

**STANDARD PERFORMANCE  
SPECIFICATION FOR NEWLY  
MANUFACTURED BASEBALL/SOFTBALL  
BATTER'S HELMETS**

**NOCSAE DOC ND 022 – 21m24**

Prepared By

**NOCSAE®**

**NATIONAL OPERATING COMMITTEE  
ON STANDARDS FOR ATHLETIC EQUIPMENT**

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## 1. Scope

- 1.1. This standard specification establishes performance requirements for new baseball/ softball batter's helmets as supplied by manufacturers. The requirements of this standard shall be subject to Level 3 compliance criteria unless otherwise stated herein.
- 1.2. **All testing and requirements of this standard specification must be in accordance with NOCSAE DOC 001 except where modified herein.**
- 1.3. **All testing and requirements of this standard specification must be in accordance with NOCSAE DOC 021 except where modified herein.**
- 1.4. *This standard does not purport to address all of the safety problems, 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. Referenced Documents

- 2.1. NOCSAE DOC (ND) 001: *Standard Test Method and Equipment Used in Evaluating the Performance Characteristics of Headgear/Equipment.*
- 2.2. NOCSAE DOC (ND) 021: *Standard Projectile Impact Test Method and Equipment Used in Evaluating the Performance Characteristics of Protective Headgear/Projectiles*

## 3. Test Sample Size

- 3.1. For any standalone test report, at least three (3) of each helmet model in each of the critical sizes must be tested.

## 4. Helmet Preparation

- 4.1. Helmets must be tested complete in the condition as offered for sale.
- 4.2. Helmets used for testing must be selected in a random manner.
- 4.3. Helmets shall be tested on each size headform that they fit. See ND 001 Section 20.
- 4.4. To obtain a reasonable fit (as determined by the test technician) for testing purposes, helmets with the thinnest padding in a shell size may require "shim" pads to be inserted between the smallest NOCSAE headform that the helmet is to be tested on and the interior of the helmet, opposite from the impact site.
- 4.5. Helmets of a given model with a size smaller than 6 <sup>5</sup>/<sub>8</sub> may not fit the smallest NOCSAE headform. In that event, testing of that size is waived so long as the other sizes of that model have been tested and meet all requirements.
- 4.6. Conditioning Environments:
  - 4.6.1. Ambient Temperature: Expose product to conditioned temperature of 72 ± 5 °F (22 ± 2 °C) for a minimum of four hours.

4.6.2. High Temperature: Expose product to conditioned temperature of  $115 \pm 5$  °F ( $46 \pm 3$  °C) for at least four hours and a maximum of twenty-four (24) hours.

4.6.2.1. When performing high temperature testing, the first impact shall occur between the first and second minute after removing the sample from the conditioning environment. Successive impacts in each location shall occur 75 seconds ( $\pm 15$  sec) after the preceding impact. If the sample cannot be tested within these time constraints, the sample must be returned to the conditioning environment for a minimum of three minutes for each minute the sample was out of the conditioning environment. Conditioning must be complete before testing can resume of the sample.

## 5. Impact Attenuation Tests

5.1. Projectile tests shall be conducted using the procedures and equipment described in NOCSAE DOC 021.

5.2. Impact locations are described in Section 19, NOCSAE DOC 001 and shown in Figure 1.

5.2.1. Because of the sun visor on a batter's helmet, the standard front impact location shall be obtained by tilting the headform and helmet forward and approximately  $40 \pm 1$  degrees towards the end of the muzzle. The projectile shall be aimed at the standard front impact location which will allow the impact without the ball touching the visor.

5.2.2. For the random impacts, the headform and helmet can be oriented either in an upright (vertical) position or tilted approximately  $40 \pm 1$  degrees.

5.3. The head model will be positioned with its impact site located within 24 inches (610 mm) from the end of the muzzle (or from the point at which the ball is released).

5.4. Two of the submitted samples shall be impacted with a softball in accordance with Table 1 and as depicted in Figure 2.

