



QUALITY ASSURANCE SPECIFICATIONS™

SFI SPECIFICATION 52.1

EFFECTIVE: JUNE 5, 2012*

PRODUCT: Fueler Apron

1.0 GENERAL INFORMATION

- 1.1 This SFI Specification establishes uniform test procedures and minimum standards for evaluating and determining performance capabilities for Fueler Aprons 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 52.1" 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 Fueler Aprons that meet or exceed the SFI Specification 52.1 test standards, by complying with the requirements of the SFI Specification 52.1 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 Fueler Aprons in compliance with all requirements of the SFI Specification 52.1 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 Fueler Apron: An apron constructed of fire resistant/retardant material that is designed to repel fluids and protect against spills.
- 2.2 Layer: Any single woven, non-woven, knitted, or felted flame resistant/retardant cloth. Excluding any combinations, composites or assemblies of single fabrics.
- 2.3 Multiple Layers: Fueler Aprons can be constructed of a single layer or multiple layers of fabric, and must meet the minimum requirements of this specification.
- 2.4 Closures: Any Velcro closure must be of fire retardant/fire resistant material.
- 2.5 TPP: Thermal Protective Performance (see SFI Technical Bulletin 3.2.)
- 2.6 After-flame Time: The time an object continues to flame after the thermal load is removed.
- 2.7 Liquid Penetration: The movement of liquid matter through material.
- 2.8 Any fueler apron pertaining to this specification shall remain as constructed by the original manufacturer and not modified.

3.0 CONSTRUCTION

Fueler Aprons shall be made of fire resistant/retardant material. The weave of the material shall be continuous with no breaks, holes or separations except where necessary to provide functionality. Thread shall be made of fire resistant/retardant material. The apron shall be of a standard apron design, covering the wearer's upper torso area to mid-thigh.

4.0 MODEL CLASSIFICATION

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

5.0 TESTING

5.1 TPP RATING

Test in accordance with SFI Technical Bulletin 3.2. At least four samples shall be supplied.

5.2 FLAME RESISTANCE

Test each individual material layer (single and multiple layer levels) as defined in Section 2.2 and each individual strap material in accordance with SFI Technical Bulletin 3.2.

5.3 THREAD HEAT RESISTANCE

The test shall be conducted in accordance with FTM 191-1534 unless otherwise specified.

5.3.1 SAMPLES

The sample material shall be identical to the thread used in the actual construction of the Fueler Apron. Sufficient material for at least three tests shall be supplied. If more than one type of thread is used within one product model, then each type shall be tested.

5.3.2 PRECONDITIONING

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

5.3.3 PROCEDURE

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

5.4 LIQUID PENETRATION RESISTANCE TEST

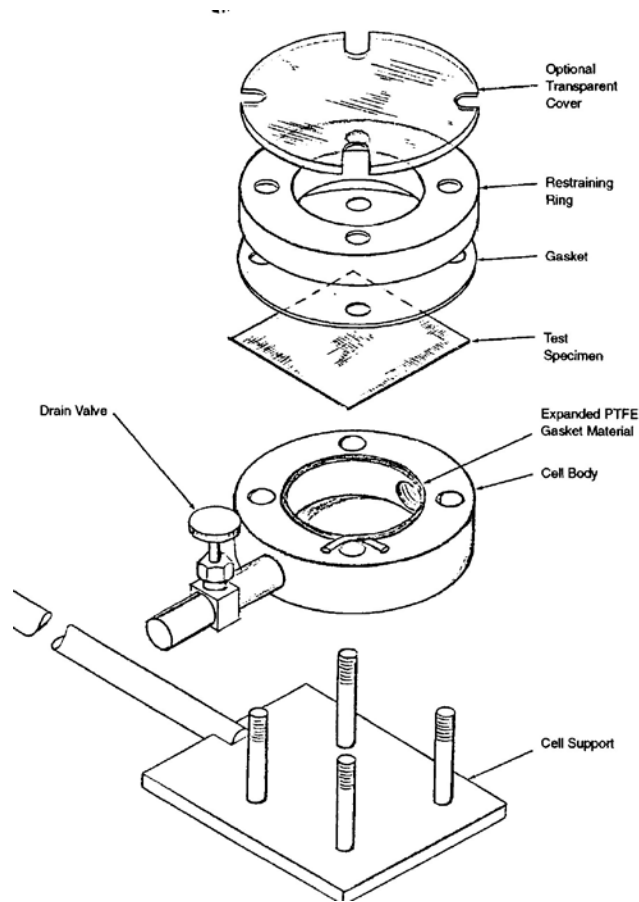
5.4.1 SAMPLES

Three (3) square samples of material not previously laundered, each 2.75 x 2.75 inches minimum shall be supplied. The material shall have the identical layer fabric, layer order and construction and overall assembly as that of the product model that is being evaluated.

