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2017-10-27	1.2.0	AUTOSAR Release Management	• Alignment of requirement abstraction levels • Differentiation of AP requirements • Improvement of readability and focus scope of requirements • Editorial review
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2014-10-31	4.2.1	AUTOSAR Release Management	• New requirement for Secure Onboard Communication • New requirement for naming schemes and conventions
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Document Change History			
Date	**Release**	**Changed by**	**Change Description**
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2010-09-30	3.1.5	AUTOSAR Administration	• Changed [RS_Main_00270]
2010-02-02	3.1.4	AUTOSAR Administration	• Changed [Main90] and [Main 370] • Legal disclaimer revised
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Document Change History			
Date	**Release**	**Changed by**	**Change Description**
2006-05-16	2.0	AUTOSAR Administration	• Removed section “2.1 Recipients” • Update of section 3.1.1 • Changed [RS_Main_00011], [RS_Main_00060], [RS_Main_00300], [RS_Main_00310], [RS_Main_00320], [RS_Main_00330], [RS_Main_00340], [RS_Main_00350], [RS_Main_00360], [Main370], [Main380] • Use Case added • Changed [Main20] • Rationale extended • Changed [RS_Main_00010], [Main50], [RS_Main_00080], [Main90], [RS_Main_00130], [RS_Main_00230], [Main240] • Rationale added • Changed [RS_Main_00160], [RS_Main_00280] • Rationale and Use Case added • Changed [RS_Main_00300], [RS_Main_00310] • Headline and Short description written in active • Update of section 3.3 according to changes of 3.1.1
2005-05-31	1.0	AUTOSAR Administration	• Initial release

Disclaimer

Table of Content

1 Scope of the document

Each partner has committed to the overall project objectives (PO) of AUTOSAR. The objectives are listed in the AUTOSAR Standard Info Pack V3.3 or in subsequent documents. AUTOSAR Standard Info Pack is an official communication paper of development partnership.

These objectives are not directly usable and have to be refined in order to generate the specific technical requirements. For this purpose, the AUTOSAR Main Requirements are established as a fundamental base to derive these specific requirements.

The goal of this document is to define the main requirements of AUTOSAR including its link to the AUTOSAR objectives.
The term AUTOSAR is used as a synonym of the development partnership and the technical product AUTomotive Open System ARchitecture.

2 How to read this document

Each requirement has its unique identifier starting with the prefix “RS_Main_” (for “Main Requirement”). For any review annotations, remarks or questions, please refer to this unique ID rather than chapter or page numbers!

2.1 Conventions used

- The representation of requirements in AUTOSAR documents follows the table specified in [TPS_STDT_00078]. In requirements, the following specific semantics are used (taken from Request for Comment RFC 2119 from the Internet Engineering Task Force IETF)
- The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119. Note that the requirement level of the document in which they are used modifies the force of these words.
- MUST: This word, or the terms "REQUIRED" or "SHALL", mean that the definition is an absolute requirement of the specification.
- MUST NOT: This phrase, or the phrase „SHALL NOT“, means that the definition is an absolute prohibition of the specification.
- SHOULD: This word, or the adjective "RECOMMENDED", mean that there may exist Valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
- SHOULD NOT: This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist Valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
- MAY: This word, or the adjective „OPTIONAL“, means that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item. An implementation, which does not include a particular option, MUST be prepared to interoperate with another implementation, which does include the option, though perhaps with reduced functionality. In the same vein an implementation, which does include a particular option, MUST be prepared to interoperate with another implementation, which does not include the option (except, of course, for the feature the option provides.)

2.2 Acronyms and Abbreviations

All acronyms and abbreviations used throughout this document are included in the official AUTOSAR glossary [Glossary]. For respective explanation please see there.

3 Requirements Tracing

The following table references the requirements specified in **[RS_ProjectObjectives]** and links to the fulfilments of these.

Requirement	Description	Satisfied by
RS_PO_00001	AUTOSAR shall support the transferability of software.	RS_Main_00060, RS_Main_00100, RS_Main_00122, RS_Main_00123, RS_Main_00124, RS_Main_00130, RS_Main_00140, RS_Main_00150, RS_Main_00220, RS_Main_00270, RS_Main_00310, RS_Main_00400, RS_Main_00410, RS_Main_00440, RS_Main_00445, RS_Main_00450, RS_Main_00460, RS_Main_00480, RS_Main_00507, RS_Main_00513, RS_Main_01001, RS_Main_01002, RS_Main_01003
RS_PO_00001	AUTOSAR shall support the transferability of software.	RS_Main_00060, RS_Main_00100, RS_Main_00122, RS_Main_00123, RS_Main_00124, RS_Main_00130, RS_Main_00140, RS_Main_00150, RS_Main_00220, RS_Main_00270, RS_Main_00310, RS_Main_00400, RS_Main_00410, RS_Main_00440, RS_Main_00445, RS_Main_00450, RS_Main_00460, RS_Main_00480, RS_Main_00507, RS_Main_00513, RS_Main_01001, RS_Main_01002, RS_Main_01003
RS_PO_00002	AUTOSAR shall support the scalability to different vehicle and platform variants.	RS_Main_00060, RS_Main_00121, RS_Main_00122, RS_Main_00123, RS_Main_00124, RS_Main_00130, RS_Main_00140, RS_Main_00230, RS_Main_00310, RS_Main_00360, RS_Main_00400, RS_Main_00511, RS_Main_01001, RS_Main_01005
RS_PO_00002	AUTOSAR shall support the scalability to different vehicle and platform variants.	RS_Main_00060, RS_Main_00121, RS_Main_00122, RS_Main_00123, RS_Main_00124, RS_Main_00130, RS_Main_00140, RS_Main_00230, RS_Main_00310, RS_Main_00360, RS_Main_00400, RS_Main_00511, RS_Main_01001, RS_Main_01005
RS_PO_00003	AUTOSAR shall support a broad variety of functional domains.	RS_Main_00001, RS_Main_00002, RS_Main_00190, RS_Main_00280, RS_Main_00285, RS_Main_00410
RS_PO_00003	AUTOSAR shall support a broad variety of functional domains.	RS_Main_00001, RS_Main_00002, RS_Main_00190, RS_Main_00280, RS_Main_00285, RS_Main_00410
RS_PO_00004	AUTOSAR shall define an open architecture for automotive software.	RS_Main_00001, RS_Main_00002, RS_Main_00049, RS_Main_00050, RS_Main_00080, RS_Main_00106, RS_Main_00170, RS_Main_00220, RS_Main_00260, RS_Main_00261, RS_Main_00285, RS_Main_00320, RS_Main_00410, RS_Main_00430, RS_Main_00440, RS_Main_00445, RS_Main_00450, RS_Main_00460, RS_Main_00505, RS_Main_00510, RS_Main_00513, RS_Main_01004, RS_Main_01008
RS_PO_00004	AUTOSAR shall define an open architecture for automotive software.	RS_Main_00001, RS_Main_00002, RS_Main_00049, RS_Main_00050, RS_Main_00080, RS_Main_00106, RS_Main_00170, RS_Main_00220, RS_Main_00260, RS_Main_00261, RS_Main_00285, RS_Main_00320, RS_Main_00410, RS_Main_00430, RS_Main_00440, RS_Main_00445, RS_Main_00450, RS_Main_00460, RS_Main_00505, RS_Main_00510, RS_Main_00513, RS_Main_01004, RS_Main_01008
RS_PO_00005	AUTOSAR shall support	RS_Main_00010, RS_Main_00011, RS_Main_00012,

