

**LABORATORY PROCEDURAL GUIDE
FOR RECERTIFYING HOCKEY HELMETS**

NOCSAE DOC (ND) 033 – 04m11

Prepared By



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

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1 Scope

- 1.1 This procedural guide establishes recommended practices for the recertification of hockey helmets.
- 1.2 ***All testing and requirements of this standard specification must be in accordance with NOCSAE DOC.001, NOCSAE DOC.032 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 PROTECTIVE HEADGEAR, NOCSAE DOC.001
- 2.2 STANDARD PERFORMANCE SPECIFICATIONS FOR RECERTIFIED HOCKEY HELMETS, NOCSAE DOC.032.
- 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).

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.

- 3.6.4 Tape measure or appropriate drop height gauges.
- 3.6.5 Non-conducting glass/plastic jeweler's screwdriver (tweaking tool).
- 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.032.
- 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.032.
 - 7.1.2 Recertifiers that adhere to this guideline and participate in industry wide surveillance and reporting efforts may utilize that combined information. 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:

¹ **Note:** This method will allow each recertified to determine the rate of testing needed for each category 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.

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.

- 7.2.1 Good: Helmets appear to be in satisfactory shape - no cracks, no missing pads, no missing chin straps, components installed correctly, etc.
- 7.2.2 Repair: Helmets have visible defects that are repairable - missing/torn pads, missing/torn chinstraps, etc.
- Helmets with a cracked shell, or cracks in the shell, are **not** considered repairable.
- 7.2.3 Reject: Helmets have obvious defects which are beyond repair - cracked shell, etc.
- 7.2.4 An adequate representative sample from each group that is to be returned to use must be tested.
- 7.2.5 At least 50% of the product tested 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 5.3, NOCSAE DOC.032) must be used.
- The other 50% may be tested only BEFORE or only AFTER reconditioning, or any combination of either.

8 Testing Procedure for Recertification

- 8.1 Calibrate your system.
- 8.2 Exchange the MEP pad used for calibration for the MEP pad used for testing. Perform pre-testing system check.
- 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. Observe time limits between impacts. This second location is to be rotated periodically and proportionately to include the other impact locations as described in Section 5, NOCSAE DOC.032.
- 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 categories as outlined in Section 7 above, the "BEFORE" and "AFTER" results must be reported on the same record (Helmet Identification or Test Tag number).

FEBRUARY, 2011 MODIFICATIONS/REVISIONS

- Added additional accelerometer options in section 3.4
- Specified resolution and tolerance for DVM and Torque Wrench
- Updated footnote on page 1 to remove reference to “blue box” and GHI obsolete data acquisition systems.