble on the drawing.
  - c. All non-conformances and their dispositions must be documented clearly in the CMM report (i.e. highlighted red) or in a separate inspection report.
8. Complete an Inspection report:
- a. All inspected dimensions which are .009"(.114mm) total tolerance (for example+/- .0045", true position of .009" diametrical or flat within .009") or less are required to have the actual inspection measurements noted on the inspection drawing next to the green highlighting.
  - b. All inspected dimensions which are .004"(.1 mm) total tolerance (for example+/- .002" or +/-0.05mm) or less are required to be documented in 4 decimal places for inch units and 3 decimal places for millimeters.
  - c. Where the PO or drawing is marked "Inspection Record Required" or "Critical Feature" actual measurements must be recorded for each instance on each part.
  - d. All information for a single Job#/Assy#/Part# should be on a single inspection record spreadsheet (i.e. non-conformance data as well as measurements which show conformance of features marked "Inspection Record Required" or "Critical Feature".
  - e. For any inspected feature which is non-conforming. Note the disposition documentation (e.g. email or phone conversation).
  - f. Inspection reports may be used to document inspection related conversations with the project engineer (e.g. inability to inspect a feature or inspection tool accuracy issues.)
  - g. Both printable and Excel Inspection Record templates can be downloaded from <https://electroimpact.com/Company/Suppliers.aspx>
9. Weld Inspection – Welding is considered a special process. As such, additional requirements may apply, such as certified welders, certified weld inspectors, calibrated equipment, Weld Procedure Specification documents, as-tacked inspections or NDE).
- a. If no weld inspection requirements are specified, the welding the supplier is responsible for providing welds in accordance with the tool drawing, and for visual inspection of all welds, but no additional documentation is required. Documentation of this type of weld inspection may be made by highlighting the weld symbols on a copy of the weld drawing with green to show that each weld was inspected.
  - b. If any additional weld inspection requirements exist, the supplier must document compliance with all requirements. The supplier's qualifications and the format of the documentation must be approved prior to submission.
10. Dispositioning Non-conformances.
- a. All non-conformances identified in the production process or during inspection must be dispositioned by the project engineer prior to product delivery.
  - b. Dispositions must be documented. Documentation must include:
    - i. Job#, Assy#, Part#

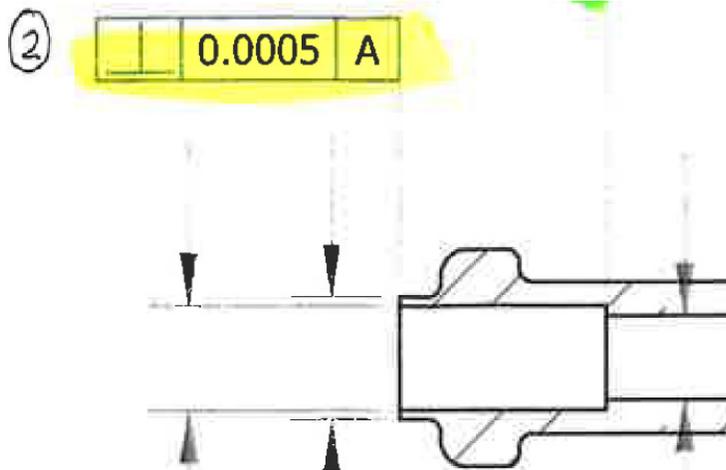
- ii. Project engineer name
    - iii. Complete description of non-conformance (including actual measurements)
    - iv. Disposition (Use as is, rework according to instructions)
  - c. Verbal dispositions may be documented by:
    - v. An email from the project engineer following up on verbal disposition
    - vi. A verbal contact log which includes:
      - 1. Job#, Assy#, Part#
      - 2. Project engineer name
      - 3. Complete description of non-conformance (specification, tolerance and actual measurement)
      - 4. Disposition (Use as is, rework according to instructions)
      - 5. Date of contact
      - 6. Method of contact (e.g. in person, phone)
      - 7. Supplier contact name
11. Importance of contacting the engineer. The engineer listed in the line item the PO is the primary contact for all questions relating to that line item. The engineer should be contacted for:
- a. Conflicts between documents
  - b. Questions about interpretation of the drawing
  - c. Questions about manufacturing processes
  - d. Deviations from the drawing
  - e. Deviations from the PO (including delivery date) (please include the purchaser in any discussions if the purchaser is different than the engineer)
  - f. Changes to the drawing
  - g. Changes to the PO (including delivery date) (please include the purchaser in any discussions if the purchaser is different than the engineer)
  - h. Disposition of non-conforming parts
  - i. Inability to inspect any feature or insufficient accuracy on inspection tools.
  - j. Changes in delivery schedule
12. Use the Inspection Record Spreadsheet as a record of communication with an engineer. Any communication with an engineer during manufacturing or inspection can be documented using the Inspection Record Spreadsheet.
- a. For example, if a feature is incorrectly or ambiguously called out on a drawing, (see below)



