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Methods for Verification of Equipment Criteria for Floorball

Abstract

The purpose of this document is to specify verifying testing methods to be used in connection with certification of floorball equipment. These methods, as well as the rules for certification of floorball equipment, have been compiled by the Swedish National Testing and Research Institute in collaboration with the Swedish Floorball Federation in consideration of functional and safety requirements.

The specified methods deal with sticks, balls, goals, rinks and face mask. The methods were chosen on basis of revised rules for floorball according to SP report 93M30974, and were adapted to product certification (P-marking) at SP.

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Method Description**Polymer Technology**

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Summary

This document specifies the applicable methods used in connection with the certification of floorball equipment. The methods in this report, together with the current certification rules, have been presented by SP in collaboration with the Swedish Floorball Federation with consideration taken to functional and safety requirements. The methods have been revised following a full-scale validity of 2-year period.

The specified methods deal with sticks, balls, goals, rinks and face masks. The methods constitute a revised version of methods in line with SP-assignment 93M30974, and are adapted to SP's procedure for P-marking.

1 Objective

The objective of this document is to specify applicable methods of use in connection with the certification of floorball equipment. The specified methods cover sticks, balls, goals, rinks and face masks. The methods have been presented by SP in conjunction with the Swedish Floorball Federation with primary consideration taken to functional and safety aspects.

2 Background

Floorball is a relatively new and increasingly popular sport in Sweden. The equipment used is characterised by a wealth of variation and a high level of development, clearly demonstrated by for instance a large variety of sticks.

The aim of the Swedish Floorball Federation (SFF) is to manage and control the development of the equipment under the prevailing circumstances. SP has thereby reviewed the equipment criteria in the rule book and formulated a method for verification testing (report 93M30974). The method has subsequently been revised with the information gained from a 2-year evaluation period.

In the process of formulating verification testing methods, special consideration was taken to (a) their suitability both in connection with type testing and an continuous inspection procedure for P-marking and (b) the possibility of implementing a in-house inspection at the manufacturer and supplier with the simplest possible equipment.

3 Purpose, Area of Use

The purpose of the testing methods is to guarantee the quality, attributes, dimensions and safety aspects of floorball equipment. The proposed methods represent the basis for certification of floorball equipment with respect to P-marking.

4 References

ISO 291-1977 Standard atmospheres for conditioning and testing.

SFA's rules handbook.

Swedish Ice Hockey Association testing methods.

ASTM D 2444-84 - Standard Test Method for Impact Resistance of Thermoplastic Pipe and Fittings by means of a Tup (Falling Weight)

ASTM D 4476-85 - Flexural Properties of Fiber Reinforce Pultruded Plastic Rods

BS 1892:Part 2: Section 2.11:1989 - Gymnasium equipment, Specification for practice and games netting and supporting trackways

ISO 8295 Plastics - Film and Sheeting - Determination of Coefficient of Friction

prEN 967 point 6.6 Determination of penetration characteristics

prEN 967 point 6.7 Face protectors - Determination of rigidity

5 Testing

5.1 In General

5.1.1 Testing Climate

The tests are to be carried out at 23 ± 2 °C and 50 ± 5 % RH unless otherwise stated.

5.1.2 Length Measurement

The following accuracy and rounding off factors are applicable unless otherwise stated:

≤ 10 mm	accuracy ± 0.1 mm, rounded off to 0.1 mm
≤ 100 mm	accuracy ± 0.1 mm, rounded off to 0.2 mm
≤ 1000 mm	accuracy ± 0.5 mm, rounded off to 1.0 mm
> 1000 mm	accuracy ± 1.0 mm, rounded off to 2.0 mm

5.1.3 Weight Measurement

The following accuracy and rounding off factors are applicable unless otherwise stated:

≤ 100 g	accuracy ± 0.1 g, rounded off to 0.2 g
≤ 1000 g	accuracy ± 0.5 g, rounded off to 1.0 g
≤ 10000 g	accuracy ± 1.0 g, rounded off to 2.0 g
> 10000 g	accuracy ± 5.0 g, rounded off to 10.0 g

5.2 Stick

5.2.1 Scope and Application

The purpose of the tests detailed below is to guarantee the quality of the stick with regard to design, weight, blade discoloration onto the playing surface and dimensions as well as certain mechanical attributes such as rigidity, impact strength and fracture susceptibility (shaft).

The dimensions of the blade of the stick and the size of the mesh on the face mask are interconnected, for the purpose of preventing the blade from penetrating the face mask.

5.2.2 Stick Design

5.2.2.1 Equipment

Sponge of polyurethane.
(E.g. car sponge without detergent.)

5.2.2.2 Samples

Three sticks.

5.2.2.3 Implementation

The sticks are examined both visually and with the aid of a sponge. The sponge is applied to the surfaces to detect possible rough edges and sharp objects e.g. protruding supports or an edge radius below 2 mm. Any possible coupling between the shaft and blade is inspected with respect to its design.

5.2.2.4 Results

The occurrence of sharp objects and rough edges is reported.

5.2.3 Stick Weight

5.2.3.1 Equipment

Scales with an accuracy of ± 0.5 g.

5.2.3.2 Samples

Three sticks.

5.2.3.3 Implementation

The weight of the sticks is determined by means of weighing scales. If the sticks weigh under 380 g including grip binding, the weight can be reported. If the sticks weigh over 380 g including grip binding, the grip binding is removed and the stick is re-weighed.

5.2.3.4 Results

Individual measurement values rounded off to 1 g are reported. If the value reported includes the grip binding this is to be specified in the report.

5.2.4 Stick Dimensions

5.2.4.1 Equipment

Suitable equipment for length measurements, e.g. steel rule, measuring tape, sliding callipers and equipment for measuring the blade's penetration depth as well as the blade's concavity depth (appendix 1) with an accuracy factor specified in section 5.1.2.

5.2.4.2 Samples

Three sticks.

5.2.4.3 Implementation

Stick dimensions are measured according to appendices 2 and 3.

- a) stick length
- b) the shaft's curve radius
- c) length to the bully line
- d) width of bully line
- e) stick radius
- f) blade edge radius
- g) blade length
- h) blade thickness
- i) blade height
- j) blade penetration depth
- k) blade concavity depth

5.2.4.4 Results

Individual results reported are rounded off as specified in section 5.1.2.

5.2.5 Shaft Rigidity

5.2.5.1 Equipment

Universal testing machine with a velocity of 200 mm/min during testing.
Printer or similar device to determine the deflection for various load factors.
Cylindrical supports mounted in bearings with 35 ± 10 mm diameter for 3-point deflection test with 800 mm between the centre of the supports. Cylinder with 35 ± 10 mm diameter for applying the force.
All the cylindrical supports are to have a lowering mechanism with 15 ± 5 mm radius (appendix 4) where the shaft is located.

5.2.5.2 Samples

Six sticks.

5.2.5.3 Implementation

The stick is placed on the support without being attached. The load is applied by 200 mm/min in the middle of the shaft to a deflection of 60 mm whilst a force/displacement diagram is taken. The stick is to be loaded in 2 directions, with the point of the blade both vertical and horizontal. The shaft's resulting deformation following deflection is registered, whereby the value is read after 10 seconds. Three sticks are tested in each direction.

5.2.5.4 Results

The individual value of the deflection at 300 N rounded off to whole mm. Any occurrence of fracture is to be reported, otherwise the individual value of the force is reported at 60 mm deflection in N.

The individual value of the resulting deformation following deflection is rounded off to whole mm.

5.2.6 Impact Strength

5.2.6.1 Equipment

Drop hammer with a weight of 350 ± 10 g. The head is to be of hardened steel and have a 7 mm radius. A stand with a drop height of 1000 ± 5 mm, from where the hammer is to be able to fall freely. A mechanism for repeat releasing of the drop hammer. Test holder of aluminium or steel and designed as a V-block with a length of 150 mm and inner 90° angle, with sufficient depth to enable the stick to lie in the dip and not on the edges.

5.2.6.2 Samples

Six sticks. Those sticks tested as per point 5.2.5, where fracturing or any type of deformation did not occur can, in theory, be used for impact testing.

5.2.6.3 Implementation

The testing is carried out in two places on the stick, 700 mm from the end of the shaft, and 40 mm from the blade attachment. The stick is placed in the holder with the point of the stick blade vertical. The drop hammer is released 1000 ± 5 mm towards a point 700 mm from the end of the shaft. The test is carried out on 3 sticks. The stick is placed in the holder with the blade narrowly outside with its point directed vertically. The drop hammer is released 40 mm along the shaft taken from the blade attachment (appendix 5).

5.2.6.4 Results

Any cracks or fractures are reported.

5.2.7 Blade Radii

5.2.7.1 Equipment

Measurement device with a radius of 2 mm and 260 mm.

5.2.7.2 Samples

Three blades.

