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Table of Contents

1	Introduction.....	6
2	Related Documentation	7
2.1	Input documents	7
2.2	Related standards and norms	7
3	Overview of AUTOSAR Conformance Testing.....	8
4	Basic Conditions.....	10
4.1	Product under Test	10
4.2	Conformance Test Suite CTS (test implementation)	10
4.2.1	Allocation of Conformance Test Specifications	11
4.2.2	Setup of Conformance Test Suite	11
4.2.3	Maintenance of Conformance Test Suite	11
4.3	Process - Conformance Test Failed.....	12
4.4	AUTOSAR Label.....	13
4.5	Conformance Attestation Validity	13
5	Third Party Conformance Test Procedures (Path A)	14
5.1	Conformance Test Roles and Responsibilities.....	14
5.2	Conformance Test Process Overview.....	17
5.2.1	Test Setup of CTS and Maintenance	17
5.2.2	Purchase of service and Licensing	17
5.2.3	Product Report.....	17
5.2.4	Conformance Test Execution	18
5.2.5	Test Report and Test Results	18
5.2.6	Attestation of conformance (third party attestation).....	18
5.2.7	Support of standard maintenance	19
5.2.8	Feedback to the AUTOSAR organization.....	19
5.3	Support	20
5.3.1	AUTOSAR support to CTA.....	20
5.3.2	CTA support to PS	20
6	First party Conformance Test Procedures (Paths B and C)	21
6.1	Self Conformance Test Roles and Responsibilities	21
6.1.1	Path B: Roles and Responsibilities	21
6.1.2	Path C: Roles and Responsibilities	23
6.2	Self Conformance Test Process Overview.....	24
6.2.1	Path B: Process Overview	24
6.2.2	Path C: Process Overview	24
6.2.3	Test Report and Test Results	25
6.2.4	Self attestation of conformance (first party attestation)	25
6.2.5	Support of standard maintenance	26
6.2.6	Feedback to the AUTOSAR organization.....	26
6.3	AUTOSAR support to CTA.....	26
Annex A	Requirements traceability.....	27

Annex B	Product report template.....	28
Annex C	Conformance test report template.....	29
Annex D	Conformance attestation template	31
Annex E	Conformance self attestation template.....	32
Annex F	Quarterly reports for third party CTAs	33
Annex G	Quarterly reports for first party CTAs	35
Annex H	Conformance Test Agency Self Assessment Sheet.....	37
H.1	Usage.....	37
H.2	Terminology and AUTOSAR Frame Conditions.....	37
H.3	Self Assessment According to ISO/IEC 17025	38
H.3.1	Management requirements	38
H.3.1.1	Organization.....	38
H.3.1.2	Management system.....	38
H.3.1.3	Document control.....	38
H.3.1.4	Review of requests, tenders and contracts	39
H.3.1.5	Subcontracting of conformance tests.....	39
H.3.1.6	Purchasing services and supplies.....	39
H.3.1.7	Service to the customer	39
H.3.1.8	Complaints	39
H.3.1.9	Control of nonconforming testing	40
H.3.1.10	Improvement.....	40
H.3.1.11	Corrective action	40
H.3.1.12	Preventive action	40
H.3.1.13	Control of records	40
H.3.1.14	Internal audits	40
H.3.1.15	Management reviews.....	41
H.3.2	Technical Requirements	41
H.3.2.1	General.....	41
H.3.2.2	Personnel.....	41
H.3.2.3	Test methods and method validation	41
H.3.2.4	Handling of test items	42
H.3.2.5	Assuring the quality of test results	42
H.3.2.6	Reporting the results.....	42
H.4	Self Assessment According to ISO/IEC Guide 65.....	44
H.4.1	Certification Body.....	44
H.4.1.1	General provisions	44
H.4.1.2	Organization.....	44
H.4.1.3	Operations	45
H.4.1.4	Subcontracting	45
H.4.1.5	Quality system	45
H.4.1.6	Conditions and procedures for granting, maintaining, extending, suspensing and withdrawing certification.....	45
H.4.1.7	Internal audits and management reviews.....	45
H.4.1.8	Documentation.....	46
H.4.1.9	Records.....	46

H.4.1.10	Confidentiality	46
H.4.2	Certification body personnel.....	46
H.4.2.1	General	46
H.4.2.2	Qualification criteria	46
H.4.3	Changes in the certification requirements	46
H.4.4	Appeals, complaints and disputes.....	47
H.4.5	Application for certification	47
H.4.5.1	Information on the procedure	47
H.4.5.2	The application.....	47
H.4.6	Preparation for evaluation	47
H.4.7	Evaluation	47
H.4.8	Evaluation report.....	47
H.4.9	Decision on certification	48
H.4.10	Surveillance	48
H.4.11	Use of licenses, certificates and marks of conformity.....	48
H.4.12	Complaints to suppliers.....	49
Annex I	Acronyms and Abbreviations	50

1 Introduction

The purpose of AUTOSAR conformance testing is to verify that the product under test adheres to the relevant AUTOSAR specifications. Ultimately, this is a condition for interoperability, re-use/portability and scalability of those products that have successfully demonstrated their conformance to the AUTOSAR standard.

The document defines the conformance test process, which sets out all the principle activities necessary to check a product with respect to AUTOSAR conformance. The document focuses on each step of the conformance test process and the roles and responsibilities of all parties involved. This also includes the final conformance attestation.

Technical aspects of conformance testing are not covered by this specification. Instead, the testing methodologies are specific to each technical area (i.e. category of the product under test) and accordingly defined in other documents:

- Basic Software (BSW)
- RTE
- Application layer functions (SW-C)
- Tools (Feature definition, interoperability, data exchange files)

Furthermore the processes and tests do not check the consistency of the specifications. Pre-requisite is that consistency and completeness are given.

Conformance testing should not hinder the exploitation of the standard, but is strongly expected to help in its implementation. Testing can never cover all possible issues and reveal absolutely all flaws and is such rather a means to effectively raise the probability of a product to fully meet the AUTOSAR standard.

An overview of AUTOSAR conformance testing is shown in chapter 3. Chapter 4 describes all necessary inputs to the conformance test process. Chapter 5 focuses on the context, roles and responsibilities and procedures of the conformance test process when involving a third party CTA to independently attestate the test results which is referred to as path A. Alternatively, self attestation of conformance by a first party CTA itself is described in chapter 6 (path B and path C), self declaration by the product supplier itself is described in document [2] (path D). In either case individual business issues are subject to bilateral arrangements and hence out of scope of the standardization.

It is assumed that a conformance test system is available. This consists of the conformance test specifications, the conformance test suite (CTS), as well as an available and running Conformance Test Process (this document), and one or several CTA(s). These CTAs have to prove their capability to perform CT by a self assessment Annex H. In case a conformance test system is not available, conformance test path D applies, which is described in a separate document (see [2]).

2 Related Documentation

2.1 Input documents

[1] AUTOSAR Glossary

[2] Conformance Test Process Definition Path D
AUTOSAR_PD_CTPProcessDefinitionPathD.pdf

