



SLOVENSKI STANDARD
oSIST prEN IEC 62275:2022
01-april-2022

Sistemi za urejanje pokabljenja - Kabelske vezice za električne inštalacije

Cable management systems - Cable ties for electrical installations

Kabelführungssysteme - Kabelbinder für elektrische Installationen

Systèmes de câblage - Colliers pour installations électriques

Ta slovenski standard je istoveten z: **prEN IEC 62275:2022**

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

ICS:

29.120.99

Druga električna dodatna
oprema

Other electrical accessories

oSIST prEN IEC 62275:2022

en

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

oSIST prEN IEC 62275:2022

<https://standards.iteh.ai/catalog/standards/sist/df1baf0f-815b-4f21-988b-7dc96a1b18dc/osist-pren-iec-62275-2022>



23A/994/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 62275 ED4	
DATE OF CIRCULATION: 2022-01-28	CLOSING DATE FOR VOTING: 2022-04-22
SUPERSEDES DOCUMENTS: 23A/963/CD, 23A/978A/CC	

IEC SC 23A : CABLE MANAGEMENT SYSTEMS	
SECRETARIAT: United Kingdom	SECRETARY: Mr Rajeev Vagdia
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input checked="" type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING
<p>Attention IEC-CENELEC parallel voting</p> <p>The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Cable management systems - Cable ties for electrical installations

PROPOSED STABILITY DATE: 2026

NOTE FROM TC/SC OFFICERS:

Copyright © 2021 International Electrotechnical Commission, IEC. All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part of it, for any other purpose without permission in writing from IEC.

CONTENTS

1		
2	CONTENTS	2
3	FOREWORD	4
4	1 Scope	6
5	2 Normative references	6
6	3 Terms and definitions	6
7	4 General requirements	8
8	5 General notes on tests	8
9	6 Classification	13
10	6.1 According to material	13
11	6.1.1 Metallic component	13
12	6.1.2 Non-metallic component	13
13	6.1.3 Composite component	13
14	6.2 According to loop tensile strength for cable ties and mechanical strength for 15 fixing devices	13
16	6.2.1 Loop tensile strength for cable ties	13
17	6.2.2 Type 1 – Retains at least 50 % of declared loop tensile strength for 18 cable ties and mechanical strength for fixing devices after test 19 conditions	13
20	6.2.3 Type 2 – Retains 100 % declared loop tensile strength for cable ties 21 and mechanical strength for fixing devices after test conditions	13
22	6.2.4 According to loop tensile strength and mechanical strength of integral 23 assemblies	13
24	6.3 According to temperature	14
25	6.3.1 According to maximum operating temperature for application given in 26 Table 4	14
27	6.3.2 According to minimum operating temperature for application given in 28 Table 5	14
29	6.3.3 According to minimum temperature during installation as declared by 30 the manufacturer	14
31	6.4 According to contribution to fire for non-metallic and composite cable ties 32 and integral assemblies only	14
33	6.4.1 Flame propagating	14
34	6.4.2 Non-flame propagating	14
35	6.5 According to environmental influences	15
36	6.5.1 According to resistance to ultraviolet light for non-metallic and 37 composite components	15
38	6.5.2 According to resistance to corrosion for metallic and composite 39 components	15
40	7 Marking and documentation	15
41	8 Construction	17
42	9 Mechanical properties	18
43	9.1 Requirements	18
44	9.2 Installation test	18
45	9.3 Minimum installation temperature test for cable ties	18
46	9.4 Minimum operating temperature test for cable ties	19
47	9.5 Loop tensile strength test for cable ties classified according to 6.2.2	21
48	9.5.1 As-received condition	21
49	9.5.2 After heat ageing	21