5.2.7.3 Implementation

Using the 2 mm measuring device, the peripheral radii around the blade are checked. Using the 260 mm measuring device, the bottom edge radius of the blade is checked.

5.2.7.4 Results

Occurrences of radii < 2 mm are reported.
Bottom edge radius > 260 mm is reported.

5.2.8 Blade Discoloration onto Playing Surface

5.2.8.1 Equipment

Pendulum apparatus, described in appendix 6. The mass of the bar, weight and test bit are to be such that the energy the stopping disc is met with is 36 ± 1 Nm. The spring constant C is $3.5 \cdot 10^4$ N/m. Lacquered sport parquet to be at least as high and at least as wide as the stopping disc.

The sport parquet construction: At the bottom 6 mm plywood, intermediate layer 12 mm ribbed pinewood sheeting, wearing course 3.6 mm beech and five layers UV-hardened lacquer, Bona Kemi Pacific 1 SM (E.g. Tarkett Sport).

5.2.8.2 Samples

Three stick blades. The end of the blade truncated to length of 100 mm.

5.2.8.3 Implementation

The test bit is permanently mounted on the pendulum so that the end blade, when lowering the pendulum, moves towards the stopping disc 1/3rd from the top edge of the disc. The pendulum is released from an upright position. The test disc is inspected with regard to discoloration – the European scale for colour coding is used as a colour reference. Three tests are carried out, replacing the test disc or movement in the horizontal axis is to occur following each impact.

5.2.8.4 Results

Occurrence of discoloration onto the test disc is reported.

5.3 Ball

5.3.1 Scope and Application

The purpose of the tests listed below is to guarantee the quality of the ball with regard to weight, dimensions, rebound and strength.

5.3.2 Ball Weight

5.3.2.1 Equipment

Scales with accuracy ± 0.1 grams.

5.3.2.2 Samples

Five balls.

5.3.2.3 Implementation

A scale is used to determine the weight of balls.

5.3.2.4 Results

Results are reported as individual measured results, rounded off to 0.5 grams.

5.3.3 Ball Dimensions

5.3.3.1 Equipment

Circometer or sliding callipers and a graded measuring device with an accuracy specified in section 5.1.2.

5.3.3.2 Samples

Five balls.

5.3.3.3 Implementation

The ball diameter is measured in 5 areas on each ball. The diameter of the holes are checked using the measuring device in 5 randomly selected holes for each ball. The holes' internal placement at the joint are checked using the sliding callipers. Five randomly selected holes for each ball are measured in relation to the distance to nearby holes on the opposite half of the ball (appendix 7).

- a) ball diameter
- b) hole diameter
- c) internal placement of hole at joint
- d) internal placement of hole over joint

5.3.3.4 Results

The results are reported as individual measurements for each ball rounded off to 0.2 mm.

5.3.4 Ball Surface Fineness

5.3.4.1 Equipment

Perthometer or standard for processing of plastic surfaces. Sliding callipers.

5.3.4.2 Samples

Five balls.

5.3.4.3 Implementation

The surface fineness of the ball is determined by a perthometer or by comparing the ball with the standard. Ball unevenness at the joint is measured using sliding callipers.

5.3.4.4 Results

The average value of the surface fineness of the balls, and possible unevenness at the joints are reported.

5.3.5 Number of Holes

5.3.5.1 Samples

Five balls.

5.3.5.2 Implementation

The number of holes in the ball is checked.

5.3.5.3 Results

The number of holes in the ball is reported.

5.3.6 Breaking Stress of Material and Joint

5.3.6.1 Equipment

Universal testing machine, with a speed of 100 mm/min under testing.
Printer or similar device for registering the force.

5.3.6.2 Samples

Samples according to ISO 37, type 3, are to be used. Four samples are taken of each of the five balls, two without joint and two with joint.

5.3.6.3 Implementation

The balls are dissected so that the best possible level surface is achieved for perforation of the samples. Following measurement of the cross section of the sample surfaces, the samples are mounted one by one in the tensile testing machine at a tensile speed of 100 mm/min. The force is registered at point of fracture. The sample tests are run individually for samples with and without joints.

5.3.6.4 Results

The results from the tests are reported individually as an average value of the breaking stress rounded off to 0.1 N/mm².

5.3.7 Rebound

5.3.7.1 Equipment

When testing, a stand with 2 accompanying 2 m long metal wires with diameters of 0.15 mm is used, along with a conical shaped rubber stopper with $\varnothing_{\max} = 12.5$ mm and $\varnothing_{\min} = 10$ mm. A groove is made in the stopper 15 mm from the bottom edge of the stopper, so that the diameter of the stopper in the groove is 10 mm. The metal wires are mounted so their upper attachment points are 900 mm from each other. The ends of the metal wires are joined together and attached in the stopper. A steel plate measuring 200 x 200 x 10 mm is used as a rebounding surface. The ball holder is placed 1 000 mm from the steel plate, allowing a ball to be repeatedly dropped when carrying out the rebound test (appendix 8).

5.3.7.2 Samples

Five balls.

5.3.7.3 Implementation

The stopper is inserted into one of the holes of the ball until it becomes attached in the groove. The steel plate is mounted so that the rebound surface lies vertical to the attachment points of the wires. The ball is dropped 1 000 mm from the rebound surface and the rebound is registered. Two tests per ball are carried out of which one is made at an angle of rotation 90° from starting point.

5.3.7.4 Results

The results are reported as individual values rounded off to 2 mm.

5.3.8 Ball Marking

5.3.8.1 Equipment

Sliding callipers with an accuracy specified in section 5.1.2.

5.3.8.2 Samples

Five balls.

5.3.8.3 Implementation

Area calculation of all text, as well as checking the embossed print.

5.3.8.4 Results

The results are reported as approved or failed.

5.4 Goal

5.4.1 Scope and Application

The purpose of the tests listed below is to guarantee the quality of the goal apparatus with respect to dimensions and weight, as well as pad discoloration onto the playing surface, drop net strength and the mesh size of the net.

5.4.2 Goal Dimensions

5.4.2.1 Equipment

Steel rule and radius template with an accuracy as specified in section 5.1.2.

5.4.2.2 Sample

One goal.

5.4.2.3 Implementation

The goal dimensions are measured according to appendix 9. The radii of the goal, which should not come into contact with the playing surface, are checked using the radius template.

- a) goal width
- b) goal height
- c) back bar diameter
- d) goal frame diameter
- e) goal depth
- f) goal corner radius
- g) drop net attachment bar

5.4.2.4 Results

Individual results are reported with rounding off as specified in section 5.1.2.

5.4.3 Goal weight

5.4.3.1 Equipment

Scale with accuracy ± 5 g.

5.4.3.2 Samples

One goal with net.

5.4.3.3 Implementation

The goal is weighed on the scale.

5.4.3.4 Results

Goal weight is reported in kg to one decimal point.

5.4.4 Pad Discoloration onto Playing Surface

5.4.4.1 Equipment

As specified in section 5.2.9.1.

5.4.4.2 Samples

Three pads.

5.4.4.3 Implementation

The pads are mounted furthest out on the pendulum with the underside of the pad facing outwards. The tests are implemented thereafter as per section 5.2.9.3.

5.4.4.4 Results

The occurrence of discoloration on the test plate is reported.

5.4.5 Drop Net Strength

5.4.5.1 Equipment

Weight with mass 10 ± 0.2 kg. Device for attachment of weight to the net.

5.4.5.2 Samples

One goal with attachable net.

5.4.5.3 Implementation

The drop net is attached to the goal according to manufacturer instructions. The instructions are to include a specification for the top edge of the drop net to be fixed to the crossbar and not mounted on the goal net. The goal is positioned so that the distance from the bottom edge of the goal to the playing surface allows for the weight to hang freely. The net is to be tested once for both outer edges and once in the middle. The weight is attached to two mesh openings next to each other, one mesh opening in from the outer edge and bottom edge of the net. The weight is hoisted up to a height equivalent to 2/3rds of the goal height. The weight is released and allowed to fall freely. Following each fall, the net and attachment device are inspected to see if they are intact. Three rounds of tests are carried out.

5.4.5.4 Results

Any damage that has arisen to the net or attachment devices is reported.

5.4.6 Net Mesh Size

5.4.6.1 Equipment

Steel rule.

5.4.6.2 Samples

One attachment net for one goal.

5.4.6.3 Implementation

Measurement of the net is carried out according to BS 1892:Part 2: Section 2.11.

5.4.6.4 Results

The mesh size is to be reported.

5.4.7 Drop Net Length

5.4.7.1 Equipment

Steel rule.

5.4.7.2 Samples

One attachment net for one goal.

5.4.7.3 Implementation

Measurement of the drop net is carried out.

5.4.7.4 Results

The distance between the bottom edge of the net and the playing surface is reported.

5.5 Rinks

5.5.1 Scope and Application

The purpose of the tests listed below is to guarantee the quality of rinks with regard to dimensions, ball rebound, strength and durability.

