APPLICATION FOR ESCC QUALIFICATION APPROVAL

Page 1

Component Title: Connectors Electrical Rectangular Non-Removable Solder Bucket PCB and Wire-Wrap Contacts and Removable Coaxial and Power Contact and Removable Crimp Contacts, and press fit contact based on type D*M

Appl. No. 391

Executive Member: CNES Date: 27/11/2024

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Components (including series and families) submitted for Qualification Approval

ESCC COMPONENT. NO.	VARIANTS	RANGE OF COMPONENTS	BASED ON	TEST VEHICLE / S	COMPO-NENT SIMILAR
3401002	01	D-Subminiature for crimp contacts: 9, 15, 25, 37 and 50 size 20 contacts for standard density layout	SND Series	TV1-1, TV1-2, TV1-3, TV1-4, TV2, TV3, TV4, Contact set: Connectors: 340109802BDEM15SNMBSDD62 340100202BDEMA15PNMBD 340109801BDBM25SNMBSND62 340100201BDBMA25PNMBD 340109803BDAM3W3SNMBSCBM97 340100101BDAM3W3PNMBD 340109802BDEM15PNMBSDD97A175D 340100202BDEMA15SNMBA175 340109802BDDM78SNMBSDD62 340100202BDDMA78PNMBD 340109801BDDM50SNMBSND62 340100201BDDMA50PNMBD 340109803BDCM8W8PNMBSCBM97D 340100101BDCM8W8SNMB 340109801BDDM50SNMBSND97A175 340100201BDDMA50PNMBA175D Contacts: 340100509B 340100510B 340100511B 340100512B 340104018B 340104019B 340104020B 340104021B 340109901B 340109902B Accessories: 340102299B	
3401002	02	D-Subminiature for crimp contacts: 15, 26, 44, 62, 78 and 104 size 22 contacts for high density layout	SDD Series		
3401005	11, 12	Range of Contacts (removable size 20 contacts)	SND Series		
3401005	09, 10	Range of Contacts (removable size 22 contacts)	SDD Series		
3401001	01	D-Subminiature connectors for removable crimp contacts: 3W3 to 8W8, combined contact arrangements	SCBM Series		
3401040	18, 19, 20, 21	Range of Contacts (removable size 8 power contacts)	SCBM Series		
3401098	01	D-Subminiature straight and right-angle press-fit connectors: 9, 15, 25, 37 and 50 size 20 contacts for standard density layout	SDD Series		
3401098	02	D-Subminiature straight and right-angle press-fit connectors: 15, 26, 44, 62, 78 and 104 size 22 contacts for high density layout	SND Series		
3401098	03	D-Subminiature straight connectors: 3W3 to 8W8, combined contact arrangements	SCBM Series		
3401099	01, 02	Range of Contacts (removable size 8 press-fit contacts)	SCBM Series		
3401022	99	D-Subminiature accessories	SND, SDD, SCBM Series		

2 Component Manufacturer

Amphenol Positronic

3 Location of Manufacturing Plant

Zone Industrielle d'Engachies
46 Route d'Engachies
32020 Auch
France

4 ESCC Specification used for Qualification

Generic: 3401
Issue 5
Detail/s: 3401/001 issue 12, 3401/002 issue 13, 3401/005 issue 10, 3401/022 issue 14, 3401/040 issue 7, 3401/098 issue 2, 3401/099 issue 2
Issue Click here to enter text.

5 Qualification Report Reference and date:

TR2024-040, ESCC 3401 Test results summarize

Date: 10/10/2024

6 **PID** used for manufacturing Qualification Lot

Ref No: PM2_194
Issue: Rev 01
Date: 28/10/2024

7 **PID** changes since start of qualification

None ☒
Minor* ☐
Major* ☐

(* Details not published, provided in confidential annex 2.)

Click here to enter text.

