

Addendum To Appendix QJ

Seller Quality Requirements – QCS-001 Processing Sources Seller Processing Instructions/Planning Requirements

A. General Requirements

1. The processing instructions/planning requirements contained herein are, without limitation, a part of Appendix QJ, Seller Quality Requirements – QCS-001 Processing Sources. Seller shall include such requirements in Seller's processing instructions/planning as defined herein.
2. For purposes of clarification and qualification of this processing instructions and/or planning requirements Addendum, the pertinent paragraphs from Appendix QJ, Section O, are included herein.

B. Minimum Processing Instructions and/or Planning Requirements

1. Seller and Seller's sub-tiers shall ensure that processing instructions and/or planning include, and meet, at a minimum, the requirements delineated herein.
2. Upon Buyer's request therefor, Seller shall provide to Buyer, at no increase in price, cost or fee to Buyer, copies of such processing instructions and/or planning.
3. Seller shall submit all above noted Seller processing instructions and/or planning for Buyer Items classified as "Critical", for instance, Fatigue/Fracture Critical, Fracture/Durability Critical, Safety Critical, etc. to Buyer for LM Aero Program Level III review, approval and signature.

C. Pre-Penetrant Etch Requirements

1. Seller and Seller's sub-tiers shall ensure processing instructions and/or planning for pre-penetrant etch operations contain the following requirements:
 - a. a job listing log is maintained that includes Item (part) number, material type, shop traveler/planning router number, etch rate, time in etch tank, amount of metal removed per surface, and identification of employee performing etch operation,
 - b. etch rate calculations are performed with a calibrated balance scale, (4 place) when etch rates are determined using the weight loss method,

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- c. etch rates are determined every 8 hours of operation or once each shift,
 - d. amount of metal removed from surface is in accordance with Buyer's specification(s), (minimum) plus .0001" per surface, not to exceed maximum specified amount per specification, e.g., NDTs 1101 aluminum etch is .0003" to .0007" per surface. Remove a minimum of .0004" and not to exceed .0007", and
 - e. etch rates, time in and time out of etch tank, and actual amount of metal removed per surface are documented on Certificate of Conformance ("CoC").
2. Seller shall document the following data on processing instructions and/or planning when pre-penetrant etch is performed. Seller shall document that material being etched, amount of removal per surface and specification will change as specifications and requirements change:
- a. (Aluminum) Etch to remove 0.0003 - 0.0007" per surface per NDTs 1101 or as required by Buyer specification(s),
 - b. Daily Etch Rate (per established procedure):
_____ (in/surface/minute),
 - c. Tank Number: _____ Tank Temperature: _____,
 - d. Time in Etch Tank: _____ AM/PM, Date: _____,
 - e. Time Out of Etch Tank: _____ AM/PM, Date: _____, and
 - f. Amount of Metal Removed: _____ **PER SURFACE**

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D. Penetrant Testing Requirements

1. Seller and Seller's sub-tiers shall ensure processing instructions and/or planning for penetrant testing operations contain the following requirements:
 - a. manufacturer of, and Sensitivity level of, penetrant material are documented and recorded on processing instructions and/or planning,
 - b. all batch numbers of penetrant material, emulsifiers and developers used are documented and recorded on processing instructions and/or planning,
 - c. penetrant, emulsifier and developer dwell times are documented and recorded on processing instructions and/or planning,
 - d. pre-cleaning method(s)/material(s), immersion times, temperatures and tank numbers are documented and recorded on processing instructions and/or planning, and
 - e. a job listing log is maintained that documents Item (part) number, material type, shop traveler/planning router number, number of Items inspected, number of Items accepted/rejected and the acceptance criteria used.

E. Magnetic Particle Testing Requirements

1. Seller and Seller's sub-tiers shall ensure processing instructions and/or planning for magnetic particle testing operations contain the following requirements:
 - a. approved Technique Data Sheet(s) ("TDS") are available and approval is signed by a Seller Non-Destructive Test ("NDT") Level III. NOTE: Buyer's specification(s) may also require Buyer's NDT Level III signed approval of Seller TDS,
 - b. required residual magnetism level is documented and recorded on processing instructions and/or planning, and
 - c. a job listing log is maintained that documents Item (part) number, material type, shop traveler/planning router number, number of Items inspected, number of Items accepted/rejected and the acceptance criteria used.

