

Guideline

Guideline for First Article Inspection by Suppliers of HENSOLDT Group

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Area of Application: HENSOLDT Optronics GmbH, HENSOLDT Sensors GmbH



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1 General

1.1 Aim & Purpose

The purpose of this Guideline is to support a smooth handling of the First Article Inspection (FAI) process of components between HENSOLDT and its suppliers. This Guideline applies to all suppliers of:

- Production materials
- Series and replacement parts
- Components
- Assemblies
- Subassemblies and individual parts
- Castings
- Forgings and modifications to standard catalogue or commercial off-the-shelf (COTS) units

The requirements set out herein have been taken over from the applicable quality standards in line with [RD01] VDA Band 2 Sicherung der Qualität von Lieferungen - Produktionsprozess und Produktfreigabe (PPF).

In the context of an FAI process, the supplier provides proof that their products comply with HENSOLDT's quality requirements.

1.2 Scope of Application

This document is applicable for HENSOLDT Sensors GmbH and HENSOLDT Optronics GmbH.



2 Definitions

2.1 Guideline

A guideline contains a set of instructions on how to perform a task and this Guideline provides supportive guidance for an initial FAI process. Please note that a Guideline does not replace applicable standards and directives but is to be understood exclusively as an auxiliary tool for a smooth initial sampling of components. This Guideline applies to any type of sampling commissioned by HENSOLDT. Any deviations from this Guideline must be agreed with HENSOLDT.

2.2 Samples

Samples are first articles of products on which tests are performed to determine whether they meet the specified requirements. A differentiation is made between "samples for production process and product release" and "other samples".

2.3 Samples for production process and product release

Samples for production process and product release are products and materials which have been manufactured entirely under series-production conditions.

These samples which are intended for inspections, test and shipment to the customer, should be taken as a random sample from a production made under series conditions. The batch size must be agreed between the customer and the supplier by taking into account the product type and product process. The same applies to the number of samples to be taken and the number of samples to be delivered.

2.4 Other samples

Other samples (DIN 55350, part 15) are products and materials which have not been manufactured entirely under series-production conditions. Other samples must not be used for initial sample release. Such samples can be used for customer-ready products if they meet the specifications. The release of "other samples" does not at the same time mean the release for series production and does not constitute a waiver of the initial sample release procedure.

2.5 **Pre-series samples**

Pre-series samples come from small-series tools or near-series systems that ensure a process-reliable production. The manufacturing process used also corresponds to the later series production. As a safeguard for the series start-up phase, the parts can be used for installation in pre-series products both in terms of quality and due to the quantities produced and can therefore also be sampled.

2.6 First Article Inspection (FAI)

A first article inspection is a planned, complete, independent and documented inspection and verification process to ensure that the prescribed production processes were used to manufacture a product that is in accordance with the technical drawings, digital product definition (DPD), planning, order, technical specifications and/or any other applicable design document.

2.7 Production process and product release

Product process and product release is a procedure for sampling series parts. The objective is to ensure the quality of the parts supplied, which means that the parts from the series tools or series processes must comply with the general requirements or specification.

All sampling processes have one thing in common: the classification according to different levels (presentation levels) of sampling which need to be agreed with the customer when a sampling request is made.



The following 5 stages apply to the production process and product release:

- Level 1
 - The customer is only presented with the cover sheet of the First Article Inspection Report.
- Level 2

The customer is presented with the cover sheet of the First Article Inspection Report, including sample parts and limited supporting data.

• Level 3

The customer is presented with the cover sheet of the First Article Inspection Report, sample parts and comprehensive supporting data.

• Level 4

The cover sheet of the First Article Inspection Report and other requirements as specified by the customer.

• Level 5

The cover sheet of the First Article Inspection Report with sample parts and complete supporting data are available for an evaluation at the supplier's production site.

Then, different inspections will be specified that allow for a statement as to whether the parts meet the requirements, need to be reworked or even "manufactured" from the supplier's point of view.