	the development of dependable systems.	RS_Main_00030, RS_Main_00170, RS_Main_00260, RS_Main_00261, RS_Main_00285, RS_Main_00340, RS_Main_00350, RS_Main_00435, RS_Main_00480, RS_Main_00490, RS_Main_00501, RS_Main_00503, RS_Main_00510, RS_Main_00514, RS_Main_01007
RS_PO_00005	AUTOSAR shall support the development of dependable systems.	RS_Main_00010, RS_Main_00011, RS_Main_00012, RS_Main_00030, RS_Main_00170, RS_Main_00260, RS_Main_00261, RS_Main_00285, RS_Main_00340, RS_Main_00350, RS_Main_00435, RS_Main_00480, RS_Main_00490, RS_Main_00501, RS_Main_00503, RS_Main_00510, RS_Main_00514, RS_Main_01007
RS_PO_00006	AUTOSAR shall support sustainable utilization of natural resources.	RS_Main_00026, RS_Main_00049, RS_Main_00050, RS_Main_00200, RS_Main_00285, RS_Main_01005
RS_PO_00006	AUTOSAR shall support sustainable utilization of natural resources.	RS_Main_00026, RS_Main_00049, RS_Main_00050, RS_Main_00200, RS_Main_00285, RS_Main_01005
RS_PO_00007	AUTOSAR shall support the collaboration between various partners.	RS_Main_00060, RS_Main_00080, RS_Main_00100, RS_Main_00106, RS_Main_00121, RS_Main_00122, RS_Main_00123, RS_Main_00124, RS_Main_00125, RS_Main_00127, RS_Main_00128, RS_Main_00160, RS_Main_00161, RS_Main_00180, RS_Main_00250, RS_Main_00300, RS_Main_00301, RS_Main_00310, RS_Main_00320, RS_Main_00330, RS_Main_00400, RS_Main_00420, RS_Main_00480, RS_Main_00500
RS_PO_00007	AUTOSAR shall support the collaboration between various partners.	RS_Main_00060, RS_Main_00080, RS_Main_00100, RS_Main_00106, RS_Main_00121, RS_Main_00122, RS_Main_00123, RS_Main_00124, RS_Main_00125, RS_Main_00127, RS_Main_00128, RS_Main_00160, RS_Main_00161, RS_Main_00180, RS_Main_00250, RS_Main_00300, RS_Main_00301, RS_Main_00310, RS_Main_00320, RS_Main_00330, RS_Main_00400, RS_Main_00420, RS_Main_00480, RS_Main_00500
RS_PO_00008	AUTOSAR shall standardize basic software functionality of automotive ECUs.	RS_Main_00001, RS_Main_00002, RS_Main_00120, RS_Main_00122, RS_Main_00123, RS_Main_00124, RS_Main_00125, RS_Main_00435, RS_Main_00510
RS_PO_00008	AUTOSAR shall standardize basic software functionality of automotive ECUs.	RS_Main_00001, RS_Main_00002, RS_Main_00120, RS_Main_00122, RS_Main_00123, RS_Main_00124, RS_Main_00125, RS_Main_00435, RS_Main_00510
RS_PO_00009	AUTOSAR shall support applicable international automotive standards and state-of-the-art technologies.	RS_Main_00011, RS_Main_00012, RS_Main_00030, RS_Main_00170, RS_Main_00260, RS_Main_00261, RS_Main_00285, RS_Main_00350, RS_Main_00420, RS_Main_00430, RS_Main_00435, RS_Main_00490, RS_Main_00505, RS_Main_00507
RS_PO_00009	AUTOSAR shall support applicable international automotive standards and state-of-the-art technologies.	RS_Main_00011, RS_Main_00012, RS_Main_00030, RS_Main_00170, RS_Main_00260, RS_Main_00261, RS_Main_00285, RS_Main_00350, RS_Main_00420, RS_Main_00430, RS_Main_00435, RS_Main_00490, RS_Main_00505, RS_Main_00507

4 Requirements Specification

4.1 Architecture

4.1.1 [RS_Main_00001] AUTOSAR shall provide a software platform for deeply embedded systems

[

Type:	Valid
Description:	AUTOSAR shall provide a software platform called AUTOSAR Classic Platform, which targets the domain of deeply embedded systems.
Rationale:	Many automotive applications are deeply embedded in the physical world and have high demands regarding predictability, safety and responisvness.
Use Case:	Drive and brake by wire systems
Applies to:	CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00003, RS_PO_00004, RS_PO_00008)

4.1.2 [RS_Main_00002] AUTOSAR shall provide a software platform for high performance computing platforms

[

Type:	Valid
Description:	AUTOSAR shall provide a software platform called AUTOSAR Adaptive Platform, which targets the domain of automotive applications with high demands regarding computing power and memory.
Rationale:	Advanced automotive applications require a huge amount of ressources (computing power and memory). To develop efficiently such systems a software platform with different characteristics as required for RS_Main_00001 is required e.g. different scheduling strategies, dynamic memeory management etc.
Use Case:	Development of applications for automated driving and advanced driving assistance systems
Applies to:	AP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00003, RS_PO_00004, RS_PO_00008)

4.1.3 [RS_Main_00400] AUTOSAR shall provide a layered software architecture

⌈

Type:	Valid
Description:	AUTOSAR shall provide a software architecture, which distinguishes between Application Software, a Runtime Enironment and Basic Software.
Rationale:	The Runtime Environment defines a standardized programming interface for the Application Software. This enables the reallocation and reuse of Software Components.
Use Case:	Relocation of yaw rate control from one ECU to another.
Applies to:	CP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00001, RS_PO_00002, RS_PO_00007)

4.1.4 [RS_Main_00150] AUTOSAR shall support the deployment and reallocation of AUTOSAR Application Software

