

## COMPLIANCE TESTING PROGRAM

July 6, 2020

**NIJ CTP Product Conformity Assessment System  
Document 606.2.1: Ballistic Body Armor Initial Type Testing (ITT) Scheme  
Version 1.1**

This revision (1.1) reflects changes resulting from the conclusion of the former Justice Technology Information Center (JTIC) program on December 31, 2019, which previously hosted the NIJ CTP. The NIJ CTP has transitioned to, and is now hosted by, RTI International as part of the Criminal Justice Testing & Evaluation Consortium (CJTEC). Revisions in this document are:

- 1) All references to JTIC have been removed from the document.
- 2) This document has been renumbered from 606.2 to 606.2.1, and re-named Ballistic Body Armor *Initial Type Testing (ITT)* Scheme, to clarify the purpose and scope of this document.
- 3) Section 1 (Scope) has been updated to harmonize with other NIJ CTP Product Conformity Assessment System documents.
- 4) Revised format and updated Section 10, Revision History.

Document Identification: 606.2.1	Approval Date: 2 July 2020
Revision: Rev 1.1	Implementation Date: 13 July 2020



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## NIJ CTP Product Conformity Assessment System: Ballistic Body Armor Initial Type Testing (ITT) Scheme

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## Introduction

This product conformity assessment scheme forms a part of the National Institute of Justice Compliance Testing Program (NIJ CTP) Product Conformity Assessment System. The top level system document (NIJ CTP Product Conformity Assessment System, Document ID 606.1) contains additional information and requirements that are applicable to this subordinate scheme. The conformity assessment requirements contained in this scheme have precedence over those contained in NIJ Standard 0101.06.

Participation in this scheme requires the transfer of body armor between the applicant, the NIJ CTP and the test laboratory. Participants are expected to comply with all applicable federal, state and local laws.

The official specification limits contained in this scheme shall be in International System of Units (SI). Any other units provided in parenthesis following the SI units are for convenience only. If any difference exists because of conversion or rounding, the SI units have precedence.

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## 1 Scope

**1.1** This scheme describes the specific conformity assessment requirements of the National Institute of Justice Compliance Testing Program (NIJ CTP) for ballistic-resistant body armor models to be listed on [NIJ's Compliant Products List \(CPL\)](#).

### 1.2 Roles and Responsibilities

**1.2.1** The NIJ CTP is responsible for the overall management and performance of the activities described in this scheme.

**1.2.2** The ballistic testing of samples conducted through the activities described in this scheme will be performed by [NIJ-approved laboratories](#) (see Section 6.1.5) according to the requirements of this scheme.

**1.2.3** Applicants are responsible for submitting the required information (described in Section 4) to the NIJ CTP and complying with all terms and conditions of any agreements required of Applicants to participate in, or to maintain good standing with, the NIJ CTP.

**1.3** Only the following categories of ballistic-resistant body armor are within the scope of this document:

a) soft body armor typically made up of layers of textile-based materials shaped into armor panels that are intended to provide either full torso (front, back and sides) or limited torso (front and back) coverage,

b) in-conjunction armor that consists of a single armor panel or plate that is intended to be layered with a specific stand alone soft body armor (Item a above) to provide increased protection to the torso,

c) Type III stand-alone flexible scaled armor consisting of multiple overlapping tiles or plates, or

d) hard armor that consists of a single armor plate that is intended to provide stand alone protection to the torso.

**1.4** Only armor models seeking classification as Type IIA, II, IIIA, III or IV, as described in NIJ Standard 0101.06, Section 2, are included in this scheme.

**1.5** Armor accessories are not within the scope of this scheme.

**1.6** Where requirements contained in this document may differ with requirements contained in NIJ Standard 0101.06, this document shall take precedence.

**1.7** The requirements in *NIJ CTP Product Conformity Assessment System – General Requirements* apply unless otherwise indicated.

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## 2 Normative References

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- 2.1 ASTM E3005-20. *Standard Terminology for Body Armor*.
- 2.2 ISO/IEC 17020:2012. *Conformity assessment - Requirements for the operation of various types of bodies performing inspection*.
- 2.3 ISO/IEC 17025:2017. *General requirements for the competence of testing and calibration laboratories*.
- 2.4 ISO/IEC 17065. *Conformity Assessment – Requirements for bodies certifying products, processes and services*.
- 2.5 ISO/IEC 17067:2013. *Conformity Assessment – Fundamentals of product certification and guidelines for product certification schemes*.
- 2.6 NIJ Standard-0101.06. *Ballistic Resistance of Body Armor*.

## 3 Terms and Definitions

The terms defined here supplement those provided in the NIJ CTP Product Conformity Assessment System.

### 3.1 accessory

A body armor component that is detachable or removable from the body armor and is intended to provide extended area of coverage protection against threats that may include ballistic threats, stabbing, fragmentation, blunt impact, or a combination of threats (ASTM E3005).

### 3.2 armor accessory

See *accessory*.

### 3.3 armor panel

See *panel*.

### 3.4 armor plate

See *plate*.

### 3.5 body armor

An item of personal protective equipment typically consisting of armor panels and/or plates held in place by an armor carrier and intended to protect the wearer from threats that may include ballistic threats, stabbing, fragmentation, or blunt impact (ASTM E3005).

### 3.6 construction

Physical characteristics of an actual product sample.

**Note:** With regard to ballistic-resistant body armor, construction includes, but is not limited to: key features, layout of materials, actual shape and actual size.

### 3.7 design

Documented plan that defines the intended physical characteristics of a product.

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**Note:** With regard to ballistic-resistant body armor, design includes, but is not limited to: key features, layout of materials, intended shapes, intended sizes and any processes necessary to achieve the desired result.