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F. Radiography Testing Requirements

1. Seller and Seller's sub-tiers shall ensure processing instructions and/or planning for radiography testing operations contain the following requirements:
 - a. approved TDS are available and signed by a Seller NDT Level III. NOTE: Buyer's specification(s) may also require Buyer's NDT Level III signed approval of Seller TDS, and
 - b. a job listing log is maintained that documents Item (part) number, material type, shop traveler/planning router number, number of Items inspected, number of Items accepted/rejected and the acceptance criteria used.

G. Ultrasonic Testing Requirements

1. Seller and Seller's sub-tiers shall ensure processing instructions and/or planning for ultrasonic testing operations contain the following requirements:
 - a. approved scan plan/technique number, when required by Buyer's specification(s), are available and signed by Seller's NDT Level III. NOTE: Buyer's specification(s) may also require Buyer's NDT Level III signed approval of Seller's scan plan/technique number,
 - b. serial number(s) of the standards used are documented and recorded on processing instructions and/or planning, and
 - c. a job listing log book is maintained that documents Item (part) number, material type, shop traveler/planning router number, number of Items inspected, number of Items accepted/rejected and the acceptance criteria used.

H. Solid Film Lubricant (SFL)/ Prime/Paint/Fuel Tank Coating Requirements

1. Seller and Seller's sub-tiers shall ensure processing instructions and/or planning for sfl, prime, paint and fuel tank coating operations contain the following requirements. Additionally, Seller's specification data

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elements/information requirements, as defined herein, shall be documented on applicable Seller's processing instructions and/or planning:

- a. material manufacturer's identification for sfl, primer, paint (top coat) and fuel tank coating,
 - b. batch numbers of sfl, primer, paint (top coat) and fuel tank coating,
 - c. Engineering Materials and Processes (EMAP) material numbers when EMAP materials are required,
 - d. mix times, stand times for primer, paint (top coat) and fuel tank coating,
 - e. viscosity of primer, top coat and fuel tank coating at time of application,
 - f. temperature and humidity at time sfl, primer, paint (top coat) and fuel tank coating is applied,
 - g. required and resulting actual thickness of sfl, primer, top coat, or fuel tank coating based upon number of coats applied,
 - h. cure cycles to include time in, time out of furnace, temperature and humidity data,
 - i. printed name and signature of Seller's QCS-001 qualified applicator, and
 - j. required and resulting actual inspections performed to include as applicable, by material type:
 1. specification or Buyer requirement,
 2. required coating thickness verification,
 3. wet and/or dry tape tests,
 4. coating Adhesion tests,
 5. coating Cure verification, and
 6. coating visual examination.
2. Seller's and Seller's sub-tiers testing procedures for sfl, primer, paint (top coat) and fuel tank coating shall include:

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- a. applicable and reference testing specification, and
 - b. accept/reject criteria.
3. Seller's and Seller's sub-tiers equipment listing for processing sfl, primer, paint (top coat) and fuel tank coating shall include:
- a. paint booths,
 - b. curing ovens,
 - c. preventative maintenance schedule, and
 - d. equipment that is calibrated, with frequency and accuracies documented.
4. Seller's and Seller's sub-tiers CoC for sfl, primer, paint (top coat) and fuel tank coating shall include:
- a. material manufacturer's name and batch number of primer, top coat, fuel tank coating,
 - b. sfl, to include EMAP Material Code, as applicable,
 - c. cure cycles used shall include temperature and humidity verification, as required,
 - d. coating thickness results, and
 - e. coating adhesion results.

I. Chemical Processing Requirements

1. Seller and Seller's sub-tiers shall ensure processing instructions and/or planning for chemical processing operations include the following requirements. Additionally, Seller's processing parameters, as defined herein, shall be documented on Seller's applicable processing instructions and/or planning:
 - a. tank number(s),
 - b. tank sequence,
 - c. time in tank at time of processing, and
 - d. temperature of tanks at the time of processing when solutions are heated.
2. When Buyer unique specifications are required, Seller and Seller's sub-tiers shall include process flow charts indicating EMAPS approved materials, including chemicals, by EMAPS item number.

