SPECIFICATION

Quality Control for Machining

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Submodel Template of the

Asset Administration Shell

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04.12.2023	4th Version	Minor adjustments
06.12.2023	5thVersion	Final document

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Foreword

Reliable quality control is an essential part of the value chain and a key factor in the success of the company, especially for high-quality products that are manufactured using machining processes.

In quality control, the quality of the intermediate and/or end products is checked against customer requirements and applicable standards through inline inspections or offline laboratory tests. Quality control processes and results are documented and relevant quality control documents are collected and maintained.

The Submodel Quality Control for Maching aims to provide a standardized property structure for quality control in cyclical production processes, particularly for machining, which enables the standardized and automated assignment of metrology data of manufactured parts to their production parameters.

The Submodel has been developed in the joint-project InterOpera by a working group of industrial and scientific specialists with different roles related to predictive maintenance. The members of the working group are listed in authors caption on page 2.

1 General

1.1 About this document

This document is a part of a specification series. Each part specifies the contents of a Submodel template for the Asset Administration Shell (AAS). The AAS is described in [1-3] and [6]. First exemplary Submodel contents were described in [4], while the actual format of this document was derived by the "Administration Shell in Practice" [5]. The format aims to be very concise, giving only minimal necessary information for applying a Submodel template, while leaving deeper descriptions and specification of concepts, structures and mapping to the respective documents [1-6].

The target group of the specification are developers and editors of technical documentation and manufacturer information, which are describing assets in smart manufacturing by means of the Asset Administration Shell (AAS) and therefore need to create a Submodel instance with a hierarchy of SubmodelElements. This document especially details on the question, which SubmodelElements with which semantic identification shall be used for this purpose.

1.2 Scope of the Submodel

This Submodel template aims at interoperable provision of information describing quality control relevant data regarding the asset of the respective Asset Administration Shell. Central element is the provision of properties [7], ideally interoperable by the means of dictionaries such as ECLASS and IEC CDD (Common Data Dictionary). The purpose of this document is to make selected specifications of Submodels in such manner that information about assets can be exchanged in a meaningful way between partners in a value creation network. It targets quality control processes and metrology data measured for parts manufactured in cyclical production processes, particularly for, but not limited to machining processes.

The intended use-case is the provision of a standardized property structure for quality control in machining, which enables the standardized and automated assignment of metrology data of manufactured parts to their production parameters.

This concept can serve as a basis for standardizing the respective Submodel. The conception is based on existing norms, studies of common practices at enterprises, directives and standards so that a far-reaching acceptance can be achieved.

Beside a standardized Submodel this template also introduces standardized SubmodelElementCollections (SMC) in order to improve the interoperability while modelling aspects of quality topics within other Submodels.

The task of quality control is to check the quality of the intermediate or/and end products against customer requirements and applicable standards through inline inspections or in offline laboratory tests. The quality control process and results must be documented and relevant quality control documents must be collected and maintained.

In the field of machining, there are already standardized characteristics for describing the dimensional and surface quality, which are used as test parameters in quality control. However, there are no standardized data formats for the representation and transmission of the definition of these characteristics across different instances. In practice, the assignment of data records from quality control to other data of the specific part, such as machine cycle data, is therefore

a challenge that is often carried out manually or via automation steps individually tailored to the specific application and is therefore time-consuming and cost-intensive in operation and maintenance as well as error-prone. In particular, use cases in the area of Industry 4.0 and artificial intelligence require an efficient and error-free transfer of such data from one instance to another.

The Submodel addresses the interoperable standardized provision of data and information from quality inspections on manufactured parts, such as dimensional accuracy and surface quality. The focus of the Submodel is on machining processes. In order to achieve an easy transferability to other processes, the Submodel shall contain a section for the description of generally valid quality-relevant properties and a domain-specific section that contains the specific aspects for machining manufacturing processes. Within the machining processes, turning, milling and drilling are considered.

Use case examples

Typical application

An automobile manufacturer (customer) commissions a supplier (manufacturing company) to manufacture a brake caliper (part) using the milling process. Due to the safety-relevant aspect of the component, the client expects: component-specific traceability of quality-related data from production and the component. In order to achieve complete quality assurance, the manufacturing company would like to carry out a 100% optical inline quality control, supplemented by a quality forecast by an AI system (if necessary provided and trained by an external AI service provider) for each component using process data from the corresponding machine cycle.

The construction of the part takes place jointly between the customer and the manufacturing company. The client specifies the quality requirements (target values and tolerances for dimensional accuracy, surface roughness and attributive features, such as freedom from burrs). In the AAS of the digital twin of the component, the corresponding quality feature types can be selected, meta information can be defined and the specific data (e.g. tolerances) can be entered via the Submodel "Quality Control for Machining".

The manufacturing company plans production on a multi-axis milling machine, selects the required milling tools (tools) and sets relevant process parameters and parameters.

Process data is collected from the manufacturing company via test series and sample parts are sent to an external quality testing laboratory to perform the metrology of the sample parts. The quality testing device there or the corresponding software has access to the administration shells of the digital twins of the sample parts and translates the information stored there directly into a test program. The measured data is stored directly in the administration shell. The manufacturing company or the AI service provider can directly assign the production process data of the parts to the quality data for the model training via the part identifier stored in their administration shell. This enables error-free automated labeling for AI model training.

In series production, the quality characteristics determined in the test laboratory could be assigned to the test objects (parts) and their production process data automatically in the same way, and the AI models can thus be automatically retrained.

The data from a seamless inline quality control in series production could also be automatically assigned to the digital twin of the specific component and the corresponding manufacturing process data via the administration shell, and part traceability could thus be implemented.

Components that do not meet the quality requirements could be rejected as NOK parts at every step of the production process via the optical inline quality control and/or the quality forecast using the AI model, which in turn saves time and money. The product-specific quality data acquisition can also be used to analyze the course of several components in order to identify systematic errors in the manufacturing process.

In the event of a subsequent complaint, the manufacturing company can evaluate the production and quality data of the specific component and prove that everything was okay in the production process.

Of course, besides full implementation also individual aspects of this practical example can be implemented with the Submodel Quality Control for Machining.

Demonstrational use case example

As a demonstrational use case example a typical metal part has been constructed by the University of Bayreuth to show the capabilities and usage of the Submodel (see Figure 6, Annex B). The demonstrator article has several linear quality features like width and height as well as geometric features, e.g. perpendicularity, flatness, positions of the drilling holes, and surface properties like roughness. These have been defined in an example AAS-file together with fictional production job data and metrology results.

1.3 Relevant standards and sources of concepts for the Submodel template

According to [3], interoperable properties might be defined by standards, consortium specifications or manufacturer specifications. Useful standards providing sources of concepts are:

Table 1: List of examplary standards defining interoperable properties

DIN EN ISO 14405-1:2017-07	Geometrical product specification (GPS) - Dimensional tolerancing - Part 1: Linear size dimensions (ISO 14405-1:2016) [8]
DIN EN ISO 1101:2017-09	Geometrical product specifications (GPS) - Geometrical tolerancing - Tolerances of form, orientation, location and run-out (ISO 1101:2017) [9]
DIN EN ISO 25178-601:2023-11 - Draft	Geometrical product specifications (GPS) - Surface texture: Areal - Part 601: Design and characteristics of contact (stylus) instruments (ISO/DIS 25178-601:2023) [10]
VDMA 40001-3:2023-07 - draft	OPC UA companion specification machinery 40001-3 [13]

So called property dictionaries are used identify information elements (see Terms and Definitions of [6]). Such property dictionaries include:

- ECLASS, see: https://www.eclasscontent.com/
- IEC CDD, see: https://cdd.iec.ch/cdd/iec61987/iec61987.nsf and https://cdd.iec.ch/cdd/iec62683/cdddev.nsf

In this document, properties are aimed to be described by ECLASS.

2 Information set for Submodel Quality Control for Machining

For the definition of the Submodel Quality Control for Machining the following aspects are considered as suggested in [5]:

Use and economic relevance

Reliable quality control is an essential part of the value chain and a key factor in the success of the company, especially for high-quality products that are manufactured using machining processes.

In quality control, the quality of the intermediate and/or end products is checked against customer requirements and applicable standards through inline inspections or offline laboratory tests. Quality control processes and results are documented and relevant quality control documents are collected and maintained.

While in statistical quality control the test results only have to be assigned to the production lot or a shift, new business use cases require the component-specific assignment of the quality data, such as part/product traceability or the use of models of artificial intelligence or the Machine learning for quality monitoring tasks in production.

Despite existing guidelines and standards, the assignment of data sets from quality control to other data of the specific part, such as machine cycle data, is a challenge in practice, which is often done manually or via automation steps individually tailored to the specific application and is therefore time-consuming. and is cost-intensive to operate and maintain, as well as being error-prone.

In order to achieve a complete, error-free and fast assignment of in-house or externally determined quality data to the part and thus to other relevant production data, it is necessary to standardize the data transfer and to describe the individual characteristics and metadata semantically. A corresponding standardized transfer is to be made possible via the sub-model Quality Control for Machining of the Asset Administration Shell.

For manufacturing companies, this makes it easier to implement the increasingly required complete traceability of parts, since system breaks in the exchange of information can be closed, especially between the quality testing laboratory and production, but also through to design. Relevant quality information can also be made available via the sub-model for the Digital Product Passport planned by the EU.

In addition, the implementation of artificial intelligence and machine learning applications for quality monitoring and control tasks in production is simplified, since the training data can be automatically labeled using this solution. This opens up new potential for the realization of automated post-training of the AI models in ongoing series production.

The Submodel Quality Control for Machining opens up the possibility for test laboratories and test equipment/software manufacturers to read out the relevant test requirements and characteristics of the components to be tested in a standardized form and to pass on the test results in a standardized manner. This opens up new possibilities for automating the test process, from creating the test program to documenting and passing on the results.

An overview of the general use case for the Submodel Quality Control for Machining is shown in Figure 1.

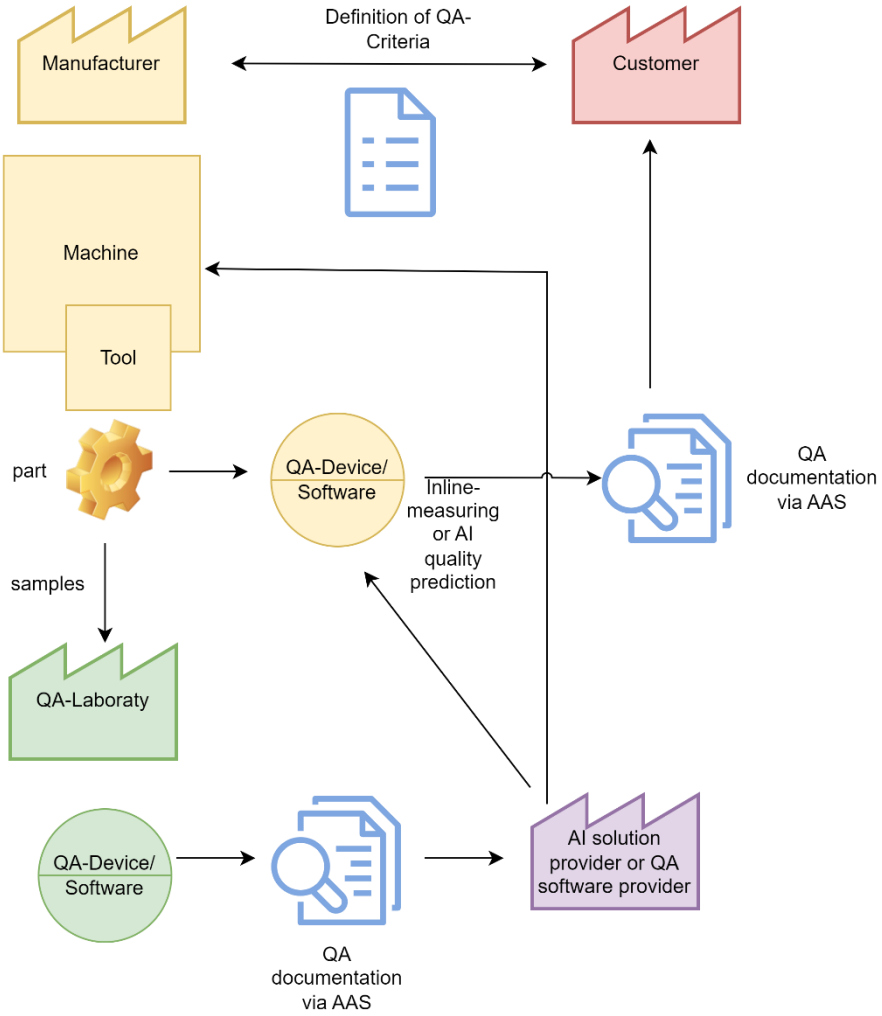

Figure 1: Overview

Although, the Submodel is designed on the basis of machining processes, particularly turning, milling, drilling, it can be used and applied for quality control in other cyclical manufacturing processes like injection moulding, aluminum casting, welding.

It is important to note that the focus of the Submodel is on the description of the end result of quality features of a manufactured product. Details on factors which influence the quality like machine, tool, workpiece are not explicitly described, but can be referenced from the according AAS Submodels on technical data of these components.

Possible functions and interactions

In a quality control solution for manufacturing parts, semantic descriptions for interpreting the data via the AAS from different relevant process steps have to be considered.

According to the process steps depicted in Figure 2 and described below, the Submodel has been subdivided into thematically separated subsections, represented by Submodel Element Collections, providing the relevant information for each process step.

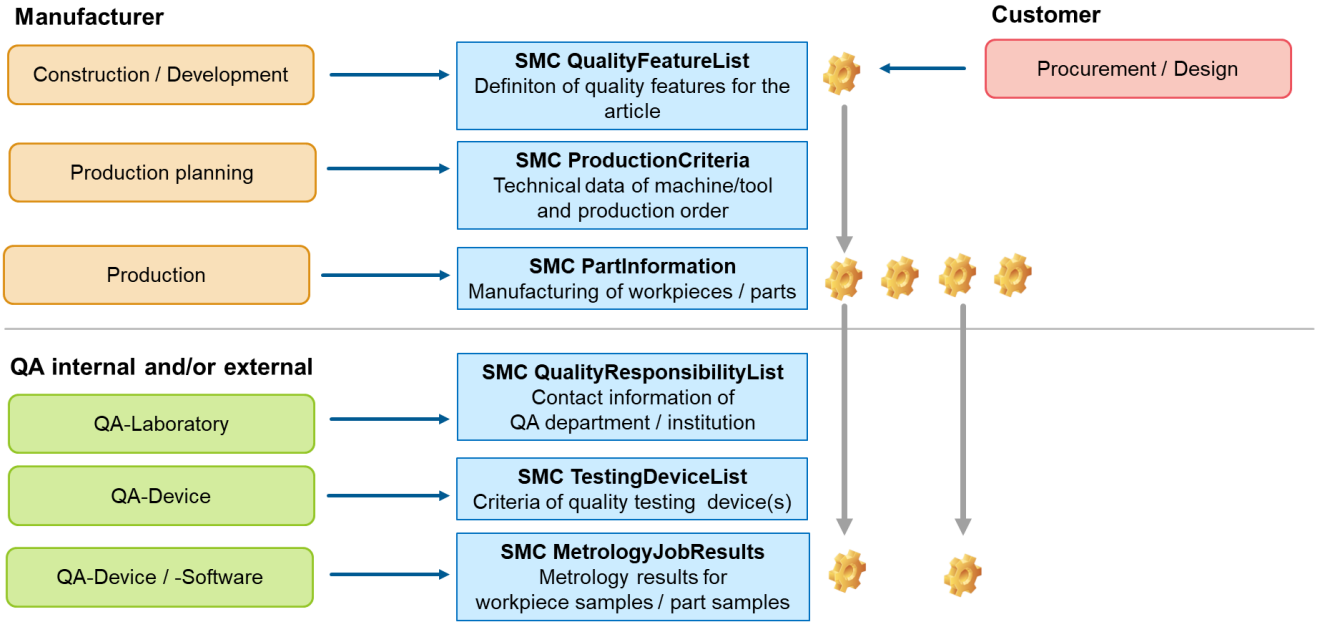

Figure 2: Relevant processes and thematic subdivision of Submodel Quality Control for Machining

Before the concrete parts are produced, information from several steps are collected in the Submodel:

Quality Features

During the design phase of the article quality features are defined by the construction / design departments of the customer and/or manufacturer. According to the customer demands nominal values and tolerance limits are defined, as well as whether the quality feature is relevant for inspection or quality assurance. The definition of quality features are documented in the CAD-file and/or life cycle management software.