50	9.5.3	After temperature cycling.....	22
51	9.6	Loop tensile strength test for cable ties classified according to 6.2.3	22
52	9.6.1	As-received condition	22
53	9.6.2	After-heat ageing.....	22
54	9.6.3	After temperature cycling.....	23
55	9.6.4	After vibration test for metallic cable ties	23
56	9.7	Mechanical strength test for fixing devices and integral assemblies	25
57	9.7.1	As-received condition	25
58	9.7.2	After-heat ageing.....	30
59	9.7.3	After temperature cycling.....	31
60	10	Contribution to fire.....	32
61	11	Environmental influences.....	34
62	11.1	Resistance to ultraviolet light.....	34
63	11.2	Resistance to corrosion	37
64	12	Electromagnetic compatibility	37
65	Annex A (normative)	Compliance checks to be carried out for cable ties and fixing devices currently complying with IEC 62275:2018 in order to comply with this edition 4	38
68	Bibliography.....		40
69			
70	Figure 1 – Reference thickness for cable ties.....		9
71	Figure 2 – Typical arrangements for cable tie orientation on split mandrel for tensile test 12		
72	Figure 3 – Test piston for durability test for marking.....		16
73	Figure 4 – Test apparatus for cable tie impact test.....		21
74	Figure 5 – Typical arrangement for the vibration test.....		24
75	Figure 6 – Typical arrangement of test assembly for fixing devices and for integral fixing devices.....		30
76	Figure 7 – Arrangement for the needle flame test.....		34
77	Figure 8 – Recommended sample repositioning for ultraviolet light and water exposure.....		36
78			
79	Table 1 – Stabilization time for samples.....		9
80	Table 2 – Test mandrel diameter.....		10
81	Table 3 – Loop tensile strength.....		13
82	Table 4 – Maximum operating temperature for application		14
83	Table 5 – Minimum operating temperature for application		14
84	Table 6 – Literature information		17
85	Table 7 – Energy values of hammer.....		21
86	Table A.1 – Required compliance checks.....		38
87			
88			
89			
90			

iTeh STANDARD
PREVIEW
(standards.iteh.ai)

oSIST prEN IEC 62275:2022
<http://standards.iteh.ai/catalog/standards/sist/df1baf0f-815b-4f21-988b-7dc96a1b18dc/o-sist-pr-en-iec-62275-2022>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CABLE MANAGEMENT SYSTEMS –
CABLE TIES FOR ELECTRICAL INSTALLATIONS**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62275 has been prepared by subcommittee 23A: Cable management systems, of IEC technical committee 23: Electrical accessories.

This fourth edition cancels and replaces the third edition published in 2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) scope clarification,
- b) new definitions,
- c) deletion of the exception for the stabilization of the moisture content
- d) possibility to carry out tensile strength tests with dead weights,
- e) differentiation of rubber and acrylic adhesive fixings,
- f) clarification for mechanical testing of integral devices

- 144 g) clarifications on Table 6,
 145 h) clarifications in subclause 9.1
 146 i) the minimum installation temperature test for cable ties is carried out only when the
 147 declared minimum temperature is lower than 0°C,
 148 j) metallic cable ties shall be classified according to 6.2.3,
 149 k) definition of colours to be tested for contribution to fire,
 150 l) addition of a “some countries” note in clause 10
 151 m) clarification of the mounting of fixing devices in the resistance to ultraviolet light test
 152 n) clarification on the testing of integral devices in the resistance to ultraviolet light test
 153

154 The text of this standard is based on the following documents:

CD	Compilation of Comments
23A/963/CD	23A/978A/CC

155
 156 Full information on the voting for the approval of this standard can be found in the report on
 157 voting indicated in the above table.

158 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

159 The following differing practices of a less permanent nature exist in the countries indicated
 160 below.

- 161 – 6.2.2: additional type classifications are applicable when pre-qualified moulding materials
 162 are used (Canada, USA).
 163 – 6.2.3: additional type classifications are applicable when pre-qualified moulding materials
 164 are used (Canada, USA).
 165 – 7.3: some marking information is required to be placed on the packaging (Canada, Russia,
 166 USA).

167 In this publication, the following print types are used:

- 168 – Requirements proper: in roman type.
 169 – *Test specifications*: in italic type.
 170 – Notes: in smaller roman type.

171 The committee has decided that the contents of this publication will remain unchanged until
 172 the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data
 173 related to the specific publication. At this date, the publication will be

- 174 • reconfirmed,
 175 • withdrawn,
 176 • replaced by a revised edition, or
 177 • amended.