8 Current **PID** Verified by F. NOUALS - CNES

Name of Executive Representative

Ref No: PM2_194
Issue Rev 02
Date 10/12/2024

Current Manufacturing facilities surveyed by: 9

Nouals François, CNES — 22/11/2024

(Name of Executive Responsible) — (Date)

Audit Report - ESA-TECQES-RP-2022-002422

Report Reference

Satisfactory: Yes ☒ No ☐ Explain

Quality and Reliability Data 10

Evaluation testing performed Yes ☒ No ☐

Report Ref. No.: 2016900699-001□ Date: 08/08/2016

Equivalent Data:

Certification:

Failure analysis, DPA, NCCS available Yes ☒ No ☐

(supply data)

Ref Nos. and purpose:

- NC2CPOS201 (closed)
- DPA : see Construction analysis CA0004772_Test_Report

Component Title: Connectors Electrical Rectangular Non-Removable Solder Bucket PCB and Wire-Wrap Contacts and Removable Coaxial and Power Contact and Removable Crimp Contacts, and press fit contact based on type D*M

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Executive Member: CNES Date: 27/11/2024

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The undersigned hereby certifies on behalf of the ESCC Executive, that the above information is correct; that the appropriate documentation has been evaluated; that full compliance to all ESCC requirements is evidence except as stated in box 13; that the reports and data are available at the ESCC Executive and therefore applies for ESCC qualification status to be given to the component(s) listed herein.

Date: 27/11/2024

L. FONTAINE, CNES

(Signature of the Executive Coordinator)

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Continuation of Boxes above: (Only non-confidential comments)

Signature numérique de Fontaine Lya-Cnes
Date : 2024.11.27 10:29:50 +01'00'

13 Non compliance to ESCC requirements:

No.:	Specification	Paragraph	Non compliance

14 Additional tasks required to achieve full compliance for ESCC qualification or rationale for acceptability of noncompliance:

15 Executive Manager Disposition

Application Approval: Yes ☒ No ☐

Action / Remarks:

Date:

B. Schade: Head of the Quality Department

ANNEX 1: LIST OF TESTS DONE TO SUPPORT QUALIFICATION

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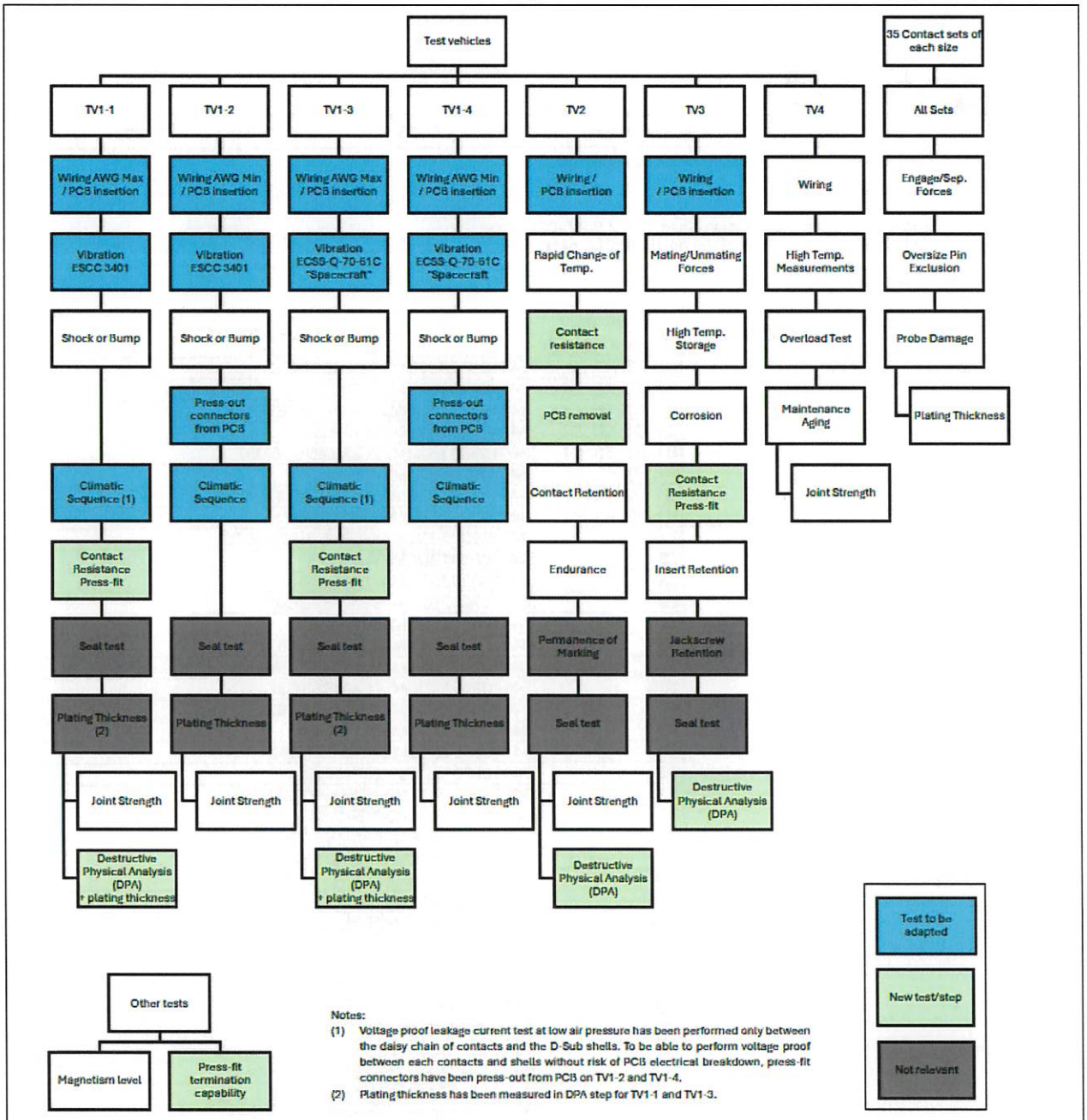
Tests conducted in compliance with:

- ESCC 3401 generic specification; Chart IV (for ESCC/QPL parts);
- Or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

	Test Vehicle	Connector / Contact test S/N	According to ESCC Ref.	Date/code (year/week)
Subgroup I	TV1	A1, A2, A3, A4	340109802BDEM15SNMBSDD62	2345
		B1, B2, B3, B4	340100202BDEMA15PNMBD	2345
		C1, C2, C3, C4	340109801BDBM25SNMBSND62	2347
		D1, D2, D3, D4	340100201BDBMA25PNMBD	2328
		E1, E2, E3, E4	340109803BDAM3W3SNMBSCBM97	2346
		F1, F2, F3, F4	340100101BDAM3W3PNMBD	2343
		G1, G2, G3, G4	340109802BDEM15PNMBSDD97A175D	2347
		H1, H2, H3, H4	340100202BDEMA15SNMBA175	2341
Subgroup II	TV2	7A	340109803BDCM8W8PNMBSCBM97D	2011
		7B	340100101BDCM8W8SNMB	1951
		8A	340100202BDDMA78PNMBD	2006
		8B	340109802BDDM78SNMBSDD62	2003
		9A	340100201BDDMA50PNMBD	2005
		9B	340109801BDDM50SNMBSND62	2010
		10A	340100201BDDMA50PNMBA175D	1951
		10B	340109801BDDM50SNMBSND97A175	2007
Subgroup III	TV3	A5	340109802BDDM78SNMBSDD62	2347
		B5	340100202BDDMA78PNMBD	2345
		C5	340109801BDBM25SNMBSND62	2347
		D5	340100201BDBMA25PNMBD	2328
		E5	340109803BDAM3W3SNMBSCBM97	2346
		F5	340100101BDAM3W3PNMBD	2343
		G5	340109802BDEM15PNMBSDD97A175D	2347
		H5	340100202BDEMA15SNMBA175	2347
Subgroup IV	TV4	19A	340109803BDCM8W8PNMBSCBM97D	2011
		19B	340100101BDCM8W8SNMB	1951
		20A	340100201BDDMA50PNMBD	2005
		20B	340109801BDDM50SNMBSND62	2010
		21A	340100201BDDMA50PNMBA175D	1951
		21B	340109801BDDM50SNMBSND97A175	2007
		22A	340100202BDDMA78PNMBD	2006
		22B	340109802BDDM78SNMBSDD62	2003
Subgroup V	Contact sets	1 to 10	Part of 340109802BD*M*PNMBSDD97*D	2002
			Part of 340109802BD*M*SNMBSDD62*	2002
		11 to 20	Part of 340109802BD*M*PNMBSND97*D	2002
			Part of 340109802BD*M*SNMBSND62*	2002
		21 to 30	Part of 340109803BD*M*PNMBSCBM97*D and 340109901	2002
			Part of 340109803BD*M*SNMBSCBM97* and 340109902	2002
		31 to 40	340100509	2002
			340100510	2002
		41 to 50	340100511	2002
			340100512	2002
		51 to 60	340104020	2002
			340104019	2002