5.5.2 Rink Dimensions

5.5.2.1 Equipment

Steel rule or metal measuring tape with an accuracy as specified in section 5.1.2.

5.5.2.2 Samples

Two rink section.

5.5.2.3 Implementation

Testing takes place using a steel rule with three measuring points for each rink section (appendix 10).

- a) rink height
- b) distance from the playing surface to the bottom edge of the rink

5.5.2.4 Results

Individual results are reported with rounding off as specified in section 5.1.2.

5.5.3 Rink radii

5.5.3.1 Equipment

Steel rule or metal measuring tape and radius template with an accuracy as specified in section 5.1.2.

5.5.3.2 Samples

Two rink section.

5.5.3.3 Implementation

The steel rule or metal measuring tape is used for measuring the corner radius. The measurement is made using an upright corner section (appendix 10). The radius mall is used for measuring the top edge and short end. The radii are checked at three measuring points on each section of the rink.

- c) rink top edge radius
- d) rink edge radius
- e) rink corner radius

5.5.3.4 Results

Individual results are reported with rounding off as specified in section 5.1.2.

5.5.4 Rink Section Fitment

5.5.4.1 Equipment

Steel rule with an accuracy as specified in section 5.1.2.

5.5.4.2 Samples

Two rink sections.

5.5.4.3 Implementation

The rink sections are mounted as per the manufacturer's instructions. The measurement is carried out with respect to the parallelism of the joint both vertically and horizontally as well as the width of the joint using three measuring points for each joint (appendix 10).

- f) rink joint width
- g) rink horizontal parallelism
- h) rink vertical parallelism

5.5.4.4 Results

Individual results are reported with respect to greatest level of nonconformity for each dimension a, b and c. Rounding off as specified in section 5.1.2.

5.5.5 Rink Surface Fineness

5.5.5.1 Equipment

Sponge of polyurethane.
(E.g. car sponge without detergent.)

5.5.5.2 Samples

Two rink section.

5.5.5.3 Implementation

The rinks are examined both visually and with the aid of the sponge. The sponge is applied over the short sides of the rink, the top side and the surface resting on the playing surface in order to detect possible rough edges and sharp objects e.g. protruding supports.

5.5.5.4 Results

Type and positioning of any rough edges, sharp objects or other damage is reported.

5.5.6 Impact Test

5.5.6.1 Equipment

Drop hammer with weight 1000 ± 50 g. The head is to be of hardened steel and have a 7 mm radius. Stand, where the drop hammer can fall freely from a drop height of 400 ± 5 mm. Equipment for repeated release of the drop hammer. Test holder with minimum dimensions of 200 x 200 mm and thickness 20 ± 1 mm. Sponge.

5.5.6.2 Samples

One rink section.

5.5.6.3 Implementation

The rink is mounted in the test holder so that the surface of the rink, which normally faces the playing area, faces upwards. The drop hammer is released from a height of 400 mm. The test is carried out in five different places on the rink. The appearance of the points of impact, where the drop hammer has hit the rink, is noted. The rink is examined both visually and with the aid of the sponge. The sponge is applied over the points of impact in order to detect possible rough edges and sharp objects e.g. protruding supports.

5.5.6.4 Results

The appearance of the points of impact, and the occurrence of protruding objects following the test are reported.

5.5.7 Ball Rebound from Rinks

5.5.7.1 Equipment

Test holder of aluminium or steel with dimensions of 200 x 200 mm and thickness of 10 mm. Sliding callipers and a ball.

5.5.7.2 Samples

One rink section.

5.5.7.3 Implementation

To begin with, a series of tests are carried out in line with point 5.3.7.3 to be used as reference values. The rebound test from the rinks is carried out in line with point 5.3.7.3, but with a piece cut out of the rink section and mounted in the test holder acting as a rebound surface. The dimensions of the cut piece are to be the same as the test holder. The test piece is mounted so that the ball rebounds against the side facing the playing area. Five rebound tests are carried out.

5.5.7.4 Results

The results are reported in relation to the rebound against the steel plate according to point 5.3.7.3 as an average value in percent rounded off to 1 %.

5.6 Face Mask

5.6.1 Scope and Application

The purpose of the tests listed below is to guarantee the quality of the face mask with respect to strength and protrusion of stick blade.

The mesh size for the face masks and the dimensions of the stick blade are interconnected in order to prevent the blade from penetrating the face mask.

5.6.2 Face Mask Net Size

5.6.2.1 Equipment

Dummy head with dimensions as specified in prEN 967, annex B. Stick blade measuring device.

5.6.2.2 Samples

One face mask.

5.6.2.3 Implementation

The tests are carried out according to prEN 967, point 6.7, with disparity for the dimensions of the measuring device appendix 12. The face mask is to be mounted on the dummy head according to manufacturer recommendations when testing. Attempts are made to make contact with the dummy head by inserting the measuring device into all of the net mesh openings.

5.6.2.4 Results

A report is made as to whether the dummy head is affected or not. If contact is made, the current net mesh placement is specified.

5.6.3 Impact Test

5.6.3.1 Equipment

Dummy head with dimensions according to prEN 967, annex B (appendix 11). Equipment for impacts, measurement and registration according to prEN 967, point 6.8.2.

5.6.3.2 Samples

Three face masks.

5.6.3.3 Implementation

The tests are carried out according to prEN 967, point 6.8, section eyes and teeth protection. The face mask is to be mounted on the dummy head according to manufacturer recommendations when testing. The puck is released with a velocity of 10 m/s (36 km/h). Following each impact the dummy head is inspected to see if contact has been made from the deformed protective net. The tests are carried out from three different angles, according to point 6.8.1 in prEN 967. Any other damage to the face mask, such as cracks, broken attachments and welds etc. are noted.

5.6.3.4 Results

A report is to be made as to whether the face mask has come into contact with the dummy head or not, including any damage to the face mask.

6 Report

Each test report is to include the following information as a minimum requirement.

6.1 Name and Address

Name and address of the testing laboratory and information on testing site, if different to that of the specified address.

6.2 Identification

Unambiguous identification of the test report and of each page as well as information on the total number of pages in the report.

6.3 Client

Client's name and address.

6.4 Test Items

Description and identification of test items.

6.5 Date

The arrival date of the test item and time of test implementation along with the issue date of the report.

6.6 Method

Description and identification of method or routine.

6.7 Sampling

Description of sample procedure in appropriate cases.

6.8 Nonconformity, Additions or Exceptions

Information relating to each instance of nonconformity, addition or exception from the testing method.

6.9 Results

Information on measurement procedures and attained results, in appropriate cases backed up by charts, diagrams, etc. along with information on observed defects.

6.10 Signature

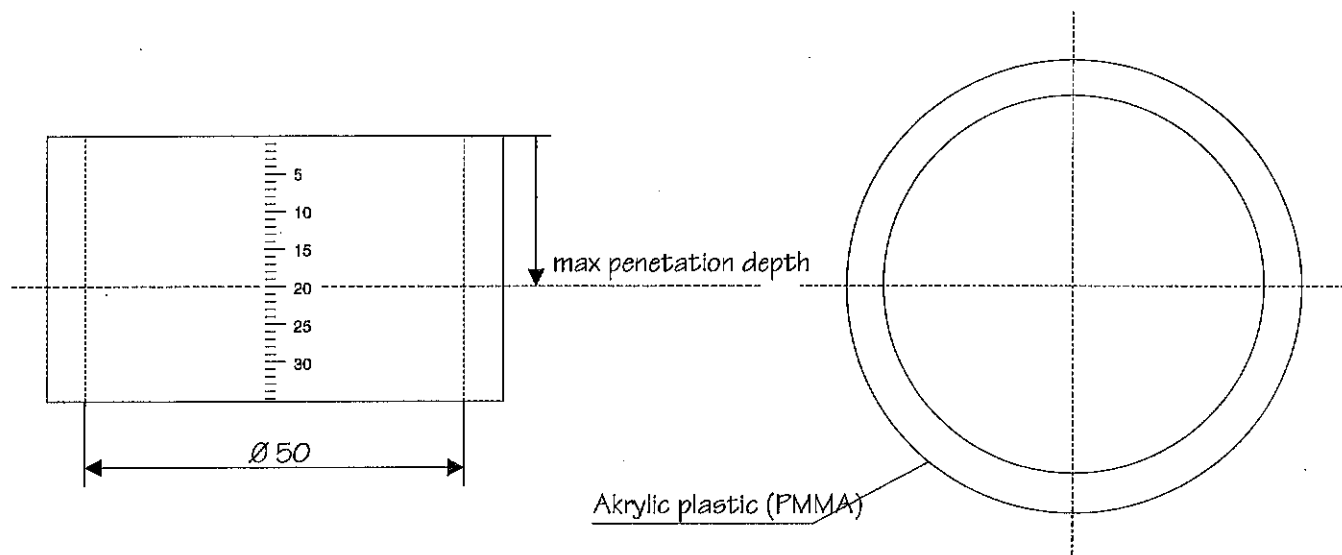
Signature with title, or other equivalent confirmation, of personnel responsible for the tests.