### **3.8 full torso coverage**

Coverage that includes, as a minimum, protection for the front, back and sides of the upper torso.

### **3.9 flexible body armor**

Body armor constructed of pliable, textile-based materials such that the complete system is capable of being flexed. Such systems are typically in the form of vests or jackets that provide greater coverage area than rigid plate armor. Generally, these armors provide protection against handgun threats (NIJ Standard-0101.06, 3.20).

**Note:** Although NIJ Standard-0101.06 uses the term *flexible*, the community is moving away from that to use the term *soft*.

### **3.10 hard armor**

An item of personal protective equipment that is constructed of rigid materials and is intended to protect the wearer from threats that may include ballistic threats, stabbing, fragmentation, or blunt impact, or combinations thereof.

### **3.11 in conjunction armor**

Armor system that uses an armor panel or plate in conjunction with, or layered over, a soft armor that has been designed to provide a specific level of ballistic protection when used alone.

### **3.12 in conjunction plate**

An insert that is designed to provide increased ballistic or stab protection only when used with a particular model of soft armor vest or jacket. (NIJ Standard-0101.06, 3.24)

### **3.13 key feature**

Key features include, but are not limited to: materials of construction (and source), slits, slots, cuts, notches, seams, darts, stitching, overlaps, folds, additional panels or similar features.

### **3.14 limited coverage**

Coverage that is less than full torso coverage.

### **3.15 listed company**

Company name or brand under which a product is labeled, listed and sold.

### **3.16 NIJ CTP listed**

equipment found compliant by the NIJ CTP with an applicable NIJ CTP scheme and subsequently listed on a NIJ CTP compliant product list.

### **3.17 manufacturing location**

Physical location(s) of the production facility where final construction takes place and surveillance inspections are performed.

**Note:** For ballistic-resistant body armor, where final assembly, as described on the NIJ CTP Build Sheet, takes place and the Mark of Conformity is applied.

### **3.18 nonplanar armor**

Body armor with features that prevent the armor from making full contact with a planar backing

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material surface; examples include female body armor with bust cups and curved rigid plates (NIJ Standard-0101.06, 3.31).

### 3.19 panel

Component of soft body armor constructed of flexible protective materials enclosed in a non-removable panel cover.

### 3.20 plate

Component of hard body armor consisting of rigid or flexible protective materials.

### 3.21 soft armor

See *flexible body armor*.

## 4 Application

### 4.1 Applicants must provide the following with their ballistic-resistant body armor model applications:

- a) scope of requested certification to include: applicable standard or associated scheme, structure (planar, non-planar, soft, hard, ICW, front opening), Classification (type), shot-to-edge distances for each threat, range of sizes (area), curve (flat, single, multiple), proposed shots per panel and proposed number of panels;
- b) declared gender, **Note:** The applicant must self-declare a gender (male, female or neutral). However, there are no required differences in construction, testing or inspection.
- c) the period of time the applicant warrants the armor model's ballistic-resistant performance for the originally declared threat level; **Note:** The applicant must self-declare a ballistic performance warranty period. However, there are no tests or inspections to validate the warranty period.
- d) drawing of the proposed label containing all of the information identified in Appendix A;
- e) complete description of the construction including materials and assembly;
- f) material data sheet for each key or hazardous material used in the model; **Note:** This includes materials that may be hazardous in their "as received," "during testing" or "post testing" conditions.
- g) diagrams of all shapes that includes key features (model design aspects that vary in relation to size shall be clearly defined in order to fully document the entire scope or range of a model);
- h) NIJ-Approved test laboratory selected by the applicant for initial type testing;
- i) previously completed test reports the applicant believes should be considered for this model;
- j) description of materials or features contained in the proposed model armor not fully addressed by NIJ 0101.06.

**Note:** In conjunction armor consists of a dependent panel that must be used with a stand-alone soft armor panel. It may be considered either a soft or hard panel with regards to required information concerning its design.

**Note:** The NIJ CTP may require additional administrative forms or agreements to be completed before accepting the application.

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**4.2** A body armor design, previously determined by testing to be noncompliant, may not be re-evaluated unless a design change has been implemented that impacts the body armor’s performance or the new request includes a change in scope as described below.

**4.2.1** An applicant may submit one additional application for a previously submitted soft panel design that failed test requirements if that failure was limited to Perforation and Backface Signature Testing (P-BFS) of an NIJ-C-1 size only. Any additional failures prevent that design from being submitted again.

**4.2.2** The new application must not have any changes to the design except changing the smallest size limit from NIJ-C-1 to NIJ-C-2. Additional untested specimens may be necessary in order to have the appropriate number of specimens for conditioning.

## 5 Selection

**5.1** The inspection body shall prepare an NIJ CTP test plan for the applicant and test laboratory that meets the requirements of NIJ Standard 0101.06, this scheme, and includes at least the following:

- a) NIJ CTP test identification number or project number,
- b) manufacturer reference identification or tentative model identification,
- c) threat level (Type),
- d) number of test items,
- e) test item sizes,
- f) special instructions (if any) for the test laboratory (such as specific shot locations).

### 5.2 Test Item General Requirements

**5.2.1** Except for size as dictated by NIJ Standard-0101.06 and design aspects directly related to size or optional neck openings, the panels or plates of a single compliance test group shall contain no variation in construction between either each other or the applicant’s documentation.

**5.2.2** The term *armor* may refer to either **two** panels (two test items) when discussing soft armor or **one** plate (one test item) when discussing hard armor or a combination of these when discussing in conjunction armor. In order to facilitate clarity, this scheme shall use the term *test item* instead of armor when discussing individual specimens from a compliance test group.

**5.2.3** Tables 1, 2 and 3 summarize test requirements including the number of test items provided to the test laboratory and their purpose.

