

MEMO

Date:	24/07/2026	Ref.:	ESA-TECMSP-MO-2026-000803
From:	Stan Heltzel	Visa:	Thomas Rohr
To:	ESA recommended test laboratories for PCB evaluation		
Copy:	PCB/SMT WG		

Subject: Change of PCB rework simulation in group 4 and group 6

In frame of PCB qualification renewal and delta qualification testing, rework simulation is executed within the group 4 and group 6 test flows. This memo highlights the changes introduced in ECSS-Q-ST-70-60C Revision 1 (2025) and it does not introduce new requirements.

Table 1 provides an overview of rework simulation performed in frame of group 4 and group 6 test flows. For completeness and comparison, this table also lists the old rework procedure from the obsolete ECSS-Q-ST-70-60 Corrigendum 1 (2018).

The table includes:

- the features under test: PTH and via-in-pad
- the solder iron temperature which may depend on the PCB laminate type
- the number of temperature elevations
- the configuration of the soldered wire after rework, for the remainder of the group 4 or 6 test
- the acceptance criteria
- the clauses and requirements from ECSS-Q-ST-70-60 that specify the described topics.

This memo and the rework simulation tests specified in Table 1 shall be applicable for new initial qualifications, delta qualifications and qualification renewal. ESA's recommended laboratories for PCB testing are hereby requested to implement all the rework simulation as outlined in Table 1.

This memo does not (necessarily) apply to project qualification under RFA, since it is under the responsibility of the procurement authority to implement a representative (for the project) rework simulation, as specified in requirement 9.8.2.e, and to request approval from the customer chain through the RFA process.

Furthermore, rework simulation is also included in group 3 testing for procurement. This method did not change, except that a sampling of the batch has been introduced. This is shown, for completeness, in Table 2.

Note: Rework temperatures for PPE materials are not specified in ECSS-Q-ST-70-60. At the time of issuing this memo, the members of the PCB/SMT WG deemed it good practice to employ for rework on PPE the same temperatures as for polyimide.

	feature under test	group 4 clause	group 6 clause	temp for polyimide	temp for epoxy	clause rework	temp elevations	clause rework	wire configuration	clause	acceptance criteria
ECSS-Q-ST-70-60 Corrigendum 1 2018	4x PTH	9.6.2.c.5	9.8.2.c.3	350 °C	350 °C	9.5.4.2.d	10x	9.5.4.3.l	leave wire inserted	note 1 of 9.5.4.3.l	evaluation as per clause 10
ECSS-Q-ST-70-60 Revision 1 2025	2x PTH	9.6.2.c.5	9.8.2.c.3	350°C	350 °C	9.5.4.2.d	10x	9.5.4.3.l	leave wire inserted	note 1 of 9.5.4.3.l	evaluation as per clause 10
	2x via-in-pad top	9.6.2.c.6	9.8.2.c.4	340 °C	330 °C	9.5.4.2.f	10x	9.5.4.3.l	remove wire for AAD	note of 9.5.4.3.f	evaluation as per clause 10
									possibly leave wire attached for non-leaded SMT	note 2 of 9.5.4.2.f	
	2x via-in-pad bottom	9.6.2.c.6	9.8.2.c.4	340 °C	330 °C	9.5.4.2.f	10x	9.5.4.3.l	remove wire for AAD	note of 9.5.4.3.f	evaluation as per clause 10
									possibly leave wire attached for non-leaded SMT	note 2 of 9.5.4.2.f	
	2x PTH	to be performed 9.5.4.2.e		380 °C	n/a	9.5.4.2.e	10x	9.5.4.3.l	leave wire inserted	note 1 of 9.5.4.3.l	test for information, no acceptance criteria specified note of 9.5.4.2.e

Table 1 –Rework simulation in frame of group 4 and group 6 in the new ECSS-Q-ST-70-60 rev 1 (and comparison to the obsolete Corrigendum 1).

	feature under test	group 3 procurement clause	temp for polyimide	temp for epoxy	clause rework	temp elevations	clause rework	wire configuration	clause	acceptance criteria
ECSS-Q-ST-70-60 Revision 1 2025	1x PTH	8.2.4.d.3	350°C	350°C	9.5.4.2.d	10x	9.5.4.3.l	leave wire inserted	note 1 of 9.5.4.3.l	evaluation as per clause 10
	25% sampling of the batch	8.2.4.q								

Table 2 – Rework simulation in frame of group 3 for procurement