MEMO

Date	26th of September 2026	**Ref**	ESA-TECMSP-MO-2026-001447
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To	ESA PA Managers, ESA Approved assembly lines, PCB-Assembly working group	**Copy**	TEC-MSP, TEC-Q, TEC-EDC

Subject: Checklist for the review of Approval status of Electronic Assembly configurations during MPCB

This memo supersedes the memo ESA-TECQTM-MO-1931 issue 3.

One of the purposes of the Materials and Processes Control Board (MPCB) is to ensure that the assembly of electronic components on Printed Circuit Board (PCB) substrates is in compliance with the ECSS-Q-ST-70-61, ECSS-Q-ST-70-28 and ECSS-Q-ST-70-26. The following memo provides a checklist for the assessment of the assembly configurations during MPCBs.

It is the responsibility of the Prime to ensure that the information is available for the Electronic Assembly MPCB (EA MPCB) as a minimum 2 weeks before the planned review.

The data package shall be reviewed by the contractual chain, and comments shall be provided to the supplier. The comments shall be analysed by the supplier and the updated data package reviewed during the Electronic Assembly MPCB.

All RFAs and RFDs shall be provided at least in draft as part of the data package. The RFA shall either include the assembly verification programme or provide an extract of the assembly verification to allow proper review by the customer chain.

It is recalled that assembly experts from the customer supply chain shall participate to the EA MPCB and review the data package in advance. The SOC issued by the supplier shall be available for review during the meeting to allow the identification and assessment of any partial compliance or non-compliance with the applicable PA requirements.

The data package shall contain the following information:

1. Provide, the design justification file of the unit and when available, photos of representative assembled boards.
2. PCB technology according to ECSS-Q-ST-70-60 requirement ECSS-Q-ST-70-60_1390054.

3. PCB substrate trademark and the used conformal coating and identification of the materials used during assembly verification.
4. Confirmation that none of the EEE parts are procured with pure tin. If pure tin finish parts are procured, evidence of re-processing verification shall be provided with evidence that the parts have not been damaged in compliance with the ECSS-Q-ST-60 Clauses 4.2.2.2/5.2.2.2/6.2.2.2 j . Microsections to demonstrate that all pure tin has been alloyed shall be provided as well as evidence of absence of remaining pure tin by means of analysis such as EDX, X—Ray Fluorescence (XRF).
5. List the solder alloy(s) used with associated flux and state the compliance to approved PID.
6. State if EEE COTS are used.
7. Identification of whether any bake out of the final assembly is performed for cleanliness or bioburden reduction. If such bake out is performed or planned, the impact on the assembly approval status shall be assessed.
8. Confirmation, based on project thermal analysis and using the design TRP as an input, that the solder joint temperature on the PCB is within the range of -55/+85°C throughout the mission, in compliance with the ECSS-Q-ST-70-61. In case the temperature is outside this temperature range, an RFA or RFD shall be issued. It is the responsibility of the prime to provide the TRP input to allow the supplier to make the calculation.
9. Confirmation based on the project thermal analysis, that the number of thermal cycles applied for the verification of the assembly is sufficient to cover the mission with a minimum margin of 2 (when assessment is done by microsectioning) , margin of 3 (when electrical monitoring of min 32 devices is performed), and margin of 6 (when electrical monitoring is performed with limited number of parts, e.g. Area array devices). The calculation shall be performed using the Norris-Landzberg model (ECSS-Q-ST-70-61_1511007). The input used and its associated calculation shall be provided.
10. Confirmation based on the project vibration requirements and mechanical analysis, that the vibration tests performed for the claimed assembly verification cover the application. The supplier shall assess if the responses of the assembly verification's PCB cover the application as the test vehicle may not be fully representative of the FM. An RFA or RFD shall be issued in case the vibration levels do not cover the application.
11. Provide the assembly Compliance matrix of EEE parts packages assembled on the flight hardware with its associated ESA Approval status and references to Summary Tables and references of RFAs and RFDs.

    The following information is expected in the Assembly Compliance matrix
    - The list of all packages, including SMT packages, through hole devices, in-house manufactured coils or passive parts, solderless parts, crimped contacts, lugs and splices shall be extracted from the last issue of the DCL. An RFA shall be issued for all packages for which the assembly is not covered by ESA approved Summary tables or by similarity rules in compliance with the ECSS-Q-ST-70-61C. Compliance with the ECSS-Q-ST-70-61 shall be provided.

