INTERNATIONAL STANDARD

ISO 8947

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Agricultural machinery — Equipment for working the soil — S-tines: test method

Matériel agricole — Matériel de travail du sol — Méthode d'essai des dents de cultivateurs de type S

Reference number
ISO 8947:1993(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.

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 8947 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Sub-Committee SC 5, *Equipment for working the soil.*

Annex A forms an integral part of this International Standard.

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Agricultural machinery — Equipment for working the soil — S-tines: test method

1 Scope

This International Standard specifies the test method for S-type cultivator tines used in working the soil. The aim of the test is to give reproducible results to compare the quality of S-tines.

It applies to S-tines as specified in ISO 5678; the test method can also be used to test other similar products.

2 Normative references

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

ISO 5678:1993, *Agricultural machinery — Equipment for working the soil — S-tines: main dimensions and clearance zones.*

ISO 5680:1979, *Equipment for working soil — Tines and shovels for cultivators — Main fixing dimensions.*

3 Test procedure

Not less than 20 tines of the same type and manufacturer are needed for the tests. The tines should preferably be taken from the batch by test staff.

The tests shall be carried out with tines without shovels, except for the variation in working depth (see 3.4). Results reported shall be the averages of three tines tested in each case. The tests indicated in 3.1 to 3.6 shall be carried out.

3.1 Dimensions

Check the dimensions of five tines for compliance with the dimensions given in ISO 5678 and ISO 5680. Report any deviations.

3.2 Bending in direction of travel

Attach the tine to the test rig, in accordance with the manufacturer's instructions, so that the tine position will be as in the working position. Use those attachments which are delivered with the tine. Apply a horizontal load on the front side mid-point of the shovel lower fixing hole (see figure 1).

Apply the following static loadings, F, in newtons:

50; 100; 200; 300; 400; 500; 600; 700; 800; 900; 1 000

Measure and record the distance the tine bends, a, in the loading direction, for each loading. This distance a is measured at the centre of the shovel lower fixing hole, on the front side of the tine.

3.3 Lateral bending

Attach the tine to the test rig and apply a load perpendicular to the tine on the front side mid-point of the shovel lower fixing hole (see figure 2).

Apply the following static loadings, F, in newtons:

50; 100; 200; 300; 400; 500; 600

Measure and record the distance the tine bends, b, in the loading direction, for each loading.

3.4 Variation in working depth and in soil penetration angle

Variation in working depth, c, shall be tested on tines equipped with the standard shovels, i.e. with the shovels with which the tines are sold.

Attach the tine and apply a load as in 3.2. Apply the following loadings, in newtons:

50; 100; 200; 300; 400; 500; 600; 700; 800; 900; 1 000

Measure and record the variation in working depth, c, at the shovel point for each loading (see figure 3). At the same time, measure and record the variation of the soil penetrating angle, α, in degrees, of the shovel. The angle of penetration of the shovel into the soil is measured between the horizontal surface and perpendicular to the axis of the lower fixing hole.

3.5 Permanent deformation

Attach the tine and apply a load as in 3.2. Apply the following loadings, in newtons:

500; 1 000; 1 500; 2 000; 2 500; 3 000; 3 500; 4 000; 4 500; 5 000

Release the load after each loading, and measure and record the permanent deformation, d, in the same manner as a in figure 1.

3.6 Fatigue test

Subject a tine to sinusoidal stresses with a frequency of 6 Hz. Carry out 2×10^6 strokes: if the tine remains unbroken in this test, it shall be regarded as unbreakable.

Set a stroke length equal to the bending of the tine with a load of 1 000 N as determined in 3.2 plus a pretension of 20 mm (see figure 4).

4 Test report

The results obtained in 3.1 to 3.6 shall be given in a test report: an example of a format is shown in annex A.

