

Električni releji - Preskusi in meritve - 7-43. del: Zaščitni indeks sledenja (PTI)

Electrical relays - Tests and Measurements - Part 7-43: Proof tracking index (PTI)

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Ta slovenski standard je istoveten z: prEN IEC 61810-7-43:2023

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TITLE:

Electrical relays – Tests and Measurements – Part 7-43: Proof tracking index (PTI)

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Tests and Measurements**
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The International Standards of the IEC 61810 have been prepared by IEC technical committee 94: All-or-nothing electrical relays.

The text of this International Standard is based on the following documents:

CD	CC
94/841/CD	94/914/CC

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

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

A list of all parts of IEC 61810 series, published under the general title *Electromechanical elementary relays*, can be found on the IEC website.

68 This International Standard is to be used in conjunction with IEC 61810-1:2015.

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

- 72 • reconfirmed,
- 73 • withdrawn,
- 74 • replaced by a revised edition, or
- 75 • amended.

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All-or-nothing electrical relays – Tests and Measurements

Part 7-43: Proof tracking index (PTI)

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84 **1 Scope**

85 This part of IEC 61810-7 is used for testing along with the appropriate severities and conditions
86 for measurements and tests designed to assess the ability of specimens to perform under
87 expected conditions of transportation, storage and all aspects of operational use.

88 The object of this test is to define a standard test method for evaluation of appropriate materials
89 having appropriate values of tracking resistance.

90 **2 Normative references**

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

95 IEC 61810-7-0:202X, *Electrical relays – Tests and Measurements – Part 7-0: General and*
96 *Guidance*

97 IEC 60112:2020, *Method for the determination of the proof and the comparative tracking indices*
98 *of solid insulating materials* oSIST prEN IEC 61810-7-43:2023

99 <https://standards.iteh.ai/catalog/standards/sist/5f774780-9b0a-4959-98ae-3f10719fa7b8/osist-pren-iec-61810-7-43-2023>

100 3 Terms and definitions

101 Clause 3 of IEC 61810-7-0 is applicable.

102 3.1

103 tracking

104 progressive formation of conducting paths, which are produced on the surface and/or within a
105 solid insulating material, due to the combined effects of electric stress and electrolytic
106 contamination

107 3.2

108 tracking failure

109 failure of insulation due to tracking between conductive parts

110 3.3

111 proof tracking index

112 PTI

113 numerical value of the proof voltage (in V) at which five test specimens withstand the test period
114 for 50 drops without tracking failure and without a persistent flame occurring marking

115 3.4

116 persistent flame

117 flame which burns for more than 2 s

118 4 Test procedure

119 4.1 Purpose

120 To determine the suitability of plastic material used within the relays as insulation material.

121 The proof tracking test indicates the relative resistance of solid electrical insulating materials
122 to tracking for voltages up to 600 V, when the surface is exposed to water with addition of
123 contaminants under electric stress.

124 4.2 Procedure

125 For the purposes of this standard, the following applies:

126 The proof tracking test is carried out in accordance with IEC 60112, using test solution A.

127 An AC voltage between 100 V and 600 V is applied to the electrodes during the test.

128 Insulating material which can be exposed to tracking shall show a sufficient tracking resistance.
129 Tracking is probable

- 130 • between active parts of different potentials;
- 131 • between active parts and earthed metal parts.

132 Any flat surface may be used, provided that the area is sufficient to ensure that no liquid flows
133 over the edges of the specimen during the test. Flat surfaces of not less than 15 mm × 15 mm
134 are recommended. The thickness of the specimen should be 3 mm or more and should be
135 indicated in the test report.

136 NOTE 1 If the surface 15 mm × 15 mm cannot be obtained because of the small dimensions of the relay, special
137 specimens made with the same manufacturing procedure can be used.

138 The relationship between the material group and the proof tracking index (PTI) is given in Table
139 1.

140

Table 1 – Material groups

Material group I	$600 \leq \text{PTI}$
Material group II	$400 \leq \text{PTI} < 600$
Material group IIIa	$175 \leq \text{PTI} < 400$
Material group IIIb	$100 \leq \text{PTI} < 175$

141 The test specimen shall be exposed for 50 drops maximum and stopped at any count of drops
142 before if tracking failure and/or a persistent flame is occurred.

143 During the test it is not permitted that the test specimen shows any hole in the test area.

144 5 test specimens shall be tested - if one of five specimens fails at the certain test voltage, a
145 new set of five samples may be tested. If only one of the totals of ten specimens fails, the result
146 is "pass".

147 NOTE 2 PTI (proof tracking index) is the value of the proof voltage in V at which a material withstands 50 drops
148 without tracking.

149 4.3 Conditions

- 150 • IEC 60112, solution A conditions apply.
- 151 • Number of test specimens <https://standards.iteh.ai/catalog/standards/sist/5f774780-9b0a-4959-98ae->
- 152 • The test voltage shall be taken from main standards, detail specification or as defined
153 by the manufacturer.

154 Applied test voltage shall be following the requirements and verified for a proof
155 tracking index of PTI 175 V, or as specified by the manufacturer.
156 If the application of the relay necessitates more stringent requirements, the tracking
157 resistance shall be PTI 250 V, PTI 400 V, or PTI 600 V, see Table 1.

- 158 • Ambient conditions shall be according to the reference values, see IEC 61810-7-0, table
159 2.

160 5 Evaluation

161 If no tracking failure and/ or a persistent flame occurs during the 50 drops the test shall be
162 considered as positive.

163 Otherwise, the test is failed, the report shall name the number at which test failed or 50 if passed.

164 If test is carried out at end components, there shall be no hole originated in the test area.
165 Otherwise, the test shall be considered as negative and shall be repeated on a thicker area of
166 the component or instead on a test specimen.

167

168 **Annex T**
169 **(informative)**

170 **Test report**
171

172 The Test report shall consist the following:

173 • Description of test specimen

174 ○ Material description

175 ■ Material Grade

176 ■ Material manufacturer

177 ○ Size

178 ○ Thickness

179 ○ Colour

180 • Test solution

181 • Test voltage / PTI value

182 • Numbers of drops

183 50 or any other count of drops where the test is stopped

184 • IF applicable - tracking failure or persistent flame occurs

185 • If applicable – any other observation

186