⌈

Type:	Valid
Description:	AUTOSAR shall develop means to enable reallocation of AUTOSAR Application Software at the following points in time: • Design-time: During development of the ECUs • Run-time: Time between start-up and shut-down of the software stack • Life-time: Time after start of production
Rationale:	Enable the reallocation of Application Software to different ECUs.
Use Case:	• OEM provides safety or security related software for installation onto vehicle • OEM provides additional QM software for installation onto vehicle • Developer performs agile development of vehicle functions • Reallocation of yaw rate control from one ECU to another at development-time • Optimization of overall system architecture. • Update of (single) Adaptive Application or update of specific configurations over the air
Applies to:	AP, CP, FO
Dependencies:	RS_Main_00140, RS_Main_00141
Supporting Material:	--

⌋(RS_PO_00001)

4.1.5 [RS_Main_00060] AUTOSAR shall provide a standardized software interface for communication between Applications

[

Type:	Valid
Description:	As the interface definition for applications is a prerequisite for reuse of software AUTOSAR shall provide such a standardized interface.
Rationale:	From an application point of view the interface to other AUTOSAR Application Software of one AUTOSAR Platform shall be identical, independent whether the Application Software is located on the same or on another ECU.
Use Case:	Application Software development independent from the underlying communication system.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00002, RS_PO_00007)

4.1.6 [RS_Main_00140] AUTOSAR shall provide network independent communication mechanisms for applications

[

Type:	Valid
Description:	AUTOSAR shall support the development of Application Software independent from the implemented communication protocol.
Rationale:	Independency from the underlying communication protocol is a prerequisite to support the reallocation of Application Software across ECUs that belong to the same Platform type.
Use Case:	Reallocation of Application Software from ECU A with CAN communication to ECU B with FlexRay communication.
Applies to:	CP, AP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00002)

4.1.7 [RS_Main_00410] AUTOSAR shall provide specifications for routines commonly used by Application Software to support sharing and optimization

⌈

Type:	Valid
Description:	AUTOSAR shall support the development of Application Software by providing standardized libraries with commonly used functions.
Rationale:	Share routines between different Applications. Use of optimized routines by Applications integrated in different ECUs.
Use Case:	Relocation of SW component from ECU A to ECU B with a different microcontroller.
Applies to:	CP, AP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00001, RS_PO_00003, RS_PO_00004)

4.1.8 [RS_Main_00190] AUTOSAR shall support interoperability with non-AUTOSAR software on the same ECU

⌈

Type:	Valid
Description:	Reuse of existing legacy software shall be supported by AUTOSAR. Integration of legacy software in an ECU compliant to AUTOSAR shall be supported.
Rationale:	A smooth migration to AUTOSAR requires that existing software can be reused.
Use Case:	Reuse of existing driver software for a new ECU that is developed according to AUTOSAR. Communication with non-AUTOSAR software systems.
Applies to:	CP, AP, FO
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00003)

4.1.9 [RS_Main_00330] AUTOSAR shall support the principle of information hiding

[

Type:	Valid
Description:	AUTOSAR shall provide protection mechanisms for internal information of Applications.
Rationale:	Well-defined interfaces and data flow between AUTOSAR Application Software.
Use Case:	Reduce impact of modifications within a Software Component.
Applies to:	CP, AP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00007)

4.1.10 [RS_Main_00011] AUTOSAR shall support the development of reliable systems

[

Type:	Valid
Description:	AUTOSAR shall provide mechanisms for error handling in order to support the development of reliable systems.
Rationale:	Reliability is one possibility to achieve safety without decreasing availability.
Use Case:	Reduction of repair time of a vehicle in field service.
Applies to:	CP, AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00005, RS_PO_00009)

4.1.11 [RS_Main_00230] AUTOSAR shall support network topologies including gateways

[

Type:	Valid
Description:	AUTOSAR shall support net topologies with different in-vehicle network technologies. Interconnection of these networks via gateways, bridges, or repeaters shall be supported.
Rationale:	ECUs communicate via different communication systems.
Use Case:	Support of today's network topologies of E/E-architectures in series production.
Applies to:	CP, AP
Dependencies:	--

Supporting Material:	--

](RS_PO_00002)

4.1.12 [RS_Main_00501] AUTOSAR shall support redundancy concepts

[

Type:	Valid
Description:	In engineering, redundancy is the duplication of critical components or functionality of a system with the intention of increasing reliability of the system. AUTOSAR shall support the freedom of interference according to ISO26262.
Rationale:	Use-Cases like highly automated driving require a high system reliability.
Use Case:	Driver temporarily/partially passes responsibility for driving task to vehicle.
Applies to:	AP, CP
Dependencies:	ISO26262
Supporting Material:	http://en.wikipedia.org/wiki/Redundancy_(engineering) http://en.wikipedia.org/wiki/Active_redundancy

](RS_PO_00005)

4.1.13 [RS_Main_00012] AUTOSAR shall provide a software platform to support the development of highly available systems.

[

Type:	Valid
Description:	Availability of the Adaptive Platform is defined as the probability that platform services will operate satisfactorily at a given point in time. It excludes both preventive and corrective maintenance downtime. Availability is limited to normal runtime behavior (excluding e.g. software update)
Rationale:	Facilitate the development of highly available systems by using AUTOSAR platforms.
Use Case:	Highly available systems are required for automated driving applications.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00005, RS_PO_00009)

4.1.14 [RS_Main_00511] AUTOSAR shall support virtualization

[

Type:	Valid
Description:	AUTOSAR shall support virtualization in a way that it can be hosted and executed as a guest operating system in a

	virtualized environment.
Rationale:	It shall be possible to run AUTOSAR on top of existing hypervisor solutions.
Use Case:	Development of ECUs which contain infotainment as well as control functionality
Applies to:	CP, AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00002)

4.1.15 [RS_Main_00010] AUTOSAR shall support the development of safety related systems.

[

Type:	Valid
Description:	AUTOSAR Platforms shall support commonly used safety mechanisms. This includes but is not limited to: • Mechanisms to ensure freedom of interference for Adaptive Applications, Functional Cluster, Software Components and Basic Software Modules • Safe inter ECU communication • Measures to implement fail operational systems • Templates to support the configuration and documentation of safety relevant aspects However, it cannot ensure safety for systems. This is to be ensured on system level.
Rationale:	Facilitate the development of safety related systems by using AUTOSAR platforms. Platforms designed for the support of safety related systems are needed for safety related ECUs like digital engine control units and electronic power steering systems.
Use Case:	Driver temporarily/partially passes responsibility for driving task to vehicle (ADAS/HAD) OEM provides safety or security related software for installation onto vehicle High availability, fail-operational systems
Applies to:	CP, AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00005)

4.1.16 [RS_Main_00420] AUTOSAR shall use established software standards and consolidate de-facto standards for basic software functionality

[

Type:	Valid
Description:	The different solutions for basic software functionalities shall be consolidated to a single standard. Whenever possible

