



**Methods for Testing and Specification (MTS);
The Testing and Test Control Notation version 3;
Part 1: TTCN-3 Core Language**

*iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard: https://standards.iteh.ai/catalog/standards/sist/1b9486588701/etsi-es-201-873-1-v4.9.1-2017-03
https://standards.iteh.ai/catalog/standards/sist/1b9486588701/etsi-es-201-873-1-v4.9.1-2017-03*

Reference

RES/MTS-201873 -1 T3ed491

Keywords

language, methodology, testing, TTCN-3

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2017.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	13
Foreword.....	13
Modal verbs terminology.....	13
1 Scope	14
2 References	14
2.1 Normative references	14
2.2 Informative references	15
3 Definitions and abbreviations.....	16
3.1 Definitions	16
3.2 Abbreviations	21
4 Introduction	22
4.0 General	22
4.1 The core language and presentation formats	22
4.2 Unanimity of the specification	24
4.3 Conformance	24
5 Basic language elements	24
5.0 General	24
5.1 Identifiers and keywords	25
5.2 Scope rules	25
5.2.0 General.....	25
5.2.1 Scope of formal parameters	28
5.2.2 Uniqueness of identifiers	28
5.3 Ordering of language elements.....	29
5.4 Parameterization.....	29
5.4.0 General.....	29
5.4.1 Formal parameters	30
5.4.1.0 General	30
5.4.1.1 Formal parameters of kind value.....	30
5.4.1.2 Formal parameters of kind template.....	33
5.4.1.3 Formal parameters of kind timer.....	35
5.4.1.4 Formal parameters of kind port.....	35
5.4.2 Actual parameters	36
5.5 Cyclic Definitions.....	41
6 Types and values	42
6.0 General	42
6.1 Basic types and values.....	43
6.1.0 Simple basic types and values.....	43
6.1.1 Basic string types and values	43
6.1.1.0 General	43
6.1.1.1 Accessing individual string elements	46
6.1.2 Subtyping of basic types	46
6.1.2.0 General	46
6.1.2.1 Lists of templates	47
6.1.2.2 Lists of types	47
6.1.2.3 Ranges.....	47
6.1.2.4 String length restrictions	48
6.1.2.5 Pattern subtyping of character string types	48
6.1.2.6 Mixing subtyping mechanisms.....	49
6.1.2.6.1 Mixing patterns, lists and ranges	49
6.1.2.6.2 Using length restriction with other constraints	49
6.2 Structured types and values	50
6.2.0 General.....	50

6.2.1	Record type and values	51
6.2.1.0	General	51
6.2.1.1	Referencing fields of a record type	54
6.2.1.2	Optional elements in a record.....	55
6.2.1.3	Nested type definitions for field types	56
6.2.2	Set type and values	56
6.2.2.0	General	56
6.2.2.1	Referencing fields of a set type	56
6.2.2.2	Optional elements in a set	56
6.2.2.3	Nested type definition for field types	57
6.2.3	Records and sets of single types	57
6.2.3.0	General	57
6.2.3.1	Nested type definitions.....	59
6.2.3.2	Referencing elements of record of and set of types	60
6.2.4	Enumerated type and values	61
6.2.5	Unions.....	62
6.2.5.0	General	62
6.2.5.1	Referencing fields of a union type	63
6.2.5.2	Option and union.....	64
6.2.5.3	Nested type definition for field types	65
6.2.6	The anytype	65
6.2.7	Arrays	65
6.2.8	The default type	67
6.2.9	Communication port types.....	67
6.2.10	Component types	69
6.2.10.1	Component type definition.....	69
6.2.10.2	Reuse of component types	70
6.2.11	Component references	72
6.2.12	Addressing entities inside the SUT.....	74
6.2.13	Subtyping of structured types	76
6.2.13.0	General	76
6.2.13.1	Length subtyping of record ofs and set ofs	76
6.2.13.2	List subtyping of structured types and anytype	77
6.2.13.3	Subtyping of the iterated type of record ofs and set ofs	80
6.2.13.4	Mixing subtyping mechanisms.....	81
6.3	Type compatibility	81
6.3.0	General.....	81
6.3.1	Compatibility of non-structured types	81
6.3.2	Compatibility of structured types.....	83
6.3.2.0	General	83
6.3.2.1	Compatibility of enumerated types	83
6.3.2.2	Compatibility of record and record of types	83
6.3.2.3	Compatibility of set and set of types.....	84
6.3.2.4	Compatibility of union types.....	85
6.3.2.5	Compatibility of anytype types	86
6.3.2.6	Compatibility between sub-structures	87
6.3.3	Compatibility of component types.....	87
6.3.4	Type compatibility of communication and connection operations	88
6.3.5	Type conversion.....	88
6.4	Type synonym	88
7	Expressions.....	89
7.0	General	89
7.1	Operators	89
7.1.0	General.....	89
7.1.1	Arithmetic operators	91
7.1.2	List operator.....	92
7.1.3	Relational operators	92
7.1.4	Logical operators	94
7.1.5	Bitwise operators	95
7.1.6	Shift operators.....	96
7.1.7	Rotate operators	96