6.11 Report

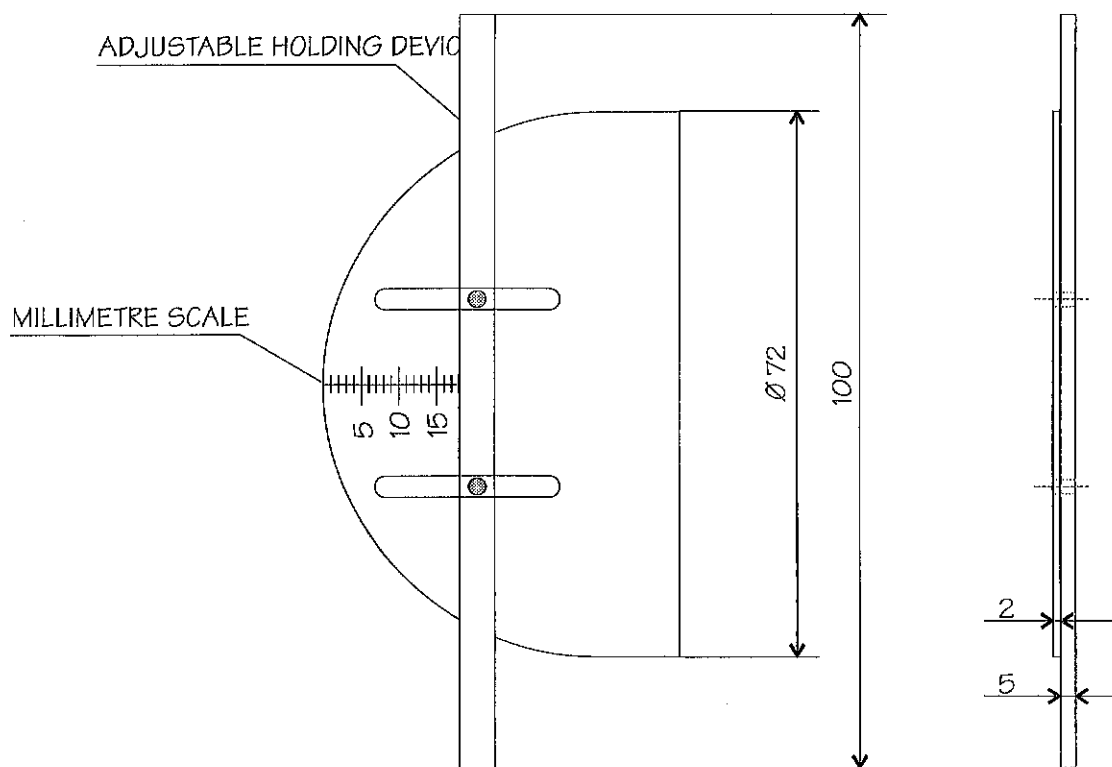
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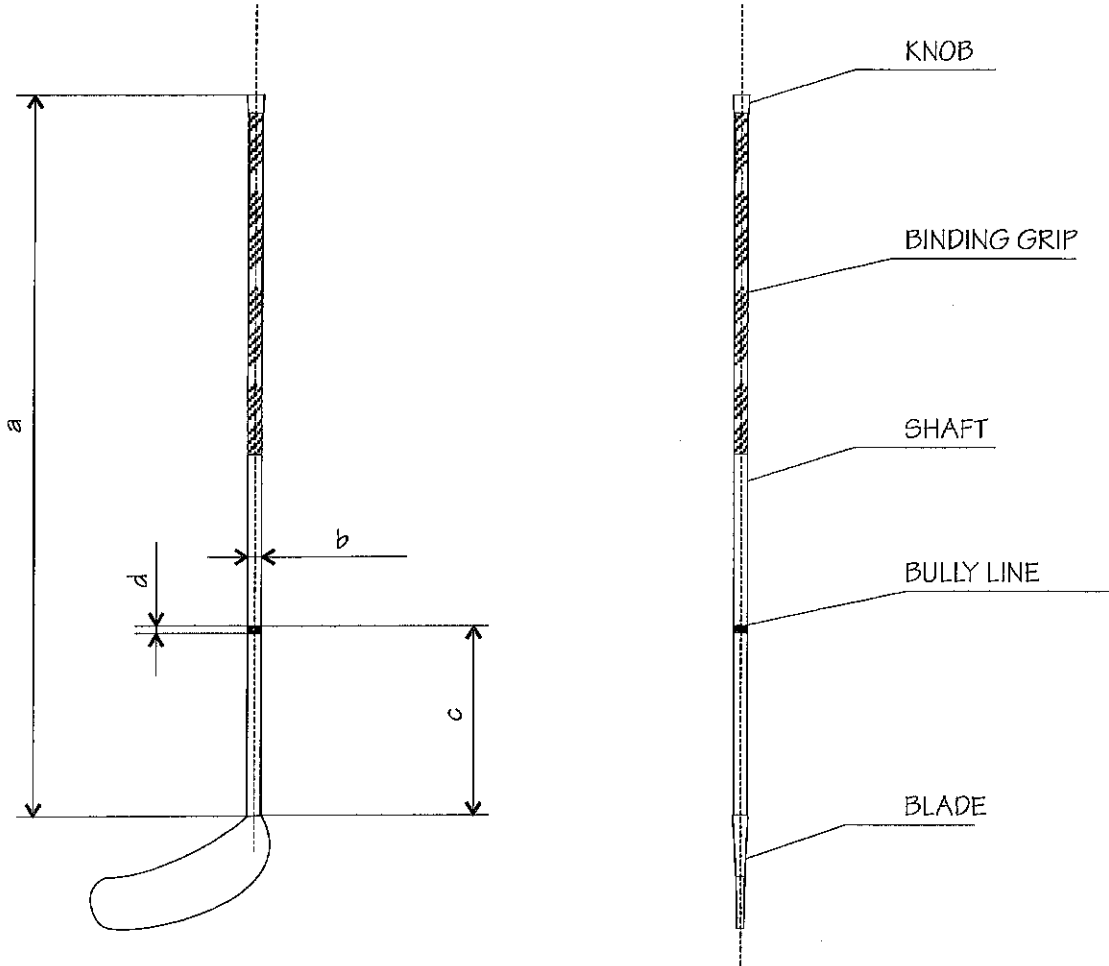
MEASURING DEVICE FOR BLADE PENETRATION DEPTH




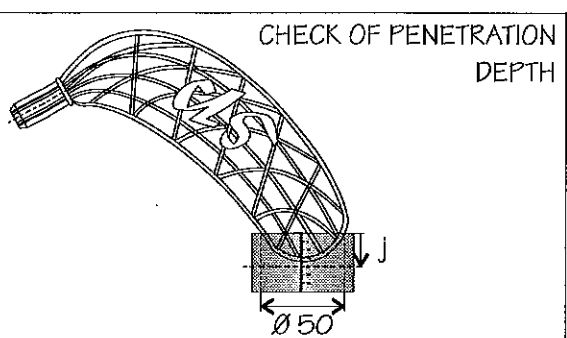
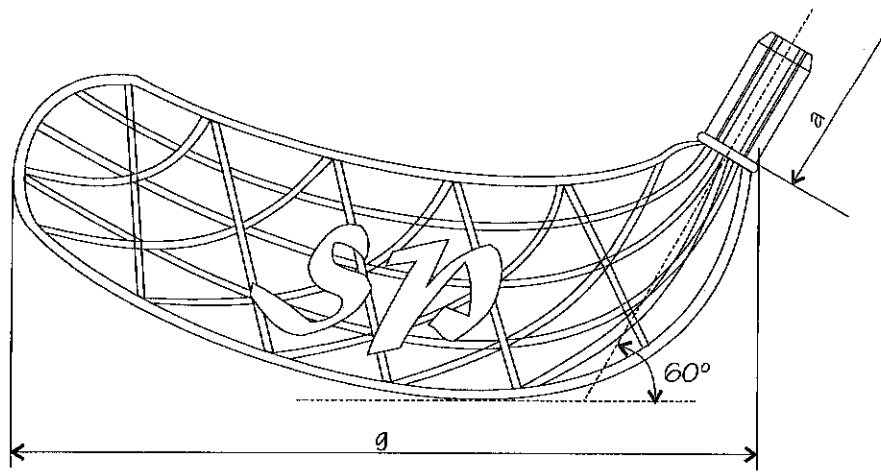
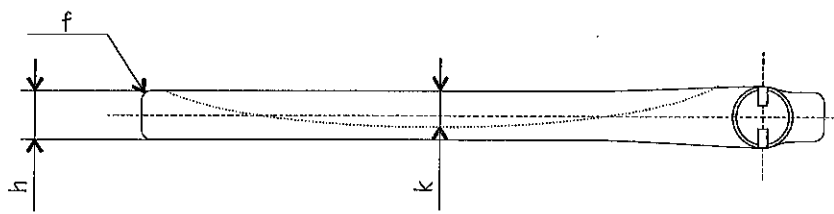
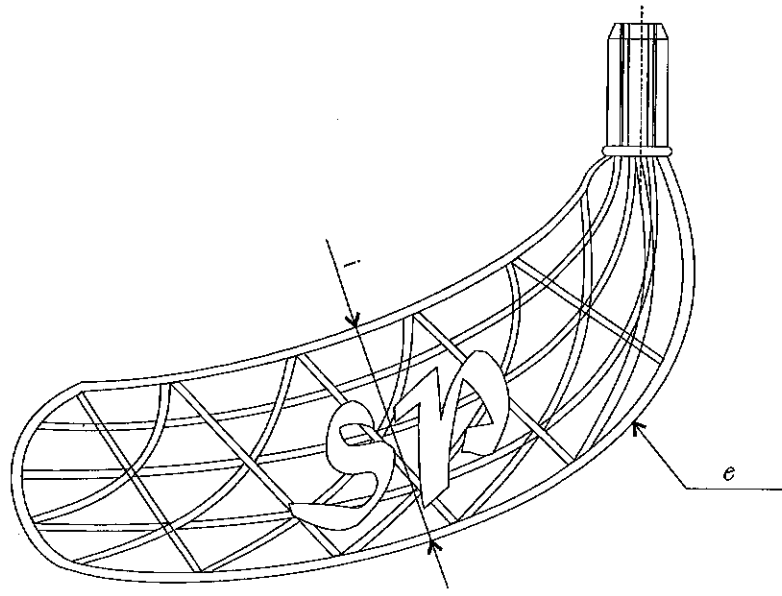
MEASURING DEVICE FOR BLADE CONCAVITY DEPTH