In the Submodel following categories of quality features can be defined, according to the cited DIN / ISO specifications of quality assurance of geometric product specifications (GPS) [11]:

- Dimensional Tolerancing - Linear Size Dimensions (DIN EN ISO 14405-1) [8]
- Geometric tolerancing – tolerancing of shape, direction, location and run (DIN EN ISO 1101) [9]
- Surface quality – Part 1: Specification of surface quality (DIN EN ISO 25178-1) [10]

With these specifications it is possible to define quality features of **size, distance, radius, angle, form, orientation, location, run-out,** and **surface properties**.

Additionally, it is possible to define **attributive (categorial) quality features** derived from human senses, like visual inspection of surface (e.g. surface glance) or acoustic inspection of

the manufacturing process (e.g. rattle), assessed by attributes like okay, not okay or 1,2,3,4,5,6.

Quality features of kind size, distance, radius, angle can be defined in the SMC LinearFeatuesList, whereas quality features of kind form, orientation, location, run-out can be defined in the SMC GeometericFeaturesList. For surface features there is a SMC ArealSurfaceFeatureList, and for attribute features the SMC AttributiveFeatures can be used.

The relevant SMC's are shown in Figure 3.

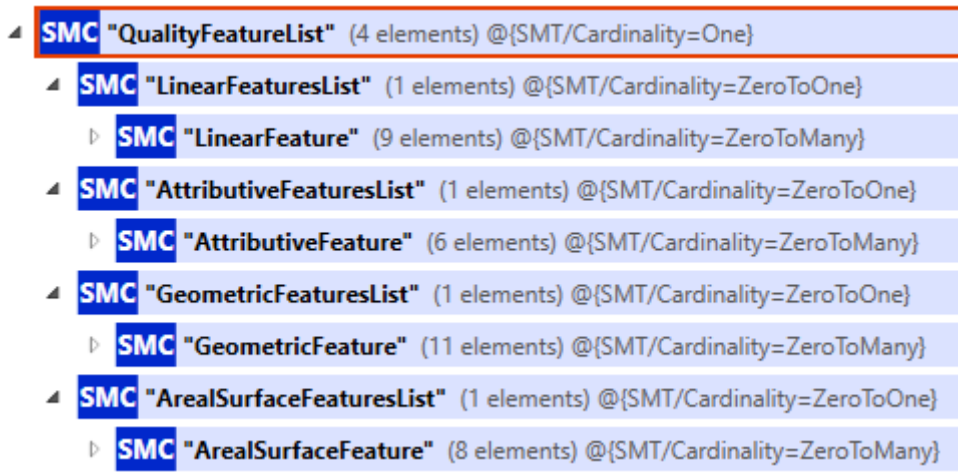

Figure 3: Relevant SMC's for defining quality features

Production Criteria

For the production process criteria of technical data for the machine and or relevant tools which influence the quality of the produced part can be defined by referencing to the IDTA Submodel Generic Frame for Technical Data for Industrial Equipment in Manufacturing [12].

In order to assign the manufactured part to the production order parameters for the production job order can be in the SMC ProductionJobOrderParameters. The relevant information and sematic description in this SMC is aligned with the OPC UA companion specification machinery (JobOrderParameters) to enable interoperability with the OPC UA standards.

Besides the assignment to a specific job order number it is possible to describe the job order by start and end date and time, if a concrete job order number is not available.

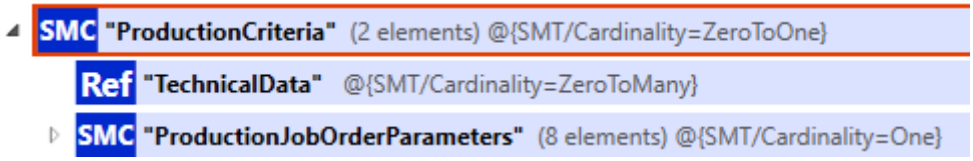

Figure 4: Relevant elements for defining the production job and technical data of the machine/tool

Part Information

To identify the part itself there is a PartIdentifier Property in the SMC PartInformation, which refers to the AAS of the part itself. In addition it is optionally possible to add a PartNumber which also could be interpreted as cycle number of the machine, if available.

To allow assignment to specific information of the article, an article number has to provided in the ItemNumber property. Additionally, information on serial number, order umber, and lot number can be provided, as well as a reference on the IDTA 3D CAD AAS Submodel [14].

Quality Responsibility

In order to provide information on the department(s) or organization(s) who is/are responsible for assessing the quality features, their contact data and role can be documented in the SMC QualityResponsibilityList, vie the subordinated SMC QualityResponsibility.

The contact information shall be provided by referencing to the IDTA AAS Submodel Contact Information [15].

Testing Devices

In order to be able to interpret the provided information on the metrology data of the quality features it is not only necessary to provide a proper definition of the quality featues (see SMC QualityFeaturesList) but also to provide relevant information about the testing device used to measure the quality.

This information can be documented in the SMC TestingDevicesList, via SMC TestingDeviceProperties. In this SMC a reference to the responsible quality department (see SMC QualityResponsibility above) can be provided, as well as to the InterOpera Submodel Calibration Certificate [16], if available. Necessary to be able to interpret the metrology results are information on measuring accuracy and resolution. To identify the measuring device, device name and serial number shall be provided. Additionally, information on measuring range, measuring type and the norm according to which the measuring takes place can be added.

Metrology Job Results

The SMC MetrologyJobResults is foreseen to define the metrology jobs and to provide information on the measuring results for a part or a series of parts.

The properties of this SMC are aligned to the OPC UA companion specification machinery (JobOrderParameters and JobOrderResponseData) to enable interoperability with the OPC UA standards.

Information on the metrology job order is documented via properties within the SMC MetrologyJobResults, whereas data on the metrology results are recorded in the subordinate SMC MetrologyResultsList, via SMC MetrologyData.

In the SMC MetrologyData references to the according quality feature definition as well as to the testing device used and the part for which the measurement takes place should be provided. In alignment to OPC UA companion specification machinery an ID, descriptipn and

engineering unit can be provided. Depending on the type of quality feature the actual value or attribute of the quality feature, and whether the result is in spec or not have to be assigned. There are additional optional properties like deviation from nominal value and min/max values as well as standard deviation. Min/max and standard deviation can be used if there are more than one measurement on the same part or in case that not part specific data is provided in the actual value of the quality feature, but an average value for a series of parts (e.g. a lot or batch). The latter case can be indicated by setting the DataProvidedAsSeriesAverage to true.

Property specification

See section 3 Submodel and Collections on the following pages.

3 Submodel and Collections

3.1 Properties of the Submodel Quality Control for Machining

The figure below shows the UML-diagram defining the relevant properties which need to be set. Table 2 describes the details of the Submodel structure combined with examples.

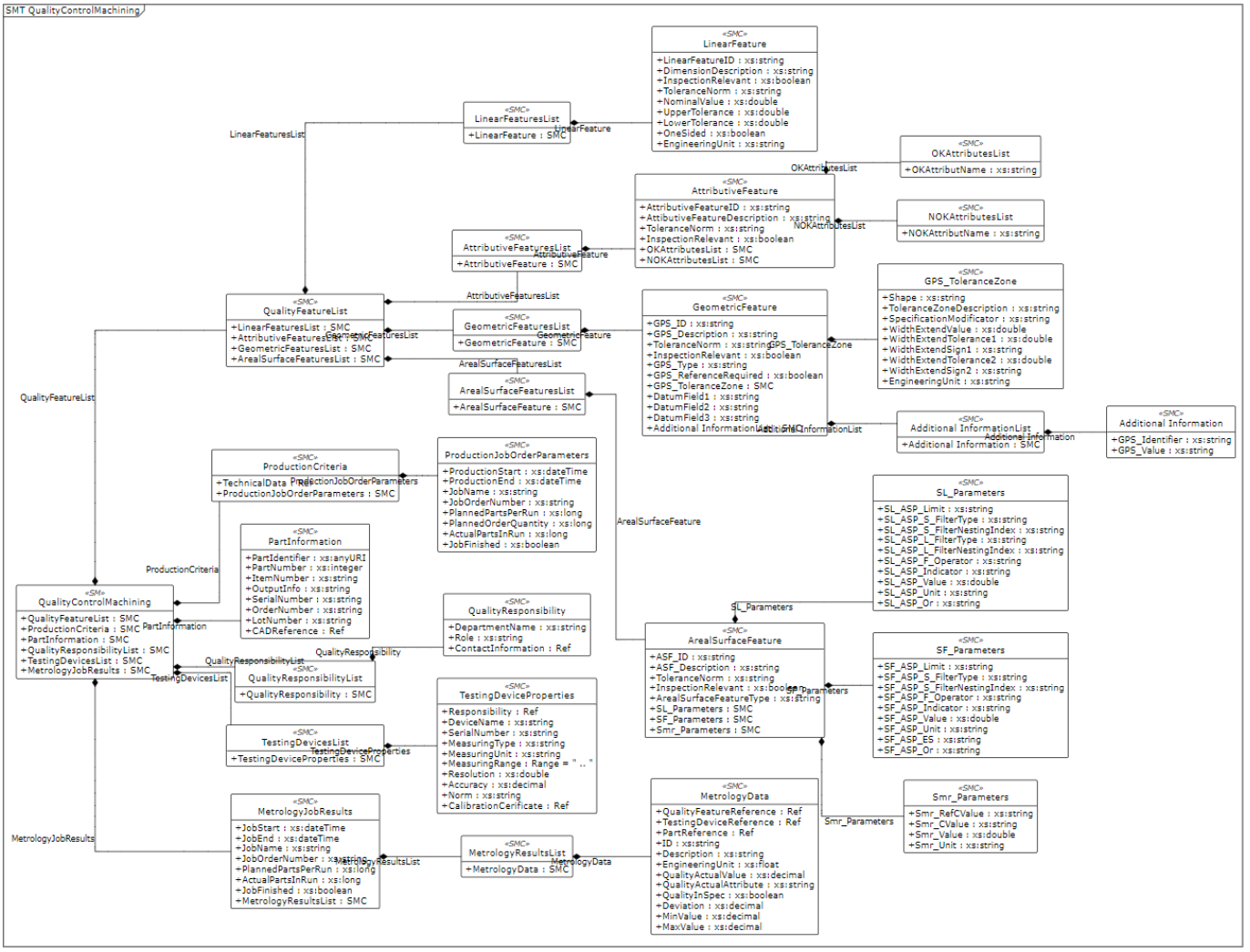

Figure 5: UML-Diagram for Submodel Quality Control for Machining

Table 2: Properties of Submodel Quality Control for Machining

idShort:	*QualityControlMachining*		
Class:	Submodel		
semanticId:	[-] -		
isCaseOf	-		
AllowDuplicates	-		

Parent	-		
Explanation	The Submodel Quality Control for Machining allows the collection of quality relevant information about parts produced in cyclical manufacturing processes. The focus is on looking at the production result and on machining manufacturing processes of milling, turning and drilling. However, the Submodel can also be used for other manufacturing processes.@en Das Teilmodell Quality Control for Machining erlaubt die Erfassung von qualitätsrelevanten Informationen über in zyklischen Fertigungsprozessen produzierte Bauteile. Der Fokus liegt auf der Betrachtung des Produktionsresultats und auf den zerspanenden Fertigungsverfahren Fräsen, Drehen, Bohren. Das Teilmodell kann jedoch auch für andere Fertigungsverfahren verwendet werden.@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[SMC] QualityFeatureList	[IRI] https://example.com/ids/cd/5818-1925-9730-5963 preferredName @en: List of quality feature definitions preferredName @de: Liste der Qualitätsmerkmalsdefinitionen definition @en: List of quality criteria of the item and their properties definition @de: Liste von Qualitätskriterien des Artikels und deren Eigenschaften description @en: List of quality criteria of the item and their properties description @de: Liste von Qualitätskriterien des Artikels und deren Eigenschaften	[-] 4 elements	1
[SMC] ProductionCriteria	[IRI] https://example.com/ids/cd/3342-1502-4675-1518 preferredName @en: Production-relevant criteria preferredName @de: Produktionsrelevante Kriterien definition @en: Information on production-relevant criteria in connection with the production of a specific component definition @de: Informationen zu produktionsrevelvanten Kriterien im Zusammenhang mit der Fertigung eines konkreten Bauteils description @en: Information on production-relevant criteria in connection with the production of a specific component description @de: Informationen zu produktionsrevelvanten Kriterien im Zusammenhang mit der Fertigung eines konkreten Bauteils	[-] 2 elements	0..1

[SMC] PartInformation	[IRI] https://example.com/ids/cd/8151-3102-0551-0369 preferredName @en: Information about the component produced preferredName @de: Informationen zum produzierten Bauteil definition @en: Production information about the component definition @de: Produktionsinformationen zu dem Bauteil description @en: Production information about the component description @de: Produktionsinformationen zu dem Bauteil	[-] 8 elements	1
[SMC] QualityResponsibilityList	[IRI] https://example.com/ids/cd/5138-7789-8736-4298 preferredName @en: List of QS organizational units preferredName @de: Liste QS Organisationseinheiten definition @en: List of organizational units responsible for quality assurance definition @de: Liste der für die Qualitätssicherung verantwortlichen Organisationseinheiten description @en: List of organizational units responsible for quality assurance description @de: Liste der für die Qualitätssicherung verantwortlichen Organisationseinheiten	[-] 1 elements	0..1
[SMC] TestingDevicesList	[IRI] https://example.com/ids/cd/6227-4929-3901-6147 preferredName @en: List of testing devices preferredName @de: Liste der Prüfgeräte definition @en: List of testing devices used definition @de: Liste der verwendeten Prüfgeräte description @en: List of testing devices used description @de: Liste der verwendeten Prüfgeräte	[-] 1 elements	1
[SMC] MetrologyJobResults	[IRI] https://example.com/ids/cd/8445-6304-4300-8972 preferredName @en: Metrology job results preferredName @de: Ergebnisse Messauftrag definition @en: Information and measurements on the results of a quality assessment order definition @de: Informationen und Messwerte zu Ergebnissen eines Qualitätsbewertungsauftrag description @en: Information and measurements on the results of a quality assessment order description @de: Informationen und Messwerte zu Ergebnissen eines Qualitätsbewertungsauftrag	[-] 8 elements	1..*