Detail Specification reference:



An adapted qualification test program was followed, as agreed with the ESCC Executive, as the range of connectors being qualified is limited, making some of the tests irrelevant or not applicable, also the introduction of the press-fit terminations makes it necessary to add or modify some of these tests :
As we are not qualifying sealed connectors nor solder-cup contacts, the dedicated tests to these features shall be overlooked. The connectors being laser engraved, permanence of marking is to be skipped.
On the other hand, the wiring step shall be complemented with a PCB insertion procedure for the press-fit connectors. This procedure shall include a resistance measurement between the termination and the PCB holes, this measurement shall then ben repeated after conditionings to assess the drift.
Jackscrew retention ESCC3401 §9.24 is not relevant. On Positronic press-fit connector, a swage spacer is used to fix the socket jackscrew. An axial load could not be applied to the jackscrew from the end of the connector. The definition of a jackscrew per ESCC3401/022 is a “Screw lock assembly”.
Finally, harsher vibration condition shall be used, as per CNES requirements.

Chart IV	Test	Tick when done	Conditions	Date Code	Tested Qty	N° of Rejects	Comments if not performed. Comments on Rejection
Subgroup I TV1-1	Wiring	☒	ESCC 3401/098 §4.2.4 for Press-fit and ECSS-Q-ST-70-26 for Crimp	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1	0	Adapted for press fit
	Vibration	☒	ESCC 3401 Para. 9.11	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1	0	
	Shock or Bump	☒	IEC Publication No. 512-4	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1	0	
	Climatic sequence	☒	ESCC 3401 Para. 9.13	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	Note that voltage proof current test at low air pressure has been performed only between the daisy chain of contacts and the D-sub shells.
	Seal	☐	ESCC 3401 Para. 9.9	-	-	-	Not performed - as agreed
	Plating thickness	☒	ESCC 3401 Para. 5.2.3	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	Done during DPA as agreed
	Joint strength	☒	ESCC 3401 Para. 9.15	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	

Additional testing	Destructive Physical Analysis (DPA)	☒	ESCC21001	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
Subgroup I (additional testing) Tv1-2	Wiring	☒	ESCC 3401/098 §4.2.4 for Press-fit and ECSS-Q-ST-70-26 for Crimp	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	Subgroup performed in addition to Subgroup 1 to test the press out of connectors from PCB - as agreed
	Vibration	☒	ESCC 3401 Para. 9.11	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
	Shock or Bump	☒	IEC Publication No. 512-4	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
	Press-Out connectros from PCB	☒		2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	To be able to perform voltage proof between each contacts and shells without risk of PCB electrical breakdown, press-fit connectors have been pressed-out from PCB.
	Climatic sequence	☒	ESCC 3401 Para. 9.13	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	Note that voltage proof current test at low air pressure has been performed only between the daisy chain of contacts and the D-sub shells.
	Seal	☐	ESCC 3401 Para. 9.9	-	-	-	Not performed - as agreed
	Plating thickness	☐	ESCC 3401 Para. 5.2.3	-	-	-	Not performed - as agreed
	Joint strength	☒	ESCC 3401 Para. 9.15	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	

Subgroup I (additional testing) TV1-3	Wiring	☒	ESCC 3401/098 §4.2.4 for Press-fit and ECSS-Q-ST-70-26 for Crimp	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	Performed in addition to Subgroup 1 - as agreed
	Vibration	☒	ECSS-Q-70-61C "Spacecraft"	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
	Shock or Bump	☒	IEC Publication No. 512-4	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
	Climatic sequence	☒	ESCC 3401 Para. 9.13	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	Note that voltage proof current test at low air pressure has been performed only between the daisy chain of contacts and the D-sub shells.
	Seal	☐	ESCC 3401 Para. 9.9	-	-	-	Not performed - as agreed
	Plating thickness	☒	ESCC 3401 Para. 5.2.3	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	Done during DPA as agreed
	Joint strength	☒	ESCC 3401 Para. 9.15	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
Additional testing	Destructive Physical Analysis (DPA)	☒	ESCC21001	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
Subgroup I (additional testing)	Wiring	☒	ESCC 3401/098 §4.2.4 for Press-fit and ECSS-Q-ST-70-26 for Crimp	2345 2345 2347 2328 2346	1 1 1 1 1	0	Performed in addition to Subgroup 1 - as agreed

