

LABORATORY PROCEDURAL GUIDE

**FOR RECERTIFYING
FOOTBALL HELMETS**

NOCSAE DOC (ND)005-96m14

Prepared By



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

Modified October 2014

TABLE OF CONTENTS

Scope	1
Referenced Documents	1
Test Equipment Required	1
Mechanical Set-up	2
Laboratory Environment	2
Helmet Preparation	2
Sample Selection	2
Testing Procedure for Recertification	3
Reports.....	3
APRIL, 2002 MODIFICATIONS/REVISIONS	4
JANUARY, 2003 MODIFICATIONS/REVISIONS.....	4
APRIL, 2003 MODIFICATIONS/REVISIONS	4
DECEMBER, 2008 MODIFICATIONS/REVISIONS	4
JUNE, 2009 MODIFICATIONS/REVISIONS	4
FEBRUARY, 2011 MODIFICATIONS/REVISIONS	4
AUGUST, 2011 MODIFICATIONS/REVISIONS.....	4
OCTOBER, 2014 MODIFICATIONS/REVISIONS.....	4

1. Scope

- 1.1. This procedural guide establishes recommended practices for the recertification of football helmets.
- 1.2. **All testing and requirements of this standard specification must be in accordance with NOCSAE DOC.001, NOCSAE DOC.004 and NOCSAE DOC.101.**
- 1.3. *This recommended practice 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 recommended practice to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

- 2.1. STANDARD DROP TEST METHOD AND EQUIPMENT USED IN EVALUATING THE PERFORMANCE CHARACTERISTICS OF HEADGEAR/EQUIPMENT, NOCSAE DOC.001.
- 2.2. STANDARD PERFORMANCE SPECIFICATIONS FOR RECERTIFIED FOOTBALL HELMETS, NOCSAE DOC.004.
- 2.3. EQUIPMENT CALIBRATION PROCEDURES - KME SERIES 200, NOCSAE DOC.101.

3. Test Equipment Required

- 3.1. Twin-wire Guide Assembly (as shown in Figure 3, NOCSAE DOC.001).
- 3.2. Appropriate NOCSAE headforms (see Section 13 and 15.5, NOCSAE DOC.001).
- 3.3. Appropriate MEP pads (see Section 15.2, NOCSAE DOC.001).
- 3.4. PCB Triaxial Accelerometers, #354MO3, #356A66 or equivalent.
- 3.5. KME Series 200 Data Analyzer (or any analog/digital equivalent that can be demonstrated to correctly calculate SI from a given input signal)¹
- 3.6. Miscellaneous tools and equipment.
 - 3.6.1. Digital voltmeter (DVM), 3 ½ digit, 1mv resolution, ±0.5% accuracy and connecting cables.
 - 3.6.2. Torque wrench, range to 200 in/lb minimum, 5 % accuracy.
 - 3.6.3. Appropriate electrical connectors (banana clips).
 - 3.6.4. Tape measure or Height Gauge.
 - 3.6.5. Non-conducting glass/plastic jeweler's screwdriver (tweaking tool).

¹ The portion of this procedural guide that is specific to data acquisition equipment use and calibration is for the KME Series 200 only. HITS program users should refer to the HITS manual and on screen instructions for calibration procedures. Users of other data acquisition systems should refer to the specific manual for that system for differences in system operation.

3.6.6. Miscellaneous hand tools.

4. Mechanical Set-up

All components of each assembly (i.e., the headform, headform adjuster, headform rotator stem, headform collar, etc.) must be rigidly connected. Any looseness or play will cause spurious signals (false SI results).

5. Laboratory Environment

See Section 12.1 and 12.3, NOCSAE DOC.001.

6. Helmet Preparation

6.1. See Section 3, NOCSAE DOC.004.

6.2. Helmets to be tested must be moved into a Laboratory environment for conditioning at least four (4) hours prior to impacting.

7. Sample Selection

7.1. See Section 11, NOCSAE DOC.001.

7.1.1. Each recertifier must test an adequate and representative sample¹ size in order to be reasonably sure that helmets returned to use, but not actually tested, will meet the requirements as set out in NOCSAE DOC.001 and NOCSAE DOC.004.

7.1.2. Recertifiers that adhere to this guideline and participate in industry wide surveillance and reporting efforts may utilize that combined information². This may reduce the number of test samples required.

7.2. Recertifiers are faced with processing a wide range of products in various ages and condition. It is therefore necessary to divide the products submitted for recertification into categories, lots or other controlled groupings that are related to the samples pulled for testing in a meaningful way that allows the recertification firm to quickly evaluate additional samples in the event of a test failure of a sample that represents that particular grouping, lot or other control grouping:

7.2.1. An adequate representative sample from each grouping that is to be returned to use, must be tested. Individual programs may vary but assurance must demonstrate that a statistically sound sample of reconditioned helmets has been tested from each grouping.

¹ **Note:** This method will allow each recertifier to determine the rate of testing needed for each grouping to comply with Section 7.1.1 and 7.1.2 above. This method will also demonstrate the improvement, if any, that resulted from the recertifiers efforts.

² This information is key to other recertifiers, manufacturers and consumers. The developed information should be used to inform and educate the consumer on the need, and frequency, with which to participate in the recertifying process. Manufacturers using this information will be better able to determine product performance.

7.2.2. Helmets that are samples for testing representative of the helmets to be returned to the field of play must be tested prior to undergoing any repairs (BEFORE) and then these **very same** helmets tested **again** after (AFTER) completing any repairs. When testing the AFTER, the same "other" impact location (see Section 5.2, NOCSAE DOC.004) must be used.

8. Testing Procedure for Recertification

- 8.1. Calibrate your system and run the pre-testing calibration check as described above.
- 8.2. MEP Pad - Exchange the MEP pad used for calibration for the MEP pad used for testing.
- 8.3. Helmets selected for testing must be tested on the front, twice in a row, and then one other location, twice in a row. This second location is to be rotated periodically and proportionately to include the other impact locations as described in Section 5, NOCSAE DOC.004.
- 8.4. Immediately after impact, record SI results and peak g's. Any delay greater than 30 seconds can result in erroneous data.
- 8.5. Periodically, post-testing calibration checks need to be run to assure that the system being used has remained correctly calibrated (see Sections 18, NOCSAE DOC.001).

9. Reports

- 9.1. All reports must comply with Section 14, NOCSAE DOC.001.
- 9.2. When using sample selection as outlined in Section 7 above, the "BEFORE" and "AFTER" results must be reported on the same record (Helmet Identification or Test Tag number).

APRIL, 2002 MODIFICATIONS/REVISIONS

- Simplified document references within document.

JANUARY, 2003 MODIFICATIONS/REVISIONS

- Added to footnote 1 to included PC based data acquisition systems

APRIL, 2003 MODIFICATIONS/REVISIONS

- Modified naming convention and added NOCSAE logo to cover page.
- Defined data acquisition systems capabilities for use with the standard

DECEMBER, 2008 MODIFICATIONS/REVISIONS

- Updated footnote on page 1 to remove reference to “blue box” and GHI obsolete data acquisition systems.

JUNE, 2009 MODIFICATIONS/REVISIONS

- Clarified Section 7.2.1 and 7.2.2 defining good and repair

FEBRUARY, 2011 MODIFICATIONS/REVISIONS

- Added additional accelerometer options in section 3.4
- Specified resolution and tolerance for DVM and Torque Wrench

AUGUST, 2011 MODIFICATIONS/REVISIONS

- Clarified requirements in section 7

OCTOBER, 2014 MODIFICATIONS/REVISIONS

- Updated title name of NOCSAE DOC. 001