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An American National Standard

Standard Specification for Face Guards for Youth Baseball[1]

This standard is issued under the fixed designation F910; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

In baseball, or similar sports, where the force of a pitched, hit, or deflected ball can cause facial injury, there is a need for head, facial, eye, and teeth protection. After careful consideration of the mechanisms and forces involved in this context, this specification for eye and facial protective equipment has been prepared.

The impact test is designed to approximate the impact of a direct perpendicular blow from a baseball traveling at 30 m/s (67.1 mph). These speeds have been confirmed by actual measurements on baseballs thrown by youth league pitchers. Performance and design requirements developed on this basis are intended to minimize injury and to prolong the useful life of the equipment. However, because of complex interactions of variables such as ball speed, direction and point of impact, and particularly, individual differences in reaction to impact forces, it must be kept in mind that some injuries, even some serious injuries, are still possible.

1. Scope

1.1 This specification covers protective face guards for sports such as youth baseball (batters and baserunners).

1.2 This type of face guard is designed to be attached to a pre-existing helmet.

1.3 The equipment covered by this specification is intended to reduce hazards of injury to the face, including eyes and mouth, due to impacts from baseballs or softballs.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 The following precautionary caveat pertains only to the test method portion, Section 5, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. General Requirements

2.1 *Materials:*

2.1.1 The design of the face guards and the choice of materials shall be such as to combine mechanical strength and durability consistent with the intended use of the equipment.

2.1.2 Materials coming into contact with the wearer's face shall not be a type known to cause skin irritation or disease, and shall not undergo significant loss of strength, flexibility, or other physical change as a result of contact with perspiration, oil, or grease from the wearer's head or skin.

2.2 *Finishes*—All points shall be well finished, and free of sharp edges or other irregularities that would present potential hazards of scratching and cutting the user or an opposing player.

2.3 *Padding*—Where padded chin straps are used, the padding material shall be attached to the device in such a way as to cover all the hard surfaces that come into contact with the chin. The method of securing padding shall maintain the padding material in position under normal conditions of heat, cold, moisture, or force distortion by the wearer. Any adhesive used to attach the padding to the face guard shall be of such a type as to cause no deterioration or stress of the face guard material.

2.4 *Attachment System*—Face guards shall be attached to the helmet in such a way as to avoid reduction of the degree of protection offered by the helmet or the combination of helmet and guard. The protection offered by the helmet or guard shall be considered impaired if there is visual evidence of stress to the helmet or guard or any disengagement of the guard following the tests as set forth in 5.3 or while in use.

[1] This specification is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilities and is the direct responsibility of Subcommittee F08.53 on Headgear and Helmets.

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FIG. 1 Face Guard and Helmet on Headform

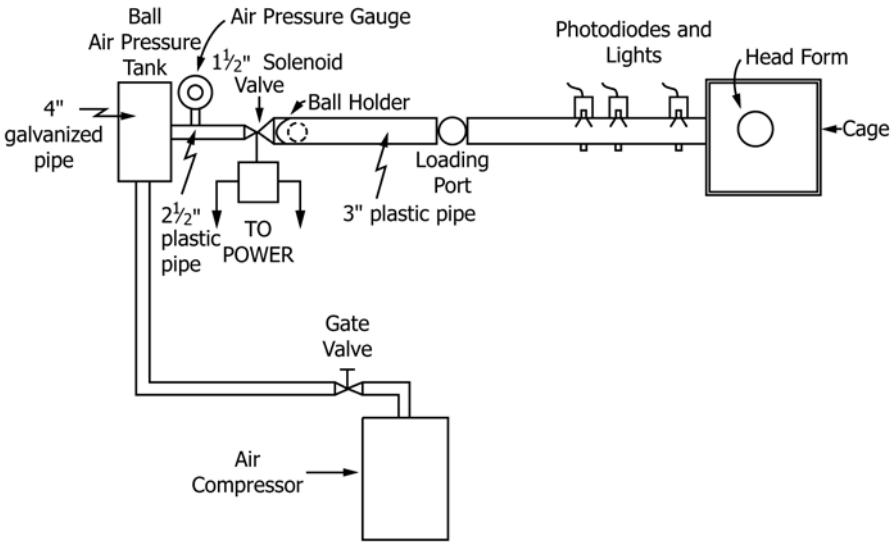

FIG. 2 Schematic of the Ball Propelling Apparatus

3. Performance Requirements

3.1 All testing shall be done with the face guard mounted on a helmet of a make or model specified by the face guard manufacturer and placed on a headform as specified in 5.1.1.