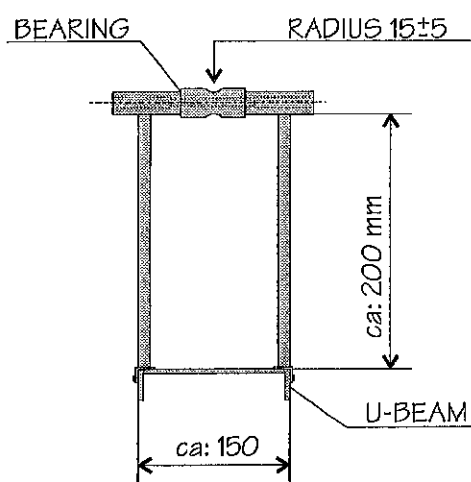
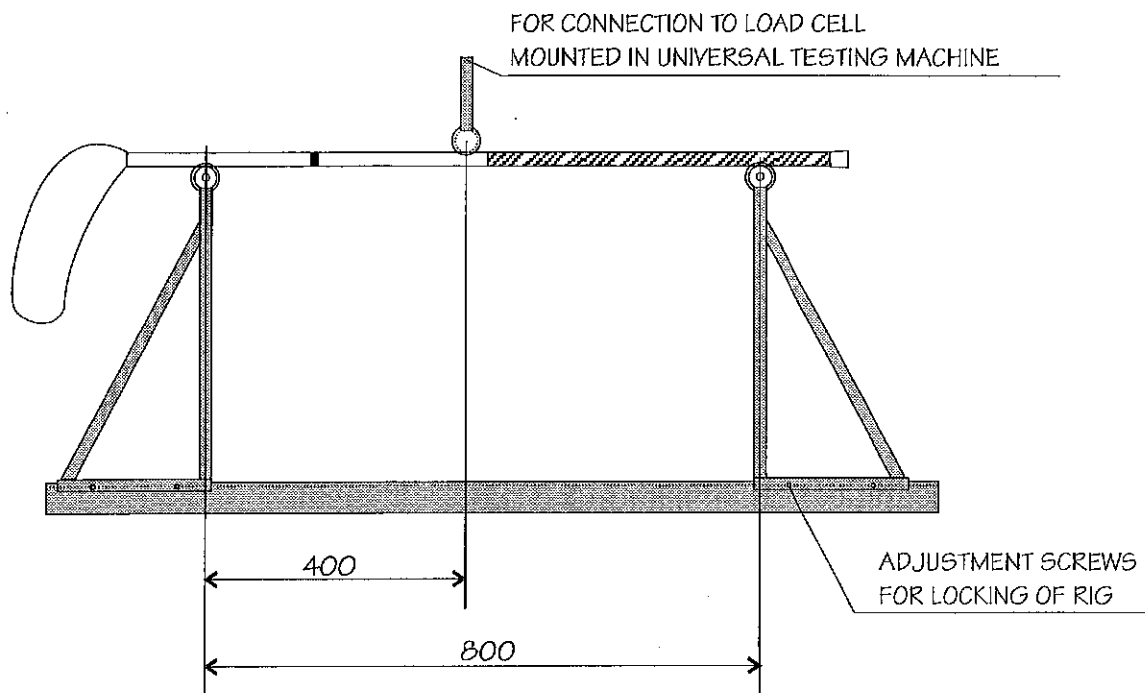
Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
 Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden	Title Equip. for penetration and concavity depth			Drawn 951115	SPM 1506-01e
				Drawing no.	



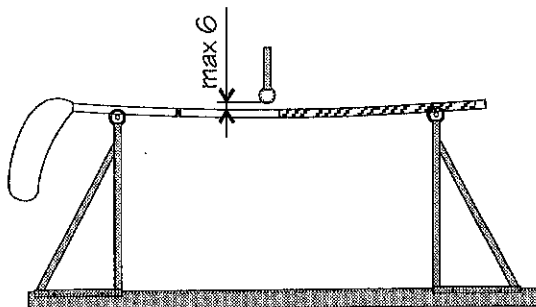
Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
 Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden			Title Floorball stick	Drawn 951115 Drawing no. SPM 1506-02e	




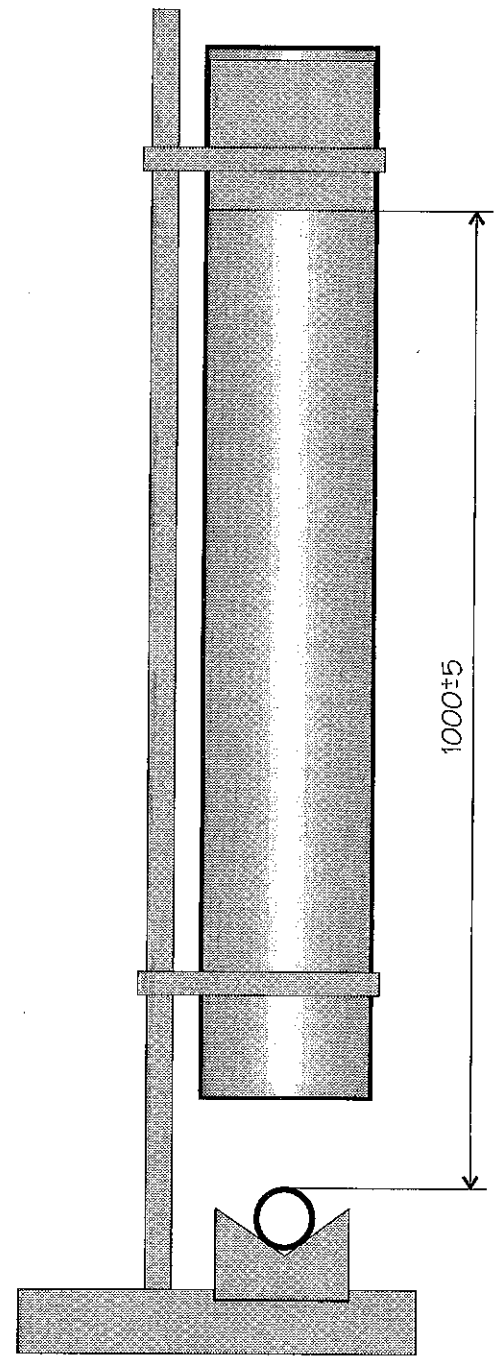
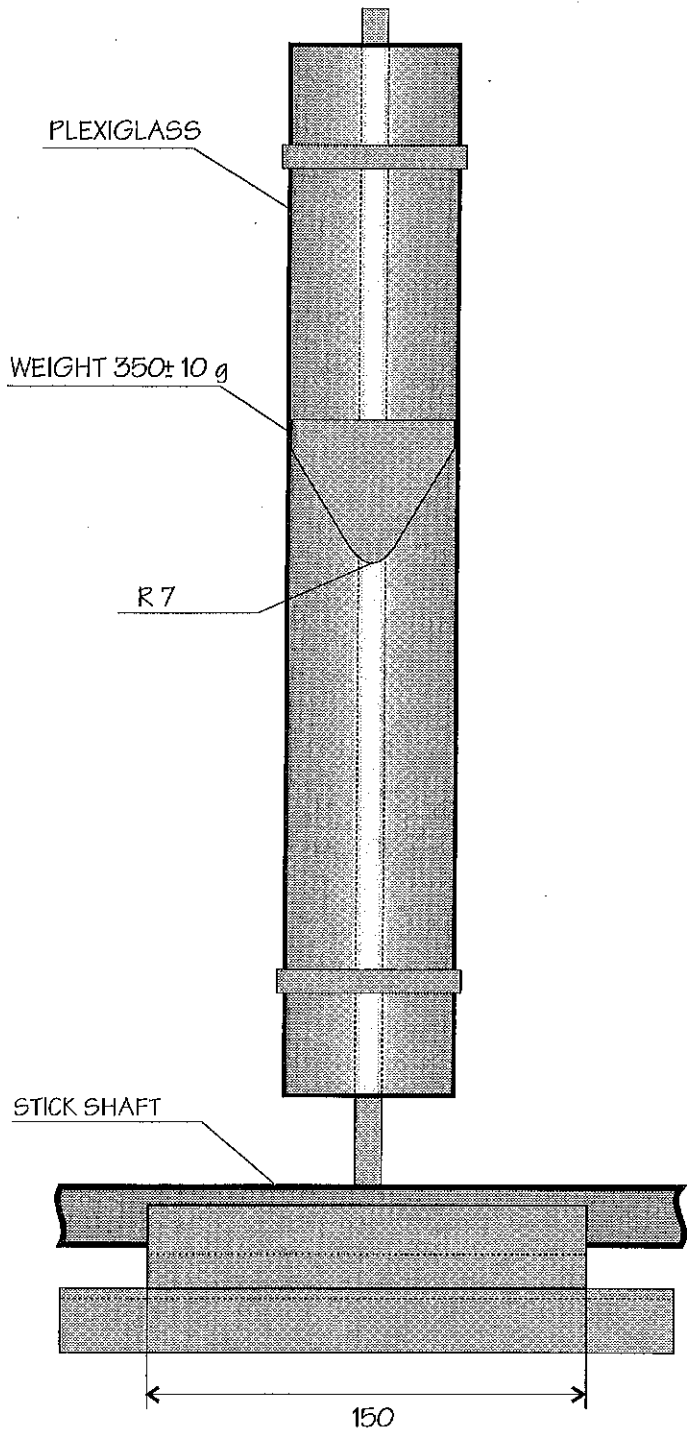
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	Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden			Title Floorball stick blade	
				Drawing no. SPM 1506-03e	




