INTERNATIONAL STANDARD

ISO 8589

Second edition
2007-12-15

Sensory analysis — General guidance for the design of test rooms

Analyse sensorielle — Directives générales pour la conception de locaux destinés à l'analyse

Reference number
ISO 8589:2007(E)

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Published in Switzerland

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 8589 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 12, *Sensory analysis*.

This second edition cancels and replaces the first edition (ISO 8589:1988), which has been technically revised.

Sensory analysis — General guidance for the design of test rooms

1 Scope

This International Standard provides general guidance for the design of test rooms intended for the sensory analysis of products.

It describes the requirements to set up a test room comprising a testing area, a preparation area, and an office, specifying those that are essential or those that are merely desirable.

This International Standard is not specific for any product or test type.

NOTE The test space can be similar for food and non-food products that are evaluated using sensory methods. However, the test rooms might need to be adapted for each specialized use. Modifications to the design are often needed for specific products and for specific types of testing. This is particularly true if the test rooms are to be used for the evaluation of non-food products.

Although many of the general principles are similar, this International Standard does not address test facilities for the specialized examination of products in inspection or in-plant quality-control applications.

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 document (including any amendments) applies.

ISO 5492, *Sensory analysis — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5492 apply.

4 Principle

The test rooms are designed

— to conduct sensory evaluations under known and controlled conditions with a minimum of distractions, and

— to reduce the effects that psychological factors and physical conditions can have on human judgement.

5 Creation of test rooms

The creation of test rooms intended for sensory analysis differs, depending on whether a new building or an existing facility is used.

A typical test facility comprises the following:

— a testing area in which work may be carried out individually in testing booths or in groups;

— a preparation area;

— an office;

— a cloakroom and toilets;

— a storage room for supplies;

— a storage room for samples;

— a waiting room for assessors.

The minimum requirements are

— a testing area in which work may be carried out individually in testing booths or in groups, and

— a preparation area.

The test room should be easily accessible to the assessors and should not be located in an area where there is a heavy traffic flow (for example, near a cafeteria), unless arrangements have been made to reduce noise and distraction. Reasonable arrangements should also be made for accessibility to the area by those with physical disabilities.

An area for assessors to gather or wait prior to entering the panel room is desirable. The organization of the areas should be easily accessible for cleaning and should allow for good conditions of hygiene.

See the examples of test room layouts given in Annex A.

6 Testing area

6.1 General requirements

6.1.1 Location

The testing area should be located near the preparation area. The areas should be close enough to each other to facilitate sample presentation, but the areas should be separate to reduce interference, such as from odour and noise. (See also 7.1.)

The assessors shall not enter or leave the testing area through the preparation area, as this could result in bias in the test results.

6.1.2 Temperature and relative humidity

The temperature in the testing area shall be controlled. Relative humidity should be controllable if it can affect the product during evaluation.

Generally, the levels should be comfortable for the assessors, unless the product test requires unusual conditions.

6.1.3 Noise

The noise level shall be kept to a minimum during the tests. Therefore, it is desirable for the room to be sound-resistant, with floors that can minimize noises associated with walking or when moving objects.

6.1.4 Odours

The testing area shall be kept reasonably free from odours. One way to achieve this is by installing an air system with activated carbon filters. If necessary, a slight positive pressure may be created in the testing area to reduce the inflow of air from other areas.

The testing area shall be constructed from materials which are easy to clean and can be kept odour free. Furnishings and equipment, such as carpets, chairs, etc., shall not emit odours that can interfere with the evaluation. Depending on the use of the laboratory, the use of fabric surfaces may need to be limited because of odour absorption and difficulties in cleaning.

Cleaning agents that are used should not leave odours in the testing area.

6.1.5 Decoration

The colour of the walls and furnishings of the testing area shall be neutral so that the colour of samples is not modified. Matt off-white or light neutral grey are recommended colours (dark grey may be appropriate for floors and chairs).

