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## Ice makers for commercial use — Classification, requirements and test conditions

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## ISO/DIS 6369:2022(E)

## 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)).

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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 86, Subcommittee SC 7 *Testing and rating of commercial refrigerated display cabinets* and Technical Committee CEN/TC 44, *Commercial refrigerated cabinets, catering refrigerating appliances and industrial refrigeration* in collaboration.

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).

# Ice makers for commercial use — Classification, requirements and test conditions

## 1 Scope

This Standard specifies methods for the measurement of energy consumption, water consumption, ice production capacity and of harvested ice characteristics of ice makers for commercial use.

This Standard does not apply to:

- ice makers intended to be incorporated in appliances for household use;
- ice makers with remote condensing units.

## 2 Normative references

There are no normative references in this document.

## 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:

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

### 3.1 Types of appliances

#### 3.1.1

##### **ice maker**

factory-made appliance consisting of a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice, also including means for storing or dispensing ice, or both

Note 1 to entry: Ice makers are intended to produce ice in irregular shapes or flakes or ribbons or wafers as well as uniformly shaped ice cubes.

#### 3.1.1.1

##### **ice maker with built-in condensing unit**

appliance in which the refrigeration unit is an integral part of the cabinet

#### 3.1.1.2

##### **ice maker with remote condensing unit**

appliance in which the compressors, condensers and liquid receivers (when required) are not supplied with the cabinet

#### 3.1.1.3

##### **split ice maker**

appliance in which the condenser is not integrated in the main ice making unit and the condenser and piping are made in accordance with manufacturers indications using dedicated condensers

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### 3.1.1.4

#### **water cooled ice maker**

appliance in which the condenser is cooled by use of water

### 3.1.1.5

#### **air cooled ice maker**

appliance in which the condenser is cooled by use of air

## 3.2 Type of ice

### 3.2.1

#### **ice cube**

single piece of ice that can have different shapes (e.g. dice, cylinder, ball, etc.) and is produced by a batch type ice maker

### 3.2.2

#### **ice flakes**

ice which contains at least 70 % flaked ice (and no more than 30 % water) which is produced by a continuous type ice maker

## 3.3 Type of production

### 3.3.1

#### **batch-type ice maker**

ice maker that has alternate freezing and harvesting periods

#### 3.3.1.1

#### **batch-type single cubes ice maker**

ice maker that produces single ice cubes

#### 3.3.1.2

#### **batch-type multiple cubes ice maker**

ice maker that produces multiple ice cubes

### 3.3.2

#### **continuous-type ice maker**

ice maker that continually freezes and harvests ice flakes at the same time

### 3.3.3

#### **modular-type ice maker**

ice maker without storage means

### 3.3.4

#### **self-contained ice maker**

ice-maker in which the ice-making mechanism, storage compartment and condensing unit are integrated within a cabinet

## 3.4

#### **ice storage bin**

factory-made container (not necessarily shipped in one package with the ice-maker) that forms or is intended to form a non-refrigerated compartment for the storage of ice

Note 1 to entry: the container is equipped with additional devices (e.g. container support, carts, etc.).

## 3.5

#### **separate storage compartment**

non-refrigerated compartment for the storage of ice that is separate from the ice-making mechanism



**3.6****purge (also blow-down)**

dissipation of a certain percentage of water to control the clarity of ice or to prevent scaling

**3.7****ice production**

amount of ice harvested, stated in kg/24 h in multiples of 1 kg

**3.8****energy consumption rate**

total energy input stated in kWh/10 kg of ice in multiples of 0,1 kWh

**3.9****potable water use rate**

amount of potable water used in making ice, including purging and harvesting, stated in l/10 kg of ice in multiples of 0,1 l

**3.10****cooling water use rate**

amount of cooling water used in making ice, stated in l/10 kg of ice in multiples of 0,1 l

**3.11****standard rating**

ratings based on tests performed at standard rating conditions

**3.12****standard rating conditions**

standard set of conditions under which the performance characteristics of ice makers are rated for comparative purposes

## **4 Measurement of energy consumption, water consumption and ice production capacity**

### **4.1 General**

Unless otherwise specified, measurements shall be made under test conditions and with equipment set-up as specified in [4.2](#) to [4.5](#) and [Clause 5](#).

