



# QUALITY ASSURANCE SPECIFICATIONS™

SFI SPECIFICATION 27.1

EFFECTIVE: OCTOBER 11, 2006\*

PRODUCT: Window Nets

## 1.0 GENERAL INFORMATION

- 1.1 This SFI Specification establishes uniform test procedures and minimum standards for evaluating and determining performance capabilities for Window Nets 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 27.1" 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 Window Nets that meet or exceed the SFI Specification 27.1 test standards, by complying with the requirements of the SFI Specification 27.1 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 Window Nets in compliance with all requirements of the SFI Specification 27.1 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 Window Nets are used to contain the occupants within a vehicle during unusual attitude conditions. They are normally required in motor sport applications when the drivers side window or window area is open.
- 2.2 The webbing is the inner portion of the Window Net that is connected to the outer borders.
- 2.3 The useful life of the Window Net shall not exceed two years and must be replaced at or before that time.
- 2.4 Any Window Net pertaining to this specification shall remain as constructed by the original manufacturer and not modified.

## 3.0 CONSTRUCTION

The Window Net can be made of various materials. The requirements, besides passing the tests herein, are those of functionality. Adequate driver visibility through the net, ease of mounting and removal, and fire retardant material properties are all desirable features. This specification pertains to window nets only and not the installation thereof.

## 4.0 MODEL CLASSIFICATION

Window net models are primarily based on materials, method of manufacture and webbing pattern dimensions. Any change of these factors constitutes a model change. The minimum width, as measured along the length of the car, shall be ten (10) inches (254mm).

## 5.0 TESTING

Test samples shall be fully processed new nets which are representative of nets currently produced or to be produced. If mounting hardware and/or mounting instructions are included with the net, they shall also be supplied.

### 5.1 PENETRATION RESISTANCE

#### 5.1.1 SAMPLES

Three samples shall be tested. If one sample fails, a fourth one shall be tested.

#### 5.1.2 APPARATUS

##### A. FIXTURE

The fixture shall simulate the open portion of the vehicle that the window net is to cover. The mounting shall also simulate that of an actual vehicle except that the net shall be mounted in the horizontal plane. The net shall be secured at each of the four corners. If mounting hardware or mounting instructions are supplied, they shall be used to mount the net to the fixture. Otherwise, dowels made of solid steel,  $0.562 \pm 0.020$  inch ( $14.3 \pm 0.5$  millimeter {mm}) in diameter, shall be used to support the net at each side and to attach the net to the fixture. The dowels shall be long enough to protrude from each end of the net to allow installation. Each end of the dowels shall have a  $0.125 \pm 0.020$  inch ( $3.2 \pm 0.5$  mm) diameter hole drilled through to allow attachment of cotter pins. After placing in the fixture, flat metal washers are to be installed on the ends of the dowels, then secured with the cotter pins.

##### B. PENETRATION OBJECT

A solid ball with a diameter of  $3.00 \pm 0.06$  inches ( $76.2 \pm 1.5$  mm) shall be used. The ball shall be made of steel with a smooth finish and weigh  $4.00 \pm 0.25$  pounds {lb} ( $17.79 \pm 1.11$  newtons {N}).

#### 5.1.3 PROCEDURE

Align the center of the ball with the geometric center of a webbing opening near the center of the net. Drop the ball from a height of  $2.00 -0/+0.12$  inches ( $50.8 -0/+3.0$  mm). The ball shall be allowed to fall freely without interference. Perform the test three times by dropping the ball onto three

different openings. Note the penetration of the ball into the webbing on each drop.

## 5.2 RAPID IMPACT RESISTANCE

### 5.2.1 SAMPLES

Three samples shall be tested. If one sample fails, a fourth one shall be tested.

### 5.2.2 APPARATUS

#### A. FIXTURE

The fixture shall be identical to the one used in the previous test.

#### B. IMPACT BAG

The impact bag shall be made of leather and/or any other heavy weight material. If the bag penetrates the net, the material shall not rip (heavy cotton canvas has proven unsuitable for this purpose). The bag shall be  $10.00 \pm 0.25$  inches ( $254 \pm 6$  mm) in diameter at the bottom, impact side and shall be long enough to allow 175 lb (778.4 N) of "OO" or smaller lead shot pellets to be placed inside the bag. The opening shall be capable of being closed off tightly to prevent spillage of the shot during testing.

### 5.2.3 PROCEDURE

Drop the impact bag from a height of  $26.5 -0/+0.5$  inches ( $673 -0/+13$  mm) directly over the center of the net and onto the webbing. The bag shall be allowed to fall freely without interference.

### 5.2.4 INSPECTION

Inspect the net for failure of the inner cross-section joints, separation of the webbing from the net border and stitching at the border.

## 6.0 PROOF OF COMPLIANCE

Window Net 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 PENETRATION RESISTANCE

Three out of four nets shall be required to prevent the ball from passing through on each of the three tries in order to pass this test.

### 6.1.2 RAPID IMPACT RESISTANCE

Three out of four nets shall be required to pass this test. Failure of a net constitutes any of the following conditions:

- A. The impact bag passes through the net.
- B. More than 50 percent of the inner cross-section webbing joints pull apart.
- C. 50 percent or more of the webbing ends separate from the border of the net.
- D. 50 percent or more of the border material is ripped at the border stitching (dowel loop).

## 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 27.1 Program, the manufacturer must submit to SFI all information delineated in the Proof of Compliance section. This information shall be provided for each Window Net 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 Window Net 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 Window Nets for sale with the representation that their product meets the SFI Specification 27.1. 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 patch which shall be sewn to the outer surface of the net (the surface facing the exterior of the vehicle). The patch issued by SFI is preprinted to indicate the month and year of certification expiration per Paragraph 2.3 of this specification.

## 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 27.1" 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 27.1, Window Net, Program, must demonstrate full compliance with the requirements of this specification within ninety (90) days of the latest effective date.

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