3 First Article Inspection

3.1 Triggering for First Article Inspection

First Article Inspection is used for new parts, technical changes (delta FAI) to products and changes to production processes.

Examples:

- delivery of a new part, design, specification or material changes, changes in substance bans, emission limits, labelling regulations, etc.
- use of alternative materials or designs
- use of new, modified or replacement tools
- change of manufacturing methods or production processes
- relocation of production to other locations or use of new production facilities
- shifting the production processes to the supplier
- change of major subcontractors
- delivery after a delivery stop caused by quality issues
- shutdown of production facilities for 24 months or longer (apart from pure spare parts production). In case of doubt, the necessity of a first article inspection to be discussed between HENSOLDT and the supplier.

3.2 Dealing with deviations

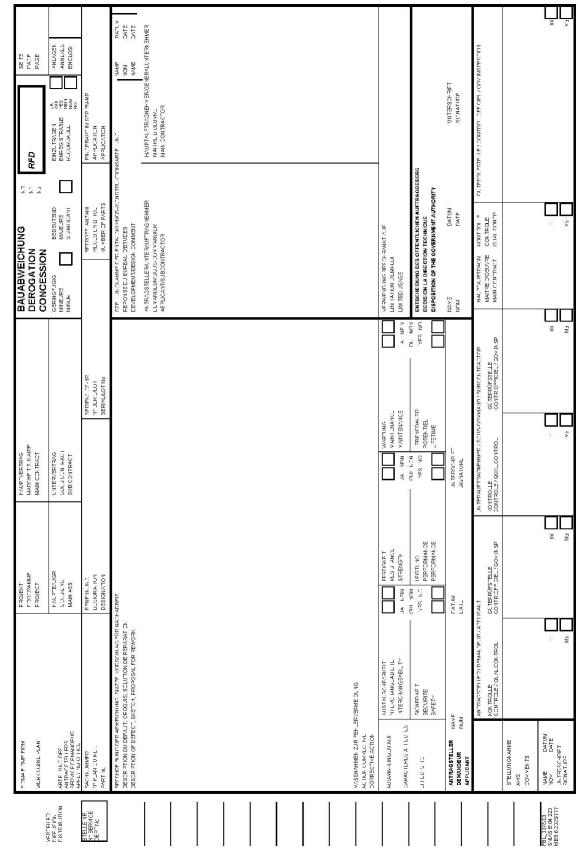
If the supplier finds any deviations from the target specifications during the initial FAI, HENSOLDT must be informed immediately after becoming aware of the deviations, however in any case before the delivery of the goods. In such cases, the goods may only be delivered with a special release issued by HENSOLDT (see Figures 1 and 2). The supplier must request such a special release from HENSOLDT. Contact for special releases is the quality manager responsible for the supplier.



Supplier Waiver Lieferanten Bauabwei	Vaiver n Baua		chung						Det	HENSOLDJ	ζ <u>Ω</u>	
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Sach Nr. (Thz), Part (drawing) No.	ting) No.		Heisteller Manufachuer	indadurer	Erz Stand/Revision							
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Wartung/ Maintenance	JaYres Nein/No	Dokumentation/ Documentation	JaYes	Nein/No Andere/ Other	JaYres NehnRo	Wartung/ Maintenance	la/ves NeinNo	Dokumentation ¹ a	JaYres NeinNo		JaYes ∧	NeinNo
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Datum / Date						Datum/ Date						
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Figure 1Example 1 – Design Deviation Form





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Figure 2 Example 2 – Design Deviation Form



3.3 Delivering initial FAI samples

- a) Each delivery of initial FAI samples must be accompanied by a delivery note stating all order data. The delivery note and the packaging must be clearly marked as "INITIAL SAMPLE".
- b) 3 sample parts must be supplied as a rule.
- c) The initial FAI sample delivery must be accompanied by the required documents:
 - FAIR;
 - Inspection results;
 - COC;
 - Factory test certificate according to DIN EN 10204 3.1
- d) If the initial FAI samples come without any parts or documents or if only incomplete FAIR documents are enclosed, we reserve the right to reject the sampling.
- a. Dealing with missing parts:

The FAIR is rejected on the cover sheet and sent to the supplier by email.

b. Dealing with missing documentation:

The supplier will be informed about the non-acceptance of the FAIR by email and must submit the missing documentation by the date requested by HENSOLDT.

