



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 62772:2022**  
**01-junij-2022**

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**Votli podporni kompozitni izolatorji za postaje z izmenično napetostjo, višjo od 1000 V, in enosmerno napetostjo, višjo od 1500 V - Definicije, preskusne metode in merila sprejemljivosti**

Composite hollow core station post insulators for substations with a.c. voltage greater than 1 000 V and d.c. voltage greater than 1 500 V - Definitions, test methods and acceptance criteria

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Isolateurs supports composites creux pour postes présentant une tension alternative supérieure à 1 000 V et une tension continue supérieure à 1 500 V - Définitions, méthodes d'essai et critères d'acceptation

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**Ta slovenski standard je istoveten z: prEN IEC 62772:2022**

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**ICS:**

29.080.10      Izolatorji      Insulators

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IEC TC 36 : INSULATORS	
SECRETARIAT: Sweden	SECRETARY: Mr Dan Windmar
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 checked="" type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
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TITLE:

**Composite hollow core station post insulators for substations with a.c. voltage greater than 1 000 V and d.c. voltage greater than 1 500 V - Definitions, test methods and acceptance criteria**

PROPOSED STABILITY DATE: 2026

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## CONTENTS

1		
2	CONTENTS .....	2
3	FOREWORD .....	4
4	INTRODUCTION .....	6
5	1 Scope .....	7
6	2 Normative references .....	7
7	3 Terms and definitions .....	8
8	3.30 11	
9	4 Identification and marking .....	12
10	5 Environmental conditions .....	13
11	6 Information on transport, storage and installation .....	13
12	7 Classification of tests .....	13
13	7.1 General .....	13
14	7.2 Design tests .....	13
15	7.3 Type tests .....	15
16	7.4 Sample tests .....	16
17	7.5 Routine tests .....	16
18	8 Design tests .....	16
19	8.1 General .....	16
20	8.2 Tests on interfaces and connections of end fittings .....	17
21	8.2.1 General .....	17
22	8.2.2 Test specimens .....	17
23	8.2.3 Reference disruptive- discharge dry power frequency voltage test .....	17
24	8.2.4 Thermal mechanical pre-stressing test .....	17
25	8.2.5 Water immersion pre-stressing test .....	17
26	8.2.6 Verification tests .....	17
27	8.3 Assembled core load tests .....	18
28	8.3.1 Test for the verification of the maximum design cantilever load (MDCL) .....	18
29	8.3.2 Test for the verification of the maximum design torsion load (MDToL) .....	19
30	8.3.3 Verification of the specified tension load (STL) .....	19
31	8.4 Tests on shed and housing material .....	20
32	8.4.1 Hardness test .....	20
33	8.4.2 Accelerated weathering test .....	20
34	8.4.3 Tracking and erosion – 1000 h salt fog a.c. voltage test .....	20
35	8.4.4 Flammability test .....	20
36	8.4.5 Hydrophobicity transfer test .....	20
37	8.5 Tests on the tube material .....	20
38	8.5.1 General .....	20
39	8.5.2 Porosity test (Dye penetration test) .....	20
40	8.5.3 Water diffusion test .....	20
41	9 Type tests .....	20
42	9.1 Internal pressure test .....	20
43	9.2 Bending test .....	21
44	9.3 Specified tension load test, compression and buckling withstand load test .....	21
45	9.4 Electrical tests .....	21
46	9.4.1 Mounting arrangements for electrical tests .....	21
47	9.4.2 Dry lightning impulse withstand voltage test .....	21

48	9.4.3	Dry or wet switching impulse withstand voltage test .....	21
49	9.4.4	Dry power-frequency withstand voltage test .....	21
50	9.4.5	Wet power-frequency withstand voltage test .....	21
51	10	Sample tests .....	22
52	11	Routine tests .....	22
53	11.1	General.....	22
54	11.2	Routine seal leak rate test.....	22
55	11.2.1	Test procedure.....	22
56	11.2.2	Acceptance criteria .....	22
57	12	Documentation .....	23
58	Annex A (informative)	Qualification of fillers .....	24
59	A.1	Introduction.....	24
60	A.2	Dye penetration test with solid filler .....	24
61	A.3	Water diffusion test with solid filler .....	24
62	A.4	Tests on interfaces and connections of end fittings with filler.....	24
63	Annex B (informative)	Load definitions, relationship of loads.....	26
64	Annex C (informative)	Principle sketch of hollow insulators design assembly.....	29
65			
66	Figure A.1 – Example of sample preparation for water diffusion test.....		25
67			
68	Table 1 – Required design and type tests .....		14
69			
70			

