

---

---

**Glass in building — General technical  
requirements of building integrated  
photovoltaic modules recycling**



This document is a preview generated by EKO



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Fundamental principles</b> .....	<b>3</b>
<b>5 Classification</b> .....	<b>3</b>
5.1 It can be classified according to the type of cell:.....	3
5.2 It can be classified according to the structure of encapsulation:.....	3
5.3 It can be classified according to abandoned condition:.....	4
<b>6 Dismantlement</b> .....	<b>4</b>
<b>7 Collection, transportation and storage</b> .....	<b>6</b>
7.1 General provisions.....	6
7.2 Collection.....	6
7.3 Transportation.....	6
7.4 Storage.....	7
<b>8 Disassembly</b> .....	<b>7</b>
8.1 General provisions.....	7
8.2 Termination.....	7
8.3 Frame.....	7
8.4 PV laminate.....	8
<b>9 Treatment</b> .....	<b>8</b>
9.1 General provisions.....	8
9.2 Glass.....	8
9.3 Interlayer.....	8
9.4 Solar cell.....	9
9.5 Welding strip.....	9
9.6 Plastic back sheet.....	10
<b>10 Recovery</b> .....	<b>10</b>
10.1 Semiconductor materials recovery.....	10
10.2 Metal materials recovery.....	11
10.3 Glass recovery.....	11
10.4 Polymer materials recovery.....	11
<b>11 Management</b> .....	<b>12</b>
<b>Annex A (informative) Data collected for the information statistic system</b> .....	<b>13</b>
<b>Annex B (informative) Matters needing attention for recycling</b> .....	<b>14</b>
<b>Annex C (informative) Common requirements for work at height</b> .....	<b>15</b>
<b>Annex D (informative) Examples of requirements applicable to pollutants' emissions</b> .....	<b>16</b>
<b>Bibliography</b> .....	<b>17</b>

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 160, *Glass in building*, Subcommittee SC 1, *Product considerations*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Glass in building — General technical requirements of building integrated photovoltaic modules recycling

## 1 Scope

This document specifies requirements for the recycling of building integrated photovoltaic (BIPV) modules. It is suitable for crystalline silicon PV modules and thin film modules.

## 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.

ISO 472, *Plastics — Vocabulary*

ISO 11469, *Plastics — Generic identification and marking of plastics products*

## 3 Terms and definitions

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

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

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

### 3.1

#### **waste photovoltaic module**

#### **waste PV module**

photovoltaic module that the holder discards, or intends to discard, or is required to be discarded

### 3.2

#### **laminated solar photovoltaic glass**

#### **laminated solar PV glass**

double glass photovoltaic module

double glass PV module

laminated glass that integrates the function of photovoltaic power generation

Note 1 to entry: This term covers both laminated glass (see ISO 12543-3) and laminated safety glass (see ISO 12543-2).

[SOURCE: ISO/TS 18178:2018, 3.1, modified — Photovoltaic has been changed to PV.]

### 3.3

#### **hazardous material**

item, element or substance with a potential for harm in terms of human injury or ill health (both short and long term), damage to property, damage to the environment, or a combination of these

[SOURCE: ISO 30000:2009, 3.5]