### 5.3 Test Item Requirements for *Soft* Panel Designs

**5.3.1** The size of soft panel test items shall be based on the maximum and minimum size of panels intended for production armor. Test items submitted for testing shall consist of two sizes (see Tables 4 and 5 of this scheme and the templates contained in Appendix C of the standard).

Table 4: Selection of the small test item template	
If the minimum area of a production armor panel is:	The small test items shall be sized to template:



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No limit	C-1
0.0980 m <sup>2</sup> (152 in <sup>2</sup> )	C-2
0.1399 m <sup>2</sup> (217 in <sup>2</sup> )	C-3
0.1890 m <sup>2</sup> (293 in <sup>2</sup> )	C-4
Not applicable	C-5

<b>Table 5: Selection of the large test item template</b>	
If the maximum area of a production armor panel is:	The large test items shall be sized to template:
Not applicable	C-1
0.1399 m <sup>2</sup> (217 in <sup>2</sup> )	C-2
0.1890 m <sup>2</sup> (293 in <sup>2</sup> )	C-3
0.2455 m <sup>2</sup> (381 in <sup>2</sup> )	C-4
No limit	C-5

**Note:** The size of panels submitted for testing may limit the sizes permitted for production armor.

**5.3.2** Test panels representing the front panel of soft body armor are not required to have a neck opening and may be sized the same as back panels meeting the same sizing template.

**Note:** NIJ Standard-0101.06, Section 5, Flexible Armor Conditioning Protocol requires four small and 12 large panels to be conditioned in the tumbler simultaneously. Therefore, when testing for a single threat round, 2twosmall and six large additional panels are included in the test specimen requirements for tumbling purposes only.

#### **5.4 Soft Body Armor Model Incorporating Two Panel Designs**

**5.4.1** A soft body armor model may incorporate one design for the front panel and a different design for the back panel if both designs have:

- a) fully demonstrated compliance with NIJ Standard 0101.06,
- b) been found acceptable for the same size range, and
- c) been found acceptable for the same threats proposed for the combined armor model.

**Note:** An example of a model using this option would be female soft armor models that use a nonplanar or structured front panel combined with a flat back panel.

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**5.4.2** The compliance test group for **each** design shall meet the requirements of Section 5.3 of this scheme.

**Note:** If an applicant successfully submits an armor model that uses two flat panels of the same design (front and back), the applicant may then submit a second application for an armor model that uses the previous flat panel design for the back of the new model and a newly designed structured panel for the front of the new model. Applicants utilizing this option are not required to market a model consisting of just nonplanar panels for both the front and back.

## **5.5 Test Item Requirements for In Conjunction Armor**

**5.5.1** The size of in conjunction armor test items does not impose a limit on the size of panels intended for production armor. Plate test items used for evaluation shall be no larger than 254 mm x 305 mm (10.0 in x 12.0 in).

**5.5.2** The compliance test group shall include the number of in-conjunction plates identified in Table 3 and at least an equal number of NIJ CTP Listed soft panels. Additional soft panels of the same design may be included and used for drop testing and not used for ballistic testing.

**5.5.3** All soft panel test items shall meet template size NIJ-C-2 of NIJ Standard-0101.06, Appendix C. If the size range of the NIJ CTP Listed soft armor does not include NIJ-C-2, then the smallest size for which it is listed shall be used for testing (and conditioning).

**5.5.4** The in-conjunction soft armor provided by the applicant for drop testing is not required to also be used in the ballistic testing. If not also used in ballistic testing, the construction of the soft armor must be inspected first by the test laboratory and then provided to the CTP for inspection, in addition to the usual test items.

## **5.6 Test Item Requirements for Scaled Type III Designs**

The size of scaled Type III armor test items does not impose a limit on the size of panels intended for production armor. Test items used for evaluation shall be sufficiently large to allow for six shots per panel and be no larger than 254 mm x 305 mm (10.0 in x 12.0 in).

## **5.7 Test Item Requirements for Hard Plate Type III Designs**

The size of hard plate Type III armor test items does not impose a limit on the size of panels intended for production armor. Test items used for evaluation shall be no larger than 254 mm x 305 mm (10.0 in x 12.0 in).

## **5.8 Test Item Requirements for Hard Plate Type IV Designs**

**5.8.1** The size of hard plate Type IV armor test items does not impose a limit on the size of panels intended for production armor. Test items used for evaluation shall be no larger than 254 mm x 305 mm (10.0 in x 12.0 in).

**5.8.2** Testing of hard plates for a single threat round requires between seven and 37 test specimen plates. The appropriate number of plates required for evaluation is 36 divided by the number of shots per plate (applicant's decision), up to six. An additional plate is then added as an extra (replacement if necessary). All test plates shall be conditioned.