A new complete initial FAI process has to be carried out in both cases (a. and b.).

3.4 Preconditions – checklist before performing the Initial FAI

The preconditions (see Annex, page 18) must be evaluated, checked and documented before performing the FAI.

Each inspection criterion will be checked individually, and the result will be documented in full with the information obtained in this checklist and/or a supplementary First Article Inspection Report (FAIR).

3.5 Performing Initial FAI

The supplier will carry out the FAI inspections ordered by HENSOLDT on the basis of the agreed drawings and specifications.

As a rule, all ordered sample parts must be fully inspected and clearly identified (note regarding identification data, serial number in the test protocol) in order to ensure an allocation to the individual measured values.

The identification must be made to ensure that it cannot be blurred or lost during transport and handling of the parts.

Prior to verification, the entire configuration (hardware, software, firmware) of the sample part, where applicable, and the test environment needs to be compared with the requirements and documented.

The supplier must use the test equipment and test methods that allow them to inspect the parts and assemblies from in-house and third-party manufacturing for compliance with the specified documentation (customer requirements, technical, functional and all non-technical requirements).

Documented test instructions and test report, including test equipment used must be specified. Inspection software or equipment must be suitable, validated and approved.

Any inspection processes deviating from the specifications must be agreed with the quality manager of HENSOLDT responsible for the supplier in due time in advance.

If the FAI requires special testing equipment which is not available to the supplier, they must commission a suitable, reliable and independent other testing body in good time.

The responsibility remains with the supplier in any case.

In case of single or multiple tools, care must be taken during FAI that samples from all nests are taken into account and are clearly identified (3 parts per nest) to ensure an allocation to the individually measured values.

All measured values of each sample must be listed.

The supplier is generally obliged to carry out internal releases, to document them and to make them available for inspection.



4 First Article Inspection Report (FAIR)

A First Article Inspection Report will be prepared according to the customers specifications. Such inspection verifies whether the part to be inspected corresponds to the requirements pursuant to the applicable documents (delivery specification, drawing, etc.) and whether the target characteristics defined therein are met. In order to determine that, the previously agreed number of pieces from the affected delivery will be tested and the results will be recorded in the First Article Inspection Report. It will not be inspected whether it is suitable to fulfil the requirements of the specifications. The purpose is to avoid errors in series production from the start. If the affected product is produced again, it must be done under consistent conditions and based on this initial sample.

- The First Article Inspection Report (FAIR) consists of a cover sheet and the inspection result data sheets agreed between HENSOLDT and the supplier as well other required documents.
- Initial FAI samples must be delivered accompanied by a complete documentation.
- The customer will inform the supplier of any additional documentation requirements.
- The scope of the documentation depends on the presentation level selected by HENSOLDT for the supplier (based on VDA Volume 2).
- Information must be provided on what is being inspected (individual part or assembly), what type of FAI (initial FAI or subsequent FAI) and what triggered the FAI.

4.1 Notes to the First Article Inspection Report

Normally, the HENSOLDT cover sheet "FAI Report template" must be used.

The cover sheet to the FAIR must state, inter alia (see Figure 3, page 15).