5.5. The third submitted sample shall be impacted at ambient condition with a baseball in two locations. At least one of the locations shall be the location that exhibited the highest resultant Severity Index reading of the two sample helmets when impacted at ambient condition with softball. The other location shall be selected to exploit any location on the helmet within the specified impact area (Figure 1) that may result in a failure during the impact test. The impact velocity with a baseball shall be  $60 \pm 3\%$  MPH.

5.6. The softball(s) used shall weigh  $5 \frac{7}{8}$  to  $6 \frac{1}{8}$  ounces (166 – 174 grams), have a circumference of 10.875 – 11.125 inches, and have a C-D at .25 inches of 300 – 400 lbs.

5.7. The baseball(s) used shall weight 5 – 5.25 ounces (142 – 149 grams), have a circumference of 9 – 9.25 inches, have a C-D at .25 inches of 200 – 300 lbs, and be of the construction specified by Major League Baseball.

5.8. The high temperature impacts are to be conducted on the same two (2) helmets upon which the ambient temperature softball impact tests were performed.

- 5.8.1. The high temperature condition impacts must be done after the ambient temperature impacts.

**TABLE 1**  
Projectile Impact Schedule  
Velocity - MPH (m/s)  $\pm$  3%

Sample #	Conditioning Environment	Projectile	IMPACT VELOCITY MPH (M/S)	FRONT	SIDE	FRONT BOSS	REAR BOSS	REAR	RANDOM
1	Ambient Temperature	Softball	55 (24.6)	X	X	X	X	X	X
1	High Temperature	Softball	55 (24.6)		X				
2	Ambient Temperature	Softball	55 (24.6)	X	X	X	X	X	X
2	High Temperature	Softball	55 (24.6)		X				
3	Ambient Temperature	Baseball	60 (26.8)	Choose the location that resulted in the highest SI from samples 1 and 2 at ambient condition					X

## 6. Test Requirements

- 6.1. The peak severity index of any impact shall not exceed 1200 SI.
- 6.2. Helmet repositioning during testing is anticipated. Any structural changes or other changes that take place during impact testing which result in un-restorable, loosening of the fit shall be cause for failure.
- 6.3. A passing helmet model is able to withstand all impacts at an acceptable SI and meets all other requirements when tested in accordance with this performance specification.

## 7. Construction

- 7.1. General: Headgear is worn on the head in an effort to reduce or minimize injury to that portion of the head which is within the specified area of coverage. Headgear shall be constructed to reduce the risk of injury to the wearer and to remain on the wearer during impact. Optional devices fitted to the headgear shall be designed so that they are unlikely to cause injury during use. For example: wire face protectors must not be designed with weld junctions and/or wire terminus ends in the ocular area, such that in the event of a weld separation, the wire ends could come into contact with the ocular area.
- 7.2. The protective equipment must survive all test protocols substantially intact and ready for use.
- 7.3. Projections: Internal rigid projections that may contact the wearer's head during impact shall be covered to reduce the likelihood of injury. Pressure sensitive film or electronic methods may be employed to evaluate the transmitted force of internal projections suspected to be a likely source of injury; such forces shall be limited to a maximum of 750 lbs/in<sup>2</sup>.

- 7.4. Metallic Hardware as defined in ND001 shall meet the requirements of ND015 *Standard Test Method and Specification Used in Evaluating the Corrosion Characteristics and Effects on Metallic Hardware Disassembly*.

## 8. Materials

- 8.1. Materials used in the product shall be durable and resistant to exposure to sun, rain, cold, dust, vibration, perspiration, and products likely to be applied to the skin or hair. Materials known to cause skin irritation or disease shall not be used. Lining materials, if used, may be detachable for washing. If hydrocarbons, cleaning fluids, paints or transfers/decals or other additions may affect the equipment adversely, a warning shall be provided.