	AUTOSAR shall make use of existing standards provided that they meet the given requirements.
Rationale:	Historically, OEMs and the big Tier1 have created proprietary standard core solutions, with partly different functionality. To achieve a common standard, which is accepted and used by all of the participating partners these solution shall be consolidated by AUTOSAR. If an agreed common solution supported by OEMs and Tier 1 already exists, this solution shall be adopted by AUTOSAR in order to ease reuse of existing software.
Use Case:	OSEK Operating System in AUTOSAR ECUs. Partial Networking. Network Management. POSIX
Applies to:	CP, AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00007,RS_PO_00009)

4.1.17 [RS_Main_00440] AUTOSAR shall standardize access to non-volatile memory

[

Type:	Valid
Description:	An important software functionality is the access to non-volatile memory. AUTOSAR shall support read and write access to non-volatile memory.
Rationale:	Application Software needs to store data, which is available after a restart.
Use Case:	Storage of error codes
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00004)

4.1.18 [RS_Main_00445] AUTOSAR shall standardize access to crypto-specific HW and SW

[

Type:	Valid
Description:	The AUTOSAR platforms shall support access to crypto and security related Hardware and define Software to access those.
Rationale:	Software Components need to encrypt, authenticate and store data in a secure memory for protection against malicious entities.
Use Case:	Security
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00004)

4.1.19 [RS_Main_00460] AUTOSAR shall standardize methods to organize mode management on Application, ECU and System level

[

Type:	Valid
Description:	The AUTOSAR Basic Software shall provide mode management mechanisms for Application Software to control or react on modes of the ECU / vehicle
Rationale:	The behavior of Application Software highly depends on the overall mode of the ECU and/or the System. Therefore the overall mode management has to be standardized to achieve the same behavior if Application Software is transferred from one ECU to another ECU or from one System to another System.
Use Case:	Degradation of application functionality in certain power modes.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00004)

4.1.20 [RS_Main_00514] AUTOSAR shall support the development of secure systems

[

Type:	Valid
Description:	AUTOSAR shall specify an automotive security approach defining security measures and properties.
Rationale:	Protection of data against misuse is important when storing sensitive data (e.g. personal data, credit card information) in the car.
Use Case:	Customer acquires license to use feature or data in his vehicle
Applies to:	CP, AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00005)

4.1.21 [RS_Main_00170] AUTOSAR shall provide secure access to ECU

[

Type:	Valid
Description:	AUTOSAR shall provide secured access to ECU, (e.g. by user authentication), including standardized up- and download of data and software. For this mechanisms and methods shall be defined.

Rationale:	The update and upgrade feasibility provided by AUTOSAR includes technical challenges (e.g. standardized up-/download protocol, partly update of the software) and mechanisms (e.g. how to authorize the user).
Use Case:	Download of dedicated Software Components in ECU.
Applies to:	AP, CP
Dependencies:	To fulfill this requirement it is also necessary that the environment that is not standardized by AUTOSAR (e.g. bootloader) needs to match the same security requirements.
Supporting Material:	--

](RS_PO_00004, RS_PO_00005, RS_PO_00009)

4.1.22 [RS_Main_00510] AUTOSAR shall support secure onboard communication

[

Type:	Valid
Description:	AUTOSAR shall provide means to check data authenticity, data integrity and data freshness in inter ECU communication.
Rationale:	Dependable systems rely on authentic and trustworthy exchange of information between ECUs. Protecting and assuring data authenticity, data integrity and data freshness in inter ECU communication allows for the development of secure and safe systems by using the AUTOSAR platform.
Use Case:	Protection of on-board communication against manipulation.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00004, RS_PO_00005, RS_PO_00008)

4.1.23 [RS_Main_00260] AUTOSAR shall provide diagnostics means during runtime, for production and services purposes

[

Type:	Valid
Description:	AUTOSAR shall support diagnostic standards (OBD and ISO14229) and communication protocols (UDS) to allow diagnostic access to the ECUs.
Rationale:	Standardized diagnostic access is required for field service and admission.
Use Case:	Perform diagnosis of Application Software or ECUs during maintenance of the car.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00004, RS_PO_00005, RS_PO_00009)

4.1.24 [RS_Main_00261] AUTOSAR shall provide means for calibration

[

Type:	Valid
Description:	AUTOSAR shall provide a unified way for off- and onboard data calibration. The calibration data shall be accessable by Applications.
Rationale:	Use of calibration data for production and field service.
Use Case:	Measurement and logging of customer data in product use
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00004, RS_PO_00005, RS_PO_00009)

4.1.25 [RS_Main_00280] AUTOSAR shall provide standardized communication interfaces for the onboard data exchange between ECUs with different software platforms

⌈

Type:	Valid
Description:	AUTOSAR shall support the interaction between platforms defined by AUTOSAR or other parties (e.g. running other operating systems). These interacting software platforms may be deployed on: one MCU with different cores (virtualization) one ECU with different MCUs different ECUs
Rationale:	Automotive networks consist of ECUs running different software platforms beside the software platforms defined by AUTOSAR. Examples, which can also be found in automotive networks are Genivi, WinCE, VxWorks, Linux, Android, or QNX. For a seamless integration, it is essential to provide standardized communication mechanisms.
Use Case:	Driver temporarily/partially passes responsibility for driving task to vehicle (ADAS/HAD) Software as a product Smartphone integration App interaction Heterogeneuos Architecture Highly Automated Driving Car-2-X communication, vehicle data storage Communication with traffic light
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00003)

4.1.26 [RS_Main_00285] AUTOSAR shall support protocols for Intelligent Transportation Systems

⌈

Type:	Valid
Description:	AUTOSAR communication shall support geo-networking, transport protocols and facility protocols for Vehicle-2-X applications as defined by ETSI
Rationale:	Geo-networking (GN) and the basic transport protocol (BTP) are essential components of a V2X stack. The facilities (FAC) implement the functionality for reception and transmission of standardized V2X messages. V2X facilities also build the interface for vehicle specific applications. For the European market they especially

	support decoding, encoding and management of cooperative awareness messages. All protocols are accompanied by standardized mechanisms to secure privacy and maintain availability of the service in highly congested areas
Use Case:	Examples e.g. enhance traffic flow by provision of infrastructure messages (traffic lights ahead, …) to software components, implementation of standardized sending applications
Applies to:	CP, AP
Dependencies:	--
Supporting Material:	EN 302 636, EN 302 636, ETSI TS 102 636-3

⌋(RS_PO_00003,RS_PO_00004,RS_PO_00005,RS_PO_00006,RS_PO_00009)

4.1.27 [RS_Main_00026] AUTOSAR shall support high speed and high bandwidth communication between executed SW

⌈

Type:	Valid
Description:	The middleware shall support high speed and high bandwidth communication between executed SW.
Rationale:	Requirements for communication speed and bandwidth have grown at a rapid pace in the past and continue to grow at an unbroken rate.
Use Case:	High-bandwidth data like image or sensor data is exchanged between components within automotive networks.
Applies to:	CP, AP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00006)

