SLOVENSKI STANDARD
SIST ISO 5682-1:1995

01-september-1995

Stroji za zaščito rastlin - Kropilna oprema - 1. del: Postopki preskušanja šob

Equipment for crop protection -- Spraying equipment -- Part 1: Test methods of sprayer nozzles

Matériel de traitement agropharmaceutique -- Équipements de pulvérisation -- Partie 1: Méthodes d'essai des buses de pulvérisation

Ta slovenski standard je istoveten z: ISO 5682-1:1981

ICS:

65.060.40 Oprema za nego rastlin Plant care equipment

SIST ISO 5682-1:1995 **en**

International Standard 5682/1

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Equipment for crop protection — Spraying equipment — Part 1 : Test methods of sprayer nozzles

Matériel de traitement agropharmaceutique — Équipements de pulvérisation — Partie 1 : Méthodes d'essai des buses de pulvérisation

First edition — 1981-07-01

UDC 631.348.45 : 620.1 **Ref. No. ISO 5682/1-1981 (E)**

Descriptors : agricultural machinery, sprayers, agricultural sprayers, tests, performance tests, test equipment, test results.

Price based on 14 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5682/1 was developed by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, and was circulated to the member bodies in November 1977.

It has been approved by the member bodies of the following countries :

Australia	Germany, F. R.	Poland
Austria	India	Romania
Belgium	Iran	South Africa, Rep. of
Bulgaria	Ireland	Spain
Canada	Italy	Sweden
Chile	Korea, Dem. P. Rep. of	Switzerland
Czechoslovakia	Mexico	Turkey
Denmark	Netherlands	United Kingdom
Finland	New Zealand	USSR
France	Philippines	Yugoslavia

The member body of the following country expressed disapproval of the document on technical grounds :

USA

Printed in Switzerland

Equipment for crop protection — Spraying equipment — Part 1 : Test methods of sprayer nozzles

1 Scope and field of application

This International Standard specifies methods for estimating the accuracy of spraying of hydraulic sprayer nozzles, for hydraulic spraying.

It applies to the sprayer nozzles of mounted, towed and self-propelled agricultural sprayers used for crop protection and fertilization.

2 References

ISO 3339/0, *Agricultural tractors and machinery — Classification and terminology — Part 0 : Principles for classification and general definitions.*

ISO 3339/3, *Agricultural tractors and machinery — Classification and terminology — Part 3 : Equipment for sowing, planting and distributing fertilizers.*[1]

3 Test liquids

3.1 Clean water, free from solids in suspension (see tests 6.1, 6.2, 6.3, 6.5).

3.2 Clean water, with the addition of abrasive or corrosive material (see test 6.4).

3.3 Clean water with the addition, if necessary, of a soluble colouring agent (dark coloured aniline dye or similar product) the surface tension of the mixture shall be measured at 20 °C (see test 6.6) and stated in the test report.

