



# QUALITY ASSURANCE SPECIFICATIONS™

SFI SPECIFICATION 3.3

EFFECTIVE: DECEMBER 31, 2010\*

PRODUCT: Driver Accessories

## 1.0 GENERAL INFORMATION

- 1.1 This SFI Specification establishes uniform test procedures and minimum standards for evaluating and determining performance capabilities for Driver Accessories used by individuals engaged in competitive motorsports.
- 1.2 The procedures, test evaluations and standards contained herein, are intended only as minimum guidelines for construction and evaluation of products. Certification that products meet such minimum standards is made by the product manufacturer and products are not certified, endorsed or approved by SFI under this program.
- 1.3 Use of the "This Manufacturer Certifies That This Product Meets SFI Specification 3.3" logo/designation, the authorized artwork style, or conventional lettering by a manufacturer, on a subject product, is intended only to indicate that the manufacturer of the product has represented that they have submitted the product to the recommended tests, with positive results, in compliance with the standards established herein.
- 1.4 This SFI Specification requires a demonstration that the product of a manufacturer meets or exceeds the requirements when the manufacturer enters the program; and on a periodic basis thereafter. Any manufacturer may participate in the program by providing Driver Accessories that meet or exceed the SFI Specification 3.3 test standards, by complying with the requirements of the SFI Specification 3.3 program, and by signing a licensing agreement with the SFI Foundation, Inc.

- 1.5 Compliance with this specification is entirely voluntary. However, when a manufacturer provides Driver Accessories in compliance with all requirements of the SFI Specification 3.3 and enters into the licensing agreement with the SFI Foundation, Inc., they may certify that compliance with such standards is in accordance with the guidelines established herein.
- 1.6 Manufacturers wishing to participate in the program, in addition to the other requirements of this specification, must label each of their products with the manufacturer's name, trademark or symbol as well as the date of manufacture of the product.
- 1.7 No manufacturer may display the SFI logo/designation on their product unless the manufacturer has signed a licensing agreement with SFI and has successfully complied with all the requirements of this specification and the self-certification program.

## 2.0 DEFINITIONS

- 2.1 Driver Accessories: The various items that complement a driver's suit to protect the wearer. This specification covers gloves, underclothing, hoods, socks, shoes, boots, helmet supports, harness pads, arm restraints, and helmet skirts.
- 2.2 Layers: Accessory material can be constructed of a single layer or multiple layers of fabric. An accessory's suitability or rating is based on the thermal protection capability of the material regardless of the number of layers.
- 2.3 After-flame time: The time an object continues to flame after the thermal load is removed.
- 2.4 FTM 191-1534: Federal Test Methods, Standard 191A, Textile Test Methods, Method 5134; Melting Point of Synthetic Fibers.
- 2.5 Any Driver Accessory pertaining to this specification shall remain as constructed by the original manufacturer and shall not be modified or altered by anyone else.

## 3.0 CONSTRUCTION

All accessories shall be made of fire resistant/retardant material except where noted. The weave of the material shall be continuous with no breaks, holes or separations except where necessary to provide functionality. Thread used for accessory construction shall be made of fire resistant/retardant material.

### 3.1 GLOVES

Gloves shall have separate sections for each finger and thumb. The upper and lower halves of the glove may be constructed differently. All construction seams must be on the inside of the glove i.e. not visible from the outside. Gloves may also be composed of a separate top covering, a separate bottom covering and separate coverings for the areas on the sides of the fingers (also called forchettes), all being of different construction. If a fastening mechanism is used, the mechanism is not required to be made of fire resistant/retardant material. On all gloves, the bottom covering and forchettes, if applicable, may not be made entirely of leather and must have a layer of material (which the manufacturer represents to be fire resistant/retardant) separating any leather from the driver's hand and it is not required to be tested. Gloves shall be rated by the amount of thermal protection provided by the material used. Sections shall be sewn together.