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Table 1: Test Item Allocation Chart (Part 1)												
	Test Bullet	New Armor Test Velocity (m/s)	Cond. Armor Test Velocity (m/s)	Test Method	Fair Hits (min)	Fair Hits (max)	Shots per Test Item (min)	Shots per Test Item (max)	Number of Test Items	Number of Test Items per Test	Number of Extra Test Items	Total Number of Test Items
Soft IIA	9 mm, FMJ RN	373		New P-BFS	48	48	6	8	8	4S + 4L	4L	6S + 22L
			355	Cond. P-BFS	24	24	6	8	4	2S + 2L		
		373		New BL	120	120	12		10	10L		
			355	Cond. BL	24	24	12		2	2L		
	.40 S&W, FMJ	352		New P-BFS	* 44	48	* 6 / 5	8	8	4S + 4L	4L	6S + 22L
			325	Cond. P-BFS	* 22	24	* 6 / 5	8	4	2S + 2L		
		352		New BL	120	120	12		10	10L		
			325	Cond. BL	24	24	12		2	2L		
Soft II	9 mm, FMJ RN	398		New P-BFS	48	48	6	8	8	4S + 4L	4L	6S + 22L
			379	Cond. P-BFS	24	24	6	8	4	2S + 2L		
		398		New BL	120	120	12		10	10L		
			379	Cond. BL	24	24	12		2	2L		
	.357 Magnum, JSP	436		New P-BFS	* 44	48	* 6 / 5	8	8	4S + 4L	4L	6S + 22L
			408	Cond. P-BFS	* 22	24	* 6 / 5	8	4	2S + 2L		
		436		New BL	120	120	12		10	10L		
			408	Cond. BL	24	24	12		2	2L		
Soft IIIA	.357 SIG, FMJ FN	448		New P-BFS	48	48	6	8	8	4S + 4L	4L	6S + 22L
			430	Cond. P-BFS	24	24	6	8	4	2S + 2L		
		448		New BL	120	120	12		10	10L		
			430	Cond. BL	24	24	12		2	2L		
	.44 Magnum, SJHP	436		New P-BFS	* 44	48	* 6 / 5	8	8	4S + 4L	4L	6S + 22L
			408	Cond. P-BFS	* 22	24	* 6 / 5	8	4	2S + 2L		
		436		New BL	120	120	12		10	10L		
			408	Cond. BL	24	24	12		2	2L		

\* NIJ Standard-0101.06, Sub Clause 7.8.1 allows only five shots to be taken on Size C1 test item for threat 2 **only if** "space limitations prevent taking six shots."

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Table 2: Test Item Allocation Chart (Part 2)												
	Test Bullet	*New Armor Test Velocity m/s	Cond. Armor Test Velocity m/s	Test Method	Fair Hits (min)	Fair Hits (max)	Shots per Test Item (min)	Shots per Test Item (max)	Number of Test Items	Number of Test Items per Test	Number of Extra Test Items	Total Number of Test Items
Soft III	7.62 mm, NATO FMJ	847		New P-BFS	48	48	6	8	8	4S + 4L	4L	6S + 22L
			847	Cond. P-BFS	24	24	6	8	4	2S + 2L		
		847		New BL	120	120	12		10	10L		
			847	Cond. BL	24	24	12		2	2L		
Soft IV	.30 Caliber, M2 AP	878*		New P-BFS	48	48	6	8	8	4S + 4L	4L	6S + 22L
			878	Cond. P-BFS	24	24	6	8	4	2S + 2L		
		878*		New BL	120	120	12		10	10L		
			878	Cond. BL	24	24	12		2	2L		

\* NIJ Standard-0101.06, Sub Clauses 2.4 and 2.5 indicates that the velocities for these test bullets are the same for both "as new" and conditioned armor.

Table 3: Test Item Allocation Chart (Part 3)												
	Test Bullet	*New Armor Test Velocity m/s	Cond. Armor Test Velocity m/s	Test Method	Fair Hits (min)	Fair Hits (max)	Shots per Test Item (min)	Shots per Test Item (max)	Number of Test Items	Number of Test Items per Test	Number of Extra Test Items	Total Number of Test Items
Flexible Scaled Armor III	7.62 mm, NATO FMJ	847	847	P-BFS	108	108	6	6	18	N/A	2	40
				BL	120	120	6	6	20			
Hard and Inserts III	7.62 mm, NATO FMJ	847	847	P-BFS	24	24	6	6	4	N/A	1	9
				BL	24	24	6	6	4			
Hard and Inserts IV	.30 Caliber, M2 AP	878	878	P-BFS	24	24	1	6	4 - 24	N/A	1	7-37
				BL	12	12	1	6	2 - 12			

\* NIJ Standard-0101.06, Sub Clauses 2.4 and 2.5 indicates that the velocities for these test bullets are the same for both "as new" and conditioned armor.

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## 6 Determination

### 6.1 General Testing Requirements

**6.1.1** The applicant must supply consistently constructed test items to the previously selected test laboratory in accordance with the NIJ CTP test plan.

**6.1.2** The laboratory is responsible for test item identification throughout the life of the test item in the laboratory. The laboratory shall use a method that will not be destroyed or become illegible during testing.

**6.1.3** Test laboratories shall build up backing material behind test specimens in order to conform to the shape of nonplanar armor. Nonplanar armor shall not be pressed flat by the test laboratory in order to avoid building up the backing material. However, soft nonplanar armor may be constructed by the applicant so that the amount of material built up behind test specimens is minimized so long as the construction remains true to the design defined in the application.

**Note** Applicants may use various seams to form planar material (X and Y axis) into a nonplanar shape (X, Y and Z axis). Inherent in those techniques is the ability to vary the volume covered/contained by the nonplanar shape. This may include a flat (not concave) final shape with the same seams present that are used to make the nonplanar shape.

**6.1.4** The test laboratory shall record if the test specimens are tested in a planar or nonplanar configuration to indicate if additional clay was used to build up the surface behind the test item.

**6.1.5** Test laboratories may fill voids during test sequences when doing so would improve the accuracy of test results. The existing requirements for filling voids between test sequences are applicable. Any filling of voids during test sequences must be clearly documented and justified in the test report. Documentation shall include at least shot number and proximity of next planned shot to voids caused by previous shots.

**6.1.5** All testing, conditioning and test reports shall be:

- a) performed by NIJ Approved Test Laboratories (within their scope of approval),
- b) completed according to the test laboratory's accredited ISO/IEC 17025 management system,
- c) compliant with NIJ Standard-0101.06, and
- d) comply with additional instructions provided in the NIJ CTP test plan.

**6.1.6** Test reports shall reference the test laboratory's ISO/IEC 17025 accreditation and the associated accreditation body.