3.2 Properties of the SMC QualityFeatureList

Table 3: Specification of SMC QualityFeatureList

idShort:	QualityFeatureList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/5818-1925-9730-5963		
isCaseOf	-		
AllowDuplicates	-		
Parent	QualityFeatureList		
Explanation	List of quality criteria of the item and their properties@en,Liste von Qualitätskriterien des Artikels und deren Eigenschaften@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[SMC] LinearFeaturesList	[IRI] https://example.com/ids/cd/6557-3905-7857-6386 preferredName @en: List of linear quality features preferredName @de: Liste linearer Qualitätsmerkmale definition @en: List of linear quality characteristics, such as dimensions, weight, angles definition @de: Liste linearer Qualitätsmerkmale, wie Dimensionen, Gewicht, Winkel description @en: List of linear quality characteristics, such as dimensions, weight, angles description @de: Liste linearer Qualitätsmerkmale, wie Dimensionen, Gewicht, Winkel	[-] 1 elements	0..1
[SMC] AttributiveFeaturesList	[IRI] https://example.com/ids/cd/0114-0656-0103-0482 preferredName @en: List of attributive quality features preferredName @de: Liste attributiver Qualtätsmerkmale definition @en: List of attributive quality characteristics definition @de: Liste attributiver Qualtätsmerkmale description @en: List of attributive quality characteristics description @de: Liste attributiver Qualtätsmerkmale	[-] 1 elements	0..1
[SMC] GeometricFeaturesList	[IRI] https://example.com/ids/cd/1073-7051-5957-0783 preferredName @en: List of geometric quality characteristics preferredName @de: Liste geometrischer Qualitätsmerkmale definition @en: List of geometric quality characteristics according to DIN EN ISO 1101 definition @de: Liste geometrischer Qualitätsmerkmale gemäß DIN EN ISO 1101	[-] 1 elements	0..1

	description @en: List of geometric quality characteristics according to DIN EN ISO 1101 description @de: Liste geometrischer Qualitätsmerkmale gemäß DIN EN ISO 1101		
[SMC] ArealSurfaceFeaturesList	[IRI] https://example.com/ids/cd/4428-3696-6460-4326 preferredName @en: List of areal surface parameters preferredName @de: Liste flächenhafter Oberflächenkenngrößen definition @en: List of areal surface parameters according to EN ISO 25178-1 definition @de: Liste flächenhafter Oberflächenkenngrößen gemäß EN ISO 25178-1 description @en: List of areal surface parameters according to EN ISO 25178-1 description @de: Liste flächenhafter Oberflächenkenngrößen gemäß EN ISO 25178-1	[-] 1 elements	0..1

3.3 Properties of the SMC LinearFeaturesList

Table 4: Specification of SMC LinearFeaturesList

idShort:	LinearFeaturesList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/6557-3905-7857-6386		
isCaseOf	-		
AllowDuplicates	-		
Parent	LinearFeaturesList		
Explanation	List of linear quality characteristics, such as dimensions, weight, angles@en,Liste linearer Qualitätsmerkmale, wie Dimensionen, Gewicht, Winkel@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[SMC] LinearFeature	[IRI] https://example.com/ids/cd/5115-2061-9910-1797 preferredName @en: Linear quality feature preferredName @de: Lineares Qualitätsmerkmal definition @en: Description of the definition of a linear quality characteristic such as length, weight, angle, according to DIN EN ISO 14405-1: Dimensional tolerancing - Part 1: Linear size dimensions definition @de: Beschreibung der Definition eines linearen Qualitätsmerkmals wie z.B. Länge, Gewicht, Winkel, gemäß DIN EN ISO 14405-1: Dimensionelle Tolerierung – Teil 1: Lineare	[-] 9 elements	0..*

	Größenmaße description @en: Description of the definition of a linear quality characteristic such as length, weight, angle, according to DIN EN ISO 14405-1: Dimensional tolerancing - Part 1: Linear size dimensions description @de: Beschreibung der Definition eines linearen Qualitätsmerkmals wie z.B. Länge, Gewicht, Winkel, gemäß DIN EN ISO 14405-1: Dimensionelle Tolerierung – Teil 1: Lineare Größenmaße		

idShort:	LinearFeature		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/5115-2061-9910-1797		
isCaseOf	-		
AllowDuplicates	-		
Parent	LinearFeature		
Explanation	Description of the definition of a linear quality characteristic such as length, weight, angle, according to DIN EN ISO 14405-1: Dimensional tolerancing - Part 1: Linear size dimensions@en,Beschreibung der Definition eines linearen Qualitätsmerkmals wie z.B. Länge, Gewicht, Winkel, gemäß DIN EN ISO 14405-1: Dimensionelle Tolerierung – Teil 1: Lineare Größenmaße@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] LinearFeatureID	[IRI] https://example.com/ids/cd/3386-5236-5928-0350 preferredName @en: Feature ID preferredName @de: Merkmal ID definition @en: Name or ID of the quality feature definition @de: Name oder ID des Qualitätsmerkmals description @en: Name or ID of the quality feature description @de: Name oder ID des Qualitätsmerkmals	[String]	1
[Prop] DimensionDescription	[IRI] https://example.com/ids/cd/4088-8270-1605-7872 preferredName @en: Feature description preferredName @de: Merkmalsbeschreibung definition @en: Description of the quality feature definition @de: Beschreibung des Qualitätsmerkmals	[String]	0..1

	description @en: Description of the quality feature description @de: Beschreibung des Qualitätsmerkmals		
[Prop] InspectionRelevant	[IRI] https://example.com/ids/cd/8702-4101-2909-7475 preferredName @en: Test measure relevance preferredName @de: Relevanz als Prüfmaß definition @en: Is the measurement relevant as a test measure for quality assurance? True means yes, false means no definition @de: Ist das Maß als Prüfmaß für die Qualiätssicherung relevant? True bedeutet ja, false nein description @en: Is the measurement relevant as a test measure for quality assurance? True means yes, false means no description @de: Ist das Maß als Prüfmaß für die Qualiätssicherung relevant? True bedeutet ja, false nein	[Boolean]	1
[Prop] ToleranceNorm	[IRI] https://example.com/ids/cd/1438-6430-5061-7770 preferredName @en: Tolerance definition preferredName @de: Toleranzdefinition definition @en: Reference to one or more norms and guidelines in which the code for the used tolerance is defined definition @de: Verweis auf eine oder mehrere Normen und Richtlinien, in denen der Code für die verwendete Toleranz festgelegt ist description @en: Reference to one or more norms and guidelines in which the code for the used tolerance is defined description @de: Verweis auf eine oder mehrere Normen und Richtlinien, in denen der Code für die verwendete Toleranz festgelegt ist	[String]	0..*
[Prop] NominalValue	[IRI] https://example.com/ids/cd/4807-4847-1356-5014 preferredName @en: Nominal value preferredName @de: Sollwert definition @en: Value for physical quantities that may be expressed as the nominal value of the quantity together with deviations from that nominal value as percentages or absolute values definition @de: Wert für physikalische Größen, der als Nominalwert der Größe zusammen mit Abweichungen von diesem Nominalwert als Prozentsätze oder absolute Werte ausgedrückt werden kann description @en: Value for physical quantities that may be expressed as the nominal value of the quantity together with deviations from that nominal value as percentages or absolute values description @de: Wert für physikalische Größen, der als Nominalwert der Größe zusammen mit Abweichungen von	[Double]	1

	diesem Nominalwert als Prozentsätze oder absolute Werte ausgedrückt werden kann		
[Prop] UpperTolerance	[IRI] https://example.com/ids/cd/4517-1086-4442-0129 preferredName @en: Upper Tolerance preferredName @de: Obere Toleranz definition @en: Upper tolerance limit of the feature as an absolute value.If there is a one-sided tolerance, only one tolerance limit is specified. definition @de: Obere Toranzgrenze des Merkmals als absoluter Wert. Wenn eine einseitige Tolerierung vorliegt, wird entsprechend nur eine Toleranzgrenze angegeben. description @en: Upper tolerance limit of the feature as an absolute value.If there is a one-sided tolerance, only one tolerance limit is specified. description @de: Obere Toranzgrenze des Merkmals als absoluter Wert. Wenn eine einseitige Tolerierung vorliegt, wird entsprechend nur eine Toleranzgrenze angegeben.	[Double]	0..1
[Prop] LowerTolerance	[IRI] https://example.com/ids/cd/5141-7263-8960-8647 preferredName @en: Lower Tolerance preferredName @de: Untere Toleranz definition @en: Lower tolerance limit of the feature as an absolute value. If there is a one-sided tolerance, only one tolerance limit is specified. definition @de: Untere Toranzgrenze des Merkmals als absoluter Wert. Wenn eine einseitige Tolerierung vorliegt, wird entsprechend nur eine Toleranzgrenze angegeben. description @en: Lower tolerance limit of the feature as an absolute value. If there is a one-sided tolerance, only one tolerance limit is specified. description @de: Untere Toranzgrenze des Merkmals als absoluter Wert. Wenn eine einseitige Tolerierung vorliegt, wird entsprechend nur eine Toleranzgrenze angegeben.	[Double]	0..1
[Prop] OneSided	[IRI] https://example.com/ids/cd/6991-3726-0322-4795 preferredName @en: Tolerance one sided preferredName @de: einseitig toleriert definition @en: Is the measure tolerated one-sidedly? True means yes, false means no. If there is a one-sided tolerance, only one tolerance limit is specified definition @de: Ist das Maß einseitig toleriert? True bedeutet ja, false nein. Wenn eine einseitige Tolerierung vorliegt, wird entsprechend nur eine Toleranzgrenze angegeben description @en: Is the measure tolerated one-sidedly? True means yes, false means no. If there is a one-sided tolerance, only one tolerance limit is specified description @de: Ist das Maß einseitig toleriert? True	[Boolean]	0..1

	bedeutet ja, false nein. Wenn eine einseitige Tolerierung vorliegt, wird entsprechend nur eine Toleranzgrenze angegeben		
[Prop] EngineeringUnit	[IRI] https://example.com/ids/cd/0377-0811-2053-0043 preferredName @en: Engineering Unit preferredName @de: Technische Einheit definition @en: Physical unit of feature definition @de: Physikalische Einheit des Merkmals description @en: Physical unit of feature description @de: Physikalische Einheit des Merkmals	[String]	1

3.4 Properties of the SMC AttributiveFeaturesList

Table 5: Specification of SMC AttributiveFeaturesList

idShort:	AttributiveFeaturesList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/0114-0656-0103-0482		
isCaseOf	-		
AllowDuplicates	-		
Parent	AttributiveFeaturesList		
Explanation	List of attributive quality characteristics@en,Liste attributiver Qualtätsmerkmale@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[SMC] AttributiveFeature	[IRI] https://example.com/ids/cd/2771-5749-5004-8567 preferredName @en: Attributive quality feature preferredName @de: Attributives Qualitätsmerkmal definition @en: Information about an attributive quality feature definition @de: Informationen zu einem attributiven Qualitätsmerkmal description @en: Information about an attributive quality feature description @de: Informationen zu einem attributiven Qualitätsmerkmal	[-] 6 elements	0..*

3.5 Properties of the SMC AttributiveFeature

Table 6: Specification of SMC AttributiveFeature

idShort:	AttributiveFeature		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/2771-5749-5004-8567		
isCaseOf	-		
AllowDuplicates	-		
Parent	AttributiveFeature		
Explanation	Information about an attributive quality feature@en,Informationen zu einem attributiven Qualitätsmerkmal@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] AttributiveFeatureID	[IRI] https://example.com/ids/cd/4336-9496-1413-4432 preferredName @en: Feature ID preferredName @de: Merkmal ID definition @en: Name or ID of the quality feature definition @de: Name oder ID des Qualitätsmerkmals description @en: Name or ID of the quality feature description @de: Name oder ID des Qualitätsmerkmals	[String]	1
[Prop] AttibutiveFeatureDescription	[IRI] https://example.com/ids/cd/4607-6688-7239-7126 preferredName @en: Feature description preferredName @de: Merkmalsbeschreibung definition @en: Description of the quality feature definition @de: Beschreibung des Qualitätsmerkmals description @en: Description of the quality feature description @de: Beschreibung des Qualitätsmerkmals	[String]	1
[Prop] ToleranceNorm	[IRI] https://example.com/ids/cd/1438-6430-5061-7770 preferredName @en: Tolerance definition preferredName @de: Toleranzdefinition definition @en: Reference to one or more norms and guidelines in which the code for the used tolerance is defined definition @de: Verweis auf eine oder mehrere Normen und Richtlinien, in denen der Code für die verwendete Toleranz festgelegt ist description @en: Reference to one or more norms and guidelines in which the code for the used tolerance is defined description @de: Verweis auf eine oder mehrere	[String]	0..*

	Normen und Richtlinien, in denen der Code für die verwendete Toleranz festgelegt ist		
[Prop] InspectionRelevant	[IRI] https://example.com/ids/cd/8702-4101-2909-7475 preferredName @en: Test measure relevance preferredName @de: Relevanz als Prüfmaß definition @en: Is the measurement relevant as a test measure for quality assurance? True means yes, false means no definition @de: Ist das Maß als Prüfmaß für die Qualiätssicherung relevant? True bedeutet ja, false nein description @en: Is the measurement relevant as a test measure for quality assurance? True means yes, false means no description @de: Ist das Maß als Prüfmaß für die Qualiätssicherung relevant? True bedeutet ja, false nein	[Boolean]	1
[SMC] OKAttributesList	[IRI] https://example.com/ids/cd/4408-7850-7727-4969 preferredName @en: List of accepted attributes preferredName @de: Liste der akzeptierten Attribute definition @en: List of attributes that are accepted or tolerable in terms of quality assurance (OK attributes) definition @de: Liste der Attribute, die akzeptiert bzw. im Sinne der Qualitätssicherung tolerabel sind (i.O.-Attribute) description @en: List of attributes that are accepted or tolerable in terms of quality assurance (OK attributes) description @de: Liste der Attribute, die akzeptiert bzw. im Sinne der Qualitätssicherung tolerabel sind (i.O.-Attribute)	[-] 1 elements	1
[SMC] NOKAttributesList	[IRI] https://example.com/ids/cd/0405-9533-9682-5295 preferredName @en: List of attributes not accepted preferredName @de: Liste der nicht akzeptierten Attribute definition @en: List of attributes that are not accepted or intolerable in terms of quality assurance (not OK attributes) definition @de: Liste der Attribute, die nicht akzeptiert bzw. im Sinne der Qualitätssicherung intolerabel sind (n.i.O.-Attribute) description @en: List of attributes that are not accepted or intolerable in terms of quality assurance (not OK attributes) description @de: Liste der Attribute, die nicht	[-] 1 elements	1

	akzeptiert bzw. im Sinne der Qualitätssicherung intolerabel sind (n.i.O.-Attribute)		

3.6 Properties of the SMC OKAttributesList

Table 7: Specification of SMC OKAttributesList

idShort:	OKAttributesList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/4408-7850-7727-4969		
isCaseOf	-		
AllowDuplicates	-		
Parent	OKAttributesList		
Explanation	List of attributes that are accepted or tolerable in terms of quality assurance (OK attributes)@en,Liste der Attribute, die akzeptiert bzw. im Sinne der Qualitätssicherung tolerabel sind (i.O.-Attribute)@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] OKAttributName	[IRI] https://example.com/ids/cd/3224-3154-6775-5935 preferredName @en: Attribute name of an accepted attribute preferredName @de: Attributname eines akzeptierten Attributs definition @en: Name of an attribute that is accepted or tolerable in terms of quality assurance (OK attribute) definition @de: Bezeichnung eines Attributs, das akzeptiert bzw. im Sinne der Qualitätssicherung tolerabel ist (i.O.-Attribut) description @en: Name of an attribute that is accepted or tolerable in terms of quality assurance (OK attribute) description @de: Bezeichnung eines Attributs, das akzeptiert bzw. im Sinne der Qualitätssicherung tolerabel ist (i.O.-Attribut)	[String]	0..*

3.7 Properties of the SMC NOKAttributesList

Table 8: Specification of SMC NOKAttributesList

idShort:	NOKAttributesList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/0405-9533-9682-5295		
isCaseOf	-		
AllowDuplicates	-		

Parent	NOKAttributesList		
Explanation	List of attributes that are not accepted or intolerable in terms of quality assurance (not OK attributes)@en,Liste der Attribute, die nicht akzeptiert bzw. im Sinne der Qualitätssicherung intolerabel sind (n.i.O.-Attribute)@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] NOKAttributName	[IRI] https://example.com/ids/cd/9254-6047-3370-1650 preferredName @en: Attribute name of an attribute that is not accepted preferredName @de: Attributname eines nicht akzeptierten Attributs definition @en: Name of an attribute that is not accepted or intolerable in terms of quality assurance (not OK attribute) definition @de: Bezeichnung eines Attributs, das nicht akzeptiert bzw. im Sinne der Qualitätssicherung intolerabel ist (n.i.O.-Attribut) description @en: Name of an attribute that is not accepted or intolerable in terms of quality assurance (not OK attribute) description @de: Bezeichnung eines Attributs, das nicht akzeptiert bzw. im Sinne der Qualitätssicherung intolerabel ist (n.i.O.-Attribut)	[String]	0..*