4.1.28 [RS_Main_01001] AUTOSAR shall support intra ECU communication

⌈

Type:	Valid
Description:	AUTOSAR communication shall support intra ECU communication.
Rationale:	An SWC should be able to communicate with each another SWC within the same ECU.
Use Case:	Several SWCs send signals to each other to exchange algorithm data.
Applies to:	CP, AP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00002, RS_PO_00001)

4.1.29 [RS_Main_01002] AUTOSAR shall support service-oriented communication

⌈

Type:	Valid
Description:	AUTOSAR shall support service-oriented communication between applications independently of the location of the applications.
Rationale:	Reuseability of services and dynamic configuration of communication paths.
Use Case:	A parking assistant application wants to use camera and radar services.
Applies to:	AP
Dependencies:	RS_Main_00150, RS_Main_00140
Supporting Material:	--

⌋(RS_PO_00001)

4.1.30 [RS_Main_01003] AUTOSAR shall support data-oriented communication

⌈

Type:	Valid
Description:	AUTOSAR shall support data-oriented communication between applications. This means that applications are able to send data to all applications configured to receive the respective data.
Rationale:	Transfer data to applications on other ECUs or on the same ECU.
Use Case:	Send current vehicle speed over CAN bus to various applications.
Applies to:	CP, AP
Dependencies:	RS_Main_00150, RS_Main_00140
Supporting Material:	--

⌋(RS_PO_00001)

4.2 Adaptive Platform

4.2.1 [RS_Main_00513] AUTOSAR shall support language bindings for different programming languages

⌈

Type:	Valid
Description:	The AUTOSAR Adaptive Platform shall support the implementation of Application Software in different programming languages.
Rationale:	Depending on the context and domain of a development project different programming languages might be appropriate. AUTOSAR shall support a variety of programming languages.
Use Case:	Implementation of complex algorithms in C++ Implementation of safety relevant functionality in C
Applies to:	AP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00001, RS_PO_00004)

4.2.2 [RS_Main_00505] AUTOSAR support the interaction of onboard application software with offboard systems.

⌈

Type:	Valid
Description:	The AUTOSAR Adaptive Platform shall support the communication between AUTOSAR Application Software and offboard services provided by devices, which are not permanently integrated into the vehicle network. These includes but is not limited to • infrastructure such as traffic lights • mobile devices • backend systems
Rationale:	Automotive applications require more and more information from different offboard systems such as infrastructure elements (e.g. traffic lights) and different back end systems (e.g. OEM-specific back end).
Use Case:	Driver temporarily/partially passes responsibility for driving task to vehicle (ADAS/HAD). Authorized party accesses configuration vehicle parameters and data. Developer performs agile development of vehicle functions. Customer acquires license to use feature or data in his vehicle.

	High quality map data Car-2-X communication, vehicle data storage
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00004, RS_PO_00009)

4.2.3 [RS_Main_00503] AUTOSAR shall provide a Software Platform that supports adaptation of communication topology after production

[

Type:	Valid
Description:	Advanced systems require dynamic allocation of AUTOSAR Applications and adaptations of the communication topology after development and production, but at life-time of the system. AUTOSAR shall provide a platform, which provides these features.
Rationale:	Advanced driving assistance functions have to be updated over the air. This might include changes to the scheduling and the communication behavior of the function and has to be supported by the platform.
Use Case:	OEM provides safety or security related software for installation onto vehicle OEM provides additional QM software for installation onto vehicle Developer performs agile development of vehicle functions Software as a product Developer performs agile development of vehicle functions Reallocation of yaw rate control from one ECU to another at development-time Optimization of overall system architecture. Update of (single) SWCs or update of specific configurations over the air
Applies to:	AP
Dependencies:	[RS_Main_00400] AUTOSAR shall provide a layered software architecture
Supporting Material:	--

](RS_PO_00005)

4.2.4 [RS_Main_01004] AUTOSAR shall support standards for wireless off-board communication

[

Type:	Valid
Description:	AUTOSAR communication shall support standards for wireless off-board communication.
Rationale:	To be compatible with off-board service providers, the AUTOSAR communication needs to support off-board

	communication standards.
Use Case:	Services for automotive applications can be provided in cloud instances or vehicle backend
Applies to:	AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00004)

4.2.5 [RS_Main_01008] AUTOSAR shall provide secure communication with off-board entities

[

Type:	Valid
Description:	AUTOSAR communication shall provide secure communication with off-board entities.
Rationale:	Data should be securely transferred between the vehicle and off-board entities to protect data integrity, privacy and prevent misuse.
Use Case:	Purchasing applications or unlocking functionality through the headunit HMI should be safe and secure.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00004)

4.2.6 [RS_Main_01005] AUTOSAR shall establish communication paths dynamically

[

Type:	Valid
Description:	AUTOSAR communication shall establish communication paths dynamically.
Rationale:	The deployment of services can depend on many factors, changing several times during the development process or after release in the field.
Use Case:	A service is selected based on availability of sensor data.
Applies to:	AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00006, RS_PO_00002)

4.2.7 [RS_Main_01007] AUTOSAR communication shall assure quality of service on communication

[

Type:	Valid
Description:	AUTOSAR communication shall assure quality of service on communication

Rationale:	Some applications are sensitive to delays in signal reception. Other applications may need guaranteed reception of certain signals for proper operation.
Use Case:	An algorithm in the ESP needs data from the wheel sensors with low-latency and guaranteed reception.
Applies to:	AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00005)

4.2.8 [RS_Main_00049] AUTOSAR shall provide an Execution Management for running multiple applications

[

Type:	Valid
Description:	The middleware shall provide an execution framework for adaptive SWCs.
Rationale:	SWCs can by started and stopped based on application logic. To support this, the execution management should be able to facilitate lifecycle operations for numerous SWCs.
Use Case:	The execution management starts all required SWCs at system initialization.
Applies to:	AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00006, RS_PO_00004)

4.2.9 [RS_Main_00050] AUTOSAR shall provide an Execution Framework towards applications to implement concurrent application internal control flows.

