



**Fiberglass Fabricators, Incorporated**

# **Standard Specification for Fiberglass Reinforced Plastic - Flat Profile - Launder Covers**

## **1 Scope**

- 1.1 This specification shall govern all work necessary to furnish flat fiberglass Launder Covers, including all anchorage hardware required for proper installation of the Launder Covers.

## **2 General**

- 2.1 The Launder Covers shall be self-supporting.

- 2.1.1 The Launder Covers shall be "Composi Cover™" as manufactured by Fiberglass Fabricators, Inc. (FFI), or equal

### **2.2 Governing Criteria**

- 2.2.1 Applicable sections of the following standards shall apply to the fiberglass Launder Covers as indicated in this specification:
  - a. ANSI/ASCE 7-10 "Minimum Design Loads for Buildings and Other Structures"
  - b. ANSI/AWWA-F102-91 Section 5 "Standard Recommended Practice for Classifying Visual Defects in Glass Reinforced Laminates"

### **2.3 Design Criteria**

- 2.3.1 Launder Cover shall be designed in accordance with ANSI/ASCE 7-10 for the designated area:
- 2.3.2 Design Loads: Minimum safety factor shall be 4:1
  - a. 30-psf minimum uniform live load or 300-lbs concentrated live load located at center of span, whichever produces maximum stress.

2.3.3 Deflection:

- a. .25" maximum under uniform live load or concentrated live load as note above
- b. Span: L/240 maximum for support members

2.3.4 Connections: shall be designed to transfer loads

### **3 Materials**

3.1 Launder Cover materials shall be Pultruded FRP by Strongwell, or equal

3.2 Resin Requirements

3.2.1 The resin shall be corrosion-resistant general purpose polyester, which has been determined to be acceptable for the service conditions. Ultraviolet-light inhibitors shall be added to the laminate.

3.3 General Requirements

- a. All structural components shall be FRP pultruded material.
- b. Standard color shall be gray.
- c. Cut edges or drilled holes shall be deburred and sealed with paraffinated resin solution.
- d. A non-skid surface shall be supplied that is comprised of aliphatic acrylic polyurethane non-skid coating with UV protection.

3.4 Gasketing for Launder Covers shall be EPDM sponge.

3.5 Hardware Requirements

3.5.1 Hinges: shall be 316 Stainless Steel. Hinge shall be continuous along the linear length of the Launder/frame intersection.

3.5.2 Latches: shall be 316 Stainless Steel. Latches shall feature integrated locking tang and lifting handle within one assembly.

### 3.6 Physical Properties (minimum):

*Table 1. Laminate Minimum Physical Properties – Pultruded FRP*

<b>Property @ 70°F</b>	<b>Value</b>	<b>Test Method</b>
Tensile Strength - plank 3" thk.	31,100 psi	ASTM D 638
Tensile Strength - plank 2" thk.	30,000 psi	ASTM D 638
Tensile Strength - structurals	30,000 psi	ASTM D 638
Tensile Modulus - plank 3" thk.	2,486,000 psi	ASTM D 638
Tensile Modulus - plank 2" thk.	3,000,000 psi	ASTM D 638
Tensile Modulus - structurals	2,500,000 psi	ASTM D 638
Compressive Strength - structurals	30,000 psi	ASTM D 695
Compressive Modulus - structurals	2,500,000 psi	ASTM D 695
Flexural Strength - plank 3" thk.	24,500 psi	ASTM D 790
Flexural Strength - structurals	30,000 psi	ASTM D 790
Flexural Modulus - plank 3" thk.	885,000 psi	ASTM D 790
Flexural Modulus - structurals	1,600,000 psi	ASTM D 790
Modulus Elasticity - structurals	2,500,000 psi	Full Section
Shear Strength - plank 3" thk.	3190 psi	ASTM D 2344
Shear Strength - plank 2" thk.	4,500 psi	ASTM D 2344
Shear Strength - structurals	4,500 psi	ASTM D 2344
Shear Modulus - structurals	425,000 psi	-
Barcol Hardness	45	ASTM D 2583
Glass Content	45%	ASTM D 2584
Water Absorption	.6% Max	ASTM D 570
Coefficient of Linear Thermal Expansion (in/in/°F)	4.4 x 10 <sup>-6</sup>	ASTM D 696