3.8 Properties of the SMC GeometricFeaturesList

Table 9: Specification of SMC GeometricFeaturesList

idShort:	GeometricFeaturesList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/1073-7051-5957-0783		
isCaseOf	-		
AllowDuplicates	-		
Parent	GeometricFeaturesList		
Explanation	List of geometric quality characteristics according to DIN EN ISO 1101@en,Liste geometrischer Qualitätsmerkmale gemäß DIN EN ISO 1101@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[SMC] GeometricFeature	[IRI] https://example.com/ids/cd/2672-5885-8376-5917 preferredName @en: Geometric quality feature preferredName @de: Geometrisches Qualitätsmerkmal	[-] 11 elements	0..*

	definition @en: Information on a geometric quality feature according to DIN EN ISO 1101 definition @de: Angaben zu einem geometrischen Qualitätsmerkmal nach DIN EN ISO 1101 description @en: Information on a geometric quality feature according to DIN EN ISO 1101 description @de: Angaben zu einem geometrischen Qualitätsmerkmal nach DIN EN ISO 1101		

3.9 Properties of the SMC GeometricFeature

Table 10: Specification of SMC GeometricFeature

idShort:	GeometricFeature		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/2672-5885-8376-5917		
isCaseOf	-		
AllowDuplicates	-		
Parent	GeometricFeature		
Explanation	Information on a geometric quality feature according to DIN EN ISO 1101@en,Angaben zu einem geometrischen Qualitätsmerkmal nach DIN EN ISO 1101@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] GPS_ID	[IRI] https://example.com/ids/cd/4284-7439-8145-0273 preferredName @en: Feature ID preferredName @de: Merkmal ID definition @en: Name or ID of the quality feature definition @de: Name oder ID des Qualitätsmerkmals description @en: Name or ID of the quality feature description @de: Name oder ID des Qualitätsmerkmals	[String]	1
[Prop] GPS_Description	[IRI] https://example.com/ids/cd/6784-5010-1341-9510 preferredName @en: Feature description preferredName @de: Merkmalsbeschreibung definition @en: Description of the quality feature definition @de: Beschreibung des Qualitätsmerkmals description @en: Description of the quality feature description @de: Beschreibung des Qualitätsmerkmals	[String]	0..1

[Prop] ToleranceNorm	[IRI] https://example.com/ids/cd/1438-6430-5061-7770 preferredName @en: Tolerance definition preferredName @de: Toleranzdefinition definition @en: Reference to one or more norms and guidelines in which the code for the used tolerance is defined definition @de: Verweis auf eine oder mehrere Normen und Richtlinien, in denen der Code für die verwendete Toleranz festgelegt ist description @en: Reference to one or more norms and guidelines in which the code for the used tolerance is defined description @de: Verweis auf eine oder mehrere Normen und Richtlinien, in denen der Code für die verwendete Toleranz festgelegt ist	[String]	0..*
[Prop] InspectionRelevant	[IRI] https://example.com/ids/cd/8702-4101-2909-7475 preferredName @en: Test measure relevance preferredName @de: Relevanz als Prüfmaß definition @en: Is the measurement relevant as a test measure for quality assurance? True means yes, false means no definition @de: Ist das Maß als Prüfmaß für die Qualiätssicherung relevant? True bedeutet ja, false nein description @en: Is the measurement relevant as a test measure for quality assurance? True means yes, false means no description @de: Ist das Maß als Prüfmaß für die Qualiätssicherung relevant? True bedeutet ja, false nein	[Boolean]	1
[Prop] GPS_Type	[IRI] https://example.com/ids/cd/7278-1884-0095-0499 preferredName @en: Type of the GPS feature preferredName @de: Typ des GPS Merkmals definition @en: ValueList (straightness, flatness, roundness, cylindricity, line shape, surface shape, parallelism, perpendicularity, inclination, line profile direction, surface profile direction, position, coaxiality, concentricity, symmetry, line profile location, surface profile location, concentricity, axial runout, total concentricity, overall plan run) definition @de: ValueList (Geradheit, Ebenheit, Rundheit, Zylindrizität, Linienform, Flächenform, Parallelität, Rechtwinkligkeit, Neigung, Linienprofil-Richtung, Flächenprofil-Richtung, Position, Koaxialität, Konzentrizität, Symmetrie, Linienprofil-Ort, Flächenprofil-Ort, Rundlauf, Planlauf, Gesamtrundlauf, Gesamtplanlauf) description @en: ValueList (straightness, flatness,	[String]	1

	roundness, cylindricity, line shape, surface shape, parallelism, perpendicularity, inclination, line profile direction, surface profile direction, position, coaxiality, concentricity, symmetry, line profile location, surface profile location, concentricity, axial runout, total concentricity, overall plan run) description @de: ValueList (Geradheit, Ebenheit, Rundheit, Zylindrizität, Linienform, Flächenform, Parallelität, Rechtwinkligkeit, Neigung, Linienprofil-Richtung, Flächenprofil-Richtung, Position, Koaxialität, Konzentrizität, Symmetrie, Linienprofil-Ort, Flächenprofil-Ort, Rundlauf, Planlauf, Gesamtrundlauf, Gesamtplanlauf)		
[Prop] GPS_ReferenceRequired	[IRI] https://example.com/ids/cd/8106-3952-4734-3894 preferredName @en: Reference required preferredName @de: Bezug erforderlich definition @en: Does a geometric reference have to be specified to make the feature unique? true corresponds to yes, false no definition @de: Muss zur Eindeutigkeit des Merkmals ein geometrischer Bezug angegeben werden? true entspricht ja, false nein description @en: Does a geometric reference have to be specified to make the feature unique? true corresponds to yes, false no description @de: Muss zur Eindeutigkeit des Merkmals ein geometrischer Bezug angegeben werden? true entspricht ja, false nein	[Boolean]	1
[SMC] GPS_ToleranzZone	[IRI] https://example.com/ids/cd/3477-9603-4206-5189 preferredName @en: Toleranzzone preferredName @de: Toleranzzone definition @en: Tolerance zone according to DIN EN ISO 1101. The tolerance zone must be arranged symmetrically around the reference geometry element, unless otherwise stated. definition @de: Toleranzzone gemäß DIN EN ISO 1101. Die Toleranzzone muss symmetrisch um das Referenzgeometrieelement herum angeordnet werden, soweit nichts anderes angegeben ist. description @en: Tolerance zone according to DIN EN ISO 1101. The tolerance zone must be arranged symmetrically around the reference geometry element, unless otherwise stated. description @de: Toleranzzone gemäß DIN EN ISO 1101. Die Toleranzzone muss symmetrisch um das Referenzgeometrieelement herum angeordnet werden, soweit nichts anderes angegeben ist.	[-] 9 elements	0..*

[Prop] DatumField1	[IRI] https://example.com/ids/cd/0823-7627-1483-8977 preferredName @en: Datum field 1 preferredName @de: Bezugsfeld1 definition @en: Information about a geometric reference that is required to define the feature definition @de: Angaben zu einem geometrischen Bezug der für die Definition des Merkmals benötigt wird description @en: Information about a geometric reference that is required to define the feature description @de: Angaben zu einem geometrischen Bezug der für die Definition des Merkmals benötigt wird	[String]	0..1
[Prop] DatumField2	[IRI] https://example.com/ids/cd/3299-7106-0636-9014 preferredName @en: Datum field 2 preferredName @de: Bezugsfeld2 definition @en: Information about a geometric reference that is required to define the feature definition @de: Angaben zu einem geometrischen Bezug der für die Definition des Merkmals benötigt wird description @en: Information about a geometric reference that is required to define the feature description @de: Angaben zu einem geometrischen Bezug der für die Definition des Merkmals benötigt wird	[String]	0..1
[Prop] DatumField3	[IRI] https://example.com/ids/cd/4112-3318-2953-7157 preferredName @en: Datum field 3 preferredName @de: Bezugsfeld3 definition @en: Information about a geometric reference that is required to define the feature definition @de: Angaben zu einem geometrischen Bezug der für die Definition des Merkmals benötigt wird description @en: Information about a geometric reference that is required to define the feature description @de: Angaben zu einem geometrischen Bezug der für die Definition des Merkmals benötigt wird	[String]	0..1
[SMC] Additional InformationList	[IRI] https://example.com/ids/cd/4911-0802-2021-5357 preferredName @en: List of additional GPS field information preferredName @de: Liste zusätzlicher GPS Feldinformationen definition @en: List with information on other GPS fields in accordance with DIN EN 1101 definition @de: Liste mit Informationen zu weiteren GPS-Feldern gemäß DIN EN 1101 description @en: List with information on other GPS	[-] 1 elements	0..*

	fields in accordance with DIN EN 1101 description @de: Liste mit Informationen zu weiteren GPS-Feldern gemäß DIN EN 1101		

3.10 Properties of the SMC GPS_ToleranceZone

Table 11: Specification of SMC GPS_ToleranceZone

idShort:	GPS_ToleranceZone		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/3477-9603-4206-5189		
isCaseOf	-		
AllowDuplicates	-		
Parent	GPS_ToleranceZone		
Explanation	Tolerance zone according to DIN EN ISO 1101. The tolerance zone must be arranged symmetrically around the reference geometry element, unless otherwise stated.@en,Toleranzzone gemäß DIN EN ISO 1101. Die Toleranzzone muss symmetrisch um das Referenzgeometrieelement herum angeordnet werden, soweit nichts anderes angegeben ist.@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] Shape	[IRI] https://example.com/ids/cd/4382-8406-0417-4865 preferredName @en: Shape preferredName @de: Gestalt definition @en: Shape of the tolerance zone according to DIN EN ISO 1101 definition @de: Gestalt der Toreanzzone gemäß DIN EN ISO 1101 description @en: Shape of the tolerance zone according to DIN EN ISO 1101 description @de: Gestalt der Toreanzzone gemäß DIN EN ISO 1101	[String]	1
[Prop] ToleranceZoneDescription	[IRI] https://example.com/ids/cd/6617-4504-1585-6448 preferredName @en: Tolerance zone description preferredName @de: Beschreibung der Toleranzzone definition @en: Information on the partition based on the deviation from the ideal value within a certain area definition @de: Angaben zur Tolenanzone anhand der Abweichung vom Sollwert innerhalb eines bestimmten Bereichs	[String]	0..1

	description @en: Information on the partition based on the deviation from the ideal value within a certain area description @de: Angaben zur Tolenanzone anhand der Abweichung vom Sollwert innerhalb eines bestimmten Bereichs		
[Prop] SpecificationModificator	[IRI] https://example.com/ids/cd/9156-7587-1684-5520 preferredName @en: Specification modifier preferredName @de: Spezifikationsmodifikator definition @en: Specification modifier according to DIN EN ISO 14405-1: LP, LS, GG, GX, GN, GC, CC, CA, CV, SX, SN, SA, SM, SD, SR, SQ) definition @de: Spezifikationsmodifikator gemäß DIN EN ISO 14405-1: LP, LS, GG, GX, GN, GC, CC, CA, CV, SX, SN, SA, SM, SD, SR, SQ) description @en: Specification modifier according to DIN EN ISO 14405-1: LP, LS, GG, GX, GN, GC, CC, CA, CV, SX, SN, SA, SM, SD, SR, SQ) description @de: Spezifikationsmodifikator gemäß DIN EN ISO 14405-1: LP, LS, GG, GX, GN, GC, CC, CA, CV, SX, SN, SA, SM, SD, SR, SQ)	[String]	0..*
[Prop] WidthExtendValue	[IRI] https://example.com/ids/cd/4033-9906-7009-1226 preferredName @en: Width or extent value preferredName @de: Wert Weite oder Ausdehnung definition @en: Value for the width or extent of the tolerance zone according to DIN EN ISO 1101 definition @de: Wert für Weite bzw. Ausdehnung der Toleranzzone gemäß DIN EN ISO 1101 description @en: Value for the width or extent of the tolerance zone according to DIN EN ISO 1101 description @de: Wert für Weite bzw. Ausdehnung der Toleranzzone gemäß DIN EN ISO 1101	[Double]	0..*
[Prop] WidthExtendTolerance1	[IRI] https://example.com/ids/cd/2425-8767-5976-3432 preferredName @en: Width or extent toranance value 1 preferredName @de: Toleranz Weite oder Ausdehnung 1 definition @en: Tolerated deviation definition @de: TolerierteAbweichung description @en: Tolerated deviation description @de: TolerierteAbweichung	[Double]	1
[Prop] WidthExtendSign1	[IRI] https://example.com/ids/cd/5669-0376-8169-3117 preferredName @en: 36ot he36 tolerance 1 preferredName @de: Vorzeichen Toleranz 1 definition @en: 36ot he36 tolerance (p, m, pm) definition @de: Vorzeichen der Tolerienung (p, m, pm)	[String]	1

	description @en: 37ot he37 tolerance (p, m, pm) description @de: Vorzeichen der Tolerienung (p, m, pm)		
[Prop] WidthExtendTolerance2	[IRI] https://example.com/ids/cd/5867-9340-3508-7840 preferredName @en: Width or extent toranance value 1 preferredName @de: Toleranz Weite oder Ausdehnung 2 definition @en: Tolerated deviation definition @de: TolerierteAbweichung description @en: Tolerated deviation description @de: TolerierteAbweichung	[Double]	0..1
[Prop] WidthExtendSign2	[IRI] https://example.com/ids/cd/4298-1727-9554-1515 preferredName @en: 37ot he37 tolerance 2 preferredName @de: Vorzeichen Toleranz 2 definition @en: 37ot he37 tolerance (p, m, pm) definition @de: Vorzeichen der Tolerienung (p, m, pm) description @en: 37ot he37 tolerance (p, m, pm) description @de: Vorzeichen der Tolerienung (p, m, pm)	[String]	0..1
[Prop] EngineeringUnit	[IRI] https://example.com/ids/cd/0377-0811-2053-0043 preferredName @en: Engineering Unit preferredName @de: Technische Einheit definition @en: Physical unit of feature definition @de: Physikalische Einheit des Merkmals description @en: Physical unit of feature description @de: Physikalische Einheit des Merkmals	[String]	1

3.11 Properties of the SMC AdditionalInformationList

Table 12: Specification of SMC AdditionalInformationList

idShort:	AdditionalInformationList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/4911-0802-2021-5357		
isCaseOf	-		
AllowDuplicates	-		
Parent	Additional InformationList		
Explanation	List with information on other GPS fields in accordance with DIN EN 1101@en,Liste mit Informationen zu weiteren GPS-Feldern gemäß DIN EN 1101@de		

[SME type]	semanticId = [idType]value	[valueType]	card.
idShort	**Description@en**	**example**	
[SMC] Additional Information	[IRI] https://example.com/ids/cd/5661-6135-3869-4776 preferredName @en: Additional GPS field information preferredName @de: Zusätzliche GPS Feldinformationen definition @en: Informationen zu weiteren GPS-Feldern gemäß DIN EN 1101 definition @de: Informationen zu weiteren GPS-Feldern gemäß DIN EN 1101 description @en: Informationen zu weiteren GPS-Feldern gemäß DIN EN 1101 description @de: Informationen zu weiteren GPS-Feldern gemäß DIN EN 1101	[-] 2 elements	0..*

3.12 Properties of the SMC AdditionalInformation

Table 13: Specification of SMC AdditionalInformation

idShort:	AdditionalInformation		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/5661-6135-3869-4776		
isCaseOf	-		
AllowDuplicates	-		
Parent	Additional Information		
Explanation	Informationen zu weiteren GPS-Feldern gemäß DIN EN 1101@en,Informationen zu weiteren GPS-Feldern gemäß DIN EN 1101@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] GPS_Identifier	[IRI] https://example.com/ids/cd/8680-4377-4720-9983 preferredName @en: Identifier 38ot he GPS field information preferredName @de: Bezeichner der GPS Feldinformationen definition @en: Identifier of additional GPS field information according to DIN EN 1101 definition @de: Bezeichner einer zusätzlichen GPS Feldinformationen gemäß DIN EN 1101 description @en: Identifier of additional GPS field information according to DIN EN 1101	[String]	0..*

	description @de: Bezeichner einer zusätzlichen GPS Feldinformationen gemäß DIN EN 1101		
[Prop] GPS_Value	[IRI] https://example.com/ids/cd/9767-5748-1333-1143 preferredName @en: Value of GPS field information preferredName @de: Wert der GPS Feldinformation definition @en: Value of additional GPS field information according to DIN EN 1101 definition @de: Wert einer zusätzlichen GPS Feldinformation gemäß DIN EN 1101 description @en: Value of additional GPS field information according to DIN EN 1101 description @de: Wert einer zusätzlichen GPS Feldinformation gemäß DIN EN 1101	[String]	0..*