[

Type:	Valid
Description:	AUTOSAR shall provide an Execution Framework towards applications to implement concurrent application internal control flows.
Rationale:	The execution framework must manage numerous running SWCs and handle their independent control flows.
Use Case:	The execution framework starts several SWCs in an ordered manner.
Applies to:	AP
Dependencies:	--
Supporting Material:	--

](RS_PO_00006, RS_PO_00004)

4.2.10 [RS_Main_00106] AUTOSAR shall provide the possibility to extend the software with new SWCs without recompiling the platform foundation

⌈

Type:	Valid
Description:	It shall be possible to extend AUTOSAR with new SWCs without recompiling the platform foundation
Rationale:	To prevent unnecessary build time, individual SWCs should be able to be compiled independently without the need to recompile all other system software.
Use Case:	A new SWC is introduced to an ECU implementation at a later point in time during the SW project.
Applies to:	AP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00004, RS_PO_00007)

4.3 Classic Platform

4.3.1 [RS_Main_00130] AUTOSAR shall provide an abstraction from hardware

[

Type:	Valid
Description:	AUTOSAR shall provide an abstraction layer from hardware characteristics. This abstraction layer shall onnly be accessable to the software modules directly interacting with the HW. Other parts of the System Software shall be independent from hardware.
Rationale:	Reuse of the Application Software independent of the underlaying hardware. Software sharing between multiple HW platforms.
Use Case:	Relocate application from one ECU with hardware A to a ECU with hardware B without changing the Application Software.
Applies to:	CP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00002)

4.3.2 [RS_Main_00100] AUTOSAR shall provide standardized Basic Software

[

Type:	Valid
Description:	AUTOSAR shall provide a complete functional specification of the Basic Software including interfaces and behavioral description.
Rationale:	To support reallocation of Software Components it is necessary that the Software Components can rely on identical services provided by the Basic Software. The Basic Software is a necessary stable foundation for implementing applications on multiple ECUs.
Use Case:	Application Software shall be useable on multiple implementations of the Basic Software.
Applies to:	CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00007)

4.3.3 [RS_Main_00430] AUTOSAR shall support established automotive communication standards

⌈

Type:	Valid
Description:	AUTOSAR ECUs shall support common established communication systems. This includes at least but is not restricted to: CAN, LIN, FlexRay, Ethernet
Rationale:	Automotive ECUs communicate over different standardized communication systems. These shall be supported by AUTOSAR.
Use Case:	Implementation of distributed functionality e. g. driving assistance systems
Applies to:	CP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00004,RS_PO_00009)

4.3.4 [RS_Main_00435] AUTOSAR shall support automotive microcontrollers

⌈

Type:	Valid
Description:	AUTOSAR shall support hardware features of commonly used automotive microcontrollers.
Rationale:	Automotive ECUs use dedicated, highly integrated microcontrollers, which have to pass automotive qualification procedures. The AUTOSAR shall support the integrated features of these microcontrollers. These include, but are not limited to: Digital I/O Analog/Digital converter Pulse-width modulation Bus controllers for CAN, LIN, FlexRay, Ethernet Multiprocessor architectures Many core architectures Memory protection units Flash Microprocessors
Use Case:	Development of typical automotive control units [UC_AD1.4] Highly Automated Driving
Applies to:	CP,AP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00005,RS_PO_00008, RS_PO_00009)

4.3.5 [RS_Main_00450] AUTOSAR shall standardize access to general purpose I/O

[

Type:	Valid
Description:	The AUTOSAR Basic Software shall support access to general purpose I/O.
Rationale:	Software Components need to access application specific hardware (sensor and actuators)
Use Case:	Temperature sensor for engine control.
Applies to:	CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00004)

4.3.6 [RS_Main_00220] The functional interfaces of AUTOSAR shall be specified in standard C

[

Type:	Valid
Description:	The specification of functional interfaces of AUTOSAR shall be specified in standard C90. This implies that languages, which can interface to standard C90 can be used for application programming.
Rationale:	A useful reduction of programming languages to current programming languages reduces the impacts on AUTOSAR definitions and specifications due to logical and/or technical differences of different programming languages.
Use Case:	AUTOSAR implementation in C, C++.
Applies to:	CP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00004)

4.4 Methodology

4.4.1 [RS_Main_00160] AUTOSAR shall provide means to describe interfaces of the entire system.

[

Type:	Valid
Description:	Well-defined interfaces are the key for exchangeability, reusability and the basis for the freedom of interference. Decomposition on interface level is essential for an appropriate clustering and partitioning in the AUTOSAR Application Software.
Rationale:	Principle: “divide and conquer” which is a key success factor in the development of large systems.
Use Case:	Development of large interconnected software systems with a high degree of reuse, such as driving assistance systems.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00007)

4.4.2 [RS_Main_00161] AUTOSAR shall provide a unified way to describe software systems deployed to Adaptive and / or Classic platforms.

[

Type:	Valid
Description:	A comprehensive software model shall capture all elements of a distributed software system. The definition of functionality shall be independent from the final assignment to platforms and ECUs.
Rationale:	The allocation of software to platforms shall be a subsequent step after the overall definition of funcationality.
Use Case:	Development of large software systems being deployed on mixed platforms.
Applies to:	CP, AP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00007)

4.4.3 [RS_Main_00180] AUTOSAR shall provide mechanisms to protect intellectual property in a shared development process

[

Type:	Valid
Description:	Integration of software of different suppliers requires exchange of software (especially source code) between the different parties involved. Thus, AUTOSAR shall provide mechanisms to safeguard software. AUTOSAR shall ensure a smooth integration process that at the same time protects intellectual property of the companies involved.
Rationale:	Integration of third party solutions requires dealing with intellectual property issues.
Use Case:	1) SW sale of split-screen software for navigation. 2) Integration of BSW modules of different suppliers.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00007)

4.4.4 [RS_Main_00300] AUTOSAR shall provide data exchange formats to support work-share in large inter and intra company development groups

[

Type:	Valid
Description:	AUTOSAR shall support the work-share in large development projects via well-defined exchange formats.
Rationale:	A typical AUTOSAR system is expected to carry a huge number of signals per vehicle. To develop vehicle descriptions a good organization of work-share is needed. To support such organizations, well defined concepts for information exchange are required.
Use Case:	Data sharing between OEM and 1st Tier supplier.
Applies to:	AP, CP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00007)

4.4.5 [RS_Main_00301] AUTOSAR shall specify profiles for data exchange to support work-share in large inter- and intra-company development groups

[

Type:	Valid
Description:	AUTOSAR shall support the work-share in large development projects via the definition of common data exchange points and profiles which provide guidance with respect to completeness and correctness of data at these data exchange points.
Rationale:	Smooth exchange of data between different stakeholders by improved tool interoperability. Avoid iterations due to incomplete data. Clear definition of a data exchange point for all stakeholders. Early identification of possible data exchange problems.
Use Case:	Data sharing between OEM and 1st Tier supplier.
Applies to:	AP, CP, FO
Dependencies:	RS_Main_00300, RS_Main_00250, RS_Main_00251
Supporting Material:	--

](RS_PO_00007)

4.4.6 [RS_Main_00080] AUTOSAR shall provide means to describe a component model for Application Software

[

Type:	Valid
Description:	AUTOSAR shall provide a formal description Application Software fort he Adaptive as well as the Classic Platform. This description together with source code and/or object code forms an AUTOSAR Application Software.
Rationale:	Software reuse is one of the major aims of AUTOSAR.
Use Case:	Momentum control in different ECUs.
Applies to:	AP, CP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00004, RS_PO_00007)

4.4.7 [RS_Main_00310] AUTOSAR shall support hierarchical Application Software design methods

[

Type:	Valid
Description:	AUTOSAR shall provide means to structure Application Software in a hierarchical way, so that only links to outside Software need to be treated / adapted / changed in the next hierarchical level.