**6.1.7** Testing may be terminated at any time by the applicant. All decisions to terminate must be reported by the test laboratory to the NIJ CTP.

**6.1.8** If testing is terminated by the applicant and there are failures during that test, the test report must be provided to the NIJ CTP and include an explanation for the termination.

**6.1.9** Following testing, the test laboratory shall supply a copy of the test report and two armor samples (four soft armor panels or two hard plates) to the NIJ CTP unless testing is terminated by the applicant before completion and there are no failures during that test. If possible, test items should be untested spares.

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## 6.2 Label Permanency and Durability Test

**6.2.1** The amount of force applied to the label shall only be as much pressure as required to hold the 100-percent knit cotton cloth against the surface of the label.

**6.2.2** The rate of rubbing the label shall be approximately 30 passes per 15-second interval.

**6.2.3** The portion of the label tested should be dry before proceeding to the next chemical. Drying can be accomplished with light blotting from a dry cloth.

**6.2.4** The NIJ CTP may accept previous Label Permanency and Durability Test results when determining label acceptability.

## 6.3 Soft Armor Conditioning

**6.3.1** Although drum rotation may vary ( $5.0 \text{ rpm} \pm 1.0 \text{ rpm}$ ), it must have  $72,000 \pm 1,500$  complete rotations within  $10 \text{ days} \pm 1 \text{ hour}$  ( $240 \text{ hours} \pm 1 \text{ hour}$ ). In order to ensure this specification is achieved, the laboratory should monitor the last four hours of conditioning and adjust (within specified limits) as needed.

**Note:** When planning conditioning testing, laboratories should plan the start of testing such that the testing will be completed during NIJ CTP's normal working business hours (Monday through Friday 8:30 am to 5:00 pm Eastern Time) in case there are problems with the armor after completion of conditioning that would require assistance from the NIJ CTP.

**6.3.1** Load armor panels into tumbler one panel at a time in order to ensure that before tumbling is started panels are distributed along the lower portion of the tumbler and not stacked precisely one over another.

**Note:** During loading, rotate panels so that no two panels are aligned in the same direction.

**6.3.2** If possible during the test item conditioning, periodically observe the armor panels to determine if they are tumbling independently. If the panels become tangled together or they are not tumbling independently, then stop the conditioning cycle, manually reorient the panels, then restart the conditioning protocol.

**6.3.3** Before opening the environmental chamber (to reorient panels or end conditioning), reduce the humidity prior to reducing the temperature in order to prevent condensation from forming and coming into contact with the panels. As described in NIJ Standard 0101.06, Section 5, tumbling must be stopped while the environment is in the out-of-tolerance conditions.

**6.3.4** If conditioning is interrupted, the amount of time that the armors spend in the out-of-tolerance conditions must be made up at the end of the protocol, as described by the Test Interruption Flow Chart, Figure 10, in Section 5 of NIJ Standard 0101.06. Any interruptions or out of tolerance conditions during conditioning shall be thoroughly documented in the test report.

**6.3.5** To the greatest extent possible, wrinkles introduced by the conditioning process should be avoided or removed so that panels are fully supported by backing material when tested ballistically. When the conditioning protocol has been completed, remove the armors from the tumbler and stack them as quickly as possible. Ideally this should be within minutes before they cool to room temperature.

**6.3.6** Planar panels shall be stacked on a flat surface. Nonplanar panels may be stacked on built up surface that conforms to and supports the shape of the panels before conditioning. Panels shall be stacked after conditioning while still warm. Place the most wrinkled armors on the bottom,

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straightening and smoothing them as much as possible, then stack other, smoother armors on top of the most wrinkled armors to help press out the wrinkles.

**6.3.7** If these procedures are not sufficient to return the samples to a condition that is acceptable for ballistic testing, the conditioned samples may be flattened using the following procedures:

- a) If necessary, and after all other attempts to flatten one or more armors have been exhausted, then the affected armor (or armors) may be warmed in an environmental chamber, with conditions of 1 hour  $\pm$  10 minutes at 45°C  $\pm$  10°C and 20 - 50 % relative humidity. Only the affected armor should be placed in the chamber for rewarming. Then the preceding stacking procedure shall be repeated in an effort to flatten the armor. If this is necessary, then describe what was done in detail in the test report. This rewarming may only be performed one time on each batch of armor.
- b) If necessary, and after all other attempts to flatten the armor have been exhausted, the armor may be removed from its carrier and the armor panel covering material slit to assist in flattening the armor.
  - 1) Horizontally slit only the armor panel cover (not the ballistic pad) with a razor blade at the bottom of the armor panel.
  - 2) Fold the armor panel cover back to access the part of the armor that requires flattening.
  - 3) Immediately mark the strike face of the ballistic-resistant material to ensure that it will be reinserted with the correct orientation.
  - 4) To reduce the possibility of an incorrect reinsertion of the ballistic-resistant material inside the armor panel cover, if possible, keep the armor panel partially inside of the armor panel cover to help maintain its original orientation.
  - 5) Flatten the ballistic-resistant material, including unfolding any corners or edges that may have become folded or dog-eared.
  - 6) Re-insert the ballistic-resistant material through the hole in the panel cover, reversing the steps that were necessary for removal. Once again, if these steps are required, what was done should be described in detail in the test report.

**6.3.8** If the armor is to be shipped to a different location for ballistic testing, it should be packaged to protect it from becoming folded, wrinkled or moved about in the container during shipment.

**Note:** Strategies may include stacking armor in a single shipping container with the flattest armors on top and the more wrinkled armors on bottom, and using packing material around the armor to keep it in place in the shipping container.