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**COMPOSITE HOLLOW CORE STATION POST INSULATORS  
WITH A.C. VOLTAGE GREATER THAN  
1 000 V AND D.C. VOLTAGE GREATER THAN 1 500 V –  
DEFINITIONS, TEST METHODS AND ACCEPTANCE CRITERIA**

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International Standard IEC 62772 has been prepared by IEC technical committee 36: Insulators.

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

FDIS	Report on voting
To be completed/FDIS	To be completed/RVD

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

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

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

- 124 • reconfirmed,
- 125 • withdrawn,
- 126 • replaced by a revised edition, or amended.

127

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## INTRODUCTION

129 Composite hollow core station post insulators consist of an insulating hollow core (tube),  
130 bearing the mechanical load protected by a polymeric housing, the load being transmitted to  
131 the core by end fittings. The hollow core is filled entirely with an insulating material. The core  
132 is made of resin impregnated fibres.

133 Composite hollow core station post insulators are typically applied as post insulators in  
134 substations. In order to perform the design tests, IEC 62217 is to be applied for materials and  
135 interfaces of the insulator. Some tests have been grouped together as "design tests", to be  
136 performed only once on insulators which satisfy the same design conditions. For all design  
137 tests on composite hollow core station post insulators, the common clauses defined in  
138 IEC 62217 are applied. As far as practical, the influence of time on the electrical and  
139 mechanical properties of the components (core material, housing, interfaces etc.) and of the  
140 complete composite hollow core station post insulator has been considered in specifying the  
141 design tests to ensure a satisfactory life-time under normally known stress conditions in  
142 service.

143 This standard relates to IEC 61462, *Composite hollow insulators – Pressurized and*  
144 *unpressurized insulators for use in electrical equipment with rated voltage greater than*  
145 *1 000 V – Definitions, test methods, acceptance criteria and design recommendations*, as well  
146 as IEC 62231, *Composite station post insulators for substations with a.c. voltages greater*  
147 *than 1 000 V up to 245 kV – Definitions, test methods and acceptance criteria*. Tests and  
148 requirements described in IEC 62231 can be used **despite the intended operating voltage limit**  
149 **for substations**.

150 The use of polymeric housing materials that show hydrophobicity and hydrophobicity transfer  
151 mechanism (HTM) is preferred for composite hollow core station post insulators. This is due  
152 to the fact that the influence of diameter can be significant for hydrophilic surfaces (see also  
153 IEC 60815-3). For instance silicone rubber is recognized as successful countermeasure  
154 against severe polluted service conditions. **For the time being, the 1 000 h a.c. tracking and**  
155 **erosion test of IEC 62217 is used to establish a minimum requirement for the tracking and**  
156 **erosion resistance, for both a.c. and d.c. In IEC 62217, tests are defined to quantify the HTM**  
157 **performance.**

158 Composite hollow core station post insulators are used in both a.c. and d.c. applications.  
159 Before the appropriate standard for d.c. applications will be issued, the majority of tests listed  
160 in this standard can also be applied to d.c. insulators. In spite of this, a specific tracking and  
161 erosion test procedure for d.c. applications as a design test is still being considered to be  
162 developed. Some information about the difference of a.c. and d.c. material erosion test can be  
163 found in the CIGRE Technical Brochure 611 [REF]. For the time being, the 1 000 h a.c.  
164 tracking and erosion test of IEC 62217 is used to establish a minimum requirement for the  
165 tracking and erosion resistance.