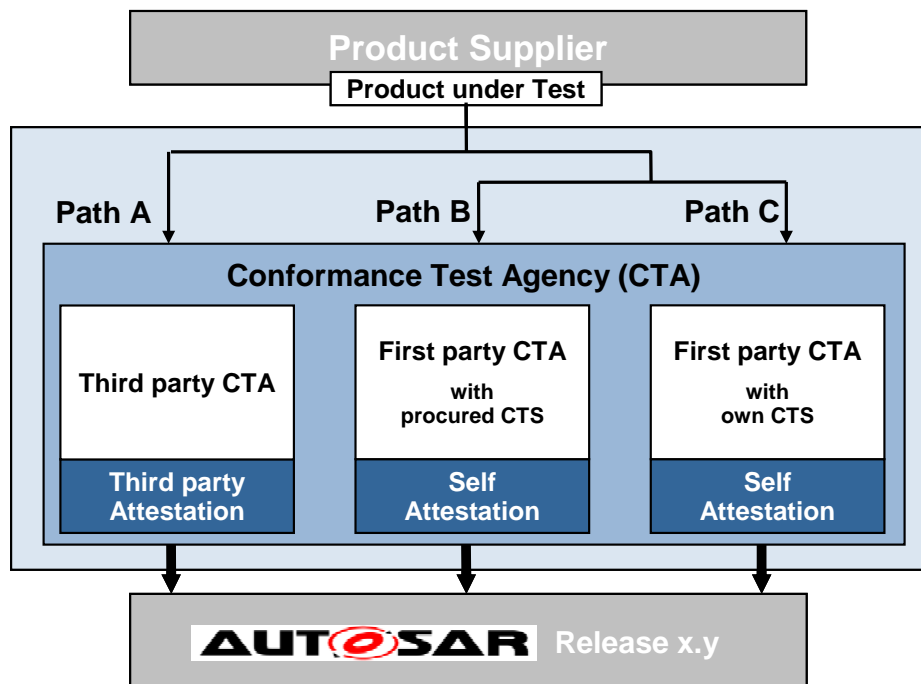
2.2 Related standards and norms

- [3] ISO 9646 Conformance testing methodology and framework
- [4] ISO 17000: 2004 Conformity assessment - Vocabulary and general principles
- [5] ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories
- [6] ISO/IEC GUIDE 65:1996 General requirements for bodies operating product certification systems
- [7] DIN EN 45011:1998 (ISO/IEC Guide 65:1996 (E)) General requirements for bodies operating product certification systems
- [8] ISO 17050-1:2004 Conformity assessment - Supplier's declaration of conformity

3 Overview of AUTOSAR Conformance Testing

Since AUTOSAR is an open standard, all finalized specifications (including the conformance test specifications) are part of the standard and will be available for exploitation to all AUTOSAR licensees. It is assumed that the relevant (test-) specifications are available and at least one CTA is available. CTAs always need to sign a CTA Undertaking. Furthermore, CTAs have to prove their capability to perform CTs by a self assessment (see Annex H).

The conformance test specifications are implemented into CTS. These CTS are used to test products developed by product suppliers against AUTOSAR specifications. CTAs approve test results. The three paths shown in Figure 3-1 are applicable to check and attest the AUTOSAR conformance. According to this, CTAs can either be independent bodies delivering a third party attestation of conformance, or product suppliers acting as first party CTA delivering self attestations of conformance for their products.



Note: x.y denotes the relevant AUTOSAR release, e.g. “**AUTOSAR** Release 4.0”

Figure 3-1: The three paths of conformance attestation

The document focuses on the relevant process steps of all three paths which are necessary to get the AUTOSAR conformance attestation for a specific product. The complexity of the test process is kept as low as possible without compromising AUTOSAR conformance test accuracy and reliability. Nevertheless it is up to each product supplier – customer relation to choose the most applicable solution to check AUTOSAR conformance.

To ensure the conformance of products with respect to AUTOSAR, AUTOSAR as an organization itself monitors the exploitation of the AUTOSAR specifications. This is enabled by collecting the relevant statistical data, delivered on an anonymous basis by each CTA.

4 Basic Conditions

4.1 Product under Test

The product under test is the item which is assessed by conformance testing. It is developed by a PS. The product under test could typically be a software module in object code, but could also be e.g. source code, a XML description or potentially a tool (provided AUTOSAR puts technical means in place to check tool conformance), e.g. a RTE generator.

In case of BSW (Basic Software) / RTE (Runtime Environment) the product under test is composed of object code, header file and ICS (Implementation Conformance Statement).

Generally, the product under test can fall under those categories which are outlined by the technical areas defined in chapter 1.

4.2 Conformance Test Suite CTS (test implementation)

A conformance test suite (CTS) is a means to perform a collection of test cases on the product under test, outcoming a list of results. The CTS shall generate reproducible results.

The CTS is based on the conformance test specifications (owned by AUTOSAR) referring to the behavior, the configuration and the interfaces of the product (black box perspective). The CTS may be a set of programs, a set of instructions for manual action (including reviews), or any appropriate alternative. It should be understood as consisting of one or several test tools plus the necessary service, e.g. to install, configure and run the tests. This service aspect should be an integral part of the CTS offer.

It is assumed that due to the large number of conformance test specifications (and e.g. different sets of conformance classes within the BSW area) there will not be a single overall CTS but rather a set of CTSs, each covering one or multiple conformance test specifications.

In order to define the boundaries between the standardisation area of AUTOSAR itself and the test tasks, it is necessary to distinct between specifications / conformance test specifications which are in the scope of the AUTOSAR and the products which are developed based on the AUTOSAR specifications.

The conformance test specifications are part of the standard itself and represent the interface towards the AUTOSAR test tasks. In order to enable consistent test products the specifications must be stringent and for that are expressed in an unambiguous notation language as far as this is technically feasible. The definitions of the conformance test specifications are part of the standard. All test cases are logically grouped, for example to enable separate testing of optional features.

With the present document AUTOSAR sets the framework for the AUTOSAR test tasks shown in Table 4-1.

1. AUTOSAR objectives	Scope of AUTOSAR standardization
2. Main requirements	
3. detailed requirements	
4. detailed specifications	
5. Conformance test specifications	
6. Test implementations (CTS)	Scope of CTA tasks or responsibility
7. Conformance Test execution	
8. Test report / conformance attestation	

Table 4-1: The contextual hierarchy of conformance test solutions

4.2.1 Allocation of Conformance Test Specifications

- All AUTOSAR conformance test specifications are available to all AUTOSAR partners and members (including CTAs).
- A CTA shall ensure itself to use always the right specifications. AUTOSAR will clearly indicate the status of AUTOSAR releases (current release, other supported releases or obsolete release).
- If a conformance test system (refer to chapter 1) is not available, then path D (see [2]) must be used.

4.2.2 Setup of Conformance Test Suite

- A CTA is responsible for the CTS which is applied for conformance testing¹.
- A CTS shall truthfully implement the CT specifications of a given product under test such that tests can be executed in a reliable, reproducible manner.
- A CTS shall identify any required attributes of the test environment².

There shall be a direct correlation between the CTS and the chosen test area. Generally, different test suites are needed for different test areas.

4.2.3 Maintenance of Conformance Test Suite

A CTA is responsible for maintenance of the CTS which is applied for conformance testing. The CTAs shall focus on:

- New releases which cause changes in the CTS
- Major bugs in the CTS which cause immediate rework

¹ regardless whether the CTS is developed by the CTA itself or externally procured

² For example for a software module these are: build environment used, test board / PC emulation (as a pre-condition), calibration set, required software configuration