6.1.6 Lighting

The source, type of lighting and lighting levels are very important in all sensory testing. Attention shall be given to general lighting in all rooms, and to lighting in each panel booth when applicable. The lighting in the testing area shall be uniform, free from strong shadows, and controllable.

Although not required, lights may be chosen that attempt to reproduce a specific lighting condition.

EXAMPLE Lights with a correlated colour temperature of 6 500 °K provide a good, neutral light similar to “northern daylight” and lights of 5 000 °K to 5 500 °K with a high colour-rendering index may simulate “noon” daylight.

Special lighting may be especially important in the case of colour assessment of products or materials. Special lighting devices may also be needed to mask colour or visual differences that are unwanted, non-test variables in the product. Devices that may be used include

— a dimmer device,

— coloured light sources,

— coloured filters,

— black light, or

— monochromatic light sources such as sodium vapour lamps.

In consumer testing, lighting that is typical of lighting found in the place where the product will be used often may be chosen. Thus, the type of lighting needed depends on the type of test that is conducted.

6.1.7 Safety considerations

Any special safety considerations appropriate for the type of laboratory should be considered, such as special ventilation hoods for odour samples, chemical wash stations if working with chemicals, and special fire considerations if working with cooking equipment.

Regardless of the type of laboratory, exit signs should be placed appropriately.

6.2 Testing booths

6.2.1 General requirements

In many sensory tests, assessors are required to make independent personal judgements. Assessors often use individual testing booths to limit distractions and to avoid communication during evaluations where individual assessment is necessary.

6.2.2 Number

The number of booths that can be installed depends on the space available and the tests usually carried out in the testing area. This number shall be chosen to allow sufficient space for movement and for the serving of samples from the serving area.

6.2.3 Set-up

Although permanent testing booths are recommended, the use of temporary, portable, testing booths may be necessary.

If the testing booths are constructed along a wall dividing the testing area from the preparation area, it is recommended that there be openings to allow samples to be passed from the preparation area to the testing booth. The openings shall be designed for easy passage of samples and covered by sliding doors or hatches which close quietly. A counter on the serving-area side of the wall is convenient. It is recommended that the openings be designed so that assessors cannot see samples being prepared or coded.

Electrical outlets, if needed, should be conveniently located to accommodate electrical equipment that may be required for specific testing situations.

If a computer system is used by assessors for data input, the necessary computer components shall be configured so as to allow the assessor to concentrate on the sensory task. For example, the screen should be at a comfortable height for viewing and should be configured so that there is minimal glare, and screen savers should generally not be used. The keyboard or other input device should be at a comfortable level and placed so that it is not in the way of the evaluation of samples.

Unless the panel is served at specific time intervals, it is recommended that a system be devised for the assessor to signal to the operator when he/she is ready for a sample. This is especially important when a wall separates the preparation area from the testing area. A switch to turn on a light on the preparation side, or a system in which a card is simply slipped under the serving door, may be used.

It may be helpful for booths to be numbered or have a sign to permit their identification and the location of the assessors.

6.2.4 Layout and size

The working area in each testing booth shall be sufficiently large to accommodate the following easily:

— the samples;

— the utensils;

— the expectoration cups;

— a sink, if necessary;

— the rinsing agents;

— the answer forms and pens or computer input devices.

The working area shall also provide adequate space to enable the completion of the answer forms or to accommodate computerized equipment for the transmission of the responses.

It is recommended that the working area be at least 0,9 m wide and 0,6 m deep. If additional equipment is needed in the booth, the size may need to be increased. The working surface of the testing booths shall be of an appropriate height to allow sample evaluation to be carried out in comfort.

The lateral dividers between the testing booths should extend beyond the counter surface so as to partially screen the assessors. An extension of at least 0,3 m beyond the counter generally works well. The dividers may extend from floor to ceiling for complete privacy, with a design allowing adequate ventilation and cleaning. Alternatively, the dividers may be suspended from the wall and enclose only the seated assessor.