4 Apparatus

4.1 Equipment

4.1.1 Pressure gauge, with an accuracy of ± 1 % at the effective working pressure.

4.1.2 Rubber or **plastics hose** for each nozzle.

4.1.3 Collecting vessel for each nozzle.

4.1.4 Measuring tube or **balance**, for measuring the quantity of liquid collected.[2]

4.1.5 Watch, with an accuracy of ± 0,5 s.

4.1.6 Scale, with an accuracy of ± 1 mm.

4.1.7 Angle meter, with an accuracy of ± 0,5°.

4.1.8 Device enabling the nozzles to be moved at a given speed.

4.1.9 Petri dishes.

4.1.10 Microscope, with an measuring accuracy of 10 µm.

4.1.11 Photographic device with electronic flash.

4.1.12 A liquid or **solid surface** suitable for collecting the drops.

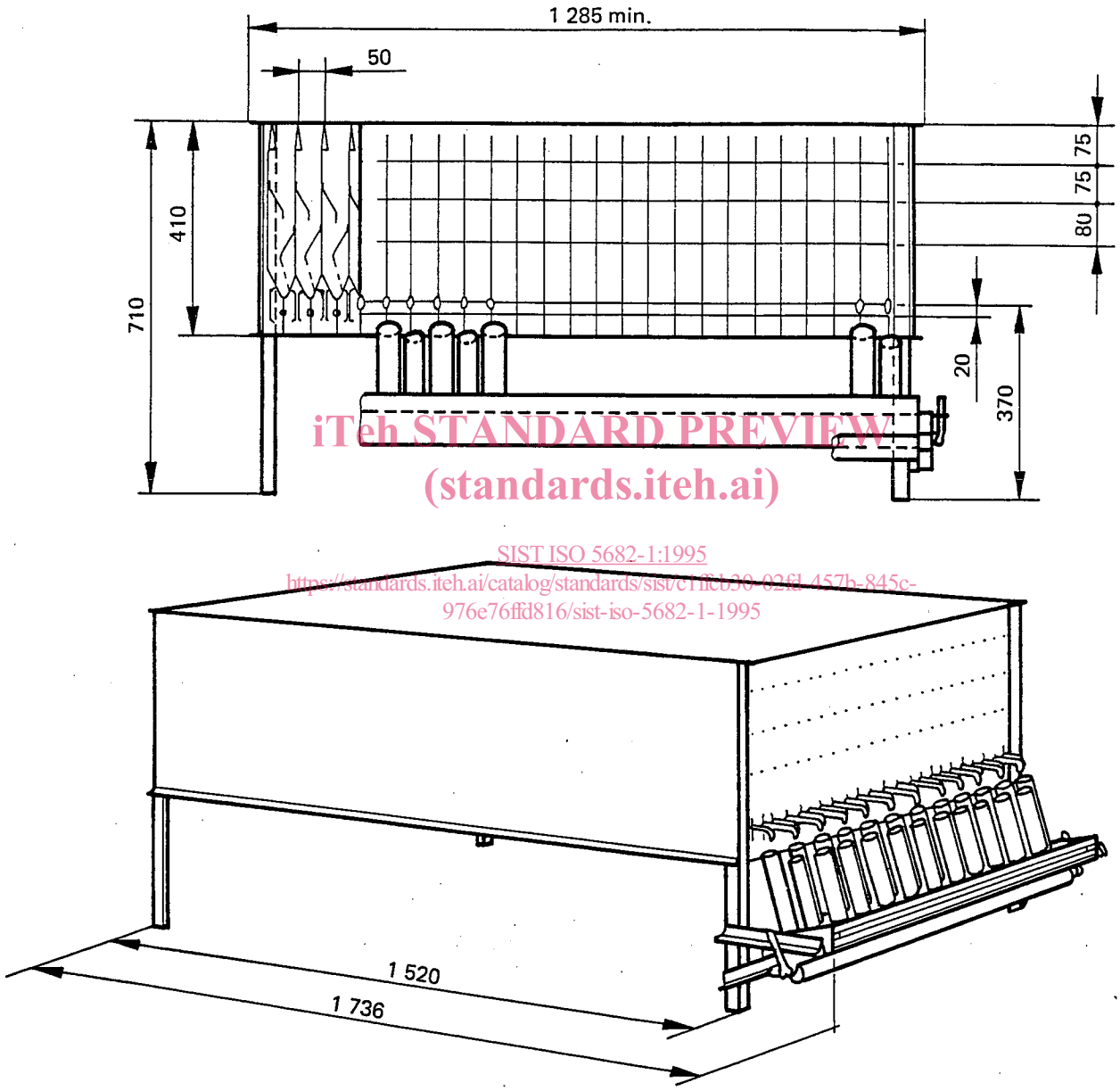
1) At present at the stage of draft.

2) The dimensions of the tube shall be compatible with the requirements of 6.3.4.

4.2 Distribution bench

See figure 1 for an example.

Dimensions in millimetres



NOTE — The distribution bench shall be equipped with a device allowing collection of the liquid when the test pressure is stabilised and the sprayer nozzles are supplied normally.

Figure 1 — Example of a distribution bench

4.2.1 Groove characteristics

a) The walls of the grooves shall be vertical.

b) The upper edges of the walls shall form a plane with, in a longitudinal direction (perpendicular to the grooves), a tolerance of 1 % (10 mm/1 m) on the horizontal and, in the lateral direction (parallel with the grooves), a tolerance of 2 % (see figure 2).

c) Maximum thickness of the groove walls shall be 4 mm.

d) Distance between two consecutive ridges shall be 50 ± 0,5 mm.

e) Minimum height of the vertical walls of the grooves shall be twice the width of the grooves.

NOTE — In the case of a distribution bench composed of grooves spaced at 25 mm intervals, these conditions apply by comparing two adjacent grooves with one 50 mm groove.