7.2	Field references and list elements.....	97
7.3	Decoded field reference.....	97
8	Modules.....	98
8.0	General.....	98
8.1	Definition of a module.....	98
8.2	Module definitions part.....	99
8.2.0	General.....	99
8.2.1	Module parameters.....	100
8.2.2	Groups of definitions.....	102
8.2.3	Importing from modules.....	103
8.2.3.0	General.....	103
8.2.3.1	General format of import.....	103
8.2.3.2	Importing single definitions.....	109
8.2.3.3	Importing groups.....	110
8.2.3.4	Importing definitions of the same kind.....	111
8.2.3.5	Importing all definitions of a module.....	112
8.2.3.6	Import definitions from other TTCN-3 editions and from non-TTCN-3 modules.....	112
8.2.3.7	Importing of import statements from TTCN-3 modules.....	114
8.2.3.8	Compatibility of language specifications in imports.....	115
8.2.4	Definition of friend modules.....	116
8.2.5	Visibility of definitions.....	116
8.3	Module control part.....	118
9	Port types, component types and test configurations.....	118
9.0	General.....	118
9.1	Communication ports.....	119
9.2	Test system interface.....	121
10	Declaring constants.....	123
11	Declaring variables.....	123
11.0	General.....	123
11.1	Value variables.....	124
11.2	Template variables.....	125
12	Declaring timers.....	126
13	Declaring messages.....	127
14	Declaring procedure signatures.....	128
15	Declaring templates.....	129
15.0	General.....	129
15.1	Declaring message templates.....	130
15.2	Declaring signature templates.....	131
15.3	Global and local templates.....	133
15.4	In-line Templates.....	134
15.5	Modified templates.....	135
15.6	Referencing elements of templates or template fields.....	138
15.6.0	General.....	138
15.6.1	Referencing individual string elements.....	138
15.6.2	Referencing record and set fields.....	138
15.6.3	Referencing record of and set of elements.....	139
15.6.4	Referencing signature parameters.....	143
15.6.5	Referencing union alternatives.....	143
15.7	Template matching mechanisms.....	144
15.7.0	General.....	144
15.7.1	Specific values.....	145
15.7.2	Special symbols that can be used instead of values.....	146
15.7.3	Special symbols that can be used inside values.....	147
15.7.4	Special symbols which describe attributes of values.....	147
15.8	Template Restrictions.....	148
15.9	Match Operation.....	150

15.10	Valueof Operation	152
15.11	Concatenating templates of string and list types	152
16	Functions, altsteps and testcases	154
16.0	General	154
16.1	Functions	154
16.1.0	General.....	154
16.1.1	Invoking functions	156
16.1.2	Predefined functions	157
16.1.3	External functions	159
16.1.4	Invoking functions from specific places	160
16.2	Altsteps.....	161
16.2.0	General.....	161
16.2.1	Invoking altsteps.....	163
16.3	Test cases.....	164
17	Void.....	165
18	Overview of program statements and operations	165
19	Basic program statements.....	167
19.0	General	167
19.1	Assignments	168
19.2	The If-else statement	170
19.3	The Select statements	170
19.3.1	The Select case statement	170
19.3.2	The Select union statement	171
19.4	The For statement.....	172
19.5	The While statement.....	173
19.6	The Do-while statement	173
19.7	The Label statement	174
19.8	The Goto statement	174
19.9	The Stop execution statement.....	175
19.10	The Return statement.....	176
19.11	The Log statement	177
19.12	The Break statement.....	178
19.13	The Continue statement.....	179
19.14	Statement block	180
20	Statement and operations for alternative behaviours.....	180
20.0	General	180
20.1	The snapshot mechanism.....	181
20.2	The Alt statement	181
20.3	The Repeat statement	185
20.4	The Interleave statement	186
20.5	Default Handling	188
20.5.0	General.....	188
20.5.1	The default mechanism	189
20.5.2	The Activate operation.....	189
20.5.3	The Deactivate operation.....	190
21	Configuration Operations	191
21.0	General	191
21.1	Connection Operations	192
21.1.0	General.....	192
21.1.1	The Connect and Map operations	193
21.1.2	The Disconnect and Unmap operations	195
21.2	Test case operations.....	196
21.2.0	General.....	196
21.2.1	Test case stop operation	197
21.3	Test Component Operations	197
21.3.0	General.....	197
21.3.1	The Create operation.....	197
21.3.2	The Start test component operation	198