3.13 Properties of the SMC ArealSurfaceFeaturesList

Table 14: Specification of SMC ArealSurfaceFeaturesList

idShort:	ArealSurfaceFeaturesList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/4428-3696-6460-4326		
isCaseOf	-		
AllowDuplicates	-		
Parent	ArealSurfaceFeaturesList		
Explanation	List of areal surface parameters according to EN ISO 25178-1@en,Liste flächenhafter Oberflächenkenngrößen gemäß EN ISO 25178-1@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[SMC] ArealSurfaceFeature	[IRI] https://example.com/ids/cd/4177-5773-3702-2507 preferredName @en: Areal Surface Surface Feature preferredName @de: Flächenhafte Oberflächenkenngröße definition @en: Definition of an areal surface parameter according to DIN EN ISO 25178-1 definition @de: Definition einer flächenhaften Oberflächenkenngröße gemäß DIN EN ISO 25178-1 description @en: Definition of an areal surface parameter according to DIN EN ISO 25178-1 description @de: Definition einer flächenhaften Oberflächenkenngröße gemäß DIN EN ISO 25178-1	[-] 8 elements	0..*

3.14 Properties of the SMC ArealSurfaceFeature

Table 15: Specification of SMC ArealSurfaceFeature

idShort:	ArealSurfaceFeature		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/4177-5773-3702-2507		
isCaseOf	-		
AllowDuplicates	-		
Parent	ArealSurfaceFeature		
Explanation	Definition of an areal surface parameter according to DIN EN ISO 25178-1@en,Definition einer flächenhaften Oberflächenkenngröße gemäß DIN EN ISO 25178-1@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] ASF_ID	[IRI] https://example.com/ids/cd/7071-1780-9421-8849 preferredName @en: Feature ID preferredName @de: Merkmal ID definition @en: Name or ID of the quality feature definition @de: Name oder ID des Qualitätsmerkmals description @en: Name or ID of the quality feature description @de: Name oder ID des Qualitätsmerkmals	[String]	0..1
[Prop] ASF_Description	[IRI] https://example.com/ids/cd/0431-9307-9225-6973 preferredName @en: Feature description preferredName @de: Merkmalsbeschreibung definition @en: Description 40ot he quality feature definition @de: Beschreibung des Qualitätsmerkmals description @en: Description 40ot he quality feature description @de: Beschreibung des Qualitätsmerkmals	[String]	0..1
[Prop] ToleranceNorm	[IRI] https://example.com/ids/cd/1438-6430-5061-7770 preferredName @en: Tolerance definition preferredName @de: Toleranzdefinition definition @en: Reference to one or more norms and guidelines in which the code 40ot he40 used tolerance is defined definition @de: Verweis auf eine oder mehrere Normen und Richtlinien, in denen der Code für die verwendete Toleranz festgelegt ist description @en: Reference to one or more norms and guidelines in which the code 40ot he40 used tolerance is defined	[String]	0..*

	description @de: Verweis auf eine oder mehrere Normen und Richtlinien, in denen der Code für die verwendete Toleranz festgelegt ist		
[Prop] InspectionRelevant	[IRI] https://example.com/ids/cd/8702-4101-2909-7475 preferredName @en: Test measure relevance preferredName @de: Relevanz als Prüfmaß definition @en: Is the measurement relevant as a test measure for quality assurance? True means yes, false means no definition @de: Ist das Maß als Prüfmaß für die Qualiätssicherung relevant? True bedeutet ja, false nein description @en: Is the measurement relevant as a test measure for quality assurance? True means yes, false means no description @de: Ist das Maß als Prüfmaß für die Qualiätssicherung relevant? True bedeutet ja, false nein	[Boolean]	1
[Prop] ArealSurfaceFeatureType	[IRI] https://example.com/ids/cd/7348-8729-9106-2343 preferredName @en: Type surface feature preferredName @de: Typ Oberflächenbeschaffenheit definition @en: Type of surface feature according to DIN EN ISO 25178-1(Value List „S-L“ or „S-F“) definition @de: Typ der Oberflächenbeschaffenheit gemäß DIN EN ISO 25178-1 (Value-List „S-L“ oder „S-F“) description @en: Type of surface feature according to DIN EN ISO 25178-1(Value List „S-L“ or „S-F“) description @de: Typ der Oberflächenbeschaffenheit gemäß DIN EN ISO 25178-1 (Value-List „S-L“ oder „S-F“)	[String]	1
[SMC] SL_Parameters	[IRI] https://example.com/ids/cd/0067-8806-3126-4120 preferredName @en: S-L parameter preferredName @de: S-L Parameter definition @en: Specification of an S-L surface finish according to DIN EN ISO 25178-1 definition @de: Spezifikation einer S-L-Oberflächenbeschaffenheit gemäß DIN EN ISO 25178-1 description @en: Specification of an S-L surface finish according to DIN EN ISO 25178-1 description @de: Spezifikation einer S-L-Oberflächenbeschaffenheit gemäß DIN EN ISO 25178-1	[-] 10 elements	0..*
[SMC] SF_Parameters	[IRI] https://example.com/ids/cd/2882-3059-2539-8162 preferredName @en: S-F parameters preferredName @de: S-F Parameter definition @en: Specification of an S-F surface finish, see	[-] 9 elements	0..*

	ISO 25178-2:2012, 3.1.6 definition @de: Spezifikation einer S-F-Oberflächenbeschaffenheit, siehe ISO 25178-2:2012, 3.1.6 description @en: Specification of an S-F surface finish, see ISO 25178-2:2012, 3.1.6 description @de: Spezifikation einer S-F-Oberflächenbeschaffenheit, siehe ISO 25178-2:2012, 3.1.6		
[SMC] Smr_Parameters	[IRI] https://example.com/ids/cd/1361-4753-3955-7966 preferredName @en: Smr parameters preferredName @de: Smr Parameter definition @en: Control elements for specifying the parameter value Smr 42ot he42 material ratio in technical drawings, applies to both S-L and S-F surface finishes, see also ISO 25178-2:2012, 3.1.6 definition @de: Steuerelemente für die Angabe des Kenngrößenwertes Smr für das Materialverhältnis in technischen Zeichnungen, gilt sowohl für S-L als auch für S-F Oberflächenbeschaffenheiten, siehe auch ISO 25178-2:2012, 3.1.6 description @en: Control elements for specifying the parameter value Smr 42ot he42 material ratio in technical drawings, applies to both S-L and S-F surface finishes, see also ISO 25178-2:2012, 3.1.6 description @de: Steuerelemente für die Angabe des Kenngrößenwertes Smr für das Materialverhältnis in technischen Zeichnungen, gilt sowohl für S-L als auch für S-F Oberflächenbeschaffenheiten, siehe auch ISO 25178-2:2012, 3.1.6	[-] 4 elements	0..1

3.15 Properties of the SMC SL_Parameters

Table 16: Specification of SMC SL_Parameters

idShort:	SL_Parameters		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/0067-8806-3126-4120		
isCaseOf	-		
AllowDuplicates	-		
Parent	SL_Parameters		
Explanation	Specification of an S-L surface finish according to DIN EN ISO 25178-1@en,Spezifikation einer S-L-		

	Oberflächenbeschaffenheit gemäß DIN EN ISO 25178-1@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] SL_ASP_Limit	[IRI] https://example.com/ids/cd/6960-1764-9237-8787 preferredName @en: S-L ASP limit preferredName @de: S-L ASP Limit definition @en: Either U (upper) or L (lower) specification limit according to ISO 25178-1 definition @de: Entweder U (obere) oder L (untere) Spezifikationsgrenze gemäß ISO 25178-1 description @en: Either U (upper) or L (lower) specification limit according to ISO 25178-1 description @de: Entweder U (obere) oder L (untere) Spezifikationsgrenze gemäß ISO 25178-1	[String]	1
[Prop] SL_ASP_S_FilterType	[IRI] https://example.com/ids/cd/8485-7870-9243-7057 preferredName @en: S-L ASP S-FilterType preferredName @de: S-L ASP S- FilterType definition @en: Filter type of S-filter definition @de: Filtertyp des S-Filters description @en: Filter type of S-filter description @de: Filtertyp des S-Filters	[String]	1
[Prop] SL_ASP_S_FilterNestingIndex	[IRI] https://example.com/ids/cd/4727-1053-3618-4780 preferredName @en: S-L ASP S-FilterNestingIndex preferredName @de: S-L ASP S-FilterNestingIndex definition @en: Nesting index of the S-filter definition @de: Nesting-Index des S-Filters description @en: Nesting index of the S-filter description @de: Nesting-Index des S-Filters	[String]	1
[Prop] SL_ASP_L_FilterType	[IRI] https://example.com/ids/cd/7843-6638-6096-3776 preferredName @en: S-L ASP L-FilterType preferredName @de: S-L ASP L-FilterType definition @en: Filter type of L-filter definition @de: Filtertyp des L-Filters description @en: Filter type of L-filter description @de: Filtertyp des L-Filters	[String]	1

[Prop] SL_ASP_L_FilterNestingIndex	[IRI] https://example.com/ids/cd/9335-7683-0140-0935 preferredName @en: S-L ASP L-FilterNestingIndex preferredName @de: S-L ASP L-FilterNestingIndex definition @en: Nesting index of the L-filter definition @de: Nesting-Index des L-Filters description @en: Nesting index of the L-filter description @de: Nesting-Index des L-Filters	[String]	1
[Prop] SL_ASP_F_Operator	[IRI] https://example.com/ids/cd/5386-7120-8889-5558 preferredName @en: S-L ASP F operator preferredName @de: S-L ASP F-Operator definition @en: Type of association operator and nesting index definition @de: Typ des Assoziationsoperators und des Nesting-Indexes description @en: Type of association operator and nesting index description @de: Typ des Assoziationsoperators und des Nesting-Indexes	[String]	1
[Prop] SL_ASP_Indicator	[IRI] https://example.com/ids/cd/5658-9571-0175-5072 preferredName @en: S-L ASP parameter preferredName @de: S-L ASP Kenngröße definition @en: Name of the areal parameter. See also ISO 25178-2:2012, 3.2 definition @de: Bezeichnung der flächenhaften Kenngröße. Siehe auch ISO 25178-2:2012, 3.2 description @en: Name 44ot he areal parameter. See also ISO 25178-2:2012, 3.2 description @de: Bezeichnung der flächenhaften Kenngröße. Siehe auch ISO 25178-2:2012, 3.2	[String]	1
[Prop] SL_ASP_Value	[IRI] https://example.com/ids/cd/3963-2529-8551-6038 preferredName @en: S-L ASP value preferredName @de: S-L ASP Wert definition @en: Specified limit value 44ot he parameter definition @de: Festgelegter Grenzwert der Kenngröße description @en: Specified limit value 44ot he parameter	[Double]	1

	description @de: Festgelegter Grenzwert der Kenngröße		
[Prop] SL_ASP_Unit	[IRI] https://example.com/ids/cd/9240-7998-7599-4139 preferredName @en: S-L ASP unit preferredName @de: S-L ASP Einheit definition @en: Unit 45ot he parameter value, 45ot h is not the default unit definition @de: Einheit des Kenngrößenwertes, sofern es nicht die defaultmäßige Einheit ist. description @en: Unit 45ot he parameter value, 45ot h is not the default unit description @de: Einheit des Kenngrößenwertes, sofern es nicht die defaultmäßige Einheit ist.	[String]	1
[Prop] SL_ASP_Or	[IRI] https://example.com/ids/cd/7566-5001-1200-8259 preferredName @en: S-L ASP Other requirements preferredName @de: S-L ASP Sonstige Anforderungen definition @en: Symbol for the option to choose other requirements according to DIN EN ISO ISO 25178-2. Additional requirements are specified here. definition @de: Symbol für die Wahlmöglichkeit sonstige Anforderungen gemäß DIN EN ISO 25178-2. An dieser Stelle werden zusätzliche Anforderungen angegeben. description @en: Symbol 45ot he45 option to choose other requirements according to DIN EN ISO ISO 25178-2. Additional requirements are specified here. description @de: Symbol für die Wahlmöglichkeit sonstige Anforderungen gemäß DIN EN ISO 25178-2. An dieser Stelle werden zusätzliche Anforderungen angegeben.	[String]	0..1

3.16 Properties of the SMC SF_Parameters

Table 17: Specification of SMC SF_Parameters

idShort:	SF_Parameters		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/2882-3059-2539-8162		
isCaseOf	-		

AllowDuplicates	-		
Parent	SF_Parameters		
Explanation	Specification of an S-F surface finish, see ISO 25178-2:2012, 3.1.6@en,Spezifikation einer S-F-Oberflächenbeschaffenheit, siehe ISO 25178-2:2012, 3.1.6@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] SF_ASP_Limit	[IRI] https://example.com/ids/cd/7918-2551-2197-9934 preferredName @en: S-F ASP limit preferredName @de: S-F ASP Limit definition @en: Either U (upper) or L (lower) specification limit according to ISO 25178-1 definition @de: Entweder U (obere) oder L (untere) Spezifikationsgrenze gemäß ISO 25178-1 description @en: Either U (upper) or L (lower) specification limit according to ISO 25178-1 description @de: Entweder U (obere) oder L (untere) Spezifikationsgrenze gemäß ISO 25178-1	[String]	1
[Prop] SF_ASP_S_FilterType	[IRI] https://example.com/ids/cd/7606-3069-0678-5580 preferredName @en: S-F ASP S-FilterType preferredName @de: S-F ASP S- FilterType definition @en: Filter type of S-filter definition @de: Filtertyp des S-Filters description @en: Filter type of S-filter description @de: Filtertyp des S-Filters	[String]	1
[Prop] SF_ASP_S_FilterNestingIndex	[IRI] https://example.com/ids/cd/6907-2279-7297-4229 preferredName @en: S-F ASP S-FilterNestingIndex preferredName @de: S-F ASP S-FilterNestingIndex definition @en: Nesting index of the S-filter definition @de: Nesting-Index des S-Filters description @en: Nesting index of the S-filter description @de: Nesting-Index des S-Filters	[String]	1
[Prop] SF_ASP_F_Operator	[IRI] https://example.com/ids/cd/4332-3300-4476-2976 preferredName @en: S-F ASP F operator preferredName @de: S-F ASP F-Operator definition @en: Type of association operator and	[String]	1

	nesting index definition @de: Typ des Assoziationsoperators und des Nesting-Indexes description @en: Type of association operator and nesting index description @de: Typ des Assoziationsoperators und des Nesting-Indexes		
[Prop] SF_ASP_Indicator	[IRI] https://example.com/ids/cd/7310-9962-8264-8503 preferredName @en: S-F ASP parameter preferredName @de: S-F ASP Kenngrösse definition @en: Name of the areal parameter. See also ISO 25178-2:2012, 3.2 definition @de: Bezeichnung der flächenhaften Kenngröße. Siehe auch ISO 25178-2:2012, 3.2 description @en: Name 47ot he areal parameter. See also ISO 25178-2:2012, 3.2 description @de: Bezeichnung der flächenhaften Kenngröße. Siehe auch ISO 25178-2:2012, 3.2	[String]	1
[Prop] SF_ASP_Value	[IRI] https://example.com/ids/cd/7189-2834-7987-9635 preferredName @en: S-F ASP value preferredName @de: S-F ASP Wert definition @en: Specified limit value 47ot he parameter definition @de: Festgelegter Grenzwert der Kenngröße description @en: Specified limit value 47ot he parameter description @de: Festgelegter Grenzwert der Kenngröße	[Double]	1
[Prop] SF_ASP_Unit	[IRI] https://example.com/ids/cd/6034-5213-9972-8537 preferredName @en: S-F ASP unit preferredName @de: S-F ASP Einheit definition @en: Unit 47ot he parameter value, 47ot h is not the default unit (the default unit µm does not need 47ot h specified) definition @de: Einheit des Kenngrößenwertes, sofern es nicht die defaultmäßige Einheit ist (die defaultmäßige Einheit µm braucht nicht angegeben zu werden) description @en: Unit 47ot he parameter value, 47ot h is not the default unit (the default unit µm does not	[String]	0..1