4.3 Process - Conformance Test Failed

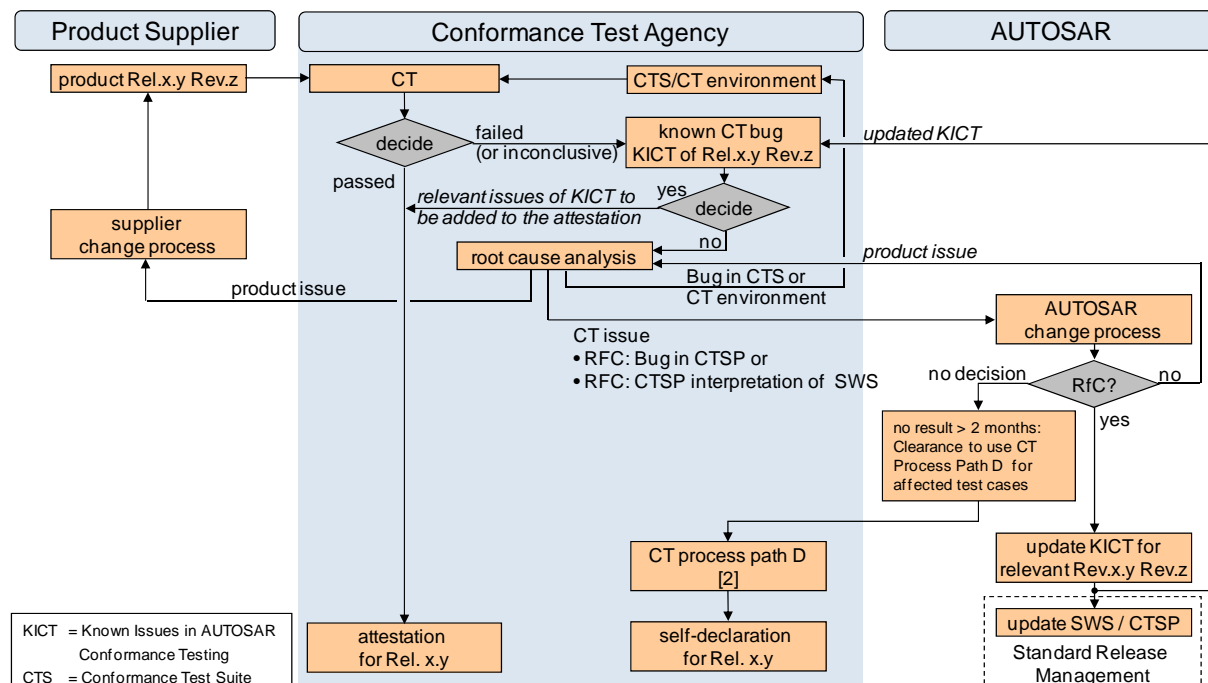


Figure 4-2: Conformance Test Process - Failed

- If the CT fails due to a known CTSP bug, then complete and final valid conformance attestation will be given. The relevant KICT (Known Issues in AUTOSAR Conformance Testing) will be attached to the attestation. AUTOSAR will follow its internal maintenance processes in order to remove identified bugs as part of future releases/revisions.
- In case of other reasons for a failed CT, the CTA has to analyze the root cause together with the product supplier. The analysis has to be possible based on object code.
- If the result of this analysis is “CT issue”, the CTA will raise an RfC to AUTOSAR.
- AUTOSAR has to decide within max. 2 months if there is a problem in the revision.
- If AUTOSAR has not decided this within 2 months, AUTOSAR Conformance Test Process Definition Path D [2] will be applied for the affected test cases.
- If AUTOSAR accepts the RfC, AUTOSAR will change the SWS or/and the CT specification for a further revision/release. The KICT (Known Issues in AUTOSAR Conformance Testing) will be updated for all affected revisions, accordingly.
- The CTA re-evaluates the test result based on the updated KICT (Known Issues in AUTOSAR Conformance Testing).

4.4 AUTOSAR Label

Products which have successfully passed one of the three paths described in this document are allowed to be marketed as “**AUTOSAR** Release x.y”, where x.y denotes the relevant AUTOSAR release, e.g. “**AUTOSAR** Release 4.0”.

4.5 Conformance Attestation Validity

The conformance attestation is regarded valid, independent of:

- Defects in CT specifications, if attestation is given before the defect was documented in the KICT (Known Issues in AUTOSAR Conformance Testing) sheet for the relevant release/revision,
- Adaptations of the product for further hardware platforms,
- Changes in used tooling, e.g. compiler, linker, etc.
- Changes in configuration:
 - If CT is performed with all sets of configurations defined for the CT
 - If all sets of configurations are not applicable for CT due to limitations defined by the product supplier, attestation will remain valid for all configurations within the frame defined by the product supplier
- Minor updates of product:
 - Changing the product referring to the same release of the AUTOSAR specification.

If a specification changes and therefore the conformance test specification is changing, then the conformance test has to be re-executed to get the attestation for a product based on this specification.

Each attestation of a product is valid worldwide and permanent.

5 Third Party Conformance Test Procedures (Path A)

5.1 Conformance Test Roles and Responsibilities

Several actors are involved in the conformance testing, each one playing an active role in the process, from the conformance test specifications up to the conformance attestation.

The main actors are the following (see Figure 5-1):

- **AUTOSAR** (sub-roles with Change Management Process bodies as they can be involved for feedback)
- **Conformance Test Agencies (CTAs)**
- **Product Suppliers (PS)**

A Third Party CTA has the tasks:

Conformance Test execution: The CTA has to apply a suitable CTS for all own conformance testing activities, regardless whether the CTS is developed by the CTA itself or externally procured. The CTS may be a set of programs, a set of instructions for manual action (including reviews), or any appropriate alternative.

- **Test attestation:** The CTA has to operate an independent third party attestation of result consistency, coherence and completeness.

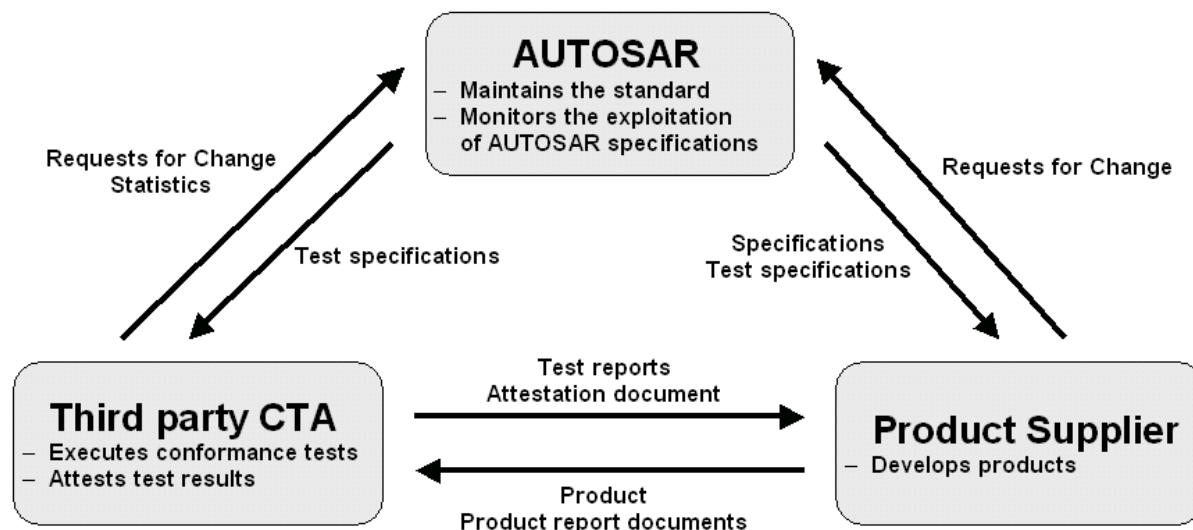


Figure 5-1: Relationship between AUTOSAR, CTA and PS, path A

The following table gives the roles and associated responsibilities for each of the CT process steps and activities of path A:

Id.	Body	CT process activity	Roles and Responsibilities
1	AUTOSAR	Scope of test	The conformance test specifications shall refer to the behavior, the configuration and the interfaces of the product (black box perspective)
2			Define and maintain a formal procedure for conformance testing
3		Conformance test specifications	Own and lay down the conformance test specifications that are the interface of AUTOSAR to the test tasks
4		Maintenance of conformance test specifications	Inform CTA about changes in the standard (upcoming releases or KICT)
5		Test report	Define and provide test report template and mandatory/optional fields
6		Product report	Define and provide product report template (see Annex B) and mandatory/optional fields
7	Third party CTA	Conformance test specifications	Get conformance test specifications and updates from AUTOSAR.
8		Setup of CTS	Check the applicability of the CTS for conformance testing, regardless whether the CTS is developed by the CTA itself or an external party. (The CTS may be a set of programs, a set of instructions for manual action (including reviews), or any appropriate alternative).
9			Assure that the CTS generates reproducible results
10			Cover various test environments, identify CTS attributes of the test environment
11		Maintenance of CTS	Maintain CTS by keeping it up-to-date and reliable
12			Secure CTS validity by linking it to the corresponding releases of the standard
13		Purchase and licensing	Purchase and licensing are subject to bilateral business arrangement with PS
14			Provide attestation service to the PS.
15		Support	Provide assistance to PS by offering all necessary process support until conformance attestation as a part of the offering
16			Gather questions from PS and report to AUTOSAR if required ("single interface to the customer") (support in AUTOSAR matters also not related to CTS/testing as an optional service)
17			Conformance test execution
18		Attestation of conformance	Analyze conformance test execution results and inform PS of the results (give reasons in case of rejection)
19			Attestate the conformance test execution results.
20			Decide about attestation or rejection then send the test results within 2 weeks after receiving the product and the product document completely
21			Report the attestations/rejections to AUTOSAR (for internal use) on a quarterly basis, data shall be made anonymous.
22			Use common CT pass / fail criteria
23			In case of bugs in the AUTOSAR specifications / conformance test specifications a CTA judgment of test results based on the KICT may be necessary.
24		Feedback	Obligation of a CTA to raise an RfC to AUTOSAR in case of inconclusive tests or flaws pointed out in the specifications in order to improve the standard continuously
25	PS	Purchase and licensing	Purchase and licensing is subject to bilateral business arrangement with CTA

26		Product and Product report	Fill mandatory fields in the product report and send the report to the CTA. If the CTA runs the test, send the product to the CTA.
27		Conformance test execution	If the conformance test execution happens onsite, run test under supervision of the CTA.