## 9. Labels and Warnings

- 9.1. Each helmet shall be permanently and legibly labeled or marked in a manner such that the following information can be easily read and is not obscured in any manner.
- 9.1.1. Name of Manufacturer
  - 9.1.2. Model Designation
  - 9.1.3. Size
- 9.2. Each helmet shall be permanently and legibly labeled or marked in a manner such that the following additional information can be easily read without removing any permanent component. The following labels shall contain a signal word which shall not be obscured in any manner:
- 9.2.1. A label that warns the user that no helmet can protect against all possible impacts and the protective device must be fitted and attached properly in accordance with the manufacturer's fitting instructions.
  - 9.2.2. A label that warns the user that the helmet can be damaged by accidental, incidental, or intentional contact with common substances (for example, certain solvents, cleaners, hair treatments, etc.) and that this damage may or may not be visible to the user. This label should also list any recommended cleaning agents or procedures, or both.
- 9.3. A permanent and legible label or mark that denotes the month and year of manufacture that can be easily read without removing any permanent component. If this mark or label requires a "code" to determine month and year, such code shall be made available upon request.
- 9.3.1. A label that denotes the first season of use may be used.
- 9.4. Headgear that are not to be recertified as mandated by the manufacturer shall bear a permanent and legible warning on the exterior of the headgear stating the following:
- 1. This headgear shall not be recertified.
  - 2. The life of certification which shall be no longer than 5 years from the date of manufacture.

- 9.5 Manufacturers of headgear intended to be recertified shall provide the recertification interval.
- 9.6 Fitting instructions shall be provided including any attachment instructions for authorized accessories.
- 9.7 Each helmet shall have permanently affixed to the exterior of the shell a clearly legible statement which can be easily read without removal of any decal tape other temporary material or permanent part, which contains language which effectively communicates to the purchaser and user the following information, using the same or similar language:

**WARNING:**

**DO NOT USE THIS HELMET IF THE SHELL IS CRACKED OR DEFORMED, OR IF THE INTERIOR PADDING IS DETERIORATED. SEVERE HEAD OR NECK INJURY, INCLUDING PARALYSIS OR DEATH, MAY OCCUR TO YOU DESPITE USING THIS HELMET. NO HELMET CAN PREVENT ALL HEAD INJURIES OR ANY NECK INJURIES A PLAYER MIGHT RECEIVE WHILE PARTICIPATING IN BASEBALL OR SOFTBALL.**

- 9.8 A permanent, exact replica of this mark must appear legibly on the exterior of the shell.

