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Test Documentation Guidelines for Suppliers

Purpose:

This document outlines Alpha technologies Ltd.'s (“ATL”) standard documentation requirements and guidelines for custom manufactured, fabricated or otherwise processed parts.

Scope:

This document applies to all suppliers to supply to ATL manufactured, fabricated or processed parts as part of meeting the contracts or permits of and ATL issued and supplier-accepted purchase order. Specific requirements within this document apply as appropriate to the parts or service is being supplied to ATL.

Definitions:

ATL: Alpha Technologies Limited, an EnerSys Company located in Burnaby, British Columbia.

ATE: Automated Test Equipment. Equipment designed specifically to test product as per and ATP.

ATP: Acceptance test procedure. A functional test procedure that is specified by ATL and generates a test record or A5 record.

AQL: Acceptance Quality Level. It is the minimum level of faults acceptable in a sample of a manufactured product for the entire batch of the product to be accepted. If the number of faults is higher than the AQL, then the entire batch is rejected.

Burn-in: Burn-in is the process by which electronics components of a system are highly stressed before being placed in service, and before the system is completely assembled, to detect those particular components that would fail as a result of the initial high failure rate portion of the bathtub curve of component reliability. Burn-in also detects faulty parts and assemblies that compromises heat transfer between semiconductors and its heat-sinks, including the device’s cooling system. Burn-in is typically conducted at elevated and controlled temperature and elevated currents.

CoC: Certificate of Conformance. A certificate of conformity, or CoC, is issued by an authorized party (sometimes the manufacturer, sometimes an independent laboratory) and states that the product meets the required standards and specifications.

CTQ: Critical to Quality, is an attribute of a part, assembly, sub-assembly, product, or process that is critical to quality or more precisely, has a direct and significant impact on its actual or perceived quality.

First Article: First build of an ATL part number that the supplier manufactured for ATL.

First Article Production: First build of a new or modified part. A minimum of five units must be produced and tested in the first article production but may be increased by ATL.

0700029 Rev C (05/2021)

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First Article Inspection Report (FAIR): A first article inspection (FAI) is a design verification report and a formal method of providing a reported measurement for each manufactured feature of a part or assembly.

FTP: File Transfer Protocol.

Hi-Pot: Hi-pot or Dielectric Voltage-Withstand is an electrical safety test that verifies if the insulation of the product's high voltage is adequate. Hi-pot test ensures that the product is capable of protecting the user from any leakage currents as a result of an electrical fault within the product.

PO: Purchase order.

Supplier/Vendor: An organization that supplies finished goods, raw materials and/or services to ATL.

Supplier Code: An ATL assigned four-digit code which is a unique identifier for an ATL supplier.

NOTE: This code is noted on the ATL PO, beginning with "V" (zeros the trail of the "V" character only may be dropped i.e. "0164" or "164" may be used in place of "V000164", but "16" would not be an acceptable substitution for "V000160").

Supplier Part Number: A Supplier-generated and controlled unique identifier, if one exists, that is applied to a supplier standard part. This number may be noted on ATL POs.

First Article Inspection Report Requirements and Guidelines:

Recommendation on how to create a FAIR report in 5 steps:

1. Pre-Plan the FAI – Before beginning gather the documentation needed:
    a. Engineering drawings, ATL Part Number, ATL PO number, etc.
    b. Bill of materials/raw materials list
    c. Identify all CTQ specifications
    d. Manufacturing planning/routing/traveller/work order information
    e. Source/supplier information
2. Create an Inspection Plan:
    a. Balloon your part drawing/documentation (see reference 1 below), identifying each requirement to be inspected with a unique identifier, including any packaging requirements, safety certification requirements, and labelling/identification requirements.
    b. Determine the target and tolerance specification and unit of measure for each balloon item.
    c. Determine any functional tests, their targets and tolerances and give them each a unique identifier or use the identifiers supplied by the customer.
    d. Determine any tools, equipment required and ensure they are calibrated and in good working condition.