				2343 2347 2341	1 1 1		
	Vibration	☒	ECSS-Q-70-61C "Spacecraft"	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
	Shock or Bump	☒	IEC Publication No. 512-4	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
	Press-Out connectros from PCB	☒		2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	To be able to perform voltage proof between each contacts and shells without risk of PCB electrical breakdown, press-fit connectors have been pressed-out from PCB.
	Climatic sequence	☒	ESCC 3401 Para. 9.13	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	Note that voltage proof current test at low air pressure has been performed only between the daisy chain of contacts and the D-sub shells.
	Seal	☐	ESCC 3401 Para. 9.9	-	-	-	Not performed - as agreed
	Plating thickness	☐	ESCC 3401 Para. 5.2.3	-	-	-	Not performed - as agreed
	Joint strength	☒	ESCC 3401 Para. 9.15	2345 2345 2347 2328 2346 2343 2347 2341	1 1 1 1 1 1 1 1	0	
Subgroup II	Wiring	☒	ESCC 3401 Para. 9.10	2011 1951 2006 2003 2005 2010 1951 2007	1 1 1 1 1 1 1 1	0	
	Rapid change of temperature	☒	ESCC 3401 Para. 9.16	2011 1951 2006 2003 2005	1 1 1 1 1	0	

				2010 1951 2007	1 1 1		
Additional testing	Contact resistance	☒	NF EN 60352-5, §5.2.3.1	2011 1951 2006 2003 2005 2010 1951 2007	1 1 1 1 1 1 1 1	0	
	Contact retention	☒	ESCC 3401 Para. 9.17	2011 1951 2006 2003 2005 2010 1951 2007	1 1 1 1 1 1 1 1	0	
	Endurance	☒	ESCC 3401 Para. 9.18	2011 1951 2006 2003 2005 2010 1951 2007	1 1 1 1 1 1 1 1	0	
	Permanence of marking	☒	ESCC 24800	-	-	-	Not performed - as agreed
	Seal	☐	ESCC 3401 Para. 9.9	-	-	-	Not performed - as agreed
	Joint strength	☒	ESCC 3401 Para. 9.15	2011 1951 2006 2003 2005 2010 1951 2007	1 1 1 1 1 1 1 1	0	
Additional testing	DPA	☒	ESCC21001	2011 2003 2010 2007	1 1 1 1	0	
Subgroup III	Wiring	☒	ESCC 3401 Para. 9.10	2347 2345 2347 2328 2346 2343 2347 2347	1 1 1 1 1 1 1 1	0	
	Mating / Unmating forces	☒	ESCC 3401 Para. 9.20	2347 2345 2347 2328 2346 2343 2347 2347	1 1 1 1 1 1 1 1	0	
	High temperature storage	☒	ESCC 3401 Para. 9.21	2347 2345 2347	1 1 1	0	

				2328 2346 2343 2347 2347	1 1 1 1 1		
	Corrosion	☒	IEC Publication No. 68-2-11	2347 2345 2347 2328 2346 2343 2347 2347	1 1 1 1 1 1 1 1	0	
Additional testing	Contact resistance Press-Fit	☒	NF EN 60352-5, §5.2.3.1	2347 2345 2347 2328 2346 2343 2347 2347	1 1 1 1 1 1 1 1	0	
	Insert retention	☒	ESCC 3401 Para. 9.23	2347 2345 2347 2328 2346 2343 2347 2347	1 1 1 1 1 1 1 1	0	
	Jackscrew retention	☐	ESCC 3401 Para. 9.24	-	-	-	Not performed - as agreed
	Seal	☐	ESCC 3401 Para. 9.9	-	-	-	Not performed - as agreed
Additional testing	DPA	☒	ESCC21001	2347 2345 2347 2328 2346 2343 2347 2347	1 1 1 1 1 1 1 1	0	
Subgroup IV	Wiring	☒	ESCC 3401 Para. 9.10	2011 1951 2005 2010 1951 2007 2026 2003	1 1 1 1 1 1 1 1	0	
	High temperature measurement	☒	ESCC 3401 Para. 9.25	2011 1951 2005 2010 1951 2007 2026 2003	1 1 1 1 1 1 1 1	0	
	Overload test	☒	ESCC 3401 Para. 9.26	2011 1951 2005 2010 1951 2007	1 1 1 1 1 1	0	