- reason for FAI;
- tool number, if any;
- number of nests (for tools);
- statement of the change status, incl. date and HENSOLDT change number under "supplier notes" a description of which changes have been realised;
- a tool test certificate (DIN EN 10204) shall be attached to the FAIR, if possible, otherwise the material must be listed in the FAIR (note: tool test results are part of the FAIR);
- the drawing used as basis for the First Article Inspection shall be attached to the FAIR;
- the weights of sample parts must be listed in the FAIR, even though no target value or tolerance range have been defined for them.

4.2 Preparation of a First Article Inspection Report

The supplier will prepare a corresponding FAIR of each sampling, which must be fully completed.

The form provided by HENSOLDT or a form structured accordingly by the supplier will constitute the formal template for the cover sheet. The complete FAIR documents approved by the supplier must be enclosed in the delivery. In order to ensure the allocability to the cover sheet, the inspection result sheet (see Figure 4, page 16) contains the decisive identification data of the samples and detailed test results of all characteristics, separately according to:

a) Appendices

The following appendiced inspections are involved:

- Dimensional Check
- Material Test
- Visual Test
- EMV Test
- Reliability Test / environmental test
- Visual inspection
- Characteristics Test (good/bad)



b) Product-related test results.

In case of a complete new FAI, all properties need to be included according to the drawing specification. This obligation shall also apply if devices or similar will be provided.

- c) Test Report Number
 - Subject number
 - Drawing number
 - Status / date
 - Change number, for changes only
 - Designation
 - Order call off no. / date
- d) Delivery note no. / date
 - Delivery quantity
 - Batch number
- e) Confirmation supplier
 - Name
 - Department
 - Telephone / Fax / email
- f) Drawing specifications;
 - a) All drawing characteristics are to be provided with position numbers which must correspond to the respective positions (reference number) set out in the appendix (measurement result sheet, material report, functional report, etc.) of the First Article Inspection Report.
 - b) If parts are manufactured in multiple tools or moulds, a corresponding nest marking is required in the FAIR. A minimum of 3 parts from each nest must be subjected to the FAI inspection.
- g) The documentation and the annexes must be clearly legible and assignable.



111		Quality assurance
HENSOLDT		ver Sheet
Detect and Protect.	Co	
Sender		Initial sample inspection report VDA Initial sample inspection English
		Subsequent sample inspection Subsequent sample inspection New Part
		Product modification
		Production relocation
		Change of production process
Address		Longer stoppage of production
		New sub-supplier
		Product with DwSpA
		Production / Inspection and Test Plan prepared
		FMEA finished
		inspection report, other samples
		opendices
	09 EMV Test	17 Inspection and Test Equipment List
	10 Reliability Test	18 Evidence of Inspection and Test Equipment Capab
	11 Design - FMEA	19 EU-Data Safety Sheet
	12 Design Release 13 Process FMEA	20 Material data sheet IMDS
	13 Process FMEA 14 Process Flow Chart	
	15 Control Plan	
	16 Process Capability E	
Code number, supplier: Inspection report No.:	Revision:	Code number, customer: Inspection report No.: Revision:
Part No.:	Revision:	Inspection report No.: Revision:
Drawing Number:		Drawing Number:
Status / Date:		Status / Date:
Modification Number:		Modifikation Number:
		Part description:
Part description:		Fait description.
Order Call-off No./Date:		
· ·		Incoming Goods No./ Date
Order Call-off No./Date:		
Order Call-off No./Date: Delivery Note No./ Date: Quantity delivered: Charge Number:		Incoming Goods No./ Date
Order Call-off No./Date: Delivery Note No./ Date: Quantity delivered:		Incoming Goods No./ Date
Order Call-off No./Date: Delivery Note No./ Date: Quantity delivered: Charge Number:		Incoming Goods No./ Date
Order Call-off No./Date: Delivery Note No./ Date: Quantity delivered: Charge Number: Sample Weight	according to VDA Vol	Incoming Goods No./ Date Delivery Destination:
Order Call-off No./Date: Delivery Note No./ Date: Quantity delivered: Charge Number: Sample Weight	according to VDA Vol	Incoming Goods No./ Date Delivery Destination:
Order Call-off No./Date: Delivery Note No./ Date: Quantity delivered: Charge Number: Sample Weight Supplier Confirmation It is hereby confirmed, that the sampling has been carried out Name: Department:	according to VDA Vol	Incoming Goods No./ Date Delivery Destination:
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Figure 3 – Cover Sheet of FAIR according VDA – FAI Template