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3. Manufacture the part:
    a. Build the product and ensure to documenting processing and any in-process inspection results.
    b. Record the equipment used, personnel involved in building and inspection checks.
4. Collect data:
    a. Keep track of calibrated, certified inspection tools used and traceability information back to the person who used them to perform the inspections.
    b. Measure/inspect all balloon items in the test plan.
    c. Record when and who inspections were done by.
5. Create Report:
    a. Measurements results, Pass/Fail.
    b. Functional test results, Pass/Fail.
    c. Test equipment traceability information
    d. Attach test plan with documents showing the balloon and functional test identifiers so testing can be duplicated.
    e. Verify the test data and certify/sign and date the report. (See reference 2 below)

Supplier supplied FAIRs must include;

1. The test results of a minimum of five units or pieces.
2. The measurements for all specifications in the engineering documentation, including the target, the tolerance, the actual measurement and indicate if the measurement passed or failed.
3. Provide all the ballooned documentation for reference.
4. Report traceability information must include:
    a. The Alpha part number and description
    b. The ATL PO number
    c. Supplier name and vendor number
    d. Any safety or compliance regulations the product is certified for. (i.e. RoHS, CSA, UL, RCM, EU, etc.) – The identification of the accredited party laboratory if completed by a 3rd party.
    e. Production date (and batch number if applicable)
    f. The name of the person that performed/responsible for the testing.
    g. The name and dated signature of the authorized person verifying the results and certifying conformance on behalf of the supplier

A copy of the report must be attached to each shipment with the other shipping documentation, and a copy emailed to Report.QA@alpha.ca.

Certificate of Conformance Requirements and Guidelines:

EnerSys is committed to a quality objective of zero defects and is committed to being an active partner with all stakeholders to accomplish this. Suppliers are best equipped to determine the level and amount

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of testing to ensure zero defects. However, the following guidelines are given in the spirit of cooperation and continuous improvement.

Simple Parts/Assemblies: (Ex: Copper bus bars, brackets, wiring harness, etc.)

It is recommended to take samplings from the beginning middle and end of a batch or run to ensure no variation due to the tool wearing or personnel changes.

Complex Metal Parts/Assemblies: (Ex: Enclosures, cabinets, racks, wiring harness, etc.)

Complete 100% inspection/testing of identified CTQ specifications and to do a minimum of 1.5 % AQL sampling for full testing of all specifications. This may be adjusted based on risk (i.e. process checks or history of conformance.)

Electronics/PCBAs:

Complete 100% final testing as listed in the ATP or by ATE and any inspection of identified CTQ specifications and to do a minimum of 1.5 % AQL sampling. This may be adjusted based on risk (i.e. process checks or history of conformance.)

All A5 test records from ATP/ATE testing are to either be submitted to ATL through the FTP service or retained by the supplier for a minimum of 5 years.

Supplier supplied CoCs are to include all traceability information such as;

a. The Alpha part number and description
b. The ATL PO number
c. Supplier name and vendor number
d. Any safety or compliance regulations the product is certified for. (i.e. RoHS, CSA, UL, RCM, EU, etc.) – The identification of the accredited party laboratory if completed by a 3rd party.
e. Production date (and batch number if applicable)
f. The name of the person that performed/responsible for the testing
g. The name and dated signature of the authorized person verifying the results and certifying conformance on behalf of the supplier

A copy of the report must be attached to each shipment with the other shipping documentation, and a copy emailed to Report.QA@alpha.ca.

All test reports and documentation must be retained by the supplier for a minimum of 5 years and must be made available upon request.