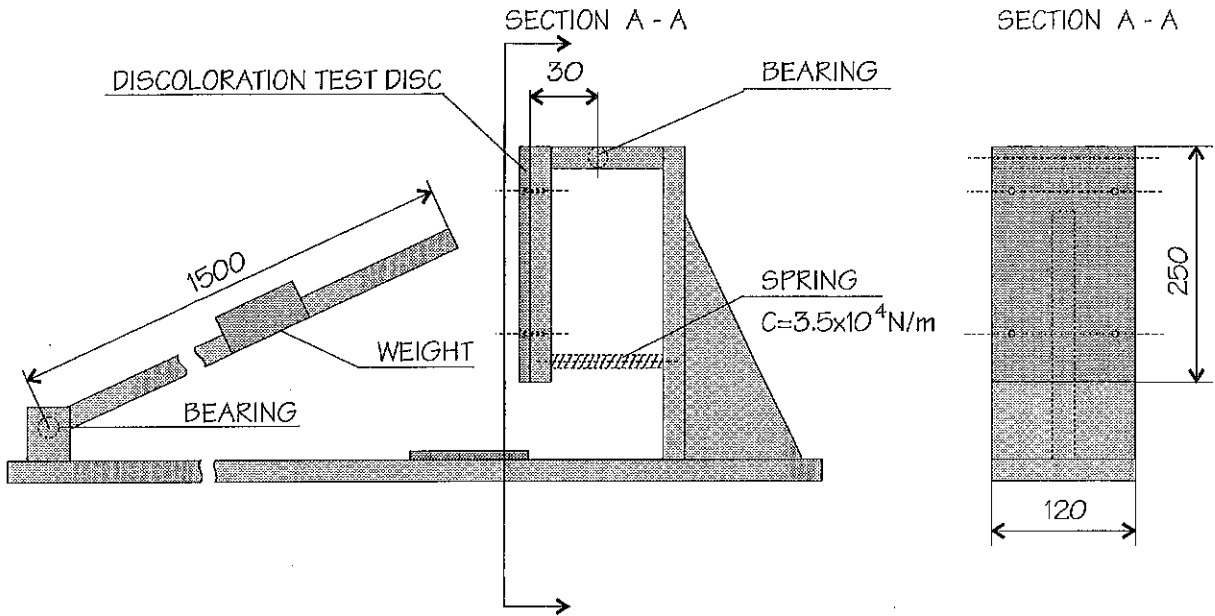
REMAINING TENSION SET AFTER DEFLECTION



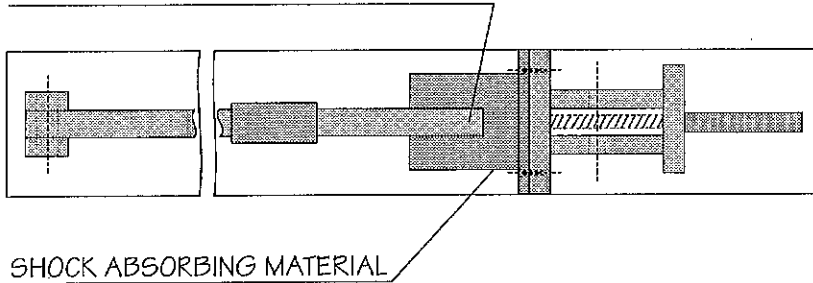
Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
 Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden			Title Deflection	Drawn 951115	Drawing no. SPM 1506-04e




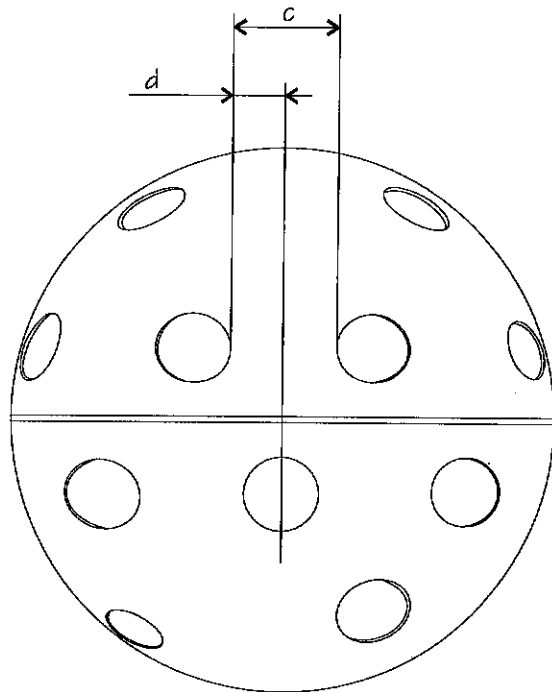
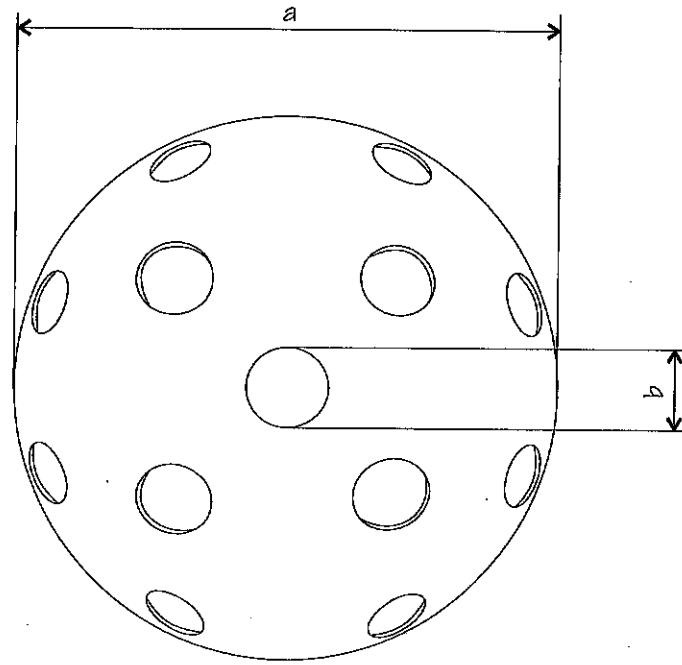
Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
 <p>Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden</p>	<p>Title</p> <p>Impact test</p>			Drawn 951115	<p>Drawing no.</p> <p>SPM 1506-05e</p>