### 3.2 UNDERCLOTHING

Underclothing shall cover the body from the neck to the ankles and wrists. The garment shall be snugly fitting at the neck, ankles and wrists. It can be a one-piece garment or a two-piece, consisting of a top and pants.

### 3.3 HOODS

Hoods shall be snugly fitting at the neck and include a bib that extends at least six (6) inches (15.2cm) below the chin. There shall either be a single oval opening for both eyes or dual, individual circular openings for each eye.

### 3.4 SOCKS

Socks shall extend up the leg and should overlap with the underclothing and/or driver suit.

### 3.5 SHOES AND BOOTS

Shoes and boots shall incorporate fire resistant/retardant material in the non-sole area. Other materials may be used providing they do not inhibit the protective capability of the assembly. Shoes shall have a standard configuration. Boots shall extend up the leg at least six (6) inches (15.2cm). This dimension shall be taken at the rear of the boot, measured from the bottom of the sole to the top of the extension.

### 3.6 HELMET SUPPORT

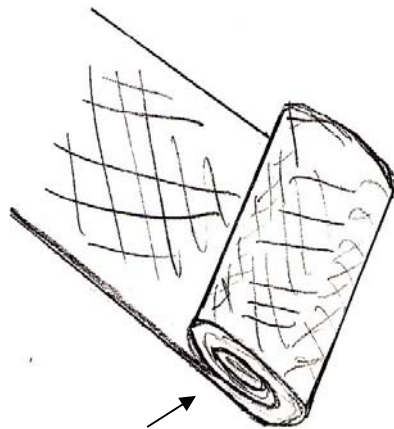
Helmet supports (also called neck braces and neck supports) shall have a fire resistant/retardant material covering. The padding or core material shall also be fire resistant/retardant. Helmet supports shall encircle the entire neck; 360 degrees. They shall have a break in the front or side and a device to fasten the ends together.

### 3.7 HARNESS PADS

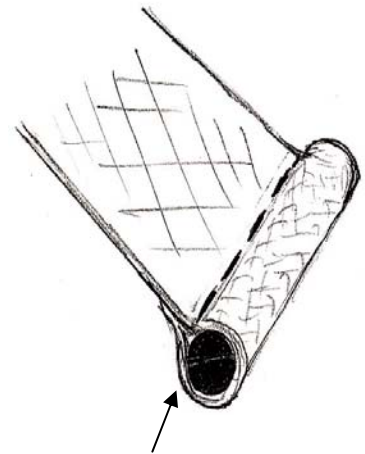
Harness pads shall have a fire resistant/retardant material covering. The padding or core material shall also be fire resistant/retardant. The configuration shall either be a "U" shape with the opening in front and have provisions for the belts to slip through or they can be individual pads for each belt strap.

### 3.8 ARM RESTRAINTS

Arm restraints are not required to be made from fire resistant/retardant material. They shall be mounted on one end to the driver restraint lap belt and the other end to the arm or wrist. The minimum width for the portion of the arm restraint that wraps around the arm or wrist shall be 1 3/4 inches (4.4 cm) minimum. The lap belt end shall be mounted in such a manner as to prevent the arm from traveling outside of the driver's compartment. Each arm may have a separate strap or the restraint may have a "Y" configuration, with only one attachment to the lap belt. Any loose webbing end shall incorporate a design method to prevent the strap from completely pulling out of any hardware (d-rings, 3-bar slide, etc.) Examples of possible methods are shown below:



Loose Strap End is Rolled or Folded and Sewn in Place



Loose Strap End is Rolled Around Dowel (plastic, foam, etc.) and Sewn in Place

### 3.9 HELMET SKIRT

Helmet skirts shall be constructed of fire resistant material and shall encircle the entire neck (360 degrees). Helmet Skirts that are used for drag racing shall be a minimum of eight (8) inches in length. Helmet skirts may be glued or sewn to the helmet lining, or may be attached to the inside or outside of the helmet with hook and loop closure. Any hook and loop closure must be of fire resistant material.

### 4.0 MODEL CLASSIFICATION

Driver Accessory models are based on materials and construction. Any variation shall be considered a model change.