166

167



168 **COMPOSITE HOLLOW CORE STATION POST INSULATORS**  
 169 **WITH A.C. VOLTAGE GREATER THAN**  
 170 **1 000 V AND D.C. VOLTAGE GREATER THAN 1 500 V –**  
 171 **DEFINITIONS, TEST METHODS AND ACCEPTANCE CRITERIA**  
 172  
 173  
 174

175 **1 Scope**

176 This International Standard applies to composite hollow core station post insulators consisting  
 177 of a load-bearing insulating tube (core) made of resin impregnated fibres, insulating filler  
 178 material (solid, liquid, gaseous – pressurized or unpressurized), a housing (outside the  
 179 insulating tube) made of polymeric material (for example silicone or ethylene-propylene) and  
 180 fixing devices at the ends of the insulating tube. Composite hollow core station post insulators  
 181 as defined in this standard are intended for general use in substations in both, outdoor and  
 182 indoor environments, operating with a rated AC voltage greater than **1 000 V a.c. and a**  
 183 **frequency not greater than 100 Hz or for use in direct current systems with a rated voltage**  
 184 **greater than 1 500 V.d.c.**

185 The object of this standard is:

186 to define the terms used;

187 to prescribe test methods;

188 to prescribe acceptance criteria.

189 All the tests in this standard, apart from the thermal-mechanical test, are performed at normal  
 190 ambient temperature. This standard **does** not prescribe tests that are characteristic of the  
 191 apparatus of which the composite hollow core station post insulator ultimately may form a part  
 192 **(e.g. disconnecter switch, reactor support, HVDC valves)**.

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193 **2 Normative references**

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

198 IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

199 IEC 60168, *Tests on indoor and outdoor post insulators of ceramic material or glass for*  
 200 *systems with nominal voltages greater than 1 000 V*

201 IEC 61109, *Insulators for overhead lines – Composite suspension and tension insulators for*  
 202 *a.c. systems with a nominal voltage greater than 1 000 V – Definitions, test methods and*  
 203 *acceptance criteria*

204 IEC 61462, *Composite hollow insulators – Pressurized and unpressurized insulators for use in*  
 205 *electrical equipment with rated voltage greater than 1 000 V – Definitions, test methods,*  
 206 *acceptance criteria and design recommendations*

207 IEC 62217, *Polymeric HV insulators for indoor and outdoor use – General definitions, test*  
 208 *methods and acceptance criteria*

209 IEC 62231, *Composite station post insulators for substations with a.c. voltages greater than 1*  
 210 *000 V up to 245 kV – Definitions, test methods and acceptance criteria*

211

### 212 3 Terms and definitions

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

#### 214 3.1

##### 215 composite hollow core station post insulator

216 post insulator, consisting of at least three insulating parts, namely a tube, a housing with or  
217 without sheds, and an internal filler. End fittings are attached to the insulating tube. The  
218 housing with or without sheds, may be omitted in case of specific environmental conditions  
219 (e.g. indoor).and applications .

220 Note 1 to entry: A hollow insulator can be made from one or more permanently assembled insulating elements  
221 [IEV 471-01-08, modified]

#### 222 3.2

##### 223 post insulator

224 insulator intended to give rigid support to a live part which is to be insulated from earth or  
225 from another live part

226 Note 1 to entry: A post insulator may be an assembly of a number of post insulator units (stack).

227 Note 2 to entry: Post insulators for substations are also known as station post insulators.

228 [IEV 471-04-01, modified]

#### 229 3.3

##### 230 tube (core)

231 central internal insulating part of a composite hollow core station post insulator which  
232 provides the mechanical characteristics

233 Note 1 to entry: The housing, insulating filler material and sheds are not part of the core.

234 Note 2 to entry: Resin impregnated fibres are structured in such a manner as to achieve sufficient mechanical  
235 strength. Layers of different fibres may be used to fulfil special requirements.

#### 236 3.4

##### 237 filler

238 insulating material filling the entire internal space (solid, liquid, gaseous – pressurized or  
239 unpressurized) of the hollow core station post insulator

#### 240 3.5

##### 241 fixing device (end fitting)

242 integral component or formed part of an insulator intended to connect it to a supporting  
243 structure, or to a conductor, or to an item of equipment, or to another insulator

244 Note 1 to entry: Where the end fitting is metallic, the term “metal fitting” is normally used.

245 [SOURCE: IEC 60050-471:2007, 471-01-06, modified by the addition of a synonym]

#### 246 3.6

##### 247 coupling

248 part of the end fitting which transmits the load to the accessories external to the insulator

249 [SOURCE: IEC 62217, section 3]