If the assessors are to be seated, comfortable seats of a height compatible with the working surface shall be provided. If the seat cannot be adjusted or moved, a distance of at least 0,35 m between the seat and the working surface is recommended. Seats that move should be able to be moved quietly.

Testing booths may be equipped with sinks. In this case, the quality and temperature of the water (if it is used in the evaluation), shall be controlled. Sinks should not be used unless there is provision for sanitation and odour control. Suction-type sinks ensure waste disposal but they are noisy.

At least one booth should be designed for a height and width to accommodate an assessor in a wheelchair, if required by local laws.

6.2.5 Colour

The interior of a booth for general use shall be painted a matt gray with a luminance factor of about 15 % (for example Munsell reference N4 to N5). However, when mainly light colours and near-white colours are to be compared, the interior of the booth may be painted so as to have a luminance factor of 30 % or higher (for example Munsell reference N6) in order to give a lower brightness contrast with the colour to be examined.

6.2.6 Lighting

See 6.1.6 for general lighting recommendations.

6.3 Area for group work

6.3.1 General requirements

An area for group work is often provided to allow discussion among the assessors and the operator. This area could be used during the initial training sessions and at any time when discussion among the assessors is required.

The area shall be large enough to contain a table that can accommodate comfortable chairs for all the assessors testing at one time. (See the examples in Annex A.) The table shall be large enough to hold the following:

— a tray or place setting to hold ballots and samples for each assessor;

— extra materials, such as reference samples, if used, and pens, pencils or cups;

— computer workstations, if necessary.

A movable centre in the table is helpful for passing samples. The table may also be equipped with removable panels which separate the assessors for individual work. It is recommended that a large writing board or chart be available for recording discussion points.

6.3.2 Lighting

Lighting requirements for group work are usually like those described in 6.1.6.

7 Preparation area

7.1 General requirements

A laboratory (or kitchen) for the preparation of samples shall be located in the immediate vicinity of the testing area. Its location shall be such that assessors do not have to pass through the preparation area to gain access to the testing area, which could cause bias in test results.

Efficient workflow arrangements in and between these functional areas are essential.

The area shall be well ventilated so that food preparation odours and foreign odours are removed.

The materials selected for the floors, walls, ceilings and furnishings shall be easy to maintain and be both odour free and impervious to odours.

It is necessary to provide for a certain amount of flexibility in the plumbing and gas and electricity services during the construction of this area, to allow for future changes in the location of equipment.

7.2 Equipment

The type of equipment required in the preparation area depends on the range of products which will be processed there.

The principal elements are the following:

— a working surface;

— a sink and other equipment needed for washing supplies;

— equipment, including electrical equipment, necessary for the conservation, preparation, control, and presentation of samples (e.g. containers, dishes, appliances, etc.), that is in good working order and calibrated as necessary for testing;

— equipment for cleaning;

— a waste container;

— storage facilities.

Additional equipment may also be necessary.

Containers for sample preparation and storage, and utensils and cutlery used in sample preparation, shall be manufactured from materials that will not impart any odour or taste to the product and that prevent adulteration or contamination of samples.

8 Office

8.1 General requirements

The office is a working area where paperwork involved with sensory analysis testing is carried out. It is essential that the office be separate from, but near, the testing area.

8.2 Size

Adequate space is required for planning tests, devising answer forms, sorting and decoding answer forms, statistical analysis of data, writing reports, and, if necessary, for meeting with clients to discuss tests and results.

8.3 Fittings

Depending on the specific tasks that will be done in the office, it may contain the following equipment: desk or work table, filing cabinet, bookshelf, chairs, telephone, calculator and computer to carry out statistical analysis of data.

Photocopying services and file storage should be available, but are not necessary in this office.

9 Additional areas

It is useful to provide a cloakroom and toilets near the testing area, but not in a place that would impact evaluations.