21.3.3	The Stop test behaviour operation	200
21.3.4	The Kill test component operation.....	201
21.3.5	The Alive operation	202
21.3.6	The Running operation	203
21.3.7	The Done operation	204
21.3.8	The Killed operation	206
21.3.9	Summary of the use of any and all with components	208
22	Communication operations.....	208
22.0	General	208
22.1	The communication mechanisms	209
22.1.0	General.....	209
22.1.1	Principles of message-based communication.....	209
22.1.2	Principles of procedure-based communication	210
22.1.3	Principles of unicast, multicast and broadcast communication.....	210
22.1.4	General format of communication operations	211
22.1.4.0	General	211
22.1.4.1	General format of the sending operations	211
22.1.4.2	General format of the receiving operations	212
22.2	Message-based communication	213
22.2.0	General.....	213
22.2.1	The Send operation	213
22.2.2	The Receive operation	214
22.2.3	The Trigger operation	218
22.3	Procedure-based communication.....	221
22.3.0	General.....	221
22.3.1	The Call operation	221
22.3.2	The Getcall operation.....	225
22.3.3	The Reply operation.....	228
22.3.4	The Getreply operation	229
22.3.5	The Raise operation	232
22.3.6	The Catch operation.....	233
22.4	The Check operation	236
22.5	Controlling communication ports	239
22.5.0	General.....	239
22.5.1	The Clear port operation	239
22.5.2	The Start port operation	239
22.5.3	The Stop port operation	240
22.5.4	The Halt port operation.....	240
22.5.5	The Checkstate port operation.....	241
22.6	Use of any and all with ports.....	242
23	Timer operations	243
23.0	General	243
23.1	The timer mechanism	243
23.2	The Start timer operation.....	243
23.3	The Stop timer operation.....	244
23.4	The Read timer operation	245
23.5	The Running timer operation.....	245
23.6	The Timeout operation	246
23.7	Summary of use of any and all with timers	247
24	Test verdict operations	247
24.0	General	247
24.1	The Verdict mechanism.....	248
24.2	The Setverdict operation	249
24.3	The Getverdict operation.....	250
25	External actions	250
26	Module control	250
26.0	General	250
26.1	The Execute statement.....	251
26.2	The Control part	253

27	Specifying attributes.....	255
27.0	General	255
27.1	The Attribute mechanism	255
27.1.0	General.....	255
27.1.1	Scope of attributes	255
27.1.2	Overwriting rules for attributes.....	256
27.1.2.0	General	256
27.1.2.1	Additional default overwriting rules for variant attributes	259
27.1.2.2	Overwriting rules for multiple encoding	260
27.1.3	Changing attributes of imported language elements	260
27.2	The With statement	261
27.3	Display attributes.....	262
27.4	Encoding attributes.....	262
27.5	Variant attributes	263
27.6	Extension attributes	266
27.7	Optional attributes	266
27.8	Retrieving attribute values.....	268
27.9	Dynamic configuration of encoding used by ports.....	269
Annex A (normative): BNF and static semantics		271
A.1	TTCN-3 BNF	271
A.1.0	General	271
A.1.1	Conventions for the syntax description	271
A.1.2	Statement terminator symbols	271
A.1.3	Identifiers	271
A.1.4	Comments.....	272
A.1.5	TTCN-3 terminals	272
A.1.5.0	General.....	272
A.1.5.1	Use of whitespaces and newlines.....	274
A.1.6	TTCN-3 syntax BNF productions	274
A.1.6.0	TTCN-3 module.....	274
A.1.6.1	Module definitions part.....	274
A.1.6.1.0	General	274
A.1.6.1.1	Typedef definitions	275
A.1.6.1.2	Constant definitions	277
A.1.6.1.3	Template definitions.....	277
A.1.6.1.4	Function definitions	279
A.1.6.1.5	Signature definitions	280
A.1.6.1.6	Testcase definitions.....	280
A.1.6.1.7	Altstep definitions	280
A.1.6.1.8	Import definitions.....	280
A.1.6.1.9	Group definitions	281
A.1.6.1.10	External function definitions	281
A.1.6.1.11	External constant definitions	281
A.1.6.1.12	Module parameter definitions	281
A.1.6.1.13	Friend module definitions	281
A.1.6.2	Control part.....	281
A.1.6.3	Local definitions	282
A.1.6.3.1	Variable instantiation	282
A.1.6.3.2	Timer instantiation	282
A.1.6.4	Operations.....	282
A.1.6.4.1	Component operations	282
A.1.6.4.2	Port operations	283
A.1.6.4.3	Timer operations	285
A.1.6.4.4	Testcase operation.....	285
A.1.6.5	Type.....	285
A.1.6.6	Value.....	286
A.1.6.7	Parameterization	287
A.1.6.8	Statements.....	287
A.1.6.8.1	With statement	287
A.1.6.8.2	Behaviour statements	288

