

**LABORATORY PROCEDURAL GUIDE
FOR CERTIFYING NEWLY
MANUFACTURED POLO HELMETS**

NOCSAE DOC (ND) 051 – 03m14

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
Calibration Procedures	3
Testing Procedure for Certification	3
Reports	3
FEBRUARY, 2011 MODIFICATIONS/REVISIONS	4
OCTOBER, 2014 MODIFICATIONS/REVISIONS	4

1 Scope

- 1.1 This procedural guide establishes recommended practices for the certification of polo helmets.
- 1.2 **All testing and requirements of this standard specification must be in accordance with NOCSAE DOC.001, NOCSAE DOC.050 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 NEWLY MANUFACTURED POLO HELMETS, NOCSAE DOC.050.
- 2.3 EQUIPMENT CALIBRATION PROCEDURES - KME 200, NOCSAE DOC.101.

3 Test Equipment Required

- 3.1 Twin-wire Guide Assembly (as shown in Figure 3, NOCSAE DOC.001).
- 3.2 Retention System
- 3.3 Roll-Off stand w/guide rod and stop anvil
- 3.4 Appropriate NOCSAE headforms (see Section 13 and 15.5, NOCSAE DOC.001).
- 3.5 Appropriate MEP pads (see Section 15.2, NOCSAE DOC.001).
- 3.6 Hemispherical anvil
- 3.7 Equestrian anvil
- 3.8 PCB Triaxial Accelerometers, #354MO3, #356A66 or equivalent.
- 3.9 KME Series 200 Data Analyzer (or any analog/digital equivalent that can be demonstrated to correctly calculate SI from a given input signal)¹
- 3.10 Miscellaneous tools and equipment.
 - 3.10.1 Digital voltmeter (DVM), 3 ½ digit, 1mv resolution, ±0.5% accuracy and

¹ The portion of this procedural guide that is specific to data acquisition equipment use and calibration is for the KME Series 200 only. You should refer to the manual for the specific system you are using for differences in system operation.

connecting cables.

3.10.2 Torque wrench, range to 200 in/lb minimum, 5 % accuracy.

3.10.3 Appropriate electrical connectors (banana clips).

3.10.4 Tape measure.

3.10.5 Non-conducting glass/plastic jeweler's screwdriver (tweaking tool)

3.10.6 Miscellaneous hand tools.

4 **Mechanical Set-up**

4.1 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, NOCSAE DOC.001.

6 **Helmet Preparation**

6.1 See Section 5, NOCSAE DOC.050.

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 sample² 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 information³. 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

² **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.

³ 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.

additional samples in the event of a test failure of a sample that represents that particular grouping, lot or other control grouping:

- 7.3 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.

8 Calibration Procedures

See NOCSAE DOC.101.

9 Testing Procedure for Certification

- 9.1 Perform the retention testing first using a helmet that has been brought to the required temperature.
- 9.2 Perform the helmet stability test next.
- 9.3 Calibrate your drop system and run the pre-testing calibration check as described above.
- 9.4 MEP Pad - Exchange the MEP pad used for calibration for the hemispherical or equestrian anvils; then to the MEP pad used for testing.
- 9.5 Helmets selected for impact testing must be tested in all locations and all drop velocities as specified in Section 9, NOCSAE DOC.050.
 - 9.5.1 Impact testing may begin in any location. Except for the high temperature impacts, all impacts must be completed before moving to a new location. It is not necessary to complete all testing on a given helmet before removing the helmet from the test rig.
 - 9.5.2 Helmets selected for high temperature testing must have already been impacted at ambient temperature.
- 9.6 When using KME equipment, immediately after impact record the SI results and the peak g's. Any delay greater than 30 seconds can result in erroneous data.
- 9.7 Periodically, post-testing calibration checks need to be run to assure that the drop system being used has remained correctly calibrated (see Sections 18, NOCSAE DOC.001).

10 Reports

- 10.1 All reports must comply with Section 14, NOCSAE DOC.001.

FEBRUARY, 2011 MODIFICATIONS/REVISIONS

- Specified resolution and tolerance for DVM and Torque Wrench
- Changed reference to drop height to drop velocity.

OCTOBER, 2014 MODIFICATIONS/REVISIONS

- Updated title name of NOCSAE DOC. 001
- Clarified requirements in section 7