



Performance standard for non-pneumatic limb tourniquets

Description: There is currently no specification or test method for non-pneumatic tourniquets used by responders, and a standard is needed to give confidence or a comparable baseline for claimed performance by manufacturers. There are known incidents of tourniquets failing when used and reports of counterfeit tourniquets being sold.

The standard should include performance requirements, such as those listed below, and test methods for assessing performance:

1. Complete occlusion of arterial blood flow in thigh
2. Capable of easy release and re-application
3. Application time ≤ 60 seconds
4. Simplicity and ease of application in the tactical environment (dark, cold, hot, wet, sand, mud, or ice)
5. Minimal familiarization required for correct application
6. Locking device/technique to ensure no slipping or loosening of the tourniquet
7. Durability at extreme temperatures (There are current examples of the tightening device on the tourniquet breaking due to exposure to extreme cold.)

End User Benefits: All types of responders may be faced with the need to apply a tourniquet, and all would benefit from having a performance standard for tourniquets.

Related Standards: There are no existing standards for non-pneumatic tourniquets, but the Defense Centers of Excellence: Joint Trauma System is in phase 3 tourniquet trials and may have relevant test methods and data.

Work to Date: The IAB has identified a subject matter expert to lead the effort and relevant end users, manufacturers, and federal agency representatives that should be invited to participate. ASTM International F04, *Committee on Medical and Surgical Materials and Devices*, and the Association for the Advancement of Medical Instrumentation were identified as potential organizations to develop this standard.

Standard practices, test methods, and procedures for monitoring effectiveness of protective clothing doffing for avoidance of contamination transfer

Contamination transfer often occurs when doffing protective clothing because responders are not taught proper procedures and precautions for avoiding transfer of contaminants following use and exposure. According to a 2015 report, fewer than one in six healthcare workers followed the correct recommendations for removal of personal protective equipment (PPE) after patient care, likely contaminating themselves and increasing the risk of transmission to others.

A standard is needed to provide the general requirements for monitoring how contamination transfer occurs during doffing. These requirements should provide for the use of specific fluorescent tracer solutions, their manner of application, selection of test subjects, safety provisions for human subjects use, manner of doffing, and procedures for viewing and documenting fluorescent on individuals following exposure.

End User Benefits: This standard would benefit any end user operating in hazardous materials response, CBRN incident response, close proximity to highly infectious diseases, or any incident having the possibility of exterior contamination of protective clothing and equipment. End users include emergency medical services providers, law enforcement, fire service, pre-hospital first receivers, and various DoD functions.

Related Standards: There are currently no existing standards; however, the US Army has developed a doffing protocol using fluorescent markers (*TECMIPT Test Operations Procedures (TTOP) Test for Cross Contamination During Doffing of Personal Protective Equipment*); it may be possible to transition that protocol to a standard.

Work to Date: This work has been initiated within ASTM International F23, *Committee on Personal Protective Clothing and Equipment*: ASTM WK55144, *New Practice for Evaluating the Transfer of Exterior Contaminants from Protective Clothing During Doffing*. Jeffrey Stull, from International Personal Protection, is the task group chair.

Performance standard for public safety bomb suits – blast overpressure requirement

The scope of this requirement is to develop performance requirements and test methods to be added to the current version of NIJ Standard-0117, *Public Safety Bomb Suit Standard*, to address blast overpressure protection. The effects of blast overpressure on the human body need to be taken into account to address external and internal impact/injury to the head, neck, thorax, abdomen, and ears.

Development of performance requirements and test methods will require research and testing.

End User Benefits: Civilian bomb technicians and military EOD technicians will benefit.

Related Standards: This technology is currently in use, and NIJ Standard-0117.01 does not address blast overpressure protection.

Work to Date: Battelle has completed a literature review and gap analysis to identify and assess research and testing related to effects of blast overpressure on bomb suit performance and on the bomb technician donning the bomb suit. The report is entitled, “Literature Review of Blast Overpressure Effects on Bomb Suit Performance,” and may be obtained by contacting the IAB Program Office at *info@interagencyboard.us*.

Performance standard for less lethal chemical agent devices

A performance standard, including test methods, is needed to address the performance of chemical agent devices and their delivery systems. Several types of chemical agent devices are currently in use, including OC (Oleoresin capsicum) spray (i.e., pepper spray), CS (Orthochlorobenzalmalonitrile) spray (i.e., tear gas), powders, and smoke.

The following issues were identified by end users and could be addressed by having a performance standard:

- Chemical concentrations vary greatly between products of the same model.
- Manufacturer claims on material safety data sheets are not consistent (different information, different place on MSDS, and written differently), and the sheets do not list all contents but only list active ingredients and “proprietary blend”.
- There have been instances of chemical agents or their carriers being ignited by use of a conducted energy device.
- The effective distance range from canister to subject is inconsistent and not predictable.
- There are inconsistencies with low temperature use; devices don’t perform as well when cold.
- High temperatures can cause canisters to burst.

End User Benefits: Standards for chemical agent devices would benefit law enforcement, corrections, sheriff, and SWAT officers who use chemical agents and those who are engaged in the development and implementation of tactical operations procedures and related equipment.

Related Standards: United Kingdom Home Office Standard for chemical devices: *CAST Standard for Police Chemical Irritant Sprays: CS and PAVA*

Work to Date: The IAB has held end user meetings to define needs and requirements, has identified relevant individuals and organizations that should be involved in this effort, and has mapped out a path forward.