*Table 2. Laminate Minimum Physical Properties – HLU FRP*

<u>Property @ 70 deg.F</u>	<u>Value</u>	<u>Test Method</u>
Tensile Strength	26,500 psi	ASTM D 638
Compressive Strength	30,000 psi	ASTM D 695
Compressive Modulus	2,500,000 psi	ASTM D 695
Flexural Strength	39,400 psi	ASTM D 790
Flexural Modulus	1,550,000 psi	ASTM D 790
Glass Content	45.6 %	ASTM D2584
Barcol Hardness	50	ASTM D 2583
Izod Impact Strength	29.1 ft-lb/in	ASTM D256
Water Absorption	.09% Max	ASTM D 570
Coefficient of Linear Thermal Expansion (in/in/°F)	3.6 x 10 <sup>-6</sup>	ASTM D 696

## **4 Submittals**

- 4.1 Final approval for incorporation into the project will be made only after the review of shop drawings, specifications, and data as follows:
- a. Shop drawings shall be complete with all dimensions, anchor locations, details of connecting piping and the size and locations of any required openings.
  - b. Specifications for all components shall be provided.
  - c. Details of the major fabricated components showing the arrangement of components and labeled with component sizes and materials of construction shall be submitted.
  - d. Structural design calculations for all components shall be submitted.
  - e. Manufacturer's recommended procedures for job site storage of equipment, handling, and erection shall be submitted.

## **4.2 Design Calculations**

- 4.2.1 As part of the shop drawings for the Launder Cover components, the fabricator shall supply any and all analyses pertinent to the composite design. The calculations shall include standard strength of materials approaches and computerized finite element analyses of sections where conventional methods do not apply. Furthermore, for the calculated loads, a complete laminate analysis shall be submitted identifying the various factors of safety for the proposed laminate schedule. Factors of safety shall be evaluated using criteria such as Tsai-Hill or equivalent theories.
- 4.2.2 The evaluation of deflection and stresses on panel sections under uniform loading shall incorporate numerical analysis calculations.
- 4.2.3 Written narrative that clearly states all of the basic design assumptions and parameters shall accompany the computerized calculations.
- 4.2.4 Approval by the engineer shall not relieve the manufacturer of responsibility for providing materials and design conforming to the intent of these specifications.
- 4.2.5 Complete structural design calculations and drawings shall be submitted as required herein. Design calculations and drawings must be approved and stamped by a registered Professional Engineer in the state of manufacture.

## **5 Quality Assurance**

### **5.1 Qualifications**

- 5.1.1 Flat cover manufacturer must have a minimum of five (5) years history of successful installations of similar size. Past job list with customer contact information will be required. Subject to compliance with requirements, manufacturers offering products which may be incorporated are limited to: Fiberglass Fabricators Inc. of Smithfield, RI.

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### **6.2 Manufacturer's Quality Control**

- 6.2.1 All fabrication shall be carefully inspected at the site of fabrication by factory inspectors who shall use whatever means necessary to assure the proper fit of all field connections and compliance with all material and fabrication requirements of the specifications.

### **6.3 Warranty**

- 6.3.1 A general warranty of the fabricated Launder Covers for materials and workmanship shall be for a minimum of one (1) year after installation with a maximum of eighteen (18) months from date of shipment.
- 6.4 The contractor shall be responsible for verifying all field dimensions to develop and approve shop drawings.

## **7 Manufacture**

### **7.1 Fabrication**

- 7.1.1 The installation contractor shall confirm all field measurements with the approved flat cover fabrication drawing before fabrication is initiated.

## **7.2 Shop Assembly**

- 7.2.1 The manufacturer shall pre-assemble and deliver Launder Covers as a complete assembly including all hardware and Gasketing.
- 7.2.2 Anchor bolts, assembly hardware, rail nut plates, hinges and lock sets shall be type 316 stainless steel.
- 7.3 Materials, equipment, and components in this section shall be the products of:

Fiberglass Fabricators, Incorporated  
P.O. Box 17068  
964 Douglas Pike  
Smithfield, RI 02917  
(P) 401-231-3552  
(F) 401-232-2260

## **8 Installation, Storage, Handling, and Maintenance**

- 8.1 The manufacturer shall provide detailed written instructions for the installation, long term storage, handling, and maintenance for the products provided.