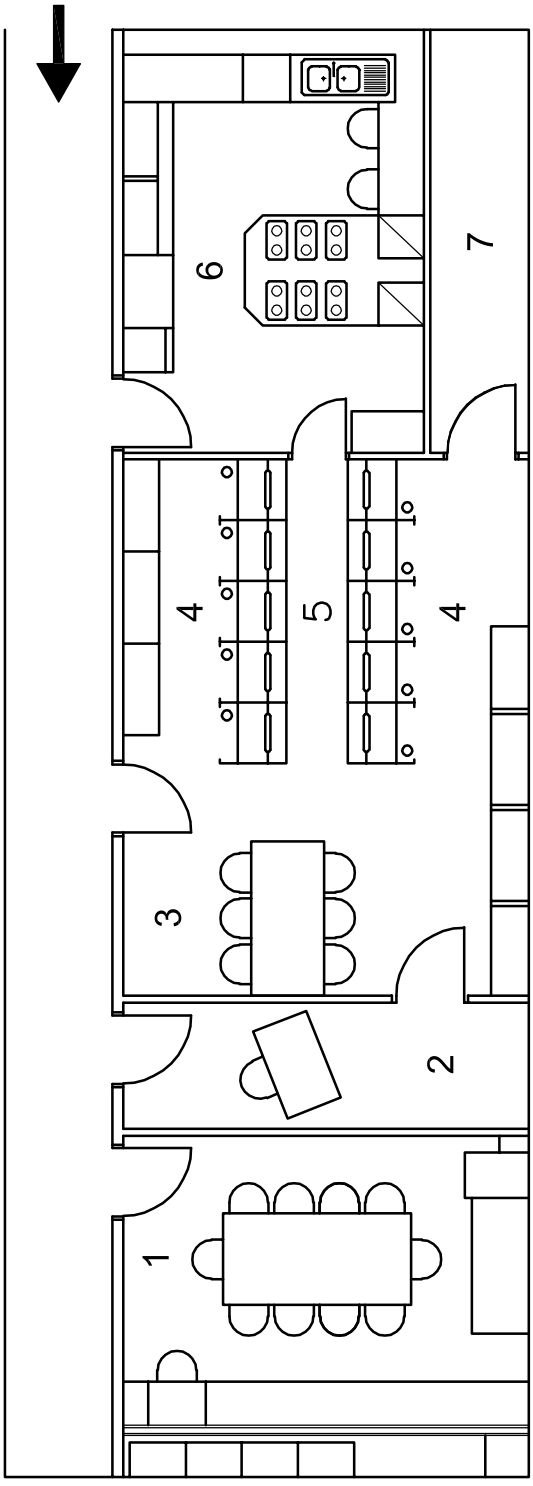
Facilities for storing equipment needed to maintain the cleanliness and hygiene of the facility are important.

10 Additional information

It is essential that all building codes in the local area be reviewed before the construction or modification of any testing facility. Building codes should be followed.

Annex A
(informative)