3.2 *Impact Requirements:*

3.2.1 When testing in accordance with Section 5, the following applies:

FIG. 3 Headform with Pressure Indicator Paste on Facial Area

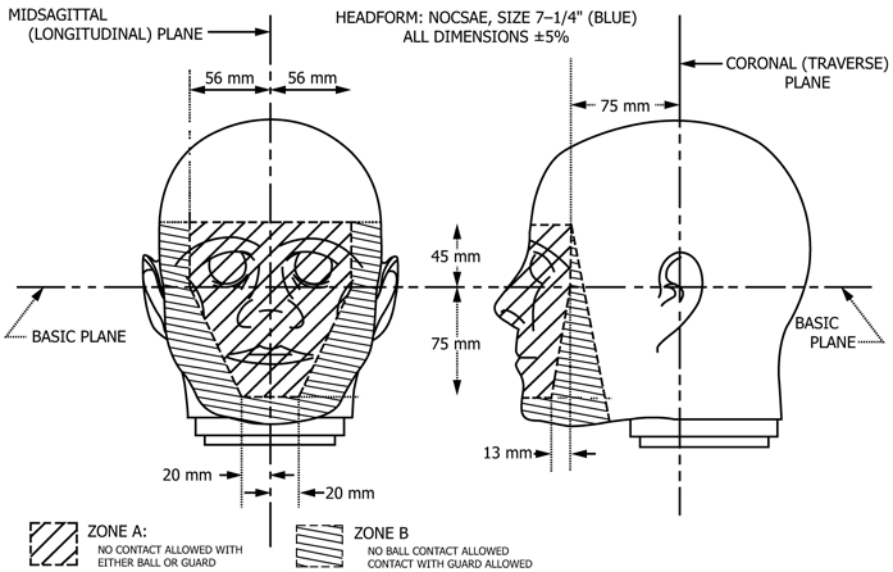

FIG. 4 No Contact Area

3.2.1.1 The wire face guard shall be deemed a failure if any weld completely separates or if any fractures in the wire between any two welds occur on any specimen as a result of impact.

3.2.1.2 The plastic face guard shall be deemed a failure if any full-thickness cracks or fractures occur on any specimen as a result of impact.

3.2.1.3 The protection by the face guard shall be deemed a failure if the face guard becomes disengaged from the helmet during testing in accordance with 5.3.

3.2.2 Neither the ball nor the face guard may contact Zone A of Fig. 4. The ball may not contact Zone B, but the face guard may contact Zone B as the result of deflection by the ball. No paste shall be left on the ball (from Zone A or B) or on