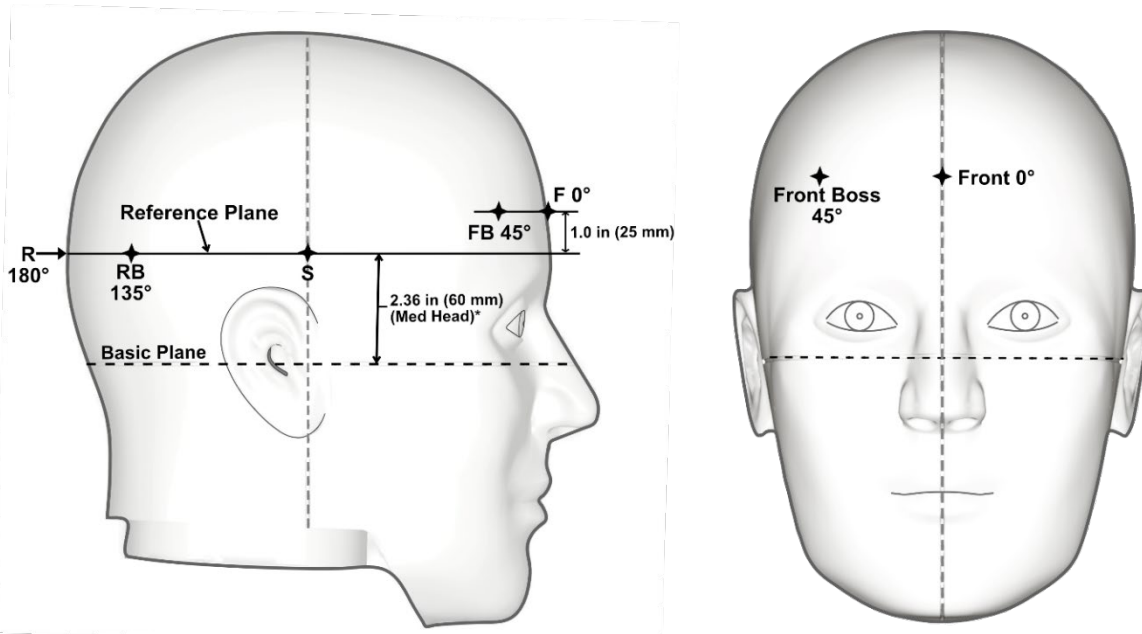
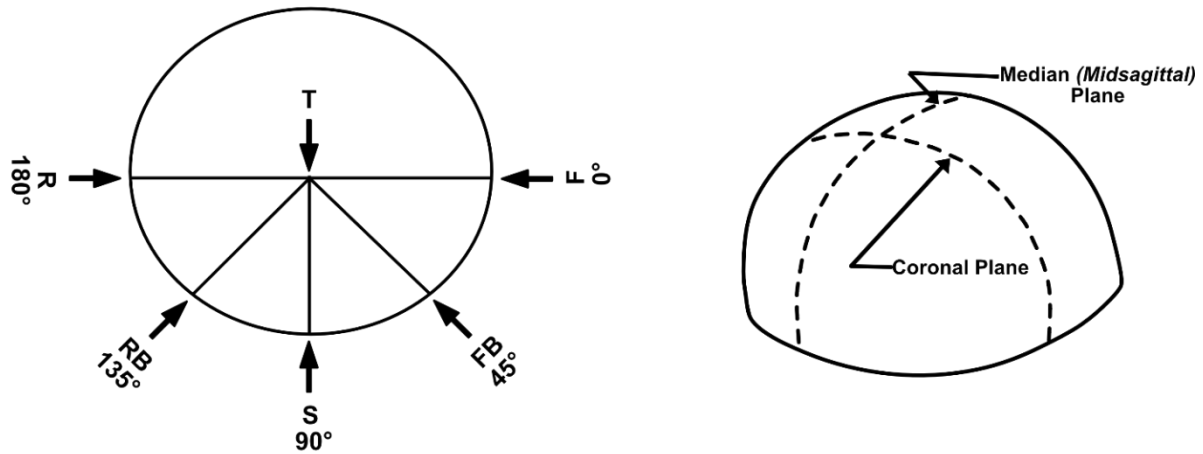


NOTE: You must have an executed, valid license agreement with NOCSAE to use any of the NOCSAE marks at any time. NOCSAE, the NOCSAE mark, and the National Operating Committee on Standards for Athletic Equipment are registered marks and the exclusive property of the Committee. Use of the marks in any manner is prohibited without prior written permission of the NOCSAE Board of Directors.

*This standard is subject to revision at any time by the responsible technical authority and must be reviewed every five years and if not revised either reapproved or withdrawn. Your comments are invited either for revision, modification or creation of additional standards and should be addressed to NOCSAE's Executive Director. Check the web at [www.nocsae.org](http://www.nocsae.org) to obtain the latest version of a standard.*

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**IMPACT AREA**



\*For the small headform, the REFERENCE PLANE is 2.16 inches above the BASIC PLANE. For the large headform, the REFERENCE PLANE is 2.48 inches above the BASIC PLANE.

Impact Area – For a helmet that is to be tested on the medium headform\*\* the impact area must include all locations on the headform above the BASIC PLANE rearward of a location 2.75 inches (70mm) forward of where the BASIC PLANE intersects with the CORONAL PLANE and any point on or above the REFERENCE PLANE in front of that same intersection.

