Topic: Potentially Hazardous Materials Contained in Ballistic-Resistant or Stab-Resistant Body Armor

The National Institute of Justice (NIJ) Compliance Testing Program (CTP) published Administrative Clarification 2015:04 to address potentially hazardous materials contained in ballistic-resistant or stab-resistant body armor submitted to the NIJ CTP for testing, particularly novel materials not already commonly associated with body armor, such as nanomaterials. Administrative Clarification 2015:04 also requires a Material Safety Data Sheet (MSDS) for all materials included in an armor model.

NIJ must consider both the potential benefits and potential risks to human health that might accompany use of such atypical materials in body armor. Nanomaterials in particular present interesting possibilities for advances in technology, but might also expose humans to hazards in the course of handling or use of products in which they are incorporated.[1] Carbon nanotubes (CNT) or other nanomaterials may pose health risks to the personnel involved in the testing or evaluation of body armor during and after testing, due to the destructive nature of the testing process on ballistic-resistant and stab-resistant body armor samples. This testing has the potential to alter the state of any encapsulation or containment that may have been present prior to testing. In situations where the permanent ballistic pad covers are breached through routine testing of the panels, testing personnel may be at risk of inhalation or absorption of nanoscale particulates.

These considerations extend to the health of end users such as police officers, where the ballistic pad cover may become breached through routine wear or an incident in which the armor is impacted by a ballistic threat in the field. In these scenarios, the encapsulation technique may also be compromised and create the potential for end users wearing body armor to be exposed to the CNTs or other nanomaterials through inhalation or absorption. While the use of CNTs in body armor is still relatively novel, law enforcement officers who may wear body armor containing CNTs or other nanomaterials, or who are considering doing so, should take into account the potential health hazards these materials may present.

Clarification

Based on the above concerns and in addition to the requirements in Administrative Clarification 2015:04, Applicants that submit ballistic-resistant or stab-resistant body armor models to the NIJ CTP for evaluation must declare in writing whether the armor contains CNTs or other nanomaterials *prior to* submission of the armor.

[1] For more information, please see "Environmental, Health, and Safety Issues" at nano.gov, the Official website of the United States National Nanotechnology Initiative: https://www.nano.gov/you/environmental-health-safety.

For any armor containing CNTs or other nanomaterials which an Applicant intends to submit, that Applicant shall provide all of the following:

1. Documentation demonstrating that the CNTs or other nanomaterials contribute to the ballistic performance of the armor, and that potential benefits outweigh the potential risks to human health. Should the CNTs or other nanomaterials not be incorporated for the purpose of ballistic protection, a justification must be provided explaining why the CNTs or other nanomaterials are incorporated into the armor, and that potential benefits of their use outweigh the potential risks to human health;

2. Documentation demonstrating that the armor does not pose a health hazard to those involved in the destructive testing process—i.e., laboratory testing, armor inspection, review, and storage or archiving; and

3. Documentation demonstrating that the armor does not pose a health hazard to end users over the service life of the armor.

Applicants who are unable to meet the above requirements will not be permitted to submit the armor model to the NIJ CTP. For armor that meet the above requirements, Applicants should expect to provide safe handling instructions, and may be responsible for any additional cost associated with ensuring safe handling and clean up.

Armor Currently Listed on the Compliant Products List (CPL)

Applicants with armor models currently listed on the CPL, or who have submitted armor to the NIJ CTP and are in the testing process, should declare in writing within 30 calendar days of the publication of this Administrative Clarification whether the listed or submitted armor contains CNTs or other nanomaterials. As a secondary check, the NIJ CTP shall also require Applicants to declare whether listed armor contains CNTs or other nanomaterials during Follow-up Inspection Testing (FIT) until all listed models have undergone their next scheduled FIT.

The NIJ CTP may also review documentation or other information provided by Applicants at the time of the original submission to the program and make an initial determination of the presence of CNTs or other nanomaterials in armor models. Any armor model containing CNTs or other nanomaterials that are currently listed on the CPL shall be suspended immediately, and an NIJ Advisory Notice shall be published for each model. If the model has been submitted by the Applicant and is in the testing process, the NIJ CTP shall advise the Applicant to immediately cease testing. In order to determine the potential risks to human health, Applicants shall provide to the NIJ CTP all of the following within 60 calendar days of publication of the Advisory Notice or notification to cease testing, as appropriate:

1. Documentation demonstrating that the CNTs or other nanomaterials contribute to the ballistic performance of the armor, and that potential benefits outweigh the potential risks to human health. Should the CNTs or other nanomaterials not be incorporated for the purpose of ballistic protection, a justification must be provided explaining why the CNTs or other nanomaterials are incorporated into the armor, and that potential benefits of their use outweigh the potential risks to human health;

2. Documentation demonstrating that the armor does not pose a health hazard to those involved in the destructive testing process—i.e., laboratory testing, armor inspection, review, and storage or archiving; and

3. Documentation demonstrating that the armor does not pose a health hazard to end users over the service life of the armor.

If the Applicant meets the requirements above, the suspension will be removed and the model will be listed as active on the NIJ CPL. If the Applicant does not meet the requirements above, or the Applicant does not provide all the documentation required, the armor model will be permanently removed from the NIJ CPL.