INTERNATIONAL STANDARD

ISO 12194

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Leaf tobacco — Determination of strip particle size

Tabac en feuilles — Détermination de la taille des particules de strips

Reference number
ISO 12194:1995(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 12194 was prepared by Technical Committee ISO/TC 126, *Tobacco and tobacco products*, Subcommittee SC 2, *Leaf tobacco*.

Annexes A to C of this International Standard are for information only.

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Leaf tobacco — Determination of strip particle size

1 Scope

This International Standard specifies a method for the measurement of the particle size of strips of leaf tobacco.

It is applicable to strips arising from the operation of threshing or hand-stripping leaf tobacco, which can be from any tobacco type including flue-cured, burley and cigar tobacco.

The test method consists of taking a sample of strips and passing it over a four-tray quality-control shaker.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was 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 edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3310-1:1990, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 lamina: Area between the veins of a tobacco leaf.

3.2 strips: Long pieces of threshed or stripped lamina.

3.3 threshing: Removal of the stem and side veins of tobacco leaves by mechanical means.

3.4 stripping: Removal of the stem from tobacco leaves, leaving the halves of the leaf more or less intact.

3.5 quality-control shaker: Apparatus that separates the strips into five particle sizes by passing them over four screens.

4 Apparatus

4.1 Quality-control shaker

The quality-control shaker consists of a feedband conveyor, four sieving trays, and a fines-collection bin, all of which are mounted on a robust frame. Separation is carried out by vibrating the four trays, each of which is fitted with a different mesh screen. These are arranged above each other in such a way that particles falling through one screen are exposed to at least 660 mm of the next screen. Any strips passing over a screen are automatically collected in separate bins at the end of each shaker screen. A diagram of the general design of the quality-control shaker is shown in figure 1.

4.2 Sieving screens

4.2.1 The four screens fitted to the quality-control shaker should be of wire mesh, constructed from stainless steel in accordance with the specification given in ISO 3310-1. The screens shall have the dimensions given in table 1. Diagrams of the screen set-up are shown in annex A.