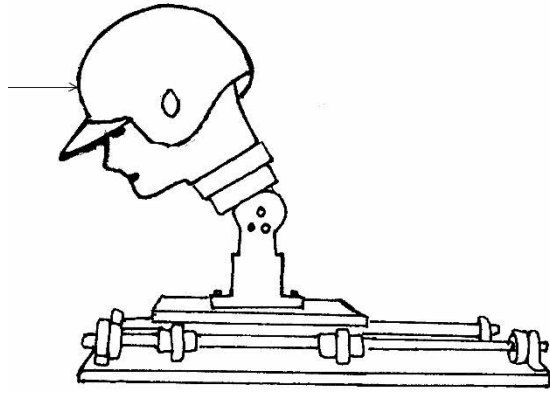
\*\*For the small headform use 2.50 inches (64mm) and for the large headform use 3.00 inches (76mm).

The random impact location may be selected from any point within the allowed impact area but not closer than 1 inch (25mm) from the edge of the helmet nor less than 1 inch (25mm) from any previous impact.

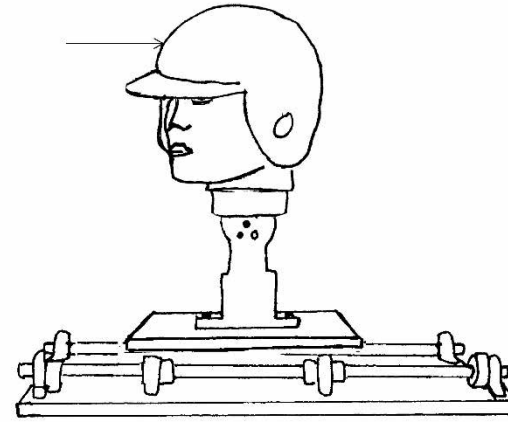
Random impact locations must allow the rotator assembly to be locked in the position selected; the headform must be placed in the upright (vertical) position or tilted forward from vertical 40±1 degrees.