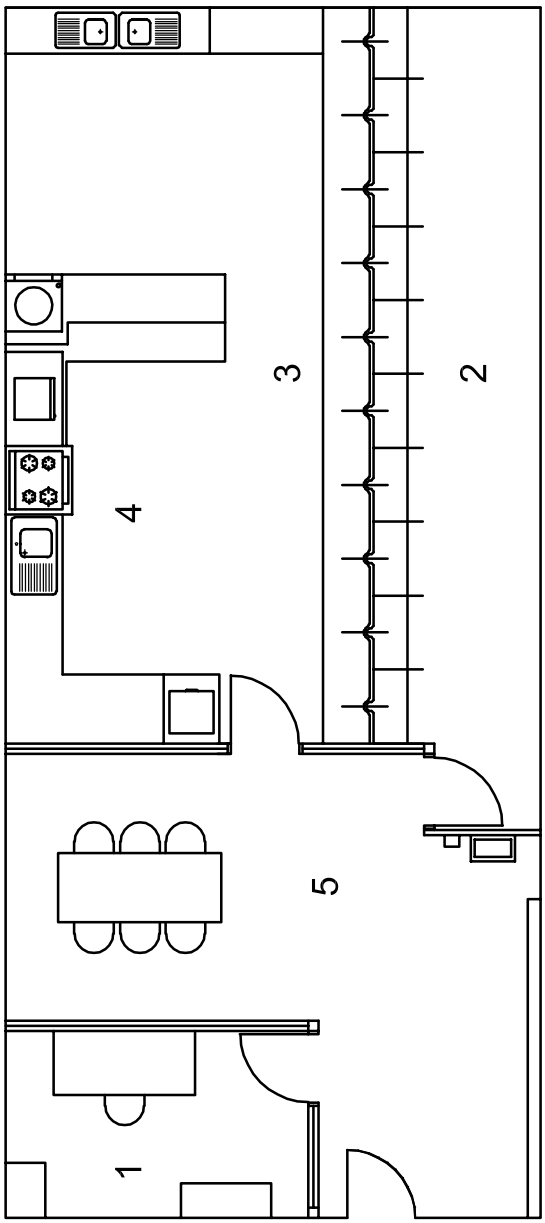
Examples of test room layouts



Key

1 Meeting room
2 Office
3 Area for group work
4 Testing booths
5 Distribution area
6 Preparation area
7 Store room

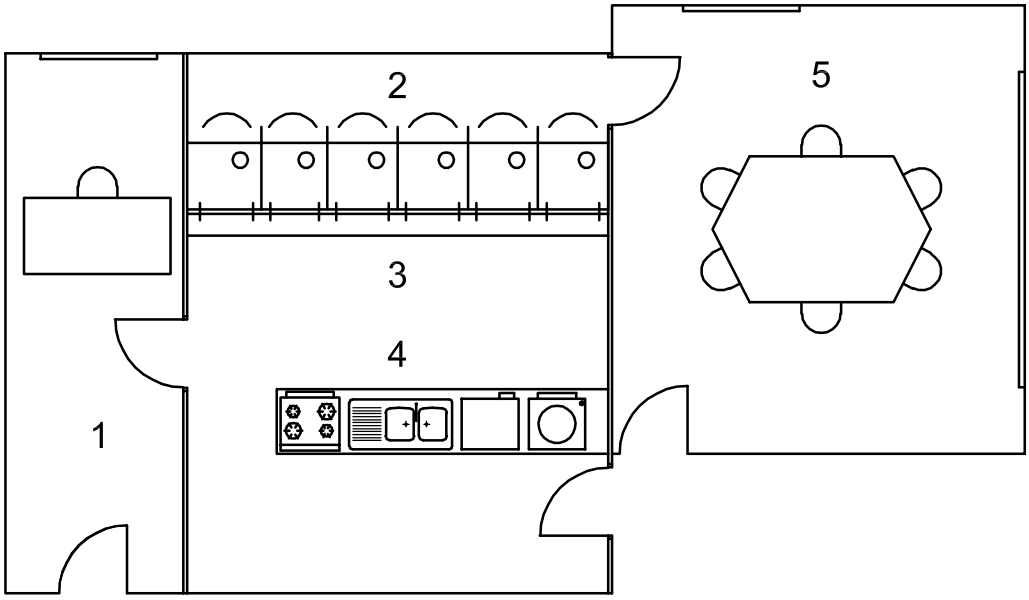
Figure A.1 — First example of a floor plan for a test room