Rationale:	Objective is to allow each actor in the development chain to focus on the required level and tasks.
Use Case:	Software development of an engine management system can only be achieved by using hierarchical strategies.
Applies to:	AP, CP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00001, RS_PO_00002, RS_PO_00007)

4.4.8 [RS_Main_00320] AUTOSAR shall provide formats to specify system development

[

Type:	Valid
Description:	In AUTOSAR it shall be possible to describe all requirements of Application Software to their platform environment. This enables the integrator to provide the Application Software in such an environment on an ECU.
Rationale:	The AUTOSAR format will include system, ECU and SW specification and is necessary for the ECU integration process.
Use Case:	OEM designs an Application Software and a Supplier will integrate these AUTOSAR Software Applications on an ECU.
Applies to:	AP, CP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00004, RS_PO_00007)

4.4.9 [RS_Main_00340] AUTOSAR shall support the continuous timing requirement analysis

[

Type:	Valid
Description:	AUTOSAR shall support observation, assessment and methodology of timing requirements throughout the development cycle.
Rationale:	Application Software has specific timing requirements which have to follow the common methodology in order to provide reliable and comparable information towards timing.
Use Case:	Real time control of today's gasoline injection system.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00005)

4.4.10 [RS_Main_00360] AUTOSAR shall support variant management

[

Type:	Valid
Description:	Variant management is introduced on vehicle level and is required to check compatibility of Application Software in different vehicle versions and release states.
Rationale:	In today's automotive development and production it is possible to reach many different variants for one vehicle platform. This also affects the AUTOSAR Application Software variants.
Use Case:	Integration of Application Software on different ECUs and/or E/E-architectures.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00002)

4.4.11 [RS_Main_00250] AUTOSAR methodology shall provide a predefinition of typical roles and activities.

[

Type:	Valid
Description:	The definition and description of roles and activities in the design methodology should support a work-share model.
Rationale:	As AUTOSAR enables work-share on different positions and activities it shall provide a common understanding of roles and activities.
Use Case:	Share activities like AUTOSAR configuration and Application Software partitioning between software integrator and software architect.
Applies to:	AP, CP, FO
Dependencies:	--
Supporting Material:	--

](RS_PO_00007)

4.4.12 [RS_Main_00507] AUTOSAR shall reflect the stages of a software system development in a formal model description

[

Type:	Valid
Description:	AUTOSAR shall reflect the stages of a software development process and define templates how information at these stages can be exchanged between the different parties. As blueprint for such development processes AUTOSAR shall

	consider existing standards like ISO26262 and Automotive SPICE.
Rationale:	During the development of a vehicle, software system at different process steps information is exchanged between the various partners. AUTOSAR shall refine the formats and state criteria for completeness of the exchanged information to capture general requirements on the progress of development.
Use Case:	OEM provides safety or security related software for installation onto vehicle OEM provides additional QM software for installation onto vehicle Developer performs agile development of vehicle functions Methodology and exchange formats
Applies to:	AP, CP, FO
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00001,RS_PO_00009)

4.5 Non-functional Requirements

4.5.1 [RS_Main_00200] AUTOSAR specifications shall allow resource efficient implementations

⌈

Type:	Valid
Description:	AUTOSAR specifications shall allow efficient implementations with respect to • RAM • ROM, Flash • Computing Power • Bus bandwith
Rationale:	Limited resources like flash, RAM, computing power characterize automotive microcontrollers.
Use Case:	Integration of the AUTOSAR platform and a single application in a typical 16-bit automotive microcontroller.
Applies to:	CP
Dependencies:	--
Supporting Material:	--

⌋(RS_PO_00006)

4.5.2 [RS_Main_00270] AUTOSAR shall provide mitigation strategies towards new releases

⌈

Type:	Valid
Description:	Migration from AUTOSAR release n to release n+1 shall be

	supported. AUTOSAR shall provide migration strategies, how Software Components and ECUs of different release have to be adapted to interoperate.
Rationale:	Compatibility ensures a long time usage of the AUTOSAR standard.
Use Case:	Integration of ECU's using infrastructure software of the latest AUTOSAR release in a network built from ECU's using a former release.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00001)

4.5.3 [RS_Main_00500] AUTOSAR shall provide naming conventions

[

Type:	Valid
Description:	AUTOSAR shall define naming conventions for internal and external symbols created and used by the standard.
Rationale:	Naming conventions shall be defined in specification documents to achieve a standardized and consistent documentation. This is good documentary practice, helps for better understanding, reduces ambiguities and improves cooperation
Use Case:	Work-share models between OEM and supplier. Development of AUTOSAR specifications.
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	--

](RS_PO_00007)

4.6 Acceptance Testing

4.6.1 [RS_Main_00120] AUTOSAR shall provide means to assure interoperability of AUTOSAR implementations (ICC1 level) on application level (RTE) and bus level.

[

Type:	Valid
Description:	AUTOSAR shall provide specified test cases and the essential test methodology to ensure interoperability on application (RTE side) and bus level for BSW on ICC1 level (Black Box Test). These specified test cases and its related methodology shall be developed to test implementations of AUTOSAR basic software.
Rationale:	Acceptance tests are strongly needed to provide evidence that a product complies with the AUTOSAR specification i.e. to ensure a certain behavior of the regarded elements at the interfaces to application and communication busses.
Use Case:	Integration of the infrastructure SW into a specific ECU, bring it into the E/E-architecture without backlashes on the system. Example from real world: Integration of BSW stack (ICC1 level) to applications and the ECU infrastructure without difficulties. Support test of any ICC implementations (from ICC1 to ICC3). Reuse of the same test specification even when the ICC3 specification details change
Applies to:	TC
Dependencies:	--
Supporting Material:	--
Tested Items:	--

](RS_PO_00008)

4.6.2 [RS_Main_00121] Acceptance tests shall minimize test effort and test costs

⌈

Type:	Valid
Description:	In order to avoid redundant test cycles and ease the reuse of test results for users of AUTOSAR standard, acceptance tests shall focus on reduction of test effort and test costs. Test concept shall address explicitly efficiency.
Rationale:	Users of acceptance tests will typically use these tests for checking that a BSW implementation is mature enough to enter the user's ECU software development process. Within this development process, there are usually more in-depth release tests in place. The acceptance tests are thus not required to test the BSW in full depth and with full coverage and can therefore not replace release tests at OEMs or Tier1s. Standard test ease the reuse of test results because they are commonly understood by different market partners (who use the test results / who implement the tests and who execute the tests).
Use Case:	BSW handover into Development process Selection of the standard tests needed for an application (where test results are required) / documentation of the standard test supported by a BSW implementation (where test results will be provided)
Applies to:	TC
Dependencies:	--
Supporting Material:	--
Tested Items:	--