	need 48ot h specified) description @de: Einheit des Kenngrößenwertes, sofern es nicht die defaultmäßige Einheit ist (die defaultmäßige Einheit µm braucht nicht angegeben zu werden)		
[Prop] SF_ASP_ES	[IRI] https://example.com/ids/cd/7680-6121-6892-4610 preferredName @en: S-F ASP Electromagnetic surface preferredName @de: S-F ASP Elektromagnetische Oberfläche definition @en: Choice of electromagnetic surface, according to DIN EN 25178-2 definition @de: Wahlmöglichkeit elektromagnetische Oberfläche gemäß DIN EN ISO 25178-2 description @en: Choice of electromagnetic surface, according to DIN EN 25178-2 description @de: Wahlmöglichkeit elektromagnetische Oberfläche gemäß DIN EN ISO 25178-2	[String]	0..1
[Prop] SF_ASP_Or	[IRI] https://example.com/ids/cd/9362-1193-1805-7465 preferredName @en: S-F ASP Other requirements preferredName @de: S-F ASP Sonstige Anforderungen definition @en: Symbol for the option to choose other requirements according to DIN EN ISO 25178-2. Additional requirements are specified here. definition @de: Symbol für die Wahlmöglichkeit sonstige Anforderungen gemäß DIN EN ISO 25178-2. An dieser Stelle werden zusätzliche Anforderungen angegeben. description @en: Symbol 48ot he48 option to choose other requirements according to DIN EN ISO 25178-2. Additional requirements are specified here. description @de: Symbol für die Wahlmöglichkeit sonstige Anforderungen gemäß DIN EN ISO 25178-2. An dieser Stelle werden zusätzliche Anforderungen angegeben.	[String]	0..1

3.17 Properties of the SMC Smr_Parameters

Table 18: Specification of SMC Smr_Parameters

idShort:	Smr_Parameters		

Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/1361-4753-3955-7966		
isCaseOf	-		
AllowDuplicates	-		
Parent	Smr_Parameters		
Explanation	Control elements for specifying the parameter value Smr 49ot he49 material ratio in technical drawings, applies to both S-L and S-F surface finishes, see also ISO 25178-2:2012, 3.1.6@en,Steuerelemente für die Angabe des Kenngrößenwertes Smr für das Materialverhältnis in technischen Zeichnungen, gilt sowohl für S-L als auch für S-F Oberflächenbeschaffenheiten, siehe auch ISO 25178-2:2012, 3.1.6@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] Smr_RefCValue	[IRI] https://example.com/ids/cd/7111-9183-4376-2561 preferredName @en: Smr reference c value preferredName @de: Smr Bezugs-c-Wert definition @en: Specification of the reference level as a percentage of the material proportion curve, see ISO 25178-2:2012, 4.4.3. The default reference is the highest point 0% of the material proportion curve and does not need to be specified. definition @de: Spezifikation des Bezugsniveaus als prozentualer Anteil der Materialanteilskurve, siehe ISO 25178-2:2012, 4.4.3. Der Default-Bezug ist der höchste Punkt 0 % der Materialanteilskurve und braucht nicht angegeben zu werden. description @en: Specification of the reference level as a percentage of the material proportion curve, see ISO 25178-2:2012, 4.4.3. The default reference is the highest point 0% of the material proportion curve and does not need to be specified. description @de: Spezifikation des Bezugsniveaus als prozentualer Anteil der Materialanteilskurve, siehe ISO 25178-2:2012, 4.4.3. Der Default-Bezug ist der höchste Punkt 0 % der Materialanteilskurve und braucht nicht angegeben zu werden.	[String]	0..1
[Prop] Smr_Cvalue	[IRI] https://example.com/ids/cd/6701-5952-9293-4705 preferredName @en: Smr c value preferredName @de: Smr c-Wert definition @en: Set height distance in relation to the reference c value in µm, see ISO 25178-2:2012, 4.4.2. The c-value is negative if it is below the reference c-value and is positive if it is is above the reference c value definition @de: Festgelegter Höhenabstand im Verhältnis zum Bezugs-c-Wert in µm, siehe	[String]	1

	ISO 25178-2:2012, 4.4.2. Der c-Wert ist negativ, wenn er unter dem Bezugs-c-Wert liegt, und ist positiv, wenn er über dem Bezugs-c-Wert liegt description @en: Set height distance in relation 50ot he reference c value in µm, see ISO 25178-2:2012, 4.4.2. The c-value is negative if it is below the reference c-value and is positive if it is is above the reference c value description @de: Festgelegter Höhenabstand im Verhältnis zum Bezugs-c-Wert in µm, siehe ISO 25178-2:2012, 4.4.2. Der c-Wert ist negativ, wenn er unter dem Bezugs-c-Wert liegt, und ist positiv, wenn er über dem Bezugs-c-Wert liegt		
[Prop] Smr_Value	[IRI] https://example.com/ids/cd/0229-3392-4556-3761 preferredName @en: Smr value preferredName @de: Smr Wert definition @en: Specified limit value 50ot he parameter definition @de: Festgelegter Grenzwert der Kenngröße description @en: Specified limit value 50ot he parameter description @de: Festgelegter Grenzwert der Kenngröße	[Double]	1
[Prop] Smr_Unit	[IRI] https://example.com/ids/cd/1966-0754-5265-9044 preferredName @en: Smr unit preferredName @de: Smr Einheit definition @en: Unit, default: %, must always be specified definition @de: Einhheit, default: %, muss immer angegeben werden description @en: Unit, default: %, must always be specified description @de: Einhheit, default: %, muss immer angegeben werden	[String]	1

3.18 Properties of the SMC ProductionCriteria

Table 19: Specification of SMC ProductionCriteria

idShort:	ProductionCriteria		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/3342-1502-4675-1518		
isCaseOf	-		
AllowDuplicates	-		
Parent	ProductionCriteria		

Explanation	Information on production-relevant criteria in connection with the production of a specific component@en,Informationen zu produktionsrevelvanten Kriterien im Zusammenhang mit der Fertigung eines konkreten Bauteils@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Ref] TechnicalData	[IRI] https://example.com/ids/cd/2260-9578-2348-1449 preferredName @en: Technical data preferredName @de: Technische Daten definition @en: Reference to the AAS Submodel Technical Data for Industrial Equipment in Manufacturing definition @de: Referenz auf das AAS Submodel Technical Data for Industrial Equipment in Manufacturing” description @en: Reference to the AAS Submodel Technical Data for Industrial Equipment in Manufacturing description @de: Referenz auf das AAS Submodel Technical Data for Industrial Equipment in Manufacturing”	[-]	0..*
[SMC] ProductionJobOrderParameters	[IRI] https://example.com/ids/cd/3806-6301-5485-2260 preferredName @en: Production order data preferredName @de: Produktionsauftragsdaten definition @en: Production order information definition @de: Informationen zum Produktionsauftrag description @en: Production order information description @de: Informationen zum Produktionsauftrag	[-] 8 elements	1

3.19 Properties of the SMC ProductionJobOrderParameters

Table 20: Specification of SMC ProductionJobOrderParameters

idShort:	ProductionJobOrderParameters		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/3806-6301-5485-2260		
isCaseOf	-		

AllowDuplicates	-		
Parent	ProductionJobOrderParameters		
Explanation	Production order information@en,Informationen zum Produktionsauftrag@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] ProductionStart	[IRI] https://example.com/ids/cd/5207-1038-2486-2065 preferredName @en: Start of production preferredName @de: Produktionsstart definition @en: Date and time when production started 52ot he52 production order definition @de: Datum und Uhrzeit des Starts der Produktion für den Produktionsauftrag description @en: Date and time when production started 52ot he52 production order description @de: Datum und Uhrzeit des Starts der Produktion für den Produktionsauftrag	[DateTime]	1
[Prop] ProductionEnd	[IRI] https://example.com/ids/cd/7773-4693-1391-2974 preferredName @en: Start of production preferredName @de: Produktionsstart definition @en: Date and time when production ended 52ot he52 production order definition @de: Datum und Uhrzeit des Endes der Produktion für den Produktionsauftrag description @en: Date and time when production ended 52ot he52 production order description @de: Datum und Uhrzeit des Endes der Produktion für den Produktionsauftrag	[DateTime]	0..1
[Prop] JobName	[IRI] https://example.com/ids/cd/9258-7531-5488-2335 preferredName @en: Name of production order preferredName @de: Name des Produktionauftrags definition @en: Human readable name of the job. Array shall always contain the same text, potentially in different languages. definition @de: Für Menschen lesbarer Name des Jobs. Das Array muss immer denselben Text enthalten, möglicherweise in verschiedenen Sprachen. description @en: Human readable name of the job. Array shall always contain the same text, potentially in different languages. description @de: Für Menschen lesbarer Name des Jobs.	[String]	0..1

	Das Array muss immer denselben Text enthalten, möglicherweise in verschiedenen Sprachen.		
[Prop] JobOrderNumber	[IRI] https://example.com/ids/cd/1213-6711-2744-4538 preferredName @en: Production order number preferredName @de: Produktionsauftragsnummer definition @en: The OrderNumbers are used to reference company internal ERP orders the job order belongs to. Shall be provided in JobOrderParameters if any planned produced material uses OrderNumber as Identification and shall contain all those OrderNumbers. definition @de: Die Bestellnummern werden verwendet, um unternehmensinterne ERP-Bestellungen zu referenzieren, zu denen der Auftrag gehört. Wird in JobOrderParameters angegeben, wenn ein geplantes produziertes Material die Bestellnummer als Identifikation verwendet, und muss alle diese Bestellnummern enthalten. description @en: The OrderNumbers are used to reference company internal ERP orders the job order belongs to. Shall be provided in JobOrderParameters if any planned produced material uses OrderNumber as Identification and shall contain all those OrderNumbers. description @de: Die Bestellnummern werden verwendet, um unternehmensinterne ERP-Bestellungen zu referenzieren, zu denen der Auftrag gehört. Wird in JobOrderParameters angegeben, wenn ein geplantes produziertes Material die Bestellnummer als Identifikation verwendet, und muss alle diese Bestellnummern enthalten.	[String]	1..*
[Prop] PlannedPartsPerRun	[IRI] https://example.com/ids/cd/7594-9499-9340-1339 preferredName @en: Planned number of parts per production run preferredName @de: Geplante Anzahl Teile pro Produktionslauf definition @en: The number of parts produced by one run definition @de: Die Anzahl der Teile, die in einem Lauf produziert werden description @en: The number of parts produced by one run description @de: Die Anzahl der Teile, die in einem Lauf produziert werden	[Long]	0..1
[Prop] PlannedOrderQuantity	[IRI] https://example.com/ids/cd/0594-3396-8657-6833 preferredName @en: Planned lot size preferredName @de: Geplante Losgröße definition @en: The planned order quantity shall be the planned quantity of products for a production order (lot size, production order quantity). [Source: ISO 22400] definition @de: Die geplante Auftragsmenge ist die geplante Produktmenge für einen Produktionsauftrag (Losgröße,	[Long]	1

	Produktionsauftragsmenge). [Quelle: ISO 22400] description @en: The planned order quantity shall be the planned quantity of products for a production order (lot size, production order quantity). [Source: ISO 22400] description @de: Die geplante Auftragsmenge ist die geplante Produktmenge für einen Produktionsauftrag (Losgröße, Produktionsauftragsmenge). [Quelle: ISO 22400]		
[Prop] ActualPartsInRun	[IRI] https://example.com/ids/cd/1220-0190-1171-2156 preferredName @en: Actual number of parts per production run preferredName @de: Tatsächliche Anzahl Teile pro Produktionslauf definition @en: The number of parts actually measuerd by one run definition @de: Die Anzahl der Teile, die in einem Lauf tatsächlich gemessen werden description @en: The number of parts actually measuerd by one run description @de: Die Anzahl der Teile, die in einem Lauf tatsächlich gemessen werden	[Long]	0..1
[Prop] JobFinished	[IRI] https://example.com/ids/cd/4643-0567-9812-9715 preferredName @en: Job finished preferredName @de: Auftrag beendet definition @en: Status order completed. True: yes, false: no definition @de: Status Auftrag beendet. True: ja, false: nein description @en: Status order completed. True: yes, false: no description @de: Status Auftrag beendet. True: ja, false: nein	[Boolean]	0..1

3.20 Properties of the SMC PartInformation

Table 21: Specification of SMC PartInformation

idShort:	PartInformation		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/8151-3102-0551-0369		
isCaseOf	-		
AllowDuplicates	-		
Parent	PartInformation		

Explanation	Production information about the component@en,Produktionsinformationen zu dem Bauteil@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] PartIdentifier	[IRI] https://example.com/ids/cd/4437-8187-9155-5412 preferredName @en: IRDI 55ot he component preferredName @de: IRDI des Bauteils definition @en: Reference 55ot he AAS 55ot he component: IRDI 55ot he management shell 55ot he component, which is carried in the machine to assign the manufacturing data 55ot he55 component definition @de: Referenz auf die AAS des Bauteils: IRDI der Verwaltungschale des Bauteils, die in der Maschine zur Zuordnung der Fertigungsdaten für das Bauteil mitgeführt wird description @en: Reference 55ot he AAS 55ot he component: IRDI 55ot he management shell 55ot he component, which is carried in the machine to assign the manufacturing data 55ot he55 component description @de: Referenz auf die AAS des Bauteils: IRDI der Verwaltungschale des Bauteils, die in der Maschine zur Zuordnung der Fertigungsdaten für das Bauteil mitgeführt wird	[AnyUri]	1
[Prop] PartNumber	[IRI] https://example.com/ids/cd/5917-2293-5085-8473 preferredName @en: Component number in the lot preferredName @de: Bauteilnummer im Los definition @en: Consecutive number of the manufactured component in the batch from the CNC definition @de: Fortlaufende Nummer des gefertigten Bauteil im Los aus der CNC description @en: Consecutive number of the manufactured component in the batch from the CNC description @de: Fortlaufende Nummer des gefertigten Bauteil im Los aus der CNC	[Integer]	0..1
[Prop] ItemNumber	[IRI] https://example.com/ids/cd/1057-5659-7502-9634 preferredName @en: Item number preferredName @de: Artikelnummer definition @en: Defines an Identifier to identify the type 55ot he item (Material or item Identifier). definition @de: Definiert einen Bezeichner zur Identifizierung der Art des Artikels (Material-Identifikator bzw. Artikelnummer) description @en: Defines an Identifier to identify the type 55ot he item (Material or item Identifier). description @de: Definiert einen Bezeichner zur Identifizierung der Art des Artikels (Material-Identifikator bzw. Artikelnummer)	[String]	1