178

179

CABLE MANAGEMENT SYSTEMS – CABLE TIES FOR ELECTRICAL INSTALLATIONS

180
181
182
183
184

1 Scope

186 This document specifies requirements for metallic, non-metallic and composite cable ties and
187 their associated fixing devices as a means used for managing or securing the wiring systems
188 in electrical installations. Cable ties and associated fixing devices can also be suitable for
189 other applications, such as support of wiring systems, and where so used, additional
190 requirements can apply.

191 This document does not contain requirements that evaluate any electrical insulation
192 properties of the cable tie or mechanical protection of the cables provided by the cable tie.

193 This document contains requirements for the mechanical interface of an adhesive fixing
194 device to a solid surface. It does not consider the mechanical behaviour of the solid surface in
195 itself.

196 This document does not consider the mechanical interface, for example the mounting screw,
197 of a fixing device other than adhesive to a solid surface.

2 Normative references

199 The following documents are referred to in the text in such a way that some or all of their
200 content constitutes requirements of this document. For dated references, only the edition
201 cited applies. For undated references, the latest edition of the referenced document (including
202 any amendments) applies.

203 IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

204 IEC 60695-11-5:2016, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test
205 method – Apparatus, confirmatory test arrangement and guidance*

206 IEC 60216-4-1:2006, *Electrical insulating materials – Thermal endurance properties – Part 4-
207 1: Ageing ovens – Single-chamber ovens*

208 ISO 4892-2:2013 + Amd.1:2021, *Plastics – Methods of exposure to laboratory light sources –
209 Part 2: Xenon-arc lamps*

210 ISO 9227:2017, *Corrosion tests in artificial atmospheres – Salt spray tests*

3 Terms and definitions

212 For the purposes of this document, the following terms and definitions apply.

213 ISO and IEC maintain terminological databases for use in standardization at the following
214 addresses:

- 215 • IEC Electropedia: available at <http://www.electropedia.org/>
- 216 • ISO Online browsing platform: available at <http://www.iso.org/obp>

217 **3.1**
218 **cable tie**
219 band or length of material, employing a locking device, used for bundling or tying groups of
220 cables together, securing and/or supporting the cables

221 Note 1 to entry: Type 1 and Type 2 cable ties are classified in 6.2.2 and 6.2.3.

222 Note 2 to entry: In some countries, such as Canada and the United States, additional Type classifications are
223 applicable when prequalified moulding materials are used. See UL 62275/CSA C22.2 No. 62275.

224 **3.2**
225 **fixing device**
226 component (such as a block or bracket) specifically designed to secure the cable tie to a
227 mounting surface

228 **3.3**
229 **metallic component**
230 component that consists of metal only

231 Note 1 to entry: A metallic cable tie having a thin non-metallic or organic coating, where the coating does not
232 contribute to the determination of the loop tensile strength, is considered a metallic component

233 Note 2 to entry: In case of doubt, "as-received condition" tests with and without coating can be carried out.

234 **3.4**
235 **non-metallic component**
236 component that consists of non-metallic material only

237 **3.5**
238 **composite component**
239 component comprising both metallic and non-metallic materials where both metallic and non-
240 metallic materials contribute to the determination of the loop tensile strength

241 **3.6**
242 **environmental influence**
243 effect of corrosive substances or solar radiation, etc.

244 **3.7**
245 **loop tensile strength**
246 reference mechanical characteristic of a cable tie with its locking mechanism engaged

247 **3.8**
248 **locking device**
249 feature of a cable tie for fixing it in a closed position

250 **3.9**
251 **low hygroscopic polymer**
252 polymer having the characteristic of not enabling attraction or holding water greater than
253 1,0 % by weight of the material from the surrounding environment at 23 °C and 50 % relative
254 humidity

255 Note 1 to entry: Examples of low hygroscopic polymers include polypropylene, acetal, ethylene
256 tetrafluoroethylene, ethylene chlorotrifluoroethylene, nylon 12, polyetheretherketone.

257 **3.10**
258 **equilibrium moisture content**
259 state at which a polymer neither absorbs or releases moisture when exposed to a surrounding
260 environment of 23 °C and 50 % relative humidity

261 **3.11**
262 **integral device**
263 a single component, as produced, incorporating a cable tie and a fixing device that are not
264 separatable.