A.1.6.8.3	Basic statements	288
A.1.6.9	Miscellaneous productions	291
Annex B (normative):	Matching values	292
B.1	Template matching mechanisms	292
B.1.0	General	292
B.1.1	Matching specific values	292
B.1.2	Matching mechanisms instead of values	292
B.1.2.0	General	292
B.1.2.1	Template list	292
B.1.2.2	Complemented template list	293
B.1.2.3	Any value	294
B.1.2.4	Any value or none	295
B.1.2.5	Value range	296
B.1.2.6	SuperSet	296
B.1.2.7	SubSet	297
B.1.2.8	Omitting optional fields	299
B.1.2.9	Matching decoded content	299
B.1.2.10	Matching enumerated value with value list	301
B.1.3	Matching mechanisms inside values	301
B.1.3.0	General	301
B.1.3.1	Any element	301
B.1.3.1.0	General	301
B.1.3.1.1	Using single character wildcards	301
B.1.3.2	Any number of elements or no element	302
B.1.3.2.0	General	302
B.1.3.2.1	Using multiple character wildcards	302
B.1.3.3	Permutation	302
B.1.4	Matching attributes of values	304
B.1.4.0	General	304
B.1.4.1	Length restrictions	304
B.1.4.2	The IfPresent indicator	305
B.1.5	Matching character pattern	306
B.1.5.0	General	306
B.1.5.1	Set expression	308
B.1.5.2	Reference expression	308
B.1.5.3	Match expression n times	310
B.1.5.4	Match a referenced character set	310
B.1.5.5	Type compatibility rules for patterns	311
B.1.5.6	Case insensitive pattern matching	311
Annex C (normative):	Predefined TTCN-3 functions	312
C.0	General exception handling procedures	312
C.1	Conversion functions	312
C.1.1	Integer to character	312
C.1.2	Integer to universal character	312
C.1.3	Integer to bitstring	312
C.1.4	Integer to enumerated	313
C.1.5	Integer to hexstring	313
C.1.6	Integer to octetstring	313
C.1.7	Integer to charstring	314
C.1.8	Integer to float	314
C.1.9	Float to integer	314
C.1.10	Character to integer	314
C.1.11	Character to octetstring	314
C.1.12	Universal character to integer	315
C.1.13	Bitstring to integer	315
C.1.14	Bitstring to hexstring	315
C.1.15	Bitstring to octetstring	316
C.1.16	Bitstring to charstring	316

C.1.17	Hexstring to integer	316
C.1.18	Hexstring to bitstring	316
C.1.19	Hexstring to octetstring	317
C.1.20	Hexstring to charstring	317
C.1.21	Octetstring to integer	317
C.1.22	Octetstring to bitstring	318
C.1.23	Octetstring to hexstring	318
C.1.24	Octetstring to character string	318
C.1.25	Octetstring to character string, version II	318
C.1.26	Charstring to integer	319
C.1.27	Character string to hexstring	319
C.1.28	Character string to octetstring	319
C.1.29	Character string to float	320
C.1.30	Enumerated to integer	320
C.1.31	Octetstring to universal character string	321
C.1.32	Universal character string to octetstring	321
C.1.33	Value or template to universal charstring	322
C.2	Length/size functions	322
C.2.1	Length of strings and lists	322
C.2.2	Number of elements in a structured value	324
C.3	Presence checking functions	325
C.3.1	The IsPresent function	325
C.3.2	The IsChosen function	326
C.3.3	The IsValue function	327
C.3.4	The IsBound function	328
C.3.5	Matching mechanism detection	329
C.4	String/list handling functions	330
C.4.1	The Regexp function	330
C.4.2	The Substring function	332
C.4.3	The Replace function	333
C.5	Codec functions	333
C.5.1	The encoding function	333
C.5.2	The decoding function	334
C.5.3	The encoding to universal charstring function	334
C.5.4	The decoding from universal charstring function	335
C.5.5	The encoding to octetstring function	337
C.5.6	The decoding from octetstring function	337
C.5.7	Retrieving the type of string encoding	337
C.5.8	Removing BOMs of UCS encoding schemes	338
C.6	Other functions	338
C.6.1	The random number generator function	338
C.6.2	The testcasename function	339
C.6.3	The hostId function	339
Annex D (normative):	Preprocessing macros	341
D.0	General	341
D.1	Preprocessing macro <code>__MODULE__</code>	341
D.2	Preprocessing macro <code>__FILE__</code>	341
D.3	Preprocessing macro <code>__BFILE__</code>	341
D.4	Preprocessing macro <code>__LINE__</code>	341
D.5	Preprocessing macro <code>__SCOPE__</code>	342
Annex E (informative):	Library of Useful Types	344
E.1	Limitations	344