250 **3.7**  
 251 **connection zone**  
 252 zone where the mechanical load is transmitted between the insulating body and the end fitting

253 [SOURCE: IEC 62217, **section 3**]

254 **3.8**  
 255 **housing**  
 256 external insulating part of composite hollow core station post insulator providing necessary  
 257 creepage distance and protecting the tube from the environment

258 Note 1 to entry: If an intermediate sheath is used it forms a part of the housing

259 [SOURCE: IEC 62217, **section 3**]

260 **3.9**  
 261 **shed**  
 262 insulating part, projecting from the insulator trunk, intended to increase the creepage distance

263 Note 1 to entry: The shed can be with or without ribs

264 [SOURCE: IEC 60050-471:2007, 471-01-15]

265 **3.10**  
 266 **insulator trunk**  
 267 central insulating part of an insulator from which the sheds project

268 Note 1 to entry: Also known as shank on smaller insulators.

269 [SOURCE: IEC 60050-471:2007, 471-01-11]

270 **3.11**  
 271 **creepage distance**  
 272 shortest distance or the sum of the shortest distances along the surface of an insulator  
 273 between two conductive parts which normally have the operating voltage between them

274 Note 1 to entry: The surface of any non-insulating jointing material is not considered as forming part of the  
 275 creepage distance.

276 [SOURCE: IEC 60050-471:2007, 471-01-04, **modified**]

277 **3.12**  
 278 **arcng distance**  
 279 shortest distance in the air external to the insulator between the metallic parts which normally  
 280 have the operating voltage between them

281 [SOURCE: IEC 60050-471:2007, 471-01-01]

282 **3.13**  
 283 **interface**  
 284 **contact** surface between the different materials

285 Note 1 to entry: Various interfaces occur in most composite insulators (cf. Annex C), e.g.  
 286 between housing and end fittings,  
 287 between various parts of the housing; e.g. between sheds, or between sheath and sheds,  
 288 between **tube** and housing  
 289 between **tube** and filler.

290 [SOURCE: IEC 62217, **section 3**]

291 **3.14**  
292 **damage limit of the tube under mechanical stress**  
293 limit below which mechanical loads can be applied, at normal ambient temperature, without  
294 micro damage to the composite tube

295 Note 1 to entry: Applying such loads means that the tube is in a reversible elastic phase. If the damage limit of  
296 the tube is exceeded, the tube is in an irreversible plastic phase, which means permanent damage to the tube  
297 which may not be visible at a macroscopic level (for a quantitative definition see Annex C of IEC 61462 ED2).

298 **3.15**  
299 **maximum mechanical load**  
300 **MML**  
301 highest cantilever **bending** load which is expected to be applied to the composite hollow core  
302 station post insulators in accordance with IEC 61462

303 Note 1 to entry: The MML of the composite hollow core station post insulator is specified by the insulator  
304 manufacturer.

305 **3.16**  
306 **specified mechanical load**  
307 **SML**  
308 cantilever **bending** load specified by the manufacturer that is used in the mechanical tests,  
309 and which is verified during a type test at normal ambient temperature

310 Note 1 to entry: The SML forms the basis of the selection of composite hollow station post insulators with regard  
311 to external loads.

312 **3.17**  
313 **specified cantilever load**  
314 **SCL**  
315 cantilever load to be withstood by the insulator when tested under the prescribed conditions in  
316 accordance with IEC 62231

317 **3.18**  
318 **maximum design cantilever load**  
319 **MDCL**  
320 load level above which damage to the insulator begins to occur and that should not be  
321 exceeded in service in accordance with IEC 62231.

322 Note to entry: For more information to load philosophies and relationships, see Annex B

323 **3.19**  
324 **specified torsion load**  
325 **SToL**  
326 torsion load level which can be withstood by the insulator when tested under the prescribed  
327 conditions in accordance with IEC 62231

328 **3.20**  
329 **maximum design torsion load**  
330 **MDToL**  
331 load level above which damage to the insulator begins to occur and that should not be  
332 exceeded in service in accordance with IEC 62231

333 **3.21**  
334 **specified tension load**  
335 **STL**  
336 tension load which can be withstood by the insulator when tested under the prescribed  
337 conditions in accordance with IEC 62231

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