**Figure 1**

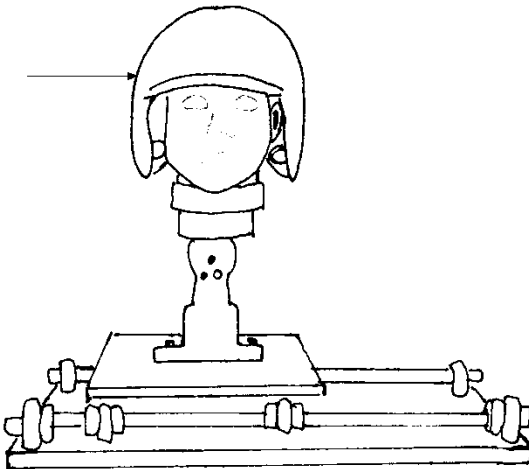




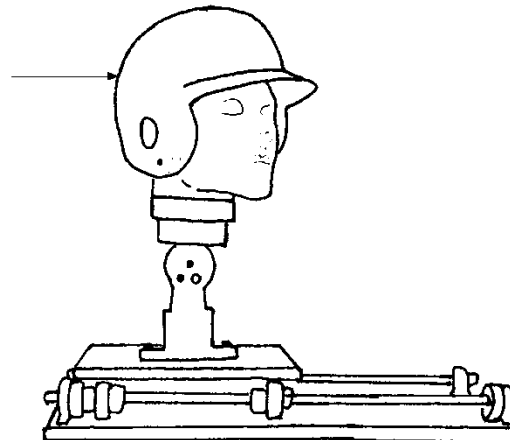
Front Impacts



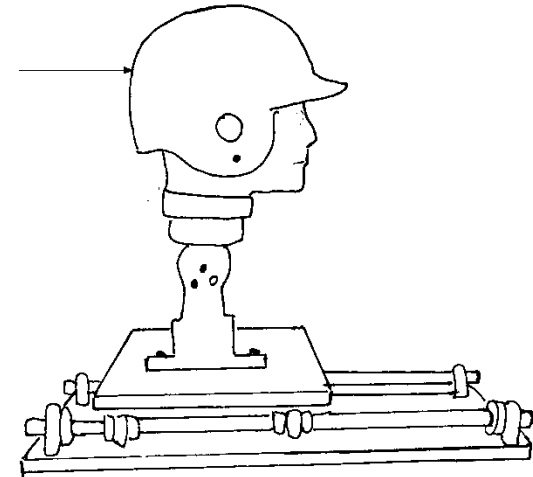
Right Front Boss Impacts



Right Side Impacts



Right Rear Boss Impacts



Rear Impacts

Figure 2

### **JANUARY 2002 MODIFICATIONS/REVISIONS**

- Simplified document references within document.
- Changed Fig 1 text to clarify Impact Area.

### **JANUARY 2003 MODIFICATIONS/REVISIONS**

- Correct typo in section 6.1 to read 9.6 instead of 9.1.6

### **APRIL 2003 MODIFICATIONS/REVISIONS**

- REVISION: Defined random impact locations referenced from previous impacts.
- Modified naming convention and added NOCSAE logo to cover page.
- Modified the description of the projectile used.

### **JANUARY 2004 MODIFICATIONS/REVISIONS**

- Modified Ball specifications for clarity

### **JUNE 2006 MODIFICATIONS/REVISIONS**

- REVISION: Changed the number of samples required to be submitted. Changed the impact projectile and impact schedule. Defined the softball projectile.

### **DECEMBER 2006 MODIFICATIONS/REVISIONS**

- Modified sections 5.5 and 5.6 to specify weight in ounces of baseball and softballs used.

### **MAY 2008 MODIFICATIONS/REVISIONS**

- REVISION: Changed section 3.2.1 to allow shimming of helmet model size with thinnest padding

### **JANUARY 2009 MODIFICATIONS/REVISIONS**

- Modified cover page, effective date no earlier than 2010

### **FEBRUARY 2010 MODIFICATIONS/REVISIONS**

- REVISION: Changed the impact velocity specified for a softball impact to the helmet. Effective date remains unchanged

### **MAY 2010 MODIFICATIONS/REVISIONS**

- Clarified section 5.5 statement for selecting baseball impact locations.

### **FEBRUARY 2011 MODIFICATIONS/REVISIONS**

- Moved test requirements to Section 6. Clarified test requirements.

### **AUGUST 2011 MODIFICATIONS/REVISIONS**

- Modified requirements for softball projectile

### **MAY 2012 MODIFICATIONS/REVISIONS**

- Clarified section 3 for standalone test report
- Moved requirements to section 4 from section 3 for clarity
- Clarified figure 2 diagrams for front and front boss impact locations.

### **OCTOBER 2014 MODIFICATIONS/REVISIONS**

- Updated document to include level of compliance requirements.
- Added Date specification becomes effective
- Updated title name of NOCSAE DOC 001
- Added SEI Certification NOCSAE Logo to Section 7, "Labels and Warnings"

### **JUNE 2015 MODIFICATIONS/REVISIONS**

- Updated NOCSAE seal/logo artwork

### **FEBRUARY 2018 MODIFICATIONS/REVISIONS**

- REVISION: Removed COR requirement from Section 5.6.
- Added reference to Section 12 NOCSAE DOC 001 in Section 4.
- General formatting updates
- Removed shimming language from 6.1

### **FEBRUARY 2020 MODIFICATIONS/REVISIONS**

- REVISION: Added requirement for headform positioning to  $40\pm 1$  degree tilt for standard front and allowing headform to be tilted either  $40\pm 1$  degrees or upright for random impacts in section 5.1

### **JANUARY 2021 MODIFICATIONS/REVISIONS**

- REVISION: Added a compression deflection upper limit of 400 lbs to the softball projectile specification.

### **JUNE 2024 MODIFICATIONS/REVISIONS**

- Replaced references to ND 001 Section 9, 10, and 12 and ND 021 Section 9 with the referenced language

- Added Conditioning Environment, Construction, and Materials requirements from ND 001
- Added ND 015 as a referenced document
- General formatting updates