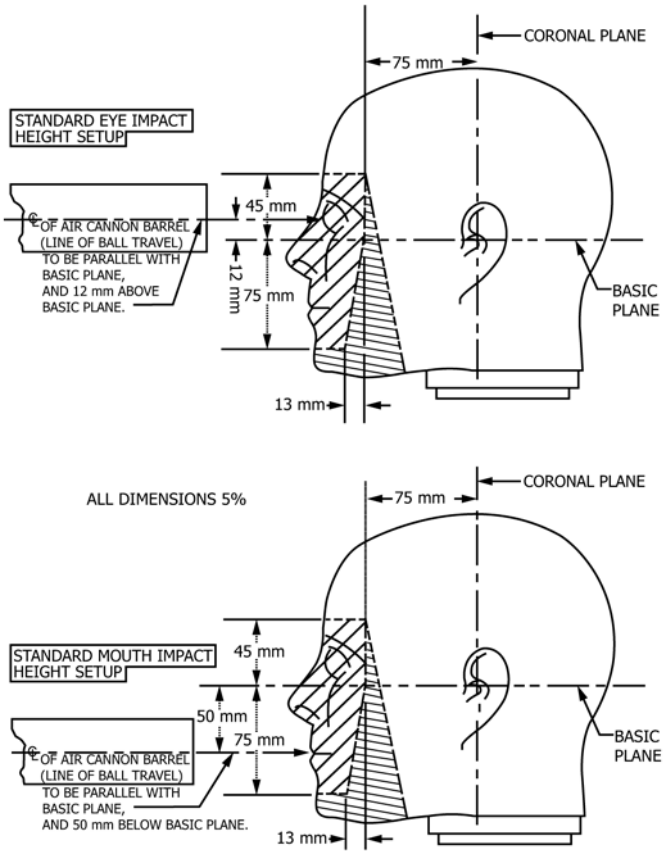

FIG. 5 Standard Mouth and Eye Impact Locations

any part of the face guard (from Zone A) as a result of the impact specified in 5.3.1. Paste residue transferred from "no contact areas" as determined above and in Fig. 4 will constitute a failure. The paste can be colored using a food coloring or other suitable material in order to apply different colors to Zone A and Zone B so that areas of facial contact are more easily distinguishable when examining the ball and face guard.

4. Sample Preparation

4.1 Test only face guards as offered for sale and only when attached to an appropriate helmet.

4.2 Condition face guards at the temperatures of 36 ± 2°C (97 ± 4°F) and at 10 ± 2°C (50 ± 4°F) for a minimum period of 4 h prior to test. The face guard will be tested within 3 min from removal from the conditioning environment. The face guard/helmet assemblies may be returned to the conditioning environment in order to meet this requirement. Prior to the resumption of testing, specimens must remain in the conditioning environment for a minimum of 15 min for each period up to 5 min long that they are out of the conditioning environment.

4.3 Assemble face guards to the helmets in accordance with instructions provided. (See 7.1.)

5. Impact Test Method

5.1 *Apparatus for Impact Tests:*

5.1.1 *Headform*[2,3] and Mounting—The face guard/helmet assemblies shall be fitted on the medium NOCSAE head form (see Fig. 1) for impact tests. Attach the head form to a mounting plate. The mounting plate[2,4] is to be assembled to linear bearings and guide rods so that the head form is free to move directionally in relation to the impact.

Fiftieth Percentile—Medium Size (6⅞ to 7¼)

5.1.2 *Ball Propelling Device*—The ball propelling device shall consist of an apparatus which has the capability of propelling a regulation baseball or softball that complies with NCAA rules at velocities up to 36 m/s (80 mph). The accuracy of this system shall be such that the center of the ball will strike

[2] If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee [1], which you may attend.

[3] The sole source of supply of the apparatus known to the committee at this time is National Operating Committee on Standards for Athletic Equipment (NOCSAE), P.O. Box 12200, Overland Park, KS 66282-2290. (See Section NOCSAE Document .001 Standard Drop Test Method and Equipment Used in Evaluating the Performance Characteristics of Protective Headgear, Fig. 1.)

[4] The sole source of supply of the apparatus known to the committee at this time is Standard Method of Impact Test and Performance Requirements for Baseball/Softball Batter's Helmets, c/o National Operating Committee on Standards for Athletic Equipment (NOCSAE), P.O. Box 12200, Overland Park, KS 66282-2290. (See section describing test equipment apparatus.)