Key

1 Office
2 Testing booths
3 Distribution area
4 Preparation area
5 Meeting room and area for group work

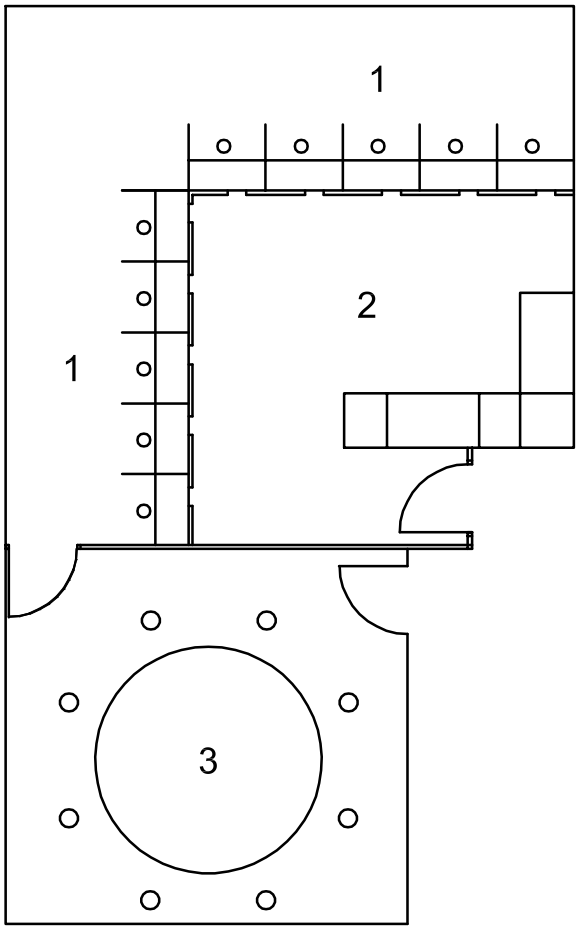
Figure A.2 — Second example of a floor plan for a test room



Key

1 Office
2 Testing booths
3 Distribution area
4 Preparation area
5 Meeting room and area for group work

Figure A.3 — Third example of a floor plan for a test room



Key

1 Testing booths
2 Preparation area
3 Meeting room and area for group work

Figure A.4 — Fourth example of a floor plan for a test room

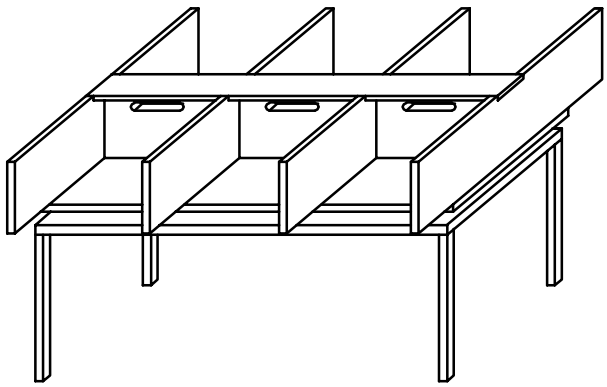
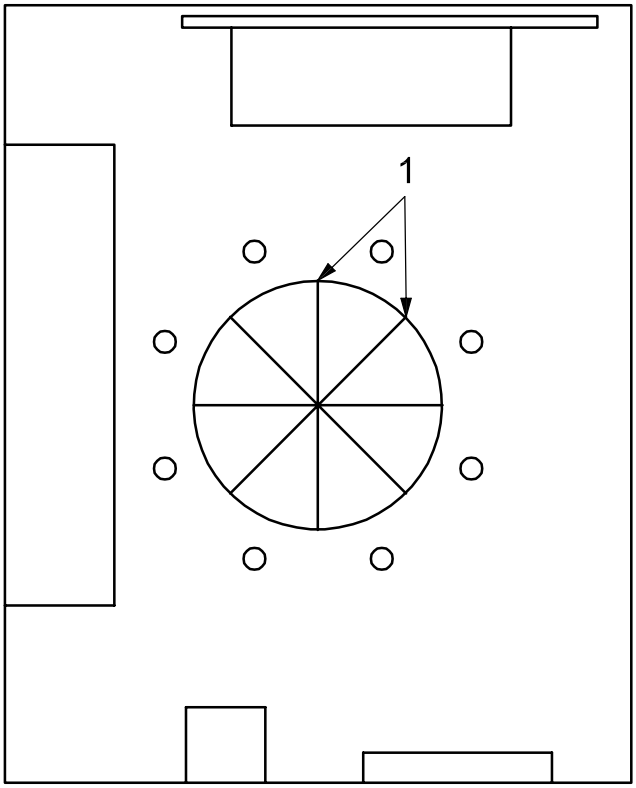