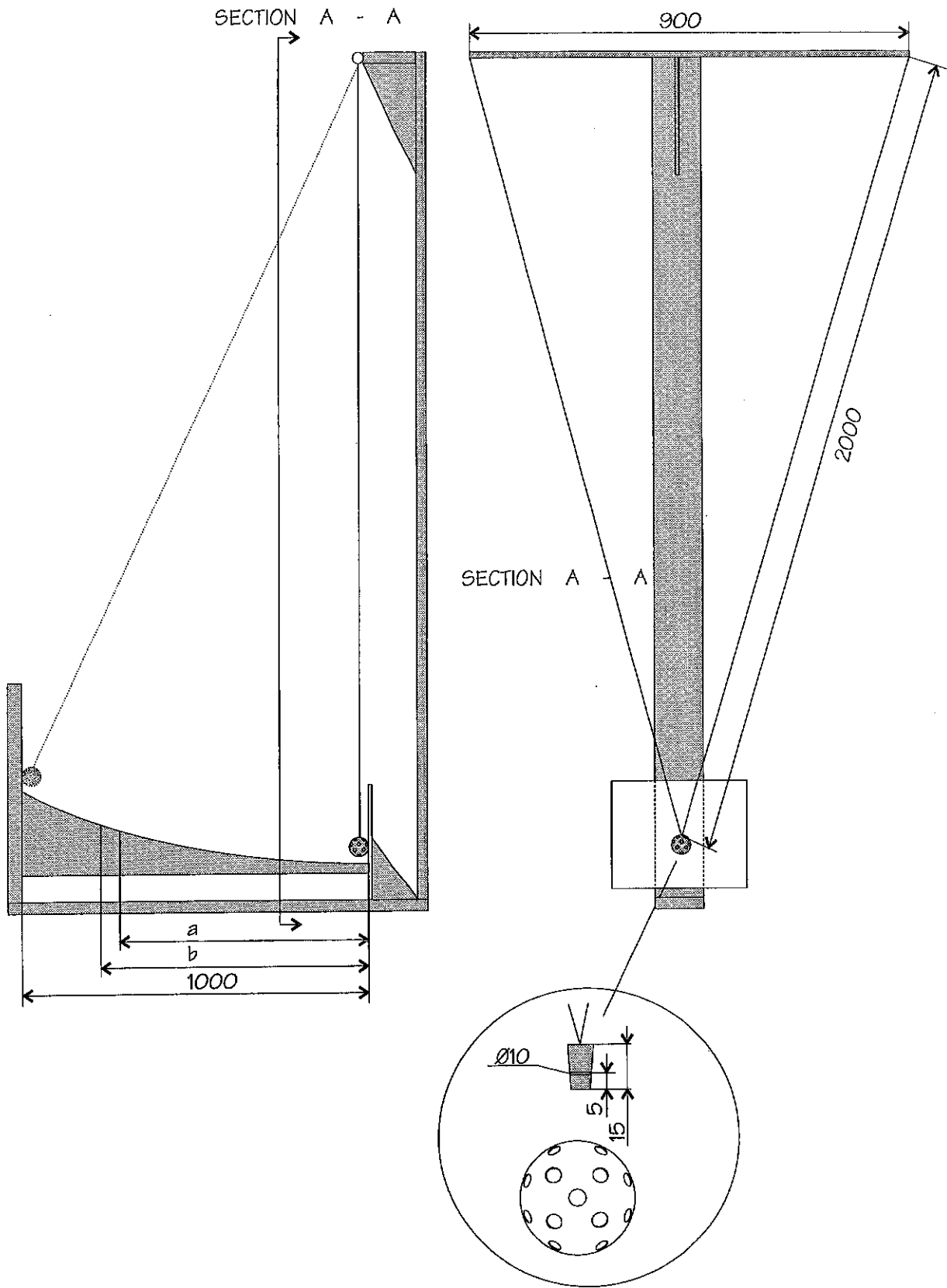
MOUNTING DEVICE FOR BLADE




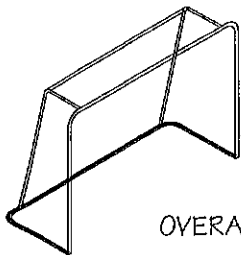
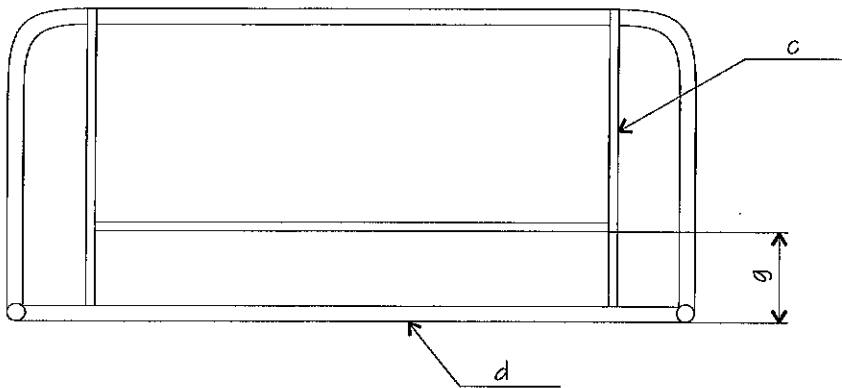
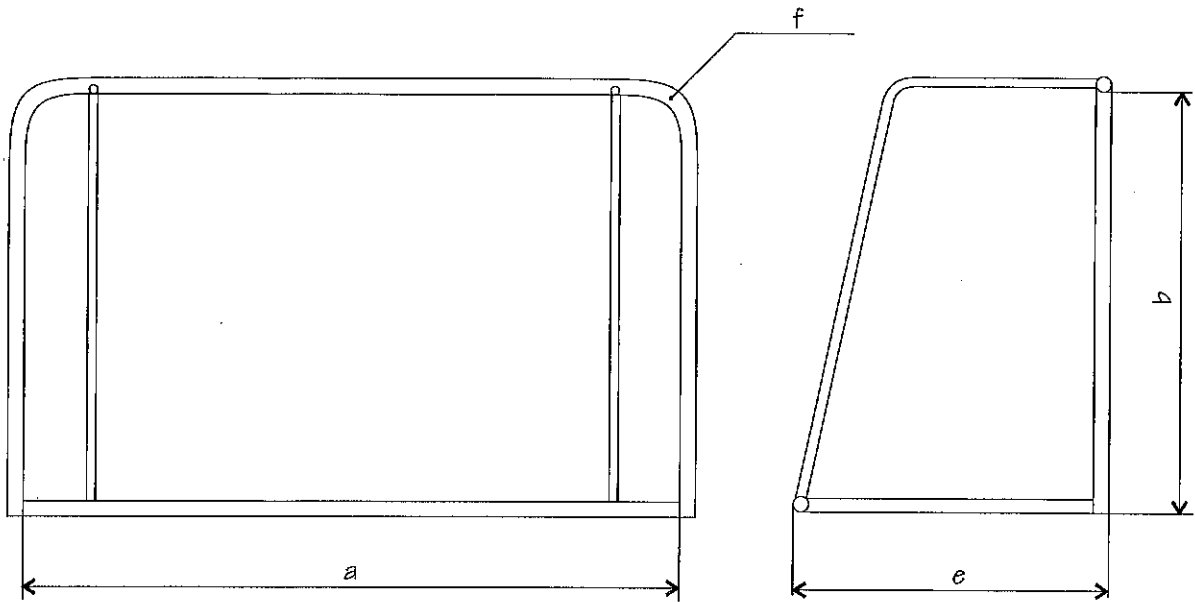
Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
	Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden			Title Discoloration	
				Drawing no. SPM 1506-06e	




Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
 <p>SP Svensk Provnings- och Forskningsinstitut</p>	<p>Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden</p>		<p>Title Floorball ball</p>	Drawn 951115	<p>Drawing no. SPM 1506-07e</p>