The total width of the distribution bench shall not be affected by the accumulation of the tolerances permitted for the upper part of each ridge.

4.2.2 Upper part of the walls

The upper part of the walls is formed by a symmetrical chamfered edge which may be rounded off and shall have the following characteristics :

a) Minimum height of the chamfered edge shall be three times the thickness of the wall.

b) Maximum thickness of the chamfered edge at its upper part shall be 1 mm.

c) Maximum rounding-off radius shall be 0,5 mm.

d) No point of the ridges shall be more than 2 mm above or below the mean plane of the ridges.

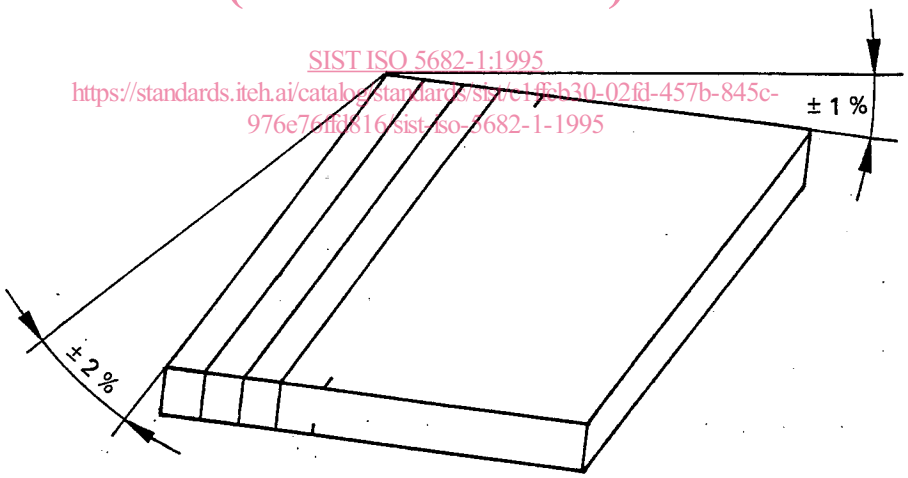


Figure 2 — Groove characteristics

5 General test conditions

All the operational data and test parameters shall be stated in the test report.

5.1 Temperature and relative humidity

The temperature of the test liquid and the air temperature of the test premises shall be between 10 and 25 °C during the test. The relative humidity of the test premises shall be normally not less than 50 %. The temperature and the relative humidity shall be stated in the test report.

5.2 Pressures

During the test period, the pressure used shall not vary more than ± 2,5 % around the mean pressure. The test pressures shall be stated in the test report.

NOTE — The general test conditions shall be resumed for tests 6.1 to 6.6.

6 Determination of the characteristics of the sprayer nozzles

The general test conditions shall be in conformity with those specified in clause 5. For each set, the nozzle with the discharge rate closest to the average value following test 6.1 shall be used for tests 6.2 to 6.6.

6.1 Uniformity of discharge rate of the nozzles

6.1.1 Sampling

Take 20 complete nozzles of the same type at random. The sampling conditions shall be stated in the test report and in particular the size of the stock, the place of sampling, etc.

The complete designation of nozzle discs and tips shall be indicated in the test report.

6.1.2 Test liquid

Use test liquid 3.1.

6.1.3 Measurements

Measure for each complete nozzle the volume discharged at the maximum working pressure indicated by the manufacturer with an error of less than 1 %. The measuring time shall be greater than or equal to 60 s and be measured with an error of less than 1 s.

6.1.4 Results

The result shall be shown in the test report by means of a graph (100 % represented by 50 mm) or table in which the discharge rate of each nozzle is expressed as a percentage of the mean discharge rate of 20 complete nozzles.

6.2 Discharge rates (variations in discharge rate according to the pressure)

6.2.1 Test liquid

Use test liquid 3.1.

6.2.2 Pressure

Use the maximum and minimum pressures indicated by the manufacturer and at least two intermediate pressures. The differences between two consecutive pressures shall be equal and not greater than 0,5 MPa (5 bar).

6.2.3 Measurements

Measure the discharge rate in litres per minute at the pressures indicated in 6.2.2.

6.2.4 Results

The result shall be given in the test report in the form of a graph (the discharge rate shall be indicated on the y-axis and the pressure on the x-axis) or table with the accuracy stated in 6.1.3.

