



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 61249-2-51:2022**  
**01-oktober-2022**

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**Materiali za plošče tiskanih vezij in druge povezovalne strukture - 2-51. del:  
Ojačeni laminati z bakreno folijo in brez nje - Osnovni materiali za nosilne trakove  
kartic integriranih vezij, neprevlečeni**

Materials for printed boards and other interconnecting structures - Part 2-51: Reinforced  
base materials, clad and unclad - Base materials for Integrated Circuit card carrier tape,  
unclad

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**ICS:**

31.180 Tiskana vezja (TIV) in tiskane Printed circuits and boards  
plošče

**oSIST prEN IEC 61249-2-51:2022 en**





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TITLE:

**Materials for printed boards and other interconnecting structures - Part 2-51: Reinforced base materials, clad and unclad - Base materials for Integrated Circuit card carrier tape, unclad**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MATERIALS FOR PRINTED BOARDS AND OTHER INTERCONNECTING  
STRUCTURES –****Part 2-51: Reinforced base materials clad and unclad-Base materials for  
Integrated Circuit card carrier tape, unclad**

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International Standard IEC 61249-2-51 has been prepared by IEC technical committee 91, Electronics assembly technology.

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

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

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.

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

- 115 • reconfirmed,
- 116 • withdrawn,
- 117 • replaced by a revised edition, or
- 118 • amended.

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# MATERIALS FOR PRINTED BOARDS AND OTHER INTERCONNECTING STRUCTURES –

## Part 2-51: Reinforced base materials clad and unclad-Base materials for Integrated Circuit card carrier tape, unclad

### 1 Scope

This standard specifies the construction, materials, property requirements, quality assurance, packaging, marking, storage of Base materials for Integrated Circuit Card carrier tape, unclad (hereinafter referred to as IC carrier tape base materials).

This standard is applicable to IC carrier tape base materials, which is a glue-coated material, one side is woven E-glass reinforced epoxy underlayer, and the other side is coated with adhesive and protected by release film.

### 2 Normative references

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

IEC 61189-2:2006, Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 2: Test methods for materials and other interconnection structures

IEC PAS 61249-6-3, Specification for finished fabric woven from "E" glass for printed boards

ISO 2813, Paints and varnishes — Determination of gloss value at 20 degrees, 60 degrees and 85 degrees

ISO 4287, Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters

ISO 8296, Plastics — Film and sheeting — Determination of wetting tension

ISO 11014:2009, Safety data sheet for chemical products – Content and order of sections

ASTM D882, Standard Test Method for Tensile Properties of Thin Plastic Sheeting

### 3 Terms and definitions

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

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

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

#### 3.1

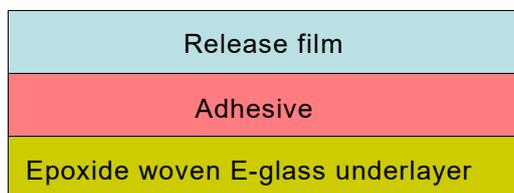
##### IC carrier tape base materials

base materials to manufacture the Integrated Circuit card carrier tape.

## 163 4 Construction and Materials

### 164 4.1 Construction

165 The construction of IC carrier tape base materials is as follows:



166

167 **Figure 1 –Construction of IC carrier tape base materials**

### 168 4.2 Epoxide woven E-glass underlayer

169 The resin of epoxide woven E-glass underlayer(hereinafter referred to as underlayer) is blend  
170 of epoxide, with E-glass reinforcement, and fully cured, the glass transition temperature shall  
171 be 150 °C minimum. Woven E-glass as specified in IEC PAS 61249-6-3.

### 172 4.3 Adhesive

173 Adhesive can be epoxy adhesive or acrylic adhesive, epoxy is preferred. The peel strength  
174 should meet the requirements of clause 6.8.

### 175 4.4 Release film

176 Release film is used to protect the adhesive, it can be release easily before use, and do not  
177 destroy the adhesive.

