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**Tractors and self-propelled machines for  
agriculture and forestry — Operator  
enclosure environment —**

**Part 3:  
Determination of effect of solar heating**

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*Tracteurs et machines automotrices pour l'agriculture et la sylviculture —  
Ambiance dans l'enceinte de l'opérateur —*

*Partie 3: Détermination de l'effet du rayonnement solaire*

ISO 14269-3:1997

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## 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 14269-3 was prepared by Technical Committee ISO/TC 23, *Tractors and machines for agriculture and forestry*, Subcommittee SC 2, *Common tests*.

This first edition, along with the other parts of ISO 14269, cancels and replaces ISO 3737:1976, ISO 6097:1989 and ISO/TR 8953:1987, which have been technically revised.

ISO 14269 consists of the following parts, under the general title *Tractors and self-propelled machines for agriculture and forestry — Operator enclosure environment*:

- *Part 1: Vocabulary*
- *Part 2: Heating, ventilation and air-conditioning test method and performance*
- *Part 3: Determination of effect of solar heating*
- *Part 4: Air filter element test method*
- *Part 5: Pressurization system test method*

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# Tractors and self-propelled machines for agriculture and forestry — Operator enclosure environment —

## Part 3:

### Determination of effect of solar heating

#### 1 Scope

This part of ISO 14269 specifies a test method for simulating solar heating in the laboratory and measuring the radiant heat energy from a natural or simulated source. This standard is applicable to tractors and self-propelled machines for agriculture and forestry when equipped with an operator enclosure.

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#### 2 Normative reference

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The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 14269. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 14269 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 14269-1:1997, *Tractors and self-propelled machines for agriculture and forestry — Operator enclosure environment — Part 1: Vocabulary*.

#### 3 Definitions

For the purposes of this part of ISO 14269, the definitions given in ISO 14269-1 apply, of which the following are particularly relevant.

**3.1 solar heating:** Heating factor from the sun to be considered in determining air circulation and cooling requirements necessary to maintain comfortable temperature inside the operator enclosure. [ISO 14269-1:1997, definition 2.18]

**3.2 solar radiant energy:** Process by which solar heating is generated. [ISO 14269-1:1997, definition 2.19]

#### 4 General

**4.1** The intended result of this method is to record the radiant heat energy affecting an operator enclosure during tests of the air-conditioning system.

**4.2** This method should be used in conjunction with the test given in ISO 14269-2:1997, *Tractors and self-propelled machines for agriculture and forestry — Operator enclosure environment — Part 2: Heating, ventilation and air-conditioning test method and performance*.

## 5 Measurement of solar radiant energy during field tests

**5.1** Place an appropriate measuring device such as a pyranometer, with an accuracy of  $\pm 3\%$  of the observed values, in the same general area as the operator enclosure under test. Measure the radiance at 10 min intervals during the test period. These readings shall be averaged and recorded as part of the reported results.

**5.2** A measured average solar radiant energy of  $950 \text{ W/m}^2 \pm 95 \text{ W/m}^2$  is considered "normal" test conditions.

## 6 Method of simulating solar radiant energy during laboratory tests

**6.1** Place the lamps in banks above the operator enclosure being tested and in a horizontal plane.

**6.2** The area within the perimeter of the light banks shall extend 25 % beyond the projected area of the operator enclosure under test when measured in all four directions.

**6.3** In order to simulate the effects of solar heating, the light source shall have 45 % or more of its radiated energy above 700 nm. It is recommended that the method of controlling the intensity not change the spectral distribution of the lamps.

## 7 Calibration of solar radiant energy from a simulated source

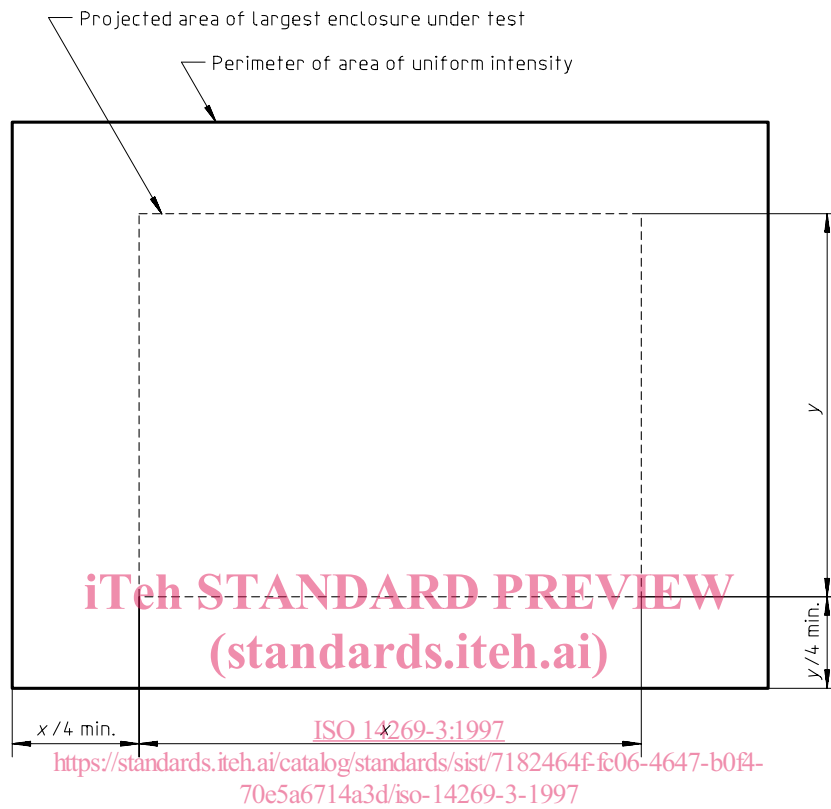
**7.1** Mount a pyranometer on a tripod and maintain it on a horizontal plane.

**7.2** The plane of measurement shall be  $100 \text{ mm} \pm 100 \text{ mm}$  lower than the roof line of the operator enclosure under test.

**7.3** Take readings at points on or within the perimeter of the area of uniform intensity as shown in figure 1. Make sufficient measurements to ensure uniformity. The maximum distance between measuring points shall be 1 200 mm.

**7.4** The intensity level shall be adjusted to an average of  $950 \text{ W/m}^2 \pm 95 \text{ W/m}^2$ . No individual reading shall vary by more than 10 % from the average.

**7.5** The intensity level shall be recalibrated every six months or every time the elevation of the roof line of the operator enclosure being tested is changed.



NOTE —  $x$  and  $y$  are dimensions of the largest enclosure to be tested.

**Figure 1 — Area of uniform intensity**

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**Descriptors:** agricultural machinery, forest equipment, self-propelled machines, agricultural tractors, operating stations, operator enclosures, environments, working conditions, solar heating, tests, performance tests.

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