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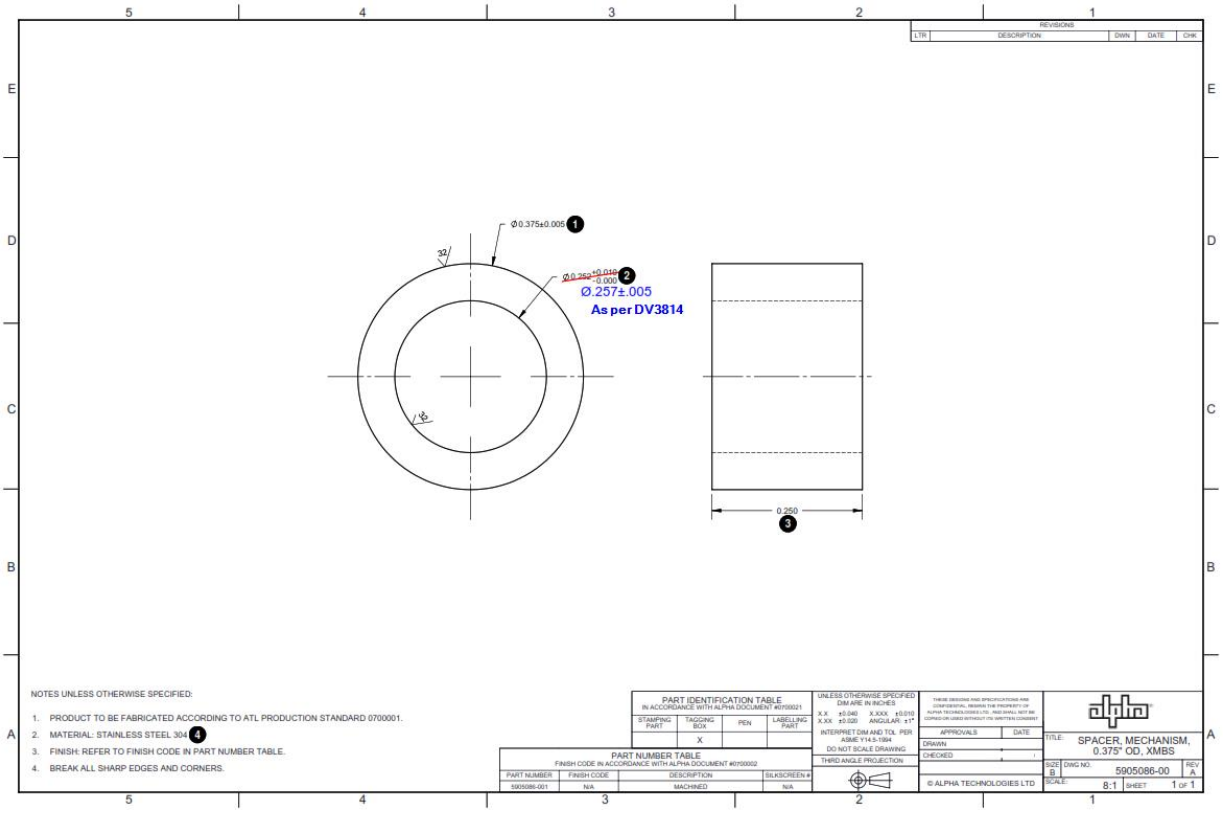
Reference 1: CTQ dimensions ballooned drawing for dwg no. 5905086-00 Rev A.



NOTE: Drawing may be redlined like above if provided a Temporary Deviation Notification as indicated by the DV#.

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Reference 2: Simple FAIR example.

Company X Logo

FIRST ARICLE INSPECTION REPORT

Customer Name:	Alpha Technologies Ltd. an EnerSys company.	Production Date:	13-May-2021
Customer PO#:	P00004567	PN:	5905086-001
PN Description:	Spacer Mechanism	REV:	A
Supplier Name:	Company X	Vendor#:	V001234
Safety Certificates:	None		
Reference:	ANSI/ASQCZ 1.4-1993 General Level II		
Process:	QC-22 Sampling Plan-Normal Inspection Rev A		

#	Dimension Target:	Unit/Qty	Lower Limit	Upper Limit	Measured Test Equipment	Measured	Status	Comments
1	0.375 ± 0.005	In.	0.370	0.380	Digital Caliper #124	0.377	Pass	
1	0.375 ± 0.005	In.	0.370	0.380	Digital Caliper #124	0.375	Pass	
1	0.375 ± 0.005	In.	0.370	0.380	Digital Caliper #124	0.374	Pass	
1	0.375 ± 0.005	In.	0.370	0.380	Digital Caliper #124	0.373	Pass	
1	0.375 ± 0.005	In.	0.370	0.380	Digital Caliper #124	0.376	Pass	
2	0.252 ± 0.005	In.	0.247	0.257	Digital Caliper #124	0.255	Pass	
2	0.252 ± 0.005	In.	0.247	0.257	Digital Caliper #124	0.253	Pass	
2	0.252 ± 0.005	In.	0.247	0.257	Digital Caliper #124	0.250	Pass	
2	0.252 ± 0.005	In.	0.247	0.257	Digital Caliper #124	0.253	Pass	
2	0.252 ± 0.005	In.	0.247	0.257	Digital Caliper #124	0.252	Pass	
3	0.250 ± 0.010	In.	0.240	0.260	Digital Caliper #124	0.255	Pass	
3	0.250 ± 0.010	In.	0.240	0.260	Digital Caliper #124	0.255	Pass	
3	0.250 ± 0.010	In.	0.240	0.260	Digital Caliper #124	0.256	Pass	
3	0.250 ± 0.010	In.	0.240	0.260	Digital Caliper #124	0.256	Pass	
3	0.250 ± 0.010	In.	0.240	0.260	Digital Caliper #124	0.254	Pass	
4	Material	SS 304			Visual	CoC	Verified	See SS 304 batch# 2021-3434 CoC
Inspected by:		Jane Doe			QTY Tested:	5	Completed:	14-May-2021

CONCLUSION:

FAI is verified and passed inspection.

This report has been verified by:

Jason Wong

Quality Manager

Signed: J Wong

Date: 15-May-2021