265 **3.12**
266 **adhesive fixing device**
267 fixing device provided with an adhesive tape specifically designed to secure the cable tie to a
268 mounting surface

269 **3.13**
270 **type test**
271 conformity test made on one or more items representative of the production”

272 [SOURCE: ISO/IEC Guide 2 (14.5 MOD)]

273 **3.14**
274 **bundle**
275 collection of wires or cables gathered or tied together

276 **4 General requirements**

277 A cable tie and a fixing device shall withstand the stresses likely to occur during recom-
278 mended installation practice and perform under the conditions of classifications in Clause 6 as
279 declared by the manufacturer.

280 *Compliance is checked by carrying out all the appropriate specified tests.*

281 NOTE Annex A details the compliance checks to be carried out for cable ties and fixing devices currently
282 complying with IEC 62275:2013 in order to comply with this edition 4.

283 **5 General notes on tests**

284 **5.1** Tests according to this document are type tests. Unless otherwise specified, tests are
285 carried out with the cable ties and their associated fixing devices, where available, installed
286 as in normal use according to the manufacturer's instructions.

287 Unless otherwise specified, requirements and tests for fixing devices also apply to adhesive
288 fixing devices.

289 NOTE For guidance in determining product types and sample sets, a family of cable ties or fixing devices having
290 material, construction characteristics, and classifications according to Clause 6, in common, are considered of the
291 same product type. Examples for consideration are identical generic material description, material colours, or
292 variable lengths of a cable tie of otherwise similar construction. The sample sets selected for testing from each
293 product type is representative of the extremes of the range (example: shortest and longest), and the minimum
294 performance level obtained for either extreme is determined to be representative of the entire range. Consideration
295 is given to minor construction variations that can be determined by inspection to have no effect on performance,
296 when determining product types.

297 **5.2** Unless otherwise specified, tests on non-metallic and composite components shall
298 commence when the samples have been removed from their packaging and then stabilized at
299 a temperature of (23 ± 5) °C and at a relative humidity of (50 ± 5) %, for a period as indicated
300 in Table 1.

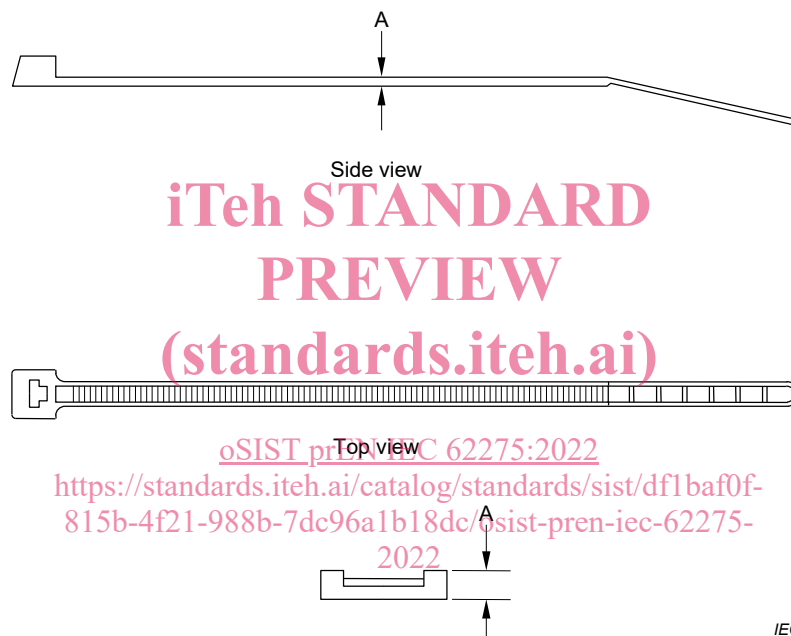
301 NOTE This stabilization intends to achieve equilibrium of moisture content for all samples before and after further
302 conditioning and testing.

