

DIN 12880

DIN

ICS 71.040.10

Supersedes
DIN 12880-1:1978-11,
DIN 12880-2:1980-04,
DIN 58945-1:1971-09 and
DIN 58945-2:1971-09

**Electrical laboratory devices –
Heating ovens and incubators**

Elektrische Laborgeräte –
Wärme- und Brutschränke

Document comprises 16 pages

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.



Contents

	Page
Foreword.....	3
1 Scope	3
2 Normative references	3
3 Terms and definitions	4
4 Dimensions.....	5
5 Material	5
6 Requirements	6
6.1 Common requirements	6
6.2 Requirements for heating ovens.....	7
6.3 Requirements for incubators and shaking incubators.....	7
7 Testing temperatures	7
7.1 General test conditions.....	7
7.2 Test equipment	7
7.3 Testing for temperature homogeneity and temperature stability.....	8
7.4 Deviation from set point and actual temperature.....	11
7.5 Heating and cooling times	11
7.6 Recovery time after door opening	12
7.7 Heat transfer to the environment	12
7.8 Type test report.....	12
8 Testing of controlled atmospheres in incubators	12
8.1 General test conditions.....	12
8.2 Test equipment	13
8.3 Measurement of humidity	13
8.4 Measurement of CO ₂ or O ₂ concentrations	13
9 Operating instructions	13
9.1 General.....	13
9.2 Heating ovens and incubators	14
9.3 Heating ovens	14
9.4 Incubators.....	14
9.5 Shaking incubators.....	14
10 Marking	14
Bibliography	16

Foreword

This standard has been prepared by Technical Committee *Wärme- und Brutschränke* of the *Normenausschuss Laborgeräte und Laboreinrichtungen* (Laboratory Equipment Standards Committee).

Amendments

This standard differs from DIN 12880-1:1978-11, DIN 12880-2:1980-04, DIN 58945-1:1971-09 and DIN 58945-2:1971-09 as follows:

- a) All above-mentioned standards have been combined into one standard under the standard number DIN 12880.
- b) Requirements and tests have been brought into line with the state of the art.
- c) Tests for humidity, and for CO₂ and O₂ concentrations have been added.
- d) Terms and definitions have been modified and expanded.
- e) Specifications regarding marking have been modified.
- f) Since safety requirements are specified in DIN EN 61010-2-010 (VDE 0411-2-010), they are no longer included in this standard.

Previous editions

DIN 12880-1: 1978-11
DIN 12880-2: 1980-04
DIN 58945-1: 1971-09
DIN 58945-2: 1971-09

1 Scope

This standard covers non-walk-in heating ovens and incubators suitable for a working temperature range of –10 °C to 300 °C. Incubators also include shaking incubators. The standard gives terms and definitions and specifies performance requirements and tests.

Controlled-atmosphere test installations (e.g. as in DIN 50011) and hot air sterilizers are not covered by this standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced documents (including any amendments) applies.

DIN EN 13150, *Workbenches for laboratories — Safety requirements and test methods*

DIN EN 61010-2-010 (VDE 0411-2-010), *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 2-010: Particular requirements for laboratory equipment for the heating of materials (IEC 61010-2-010:2003)*

DIN EN 61326-1 (VDE 0843-20-1:2006-10), *Electrical equipment for measurement, control and laboratory use — EMC requirements — Part 1: General requirements*

DIN EN 62079 (VDE 0039), *Preparation of instructions — Structuring, content and presentation*

DIN EN ISO 12100-2, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles*

3 Terms and definitions

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

3.1 heating oven
electrically heated cabinet enabling temperatures of a few degrees Celsius above ambient temperature to a maximum of 200 °C, 250 °C or 300 °C to be controlled

3.2 drying oven
heating oven used for drying samples (see 3.9)

3.3 vacuum oven
vacuum drying oven
drying oven capable of maintaining vacuum in the inner chamber

3.4 incubator
heating oven used for biological or microbiological applications, with a limited temperature range (e.g. 30 °C to 70 °C) and increased requirements regarding temperature stability and temperature homogeneity in the usable space

NOTE Optionally, incubators may also allow the controlling of environmental parameters such as humidity, or CO₂ or O₂ partial pressure. Such incubators are referred to as cell or tissue engineering incubators.

3.5 cooled incubator
incubator enabling the control of temperatures below ambient temperature, for example within a temperature range of 5 °C to 70 °C

3.6 shaking incubator
incubator fitted with an integrated device for shaking the samples

3.7 inner chamber
space delimited by the inner walls, i.e. internal height, width and depth of the heating oven or incubator (or internal diameter and depth in the case of round cabinets)

3.8 usable space
that part of the inner chamber for which the temperature variations specified by the manufacturer apply

NOTE The limiting planes of the usable space are normally parallel to those of the inner chamber and are defined by the selected measuring points when testing for temperature variation as specified in subclause 7.3.