Table 5-1: CT roles and associated responsibilities, path A

5.2 Conformance Test Process Overview

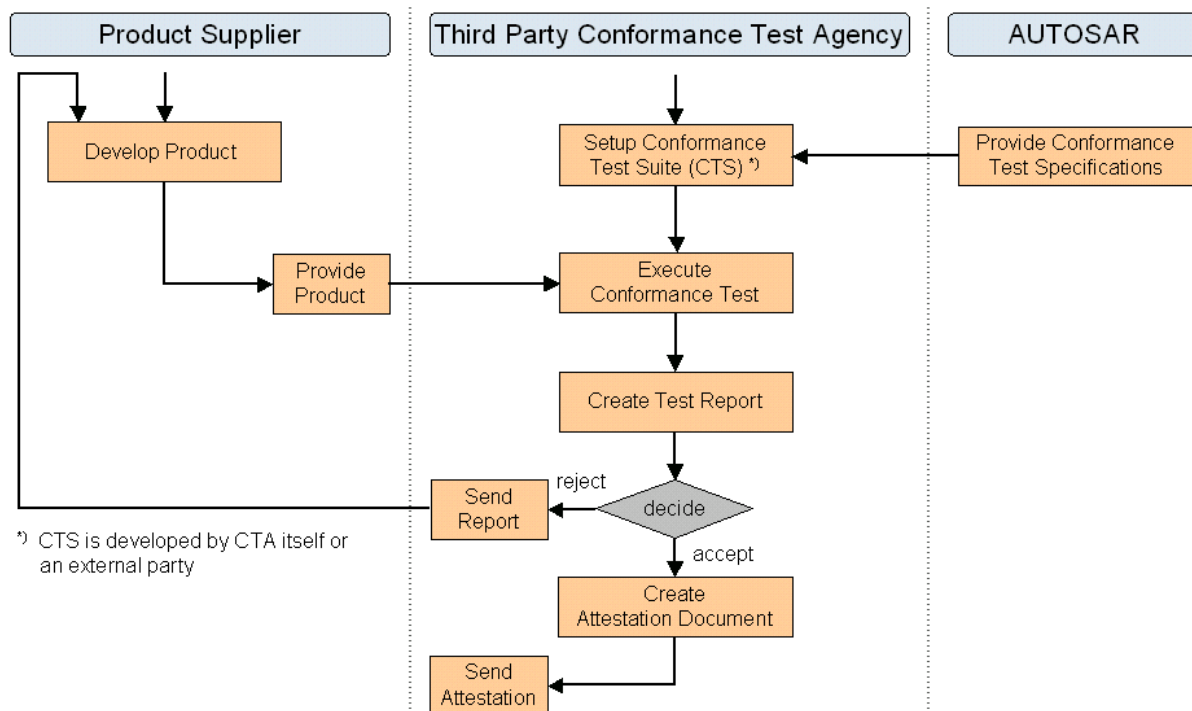


Figure 5-2: Overview Conformance Test Process, path A

5.2.1 Test Setup of CTS and Maintenance

The CTA has to check the applicability of the CTS for conformance testing and maintain it by keeping it up-to-date and reliable, and the CTA has to guarantee that the CTS always meets the conformance test specifications.

5.2.2 Purchase of service and Licensing

- A Third Party CTA provides the following service:
- **Attestation service** which is an independent third party attestation of result consistency, coherence and completeness and conformance test execution.

Any process of purchase and licensing is subject to bilateral business arrangements between PS and CTA.

5.2.3 Product Report

The product report gives a definition of the product. The PS has to deliver the product status in the form of the template (see Annex B) to the CTA. The product report should at least consist of:

- Header (standard release, date, name, configuration, check sum, product) to configure the product and/or the CTS

5.2.4 Conformance Test Execution

It is required that a conformance test execution is done impartial from the PS. As depicted in Figure 5-2, this can be achieved via test execution at the CTA. However, alternative setups can also achieve the impartial test execution, for example onsite test execution at the PS, which the CTA supervises / eye-witnesses.

5.2.5 Test Report and Test Results

The test report gives a summary of the conformance status of the product under test, including a summary of the tests performed during the conformance test process. Test report templates will be provided as part of the conformance test specifications by AUTOSAR. The CTA has to deliver the test results in the form of the template (see Annex C) to the PS. The test report should at least consist of:

- Header (standard release, date, name, platform, configuration, check sum, product, selected set of conformance classes) to clearly identify the configuration tested
- Configuration of the CTS
- Overall result including all included test groups and statistics and
- Detailed results including all test cases failed or inconclusive.

5.2.6 Attestation of conformance (third party attestation)

The purpose of the third party attestation is a confirmation of conformance with the AUTOSAR standard. This confirmation has to be justified by the third party CTA solely based on the decision following the review of the conformance test report. As a prerequisite the test report has to demonstrate fulfilment of the AUTOSAR specifications. For a third party CTA, it is to decide on the attestation or rejection within a reasonable amount of time, preferably 2 weeks after receiving the product and the product document from the PS.

Conformance is assumed if all corresponding test cases are passed; the overall verdict will be 'Passed' in this case. A single failed test case will render the entire test run 'Failed'. Inconclusive test results may give rise to an RfC. No rules for abortion (test failure) of tests sequences running shall exist. For conformance attestation, the CTA shall consider all available updates, KICT and official AUTOSAR documentation³. In any case a reproducibility of the judgement is mandatory.

Nevertheless, the product supplier is able to appeal a rejection decision within 1 month after getting the rejection. Investigations have to be started on why the product fails. In cases of bugs in the CTS, a retrospective attestation of the already tested product is possible. The third party CTA is expected to fix bugs in its CTS in short time.

³ For example, an attestation despite a test failure would be possible through the existence of a bug in the AUTOSAR specifications documented in the KICT.

The purpose of attestation is to confirm that a product conforms to the AUTOSAR specifications. The attestation has to be justified by the third party CTA based on the results of the tests. A template shall be used for the attestation document (see Annex D).

5.2.7 Support of standard maintenance

Feedback to the standard regarding conformance testing performs always through the third party CTA in accordance with the change management process. Reasons for a feedback could be:

- Inconclusive test results
- Bugs

In cases of bugs in the conformance test specification, the third party CTA is responsible for raising an RfC as soon as possible.

5.2.8 Feedback to the AUTOSAR organization

In addition, third party CTAs report to AUTOSAR every quarter of a year. This includes:

- Number of test reports handed in for each product
- Number of test results rejected
- Number of attestations (test results accepted)
- Set of conformance classes used

The report is detailed in Annex F.

5.3 Support

5.3.1 AUTOSAR support to CTA

Error reports which cannot be answered by a CTA directly are supported by the AUTOSAR change management.

5.3.2 CTA support to PS

Contact for PS is always the CTA (“single interface to the customer”) to:

- Support CT process, e.g. CTS, product test execution
- Gather questions from PS

6 First party Conformance Test Procedures (Paths B and C)

Self conformance is an alternative to the process imperatively involving a third party CTA. This chapter focuses on the differences between the self conformance procedure and the standard process (which is described in chapter 5).

The following Figure 6-1 shows the parties involved in the procedure for self attestation of conformance.

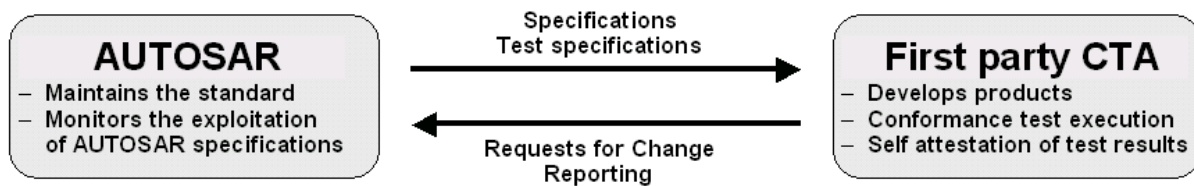


Figure 6-1: Relationship between AUTOSAR and PS, paths B and C

Two different paths of self conformance procedure are possible. If a PS is selecting self attestation of conformance, the PS can decide to purchase a CTS from an external party and performing the conformance test and attestation by itself (Path B). Alternatively, the PS can decide on developing its own CTS (Path C).