#### **6.4 Hard-Armor Conditioning**

Table 3 of NIJ Standard 0101.06 provides a time and temperature schedule for thermally cycling test items. Hard armor conditioning shall be performed in compliance with the following additional requirements:

- a) each two-hour period specified in Table 3 shall include the time required to transition to the new temperature;

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- b) the thermal cycle test shall last a total of 24 hours  $\pm$  20 minutes;
- c) the tolerance on each two-hour (120 minutes) interval is  $\pm$  5 minutes;
- d) the environmental chamber shall transition to the new temperature in 10 minutes plus or minus five minutes (10 minutes  $\pm$  5 minutes);
- e) the duration of each step starts at the time from when the ramp (transition) to that temperature begins and ends either at the time that the ramp to the next temperature begins or at the time that the test is completed;
- f) if one step is longer than two hours (120 minutes), another step may need to be shortened so that the total test duration requirements are met. If one step is shorter than two hours (120 minutes), then another step may need to be lengthened so that the total test duration requirements are met;
- g) in order to effectively track this transition period, measurements of chamber temperature and relative humidity shall be performed at intervals of one minute or less for the 24-hour thermal cycle;
- h) temperature shall be measured and recorded to 0.1 °C or better;
- i) relative humidity shall be measured and recorded to 1 percent or better;
- j) digital measurement of temperature and relative humidity is preferred as analog measurement and recording may not meet the requirements discussed above. Analog chart recordings of temperature and humidity may not provide sufficient resolution to determine conformance with these specifications.

## 6.5 Testing-Scaled Armor Perforation and Backface Signature

**6.5.1** In addition to the requirements contained in NIJ Standard-0101.06, Type III scaled armor designs shall have shots with a nonzero angle of Incidence (non-orthogonal) as described in Table 4 below. The shots shall be targeted at the union of four disks and directed into the panel as illustrated in Figure 1.

Table 4: Angled Shots, Type III Scaled Armor		
Armor Panels	Shots/Angle Per Panel	Notes
9 Panels	2/0°, 2/30°, 1/45°, 1/55°	P-BFS Configuration 1
9 Panels	2/0°, 1/30°, 2/45°, 1/55°	P-BFS Configuration 2
20 Panels	6/0°	BL
2 Panels		Spares



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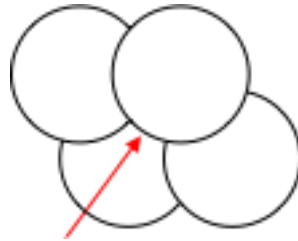


Figure 1

## 6.6 Testing-Ballistic Limit Determination

Test data related to BL shots that strike any obvious seams or non-uniformities shall be discarded and replaced with data from an additional shot.

## 6.7 Test Report

**6.7.1** Test laboratories shall report test results using the current NIJ CTP provided test report. The test report shall reflect the test laboratory's accreditation status, include the NIJ CTP test identification number and be fully in compliance with both NVLAP and ISO/IEC 17025 requirements.

**6.7.2** After testing is completed, the test laboratory shall verify that all test items conform to the description recorded on the test report.

**6.7.3** When test results from a previous test report are combined with new test results into a single test report, the final test report shall clearly identify which test data were transcribed and identify the origin.

## 6.8 NIJ CTP Post Test Inspection

**6.8.1** The NIJ CTP shall inspect the test report for any inconsistencies concerning test data.

**6.8.2** The NIJ CTP shall visually inspect all test items received from the test laboratory to verify consistency of construction and accuracy with both the applicant's and test laboratory's description of the construction.

**6.8.3** The NIJ CTP shall perform a final review of the applicant's application forms.

## 6.9 Compliance Recommendation

**6.9.1** The results of NIJ CTP's evaluation activities shall be documented in a compliance recommendation for NIJ's review that includes:

- a) A cover letter that provides the following information:
  - 1) applicant,
  - 2) product and applicable standard,
  - 3) model,
  - 4) list of materials (documents) inspected by the NIJ CTP that support the recommendation,
  - 5) list of documents included with cover letter,

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- 6) noteworthy information related to recommendation,
- 7) signatures of at least two NIJ CTP staff members who agree with the recommendation;
- b) NIJ CTP Body Armor Build Sheets;
- c) test report;
- d) label samples;
- e) additional construction information provided by the applicant;
- f) material technical data sheets (specifications);
- g) description of sizes and shapes included in the scope of this recommendation.

**6.9.2** The compliance recommendation shall be provided to NIJ to review and reference when making the certification decision.

## **7 Review and Certification Decision**

**7.1** An NIJ staff member shall carry out both the review and the certification decision.

**7.2** The NIJ CTP shall communicate this decision to the applicant using a compliance letter that includes the following information:

- a) Classification (Type),
- b) Shot-to-edge distance (threat 1),
- c) Shot-to-edge distance (threat 2),
- d) Maximum and minimum sizes tested.

**Note:** This list supplements the list of requirements identified in the NIJ CTP Product Conformity Assessment System – General Requirements.

## **8 Surveillance**

### **8.1 Compliant Product List**

In addition to the general information required by the NIJ CTP Product Conformity Assessment System, the CPL for this scheme shall also include:

- a) threat level;
- b) gender;
- c) for soft body armor that wraps around the torso
  - i. side or front opening,
  - ii. size range based on sizes tested;
- d) single or multi-curve for armor plates;
- e) period of time the applicant warrants the armor model's ballistic performance for the originally declared threat level.

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## 8.2 Attestation of Conformity

**8.2.1** The NIJ Mark shall serve as the applicant’s attestation of conformity for ballistic-resistant body armor.

**8.2.2** The NIJ Mark is a registered trademark (USPTO Reg # 5,906,126) of the federal government. It is referred to as a certification mark because it is intended to be applied by applicants (**not** the owner of the mark) to products that comply with this scheme. This includes participation in surveillance.