				Qual	itätss	icher	ung		
HENSOLDT	Τ ε	est resi	ults	1	1 1 1	1	1		1 1
Detect and Protect.									
Appendices			Initial	sample	inspectio	n report `	VDA		
01 Dimensional Check 02 Functional Test			Initial	sample ir	nspection				
03 Material Test			re-sar	npling					
04 Haptics 05 Acoustics			New F	Part					
06 Odors			Produ	ct modifie	cation				
07 Appearance				ction trar					
08 Surface Check 09 EMV Test					•	on procedu	lres		
10 Reliability Test				productio					
11 Design - FMEA				ubcontra					
12 Design Release				ct with D	•				
14 Process Flow Chart						and Test F	lan prepar	red	
15 Control Plan				carried					
16 Peocess Capability Evidence 17 Inspection and Test Equipment List			Test I	Report o	ther sam	ples			
18 Evidance of Inspection and Test Equipment Ca	apability								
F19 EU-Data Safety Sheet									
20 Material data sheet IMDS 21 Packaging									
22 Certificate									
23 Process acceptance									
24 Others									
Identification No. Supplier:			Identif	ication N	lo. Custon	nor:			
Test Report No.:	Revision			eport No			Re	vision	
Subject/Drawing/Revision No./ Status/Date:						Status/Date:			
Designation:			Designa	ation:					
Ref. Requirements				IS	T-value supp	1			uation
			Designa		T-value supp value 3	olier value 4	value 5	evalı ok	1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements	·····			IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements				IS		1	value 5		1
Ref. Requirements Nr.				IS value 2	value 3	1	value 5		1
Ref. Requirements				IS value 2	value 3	1	value 5		
Ref. Requirements Nr.			Desici	IS value 2	value 3	1	value 5		1
Ref. Requirements Nr.			Desici releas	value 2	value 3	1	value 5		1
Ref. Requirements Nr.			Desici releas	value 2	value 3	1	value 5		1
Ref. Requirements Nr.			Desici releas Speciareject, I Name:	IS value 2	value 3	1	value 5		1
Ref. Requirements Nr.			Desici releas Speciareject, I Name:	value 2	value 3	1	value 5		1
Ref. Requirements Nr.			Desici releas Speciareject, I Name:	IS value 2	value 3	1	value 5		1

Figure 4 – Example of a Dimension Table – FAI Template

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4.3 Stamped Drawing

A stamped drawing serves as the basis for the product-related inspection results. It is important, here, that all product characteristics, such as dimensions up to standards or specifications as well as product requirements set out in writing (pore definition, surface definition, identification of the casting, etc.) are stamped.

Such stamping serves as numbering and furthermore ensures a unique allocation of the product-related results.

All characteristics are to be clearly marked by consecutively numbered position numbers on the current HENSOLDT drawings (see Figure 5) or by indicating the drawing coordinates, and individually by stating the nominal value, limit value and actual values. The limit values also include general or free dimension tolerances.

The actual values are to be assigned to the individual sample parts:

Application example

The drawing highlights the most important functions of the automatic feature recognition which need to be numbered clockwise from top left to bottom right.