6.1 Self Conformance Test Roles and Responsibilities

6.1.1 Path B: Roles and Responsibilities

The following table gives the roles and associated responsibilities for each of the self CT process steps and activities of path B:

Id.	Body	CT process activity	Roles and Responsibilities
28	AUTOSAR	Scope of test	The conformance test specifications shall refer to the behavior, the configuration and the interfaces of the product (black box perspective)
29			Define and maintain a formal procedure for self conformance testing
30		Conformance test specifications	Own and lay down the conformance test specifications that are the interface of AUTOSAR to the test tasks
31		Maintenance of conformance test specifications	Inform CTA about changes in the standard (upcoming releases or KICT)
32		Test report	Define and provide test report template and mandatory/optional fields

33	CTS Provider (Not PS itself) ⁴	Conformance test specifications	Get conformance test specifications and updates from AUTOSAR.	
34		Provision of CTS	Provision of CTS from conformance test specifications (The CTS may be a set of programs, a set of instructions for manual action (including reviews), or any appropriate alternative).	
35			Assure that the CTS generates reproducible results	
36			Cover various test environments, identify CTS attributes of the test environment	
37		Maintenance of CTS	Maintain CTS by keeping it up-to-date and reliable	
38			Secure CTS validity by linking it to the corresponding releases of the standard	
39		Purchase and licensing	Purchase and licensing are subject to bilateral business arrangement with CTA	
40			Provide the CTS to the CTA.	
41		Support	Obligation to support CTS (maintain and support in use)	
42		First party CTA (PS itself)	Conformance test specifications	Get conformance test specifications and updates from AUTOSAR.
43			Setup of CTS	Check the applicability of the CTS for conformance testing, regardless whether the CTS is developed by an external party. (The CTS may be a set of programs, a set of instructions for manual action (including reviews), or any appropriate alternative)
44	Maintenance of CTS		Maintain CTS by keeping it up-to-date and reliable	
			Secure CTS validity by linking it to the corresponding releases of the standard	
45	Purchase and licensing		Purchase and licensing are subject to bilateral business arrangement with CTS Provider	
			Procure the CTS from the CTS Provider	
46	Conformance test execution		Run tests under its own quality control	
47	Test report		Fill mandatory fields	
48	Self attestation conformance		Analyze conformance test results	
49			Decide about conformance attestation	
50			Report the self attestations/rejections to AUTOSAR (for internal use) on a quarterly basis, data shall be made anonymous.	
51			Use common CT pass / fail criteria	
52		In case of bugs in the AUTOSAR specifications / conformance test specifications a CTA judgement of test results based on the KICT may be necessary.		
53	Feedback	Obligation of a first party CTA to raise an RfC to AUTOSAR in case of inconclusive tests or flaws pointed out in the specifications in order to improve the standard continuously		

Table 6-1: Additional CT roles and associated responsibilities for self conformance, path B

⁴ it is up to the CTA to purchase CTS from an external party

6.1.2 Path C: Roles and Responsibilities

The following table gives the roles and associated responsibilities for each of the self CT process steps and activities of path C:

Id.	Body	CT process activity	Roles and Responsibilities
54	AUTOSAR	Scope of test	The conformance test specifications shall refer to the behavior, the configuration and the interfaces of the product (black box perspective)
55			Define and maintain a formal procedure for self conformance testing
56		Conformance test specifications	Own and lay down the conformance test specifications that are the interface of AUTOSAR to the test tasks
57		Maintenance of conformance test specifications	Inform CTA about changes in the standard (upcoming releases or KICT)
58		Test report	Define and provide test report template and mandatory/optional fields
59	First party CTA (PS itself)	Conformance test specifications	Get conformance test specifications and updates from AUTOSAR.
60		Setup of CTS	Check the applicability of the CTS for conformance testing, regardless whether the CTS is developed by the CTA itself. (The CTS may be a set of programs, a set of instructions for manual action (including reviews), or any appropriate alternative).
61			Assure that the CTS generates reproducible results
62			Cover various test environments, identify CTS attributes of the test environment
63		Maintenance of CTS	Maintain CTS by keeping it up-to-date and reliable
64			Secure CTS validity by linking it to the corresponding releases of the standard
65		Conformance test execution	Run tests under its own quality control
66		Test report	Fill mandatory fields
67		Self attestation of conformance	Analyze conformance test results
68			Decide about conformance attestation
69			Report the self attestations/rejections to AUTOSAR (for internal use) on a quarterly basis, data shall be made anonymous.
70			Use common CT pass / fail criteria
71			In case of bugs in the AUTOSAR specifications / conformance test specifications a CTA judgement of test results based on the KICT may be necessary.
72		Feedback	Obligation of a first party CTA to raise an RfC to AUTOSAR in case of inconclusive tests or flaws pointed out in the specifications in order to improve the standard continuously

Table 6-2: Additional CT roles and associated responsibilities for self conformance, paths C

6.2 Self Conformance Test Process Overview

6.2.1 Path B: Process Overview

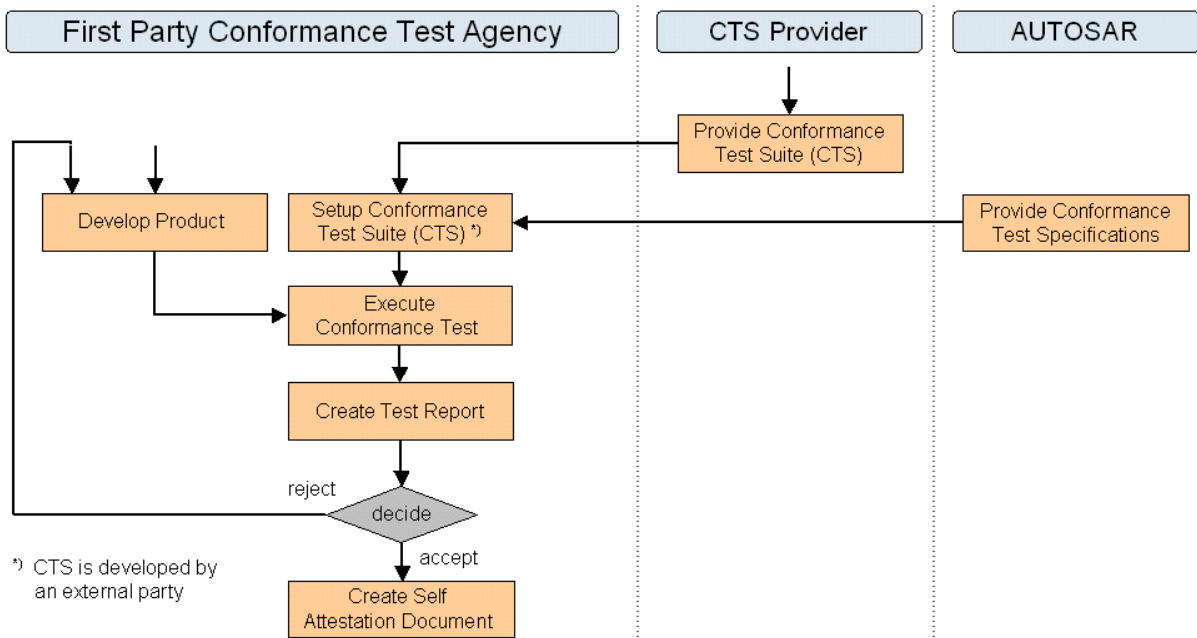


Figure 6-2: Self Conformance Test Process Overview (Path B)

In path B the first party CTA checks its own products against conformance. Thus it procures a CTS from an external CTS provider. However, finally the first party CTA is responsible for the CTS.

6.2.2 Path C: Process Overview

In contrast to path B (see 6.2.1), in path C the first party CTA directly develops its own CTS. The first party CTA is responsible for the suitability of the CTS.