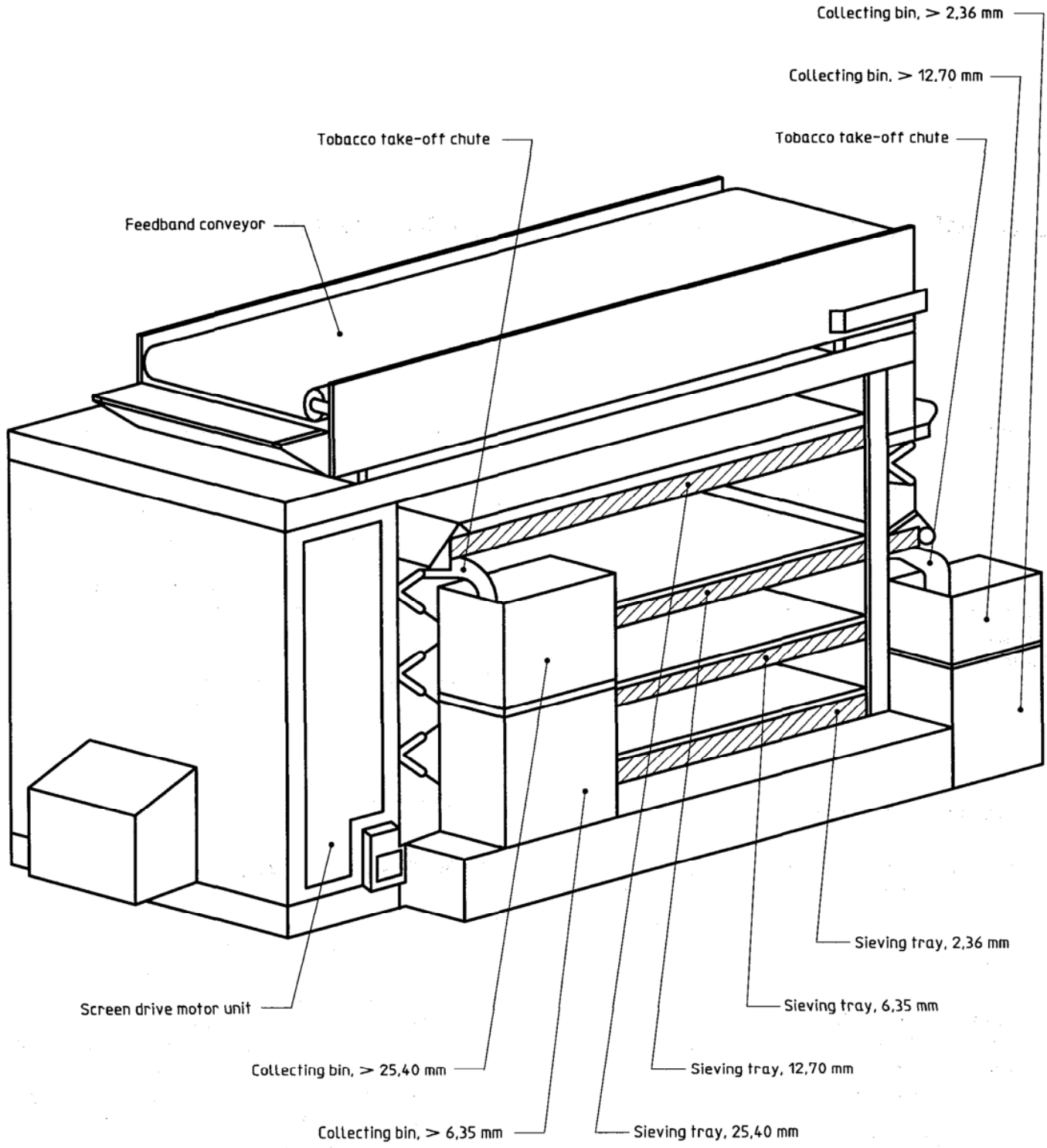


Figure 1 — General design of the quality-control shaker

Table 1 — Dimensions of screens

Size mm	Sieve opening mm	Wire diameter mm	Open area %
25,40 × 25,40	25,40	3,80	75,9
12,70 × 12,70	12,70	2,67	68,3
6,35 × 6,35	6,35	1,82	60,3
2,36 × 2,36	2,36	1,00	49,0

NOTE — All screens are single crimp except for the 2,36 mm × 2,36 mm screen which is plain weave.

4.2.2 The frequency of vibration of the screens shall be set at (525 ± 5) vibrations per minute. This is accomplished by changing the pulleys on the motor and/or the eccentric drive shaft to give a drive shaft speed of (525 ± 5) r/min. The speed of this shaft should be checked with a tachometer.

4.2.3 The stroke of each screen shall be (13,1 ± 1,2) mm as measured by the use of a stroke diagram. The method is described in annex B. The measurements shall be taken whilst the drive shaft is running at (525 ± 5) r/min.

On any one machine, the stroke should remain constant. If the measured strokes are found to be outside the tolerance, then check that there is no slackness in the drive mechanism and that the suspension mountings are secure (very small amounts of slack in a key can cause considerable loss of motion).

Errors in stroke might also be due to incorrect tray mass or spring stiffness.

4.3 Feedband

Adjust the feedband so that the sample of tobacco covering the band will be discharged in (450 ± 5) s.

4.4 Collecting bins

Ensure that each collecting bin has the same net mass.

4.5 Breaker bars

The quality-control shaker (4.1) should be fitted with breaker bars to break up any lumps of lamina that fall from the feedband. Diagrams showing examples of the bars are shown in annex C.

5 Sampling

5.1 The sample mass for flue-cured cigarette lamina and for burley lamina shall be (3 000 ± 300) g for each, and the sample mass for cigar lamina shall be (1 000 ± 100) g.

If the mass of the sample is outside the appropriate limits, reject the sample and draw a fresh one. If the sample is within limits, record the mass and pass it on for testing.

5.2 The majority of strip samples for particle-size testing are taken at the end of the threshing line as a quality-control measure. The moisture content of the samples generally ranges from 16 % to 20 %.

Tobacco strips for testing may also be sampled from the exit of the redryer and from the packed case or hogshead. Samples may also be taken and tested before and after blending of the strips during cigarette manufacture.