				2026 2003	1 1		
	Maintenance aging	☒	ESCC 3401 Para. 9.27	2011 1951 2005 2010 1951 2007 2026 2003	1 1 1 1 1 1 1 1	0	
	Joint strength	☒	ESCC 3401 Para. 9.15	2011 1951 2005 2010 1951 2007 2026 2003	1 1 1 1 1 1 1 1	0	
Subgroup V	Engagement / Separation forces	☒	ESCC 3401 Para. 9.28	2002	60	0	
	Oversize pin Excursion	☒	ESCC 3401 Para. 9.29	2002	60	0	
	Probe damage	☒	IEC Publication No. 512-8	2002	60	0	
	Plating thickness	☒	ESCC 3401 Para. 5.2.3	2002	60	0	

NOTES ON THE COMPLETION OF THE APPLICATION FORM FOR ESCC QUALIFICATION APPROVAL

ENTRIES

Form Heading	shall indicate:— the title of the component as given in its detail specification or the name of the series or family; — the entering date; — the serial number and the suffix of the form.
Box 1	shall provide details given in table; in particular there shall be listed - the variants or range of variants; the range of components by using the ESCC code for values tolerances, etc.; the designation given in detail specification as 'based on'; ---under Test Vehicle enter either a cross or the specific characteristic capable to identify the component tested; — under component similar enter a cross.
Box 2 and 3	Manufacturer's name and location of plant where the components were manufactured and tested.
Box 4	Generic and detail specifications used during qualification program.
Box 5	Reference to test report(s) submitted in support of application.
Box 6	Enter details to identify the PID that was applicable at the time the qualification lot was manufactured.
Box 7	If the PID was evolved after qualification lot manufacture, adequate details of such evolution shall be provided together with reasons for changes. Major changes shall be clearly marked.
Box 8	The box serves to identify the current PID and the Executive Representative that has verified it together with the date of this occurrence.
Box 9	This box can be completed only after a physical visit to the plant to confirm that the practices, procedures, materials, etc. used in manufacturing the components are as described in the PID. This survey shall be carried out in accordance with the requirements of ESCC Basic Specification No. 20200 and its findings shall be recorded.
Box 10	Details entered shall be sufficient to evidence that an evaluation program according to ESCC Basic Specification No. 22600 has been performed and that the results thereof are summarized in the survey and test reports. If the evaluation program has not been carried out according to established ESCC documents, the applicant Executive Representative shall provide alternative data and declare its assessed degree of satisfactory compliance with the ESCC basic requirements. Reference shall be made to the reports on Destructive Physical Analysis (DPA), Failure Analysis and Non conformance (NCCS) issued during the Evaluation and/or Qualification Phase.
Box 11	Enter the name of the Executive Coordinator and the signature.
Box 12	To be used when there is a need to expand any of the boxes from 1 through 10. Identify box affected and reference the Box 12 in the relevant Box. Box 12 can be broken into 12a, 12b, etc. if several Boxes have to be expanded.
Box 13	Fill table as requested.
Box 14	Fill in any additional tasks required to achieve full compliance.
Box 15	All Executive recommendations on the application itself, special conditions or restrictions, modifications of the QPL or ESCC QML entry, letters to the manufacturer, etc. shall be entered clearly in Box 15, signed by the ESA Representative.
Box 16	Fill in Table as requested.
Box 17	Confidential details of PID changes shall be provided.
Box 18	State noncompliance with reference to specification(s) and paragraph(s). To simplify reference in Box 18 each nonconformance shall be sequentially numbered. If relevant state 'None'
Box 19	Any additional action deemed necessary by the Executive Representative to bring the submitted data to a standard likely to be accepted by the ESCC Executive should be listed herein or the reason(s) to accept the nonconformance.
Box 20	Additional Comments