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3. Seller's and Seller's sub-tiers lot/monthly process and solution control testing requirements shall include:
 - a. required testing specification,
 - b. accept/reject criteria, adhesion, thickness, salt spray, visual examination, and
 - c. solution analysis frequency.

NOTE: If testing is accomplished at Seller's facility, it shall be controlled by documented instructions/lab procedures.

4. Seller's and Seller's sub-tiers chemical processing equipment listing shall include:
 - a. Tank size,
 - b. curing and embrittlement relief baking ovens, and
 - c. crucifiers/ammeters.

NOTE: Seller shall have documented calibration data with accuracies available for Buyer's review for calibrated equipment.

J. Heat Treatment Requirements

1. Seller and Seller's sub-tiers shall ensure processing instructions and/or planning for heat treatment operations include the following requirements, processing parameters and manufacturing data. Additionally, Seller's and Seller's sub-tiers shall document such processing parameters on applicable processing instructions and/or planning:
 - a. cleaning methods,
 - b. furnace number(s),
 - c. time in, time at, time out of furnace(s), in legible format,
 - d. actual quench delay, as required by applicable heat treat specification,
 - e. temperature of quench media at time of quench,
 - f. transfer time into cold storage after solution heat treat,
 - g. specification used and requirements for dew points, carbon potential vacuum leak rate as required by applicable heat treat specification,
 - h. specification used when in-process testing is required and actual test data results, such as hardness after tempering,

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- i. specification used for final hardness and conductivity readings, required and actual, and
 - j. specification used for part marking
2. Seller and Seller's sub-tiers heat treatment processing instructions and/or planning shall include:
 - a. complete equipment listing, including furnace(s) classification, in accordance with AMS 2750, e.g., size, furnace limits, and accuracy,
 - b. how furnace charts are identified to ensure traceability,
 - c. as a minimum, Item number, quantity, shop traveler/planning number, time in, time at, and time out of furnace shall be noted,
 - d. a written procedure for pyrometry control in accordance with AMS 2750,
 - e. reference to, and availability of, Seller's documented personnel training program for heat treatment, and
 - f. a schedule for all required lotly and/or monthly process control tests required by consensus industry standards and/or Buyer's unique requirements, including applicable ASTM test standards used.
3. Seller's and Seller's sub-tiers documentation requirements for heat treatment logs shall include the following data, as a minimum, and any additional documentation, as required, by the heat treat specification(s) being used:
 - a. shop traveler/planning traceable number(s),
 - b. customer,
 - c. Item (part) number,
 - d. material type,
 - e. material size,
 - f. heat treat specification,
 - g. furnace number,
 - h. time in, time at required temperature, and time out of furnace, and
 - i. quench delay.
4. Seller's and Seller's sub-tiers heat treatment CoC shall include:
 - a. furnace number,
 - b. temperatures by furnace used during heat treat process,
 - c. furnace times,
 - d. required and actual hardness/conductivity results, and

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- e. any required statements embedded in heat treat specifications and the following mandatory statements:

“All heat treatment processing performed on this order was accomplished using heat treatment equipment that meets the requirements of AMS 2750. All heat treatment operations were accomplished in accordance with the requested/required heat treatment specification and all required verifications tests have been performed and documented. No unauthorized changes or deviations to required heat treatment specifications or procedures have been performed.”

K. Welding Requirements

- 1. Seller and Seller's sub-tiers shall ensure processing instructions and/or planning for welding operations include the following requirements, processing parameters and manufacturing data. Additionally, Seller's and Seller's sub-tiers shall document such processing parameters on applicable processing instructions and/or planning:
 - a. date, quantity, part number and detail numbers,
 - b. material, joint pre-fit and tolerances,
 - c. weld specification and class,
 - d. type of weld (fillet, groove, etc.),
 - e. approved weld procedure number, as applicable,
 - f. approved weld schedule/technique number, if applicable,
 - g. welder number/identification,
 - h. weld machine number,
 - i. welding rod identification/traceability number and specification,
 - j. shielding gas, as applicable,
 - k. purge flow rate, as applicable,
 - l. pre-cleaning method and specification, and
 - m. final weld inspection performed by process and specification, as applicable, to include:
 - 1. radiographic inspection,
 - 2. penetrant inspection,
 - 3. magnetic particle inspection,
 - 4. ultrasonic inspection, and
 - 5. visual inspection