E.2	Useful TTCN-3 types	344
E.2.1	Useful simple basic types	344
E.2.1.0	Signed and unsigned single byte integers	344
E.2.1.1	Signed and unsigned short integers.....	344
E.2.1.2	Signed and unsigned long integers	345
E.2.1.3	Signed and unsigned longlong integers	345
E.2.1.4	IEEE 754™ floats.....	345
E.2.2	Useful character string types	346
E.2.2.0	UTF-8 character string "utf8string"	346
E.2.2.1	BMP character string "bmpstring".....	346
E.2.2.2	UTF-16 character string "utf16string"	346
E.2.2.3	ISO/IEC 10646 character string "iso8859string"	346
E.2.2.4	Status values for TTCN-3 objects.....	347
E.2.2.5	Template kinds of TTCN-3 objects	347
E.2.3	Useful structured types.....	347
E.2.3.0	Fixed-point decimal literal.....	347
E.2.4	Useful atomic string types.....	348
E.2.4.1	Single Recommendation ITU-T T.50 character type.....	348
E.2.4.2	Single universal character type.....	348
E.2.4.3	Single bit type.....	348
E.2.4.4	Single hex type	348
E.2.4.5	Single octet type	348
Annex F (informative):	Operations on TTCN-3 active objects.....	349
F.0	General	349
F.1	Test components.....	349
F.1.1	Test component references	349
F.1.2	Dynamic behaviour of PTCs	350
F.1.3	Dynamic behaviour of the MTC.....	352
F.2	Timers.....	352
F.3	Ports.....	353
F.3.0	General	353
F.3.1	Configuration Operations	353
F.3.2	Port Controlling Operations	354
F.3.3	Communication Operations.....	355
Annex G (informative):	Deprecated language features.....	356
G.1	Group style definition of module parameters.....	356
G.2	Recursive import	356
G.3	Using all in port type definitions.....	356
G.4	sizeof for length of lists.....	356
G.5	sizeoftype predefined function	356
G.6	Mixed ports	356
G.7	External constants	357
G.8	Prefixing enumerated values	357
G.9	Record of/arrays not compatible to record; set of not compatible with set.....	357
G.10	The "UCS-2" predefined variant attribute string.....	357

G.11 Prefixing identifiers of local definitions with module identifiers.....	357
G.12 Matching expressions of incompatible types	357
Annex H (informative): Bibliography.....	358
History	359

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Full standard:
<https://standards.iteh.ai/catalog/standards/sist/7b4ab4ec-ce12-428b-b8d0-1b9486588701/etsi-es-201-873-1-v4.9.1-2017-05>

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This final draft ETSI Standard (ES) has been produced by ETSI Technical Committee Methods for Testing and Specification (MTS), and is now submitted for the ETSI standards Membership Approval Procedure.

The present document is part 1 of a multi-part deliverable covering the Testing and Test Control Notation version 3, as identified below:

Part 1: "TTCN-3 Core Language";

Part 2: "TTCN-3 Tabular presentation Format (TFT)";

NOTE: Part 2 of this multi-part deliverable is in status "historical" and is not maintained.

Part 3: "TTCN-3 Graphical presentation Format (GFT)";

Part 4: "TTCN-3 Operational Semantics";

Part 5: "TTCN-3 Runtime Interface (TRI)";

Part 6: "TTCN-3 Control Interface (TCI)";

Part 7: "Using ASN.1 with TTCN-3";

Part 8: "The IDL to TTCN-3 Mapping";

Part 9: "Using XML schema with TTCN-3";

Part 10: "TTCN-3 Documentation Comment Specification";

Part 11: "Using JSON with TTCN-3";

Part 12: "Using WSDL with TTCN-3".

Modal verbs terminology

In the present document **"shall"**, **"shall not"**, **"should"**, **"should not"**, **"may"**, **"need not"**, **"will"**, **"will not"**, **"can"** and **"cannot"** are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"must" and **"must not"** are **NOT** allowed in ETSI deliverables except when used in direct citation.