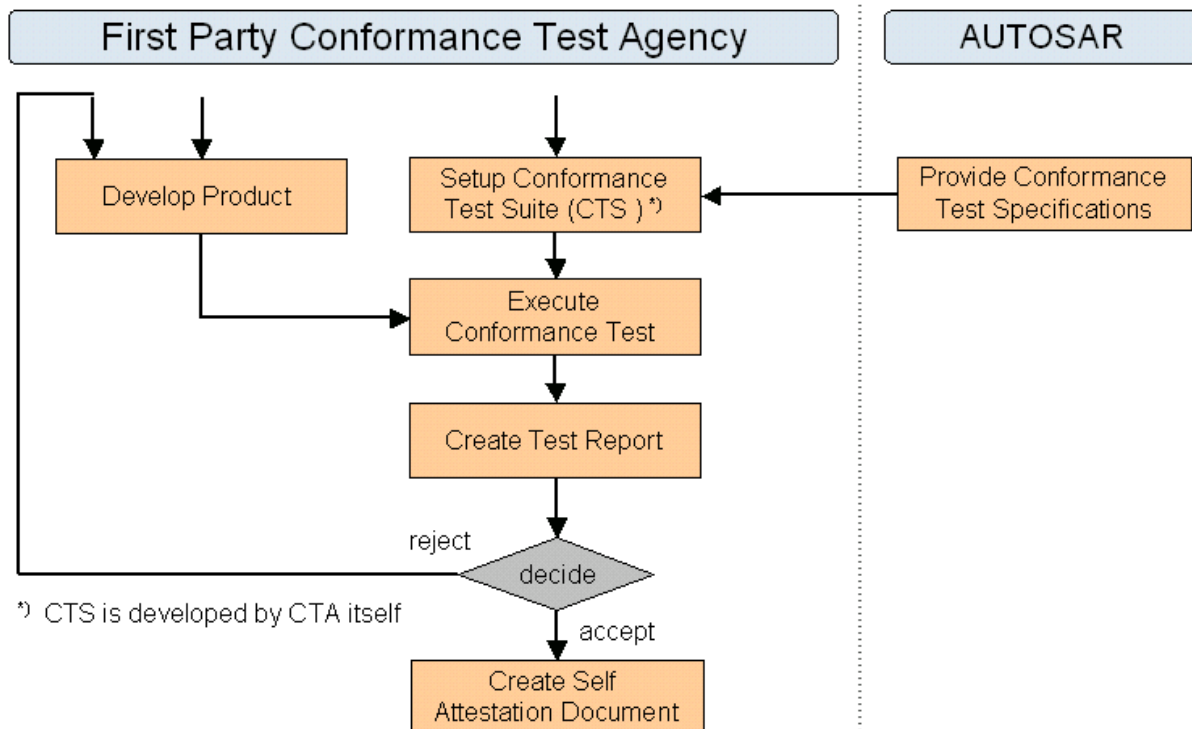


Figure 6-3: Self Conformance Test Process Overview (Path C)

6.2.3 Test Report and Test Results

The test report gives a summary of the conformance status of the product under test, including a summary of the tests performed during the conformance test process. Test report templates will be provided as part of the conformance test specifications by AUTOSAR. The PS has to prepare the test results in the form of the template (see Annex C). The test report should at least consist of:

- Header (standard release, date, name, platform, configuration, check sum, product, selected set of conformance classes) to clearly identify the configuration tested
- Configuration of the CTS
- Overall result including all included test groups and statistics and
- Detailed results including all test cases failed or inconclusive.

6.2.4 Self attestation of conformance (first party attestation)

The purpose of the self attestation of conformance is to confirm that a product is conforming to the AUTOSAR specifications. The attestation has to be justified by the first party CTA based on the results of the tests. As a prerequisite the test report has to demonstrate fulfilment of the AUTOSAR specifications. A template shall be used for the self attestation document (see Annex E).

Conformance is assumed if all corresponding test cases are passed, the overall verdict will be 'Passed' in this case. A single failed test case will render the entire test run 'Failed'. Inconclusive test results may give rise to an RfC. No rules for abortion

(test failure) of tests sequences running shall exist. For conformance attestation the CTA shall consider all available technical information⁵. In any case a reproducibility of the judgement is mandatory.

6.2.5 Support of standard maintenance

Feedback to the standard regarding conformance testing performs always through the CTA in accordance with the change management process. Reasons for a feedback could be:

- Inconclusive test results
- Bugs

In cases of bugs in the conformance test specification, the CTA is responsible for raising an RfC as soon as possible.

6.2.6 Feedback to the AUTOSAR organization

CTAs report to AUTOSAR every quarter of a year. The report includes:

- Number of test result accepted
- Set of conformance classes used

This report is detailed in Annex G.

6.3 AUTOSAR support to CTA

Error reports which cannot be answered by a CTA directly are supported by the AUTOSAR change management.

⁵ For example, an attestation despite a test failure would be possible through the existence of a bug in the AUTOSAR specifications documented in the KICT.

Annex A Requirements traceability

The conformance test requirements refer to the conformance test process definition (the present document). The following table gives an overview where each requirement has been processed.

Requirement ID	Description	Section(s) Conformance Test Process
[CTR0030]	AUTOSAR shall provide the test specifications	5.1
[CTR0060]	Comprehensive identification of required test setup	5.2.5
[CTR0100]	The test setup shall be documented	5.2.5
[CTR0101]	Attestation	5.2.6, 6.2.4
[CTR0102]	Extension of Attestation	5.2.6, 6.2.3
[CTR0110]	Validity of conformance approval is permanent	5.2.6
[CTR0130]	Formal conformance procedure	All
[CTR0170]	Update Test implementations in synchronization to standard releases	5.1, 6.1.1, 6.1.2
[CTR0220]	Assistance to CTAs	5.3.1, 6.3
[CTR0230]	Only a CTA can issue a valid conformance attestation	3, 5.2.6
[CTR0240]	Time frame for attestation (obligation of CTA)	5.2.6
[CTR0260]	Worldwide acceptance of test results	5.2.6
[CTR0270]	A conformance tested product can carry the AUTOSAR trademark through CTA approval	4.4
[CTR0280]	CTA have to perform self-assessment regularly	see Annex H
[CTR0352]	A third party CTA is expected to offer conformance testing and attestation services	5.1, 5.2.2
[CTR0390]	AUTOSAR license for a CTA	3
[CTR0420]	For self attestation of product conformance a product supplier shall become first party CTA.	3, 6
[CTR0430]	Conformance testing and attestation shall involve an accredited party Requirement replaced by [CTR0431] based on the Steering Committee Decision #35 as of the 91 st SC Meeting.	0, 3, 4, 5, 6
[CTR0431]	Conformance testing and attestation shall involve a party that proved their capability to perform CTs by a self assessment.	0, 3, 4, 5, 6
[CTR0450]	Quarterly report by a CTA	3, 5.2.8, 6.2.6, Annex F, 0

Annex B Product report template

1. Product developer			
Product report no.			
Name of Company		Responsible Product Manager	
Address of Company		Department	
		Telephone	
		Mail	
		Date of the issue (yyyy/MM/dd):	
2. Product under test			
Name of product under test	(Name of product)		
Product version number	(Identification of product with version number)		
Configuration	(Configuration includes checksum)		
3. AUTOSAR			
AUTOSAR product name	(AUTOSAR technical area / specific module / specific module cluster)		
AUTOSAR product version	(AUTOSAR version number (X. Y. Z))		
AUTOSAR release number	(AUTOSAR release number (x. y))		
4. Observations and comments			
(product variants and etc.)			
Responsible's signature			

Annex C Conformance test report template

1. Test Body			
Test report no.			
Name of Company (issuer of test)	(Name of company)	Responsible Test Engineer	(Name of responsible individual inside company)
Address of Company (issuer of test)	(Adress of company)	Department	(Name of department)
Address of test facilities		Telephone	
		Mail	
		Date of the issue (yyyy/MM/dd):	
		Date of the test run	
2. Product developer			
Name of company (developer of product)	(Name of company)		
Address of company (developer of product)	(Adress of company)		
Responsible inside company			
3. Product under test			
Name of product under test	(Name of product)		
Product under test identification	(Identification of product with version number)		
4. Conformance Test Suite (CTS)			
Name of CTS			
CTS version number	(Identification of CTS with version number)		
Configuration	(Complete and unique identification)		
5. Test environment			
Description of test environment			
6. AUTOSAR			
AUTOSAR product name	(AUTOSAR technical area / specific module / specific module cluster)		
AUTOSAR product version	(AUTOSAR version number (X. Y. Z))		
AUTOSAR release number	(AUTOSAR release number (x. y))		