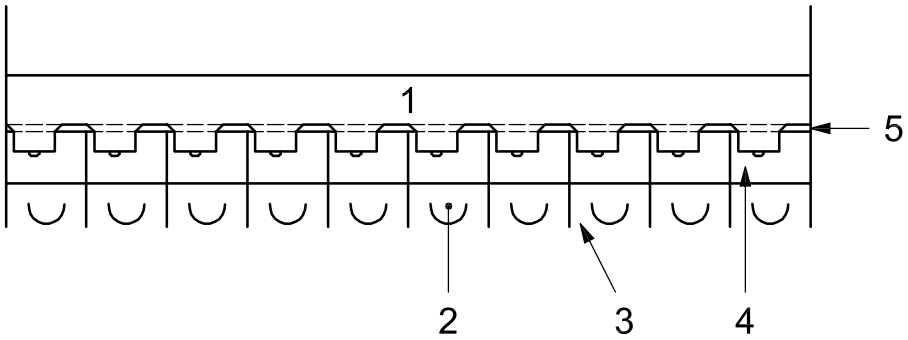
Figure A.5 — Table equipped with removable dividers



Key

1 Removable dividers

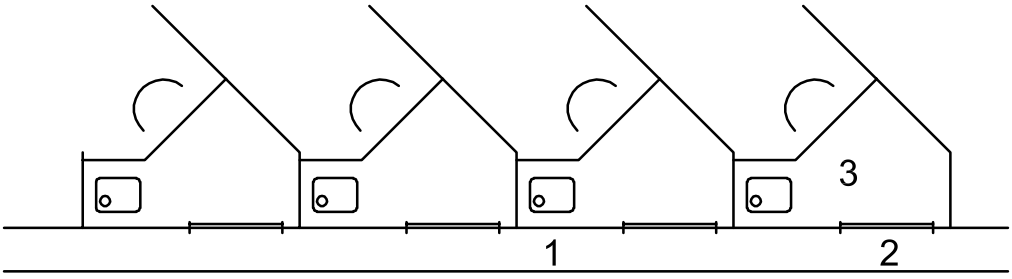
Figure A.6 — Example of a floor plan for a testing area for working in testing booths or in groups



