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|    | <b>DEPARTMENT OF COMMERCE</b><br>National Institute of Standards and Technology<br>National Voluntary Laboratory Accreditation Program | <b>ISSUE DATE:</b><br>March 19, 2010 |
|   | <b>LAB BULLETIN</b>  | <b>NUMBER:</b> LB-48-2010            |
|   |  | <b>LAP:</b> Personal Body<br>Armor   |
| <b>SUBJECT:</b> Information on testing, testing procedures, and reports for both NVLAP and the Compliance Testing Program |  |                                      |

The purpose of this laboratory bulletin is to provide NVLAP Personal Body Armor laboratories with additional information and instructions to meet the requirements and expectations of both NVLAP and the Compliance Testing Program (CTP) when performing Sections 5, 6, and 7 of NIJ 0101.06, *Ballistic Resistance of Body Armor*.

Copies of the NIST Handbook 150-24, *Personal Body Armor*, the program checklist, and other laboratory bulletins may be found at [www.nist.gov/nvlap](http://www.nist.gov/nvlap).

**Question:** What is required of laboratories that submit Compliance Test Reports (CTRs) to the CTP?

**Answer:** Since NVLAP accreditation is required for laboratories that submit CTRs to the CTP, all CTRs submitted to the CTP are required to meet NVLAP requirements, as well as CTP and NIJ requirements.

**Question:** Can my laboratory use the official CTR spreadsheet to provide to a customer a test report that will not be sent to the CTP for review?

**Answer:** No. The official CTR may only be used for tests that are to be submitted to the CTP for compliance review. The official CTR is distributed and controlled by the CTP.

However, the public version of the CTR may be used for tests that will not be submitted to the CTP. The public version CTR and any additional test information must be kept in the laboratory records system and are required to be clearly marked to indicate any deviation from the standard or other requirements. The report must be marked in such a way as to prevent inappropriate use of the report and to prevent misunderstanding.

In the public version of the CTR, references to the Compliance Testing Program have been removed. The public version is currently available from <http://www.justnet.org/Pages/manufacturers.aspx>.

**Question:** What is a “Clarification”?

**Answer:** A “Clarification” is one of a document series issued by the CTP to provide information concerning the NIJ standards, testing requirements, testing procedures, etc., in response to questions from laboratories or manufacturers. When the CTP issues a Clarification, the laboratory is required to take appropriate action to incorporate the information provided in the Clarification into the laboratory management system. This may include changes to laboratory documentation, training of laboratory staff, and changes to test protocols and procedures. Laboratories should periodically check the CTP web site for new Clarifications. Laboratories should also check that site before beginning a new test campaign.

**Question:** One of the test armors sent by a client to my laboratory was damaged in shipping. What should I do?

**Answer:** NVLAP-accredited laboratories are required to inspect incoming samples and materials and the accompanying documentation. This inspection must be done before any testing begins. The requirements for this activity are given in NIST Handbook 150 5.8.3. The laboratory is required to consult with the client about the damaged test armors before proceeding and to record the discussion.

**Question:** After sending a CTR to the CTP, I discovered an error. What should I do?

**Answer:** Amendments may be made to CTRs that have been submitted to the CTP, however, the changes need to be highlighted in some fashion and a written explanation given for each change. The explanations are required to be submitted to the CTP. The requirements for issuing an amended test report are given in NIST Handbook 150 5.10.9.

**Question:** What test records do I need to keep?

**Answer:** The requirements for recordkeeping are given in the NIJ standards and in NIST Handbooks 150 and 150-24. All records and details of tests are required to be entered into the laboratory records management system and are required to be treated according to the laboratory management system requirements. Testing information that is not included in the CTR is required to be kept by the laboratory for possible future use, review, and/or audit.

**Question:** How do I meet all the soft armor requirements for time, tumble count, and rotation rate?

**Answer:** To meet the requirements, the laboratory is required to adjust the tumble rate during the conditioning period. The requirements for the soft armor conditioning include: tumble for 240 hours +/- 1 hour, tumble through 72,000 revolutions +/- 1500 revolutions, and maintain a tumble rate of 5 RPM +/- 1 RPM. To meet the requirements, the laboratory should monitor the revolution count as often as necessary during the 240 hours and make adjustments to the rotation speed as necessary. The laboratory must closely monitor the conditioning as the end of the 240 hours approaches. Final adjustments should be made to meet the time and tumble requirements. Note that starting the tumbling protocol on a Thursday or Friday will lead to ending the conditioning on a Saturday or Sunday.

Clarification CTP 2009:05 *Armor Loading and Unloading Instructions* has been issued to address questions about loading and unloading. This Clarification refers and links to *Guidelines for Completion of Armor Conditioning by NIJ STD-0101.06 Section 5*, which gives specific details.

**Question:** What CTP documents must be available at the laboratory?

**Answer:** Prior to starting a CTR, laboratories are required to check the CTP web site for updates. Laboratories are required to download all relevant CTP documents for laboratories and manufacturers, and have them available for reference.

**Question:** Can I skip any of the temperatures required by the hard armor conditioning protocol?

**Answer:** No. For the hard-armor temperature and humidity conditioning, laboratories are required to ensure that each and every temperature step is applied per the standard. The laboratory is required to record and plot the time, temperature, and relative humidity for the full time required for the conditioning. The laboratory is required to record explanations for

over/undershoot, ringing, anomalies (such as spikes), and improbable relative humidity readings recorded on the plots.

**Question:** Are there any special requirements for documenting ballistic perforations or excessive backface signatures?

**Answer:** When perforations or excessive backface signatures occur, the laboratory is required to document the details of the test at the time of the occurrence. Unusual circumstances and observations are required to be placed in the record. Explanations of known or suspected causes for the perforation or excessive backface signature should also be recorded.

**Question:** I cannot find for purchase all of the threats (bullets) specified in NIJ 0101.06. What should I do?

**Answer:** Contact the CTP for assistance.

**Question:** Is the V50 shot pattern on a grid of horizontal and vertical lines?

**Answer:** No. V50 shot patterns should not be on a horizontal-vertical grid that would cause two (or more) shots to impact on the same threads or yarns. Shots should be offset from the grid.

**Question:** Can I round off backface signature measurements (BFS) to the nearest millimeter before entering the data into the CTR?

**Answer:** No. Laboratories are required to measure and record BFS depth to the best of their ability with a resolution of 0.1 mm. Each instrument reading is recorded as read with no round off. The CTR spreadsheet carries all digits (no round off) for calculations. The laboratory is required to verify that the radius of the tip of the measuring instrument is appropriate for the contour of the bottom of the BFS depression. It is also required that the laboratory verify that the BFS measurement has been accurately transferred to the CTR. Note that depth measurements made during clay calibration shall not be rounded.

**Question:** What records do I have to keep for armor conditioning (soft armor and hard armor, NIJ Standard 0101.06 Sections 5 and 6), is there a test report format, and to whom do I send conditioning records?

**Answer:** Records must be kept in the laboratory system that detail the relevant conditioning parameters including, as appropriate, dates and times of the test, temperature and relative humidity, and tumble counts. The records should include client name (and other information required by NIST Handbook 150, 5.10), load (for soft armor), mounting details (hard armor), photographs if appropriate, and full descriptions of anomalies should any occur. Depending on the laboratory setup and equipment, additional information that may be necessary to fully document the conditioning should be recorded.