## 178 5 Electrical properties

179 The electrical properties requirements are shown in Table 1. The samples are the IC carrier tape  
180 base materials after removal of release film, before making specimens, the samples should be  
181 cured at 160 °C ± 2 °C for 60 min ± 1 min in oven, after removal from the oven, the samples  
182 shall be cooled to room temperature in desiccator or drying cabinet.

183

**Table 1 – Electrical properties**

Performance items	Units	Test method	Requirement
Surface resistance after damp heat and recovery	MΩ	IEC 61189-2 2E03	≥ 10 <sup>5</sup>
Volume resistivity after damp heat and recovery	MΩ · m	IEC 61189-2 2E04	≥ 10 <sup>6</sup>
Surface resistance after E-24/125 while in the chamber	MΩ	IEC 61189-2 2E03	≥ 10 <sup>4</sup>
Volume resistivity after E-24/125 while in the chamber	MΩ · m	IEC 61189-2 2E04	≥ 10 <sup>5</sup>
Electric Strength	kV/mm	IEC 61189-2 2E02	≥ 20

## 184 6 Non-electrical properties

### 185 6.1 Appearance of the IC carrier tape base materials

#### 186 6.1.1 Delamination

187 The adhesive should not be separated from the underlayer.

188 **6.1.2 Colloidal particles and metallic particles in underlayer**

189 The plan view size of colloidal particles in underlayer shall not  $>2,0$  mm, the plan view size  $>$   
190  $0,5$  mm and  $\leq 2,0$  mm shall no more than 4 per 30 cm roll length, the plan view size  $\leq 0,5$  mm  
191 shall not be counted. Encapsulated metallic particles are not allowed.

192 **6.1.3 Colloidal particles in adhesive layer**

193 The plan view size of colloidal particles in adhesive layer shall not  $>2,0$  mm, the plan view size  
194  $>0,5$  mm and  $\leq 2,0$  mm shall no more than 4 per 30 cm roll length, the plan view size  $\leq 0,5$   
195 mm shall not be counted.

196 **6.1.4 Scratches of adhesive**

197 The adhesive layer should not be scratched.

198 **6.1.5 Bubbles in underlayer**

199 The bubbles in underlayer shall  $\leq 200$   $\mu\text{m}$  in length.

200 **6.1.6 Breakages and exposures of reinforcement fiber in underlayer**

201 There are no breakages and exposures of reinforcement fiber in underlayer.

202 **6.2 Dimensional of IC carrier tape base materials**

203 **6.2.1 Length and Width**

204 The length and the width of the sheet shall be as agreed between user and supplier(AABUS).  
205 And the tolerance of length shall be within  $(0,+5)$  m, the tolerance of width shall be within  $\pm 0,1$   
206 mm.

207 **6.2.2 Thickness of underlayer**

208 The nominal thickness of underlayer shall be AABUS, the tolerance shall be within  $\pm 10\%$  of the  
209 value specified.

210 **6.2.3 Thickness of adhesive layer**

211 The nominal thickness of adhesive layer shall be AABUS, the tolerance shall be within  $\pm 10\%$  of  
212 the value specified.

213 **6.3 Splices**

214 The number of splices (including splicing tape and marking, the same below) is  $\leq 2$  per 160 m,  
215 and the splices gap is  $\leq 50$   $\mu\text{m}$ .

216 Splicing tape should be evenly pasted on both sides of the IC carrier tape base materials, and  
217 should be pasted extend to the edge of the IC carrier tape base materials and ensure that the  
218 edge is orderliness, and should not be folded.

219 **6.4 Glass transition temperature**

220 The requirements of glass transition temperature for the underlayer of the IC carrier tape base  
221 materials shall be as shown in Table 2.

222 **Table 2 – Glass transition temperature of underlayer**

Performance items	Units	Test method	Requirement
Glass transition temperature (Tg)	$^{\circ}\text{C}$	IEC 61189-2 2M10	$\geq 150$

223 **6.5 Surface properties of the underlayer side**

224 The surface properties of the underlayer side include Roughness, Glossiness( $60^{\circ}$ ) and  
225 Surface energy, and the requirements shall be as shown in Table 3.