[Prop] OutputInfo	[IRI] https://example.com/ids/cd/1810-3001-2547-4167 preferredName @en: Output Info preferredName @de: Output Info definition @en: Indicating which of the optional fields are used for identification. If none is selected, only ItemNumber is used. Each selected optional field shall provide a value. definition @de: SerialNumber definiert einen Bezeichner zur Identifizierung der einen Entität des Artikels (Produktbezeichner) Wird bereitgestellt, wenn in OutputInfo definiert. description @en: Indicating which of the optional fields are used for identification. If none is selected, only ItemNumber is used. Each selected optional field shall provide a value. description @de: SerialNumber definiert einen Bezeichner zur Identifizierung der einen Entität des Artikels (Produktbezeichner) Wird bereitgestellt, wenn in OutputInfo definiert.	[String]	0..*
[Prop] SerialNumber	[IRI] https://example.com/ids/cd/2142-4184-0941-8208 preferredName @en: Serial number preferredName @de: Seriennummer definition @en: Identifier to identify the one entity of the item (Product Identifier). Shall be provided if defined in OutputInfo. definition @de: Bezeichner zur Identifizierung der einen Entität des Artikels (Produktbezeichner) Wird bereitgestellt, wenn in OutputInfo definiert. description @en: Identifier to identify the one entity of the item (Product Identifier). Shall be provided if defined in OutputInfo. description @de: Bezeichner zur Identifizierung der einen Entität des Artikels (Produktbezeichner) Wird bereitgestellt, wenn in OutputInfo definiert.	[String]	0..1
[Prop] OrderNumber	[IRI] https://example.com/ids/cd/8613-9538-1774-6180 preferredName @en: Order number preferredName @de: Auftragsnummer definition @en: Identifier to identify the order. Shall be provided if defined in OutputInfo. definition @de: Bezeichner zur Identifizierung der Bestellung. Wird bereitgestellt, wenn in Output Info definiert. description @en: Identifier to identify the order. Shall be provided if defined in OutputInfo. description @de: Bezeichner zur Identifizierung der Bestellung. Wird bereitgestellt, wenn in Output Info definiert.	[String]	0..1
[Prop] LotNumber	[IRI] https://example.com/ids/cd/9282-7386-3135-7145 preferredName @en: Lot number preferredName @de: Losnummer	[String]	0..1

	definition @en: Identifier to identify the production lot. Shall be provided if defined in OutputInfo. definition @de: Bezeichner zur Identifizierung des Fertigungsloses. Wird bereitgestellt, wenn in Output Info definiert. description @en: Identifier to identify the production lot. Shall be provided if defined in OutputInfo. description @de: Bezeichner zur Identifizierung des Fertigungsloses. Wird bereitgestellt, wenn in Output Info definiert.		
[Ref] CADReference	[IRI] https://example.com/ids/cd/5925-0611-8428-0955 preferredName @en: CAD Reference preferredName @de: CAD Referenz definition @en: Reference to IDTA Submodel 3D CAD definition @de: Reference auf IDTA Submodel 3D CAD description @en: Reference to IDTA Submodel 3D CAD description @de: Reference auf IDTA Submodel 3D CAD	[-]	0..1
[File] CADDrawing	[IRI] https://example.com/ids/cd/7227-9013-0872-1253 preferredName @en: File CAD Drawing preferredName @de: Datei CAD ZeichnungCAD Referenz definition @en: File which contains a drawing of the part definition @de: Datei, die eine Konstruktionszeichnung enthält description @en: File which contains a drawing of the part description @de: Datei, die eine Konstruktionszeichnung enthält	[-]	0..N

3.21 Properties of the SMC QualityResponsibilityList

Table 22: Specification of SMC QualityResponsibilityList

idShort:	QualityResponsibilityList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/5138-7789-8736-4298		
isCaseOf	-		
AllowDuplicates	-		
Parent	QualityResponsibilityList		
Explanation	List of organizational units responsible for quality assurance@en,Liste der für die Qualitätssicherung verantwortlichen Organisationseinheiten@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	

[SMC] QualityResponsibility	[IRI] https://example.com/ids/cd/4789-0366-5072-9974 preferredName @en: QS organizational unit preferredName @de: QS Organisationseinheit definition @en: Information about an organizational unit responsible for quality assurance definition @de: Informationen zu einer für Qualitätssicherung verantwortlichen Organisationseinheiten description @en: Information about an organizational unit responsible for quality assurance description @de: Informationen zu einer für Qualitätssicherung verantwortlichen Organisationseinheiten	[-] 3 elements	0..*

3.22 Properties of the SMC QualityResponsibility

Table 23: Specification of SMC QualityResponsibility

idShort:	QualityResponsibility		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/4789-0366-5072-9974		
isCaseOf	-		
AllowDuplicates	-		
Parent	QualityResponsibility		
Explanation	Information about an organizational unit responsible for quality assurance@en,Informationen zu einer für Qualitätssicherung verantwortlichen Organisationseinheiten@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] DepartmentName	[IRI] https://example.com/ids/cd/2245-6961-6817-5081 preferredName @en: Name 58ot he QS testing center preferredName @de: Bezeichnung der QS Prüfstelle definition @en: Name 58ot he institution/testing body definition @de: Bezeichnung der Institution/Prüfstelle description @en: Name 58ot he institution/testing body description @de: Bezeichnung der Institution/Prüfstelle	[String]	1
[Prop] Role	[IRI] https://example.com/ids/cd/5589-9577-1311-7818 preferredName @en: Role 58ot he QS testing center preferredName @de: Rolle des QS Prüfstelle definition @en: Role of the QS testing body (e.g. external quality testing laboratory) definition @de: Rolle der QS-Prüfstelle (z.B. externes Qualitätsprüflabor)	[String]	1

	description @en: Role of the QS testing body (e.g. external quality testing laboratory) description @de: Rolle der QS-Prüfstelle (z.B. externes Qualitätsprüflabor)		
[Ref] ContactInformation	[IRI] https://example.com/ids/cd/2225-4011-5480-8667 preferredName @en: Contact information QS testing center preferredName @de: Kontaktinformationen QS Prüfstelle definition @en: Reference to he AAS Submodel “Contact Information” definition @de: Referenz auf das AAS Submodel „Contact Information“ description @en: Reference to he AAS Submodel “Contact Information” description @de: Referenz auf das AAS Submodel „Contact Information“	[-]	0..1

3.23 Properties of the SMC TestingDevicesList

Table 24: Specification of SMC TestingDevicesList

idShort:	TestingDevicesList		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/6227-4929-3901-6147		
isCaseOf	-		
AllowDuplicates	-		
Parent	TestingDevicesList		
Explanation	List of testing devices used@en,Liste der verwendeten Prüfgeräte@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[SMC] TestingDeviceProperties	[IRI] https://example.com/ids/cd/3892-5484-3854-5040 preferredName @en: Test device properties preferredName @de: Prüfgerät-Eigenschaften definition @en: QS relevant information about the test device definition @de: QS relelvante Informationen über das Prüfgerät description @en: QS relevant information about the test device	[-] 10 elements	1..*

	description @de: QS relelvante Informationen über das Prüfgerät		

3.24 Properties of the SMC TestingDeviceProperties

Table 25: Specification of SMC TestingDeviceProperties

idShort:	TestingDeviceProperties		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/3892-5484-3854-5040		
isCaseOf	-		
AllowDuplicates	-		
Parent	TestingDeviceProperties		
Explanation	QS relevant information about the test device@en,QS relelvante Informationen über das Prüfgerät@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Ref] Responsibility	[IRI] https://example.com/ids/cd/0619-7461-5616-1289 preferredName @en: Testing center that operates the testing device preferredName @de: Prüfstelle, die das Prüfgerät betreibt definition @en: Reference to SMC QualityResponsibility definition @de: Referenz auf SMC QualityResponsibility description @en: Reference to SMC QualityResponsibility description @de: Referenz auf SMC QualityResponsibility	[-]	0..1
[Prop] DeviceName	[IRI] https://example.com/ids/cd/6607-8070-0920-3424 preferredName @en: Name of the test device preferredName @de: Bezeichnung des Prüfgeräts definition @en: Name of the test device definition @de: Bezeichnung des Prüfgeräts description @en: Name of the test device description @de: Bezeichnung des Prüfgeräts	[String]	1
[Prop] SerialNumber	[IRI] https://example.com/ids/cd/2142-4184-0941-8208 preferredName @en: Serial number preferredName @de: Seriennummer definition @en: Identifier to identify the one entity of the item (Product Identifier). Shall be provided if defined in OutputInfo. definition @de: Bezeichner zur Identifizierung der einen Entität des Artikels (Produktbezeichner)	[String]	1

	Wird bereitgestellt, wenn in OutputInfo definiert. description @en: Unique combination of numbers and letters used to identify the device once it has been manufactured description @de: Eindeutige Kombination aus Zahlen und Buchstaben, die zur Identifizierung des Geräts nach seiner Herstellung dient		
[Prop] MeasuringType	[IRI] https://example.com/ids/cd/2738-0458-2562-9791 preferredName @en: Type of measurement preferredName @de: Art der Messung definition @en: Type of measurement method, e.g. according to DIN EN ISO 25178-6, DIN EN ISO 25178-601, DIN EN ISO 25178-602 definition @de: Art der Messmethode, z.B. nach DIN EN ISO 25178-6, DIN EN ISO 25178-601, DIN EN ISO 25178-602 description @en: Type of measurement method, e.g. according to DIN EN ISO 25178-6, DIN EN ISO 25178-601, DIN EN ISO 25178-602 description @de: Art der Messmethode, z.B. nach DIN EN ISO 25178-6, DIN EN ISO 25178-601, DIN EN ISO 25178-602	[String]	1
[Prop] MeasuringUnit	[IRI] https://example.com/ids/cd/6768-8317-0044-2759 preferredName @en: Unit of measurement preferredName @de: Messeinheit definition @en: Unit in which the information on the measuring range and resolution is given definition @de: Einheit, in der die Angaben zum Messbereich und Auflösung erfolgen description @en: Unit in which the information on the measuring range and resolution is given description @de: Einheit, in der die Angaben zum Messbereich und Auflösung erfolgen	[String]	1
[Range] MeasuringRange	[IRI] https://example.com/ids/cd/6812-7273-5490-4788 preferredName @en: Measuring range preferredName @de: Messbereich definition @en: range defined by two values of the measurand, or quantity to be supplied, within which the limits of uncertainty of the measuring instrument are specified definition @de: Bereich in dem die Messabweichungen oder Messgeräteabweichungen innerhalb festgelegter Grenzen bleiben description @en: range defined by two values of the measurand, or quantity to be supplied, within which the limits of uncertainty of the measuring instrument are specified description @de: Bereich in dem die Messabweichungen oder	[-] ..	1

	Messgeräteabweichungen innerhalb festgelegter Grenzen bleiben		
[Prop] Resolution	[IRI] https://example.com/ids/cd/1213-6334-0470-2870 preferredName @en: resolution preferredName @de: Auflösung definition @en: Physical resolution of the measuring instrument definition @de: Physikalische Auflösung des Messinstruments description @en: Physical resolution of the measuring instrument description @de: Physikalische Auflösung des Messinstruments	[Double]	1
[Prop] Accuracy	[IRI] https://example.com/ids/cd/6703-0855-5835-7100 preferredName @en: Measurement accuracy preferredName @de: Messgenauigkeit definition @en: Accuracy expressed as a percentage. Containing the parameters referring to percentage measuring accuracy definition @de: Genauigkeit ausgedrückt in Prozent. Enthält die Parameter, die sich auf die prozentuale Messgenauigkeit beziehen description @en: Accuracy expressed as a percentage. Containing the parameters referring to percentage measuring accuracy description @de: Genauigkeit ausgedrückt in Prozent. Enthält die Parameter, die sich auf die prozentuale Messgenauigkeit beziehen	[Decimal]	1
[Prop] Norm	[IRI] https://example.com/ids/cd/5003-5386-4770-5522 preferredName @en: associated standard preferredName @de: zugehörige Norm definition @en: Reference to the relevant standard in which the measuring method is described, e.g. DIN EN ISO 25178-601 definition @de: Verweis auf entsprechende Norm in der die Messmethode beschrieben ist, z.B. DIN EN ISO 25178-601 description @en: Reference to the relevant standard in which the measuring method is described, e.g. DIN EN ISO 25178-601 description @de: Verweis auf entsprechende Norm in der die Messmethode beschrieben ist, z.B. DIN EN ISO 25178-601	[String]	0..1
[Ref] CalibrationCerificate	[IRI] https://example.com/ids/cd/8816-4802-3395-9299 preferredName @en: Calibration certificate preferredName @de: Kalibrierzertifikat definition @en: Reference to AAS Submodel “Calibration	[-]	1..*

	Certificate” definition @de: Referenz auf AAS Submodel "Callibration Certificate" description @en: Reference to AAS Submodel “Calibration Certificate” description @de: Referenz auf AAS Submodel "Callibration Certificate"		

3.25 Properties of the SMC MetrologyJobResults

Table 26: Specification of SMC MetrologyJobResults

idShort:	MetrologyJobResults		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/8445-6304-4300-8972		
isCaseOf	-		
AllowDuplicates	-		
Parent	MetrologyJobResults		
Explanation	Information and measurements on the results of a quality assessment order@en,Informationen und Messwerte zu Ergebnissen eines Qualitätsbewertungsauftrag@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Prop] JobStart	[IRI] https://example.com/ids/cd/3289-5155-1448-9167 preferredName @en: Job start preferredName @de: Job Start definition @en: Date time of job start definition @de: Datum und Zeit des Starts des Auftrags description @en: Date time of job start description @de: Datum und Zeit des Starts des Auftrags	[DateTime]	1
[Prop] JobEnd	[IRI] https://example.com/ids/cd/1548-9705-0346-9963 preferredName @en: Job end preferredName @de: Job Ende definition @en: Date time of job end definition @de: Datum und Zeit des Endes des Auftrags description @en: Date time of job end description @de: Datum und Zeit des Endes des Auftrags	[DateTime]	0..1
[Prop] JobName	[IRI] https://example.com/ids/cd/9258-7531-5488-2335 preferredName @en: Name of production order preferredName @de: Name des Produktionauftrags	[String]	0..1

	definition @en: Human readable name of the job. Array shall always contain the same text, potentially in different languages. definition @de: Für Menschen lesbarer Name des Jobs. Das Array muss immer denselben Text enthalten, möglicherweise in verschiedenen Sprachen. description @en: Human readable name of the job. Array shall always contain the same text, potentially in different languages. description @de: Für Menschen lesbarer Name des Jobs. Das Array muss immer denselben Text enthalten, möglicherweise in verschiedenen Sprachen.		
[Prop] JobOrderNumber	[IRI] https://example.com/ids/cd/1213-6711-2744-4538 preferredName @en: Production order number preferredName @de: Produktionsauftragsnummer definition @en: The OrderNumbers are used to reference company internal ERP orders the job order belongs to. Shall be provided in JobOrderParameters if any planned produced material uses OrderNumber as Identification and shall contain all those OrderNumbers. definition @de: Die Bestellnummern werden verwendet, um unternehmensinterne ERP-Bestellungen zu referenzieren, zu denen der Auftrag gehört. Wird in JobOrderParameters angegeben, wenn ein geplantes produziertes Material die Bestellnummer als Identifikation verwendet, und muss alle diese Bestellnummern enthalten. description @en: The OrderNumbers are used to reference company internal ERP orders the job order belongs to. Shall be provided in JobOrderParameters if any planned produced material uses OrderNumber as Identification and shall contain all those OrderNumbers. description @de: Die Bestellnummern werden verwendet, um unternehmensinterne ERP-Bestellungen zu referenzieren, zu denen der Auftrag gehört. Wird in JobOrderParameters angegeben, wenn ein geplantes produziertes Material die Bestellnummer als Identifikation verwendet, und muss alle diese Bestellnummern enthalten.	[String]	1..*
[Prop] PlannedPartsPerRun	[IRI] https://example.com/ids/cd/7594-9499-9340-1339 preferredName @en: Planned number of parts per production run preferredName @de: Geplante Anzahl Teile pro Produktionslauf definition @en: The number of parts produced by one run definition @de: Die Anzahl der Teile, die in einem Lauf produziert werden description @en: The number of parts planned to be	[Long]	0..1

	measured by one run description @de: Die Anzahl der Teile, die in einem Lauf gemessen werden sollen		
[Prop] ActualPartsInRun	[IRI] https://example.com/ids/cd/1220-0190-1171-2156 preferredName @en: Actual number of parts per production run preferredName @de: Tatsächliche Anzahl Teile pro Produktionslauf definition @en: The number of parts actually measuerd by one run definition @de: Die Anzahl der Teile, die in einem Lauf tatsächlich gemessen werden description @en: The number of parts actually measuerd by one run description @de: Die Anzahl der Teile, die in einem Lauf tatsächlich gemessen werden	[Long]	0..1
[Prop] JobFinished	[IRI] https://example.com/ids/cd/4643-0567-9812-9715 preferredName @en: Job finished preferredName @de: Auftrag beendet definition @en: Status order completed. True: yes, false: no definition @de: Status Auftrag beendet. True: ja, false: nein description @en: Status order completed. True: yes, false: no description @de: Status Auftrag beendet. True: ja, false: nein	[Boolean]	0..1
[SMC] MetrologyResultsList	[IRI] https://example.com/ids/cd/9710-0505-2159-6280 preferredName @en: List of measured quality characteristics preferredName @de: Liste der vermessenen Qualitätsmerkmale definition @en: List of measurement results for the quality characteristics definition @de: Liste der Messergebnisse zu den Qualitätsmerkmalen description @en: List of measurement results for the quality characteristics description @de: Liste der Messergebnisse zu den Qualitätsmerkmalen	[-] 1 elements	1