Key

1 Serving counter
2 Individual testing booths
3 Divider between booths
4 Hatch
5 Wall with openings for passing samples

Figure A.7 — Plan for testing booths and serving counter separated by a wall



Key

1 Serving counter
2 Hatch
3 Sink

Figure A.8 — Herring-bone layout of testing booths

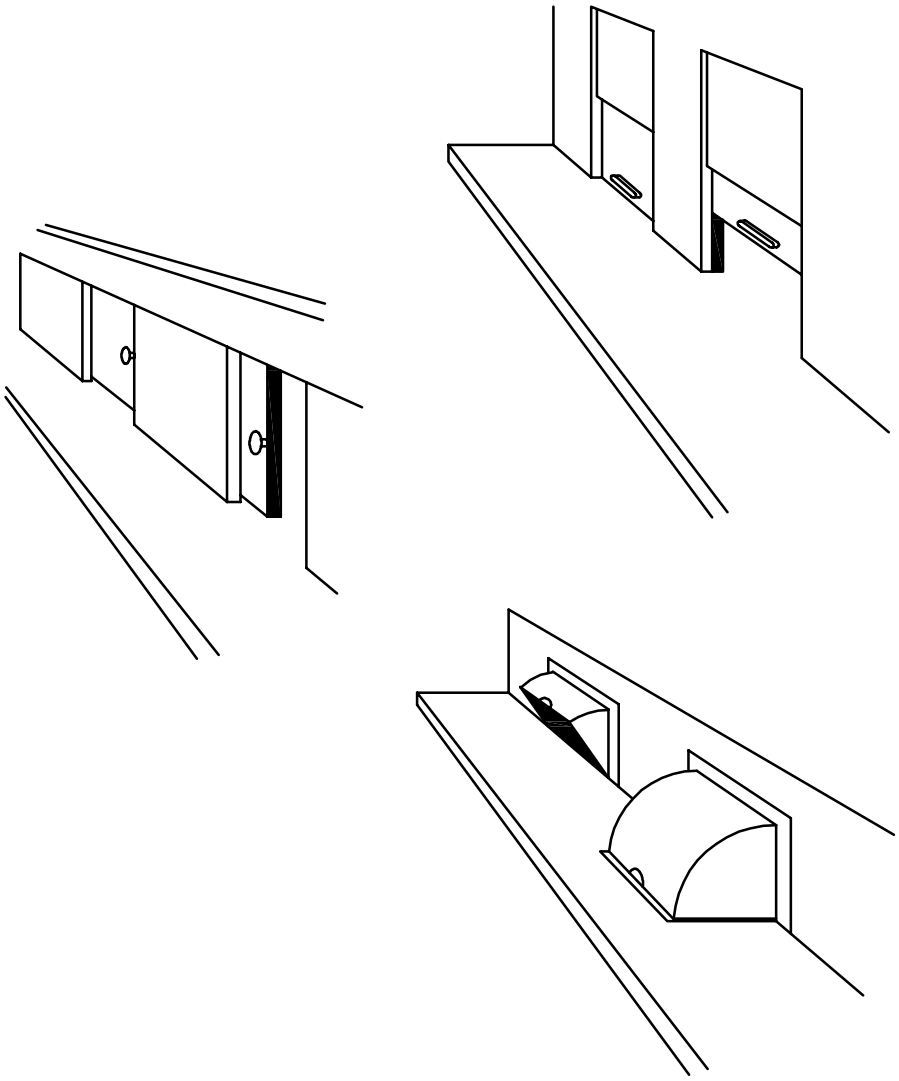
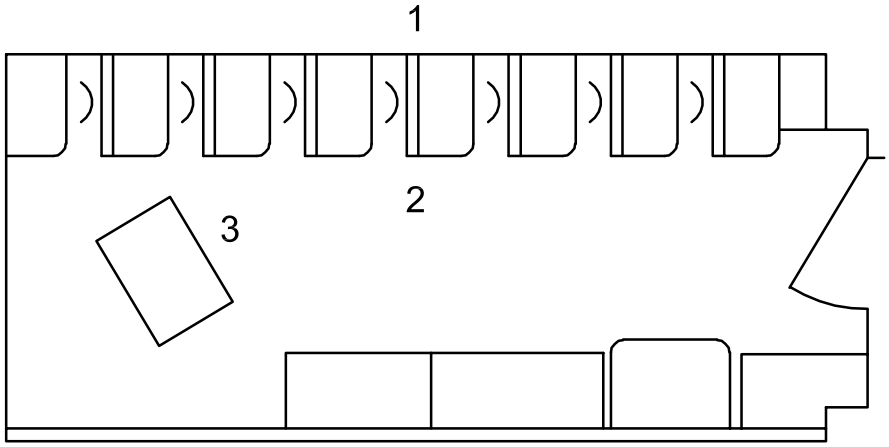


Figure A.9 — Various types of sliding doors and hatches



Key

1 Lateral layout of testing booths
2 Distribution area
3 Desk of panel chairman

Figure A.10 — Testing area with a facility for supervision by the panel chairman

NOTE A testing booth could include the following equipment:

— 1 sliding keyboard support
— 1 cut-up on the bottom of the booth with the computer-screen shelf support
— 1 tray-unit central support on castors
— 1 mirror
— 2 fluorescent lamps with a switch
— 1 rod support towel
— 1 white basin
— 1 tap for infrared water

Figure A.11 — Some examples of a testing booth

Bibliography

[1] ISO 6658, *Sensory analysis — Methodology — General guidance*

ICS 67.240

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