⌋(RS_PO_00007, RS_PO_00002)

4.6.3 [RS_Main_00122] Acceptance tests shall test interoperability of BSW implementations of one AUTOSAR release in one vehicle network

⌈

Type:	Valid
Description:	Acceptance tests shall ensure interoperability of BSW implementations of one AUTOSAR release in one vehicle network
Rationale:	Sourcing and differences in lifecycles of ECUs require flexibility in the choice of BSW implementations
Use Case:	Heterogenic vehicle networks of ECUs with different BSW implementations of the same AUTOSAR release
Applies to:	TC
Dependencies:	--
Supporting Material:	--
Tested Items:	RS_Main_00230, RS_Main_00430, RS_Main_00260, RS_Main_00160, RS_Main_00360

⌋(RS_PO_00001, RS_PO_00002, RS_PO_00007, RS_PO_00008)

4.6.4 [RS_Main_00123] Acceptance tests shall test interoperability of BSW implementations in vehicle networks

⌈

Type:	Valid
Description:	Acceptance tests shall test interoperability of BSW implementations in vehicle networks.
Rationale:	BSW is supplied from various sources and suppliers
Use Case:	heterogenic vehicle networks of ECUs from different suppliers and gateways
Applies to:	TC
Dependencies:	--
Supporting Material:	--
Tested Items:	RS_Main_00210, RS_Main_00230, RS_Main_00430, RS_Main_00260, RS_Main_00160, RS_Main_00360, RS_Main_00270

⌋(RS_PO_00001, RS_PO_00002, RS_PO_00007, RS_PO_00008)

4.6.5 [RS_Main_00124] Acceptance tests shall test interoperability of BSW implementations to applications

⌈

Type:	Valid
Description:	Acceptance tests shall test interoperability of BSW implementations to applications.
Rationale:	Application development must be independent from the different BSW implementations. The application interfaces are the RTE with its interfaces and the BSW services.
Use Case:	Strategic, abstract and generic application development Support for different development cycles for applications and BSW implementations
Applies to:	TC
Dependencies:	--
Supporting Material:	--
Tested Items:	RS_Main_00400, RS_Main_00150, RS_Main_00060, RS_Main_00410, RS_Main_00440, RS_Main_00460, RS_Main_00260, RS_Main_00160, RS_Main_00080, RS_Main_00320

⌋(RS_PO_00001, RS_PO_00002, RS_PO_00007, RS_PO_00008)

4.6.6 [RS_Main_00125] Acceptance tests shall provide means to measure the BSW implementation maturity.

⌈

Type:	Valid
Description:	Acceptance tests shall provide a reference to measure maturity.
Rationale:	An existing test specification provides verification for requirements that are available with the AUTOSAR software standard. A common set of test cases as a reference enables the verification in the software implementation.
Use Case:	Reuse of standard tests during the qualification process of BSW implementation.
Applies to:	TC
Dependencies:	--
Supporting Material:	--
Tested Items:	--

⌋(RS_PO_00007, RS_PO_00008)

4.6.7 [RS_Main_00127] AUTOSAR shall provide generic test cases

⌈

Type:	Valid
Description:	As test cases are executed on implementation level they limit a possible generic verification by partners.
Rationale:	AUTOSAR test cases should create an implementation space that is includes a possible solution.
Use Case:	Testability should be independent from the partners implementation.
Applies to:	TC
Dependencies:	--
Supporting Material:	--
Tested Items:	--

⌋(RS_PO_00007)

4.6.8 [RS_Main_00128] Acceptance tests shall cover a commonly agreed subset of AUTOSAR requirements

⌈

Type:	Valid
Description:	Acceptance tests shall cover a commonly agreed subset of AUTOSAR requirements.
Rationale:	By definition acceptance tests are designed from user perspective, the user decides to accept the BSW for further usage in projects. The configurability of AUTOSAR requires focusing on the most used features.
Use Case:	Specification and implementation effort focussed on the features or test cases with the highest market needs
Applies to:	TC
Dependencies:	--
Supporting Material:	--
Tested Items:	--

⌋(RS_PO_00007)

4.7 Processes

4.7.1 [RS_Main_00030] AUTOSAR shall support development processes for safety related systems

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Type:	Valid
Description:	To develop safety related automotive systems all processes applied need to follow the corresponding requirements given in ISO26262. AUTOSAR shall support development processes for safety related systems by providing according exchange formats (e.g. for requirements tracing) and concepts.
Rationale:	Automotive software is in many cases safety related. Therefore dedicated development processes have to be followed. AUTOSAR shall support the users to apply these standards
Use Case:	Development of brake assist, highly automated driving
Applies to:	AP, CP, FO
Dependencies:	--
Supporting Material:	ISO26262

](RS_PO_00005, RS_PO_00009)

4.7.2 [RS_Main_00490] AUTOSAR processes shall be compliant to ISO26262

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Type:	Valid
Description:	To develop safety related automotive systems all processes applied need to follow the corresponding requirements given in ISO26262.Accordingly the applicable process related requirements of ISO26262 have to be fulfilled by AUTOSAR processes.
Rationale:	AUTOSAR shall support the development of systems according to the highest ASIL.
Use Case:	Development of safety related automotive systems, e.g. to achieve high availability and fail-operational systems for highly automated driving
Applies to:	AP, CP
Dependencies:	--
Supporting Material:	ISO26262

](RS_PO_00005, RS_PO_00009)

4.7.3 [RS_Main_00350] AUTOSAR specifications shall be analyzable and support according methods to demonstrate the achievement of safety related properties.

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Type:	Valid
Description:	To achieve safety-related properties an adequate software architectural design and implementation matching the safety requirements is required and has to be demonstrated. Such demonstration can be done by safety analyses, therefore. AUTOSAR specifications shall be analyzable accordingly. Corresponding analysis methods shall be applicable to the development artifacts specified by AUTOSAR.
Rationale:	In the context of the safety-related developments a confirmation that design and implementation are adequately safe is required.
Use Case:	--
Applies to:	AP, CP, FO
Dependencies:	--
Supporting Material:	ISO26262

](RS_PO_00005, RS_PO_00009)

4.7.4 [RS_Main_00480] AUTOSAR shall support the test of implementations

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Type:	Valid
Description:	AUTOSAR shall support the testability of compliant implementations and tools.
Rationale:	Testing of implementations is required by software development, software maturity and software safety standards.
Use Case:	Tool interoperability tests and/or test of of AUTOSAR Basic Software implementations.
Applies to:	AP, CP, TC
Dependencies:	--
Supporting Material:	ISO26262

](RS_PO_00001, RS_PO_00005, RS_PO_00007)

5 References

[Glossary] Glossary,
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[ISO 26262] Road vehicles — Functional safety — Part 1 to 9

[TPS_STDT] Standardization Template,
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