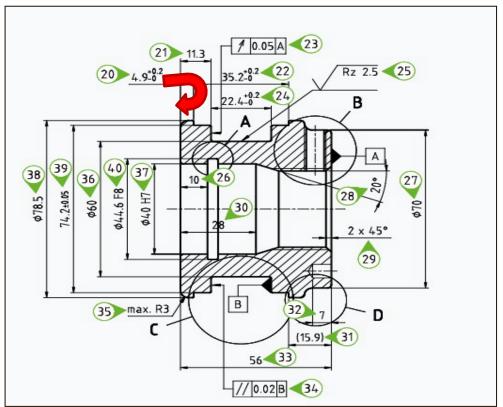


Figure 5 - Example drawing with position numbers in clockwise direction



A minimum of 30 parts need to be measured for a machine capability

Statistical characteristics, such as e.g. mean value, dispersion and process capability indicators for contractually agreed characteristics or characteristics identified in the drawing (see Figure 6) need to be mentioned.

test!

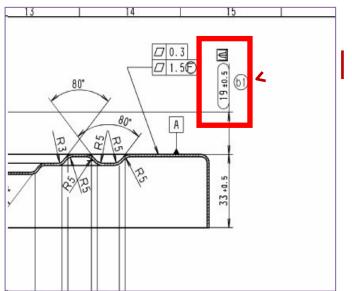


Figure 6 - Section of drawing with dimensions

Form and position tolerances to be determined from the drawing (see Figure 5):

- 1) Determination of tolerated characteristics
- Take over the upper and lower tolerance from the drawing (pos. 20; 22; 24; 39)
- 2) Tolerance tables for dimensions without tolerance specifications
 - Open intersections for tolerance tables (pos. 21)
- 3) Form and position tolerances
 - Determination of the tolerance value (pos. 23)
- 4) Surfaces
 - Determination of surface parameters for borehole (pos. 25)
- 5) Angle dimensions
 - Separate tolerance tables for angles (pos. 28; 29)
- 6) Fit
 - Resolving the fit (e.g. pos. 37 H7) to upper and lower tolerance
- 7) Dimensions with min. / max. specifications
 - Determination with or without assignment of the upper and lower tolerance (pos. 35)
- 8) Auxiliary dimensions
 - Auxiliary dimensions can be ignored during the determination
 - Determination optionally with or without assignment of the general tolerances (pos. 31)
- 9) Stamping of views
 - Clockwise stamping
 - Separate number ranges per view
- Note
- <u>References to standards or specifications must be stamped individually.</u> The stamp number of a standard may have several sub-items in the listing of test results.
- <u>Geometric characteristics</u> must be stamped clockwise (see red arrow in the drawing Figure 5, example position numbers: 20; 21; 22; 23, und 24).
- <u>Actual values</u> that are <u>outside</u> the tolerance must be identified in the inspection report (see Figure 4) and a corresponding Design Deviation Form must be created. The fully completed First Article Inspection Reports, including any required verification documents need to be provided to HENSOLDT in writing or on a data carrier. The cover sheet of the report needs to be signed by the quality manager responsible for the supplier and must be enclosed with the clearly marked initial samples.

All copies are uncontrolled.



5 References

5.1 Applicable documents

The following publications form a part of this document to the extent specified herein. In case no version is quoted for a document the current version is deemed to apply. When a version is quoted, this version shall be used.

[AD01]	Produktfreigabe (I	uality Assurance for Supplies - Production Process and
[AD02]	DIN EN 55350, pa	art 15 Other samples
[AD03]	DIN EN 10204	Metallic products – Types of inspection documents
[AD04]	DIN EN 9102 Requirements	Aerospace series – Quality Systems – First Article Inspection
[AD05]		pspace series – Requirements for advance product quality planning and rt approval process

5.2 Reference documents

The following publications contain further input and background information relating the subject addressed. In case no version is quoted for a document the current version is deemed to apply. When a version is quoted, this version shall be used.

[RD01] HMS-D-11782.....Supplier FAI Report Template



5.3 Definition of Terms

The terms and definitions established for the Business Management System are listed in the common "BMS Glossary". The following terms are specific to this document.