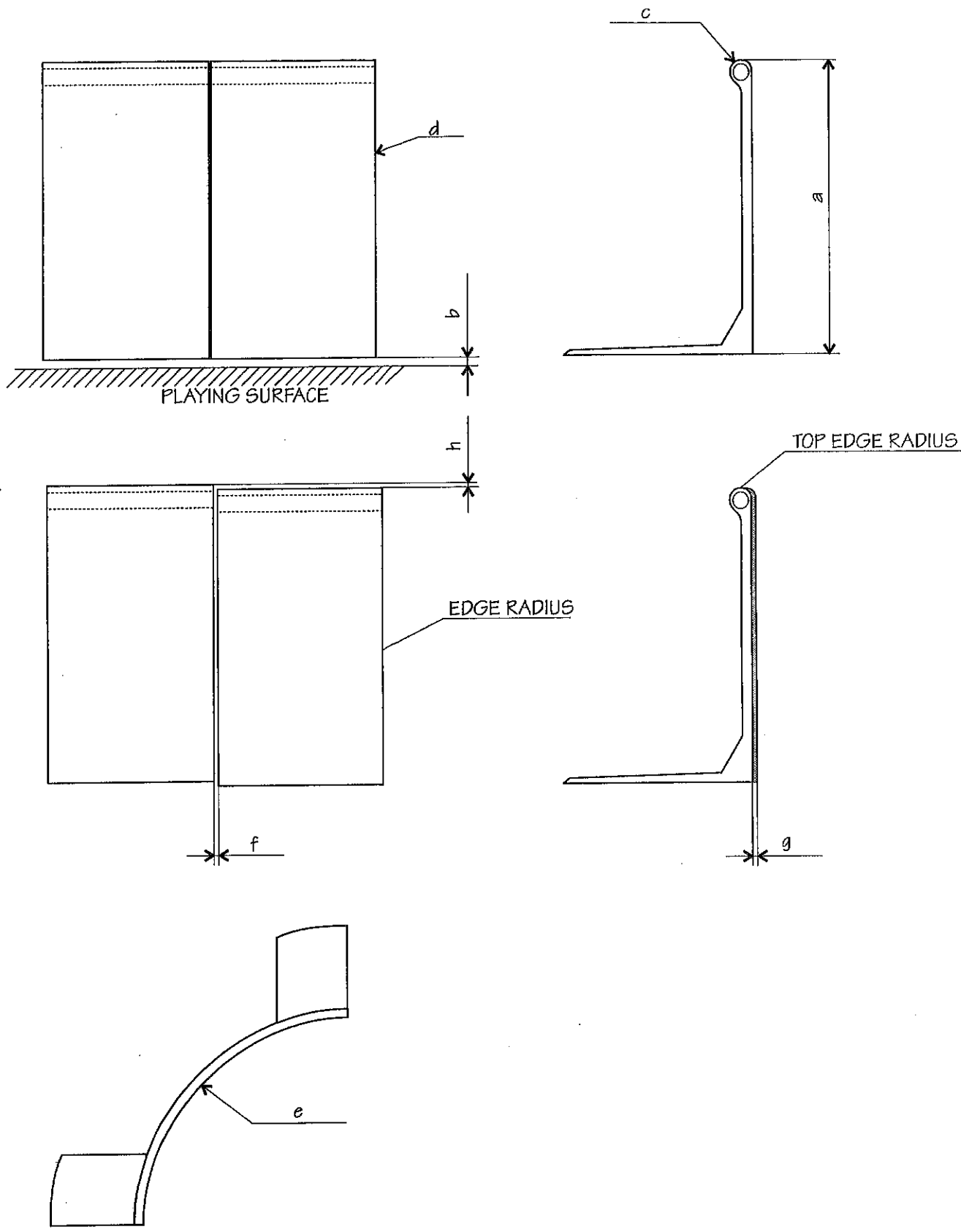



Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
 Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden			Title Ball rebound		Drawn 951115 Drawing no. SPM 1506-08e

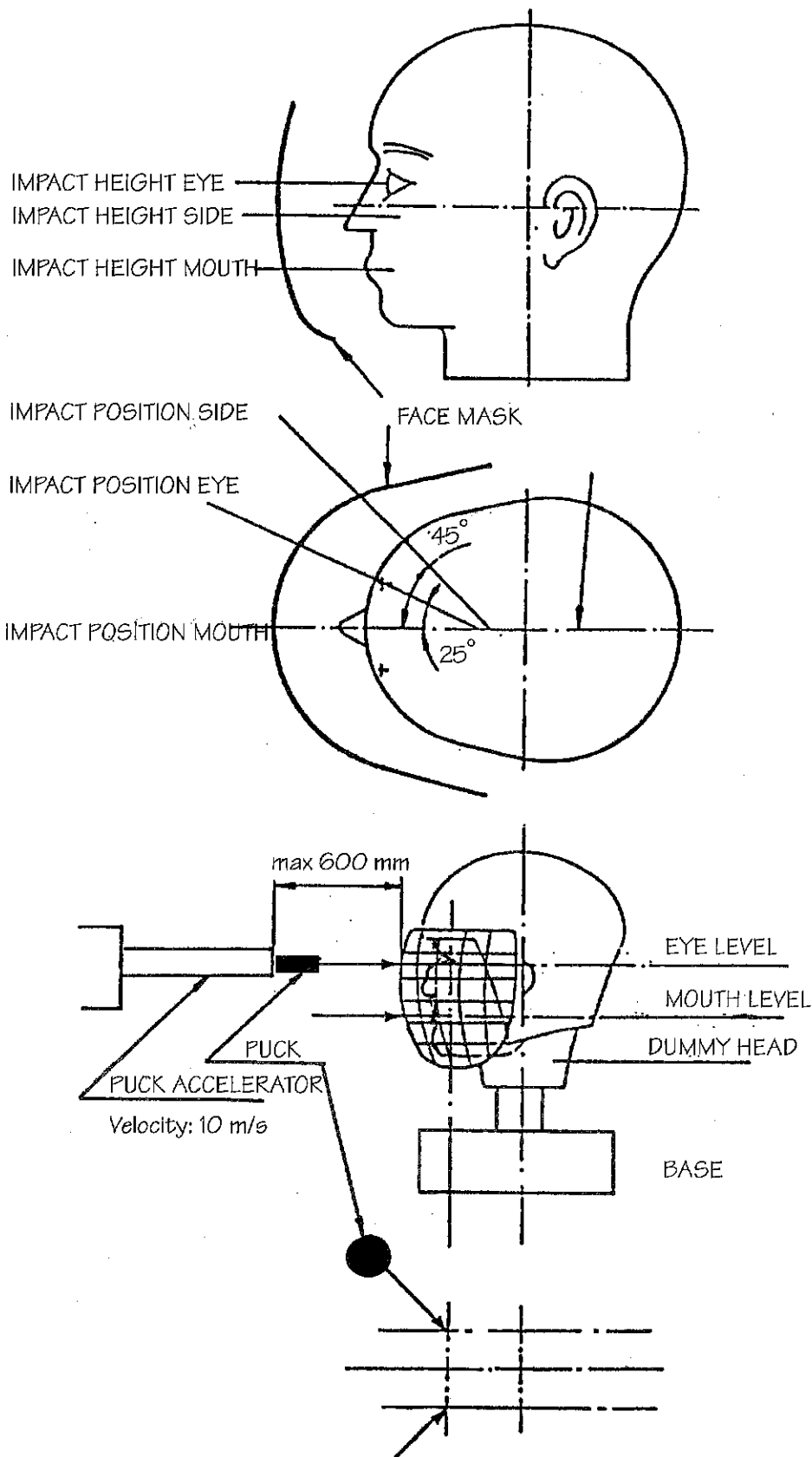



OVERALL VIEW

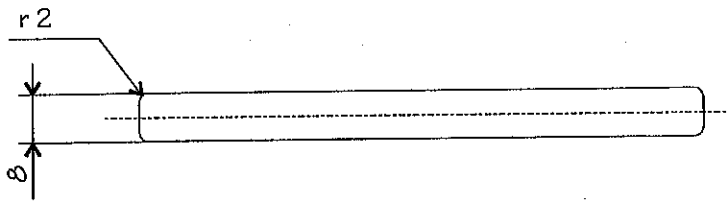
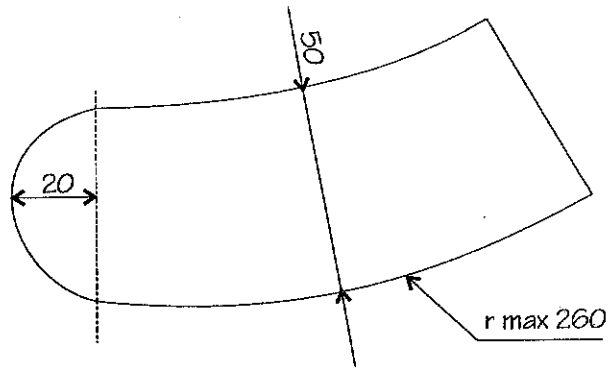
Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
 Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden			Title Floorball goal		Drawn 951115 Drawing no. SPM 1506-09e




Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
 Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden	Title Floorball rink			Drawn 951115	SPM 1506-10e
				Drawing no.	



Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces 930924, ver 2	Version 3
 <p>Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden</p>	<p>Title</p> <p>Face mask</p>			Drawn 951115	<p>Drawing no.</p> <p>SPM 1506-11e</p>



Drawn by L-Å H	Inspected by	Approved by	Remarks	Replaces	Version 1
 Swedish National Testing and Research Institute Materials Technology Section for Polymer Technology Box 857 501 15 BORÅS, Sweden	Title Stick Blade Measuring Device		Drawn 951115	Drawing no. SPM 1506-12e	