The sampling and handling of dry lamina shall be carried out carefully to avoid degradation.

6 Procedure

Ensure that sieve screens (4.2) are free of tobacco particles and that the tared collection bins (4.4) are correctly placed at the discharge outlets.

Spread the sample evenly over the entire surface of the feed conveyor. Start the sieve and then the feedband (4.3).

When the total sample has passed over the top screen, pass a soft brush gently over the breaker bars (4.5) and then over the top screen, thus freeing all trapped particles of tobacco and allowing them to pass over the remaining screens. Repeat for the remaining screens. Stop the sieve and feedband when all the tobacco has been collected in the tared bins.

Weigh the collected samples to the nearest gram. Record each mass under the headings:

on the 25,40 mm screen

on the 12,70 mm screen

on the 6,35 mm screen

on the 2,36 mm screen

below the 2,36 mm screen

Check that the sum of the individual masses is within ±50 g of the initial sample mass. If this is not so, discard the test and repeat with a new sample.

Express the individual masses as a percentage of the sum of the individual masses. Do not calculate the percentages using the initial mass of the sample.

7 Expression of results

The general formula for determining the percentage of each individual mass is:

$$\frac{m_i}{\sum_i m_i} \times 100$$

where

m_i is the individual mass, in grams, of the tobacco collected on each screen;

$\sum_i m_i$ is the sum of the individual masses, in grams.

8 Test report

The test report shall specify the result(s) obtained. It shall also mention all operating details not specified in this International Standard or regarded as optional, together with details of any incidents which may have influenced the test result(s).

The test report shall include all information necessary for the complete identification of the sample.

Annex A
(informative)

