Storage of HiPak
Environmental specification

The storage of the HiPak is classified according to IEC 60721-3-1 set IE11.

**Time limitation for operation**
If HiPaks are stored under conditions described in this specification and if all special supplier instructions on handling and packing are followed, shelf life shall not exceed 5 years. The specification as described in this document is only valid for modules as produced and packed by ABB Switzerland Ltd, Semiconductors. Since the HiPaks are electrostatic sensitive devices, please observe IEC 60747-1, chap. IX, the gate-emitter terminals must be short circuited during storage. The situation has to be considered separately for units on a higher assembly integration level (e.g. modules connected with gate units, coolers etc.).

**Description of class IE11**
This set covers continuously temperature-controlled locations, heating, cooling or humidification being used where necessary to maintain required conditions; exposure to some solar and heat radiation; movement of surrounding air, such as through open windows; without particular risk of biological attacks, with normal levels of contaminants experienced in urban areas with industrial activities scattered over the whole area, or with heavy traffic; without special precautions to minimize presence of dust or sand, but not situated in proximity to dust and sand sources, experiencing vibration of low significance.  

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Set of class IE11

**Condition**  | **Class**
--- | ---
Climatic | 1K2
Special climatic | 1Z2
Biological | 1B1
Chemically active substances | 1C2
Mechanically active substances | 1S2
Mechanical | 1M2

**Climatic conditions**

This class applies to temperature controlled enclosed locations. Humidity is not controlled. Heating and cooling is used to maintain the required conditions, especially where there is a large difference between them and the open-air climate. Stored products may be exposed to movements of surrounding air due to draughts in buildings, caused by open windows, special process conditions, etc.

**Special climatic conditions**

Biological conditions

This class applies to locations without particular risks of biological attacks. This includes protective measures, such as special product design, or storage in locations of such constructions that mould growth, attacks by animals, etc. are not probable.

**Biological conditions**

**Environmental parameter**  | **Class 1B1**
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Flora | negligible
Fauna | negligible

**Mechanical conditions**

This class applies to locations with vibration of low significance and insignificant shock.

**Environmental parameter**  | **Class 1M2**
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Displacement amplitude | 1.5 mm
Acceleration amplitude | 5 m/s²
Frequency range | 2-9 Hz
Peak acceleration | Non

Chemical conditions

This class applies to locations with normal levels of contaminants as experienced in urban areas with industrial activity scattered over the whole area, or with heavy traffic.

**Environmental parameter**  | **Class 1C2**
--- | ---
Mean value | Maximum value
Sea and road salts | Salt mist
Sulfur dioxide | 0.3 mg/m³  1.0 mg/m³
Hydrogen sulfide | 0.1 mg/m³  0.5 mg/m³
Chlorine | 0.1 mg/m³  0.3 mg/m³
Hydrogen chloride | 0.1 mg/m³  0.5 mg/m³
Hydrogen fluoride | 0.01 mg/m³  0.03 mg/m³
Ammonia | 1.0 mg/m³  3.0 mg/m³
Ozone | 0.05 mg/m³  0.1 mg/m³
Nitrogen Oxides (expressed in equivalent values of nitrogen dioxide) | 0.5 mg/m³  1.0 mg/m³

The mean values are expected long-term values. Maximum values are limit or peak values, occurring over a period of time of not more than 30 min per day.

**Mechanically active substances**

This class applies to locations without special precautions to minimize the presence of dust or sand, but not situated in the proximity to dust or sand sources.

**Environmental parameter**  | **Class 1S2**
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Sand | 30 mg/m³
Dust (suspension) | 0.2 mg/m³
Dust (sedimentation) | 1.5 mg/m³

Humidity is not controlled. Heating and cooling is used to maintain the required conditions, especially where there is a large difference between them and the open-air climate. Stored products may be exposed to movements of surrounding air due to draughts in buildings, caused by open windows, special process conditions, etc.
**Tests for Class 1K2**

Salt mist, SO$_2$, and H$_2$S tests done according to DIN 60068-2-60 (report TN PTS 06-146).

**Tests for Class 1S2**

No tests will be done.

**Tests for Class 1M2**

Tests done according to: EN60068-2-36 / EN61373:1999 Cat. 1, Class B (vibration) and EN 60068-2-27:2008 / EN61373:1999 Cat. 1, Class B (shock). The vibration tests are not done with sinusoidal vibration but random (for transport applications).

**Revision history**

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9 see IEC TR 60721-4-1, page 18