- All packages for which an ESA-approved assembly status has been granted shall have the indication of the Summary Table reference and/or the reference tracking the ESA approval.
- For all packages for which coverage by similarity with other packages is proposed in compliance with the ECSS-Q-ST-70-61 rules, the applied similarity rule and justification shall be provided together with the reference to the ESA approval for the parts against which the similarity is claimed
- For coils directly bonded or staked, justification that the coil is not damaged by vibration, shocks, or thermal cycles shall be provided. In case of absence of assembly verification for coils with stress relief directly assembled on the PCB, (P)FM or EQM heritage could be used as justification. Information on how the enamel is removed shall be provided.
- When no ESA Approval has been granted yet, reference to the assembly verification programme and report shall be identified in the table with associated RFA reference.
- When no assembly verification has yet been performed, an RFA shall be issued, together with the associated verification programme, for review.
- When verification by similarity is considered, a detailed justification shall be provided to ensure compliance with similarity rules. The similarity rule shall be provided. For example for FP it shall be stated whether the constant setting is the distance between bottom of the package and PCB or between the exit of the lead and the PCB. For FP the lead forming shall be identical as well as the pitch, lead section and materials. Special care shall be taken that the lead forming is exactly the same (in case lead forming setting is made using the stand off between the bottom of the component and the PCB then the thickness of the device may have an impact). A thinner package cannot be used as justification by similarity for a thicker package.
- When sensitive devices (see ESA-TECMSP-MO-018961 latest issue) are assembled on the board, confirmation that 5 parts were assembled and microsectioned for verification purposes shall be provided. If not, the parts shall be added in a new verification programme and an RFA shall be issued.
- For DIP/DIL package to provide package drawing or photos to confirm that the assembly verification is not needed. DIP/DIL without stress relief, with the lead brazed vertically to the side of the package shall be assembly verified according to the ECSS-Q-ST-70-61C and RFA shall be submitted.
- Any solderless assembly shall be identified. An RFA shall be issued with proposed test plan in compliance with the ECSS-Q-ST-70-61C.
- Use of sculptured flex shall be listed in the assembly compliance matrix. A test plan to demonstrate the reliability of the assembly shall be provided in an RFA.
- Cable and connectors procurement:
  - Cable procured with the connectors attached to it: The item is considered as cable assembly and procured in compliance with ESCC 3408, the item shall be included in the DCL. This item is not under review by the EA MPCB.
  - Cable and connectors are procured independently. Connectors are assembled on the cable by the customer: The cable and the connectors are in the DCL, the assembly of the connectors shall be in compliance with the ECSS-Q-ST-70-61 or ECSS-Q-ST-70-26 or ECSS-Q-ST-70-18. The status of the assembly of the

connector will be reviewed during the EA MPCB. The assembly shall be listed in the Assembly compliance matrix. The assembly shall comply with the ECSS-Q-ST-70-61 and or 70-18.

12. Confirmation that the applicable PID issue is the one that has been reviewed and approved by ESA. If this is not the case, then all changes shall be identified including also new issues of assembly procedures.
13. Confirmation that any actions open during the last Audit have been closed in compliance with the ECSS-Q-ST-70-61.
14. Indicate the certification status of the solder operators and inspectors.
15. Confirm the absence of contact between gold and aluminium also if surface treatments such as Surtec or alternative is present. Such contact concerns usually the attachment of the connectors on the aluminium case. In case of contact an RFD shall be issued. A risk is considered when the ratio gold/aluminium surfaces is above 10%.
16. Provide an overview of the schedule for the MRR of QM and (P)FM.
17. When the EA MPCB concerns a rebuilt, to provide the list of the assembly NCRs that were issued and the associated preventive and corrective actions identified in previous projects.
18. Identify the presence of harness within the unit and the associated harness specification used. A dedicated harness MPCB may need to be organised.
19. Confirm that the bake out of the parts is in compliance with their associated MSL class (Moisture sensitive levels) identified in the J-STD-033. It is recommended by ESA to have all tantalum capacitors baked out prior to assembly including when no recommendations are provided.
20. Confirm that the ESD protection used is in compliance with all ESD classes of parts to be assembled.
21. Confirm that PADs are generated for all in house manufactured magnetic parts (e.g. inductor, transformers,…).
22. Confirm that in case the PCB is not with tin lead finish or thick gold finish (degolded and pretined before soldering), a dedicated Assembly verification is proposed (See ESA-TECQTM-MO-1892).
23. To declare if assembly is outsourced.