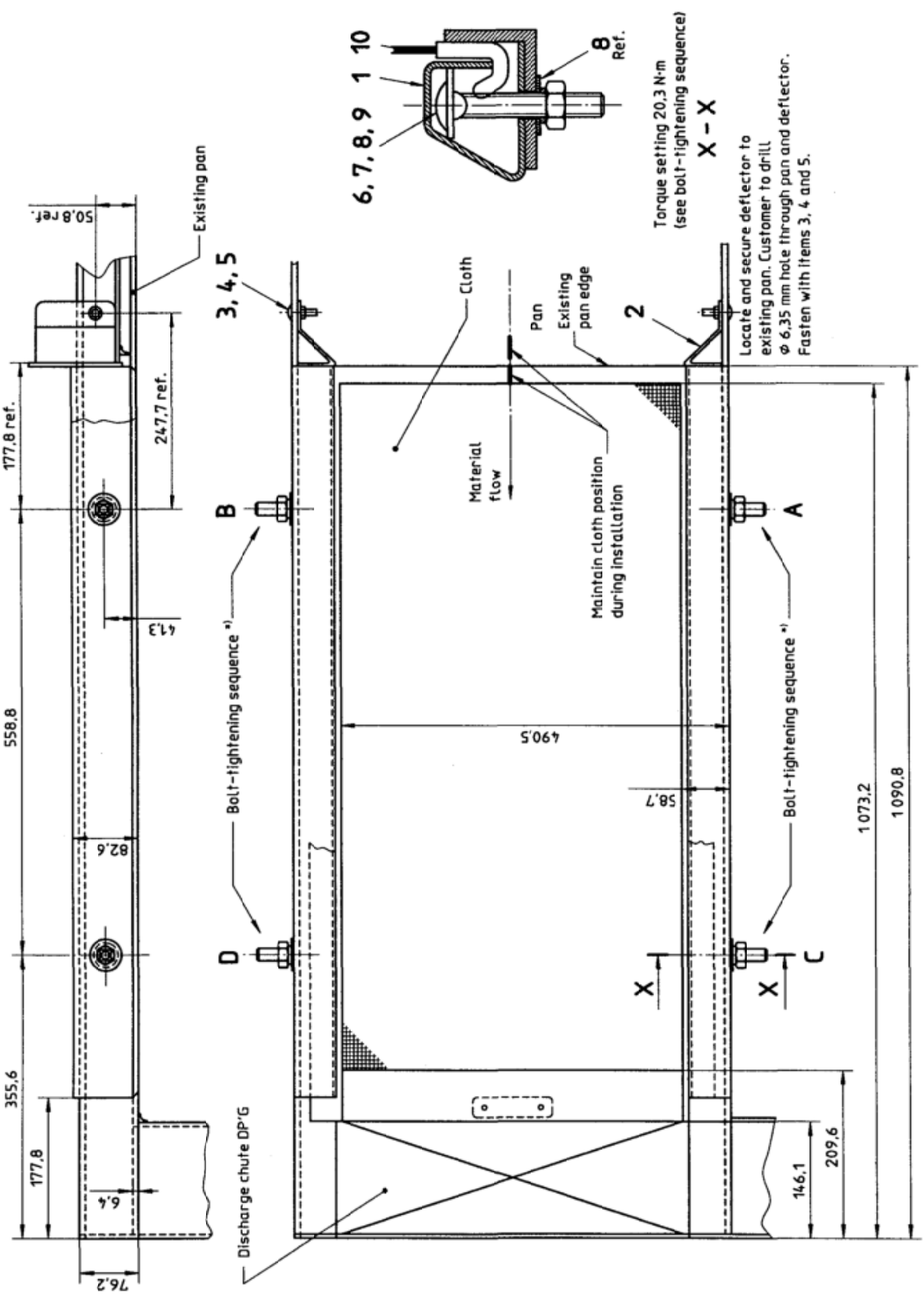
Typical sieving screen set-ups

Figures A.1 to A.3 show diagrams of typical sieving screen set-ups available commercially.

They show the OCT/W.S. Tyler screen conversion kit, Cardwell-type lab. shaker retrofit.[1)]

1) This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the equipment named.

