

		APPLICATION FOR ESCC QUALIFICATION APPROVAL			Page 1
Component Title: RESISTORS, HEATERS, FLEXIBLE, SINGLE LAYERBASED ON TYPE HFF according to ESCC Det. Spec.4009/006		Executive Member: German Space Agency at DLR			Date: 22/07/2026
					Appl. No. 396
Components (including series and families) submitted for Qualification Approval					1
ESCC COMPONENT NO.	VARIANTS	RANGE OF COMPONENTS	BASED ON	TEST VEHICLE / S	COMPONENT SIMILAR
4009/006	03	Variant 01 to 03	HFF	400900603I167416	Var 01, 02
4009/006	05	Variant 04 and 05	HFF	400900605I168336	Var 04
4009/006	03	Variant 01 to 03	HFF	400900603I169118	Var 01, 02
Component Manufacturer Isabellenhütte Heusler GmbH & Co. KG		Location of Manufacturing Plant Eibacher Weg 3-5 34683 Dillenburg Germany		ESCC Specification used for Qualification Generic: 4009 Issue: 8 Detail/s: 4009/006 Issue: draft	
Qualification Report Reference and date: Chart IV-HFF-20R-GS4009-Qualifizierung Chart IV-HFF-180R-GS4009-Qualifizierung Chart IV-HFF-200R-GS4009-Qualifizierung Date: 10/03/2026			PID used for manufacturing Qualification Lot Ref No: D QS 0026 Issue: draft Date: 18/12/2025		
PID changes since start of qualification None ☐ Minor* ☒ Major* ☐ (* Details not published, provided in confidential annex 2.)			Current PID Verified by Burak Gökgöz, German Space Agency at DLR Name of Executive Representative Ref No: D QS 0026 Issue: 1 Date: 20.07.2026		
Current Manufacturing facilities surveyed by: Burak Gökgöz, German Space Agency at DLR					9
(Name of Executive Responsible) ISA-AUD-DLR-05-2026 Issue 1 (Date: 22.05.2026)					
Report Reference Satisfactory: Yes ☒ No ☐ Explain					
Quality and Reliability Data Evaluation testing performed Yes ☒ No ☐ Report Ref. No.: - EvalTestReport_D-EW-TL-186_ESCC_Evaluation_HFF_WHB-200R0, 11.05.2026 - EvalTestReport_D-EW-TL-186_ESCC_Evaluation_HFF_WHA-14R73 incl. heat sink, 11.05.2026 Equivalent Data: - Overload_test_on optically defective heating foils_B_014706, 21.01.2026 - IR-inspection no_B_014706_discoloration, 09.06.2026 - Construction analysis, ESA-TECEDR-LAB-TR-2026-001034, 02.06.2026 Certification:			Failure analysis, DPA, NCCS Yes ☒ No ☒ available (supply data) ESA Construction Analysis Report: SA-TECEDR-LAB-TR-2026-001034, dated 02/06/2026 Ref Nos. and purpose:		
					10



APPLICATION FOR ESCC QUALIFICATION APPROVAL

Page 2

Component Title: RESISTORS, HEATERS, FLEXIBLE, SINGLE LAYERBASED ON
TYPE HFF according to ESCC Det. Spec.4009/006

Appl. No.

Executive Member: German Space Agency at DLR

Date: 22/07/2026

396

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.

11

Date: 07/08/2026

Burak gökgöz
DLR

Digital signiert von Burak Goekgoez
DN: C=DE, CN=Burak Goekgoez, GN=Burak,
L=Koeln, O=Deutsches Zentrum fuer Luft- und
Raumfahrt e. V., SN=Goekgoez, ST=
Nordrhein-Westfalen, E=burak.goekgoez@
dlr.de, organizationIdentifier=VATDE-
121965658
Grund: Ich bin der Verfasser dieses
Dokuments
Ort: Bonn
Datum: 2026.08.07 11:42:23+02'00'

i.A. Burak Gökgöz

(Signature of the Executive Coordinator)

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

12

**APPLICATION FOR ESCC QUALIFICATION APPROVAL**Component Title: RESISTORS, HEATERS, FLEXIBLE, SINGLE LAYERBASED ON
TYPE HFF according to ESCC Det. Spec.4009/006

Executive Member: German Space Agency at DLR

Date: 22/07/2026

Page 3

Appl. No.

396

Non compliance to ESCC requirements:

13

No.:	Specification	Paragraph	Non compliance

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

14

Executive Manager Disposition

15

Application Approval: Yes ☒ No ☐

Action / Remarks:

Date: 31/08/2026

A. Zadeh: Head of the Avionics and EEE Division

**APPLICATION FOR ESCC QUALIFICATION APPROVAL**Component Title: RESISTORS, HEATERS, FLEXIBLE, SINGLE LAYERBASED ON
TYPE HFF according to ESCC Det. Spec.4009/006

Executive Member: German Space Agency at DLR Date: 22/07/2026

Page 4

Appl. No.

396

ANNEX 1: LIST OF TESTS DONE TO SUPPORT QUALIFICATION

16

Tests conducted in compliance with:

- ESCC 4009 generic specification; Chart F4 (for ESCC/QPL parts);
- Or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

400900603I167416, DC2527	400900603I169118, DC2527
400900605I168336, DC2525	

Detail Specification reference: ESCC4009/006

Chart F4	Test	Tick when done	Conditions	Date Code	Tested Qty	N° of Rejects	Comments if not performed. Comments on Rejection
Environmental/ Mechanical Subgroup	Robustness of Terminations	☒	IEC 60068-2-21	all	3 x 5		
	Climatic Sequence	☒	ESCC 4009, Para. 8.7	all	3 x 5		
	External Visual Inspection	☒	ESCC 20500	all	3 x 5		
Endurance Subgroup	Operating Life	☒	ESCC 4009, Para. 8.8	all	3 x 5		
	External Visual Inspection	☒	ESCC 20500	all	3 x 5		
	Permanence of marking	☒	ESCC 24800	all	3 x 5		
Additional tests		☐					
		☐					
		☐					

**APPLICATION FOR ESCC QUALIFICATION APPROVAL**

Component Title: RESISTORS, HEATERS, FLEXIBLE, SINGLE LAYERBASED ON
TYPE HFF according to ESCC Det. Spec.4009/006

Executive Member: German Space Agency at DLR

Date: 22/07/2026

Page 6

Appl. No.

396

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