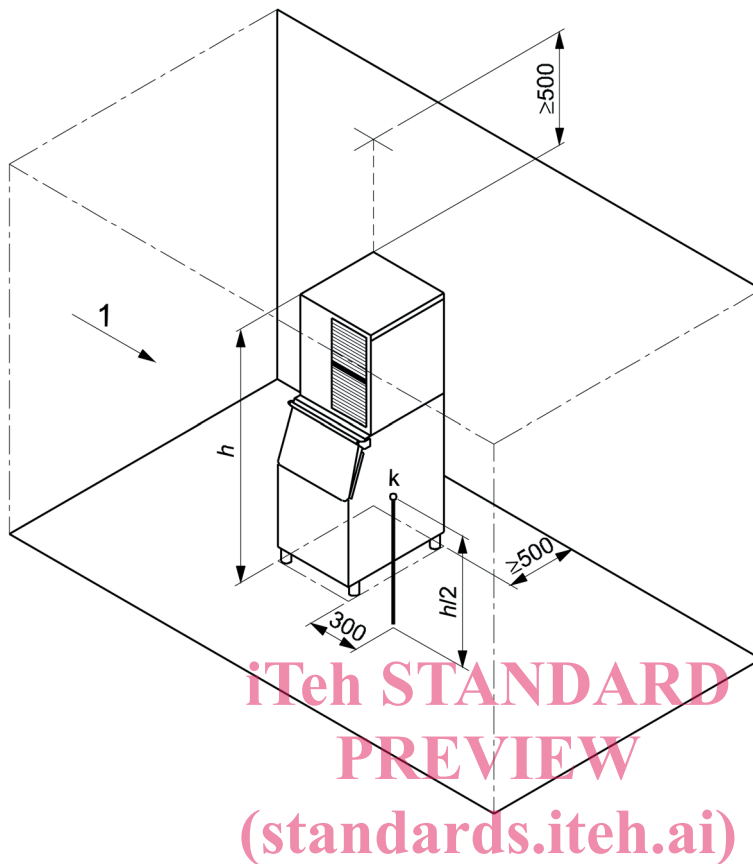
### **4.2 Test room**

The test room walls and ceilings shall be insulated to ensure that the temperature of both the inside walls and the ceiling surface is within 2 °C of the ambient temperature.

Fluorescent or LED lighting shall be used owing to its high light output, low surface temperature and low heat load on the test room.

The air flow shall be horizontal with a speed  $\leq 0,25$  m/s.

The measuring point of air speed shall be located, 300 mm upstream of the ice maker, in line with the front of the ice maker at a vertical height that is half the ice maker height (including ice maker feet and fixings) see [Figure 1](#).

**Key**

- 1 air flow
- $h$  overall height of the cabinet including feet
- $k$  climate measuring point detecting temperature
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**Figure 1 — Test room temperature measuring point and positioning of the cabinet**

#### 4.2.1 Ambient temperature

The ice maker shall be tested at an ambient temperature of  $32\text{ °C} \pm 1\text{ °C}$ .

For a split ice maker, the condenser air inlet temperature shall be  $32\text{ °C} \pm 1\text{ °C}$ , with an indoor ambient temperature of  $32\text{ °C} \pm 1\text{ °C}$ .

With the ice maker switched off and the test room in operation, the vertical ambient temperature gradient in any metre of vertical distance from 50 mm above the floor or supporting platform to a height of 2 m, or to a height of 300 mm above the top of the cabinet, whichever is greater, shall not exceed  $1,0\text{ °C}$  per metre.

Test room temperatures shall be measured by sensors, inserted in the centre of tinned solid copper or copper-zinc alloy cylinders having a mass of  $25\text{ g} \pm 1\text{ g}$  and of minimum external area (diameter = to height = to approximately 15,2 mm).

#### 4.2.2 Water supply

The water used for the test shall have an inlet temperature of  $21\text{ °C} \pm 1\text{ °C}$  and the water pressure shall be according to the manufacturer's specifications with a tolerance of  $\pm 50\text{ kPa}$ .