6.3 Distribution of the spray

6.3.1 Test liquid

Use test liquid 3.1.

6.3.2 Pressure

The tests shall be carried out at the maximum and minimum pressures stated by the manufacturer.

6.3.3 Position of the nozzle

During the test, the nozzle shall be positioned vertically above a ridge of the distribution bench and in its normal working attitude to direct its spray onto the bench.

NOTE — If the manufacturer indicates one position, the test shall be made in this position.

The height is measured between the edge of the ridge and the orifice of the nozzle.

If the manufacturer states an optimum height for use, carry out the test at the height stated and at 150 mm above and below. If the manufacturer does not indicate any height for use, carry out the tests at the following heights in millimetres : 400 — 500 — 600 — 700 and if necessary at 300 and 800 mm.

Fan spray nozzles shall be positioned for test so that the longest dimension of the spray pattern is at right angles to the grooves.

Cone spray nozzles shall be tested in two or three positions (see figure 3) :

— in their initial position;

— in a second position resulting from a 90° rotation of the nozzle disc or nut in its assembly;

— in a third position when the spiral can turn in relation to the disc, the nozzle shall be reassembled with the swirl plate turned through 90° in relation to the disc as mounted in position (2) below.

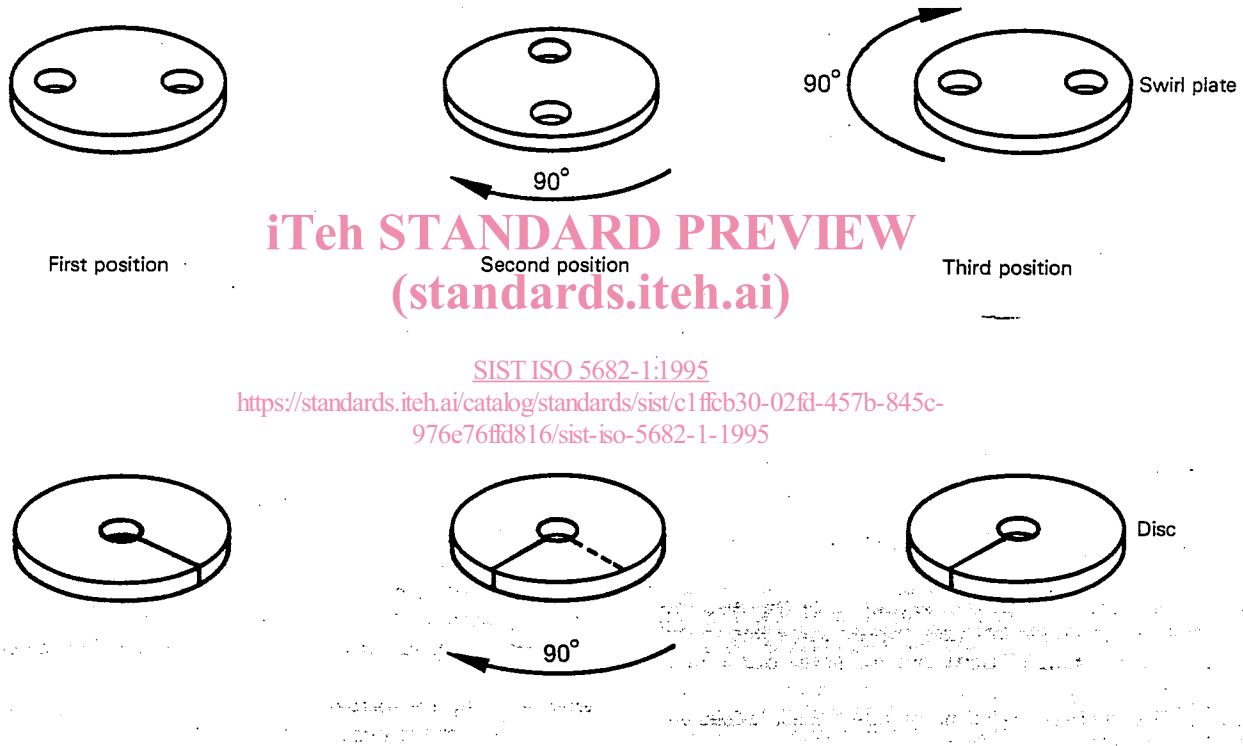


Figure 3 — Test position for cone spray nozzles