Contact the engineer and if they agree, enter the information in the Inspection Record Spreadsheet as follows:

Feature #	Drawing Zone	Piece #	Specification	Actual Value	Disposition
1	N/A	N/A	3.391	Dimensioned off of incorrect edge	Will change drawing – see email

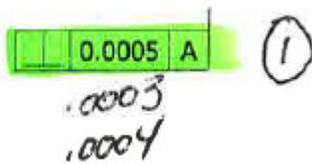
b. If a feature is not inspectable, (see below)



Notify the engineer. They may tell you to not inspect the feature or they may tell you that we will inspect ONLY that feature at Electroimpact. Enter the information in the Inspection Record Spreadsheet as follows:

Feature #	Drawing Zone	Piece #	Specification	Actual Value	Disposition
2	N/A	N/A	Perpendicular to A within 0.0005	Feature too small to inspect	Do not inspect – see email

- c. If your company uses the Inspection Record Spreadsheet early in the manufacturing process to document all communication with the engineer, (by entering the date, emailing it to the engineer and having the engineer enter the disposition) very little data will need to be re-entered during inspection.
13. Advice on inspection accuracy. All inspection processes and instruments have uncertainty. For example, Electroimpact's best CMM has an accuracy specification of 0.00035" (.009mm) over its length. If a measured value is within .009mm of the tolerance, the measured value can be within tolerance, but might measure out of tolerance with a different CMM. To protect your company, the best practice would be to treat any measurement that is within the accuracy of the instrument as being out of tolerance as being non-conforming and notify the engineer. They have the option of using the inspection as is (most likely) or re-inspecting it at Electroimpact. In either case, if we audit this inspection and find a different value (within the accuracy of your instrument and our instrument) the difference will not be treated as an inspection error. Document this as follows:



Feature #	Drawing Zone	Piece #	Specification	Actual Value	Disposition
1	N/A	N/A	Perpendicular to A within 0.0005	.0003/.0004 – Feature is within inspection uncertainty of tolerance limit (uncertainty of CMM is 0.00035")	Re-inspect at Electroimpact – see email

Similarly, the example below is cut from a reputable micrometer manufacturer's catalogue:



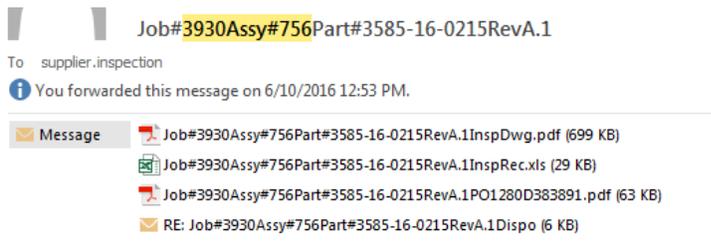
Inch		With friction thimble		
Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.001"	103-127	±.0001"	175
	.0001"	103-135*	±.0001"	175
1 - 2"	.001"	103-128	±.0001"	215
	.0001"	103-136*	±.0001"	215

Since this micrometer can have .0001" graduations and .0001" accuracy, if your measurement is within .0001" of the tolerance limit, it could measure out of tolerance if this feature were re-measured in an audit inspection. If you have noted this on the inspection record and notified

the engineer and they choose to accept your inspection, this will not affect your company's performance record.

14. Submitting documents via email.

- a. Attach all documents into a single email to [supplier.inspection@electroimpact.com](mailto:supplier.inspection@electroimpact.com)
- b. Subject: Job#XXXX Assy#XXXX Part#XXXX
- c. For all documents file names are made up of the following:
  - vii. Job#XXXXAssy#XXXXPart#XXXXDocumentType
  - viii. See table below for document type extensions
  - ix. Email subject line must include Job#XXXX Assy#XXXX Part#XXXX and short description of subject



15. Submitting documents via <https://qualitydocs.electroimpact.com/>

- a. You must apply for an account. This is a security measure only, all SIA participants account requests will be approved.
- b. When your account is approved you will receive instructions on using the site.
- c. The site allows you to attach documents without having to rename them.
- d. The site sends you and your designated email accounts and the engineer a confirmation email.

16. Submitting documents on paper. Put all required documents in an envelope in the order in the table below. A printable Inspection Record template can be downloaded from

<https://electroimpact.com/Company/Suppliers.aspx>

17. Inspection Documents

- a. When submitting documents via email, use the following abbreviations and file types.
- b. When submitting documents on paper with a shipment, put the documents in the following order.