7. Test result overview	
<i>The results relate only to the product under test specified in 3.</i>	
Number of test cases cumulative	
Number of test cases "passed"	
Number of test cases "failed"	
Number of test cases "inconclusive"	
Reasons for test cases "failed"	
Reasons for test cases "inconclusive"	
Product proposed for attestation	YES/NO
Attestation company	
8. Observations and comments	
(product variants and etc.)	
Signature of test engineer	

Annex D Conformance attestation template

1. Attestation body (Third party CTA)			
Name of Company (issuer of attestation)	(Name of company)	Responsible Engineer	(Name of responsible individual inside company)
Address of Company (issuer of attestation)	(Adress of company)	Department	(Name of department)
		Date of attestation: (yyyy/MM/dd):	
2. Product Developer			
Name of company (developer of product)	(Name of company)		
Address of company (developer of product)	(Adress of company)		
3. Product under test			
Name of product under test	(Name of product)		
Product under test identification	(Identification of product with version number)		
Date of test report (yyyy/MM/dd):			
4. AUTOSAR			
AUTOSAR product name	(AUTOSAR technical area / specific module / specific module cluster)		
AUTOSAR product version	(AUTOSAR version number (X. Y. Z))		
AUTOSAR release number	(AUTOSAR release number (x. y))		
5. The product described above conforms to the AUTOSAR Release x.y specifications.			
Responsible's signature			

Annex E Conformance self attestation template

1. Product Developer (First party CTA)			
Name of Company (issuer of attestation)	(Name of company)	Responsible Engineer	(Name of responsible individual inside company)
Address of Company (issuer of attestation)	(Address of company)	Department	(Name of department)
		Date of attestation: (yyyy/MM/dd):	
2. Product under test			
Name of product under test	(Name of product)		
Product under test identification	(Identification of product with version number)		
Date of test report (yyyy/MM/dd):			
3. AUTOSAR			
AUTOSAR product name	(AUTOSAR technical area / specific module / specific module cluster)		
AUTOSAR product version	(AUTOSAR version number (X. Y. Z))		
AUTOSAR release number	(AUTOSAR release number (x. y))		
4. The product described above conforms the AUTOSAR Release x.y specifications.			
Responsible's signature			

Annex F Quarterly reports for third party CTAs

Each individual third party CTA is expected to regularly complete the below template with the required relevant information. This report should be submitted via email to Conformance@autosar.org. It shall be available within the first half of any month following a complete calendar quarter, which it should cover.

<i>Report of quarterly statistics for third party CTAs</i>		
General information		
Company name	(Name of CTA)	
Responsible	(Name of responsible individual inside CTA)	
Last self assessment	Date (yyyy/MM/dd):	
Period covered by report	Start date (yyyy/MM/dd):	
	End date (yyyy/MM/dd):	
Statistics of attestation service		
Requests	(No. of requests)	
Attestations	(No. of attestations issued)	
Rejections	(No. of rejected requests)	
Withdrawals	(No. of withdrawals by product supplier)	
Pending	(No. of pending requests)	
Technical breakdown of attestations issued		
Basic Software	(No. of attestations for basic software)	
RTE	(No. of attestations for basic software)	
Conformance Classes	ICC1	(No. of attestations)
	ICC2	(No. of attestations)
	ICC3	(No. of attestations)
Application Software	(No. of attestations for AUTOSAR software)	
Tool	(No. of attestations for tool)	
Other technical areas	(No. of attestations for other technical areas)	
Type	(Please specify the other technical areas in more detail)	

Geographic breakdown of attestations issued		
Region		
Place of product development	Europe	(No. of attestations)
	Americas	(No. of attestations)
	Asia	(No. of attestations)
	Other (Please specify the region/s)	(No. of attestations)
Place of attestation service	Europe	(No. of attestations)
	Americas	(No. of attestations)
	Asia	(No. of attestations)
	Other (Please specify the region/s)	(No. of attestations)
Observations and comment		
(Please describe any general observations or any other comment, which you feel is relevant to the exploitation of the AUTOSAR standard on a statistical basis)		

Annex G Quarterly reports for first party CTAs

Each individual first party CTA is expected to regularly complete the below template with the required relevant information. This report should be submitted via email to Conformance@autosar.org. It shall be available within the first half of any month following a complete calendar quarter, which it should cover.

Report of quarterly statistics for for first party CTAs		
General information		
Company name	(Name of CTA)	
Responsible	(Name of responsible individual inside CTA)	
Last self assessment	Date (yyyy/MM/dd):	
Period covered by report	Start date (yyyy/MM/dd):	
	End date (yyyy/MM/dd):	
Statistics of attestation		
Products under test	(No. of products under test)	
Successful test completions	(No. of tests with an 'overall passed' verdict)	
Technical breakdown of attestation issued		
Basic Software		(No. of declarations for basic software)
RTE		(No. of attestations for basic software)
Conformance Classes	ICC1	(No. of declarations)
	ICC2	(No. of declarations)
	ICC3	(No. of declarations)
Application Software		(No. of declarations for AUTOSAR software)
Tool		(No. of attestations for tool)
Other technical areas		(No. of declarations for other technical areas)
Type	(Please specify the other technical areas in more detail)	
Geographic breakdown of attestations issued		
Region		
Place of product development	Europe	(No. of declarations)
	Americas	(No. of declarations)
	Asia	(No. of declarations)
	Other (Please specify the region/s)	(No. of declarations)
Place of test conduct	Europe	(No. of declarations)
	Americas	(No. of declarations)
	Asia	(No. of declarations)
	Other (Please specify the region/s)	(No. of declarations)
Observations and comment		
(Please describe any general observations or any other comment, which you feel is relevant to the exploitation of the AUTOSAR standard on a stastical basis)		



Annex H Conformance Test Agency Self Assessment Sheet

H.1 Usage

The self assessment sheet is based on ISO/IEC 17025:2005 [5] and ISO/IEC GUIDE 65:1996 [6]. For each applicable section of ISO/IEC 17025:2005 [5] and ISO/IEC GUIDE 65:1996 [6], there shall be a statement of compliance (SoC) in form of:

- Fully Compliant (FC): The CTA complies with all points.
- Partly Compliant (PC): The CTA complies with a set of points only.
- Not Compliant (NC): The CTA does not comply with all points.
- Not applicable (NA): The question is not applicable.
- Noted: A statement or note is acknowledged.

The comment field allows additional remarks. If you indicate PC for one section, you shall detail the incompliance in the comment field. If you indicate PC or NC for one question, you should detail the motivation.

The field “AUTOSAR Guideline” contains AUTOSAR specific clarifications per section, if applicable.

H.2 Terminology and AUTOSAR Frame Conditions

The scope of these AUTOSAR application rules comprises the competence of the organization to fulfill the tasks of a CTA according to this process description.

The CTA will not provide calibration services. Therefore, any requirements on calibration services are out of scope of this self assessment.

Only type testing is relevant for an AUTOSAR CTA. All other listed activities are out of scope (including sampling and inspection services).

ISO/IEC specific terms	AUTOSAR meaning
Laboratory	Test operation of a CTA
Customer / Applicant	Product supplier – applicable to external as well as internal customers of a CTA.
Certification	3 rd party CTA: Third Party Attestation 1 st party CTA: Self-Attestation
Certification body	CTA

Additional AUTOSAR specific terms are defined in the AUTOSAR glossary [1].