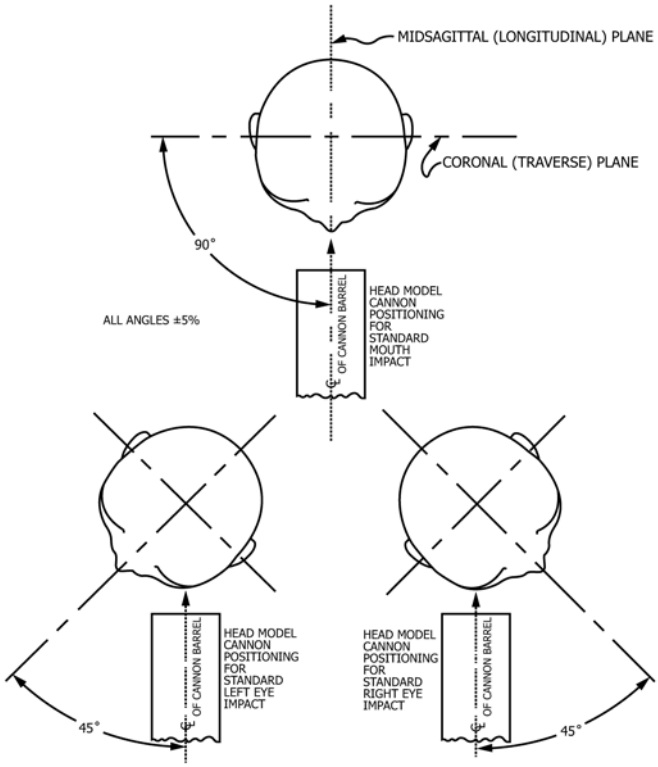

FIG. 6

the impacting surface within a 2.5-cm (1-in.) circle at the plane of testing. (A schematic diagram of a suggested apparatus appears in Fig. 2.)

5.1.3 *Gage,* or similar device shall be included as a part of the apparatus so that the air pressure for each impact can be monitored.

5.2 *Velocity Measurement*—The velocity of the baseball or softball shall be measured at a distance within 1 m (39.4 in.) of the impact point on the face guard when mounted on the helmet and headform. (Some suggested devices for measuring velocity are photocells, phototransistors, light-emitting diodes, or other velocity meters with appropriate read-out devices.)

5.3 *Procedure:*

5.3.1 Ten face guards are to be tested. The face guards to be tested are to be mounted on batting helmets in accordance with the manufacturer's specifications. Each of the ten face guard/helmet assemblies is to be impacted one time as specified in the following chart:

Sample Number	Sample Temperature	Impact Location
1	36 ± 2°C (97 ± 4°F)	directly at the mouth
2	36 ± 2°C (97 ± 4°F)	directly at the right eye
3	36 ± 2°C (97 ± 4°F)	directly at the left eye
4	36 ± 2°C (97 ± 4°F)	random at structure, anywhere within Zones A or B[A]
5	36 ± 2°C (97 ± 4°F)	directly at the center of the largest opening, anywhere within Zones A or B[A]
6	10 ± 2°C (50 ± 4°F)	directly at the mouth
7	10 ± 2°C (50 ± 4°F)	directly at the right eye
8	10 ± 2°C (50 ± 4°F)	directly at the left eye
9	10 ± 2°C (50 ± 4°F)	random at structure, anywhere within Zones A or B[A]
10	10 ± 2°C (50 ± 4°F)	directly at the center of the largest opening, anywhere within Zones A or B[A]

[A] For random impacts, the head model position and direction of ball travel is at the discretion of the technician provided that the direction of ball travel results in an impact that falls within Zones A or B of the head model test area.

5.3.2 *Velocity*—The ball velocity for each impact in each direction shall be 30 ± 2.2 m/s (67.1 ± 4.9 mph).

5.3.3 *Verification of Ball Contact*—For verification of ball or protector contact with the face, cover the entire facial area from the frontal bone superiorly to the mandible inferiorly with dental pressure indicator paste.[5] (See Fig. 3.) Contact of either ball or protector with any part of the face will leave paste at the point of contact. Inspect thoroughly both the ball and protector to determine if they contain residue of paste.

5.3.4 All of the impacts specified in 5.3.1 shall be made at each of the two temperatures called for in 4.2.

[5] Available through dental supply sources.

6. Precision and Bias

6.1 No statement is made about either the precision or the bias of the test method described in Section 5 since the result merely states whether there is conformance to the criteria for success specified in the procedure.

7. Product Marking

7.1 Markings should show manufacturer, date of manufacture, and brands and model names of helmets on which the guard can be used to meet the requirements of this specification.

7.2 Face guards offered for sale shall include detailed instructions for their assembly, use, emergency removal, and a warning to users that the face guard must be discarded if, after being impacted during use, or for any other reason, it shows any signs of damage, distortion from original shape, or weakening. In addition, information shall be provided regarding any known harmful effects from cleaning agents, painting agents, or antifog material.

8. Keywords

8.1 baseball; face guard; headform; helmet; NOCSAE; softball