3.26 Properties of the SMC MetrologyResultsList

Table 27: Specification of SMC MetrologyResultsList

idShort:	MetrologyResultsList		
Class:	SubmodelElementCollection		

semanticId:	[IRI] https://example.com/ids/cd/9710-0505-2159-6280		
isCaseOf	-		
AllowDuplicates	-		
Parent	MetrologyResultsList		
Explanation	List of measurement results for the quality characteristics@en,Liste der Messergebnisse zu den Qualitätsmerkmalen@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[SMC] MetrologyData	[IRI] https://example.com/ids/cd/8117-6506-4095-7707 preferredName @en: Metrology Tolerance preferredName @de: Daten des Qualitätsmerkmal definition @en: Measurement results a quality feature definition @de: Messergebnisse einem Qualitätsmerkmal description @en: Measurement results a quality feature description @de: Messergebnisse einem Qualitätsmerkmal	[-] 12 elements	1..*

3.27 Properties of the SMC MetrologyData

Table 28: Specification of SMC MetrologyData

idShort:	MetrologyData		
Class:	SubmodelElementCollection		
semanticId:	[IRI] https://example.com/ids/cd/8117-6506-4095-7707		
isCaseOf	-		
AllowDuplicates	-		
Parent	MetrologyData		
Explanation	Measurement results a quality feature@en,Messergebnisse einem Qualitätsmerkmal@de		
[SME type]	**semanticId = [idType]value**	**[valueType]**	**card.**
idShort	**Description@en**	**example**	
[Ref] QualityFeatureReference	[IRI] https://example.com/ids/cd/4179-8668-2209-8319 preferredName @en: Quality Tolerance preferredName @de: Definition des Qualitätsmerkmals definition @en: Reference to QualityFeature in SMC	[-]	1

	QualityFeaturesList definition @de: Referenz auf QualityFeature in SMC QualityFeaturesList description @en: Reference to QualityFeature in SMC QualityFeaturesList description @de: Referenz auf QualityFeature in SMC QualityFeaturesList		
[Ref] TestingDeviceReference	[IRI] https://example.com/ids/cd/2501-5955-3736-4214 preferredName @en: Testing Tolerance preferredName @de: Verwendetes Prüfgerät definition @en: Reference to the test device used in SMC TestingDeviceList definition @de: Referenz auf das verwendete Prüfgerät in SMC TestingDeviceList description @en: Reference to the test device used in SMC TestingDeviceList description @de: Referenz auf das verwendete Prüfgerät in SMC TestingDeviceList	[-]	1
[Ref] PartReference	[IRI] https://example.com/ids/cd/6175-2735-9328-3645 preferredName @en: Reference AAS part preferredName @de: Referenz AAS Bauteil definition @en: Reference to the AAS of the component if the SMC MetrologyData is not within this AAS definition @de: Referenz auf die AAS des Bauteils, falls sich die SMC MetrologyData nicht innerhalb dieser AAS befindet description @en: Reference to the AAS of the component if the SMC MetrologyData is not within this AAS description @de: Referenz auf die AAS des Bauteils, falls sich die SMC MetrologyData nicht innerhalb dieser AAS befindet	[-]	1
[Prop] ID	[IRI] https://example.com/ids/cd/3736-6582-3990-5881 preferredName @en: Feature ID preferredName @de: Merkmal ID definition @en: Name or ID of the quality feature definition @de: Name oder ID des Qualitätsmerkmals description @en: Name or ID of the quality feature	[String]	0..1

	description @de: Name oder ID des Qualitätsmerkmals		
[Prop] Description	[IRI] https://example.com/ids/cd/4885-1883-0938-9529 preferredName @en: Feature description preferredName @de: Merkmalsbeschreibung definition @en: Description of the quality feature definition @de: Beschreibung des Qualitätsmerkmals description @en: Description of the quality feature description @de: Beschreibung des Qualitätsmerkmals	[String]	0..1
[Prop] EngineeringUnit	[IRI] https://example.com/ids/cd/0377-0811-2053-0043 preferredName @en: Engineering Unit preferredName @de: Technische Einheit definition @en: Physical unit of feature definition @de: Physikalische Einheit des Merkmals description @en: Physical unit of feature description @de: Physikalische Einheit des Merkmals	[Float]	0..1
[Prop] QualityActualValue	[IRI] https://example.com/ids/cd/8551-5405-5694-8813 preferredName @en: Measured value preferredName @de: Merkmalsmesswert definition @en: Value or values (with several repeated measurements) for the specific quality feature of the component definition @de: Wert oder Werte (bei mehreren Wiederholungsmessungen) für das bestimmte Qualitätsmerkmal des Bauteils description @en: Value or values (with several repeated measurements) for the specific quality feature of the component description @de: Wert oder Werte (bei mehreren Wiederholungsmessungen) für das bestimmte Qualitätsmerkmal des Bauteils	[Decimal]	0..*
[Prop] QualityActualAttribute	[IRI] https://example.com/ids/cd/7304-6246-7300-7591 preferredName @en: Attribute of the feature preferredName @de: Attribut des Merkmals definition @en: For attributive characteristics: attribute or attributes in the case of several repeat determinations) for the specific quality characteristic	[String]	0..*

	of the component definition @de: Bei attributiven Qualitätsmerkmalen: Attribut oder Attibute bei mehreren Wiederholungsbestimmungen für das bestimmte Qualitätsmerkmal des Bauteils description @en: For attributive characteristics: attribute or attributes in the case of several repeat determinations) for the specific quality characteristic of the component description @de: Bei attributiven Qualitätsmerkmalen: Attribut oder Attibute bei mehreren Wiederholungsbestimmungen für das bestimmte Qualitätsmerkmal des Bauteils		
[Prop] QualityInSpec	[IRI] https://example.com/ids/cd/7559-5814-9639-0899 preferredName @en: Quality within tolerance preferredName @de: Qualität innerhalb Toleranz definition @en: Indication whether the feature is within the tolerance, i.e. OK. definition @de: Angabe, ob das Merkmal innerhalb der Toleranz liegt, also i.O. ist. description @en: Indication whether the feature is within the tolerance, i.e. OK. description @de: Angabe, ob das Merkmal innerhalb der Toleranz liegt, also i.O. ist.	[Boolean]	1
[Prop] Deviation	[IRI] https://example.com/ids/cd/5980-5320-9079-9112 preferredName @en: Deviation from nominal value preferredName @de: Abweichung vom Sollwert definition @en: Deviation from nominal value definition @de: Abweichung vom Sollwert description @en: Deviation from nominal value description @de: Abweichung vom Sollwert	[Decimal]	0..1
[Prop] MinValue	[IRI] https://example.com/ids/cd/3955-6988-6212-5009 preferredName @en: Minimal measured value preferredName @de: Minimaler Messwert definition @en: Minimum value if several values are measured when determining the characteristic definition @de: Minimaler Wert, wenn bei Bestimmung des Merkmals mehrere Werte gemessen werden description @en: Minimum value if several values are measured when determining the characteristic	[Decimal]	0..1

	description @de: Minimaler Wert, wenn bei Bestimmung des Merkmals mehrere Werte gemessen werden		
[Prop] MaxValue	[IRI] https://example.com/ids/cd/9493-6404-8041-1948 preferredName @en: Maximal measured value preferredName @de: Maximaler Messwert definition @en: Maximum value if several values are measured when determining the characteristic definition @de: Maximaler Wert, wenn bei Bestimmung des Merkmals mehrere Werte gemessen werden description @en: Maximum value if several values are measured when determining the characteristic description @de: Maximaler Wert, wenn bei Bestimmung des Merkmals mehrere Werte gemessen werden	[Decimal]	0..1
[Prop] Standarddeviation	[IRI] https://example.com/ids/cd/1493-6304-8041-3458 preferredName @en: Standard deviation of measured values preferredName @de: Standardabweichung Messwerte definition @en: Maximum value if several values are measured when determining the characteristic definition @de: Maximaler Wert, wenn bei Bestimmung des Merkmals mehrere Werte gemessen werden description @en: Standarddeviation of measuring results if several values are measured when determining the characteristic description @de: Standardabweichung der Messergebnisse, wenn bei Bestimmung des Merkmals mehrere Werte gemessen werden	[Decimal]	0..1
[Prop] DataProvidedAsSeriesAverage	[IRI] https://example.com/ids/cd/8736-1104-6662-4956 preferredName @en: Standard deviation of measured values preferredName @de: Standardabweichung Messwerte definition @en: Maximum value if several values are measured when determining the characteristic definition @de: Maximaler Wert, wenn bei Bestimmung des Merkmals mehrere Werte gemessen werden	[Boolean]	0..1

	description @en: Boolean variable which indicates that the measured quality data is provided as average value for a series of parts (e.g. a lot or batch). Has to be set on false, if the measuring data is profided part specific. description @de: Boolesche Variable, die angibt, dass die gemessenen Qualitätsdaten als Durchschnittswert für eine Reihe von Teilen (z. B. Los oder Charge) bereitgestellt werden. Muss auf false gesetzt werden, wenn die Messdaten teilespezifisch bereitgestellt werden.		

4 Usage as SubmodelElementCollection

4.1 Properties of the Submodel “Quality Control for Machining”

Due to the fact that sub-elements of Submodel Quality Control for Machining can be re-used in various contexts beside machining, the specified SMC’s in section 3 can be used within other Submodels. In this way the parent Submodel can utilize standardized means of quality control scenarios.

Annex A: Explanations on used table formats

General
The used tables in this document try to outline information as concise as possible. They do not convey all information on Submodels and SubmodelElements. For this purpose, the definitive definitions are given by a separate file in form of an AASX file of the Submodel template and its elements.

Tables on Submodels and SubmodelElements
For clarity and brevity, a set of rules is used for the tables for describing Submodels and SubmodelElements.

- The tables follow in principle the same conventions as in [5].
- The table heads abbreviate 'cardinality' with 'card'.
- The tables often place two informations in different rows of the same table cell. In this case, the first information is marked out by sharp brackets [] form the second information. A special case are the semanticIds, which are marked out by the format: (type)(local)[idType]value.
- The types of SubmodelElements are abbreviated: SME

SME type Submodel	**Element type**
Prop	Property
MLP	MultiLanguageProperty
Range	Range
File	File
Blob	Blob
Ref	ReferenceElement
Rel	RelationshipElement
SMC	SubmodelElementCollection

- If an idShort ends with '{00}', this indicates a suffix of the respective length (here: 2) of decimal digits, in order to make the idShort unique. A different idShort might be choosen, as long as it is unique in the parent's context.
- The Keys of semanticId in the main section feature only idType and value, such as: [IRI]https://admin-shell.io/vdi/2770/1/0/DocumentId/Id. The attributes "type" and "local" (typically "ConceptDescription" and "(local)" or "GlobalReference" and (no-local)") need to be set accordingly; see [6].
- If a table does not contain a column with "parent" heading, all represented attributes share the same parent. This parent is denoted in the head of the table.
- Multi-language strings are represented by the text value, followed by '@'-character and the ISO 639 language code: example@de.
- The [valueType] is only given for Properties.

Annex B: Demonstrator Use Case Drawing

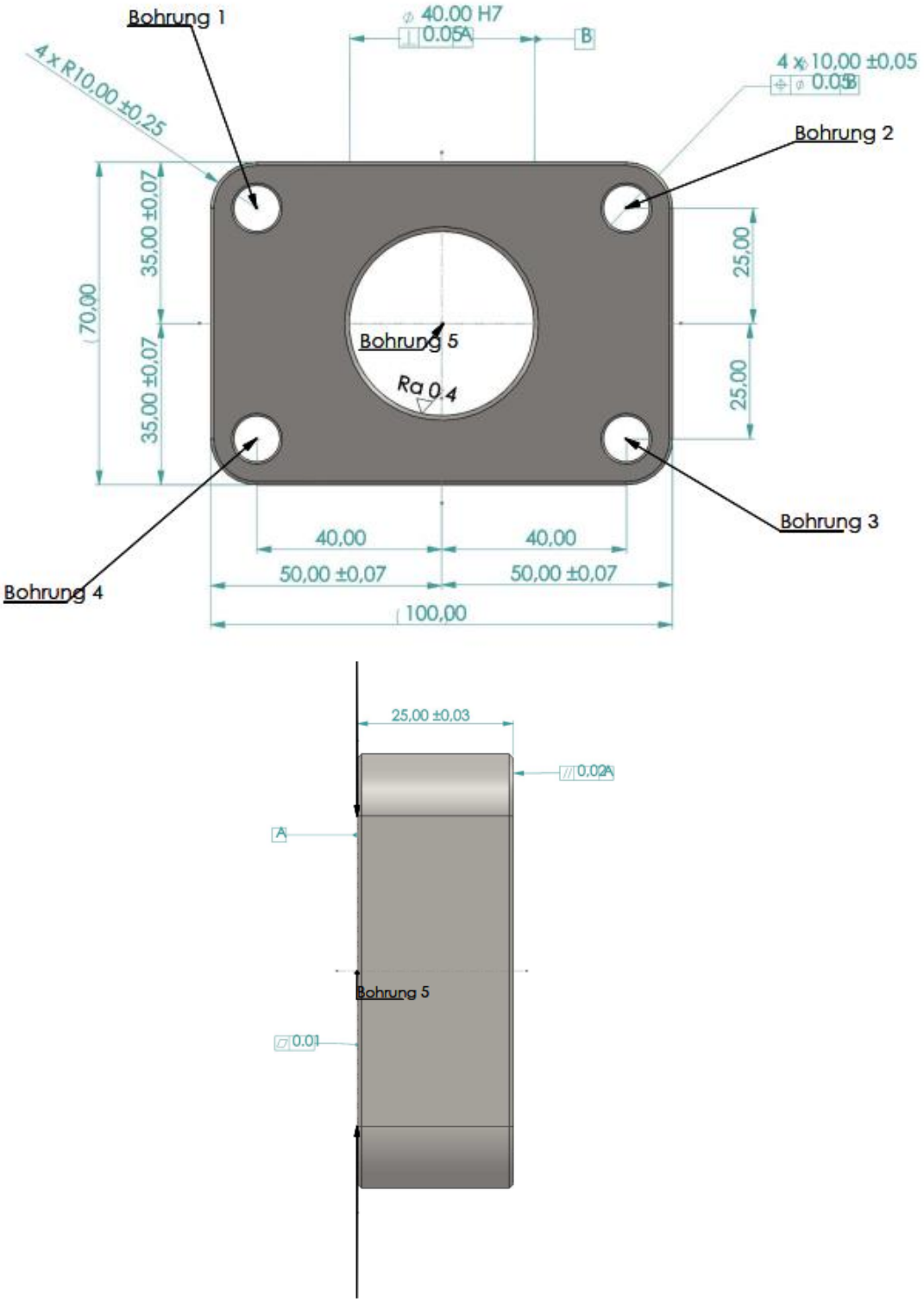

Figure 6: Drawing of the Demonstrator Use Case Example by University of Bayreuth

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