**8.2.3** Only NIJ can authorize applicants to apply the NIJ Mark to products. The vehicle for authorization shall be the compliance letter described in Section 7 of this scheme.

**8.2.4** After receiving NIJ authorization, applicants shall only apply the NIJ Mark to a product that:

- a) bears the model identification and the NIJ Standard as indicated on the applicable NIJ authorization,
- b) is manufactured under the oversight of the NIJ CTP Surveillance program described in this scheme,
- c) is produced to the same specifications as the test items that the NIJ CTP found to be in conformity with the standard, and
- d) is produced to the same specifications as provided by the Applicant to the NIJ CTP defining the model identification indicated on the applicable NIJ authorization.

**8.2.5** The NIJ Mark shall comply with the following:



- a) black on a white background,
- b) overall size one inch in diameter,
- c) inner circle 0.75 inches in diameter,
- d) text “U.S. DEPARTMENT OF JUSTICE” and “OFFICE OF JUSTICE PROGRAMS” shall use Helvetica Bold Condensed 6.5 pt. font,
- e) text “Listed Model” in Helvetica Bold Condensed 6.5 pt. Font;

**8.2.5** The NIJ CTP shall have an agreement in place with applicants regulating the usage of the NIJ Mark prior to the applicant’s receiving authorization from NIJ.

## 8.3 Product Markings

**8.3.1** Every ballistic-resistant body armor panel or plate compliant with the surveillance program contained in this scheme shall have a label permanently attached to the face of the panel using a labeling system that has been approved by the NIJ CTP as being compliant with the applicable requirements contained in NIJ Standard-0101.06.

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**8.3.2** The label may be positioned in a location where it is not visible when the armor is worn, but it shall be easy to locate and easily readable when the armor is removed.

**8.3.3** The labels shall contain the information provided in Appendix A.

#### **8.4 Surveillance Inspections**

**8.4.1** Surveillance inspections shall be performed for all participating models at each manufacturing location by third-party inspection bodies in compliance with ISO/IEC 17020.

**8.4.2** Inspectors shall verify that applicants maintain material traceability sufficient to link ballistic panel serial number and or lot number to:

- a) purchase order of each bulk material used in the ballistic panel's construction,
- b) applicant's acceptance criteria,
- c) evidence that materials met acceptance criteria, and
- d) identification of the specific employee who made the determination and accepted the material for use.

**8.4.3** The inspectors shall select and collect the following number of samples based on the type of armor:

- a) Type IIA, II, or IIIA - Two complete armor samples (Phase 1):
  - 1) side opening: two front ballistic panels + two back ballistic panels, **or**
  - 2) front opening: four front (half) ballistic panels + two back ballistic panels (w/carrier);
- b) Type III - two ballistic panels;
- c) Type IV – four ballistic panels.

**8.4.4** An initial product inspection shall be scheduled by the applicant to take place during the first production run of the model following receipt of NIJ Authorization.

**8.4.3** Following the initial product inspection, models will typically be inspected at least once every 10 months. If a model is not being produced when it is due for an inspection, it shall be inspected during the next production run.

**8.4.4** If the ballistic-resistant body armor model is manufactured under an NIJ CTP approved body armor quality management system (BA 9000), the frequency of surveillance for that model/location may be reduced to once every 20 months.

**8.4.5** The inspection frequency may be increased based on poor performance during any of the previous inspections of a facility or questionable performance of fielded armor.

#### **8.5 Surveillance Testing**

**8.5.1** Testing performed for this scheme shall be performed in compliance with the Test Laboratories' ISO/IEC 17025 accreditation. Testing shall also be performed in compliance with NIJ Standard-0101.06, Section 7, except as modified by this document.

**8.5.3** Perforation testing shall be performed on all samples in accordance with NIJ Standard 0101.06, Section 7.8, except backface signature shall not be measured. Testing shall continue until all panels are

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shot the required number of times. Testing shall continue until completed; it shall not be stopped because a perforation occurs.

**8.5.4** Within the limits provided in NIJ Standard 0101.06, test laboratories should place shots on obvious or potential weaknesses such as seams, darts and other types of discontinuities. Also, shots should be placed off obvious buildups such as are found on front-opening models.

**8.5.5** The ballistic panels shall be marked and shot using normal procedures for shot pattern, shot-to-shot distance and shot-to-edge distance as described in NIJ 0101.06. If the armor type is IIA, II or IIIA, the Threat 1 shot-to-edge distances shall be two inches and Threat 2 shot-to-edge distances shall be three inches unless otherwise directed by the NIJ CTP.

**8.5.6** Where two calibers are specified, half of the samples will be shot with each threat round.

**8.5.7 In Conjunction With (ICW) Body Armor Surveillance Testing**

**8.5.7.1** The stand-alone element of the ICW armor shall be scheduled for surveillance without regard to the dependent ballistic-resistant panels.

**8.5.7.2** Dependent ballistic-resistant panels of the ICW armor shall be scheduled for surveillance without regard to the stand-alone element. The number of test items and test methods shall comply with the requirements for hard armor. Following selection of the dependent ballistic panels, the applicant shall provide the appropriate number of the stand-alone armors to the test laboratory selected by the NIJ CTP.

**8.6 Phase 2 Surveillance Testing**

**8.6.1** If Type IIA, II, or IIIA panels experience a total of one perforation only from a fair hit during the first phase of surveillance testing, the applicant must provide the following additional test items to the test laboratory for Phase 2 Testing:

- a) side opening: five front ballistic panels + five back ballistic panels, or
- b) front opening: 10 front (half) ballistic panels + five back ballistic panels (w/carrier).