### 5.0 TESTING

#### 5.1 TPP RATING

All accessories listed shall be subjected to this test. The test shall be conducted in accordance with SFI Technical Bulletin 3.2.

##### 5.1.1 SAMPLES

The sample material shall be a representation of the actual accessory as stated in the technical bulletin. Three samples of each particular material shall be tested. If any material/construction combination of one accessory is identical to another, then only one need be tested. The samples may be a representation of the actual accessory if they comprise the identical material and construction method.

##### A. GLOVES

A set of samples shall be tested for the top covering or half, the bottom covering or half and the forchettes, if applicable.

##### B. UNDERCLOTHING

If the underclothing consists of two pieces and both are made of identical material and construction, then either one may be tested. Otherwise, each piece shall be tested separately.

##### C. HOODS AND SOCKS

The samples may be taken from any portion of the accessory.

## D. SHOES AND BOOTS

The samples shall be material from the non-sole portion of the shoe or boot.

## E. HELMET SUPPORTS AND HARNESS PADS

The samples shall be taken from the outer covering of the accessory, not including belt containment material, if applicable.

## F. HELMET SKIRT

The samples may be taken from any portion of the accessory.

## 5.2 FLAMMABILITY, FABRIC

All accessories that are required to undergo the TPP test shall be subjected to this test. The test shall be conducted in accordance with SFI 3.2 Technical Bulletin.

### 5.2.1 SAMPLES

The samples shall be provided as stated above in the previous section. If the accessory material consists of multiple layers, then only the outer layer is required to be tested, except for Helmet Skirts, in which each different material layer shall be tested. However, if any non-fabric material such as leather is used as the outer layer of gloves or the soles of shoes, that material shall not be required to pass the flammability test.

## 5.3 FLAMMABILITY, PADDING MATERIAL

This test shall only be conducted on the padding material in helmet supports and harness pads. The test shall be conducted at an ambient temperature between 10°C (50°F) and 30°C (86°F).

### 5.3.1 SAMPLES

Test sample shall be padding material from one (1) fully processed new harness pads or helmet supports with the outer covering removed, which is representative of harness pads or helmet supports currently produced or to be produced.

### 5.3.2 PROCEDURE

Determine the after-flame time only.

### 5.3.2 APPARATUS

#### A. THERMAL LOAD

The thermal load shall be a burner shall be a Bunsen or Tirrill type tube length  $3.75 \pm 0.25$  inches and inside diameter of  $0.375 +0.06/-0.00$  inch, at the flame location generating a measured temperature of  $1550^{\circ}\text{F}$ .

#### B. TIMING DEVICE

A timing device with an accuracy of  $\pm 0.5$  seconds shall be used to measure the after-flame times.

#### C. FIXTURE

A fixture shall be used to support the padding sample.

### 5.3.3 PROCEDURE

The flame shall be adjusted to 1.5" in length and positioned perpendicular to the padding surface. The padding surface shall be subjected to the thermal load for a period of  $15 \pm 1$  seconds at a distance of 1" to 1.5" (surface of padding to flame tip). Simultaneous with the removal of the flame, the timing device shall be activated. Determine the after-flame time.

### 5.4 THREAD HEAT RESISTANCE

All accessories that are required to undergo the TPP test shall be subjected to this test. The test shall be conducted in accordance with FTM 191-1534 unless otherwise specified.

#### 5.4.1 SAMPLES

The sample material shall be identical to the thread used in the actual construction of the accessory. Sufficient material for at least three tests shall be supplied.

#### 5.4.2 PRECONDITIONING

Samples shall be conditioned at a temperature of  $21 \pm 1$  degrees Celsius  $\{^{\circ}\text{C}\}$  ( $70 \pm 2$  degrees Fahrenheit  $\{^{\circ}\text{F}\}$ ) at a relative humidity of  $65 \pm 5$  percent for one hour. Samples shall be tested not more than five minutes after removal from conditioning.