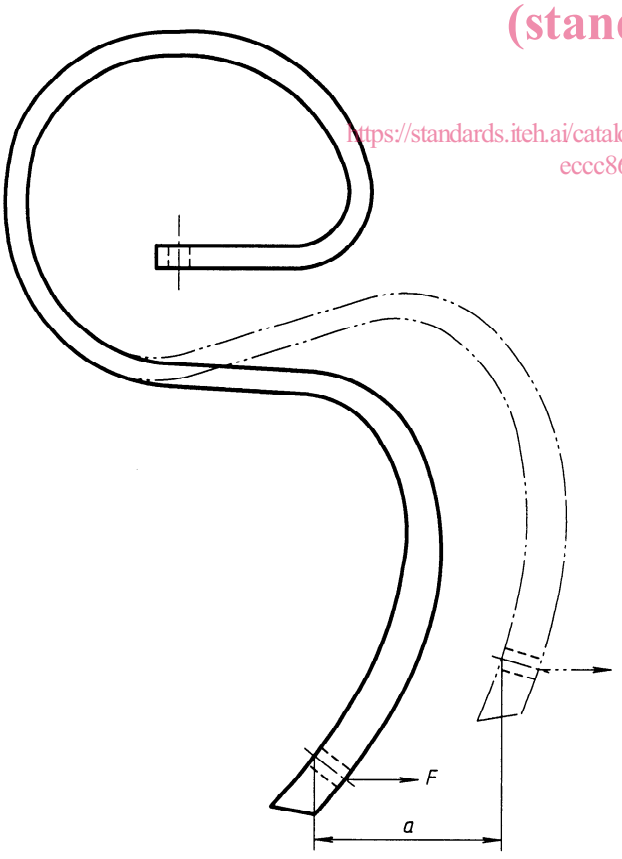

Figure 1 — Bending in direction of travel

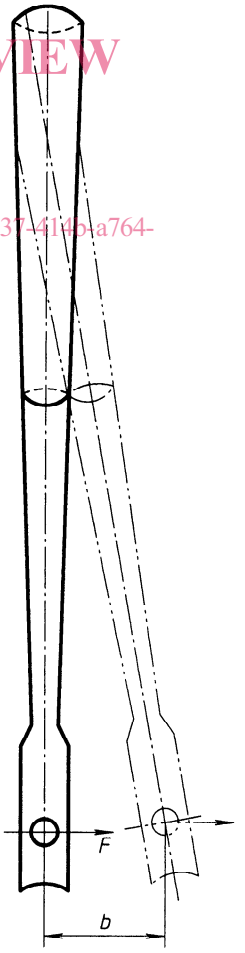

Figure 2 — Lateral bending

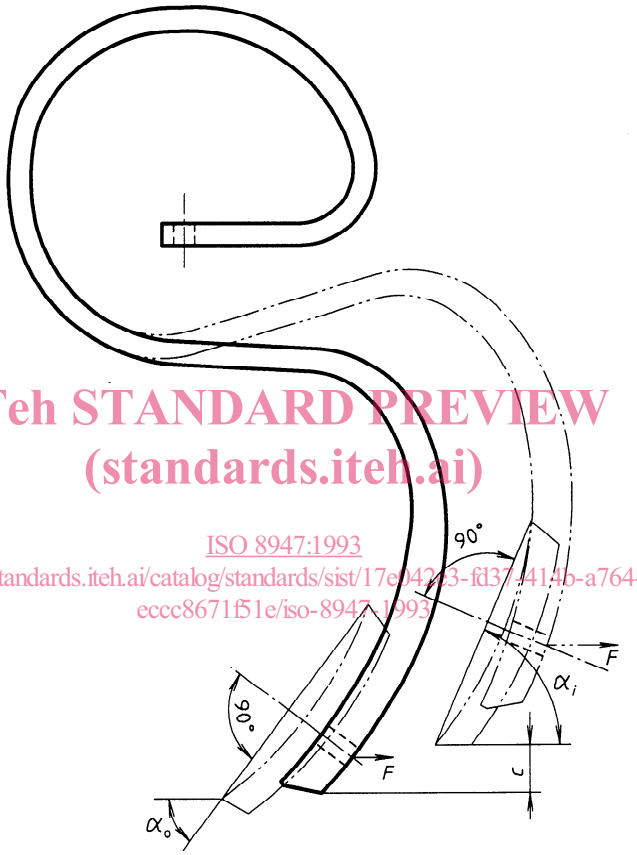

Figure 3 — Variation in working depth and in soil penetrating angle

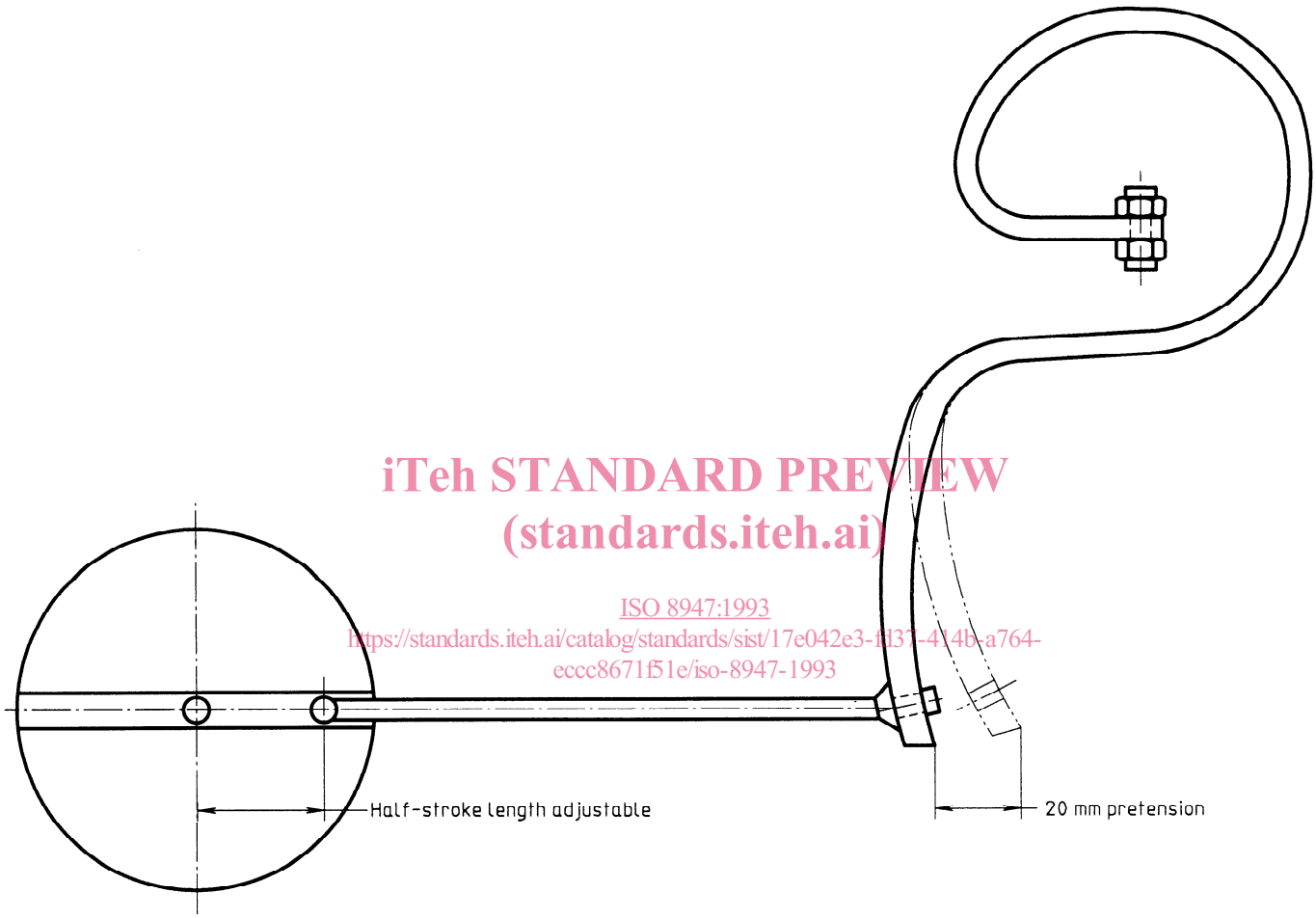

Figure 4 — Rig for fatigue test

Annex A
(normative)

Example for test report for S-tines in accordance with ISO 8947

A.1 Dimensions

Compliance with the dimensions of ISO 5678 and ISO 5680 is confirmed, with the following deviations: .....

A.2 Bending in direction of travel

Loading, F	N	50	100	200	300	400	500	600	700	800	900	1 000
Bending, a	mm											

A.3 Lateral bending

Loading, F	N	50	100	200	300	400	500	600
Bending, b	mm							

A.4 Variation in working depth and in soil penetration angle

Loading, F	N	50	100	200	300	400	500	600	700	800	900	1 000
Variation in depth, c	mm											
Variation in angle, $\alpha_i - \alpha_o$	°											

A.5 Permanent deformation

Loading, F	N	500	1 000	1 500	2 000	2 500	3 000	3 500	4 000	4 500	5 000
Deformation, d	mm										

A.6 Fatigue test

With a stroke length equal to the initial bending for a load of 1 000 N plus a pretension of 20 mm, number of strokes at breaking: .....

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Descriptors: agricultural machinery, tilling equipment, cultivators, cultivator tines, tests.

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