Standard test method for less lethal conducted energy weapons

Conducted energy weapons (CEWs) (e.g., TASERs) are used by more than 16,000 law enforcement agencies as a less lethal force option. CEWs are designed to introduce electrical charge into a human body for the purpose of creating pain and incapacitation. Although they are

commonly used, CEWs are not tested to any standards and have been found in field use to be very inconsistent in their electrical output. The biggest problem is “cold” weapons that do not have high enough output to cause pain much less incapacitation. Situations in which CEWs are deployed and have low output typically result in the use of lethal force.

A standard test method is needed to allow for consistent, independent testing of CEWs prior to purchase and deployment in the field.

End User Benefits: More than 500,000 law enforcement officers using CEWs would benefit from having a standard test method to allow for consistent testing prior to field use.

Related Standards: IEC 62792, *Measurement method for the output of electroshock weapons*.

Work to Date: The IAB has held end user meetings to define needs and requirements, has identified relevant individuals and organizations that should be involved in this effort, and has mapped out a path forward.

Performance standard for distraction devices

A performance standard is needed for noise flash diversionary devices, also known as distraction devices, flash-bangs, or stun grenades, used by law enforcement and corrections.

The following issues were identified by end users and could be addressed by having a performance standard:

- Officers have been injured, burned, or killed due to distraction devices exploding in the user’s hand.
- Devices do not remain stationary after deployment but can roll or propel to unintended locations.
- Devices produce so much smoke that visibility becomes limited.
- The sound output of the devices is neither consistent nor specified by the manufacturer.
- The brightness and duration of the light produced by the devices is inconsistent.
- Some devices have burned so hot that they caused unintended structure fires.

End User Benefits: Standards for distraction devices would benefit law enforcement, corrections, sheriff, and SWAT officers who use distraction devices and those who are engaged in the development and implementation of tactical operations procedures and related equipment.

Related Standards: There are currently no existing standards.

Work to Date: The IAB has held end user meetings to define needs and requirements, but much work is still needed to lay a foundation for standards development.

Standard test method for explosive containment vessels

Civilian and military bomb technicians use explosive containment vessels to transport explosives and improvised explosive devices. A standard, including performance requirements and test methods, is needed to evaluate: (1) the capability of total containment vessels (TCVs) to contain an explosive blast and/or chemical/biological agents inside the vessel and (2) the venting/scrubbing properties of the TCVs and related machinery.

It is not known whether publications exist regarding testing and performance of containment vessels. Unofficial testing has been conducted by the US Marine Corps Explosive Ordnance Disposal program using vessels manufactured by NABCO Inc. and Mistral Security Inc.; however, testing has been reliant upon the manufacturer for operational use and specifications. Development of performance requirements and test methods will require research and testing.

End User Benefits: Civilian and military bomb technicians and other responders who may work with Explosive/Chemical/Biological materials would benefit from having a standard test method.

Related Standards: There are currently no existing standards.

Work to Date: The IAB has discussed this need with the limited number of manufacturers producing these devices and has had discussions with ASTM International E54, *Committee on Homeland Security Applications*, since this work may fit the E54.08, *Subcommittee on Operational Equipment*.

Product Standard for less lethal impact (i.e., kinetic energy) devices using a launching system to fire projectiles

Performance requirements and test methods need to be developed to address the performance of less lethal impact devices, such as polyurethane projectiles, plastic projectiles (e.g., Pepperball, FN), wooden batons, foam batons, and bean bags, fired from a launching system.

The standard should address at least the following:

- Intended use (see examples below)
- Appropriate launching systems (such as single shot, over-under, multi-launcher, pump type; hand-held or shoulder-fired)
- Projectile type, materials, and number in cartridge
- Accuracy and velocity of projectile
- Impact energy in foot-pounds (for pain compliance or incapacitation)
- Effective distance range (minimum to maximum)
- Resistance to moisture from rain and high humidity
- Potential hazards
- Black powder/smokeless

(Note: There are international standards being developed to address the safety of the targeted individual/opponent, so this should not be addressed here.)

Examples of how less lethal impact devices are used in the field are provided below:

- (1) Crowd control.
- (2) Targeting instigators.
- (3) Incapacitating threatening, hostile, or non-compliant subjects.
- (4) Incapacitating suicidal subjects.

End User Benefits: Standards for impact devices would benefit law enforcement, corrections, sheriff, and SWAT officers who use impact devices and those who are engaged in the development and implementation of tactical operations procedures and related equipment.

Related Standards: There are currently no existing standards, but a great deal of research and testing has been done to support development of a standard.

Work to Date: The IAB has held end user meetings to define needs and requirements, has identified relevant individuals and organizations that should be involved in this effort, and has mapped out a path forward.

Standard guidance for illicit substance detection

Law enforcement officers (LEOs) are in need of guidance for dealing with suspected illicit substances encountered in the field. The issue has gained importance as officers are faced with handling “liquid meth” (i.e., methamphetamine in solution), which has become a more common procedure for attempts to smuggle illicit drugs across US borders.

A notable gap exists between finding a substance, testing it, and identifying it as methamphetamine in solution. Once the substance is identified, the handling and PPE requirements become easy to address. Before the substance is identified, officers face the very difficult situation of having a “solution suspected of containing illicit substances”.

Prior to developing guidance, an assessment of current national guidelines, methods, and best practices for LEO approach to evaluation of unknown compounds (solids, powders, liquids, vapors) for illicit substances needs to be done. The assessment should ask whether current LEO policies meet or reflect the current best practices for safety, efficiency, effectiveness, evidentiary chain of custody, intent to conceal, and processes to document prevention of contamination along chain of custody.

End User Benefits: All law enforcement officers, and potentially fire fighters, encountering solutions suspected of containing illicit substances would benefit from this guidance.

IAB Standards Development Priorities for FY2016

Related Standards: There are currently no existing standards.

Work to Date: Background research and data collection has not been performed to further define this need.