### 5.4.3 PROCEDURE

Conduct the test three times. The samples shall be tested to a temperature of  $260 \pm 2^{\circ}\text{C}$  ( $500 \pm 4^{\circ}\text{F}$ ).

### 5.4.4 INTERPRET RESULTS

For each sample, determine its condition at the specified temperature.

## 5.5 TENSILE STRENGTH

This test shall only be conducted on arm restraints. Each configuration shall be tested. If the straps are separate, two restraints shall be tested. For a "Y" configuration, only one need be tested.

### 5.5.1 SAMPLES

Test samples shall be fully processed new arm restraints which are representative of arm restraints currently produced or to be produced. All necessary mounting hardware along with mounting instructions shall be supplied with the arm restraint.

### 5.5.2 APPARATUS

#### A. TEST MACHINE

The test machine shall be capable of applying a minimum tensile load of 400 pounds {lb} (1779.2 newtons {N}) with an excursion travel of four (4) to ten (10) inches per minute {ipm} (10.2 to 25.4 centimeters per minute {cmpm}), and shall have adequate instrumentation to verify the test load. The test machine shall also be in calibration and traceable to the National Institute of Standards and Technology (NIST).

#### B. TEST FIXTURE

The test fixture shall duplicate the mounting method of the arm restraint on both ends and be capable of withstanding the applied load. A cylinder with the approximate diameter shall be used to simulate the arm or wrist.

### 5.5.3 PROCEDURES

- A. In one head of the test machine, mount the fixture to simulate the lap belt. Connect the corresponding end of the restraint to the fixture. Connect the other end to the solid cylinder, which shall be fixed to the other head. If the restraint uses a "Y" configuration, mount only one of the arm straps to the cylinder. If the strap has a connection device and/or adjustment hardware, connect and adjust per manufacturer's instructions. The strap, strap hardware and heads shall be in axial alignment.
- B. Using an excursion rate of twenty (20) ipm (50.8cm/m), apply an increasing load to the restraint device. Continue until a load of 400 +10/-0 lb (1779.2 +44.5/-0 N) is applied. Hold at that level for ten seconds, then release the load.
- C. If the "Y" configuration is used, repeat the procedure for the other arm strap.

## 6.0 PROOF OF COMPLIANCE

Driver Accessory manufacturers are required to provide the following information to enroll in this program:

### 6.1 TEST RESULTS

Test results shall be documented in a test report.

#### 6.1.1 TPP RATING

An accessory shall be evaluated by the rating received when tested in accordance with SFI Technical Bulletin 3.2.

#### A. GLOVES

A Glove shall be classified by the TPP rating of the top covering or half, as represented by the material tested. The material shall be considered to have passed the TPP test if it qualifies for an SFI grade as delineated in Table 1. In order to fulfill the requirements for a given grade, the other portions of the glove, if applicable, must satisfy the following requirements, as represented by the material tested. The bottom covering or half, as represented by the material tested, shall have a TPP rating equal to or greater than 40 percent of the value required for the top or meet the requirements for SFI grade 1, whichever is greater. The forchettes, as represented by the material

tested, shall have a TPP rating equal to or greater than 20 percent of the value required for the top or meet the requirements for SFI grade 1, whichever is greater. A glove not able to meet this criteria shall be downgraded to a level where all sections conform to the required values. For grade 1, only the top covering or half, as represented by the material tested, is required to pass the TPP requirements. Abbreviations used: calories {cal}, centimeters {cm}, watts {W}, seconds {sec} and not applicable {na}.