Term	Explanation
Commercial-Off-The-Shelf	Commercially available products
FAI	First Article Inspection
FAIR	First Article Inspection Report
COC	Certificate of Conformity

5.4 Abbreviations

Abbreviation	Term
COTS	Commercial-Off-The-Shelf
DPD	Digital product definition
EMPB	Initial Sample Inspection Report
FAI	First Article Inspection
FAIR	First Article Inspection Report

5.5 Record of Revisions

Version	Brief description of Change	Pages/Chapter	Date
1.0	Initial Version	All	22.03.2023
1.1	Adjustement layout in header for external use.	All	28.03.2023



6 Annex

6.1 Checklist preconditions for FAI

Item number:_____

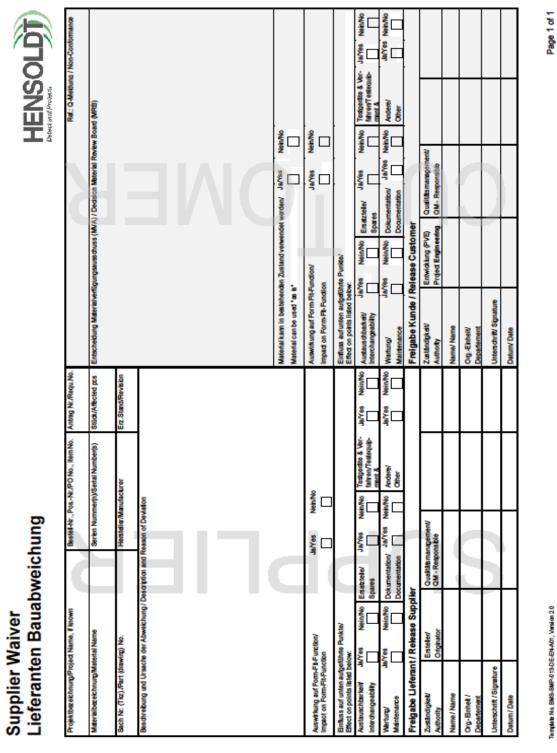
Revision status:

Order number: _____

No.	Preconditions for FAI	Status
1	Structure overview (tree structure)	
2	Design specifications (drawings, parts lists, circuit diagrams, delivery specifications, etc.)	
3	As-built list (actual configuration)	
4	To-build list (target configuration)	
5	Delta list (configuration deviating from the specifications)	
6	Open change requests	
7	List of loaded software (SCI)	
8	List of loaded firmware	
9	List of production processes	
10	Completed work plans	
11	List of the test equipment used with proof of calibration	
12	Validation protocols of special test equipment (e.g. inspection software)	
13	Test specifications	
14	Completed inspection protocols	
15	Packaging and delivery documentation	
16	Documents of the development process (specification, architecture, etc.)	
17	Review protocols (PDR, CDR, document reviews, etc.)	
18	Evidence file (test records, etc.)	
19	Safety file (inspection records, declarations of conformity, etc.)	
20	Error messages and special releases	
21	Audit reports	

Company:_____

Reviewed by:_____



6.2 **Template Deviation Form for Suppliers – HENSOLDT Sensors GmbH**

Template No. BMS-SMP-013-DE-EN-A01, Version 2.0





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6.3 Template Deviation Form for Suppliers – HENSOLDT Optronics GmbH

SCHUTZVERMERK ISO 16016 / COPYRIGHT RESERVED



6.4 VDA Cover Sheet – First Article Inspection Report

Note: Edit in [RD01] HMS-D-11782.....Supplier FAI Report Template Title of Document.

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07 Aussehensprüfung	15	Control Plan							23	Proce	ss ac	cepta	nce							
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Template No. BMS-SMP-047-EN-DE, Version 1.0



6.5 Template – Inspection Report Sheet 1

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6.6 Template continued – Inspection Report Sheet 2

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Template No. BMS-SMP-047-EN-DE, Version 1.0