



# Standard Specification for Football Helmets<sup>1</sup>

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## INTRODUCTION

This specification addresses shock absorption requirements of football helmets. The acceleration limits described herein were guided by the state-of-the-art technology concerning mechanisms and tolerance of head injury and by the performance of current football helmets, and should not be used as limitations for human tolerance or as limits of acceptance for other test procedures.

In addition to the minimum performance tests and inspection procedures described, it is the intent of this specification that the same acceleration limits apply for velocities lower than that required in the impact test, and at all helmet locations above the reference plane.

Other intentions that were not amenable to testing or inspection are offered as guidelines: (1) the chin strap and cup should be attached to the helmet in a manner to enable the helmet to remain in its normal position on the wearer's head during play and impact conditions; (2) the physical characteristics of materials used in construction of the helmet should retain their shock-absorbing characteristics under the influence of aging, use, or exposure to typical environmental conditions.

## 1. Scope

1.1 This specification covers new and reconditioned football helmets intended for use in competitive play and practice with particular reference to shock attenuation requirements.

1.2 This specification establishes shock absorption requirements of complete helmets when tested in accordance with Test Method **F429** and establishes requirements for construction, materials, visibility, and labeling.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

## 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

**F429** Test Method for Shock-Attenuation Characteristics of Protective Headgear for Football

## 3. Terminology

3.1 *Definitions of Terms Specific to This Standard*:

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee **F08** on Sports Equipment and Facilities and is the direct responsibility of Subcommittee **F08.53** on Headgear and Helmets.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.1.1 *reference index*—the manufacturer's recommended dimension from the lowest point of the helmet face opening to the basic plane of a reference headform, both points located on the median plane of the helmet.

3.2 For descriptions of other terms used in this specification, refer to Test Method **F429**.

## 4. Materials and Manufacture

4.1 The materials used in those parts of the helmet which contact the head shall not be of a type known to cause irritation or disease. Paints, glues, and finishes used in manufacture shall be compatible with materials used in the helmet shell and shock absorption system.

4.2 The helmet, as tested, shall have no rigid external projections greater than 1.6 mm in height, except for faceguard; chin strap, nose bumper, or sweatband hardware. Any faceguards or faceguard hardware installed on the helmet must be removed prior to testing.

4.2.1 All allowable external projections shall be smooth and rounded so as to minimize the potential of injury.

4.3 Any internal rigid projections that can contact the wearer's head during impact shall be protected by some means of cushioning or force spreading.

4.4 The helmet shall provide peripheral vision clearance of at least 105° to each side of the median plane when the helmet is adjusted to the reference headform with the reference index.

## 5. Impact Requirements

5.1 Each helmet model presented for impact testing shall be furnished with a reference index (see 3.1.1) as established by the helmet manufacturer. This reference index shall be used during reference marking as described in the Test Procedures section (portion on Reference Marking) of Test Method F429.

5.2 Each helmet tested in compliance to Test Method F429 shall meet the following requirements:

5.2.1 In accordance with Test Method F429 (Test Procedures section, portion on Multiple Impacts), the average  $g_{\max}$  of each set of three impacts delivered to six test locations per helmet shall not exceed 275 g. For the additional three impacts delivered to the two test locations with the highest mean  $g_{\max}$ , no single impact shall have a  $g_{\max}$  that exceeds 300 g.

5.2.2 In accordance with Test Method F429 (Test Procedures section, portion on Multiple Impacts), for helmets exposed to high and low temperatures and to water immersion at the two required test locations, no single impact shall have a  $g_{\max}$  that exceeds 300 g.

5.3 Internal shock-absorbing components of the helmet shall not become detached or loose during impact tests or show permanent deformation or physical damage.

5.4 A test report of impact tests as described in the Report Section of Test Method F429 shall be an integral part of this specification.

## 6. Product Marking and Labeling

6.1 Each helmet shall be provided with instructions for proper sizing and adjustment.

6.2 Each helmet shall be permanently labeled with the following items:

6.2.1 Identification of the manufacturer. If the helmet has been reconditioned, the identification of the reconditioner shall also be included.

6.2.2 Uncoded date of manufacture. If reconditioned, date of reconditioning shall also be included.

6.2.3 Model designation.

6.2.4 Size or size range.

6.2.5 Warning concerning improper cleaning agents and paints.

6.3 In addition to the helmet requirements of 6.2, the user shall be provided with a warning on a permanent label concerning improper attachment or application of hardware, such as face masks, that would compromise the shock-absorbing abilities of the helmet.

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