Table 1						
SFI Grade	TPP Rating					
	Top		Bottom		Forchettes	
	Cal/cm <sup>2</sup>	W-sec/cm <sup>2</sup>	Cal/cm <sup>2</sup>	W-sec/cm <sup>2</sup>	Cal/cm <sup>2</sup>	W-sec/cm <sup>2</sup>
1	> 6	> 25.1	NA	NA	NA	NA
5	> 19	> 79.6	> 7.6	> 31.8	> 6.0	> 25.1
10	> 38	> 159.1	> 15.2	> 63.6	> 7.6	> 31.8
15	≥ 60	≥ 251.2	≥ 24.0	≥ 100.5	≥ 12.0	≥ 50.2
20	> 80	> 335.0	> 32.0	> 134.0	> 16.0	> 67.0
25	> 100	> 418.7	> 40.0	> 167.5	> 20.0	> 83.7
30	≥ 120	≥ 502.4	≥ 48.0	≥ 201.0	≥ 24.0	≥ 100.5

#### B. UNDERCLOTHING, HOODS, SOCKS, HELMET SUPPORTS AND HARNESS PADS

Underclothing, hoods, socks, helmet supports and harness pads shall have a minimum TPP rating of 6.0 cal/cm<sup>2</sup> (25.1 W-sec/cm<sup>2</sup>) to be acceptable, as represented by the material tested.

#### C. SHOES AND BOOTS

Shoes and boots shall have a minimum TPP rating of 19.0 cal/cm<sup>2</sup> (79.6 W-sec/cm<sup>2</sup>) to be acceptable, as represented by the material tested.

## D. HELMET SKIRT

A Helmet Skirt shall be classified by the TPP rating. The material shall be considered to have passed the TPP test if it qualifies for an SFI grade as delineated in Table 2.

Table 2		
SFI Grade	TPP Rating	
	Cal/cm <sup>2</sup>	W-sec/cm <sup>2</sup>
5	≥ 19	≥ 79.6
10	≥ 38	≥ 159.1

### 6.1.2 FLAMMABILITY, FABRIC

All accessories, as represented by the material tested in accordance with SFI Technical Bulletin 3.2, shall be considered to have passed the flammability test if each layer that is required to be tested passes the criteria listed below.

#### A. INTERPRET RESULTS

The average after-flame time for all samples shall be 2.0 seconds or less for the layer to pass. The average char length for the five samples shall be six (6) inches (15.2cm) or less for the layer to pass. Any melting or dripping of the material shall be cause for test failure.

### 6.1.3 FLAMMABILITY, PADDING MATERIAL

The after-flame time shall be ten seconds or less.

### 6.1.4 THREAD HEAT RESISTANCE

At least two of the samples shall not melt, i.e. change from solid to liquid or be consumed, at the test temperature.

## 6.1.5 TENSILE STRENGTH

### A. ARM RESTRAINTS

The arm restraints shall pass the tensile strength test if, for each strap tested, it is able to maintain the test load for ten seconds.

## 7.0 TEST REPORTS

A separate test report, or set of test reports if required, shall be submitted for each product model. If more than one test facility is required to complete all necessary tests, then a separate test report shall be submitted from each one. A test report shall be submitted for each component, if tested separately. The test facility shall assign a unique number to each test report. This number along with the report date and page number shall appear on each page. Each test report shall include:

### 7.1 RELEVANT INFORMATION

- 7.1.1 Manufacturer's name, contact name, address and telephone number.
- 7.1.2 Name, address and telephone number of the test facility.
- 7.1.3 Name and signature of the responsible test supervisor.
- 7.1.4 Actual date of the test.
- 7.1.5 Specification number and effective date.
- 7.1.6 Product name, description and model designation.
- 7.1.7 Component name and description.

### 7.2 TESTS

Each test conducted shall be listed showing the test name, apparatus used, procedure used and test results obtained along with any other appropriate information.

### 7.3 AUTHENTICATION

Test reports shall be authenticated and stamped by a Professional Engineer who is registered in the state in which the testing is conducted. If necessary, SFI may allow an equivalent entity to provide authentication.

## 8.0 INITIAL DESIGN VALIDATION

To receive initial recognition from SFI as a participant in the SFI Specification 3.3 Program, the manufacturer must submit to SFI all information delineated in the Proof of Compliance section. This information shall be provided for each Driver Accessory model offered by the applicant that is to be included in the program. Any change in design, materials and/or methods of manufacturing not specifically excluded is considered a model change and, therefore, requires initial design validation.