**8.6.2** Testing shall be performed as described in Section 8.5 of this scheme.

**8.7 NIJ CTP Construction Inspection**

The NIJ CTP shall inspect all surveillance test items to verify consistency of construction and accuracy with both the applicant’s description of the construction and previous test items.

**8.8 Surveillance Specifications**

**8.8.1** A single perforation during Phase 1 Soft Body Armor Surveillance Testing is not considered a surveillance testing failure but does require Phase 2 Soft Body Armor Surveillance Testing to be completed.

**8.8.2** A single perforation during Phase 1 Soft Body Armor Surveillance Testing combined with one or more perforations during FIT Phase 2 shall be considered a surveillance testing failure.

**8.8.3** More than one perforation during Phase 1 Soft Body Armor Surveillance Testing is considered a surveillance testing failure.

**8.8.4** A single perforation during Hard Armor Surveillance Testing shall be considered a surveillance testing failure.

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**8.8.5** Depending on the severity, variations in construction may be determined by the NIJ CTP to be a surveillance failure.

## **9 Revisions to Requirements**

**9.1** When a revision occurs to the current standard and the revised standard is published, an implementation date shall be set by the NIJ CTP.

**9.2** On the date of implementation, the CTP shall:

- a) stop accepting applications for the prior standard (the NIJ CTP may continue processing existing applications),
- b) begin accepting applications for the revised standard, and
- c) begin surveillance for armor evaluated to the revised standard.

**9.3** Two months after the date of implementation, the NIJ CTP shall stop accepting test data to the prior standard.

**9.4** Three months after the date of implementation, the NIJ CTP shall stop adding models to the prior standard's CPL.

**9.5** At 63 months after the date of implementation, the prior standard's CPL shall be retired and the CTP shall stop performing surveillance for those models.

**9.6** While surveillance may be occurring over the same time period for models on both the prior standard's CPL and models on the revised standard CPL, surveillance shall be based on the standard applied to the model at the time of its initial certification.

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## 10 Revision History

Revision	Section	Change	Name	Date
Revision 1.0	N/A	Initial Release	Jamie Phillips	9/21/16
Revision 1.1	General Document	<ol style="list-style-type: none"> <li>1. All references to the Justice Technology Information Center (JTIC) have been removed from the document, as that program ended December 31, 2019. The NIJ CTP is now hosted by the Criminal Justice Testing &amp; Evaluation Consortium (CJTEC), operated by RTI International.</li> <li>2. This document has been renumbered from 606.2 to 606.2.1 and re-named Ballistic Body Armor <u>Initial Type Testing (ITT)</u> Scheme, to clarify the purpose and scope of this document.</li> <li>3. Updated Revision History format.</li> </ol>	Lance Miller	7/2/20
	Section 1	Updated to harmonize with other NIJ CTP Product Conformity Assessment System documents.		

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## Appendix A

### Production Marking Requirements (Label)

1. Name, logo or other identification of the listed company and the address as identified on the CPL near the top of the label.
2. The model designation as it appears on the Notice of Compliance.
3. The NIJ Mark standing by itself and not combined with any other logo, symbol, or graphic.
4. The applicable standard (NIJ Standard-0101.06) as it appears on the Notice of Compliance placed immediately below the NIJ Mark.
5. Rated level of protection and reference to the standard (including edition) defining this level of protection.
6. Size (if custom fitted, provision for the name of the individual for whom it is made).
7. Serial number.
8. Lot number if used by the applicant to track armor construction.

**Note:** If individual armors are tracked entirely by a serial number, a lot number is not required.

9. Address of manufacturing location.
10. Date of manufacture.
11. Date of issue line (to be filled in by user).
12. Applicant's "Declared Ballistic Performance Warranty Period" for the model with the originally declared threat level.
13. Contact information for warranty support (such as telephone number).
14. In type at least twice the size of the rest of the type on the label, the warning: "This garment is rated only for the ballistic threat level stated above."
15. If applicable, in type at least twice the size of the rest of the type on the label, a warning that the armor is not intended to protect the wearer from sharp edged or pointed instruments.

**Note:** Printing color changes for warnings are acceptable but cannot be substituted for the type size requirement.

16. Proper orientation of the ballistic panel in the carrier clearly identified to indicate strike face or body side.
17. Care instructions for ballistic-resistant material in accordance with 16 CFR 423 Part 423, Care Labeling of Textile Wearing Apparel and Certain Piece Goods, as amended effective April 9, 2004; Federal Trade Commission Regulation Rule.
18. If the armor provides limited coverage protection, a warning in type at least twice the size of the rest of the type on the label, exclusive of the information required in (a) above, stating "Limited Coverage: This armor provides limited coverage for the torso against ballistic threats."


**Note:** Additional information may be included on the label at the discretion of the applicant if it does not interfere with the communication of the required information listed above.



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(Listed Company's) Name  
(Listed Company's) Address

Model: \_\_\_\_\_



NIJ Standard-0101.06

Threat Level (NIJ 0101.06): \_\_\_\_\_

Size: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Lot Number: \_\_\_\_\_

Location of Manufacturer: \_\_\_\_\_

Date of Manufacture: \_\_\_\_\_

Date of Issue: \_\_\_\_\_

Manufacturer's  
Ballistic Performance Warranty Period: \_\_\_\_\_

For Warranty Information Contact:  
\_\_\_\_\_  
\_\_\_\_\_

**WARNING!**  
This garment is rated **ONLY** for  
the ballistic threat level stated  
above. It is **NOT** intended to  
protect against rifle fire or  
sharp-edged or pointed  
instruments.

**\*\* Wear Face \*\***  
This side to be worn against body.

Care Instructions for Ballistic Panel:  
(Sample Instructions Shown):

1. Do not wash or dry clean.
2. Wipe with a damp cloth.

*Figure A.1 Sample ballistic panel label*