Dimensions in millimetres

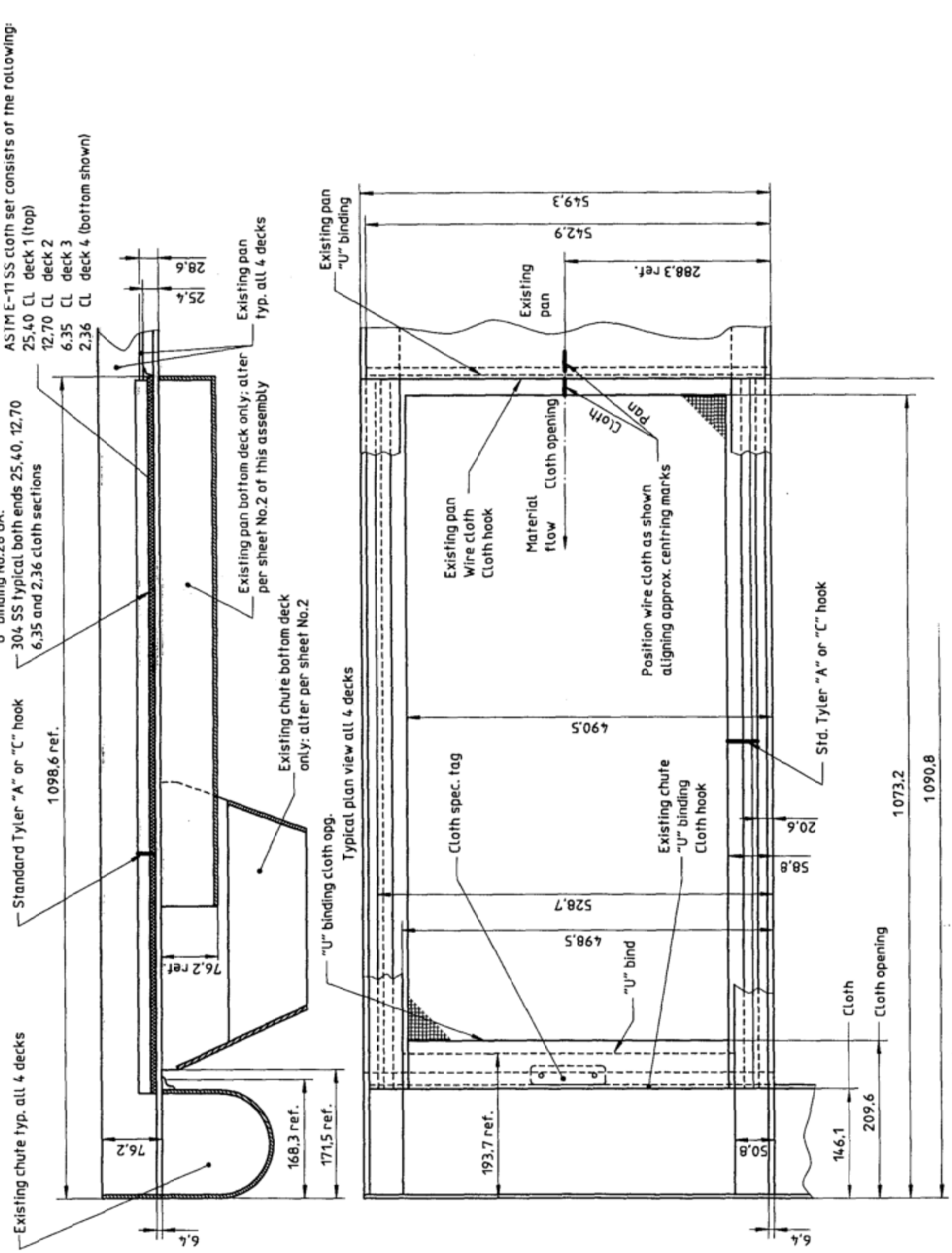


*) Sequence
1) Position cloth item No.10: centre and length.
2) Finger-tight bolts MK'D, A, B, C, D maintaining centre position.
3) Tighten item No.7 hex nut in alternating pairs A–B, C–D, A–B, C–D, etc.

Assembly number	Item	Part number	Quantity	Description of part
107101	1	REP.	8	Tension rail
	2	107107	8	Deflector
	3	107241	8	Screw
	4	ZA11082	8	Hex nut
	5	ZA11092	8	Lockwasher
	6	ZA11053	16	Carr. bolt
	7	ZA11055	16	Heavy hex nut
	8	ZA11114	16	Flat washer
	9	ZA11096	16	Lockwasher
©	10	108280	1	Sieve cloth set
© M	11	107437	1	Bottom rake assembly
© M	12	107438	1	Hopper extension
M: Items not shown.				

Figure A.1 — Conversion kit installation
(typical for all four decks)

Dimensions in millimetres



Step	Assembly sequence	Assembly sheet No.
1	Remove alternate cloth sections	
2	Alter bottom deck	2
3	Alter all 4 decks: locate mounting holes for Tyler conversion kit	3
4	Position Tyler cloth sections Mark centres	1
5	Assemble Tyler conversion kit	3

Figure A.2 — Tyler cloth location
(typical for all four decks)