Document Type	Abbreviation	File Type	Required?
PO	Poxxxxxx	.pdf	Required
Inspection Drawing	InspDwg	.pdf	Required for machined parts
Inspection Record	InspRec	.xls ,.xlsx .csv or .pdf	Required if: <ul style="list-style-type: none"> <li>- Non-conformances are present</li> <li>- Communication with engineer is documented</li> <li>- Actual values are required</li> </ul>
CMM report	CMM	.pdf or xls	Only when inspected by CMM
Disposition	Dispo	.pdf or email	Required if Non-conformances are present

Weld Inspection Record	WeldInsp	.pdf	Only when required on PO, drawing or other agreement
Weld Process Documentation	WeldProc	.pdf	Only when required on PO, drawing or other agreement
Heat Treat/Hardness Documentation	HTProc	.pdf	Only when required on PO, drawing or other agreement
Stress Relieve Documentation	StrRel	.pdf	Only when required on PO, drawing or other agreement
Coating/Plating Documentation	CoatProc	.pdf	Only when required on PO, drawing or other agreement
Material Cert	MatCert	.pdf	Only when required on PO, drawing or other agreement
Certificates of Conformance	CoC	.pdf	Only when required on PO, drawing or other agreement
Engineer Contact (other than disposition)	EngCtc	.pdf or email	Not required – for supplier’s benefit

c. Sample File name – “Job#3641Assy#1912 Part#5751C01001G21AJ101\_07-01-002InspDwg.pdf”

d. Sample files are available at <https://electroimpact.com/Company/Suppliers.aspx>

18. Special Circumstances

a. Combining and/or sampling lots of identical parts. If several lots of one part number are received at the same time:

- i. Sample the lots based on the total count
- ii. Document all lots on one inspection drawing and inspection record. Note on all documents that the all lots (job#assy#part#) covered by the document.
- iii. If submitting by email:
  - 1. Save documents in separate folders with the correct file name for each lot (job#assy#part#).
  - 2. Submit one email per lot.
- iv. If submitting on paper, submit one set of documents.

b. Combining and/or sampling lots if similar parts. If one or more lots of similar parts with different part numbers are received at the same time

- i. Check with the engineer for appropriateness of sampling
- ii. Propose the following:
  - 1. Sample the identical features based on the total count
  - 2. Sample the individual features based on the total count of each individual part number (it is possible that an individual part number is made on more than one job#assy#)
  - 3. Document all lots on one checklist (and if necessary, inspection drawing)
  - 4. Document the individual features on separate inspection records Save documents in separate folders with the correct file name for each lot (job#assy#part#)

c. Alternate Inspection Instructions

- i. The fine print on Electroimpact PO's has included the following language for several years: "Evidence of inspection and conformance to requirements is required for all parts manufactured to Electroimpact designs unless specifically authorized by the person issuing the PO." Thus, unless specifically authorized, inspection is required, and documentation submitted by suppliers participating in the Supplier Inspection Acceptance program is to be submitted in conformance with the program.
- ii. If a PO or other communication specifically authorizes other inspection or no inspection, the engineers instructions prevail
- d. Split lots. When lots (one line on a PO, same job#assy#) are to be shipped in multiple lots, Add "Lot#x" to the end of each document name (including the email subject line if submitting via email). For example:
  - i. Job#123Assy#123Part#123456Lot#1
  - ii. Job#123Assy#123Part#123456Lot#2

Document Changes

Rev	Date	Section	Old	New
B	13Jun2016	4.c.iii	100% inspect all features with tolerances closer than $\pm 0.0045''$ ( $\pm .114\text{mm}$ ).	Delete
B	13Jun2016	5.e	N/A	Write sample size on drawing
B	13Jun2016	8	Unclear	Re-wrote to clarify.
B	13Jun2016	5.b.iii	Unclear how to identify parts	Do not write on parts, use blue masking tape.
B	13Jun2016	14	Zip documents	<ul style="list-style-type: none"> <li>- Attach documents</li> <li>- One lot per email</li> </ul>
B	13Jun2016	17	N/A	Special Circumstances
C	4Jan2017	All		Minor clarifications
C	4Jan2017	1	N/A	Added upload site
C	4Jan2017	4 b	Sample size above 10001 was 500	Sample size above 10001 is 315
C	4Jan2017	17 d	N/A	Split lots
C.2	12Jan2017	2 d i	Typo – "closer than 0.0015" (0.114mm)"	"closer than 0.0045" (0.114mm)"
D	22Feb2017	8 a	Unclear	Changed wording to clarify.
D	22Feb2017	8 b	N/A	Added requirement to document tolerances closer than 0.004" using 4 decimal places
E		9		<ul style="list-style-type: none"> <li>- Added Weld inspection</li> <li>- Renumbered subsequent sections.</li> </ul>
E		16		<ul style="list-style-type: none"> <li>- Added section describing document upload site.</li> </ul>

				- Renumbered subsequent sections.
				-