

ISO/TS 10303-15:2024-07 (E)

Industrial automation systems and integration - Product data representation and exchange - Part 15: Description methods: SysML XMI to XSD transformation

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms, definitions, and abbreviated terms	2
3.1	Terms and definitions	2
3.1.1	Terms related to SysML constructs	2
3.1.2	Terms related to XSD constructs	4
3.1.3	Terms related to Schematron rules	5
3.2	Abbreviated terms	5
4	Structure and components of the XSD	6
4.1	General	6
4.2	Presentation conventions	6
4.3	Main components of the XSD	7
4.4	XSD header	7
4.5	Common structural XML element definitions	7
4.6	ExternalRefBaseObject	9
4.6.1	General	9
4.6.2	SubObject and NamedSubObject	11
4.7	DataContainer	13
4.8	List of application object specifications	13
4.8.1	List and definition of the entities as application object specifications	13
4.8.2	Object attribute specifications	13
4.8.3	Attributes optionality and cardinality	14
4.8.4	Base root objects	15
4.8.5	Base objects	15
4.8.6	Instantiation of a subtype	16
4.8.7	Representation of XML identification attribute	16
4.8.8	Multilanguage support	17
4.8.9	Representation of Date and Time	17
4.9	Groups and simple types corresponding to Select Data Types and Enumerations	18
4.9.1	Group	18
4.9.2	Enumeration	18
4.9.3	Simple type	18
5	SysML XMI to XSD	18
5.1	General	18
5.2	Presentation conventions	19
5.3	Common mapping conventions	20
5.3.1	Reference to external Canonical XMI (CXMI) files	20
5.3.2	Xmi:id, xmi:uuid, and UUID	20
5.3.3	Assumed sysml:Block in fragments	20
5.3.4	Containment and reference relationships	21
5.3.5	Used stereotypes	21
5.3.6	Select Data Type and supertype	21
5.4	Mapping of the DataContainer	21

5.5	Mapping of Entity	22
5.5.1	General entity	22
5.5.2	Entity attribute ordering	23
5.5.3	Mapping of abstract entity	23
5.5.4	Mapping of entity with one supertype	23
5.5.5	Mapping of entity with more than one supertype	24
5.5.6	Mapping of entity with the Generic stereotype	26
5.5.7	Mapping of entity with the Enrichment stereotype	26
5.5.8	Mapping of entity without supertype and not used by containment	27
5.5.9	Mapping of entity without supertype and used by containment	27
5.6	Mapping of simple type	28
5.7	Mapping of aggregation type	31
5.8	Mapping of aggregation of aggregation type	32
5.9	Select Data Type	33
5.9.1	Mapping of Select Data Type	33
5.9.2	Proxy artefact	37
5.10	Mapping of enumeration type	37
5.11	Mapping of entity attribute	38
5.11.1	General	38
5.11.2	Mapping of multiplicity and optionality	39
5.11.3	Attribute typed as an Entity	41
5.11.4	Attribute typed as Select Data Type	42
5.11.5	Attribute typed as Enumeration type	43
5.11.6	Attribute typed as simple type	44
5.11.7	Fixed Value attribute	44
5.11.8	Inverse Generic attribute	45
5.11.9	Inverse Composite Aggregation attribute	46
5.11.10	Redefined attributes	48
6	SysML XMI to Schematron	48
6.1	General	48
6.2	Type of referenced subtype entity	49
6.3	Fixed Value attribute	50
6.4	Inverse Generic attribute	51
6.5	Redefinition	52
6.6	Constraint as formal proposition	54
6.7	ExternalRefBaseObject	55
Annex A (normative)Informationobjectregistration		57
Annex B (informative)SysMLXMItoXSDtransformation--Illustrativediagramsandfiles		58
Annex C (informative) EXPRESS / Information modelling constructs and the equivalent SysML modelling constructs		61
Bibliography		72