Dimensions in millimetres

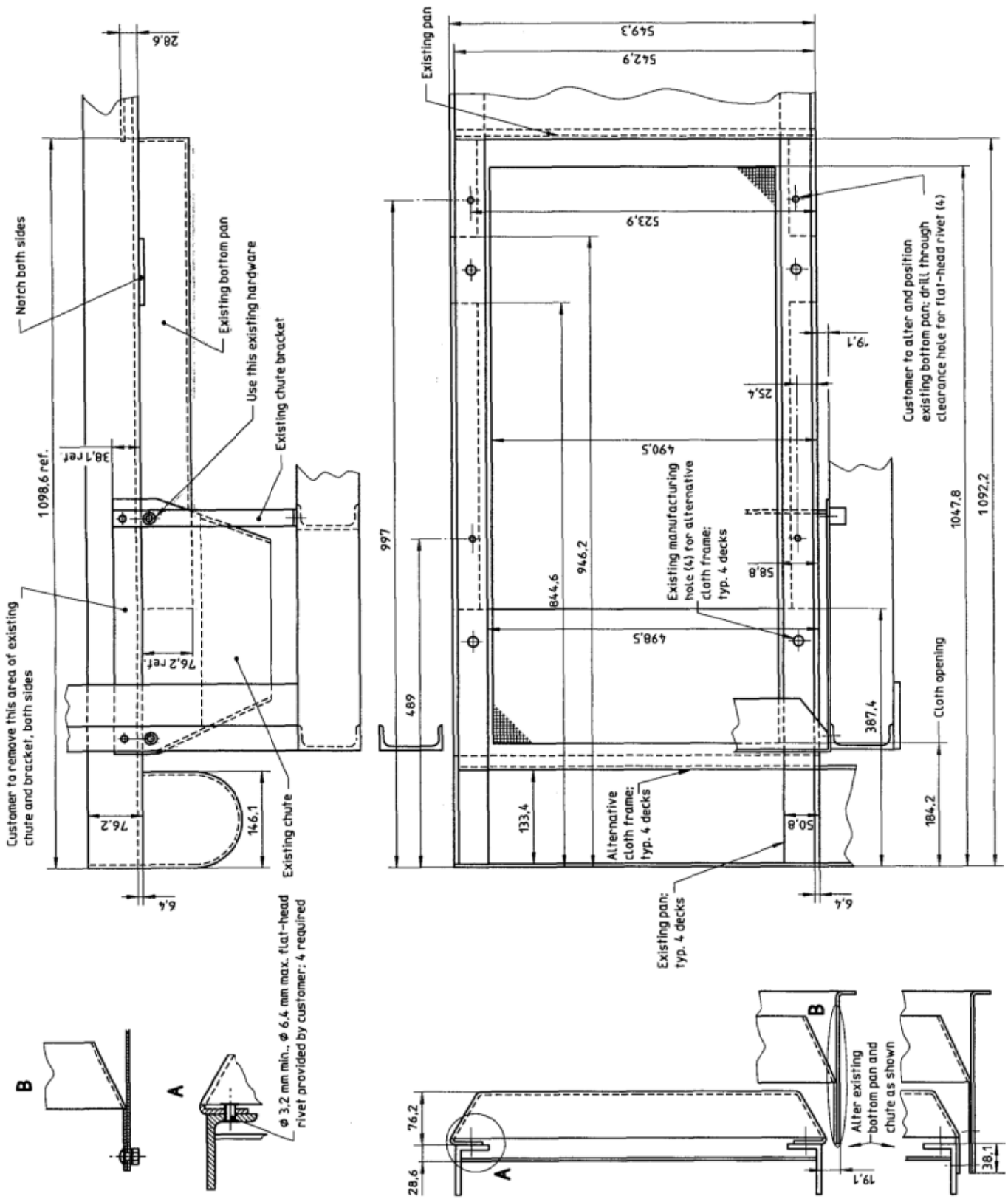


Figure A.3 — Alternative bottom deck

Annex B
(informative)

Method of checking screen stroke

B.1 Procedure

The strips are mounted on the sides of each screen in the centre. With the machine running at (525 ±5) vibrations per minute, observe the circles (see figure B.1). During running, one observes two circles at each position which appear to overlap to varying degrees. Note the reading of the circle where the circumferences of the pair just touch but do not overlap. For correct operation, this should give a reading of (13,1 ± 1,2) mm. If the machine is operating outside this range, check for slackness in the drive mechanism, tray mass or spring stiffness.

B.2 Routine check

Check once a day that the stroke of each screen is correct.

Check once a day that the speed of the eccentric drive shaft is (525 ± 5) r/min.

Check once a day that the screens are not distorted in any way. The screen must be replaced by a screen conforming to ISO 3310-1 as soon as there is a visible sign of wear or damage.

Check once a day that the tobacco discharge time is (450 ± 5) s.