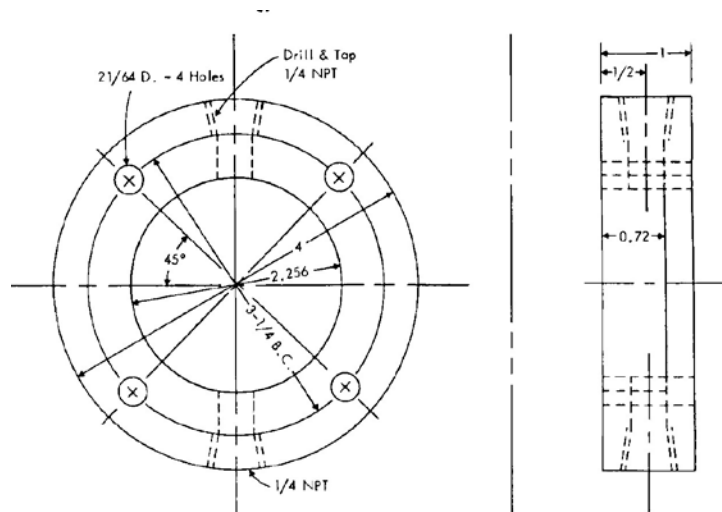
5.4.2 APPARATUS

- A. The test apparatus shall consist of a test cell capable of holding the material sample with a tight seal, similar to the configuration shown in Figure 1.
- B. The test cell shall be mounted horizontally so that liquid added to the cell will be retained in the cell chamber above the sample material. The test cell shall be raised above the work surface to allow observation of the downward facing surface of the material sample.
- C. If necessary, a spill pan may be placed under the test apparatus to catch any extra liquid. The test liquid used shall be racing fuel.

D. Suggested Test Cell Set-up, Figure 1:



E. Suggested dimensions of test cell body, Figure 2.



NOTE 1—All dimensions are in inches. (1 in. = 25.4 mm)

5.4.3 PROCEDURES

- A. Measure and record pre-test thickness and weight (ounces) of each sample.
- B. On an extra piece of the material, place a droplet of racing fuel on the normally inside surface to predetermine the appearance of end point penetration (characteristic discoloration). If not easily visible, food coloring may be added to the test liquid, or apply talcum powder to the observation side of the material sample.
- C. Mount the first sample in the test cell with the normally outside surface of the material facing up.
- D. Fill the test cell with enough racing fuel to be sure the cell remains full, even if the sample distends, taking care not to overfill and spill test liquid.
- E. Observe the downward facing surface of the material for one (1) minute.
- F. The material is considered acceptable if no liquid or characteristic discoloration caused by penetration appears on the downward facing surface.
- G. If liquid or characteristic discoloration does appear, the test is considered a failure.
- H. Record observations and results.
- I. Repeat the test for the remaining two samples.
- J. Measure and record post-test thickness and weight (ounces) of each sample.

6.0 PROOF OF COMPLIANCE

Fueler Apron 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

A Fueler Apron, as represented by the material tested in accordance with SFI Technical Bulletin 3.2, shall have a minimum TPP rating of 14.0 cal/cm² (58.6 W-sec/cm²) to be acceptable.

6.1.2 FLAMMABILITY

The after-flame time shall be three (3) seconds or less. Additionally, no melting or dripping may occur.

6.1.3 THREAD HEAT RESISTANCE

Thread specimens shall not melt, drip, separate, or ignite when tested.

6.1.4 LIQUID PENETRATION RESISTANCE TEST

- A. Each sample tested shall not show any evidence of liquid or characteristic discoloration caused by liquid penetration on the downward, or normally inside facing, surface of the material.
- B. The after-test weight of each sample shall equal the pre-test weight. An increase in weight caused by liquid absorption shall constitute a failure.

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 52.1 Program, the manufacturer must submit to SFI all information delineated in the Proof of Compliance section. This information shall be provided for each Fueler Apron 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 each model of Fueler Apron 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 Fueler Aprons for sale with the representation that their product meets the SFI Specification 52.1. 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" label purchased from SFI. Each individual Fueler Apron shall have a label attached to the exterior surface and must be visible when the apron is worn by the crewmember. The label shall have the month and year of manufacture punched out and easily identified.

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 52.1" 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 52.1, Fueler Apron, Program, must demonstrate full compliance with the requirements of this specification within ninety (90) days of the latest effective date.

*	Original Issue:	December 15, 2006
	Reviewed:	December 13, 2008
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