## 9.0 PERIODIC REVALIDATION

Test reports with successful test results must be submitted to SFI at least once every 24 month period following the date of the initial design validation test for driver accessories manufactured by the participant. If multiple test reports are required to obtain all test results, then the earliest test date shall be used to determine when the periodic revalidation reports are due. Also, SFI shall retain the option to conduct random audit reviews. SFI shall purchase the product on a commercial basis and test for compliance to the specification. The submitting manufacturer shall reimburse SFI for all audit costs.

## 10.0 CERTIFICATION OF COMPLIANCE

Upon demonstration of successful compliance with all the requirements of the specification and the self-certification program and upon entering the licensing agreement with SFI, the manufacturer may advertise, present and offer the Driver Accessories for sale with the representation that their product meets the SFI Specification 3.3. Continuing certification is contingent upon the following additional considerations: (1) the product shall be resubmitted for testing following any change in design, materials and/or methods of manufacturing not specifically excluded, and (2) periodic revalidation test reports are submitted when due to SFI.

## 11.0 CONFORMANCE LABELS

The conformance label is a "punch out" patch. Each individual accessory shall have a patch attached to the exterior surface. The patch shall have the month and year of manufacture permanently marked in the space when provided. On gloves, the patch shall be on the upper cuff area of each glove. On one-piece underclothing or the top of underclothing, the patch shall be sewed to the left sleeve facing outward, between the elbow and the shoulder seam or corner. On pants, the patch shall be sewed on the left side at the belt line. On hoods, the patch shall be sewed on the outside lower bib area in the front. On socks, the patch shall be on the outside surface above the ankle. On each individual shoe and boot, the patch shall be on an upper outside surface. On helmet supports and one piece harness pads, the patch shall be on the left extension, either on the top or outside surface. On individual harness pads, the patch shall be placed on the upper outside surface. On arm restraints, one patch shall be placed on each separate or detachable piece. On helmet skirts, one patch shall be placed on the lower front outside surface.

## 12.0 DECERTIFICATION

Participating manufacturers are subject to decertification when not in compliance with the requirements of this program or when their products are not in compliance with the requirements of this specification. Decertification will provide SFI the right to effect any and all remedies which are available to SFI in the licensing agreement.

## 13.0 APPEAL PROCEDURE

In the event of decertification, the manufacturer is entitled to an appeal of the decision of SFI. Requests for appeal must be received by SFI no later than thirty days following receipt of the notice of decertification. Appeals of such decisions will be heard at the next meeting of the Board of Directors of SFI.

## 14.0 STATEMENT OF LIMITATIONS

Testing procedures and/or standards contained in this specification are intended for use only as a guide in determining compliance with the minimum performance requirements as defined herein. The granting and assignment of the "This Manufacturer Certifies That This Product Meets SFI Specification 3.3" logo/designation is in no way an endorsement or certification of product performance or reliability by SFI. SFI, its officers, directors and/or members assume no responsibility, legal or otherwise, for failure or malfunctions of a product under this program.

## 15.0 COSTS

All costs involved in this program will be absorbed by the submitting manufacturer.

## 16.0 COMPLIANCE PERIOD

As this specification is revised to reflect changes in technology and/or field conditions, to remain current, participating manufacturers in the SFI Specification 3.3, Driver Accessories, Program, must demonstrate full compliance with the requirements of this specification within ninety (90) days of the latest effective date.

---

*	Original Issue:	February 1, 1991
	Revised:	November 10, 1991
	Revised:	December 3, 1993
	Revised:	February 16, 1996
	Reviewed:	December 5, 1997
	Edited:	January 15, 1998
	Reviewed:	November 18, 1999
	Revised:	November 29, 2001
	Reviewed:	December 4, 2003

---

Reviewed:	December 1, 2005
Revised:	October 11, 2006
Reviewed:	December 6, 2007
Reviewed:	December 10, 2009
Revised:	May 21, 2010
Edited:	June 2, 2010
Revised:	December 31, 2010
Edited:	January 11, 2011