303

Table 1 – Stabilization time for samples

Reference thickness (RT) of device mm	Stabilization time days
$RT \leq 1,2$	7 ± 1
$1,2 < RT \leq 1,4$	21_{-7}^0
$1,4 < RT$	35_{-7}^0
All thicknesses of materials known to have low hygroscopic characteristics	$2 \pm 1/3$

304 The reference thickness of a cable tie is measured at the midpoint of the strap. The reference
 305 thickness of a fixing device shall be the smallest cross-section in the area that interfaces with
 306 the cable tie or as declared by the manufacturer. See Figure 1.



307

308 **Key**

309 A reference thickness of cable tie

310

Figure 1 – Reference thickness for cable ties

311 **5.3** Unless otherwise specified, the tests shall be carried out at an ambient temperature of
 312 (23 ± 5) °C and with a relative humidity of between 40 % and 60 %.

313 **5.4** Unless otherwise specified, three new samples are submitted to the tests and the
 314 requirements are satisfied if all the tests are met. If only one of the samples does not satisfy a
 315 test owing to an assembly or manufacturing fault, that test and any preceding one which may
 316 have influenced the results of the test shall be repeated. The tests that follow shall be carried
 317 out in the required sequence on another full set of samples, all of which shall comply with the
 318 requirements.

319 **NOTE** The applicant, when submitting the first set of samples, can also submit an additional set of samples which
 320 may be necessary if one sample fails. The test station will then without further request test the additional set of
 321 samples and will reject only if a further failure occurs. If the additional set of samples is not submitted at the same
 322 time, a failure of one sample will entail a rejection.

323 **5.5** When toxic or hazardous processes are used, due regard shall be taken of the safety of
 324 persons within the test area.

325 **5.6** Unless otherwise specified, the cross-head speed of a tensile machine used during the
 326 tests shall be $(25 \pm 2,5)$ mm/min. Dead weights can be used for conducting loop tensile
 327 strength tests for cable ties and integral devices classified according to 6.2.3, provided that
 328 no sudden application of force occurs.

329 **5.7** Where required for heat ageing, a full draft circulating-air oven as specified in
 330 IEC 60216-4-1:2006 shall be used. A portion of the air shall be allowed to re-circulate and a
 331 substantial amount of air shall be admitted continuously to maintain the normal air content
 332 surrounding the samples. The oven shall be adjusted to achieve more than five complete
 333 fresh-air changes per hour.

334 **5.8** An integral device shall be tested as a complete sample. The integral device shall be
 335 subjected to the conditionings for the cable tie prior to conducting the mechanical strength
 336 test for the fixing device in accordance with 9.7.

337 A fixing device, the performance of which is dependent on the mounting hole size, the
 338 thickness of the material sheet to which it is to be mounted, or the mounting orientation
 339 declared by the manufacturer in accordance with Table 6, shall comply with all applicable
 340 tests when the device is assembled to the minimum and maximum thickness of each mounting
 341 surface, in the largest hole size, and in each intended mounting orientation declared by the
 342 manufacturer. When it can be determined that a particular mounting orientation represents the
 343 most onerous condition, the results of the tests in that orientation may represent all mounting
 344 orientations.

345 An adhesive fixing device, the performance of which is dependent on the mounting surface or
 346 the mounting orientation, shall comply with all applicable tests when the device is assembled
 347 on the surfaces for which it is intended, and in each intended mounting orientation declared
 348 by the manufacturer. When it can be determined that a particular mounting orientation
 349 represents the most onerous condition, the results of the tests in that orientation may
 350 represent all mounting orientations.

351 **5.9** Unless otherwise specified, when conducting the tests on cable ties in Clause 9, the
 352 samples shall be installed according to the manufacturer's instructions on a steel or
 353 aluminium mandrel which has a diameter A according to Table 2.

354 If the minimum declared diameter of the cable tie is greater than the diameter of the test
 355 mandrel specified in Table 2, then a test mandrel that has the minimum diameter as declared
 356 by the manufacturer shall be used.

357 The width B of the mandrel shall be at least 5 mm greater than the maximum width of the
 358 cable tie as shown in Figure 2.