H.3 Self Assessment According to ISO/IEC 17025

The following chapters of ISO/IEC 17025 are not applicable:

- 5.3 Accommodation and environmental conditions
- 5.5 Equipment
- 5.6 Measurement traceability
- 5.7 Sampling

H.3.1 Management requirements

H.3.1.1 Organization

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.1.1			
2.	4.1.2			
3.	4.1.3			
4.	4.1.4			
5.	4.1.5			
6.	4.1.6			

H.3.1.2 Management system

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.2.1			
2.	4.2.2			
3.	4.2.3			
4.	4.2.4			
5.	4.2.5			
6.	4.2.6			
7.	4.2.7			

H.3.1.3 Document control

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.3.1			
2.	4.3.2.1			
3.	4.3.2.2			
4.	4.3.2.3			
5.	4.3.3.1			
6.	4.3.3.2			
7.	4.3.3.3			
8.	4.3.3.4			

H.3.1.4 Review of requests, tenders and contracts

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.4.1			
2.	4.4.2			
3.	4.4.3			
4.	4.4.4			
5.	4.4.5			

H.3.1.5 Subcontracting of conformance tests

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.5.1			
2.	4.5.2			
3.	4.5.3			
4.	4.5.4			

H.3.1.6 Purchasing services and supplies

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.6.1			
2.	4.6.2	If a first party CTA or a third party CTA procures a CTS from a CTS provider, the CTA has to establish an improvement and feedback loop to the CTS provider.		
3.	4.6.3			
4.	4.6.4			

H.3.1.7 Service to the customer

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.7.1			
2.	4.7.2			

H.3.1.8 Complaints

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.8			

H.3.1.9 Control of nonconforming testing

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.9.1			
2.	4.9.2			

H.3.1.10 Improvement

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.10			

H.3.1.11 Corrective action

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.11.1			
2.	4.11.2			
3.	4.11.3			
4.	4.11.4			
5.	4.11.5			

H.3.1.12 Preventive action

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.12.1			
2.	4.12.2			

H.3.1.13 Control of records

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.13.1.1			
2.	4.13.1.2			
3.	4.13.1.3			
4.	4.13.1.4			
5.	4.13.2.1			
6.	4.13.2.2			
7.	4.13.2.3			

H.3.1.14 Internal audits

No	Section ISO/IEC	AUTOSAR Guideline	SoC	Comments
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	17025			
1.	4.14.1			
2.	4.14.2			
3.	4.14.3			
4.	4.14.4			

H.3.1.15 Management reviews

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	4.15.1			
2.	4.15.2			

H.3.2 Technical Requirements

H.3.2.1 General

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	5.1.1	Not applicable are: <ul style="list-style-type: none"> - Accommodation and environmental conditions - Equipment - Measurement traceability - Sampling 		
2.	5.1.2			

H.3.2.2 Personnel

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	5.2.1			
2.	5.2.2			
3.	5.2.3			
4.	5.2.4			
5.	5.2.5			

H.3.2.3 Test methods and method validation

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	5.4.1	The AUTOSAR Conformance Test Process Definition Path A-C and all AUTOSAR		

		specifications of the valid AUTOSAR release have to be applied.		
2.	5.4.2	For test execution, the procedures set by the CTS, the conformance test specifications and processes shall be followed.		
3.	5.4.3			
4.	5.4.4	If the AUTOSAR method is not applied, there shall be evidence and a written statement that the AUTOSAR method is not applicable.		
5.	5.4.5.1			
6.	5.4.5.2			
7.	5.4.5.3			
8.	5.4.6	This clause is not applicable.	N.A.	
9.	5.4.7			

H.3.2.4 Handling of test items

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	5.8.1			
2.	5.8.2			
3.	5.8.3			
4.	5.8.4			

H.3.2.5 Assuring the quality of test results

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	5.9.1			
2.	5.9.2			

H.3.2.6 Reporting the results

No	Section ISO/IEC 17025	AUTOSAR Guideline	SoC	Comments
1.	5.10.1	The test results shall be documented based on the templates defined within the AUTOSAR Conformance Test Process Definition Path A-C.		
2.	5.10.2			
3.	5.10.3			

4.	5.10.3.1			
5.	5.10.3.2	This clause is not applicable.	N.A.	
6.	5.10.4	This clause is not applicable.	N.A.	
7.	5.10.5			
8.	5.10.6			
9.	5.10.7			
10.	5.10.8	For this purpose an AUTOSAR test report template is available.		
11.	5.10.9			

H.4 Self Assessment According to ISO/IEC Guide 65

A self assessment according to ISO/IEC Guide 65 is applicable for third-party CTAs only.

H.4.1 Certification Body

H.4.1.1 General provisions

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	4.1.1			
2.	4.1.2	A CTA is not obliged to confirm that a company asking for product attestation is an AUTOSAR licensee. However, the CTA must not distribute unpublished AUTOSAR material including CTS to non-AUTOSAR members and/or partners.		
3.	4.1.3			
4.	4.1.4			

H.4.1.2 Organization

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	4.2	<p>Sub-clause o1): The type of product shall be interpreted as the targeted AUTOSAR product categories as defined in the AUTOSAR Conformance Test Process Definition Path A-C.</p> <p>Sub-clause o2): a CTA is allowed to advise an applicant with respect to correct interpretation of the AUTOSAR specifications (without specific reference to a product implementation).</p> <p>Sub-clause o3): a CTA is expected to apply a CTS for test execution. If the CTA develops the CTS, the CTA shall document the</p>		

		development process and comply with good engineering practice.		
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H.4.1.3 Operations

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	4.3			

H.4.1.4 Subcontracting

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	4.4	If the CTA employs a subcontractor, the CTA must ensure the competency of the subcontracted party, as the responsibility remains with the CTA.		

H.4.1.5 Quality system

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	4.5.1			
2.	4.5.2			
3.	4.5.3			

H.4.1.6 Conditions and procedures for granting, maintaining, extending, suspending and withdrawing certification

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	4.6.1	The CTA shall base its conditions strictly on the AUTOSAR conformance test specifications. In case of any deviation, whether positive or negative, the CTA shall provide a clear statement in writing.		
2.	4.6.2			

H.4.1.7 Internal audits and management reviews

No	Section	AUTOSAR Guideline	SoC	Comments
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	ISO/IEC Guide 65			
1.	4.7.1			
2.	4.7.2			

H.4.1.8 Documentation

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	4.8.1			
2.	4.8.2			

H.4.1.9 Records

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	4.9.1			
2.	4.9.2			

H.4.1.10 Confidentiality

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	4.10.1			
2.	4.10.2			

H.4.2 Certification body personnel

H.4.2.1 General

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	5.1.1			
2.	5.1.2			

H.4.2.2 Qualification criteria

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	5.2.1			
2.	5.2.2			
3.	5.2.3			

H.4.3 Changes in the certification requirements

No	Section	AUTOSAR Guideline	SoC	Comments
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No	ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	6			

H.4.4 Appeals, complaints and disputes

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	7.1			
2.	7.2			

H.4.5 Application for certification

H.4.5.1 Information on the procedure

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	8.1.1			
2.	8.1.2			
3.	8.1.3			
4.	8.1.4			

H.4.5.2 The application

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	8.2.1			
2.	8.2.2			

H.4.6 Preparation for evaluation

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	9.1			
2.	9.2			
3.	9.3			
4.	9.4			

H.4.7 Evaluation

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	10			

H.4.8 Evaluation report

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	11	The report shall use the templates defined within the AUTOSAR Conformance Test Process Definition Path A-C.		

H.4.9 Decision on certification

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	12.1			
2.	12.2			
3.	12.3	AUTOSAR attestation procedures and forms apply as defined within the AUTOSAR Conformance Test Process Definition Path A-C.		
4.	12.4			

H.4.10 Surveillance

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	13.1			
2.	13.2	The validity of the AUTOSAR attestation applies as defined in the AUTOSAR Conformance Test Process Definition Path A-C.		
3.	13.3			
4.	13.4			

H.4.11 Use of licenses, certificates and marks of conformity

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	14.1	The use of licenses ruled in the AUTOSAR contracts apply. The use of AUTOSAR trademarks and labels for AUTOSAR conform products applies as specified in the AUTOSAR Conformance Test Process Definition Path A-C.		

2.	14.2			
3.	14.3			

H.4.12 Complaints to suppliers

No	Section ISO/IEC Guide 65	AUTOSAR Guideline	SoC	Comments
1.	15			

Annex I Acronyms and Abbreviations

API	Application Programming Interface
Attestation	Issue of a statement, based on a decision following review that fulfilment of specified requirements has been demonstrated
Conformance Test System	A Conformance Test System consists of the conformance test specifications, the Conformance Test Suite as well as an available and running conformance test process, and one or several Conformance Test Agencies, which need to be in place. Conformance Test Agencies (CTAs) have to prove their capability to perform CTs by a self assessment.
BSW	Basic Software
CT	Conformance Test(ing)
CTA	Conformance Test Agency
CTS	Conformance Test Suite which is used for AUTOSAR conformance attestation
CTSP	Conformance test specification
ICS	Implementation Conformance Statement
KICT	Known Issues in AUTOSAR Conformance Testing
PS	Product Supplier
RfC	Request for Change
RTE	AUTOSAR Runtime Environment
SW-C	AUTOSAR Software Component
SWS	Software specification
TBD	To Be Defined