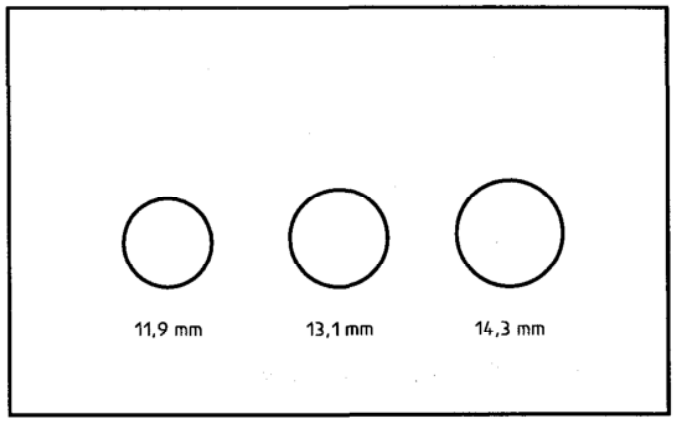
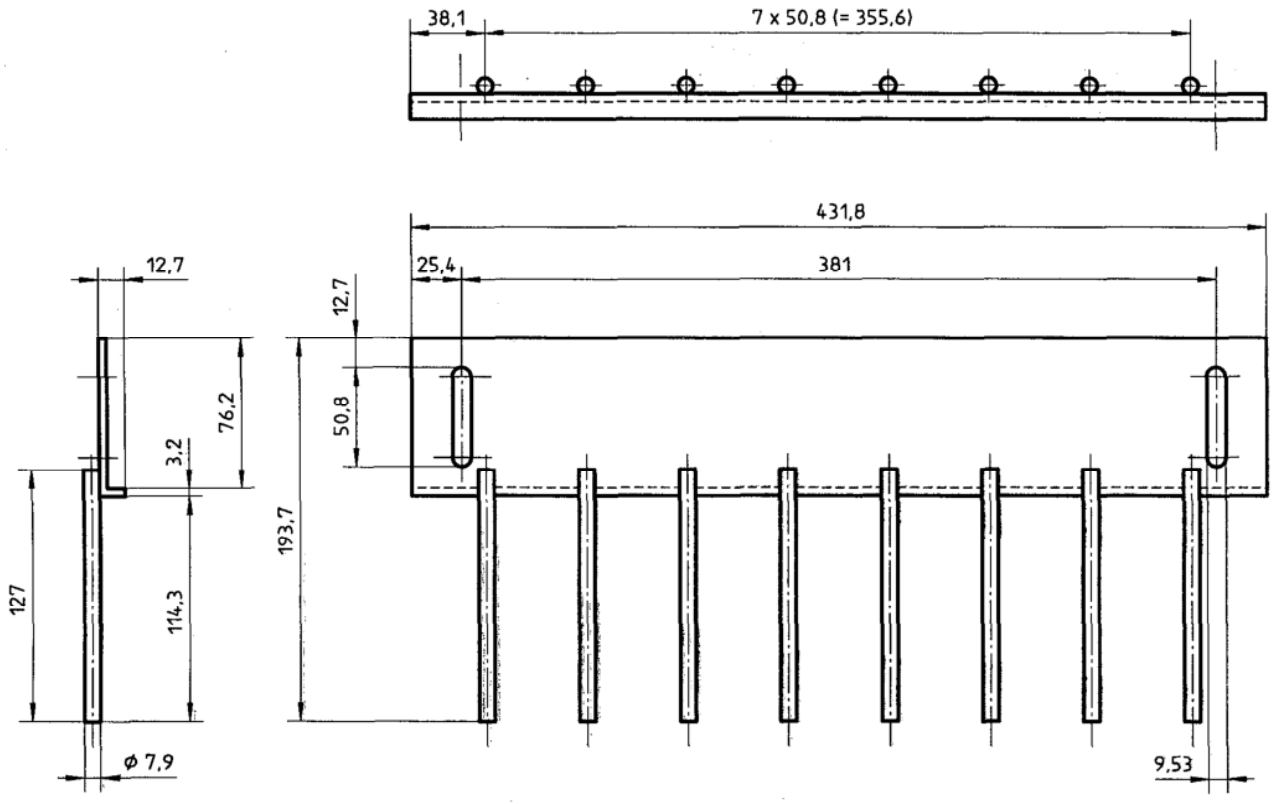


Figure B.1 — Stroke indicator

Annex C
(informative)