359

Table 2 – Test mandrel diameter

Maximum declared diameter mm	Test mandrel diameter (A) mm
≤ 20	$9,5 \pm 1$
> 20 and ≤ 38	20 ± 2
> 38	38 ± 2

360

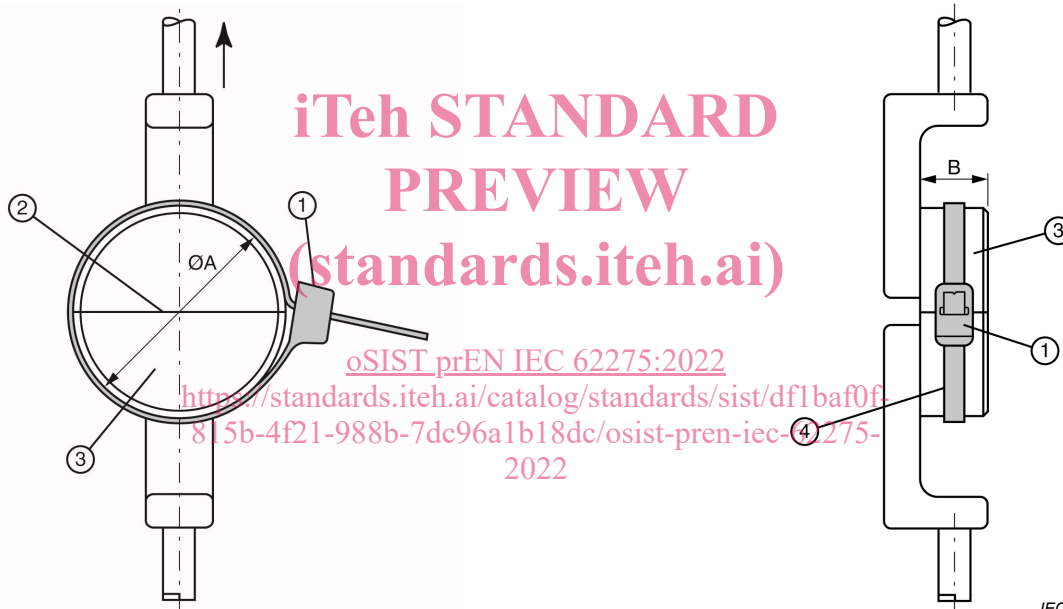
361 For the loop tensile strength tests, the mandrel shall be split in two equal parts.

362 A metallic cable tie having a parallel entry strap shall be mounted to the mandrel as shown in
 363 Figure 2a. Non-metallic or composite cable ties having a parallel entry strap shall be mounted
 364 to the mandrel as shown in Figure 2b.

365 The excess end (tail) of the cable tie is permitted to be cut off after assembly, except in the
366 tests where marking is required for the purpose of measurement (see 9.6).

367 The use of separate steel or aluminium conditioning mandrels is permitted. The conditioning
368 mandrels need not be split but shall have a diameter approximately equivalent to the
369 appropriate test mandrel to allow transfer of the sample to the test mandrel. Conditioned
370 samples shall be carefully transferred to the appropriate test mandrel for carrying out the loop
371 tensile test. Where it has been determined that the transfer of the samples from the
372 conditioning mandrel to a test mandrel has influenced the test results, an additional sample
373 set shall be conditioned and tested.

374 For integral devices, when it is determined impractical to condition the samples mounted to a
375 rigid support, samples shall be conditioned separately. When conditioning separately, they
376 shall be installed on a solid mandrel of similar size to the test fixture and the entire sample set
377 may be installed on the same mandrel. After conditioning, each sample shall be mounted to
378 the rigid support test fixture prior to the appropriate tensile pull. Where it has been determined
379 that the transfer of the samples from the conditioning mandrel to a test mandrel has
380 influenced the test results, an additional sample set shall be conditioned and tested.



381

Key

383 1 Locking device (head)

384 2 Split line

385 3 Mandrel

386 4 Cable tie

387 A Diameter of test mandrel

388 B Width of test mandrel

389 Mandrels shall be made of steel or aluminium and shall be smooth and free of burrs.

390 Care should be taken that the separation of the two halves of the mandrel remains parallel to the split line.

391 **Figure 2a) Typical arrangement for a right-angle non-metallic and composite cable tie**
392 **and a parallel entry metallic cable tie orientation on split mandrel for tensile test**