Design of breaker bars

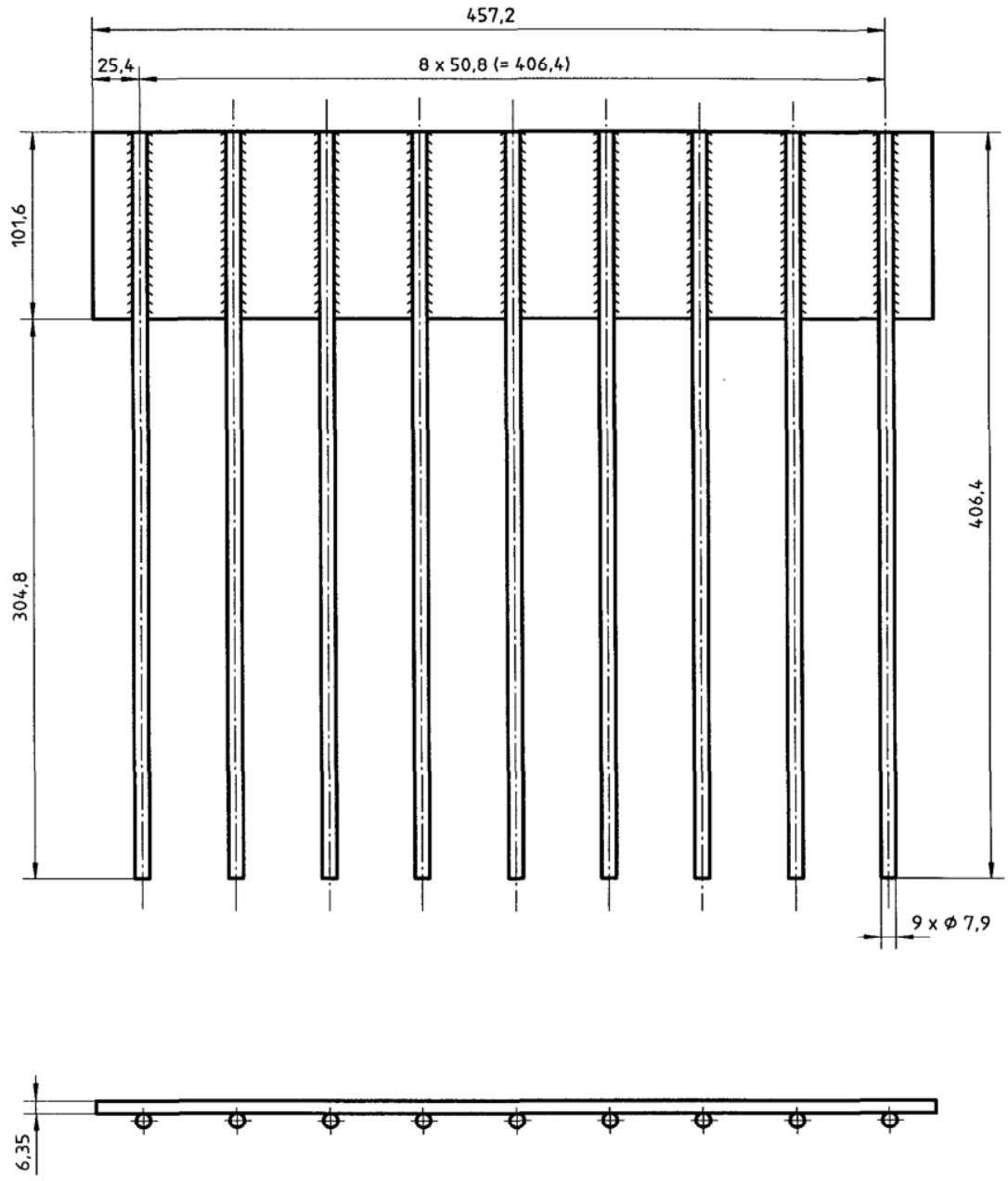
Dimensions in millimetres



NOTE — Vertical fingers of this unit should be installed exactly 50,8 mm above the horizontal fingers of the spreader assembly.

Figure C.1 — Breaker bars, example 1

Dimensions in millimetres



NOTE — Spreader is clamped between existing angle on top deck flush with rear edge.

Figure C.2 — Breaker bars, example 2

ICS 65.160

Descriptors: tobacco, leaves, tests, determination, particle size, sieve analysis.

Price based on 13 pages