

FRP Floor Panels Standard Specification

1. Scope

- Furnish all labor, materials, equipment and incidentals necessary to install the fiberglass reinforced polymer (FRP) products as specified herein.
- The work covered by this section shall include (but shall not be limited to) materials and installation for the fiberglass reinforced plastic (FRP) Floor Panel System.

2. Design Criteria

- The design of FRP products including connections shall be in accordance with governing building codes and standards as applicable.
- Design live loads of FRP floor panels shall not be less than 100 PSF uniformly distributed unless specifically stated otherwise in drawings and/or supplementary conditions. Floor panel deflection at the center of a simple span not to exceed 0.25”.
- Structural members shall be designed to support all applied loads. Deflection in any direction shall not be more than L/180 of span for structural members. Connections shall be designed to transfer the loads.

3. Materials

- Materials used in the manufacture of the FRP products shall be raw materials in conformance with the specification.
- All materials shall be of the kind and quality specified.
- All FRP products shall be manufactured utilizing Polyester or Vinyl ester resin with flame retardant and ultraviolet (UV) inhibitor additives. A synthetic surface veil shall be the outermost layer covering the exterior surface. The flame retardant FRP shapes shall achieve a flame spread rating in accordance with ASTM test method E-84. (Polyester resin is available without flame retardant and UV inhibitor additives.)
- If required, after fabrication, all cut ends, holes and abrasions of FRP shapes shall be sealed with a compatible resin coating.
- FRP products exposed to weather shall contain an ultraviolet inhibitor. Should additional ultraviolet protection be required, a one mil minimum UV coating shall be applied.
- All exposed surfaces shall be smooth and true to form.

4. Physical Properties, Electrical properties & Flammability

Property at 70F°	Amount	Test Method
Ultimate Tensile Strength	26,500 psi	ASTM D-638
Tensile Modulus	1.5 x 10 ⁶ psi	ASTM D 638
Flexural Strength	30,000 psi	ASTM D 790
Flexural Modulus	1.5 x 10 ⁶ psi	ASTM D 790
Punch Shear	23,000 psi	ASTM D-732
Barcol Hardness	40-50	ASTM D 2583
Glass Content	45%	ASTM D 2584

Table 1: Physical properties

ELECTRICAL	ASTM TEST METHOD	UNITS/ VALUE	Amount
Arc Resistance, LW ₀	D495	seconds	120
Dielectric Strength, LW ₀	D149	KV/in	35
		KV/mm	1.38
Dielectric Strength, PF ₀	D149	volts/mil	200
FLAMMABILITY ⊗	ASTM TEST METHOD	UNITS/ VALUE	Amount
Tunnel Test	E-84		25 Max
NBS Smoke Chamber	E-662		650-700 (typical)
Flammability	D635		Self Extinguishing
UL Thermal Index	Generic	°C	130
British Fire Test	BS 476-7		Class 1

Table 2: Electrical properties & Flammability

All values are minimum ultimate properties from coupon tests except as noted.

- ⋈ This value is determined from full section simple beam bending of Edgeng structural shapes.
- ⋈ The Shear Modulus value has been determined from tests with full sections of Edgeng structural shapes.
(See the Edgeng *Design Manual* for further information.)
- ⊗ Plate compressive stress/modulus measured edgewise and flexural stress/modulus measured flatwise.
- ⊕ Measured as a percentage maximum by weight.
- Typical values because these are shape and composite dependent tests.
- This is a typical value which varies with composite thickness.

LW = Lengthwise
CW = Crosswise

PF = Perpendicular to laminate face
N.T. = Not Tested

5. Submittals

Submittals shall include, but not be limited to:

- A. Drawings including layouts; connection and framing details; fastener types and spacing; product description.
- B. Material certifications.
- C. Operation and maintenance data for the FRP Floor panel System.

6. Quality Assurance

A. Qualifications:

- Five years successful experience in fabricating FRP Floor Panel Systems would be the minimum requirement for the manufacturer.
- FRP Floor Panel System manufacturer shall retain a registered professional engineer legally qualified to practice in same state as the Site.
- Responsibilities include:
 - FRP Floor Panel System performance and design criteria stated in the Contract Documents shall be reviewed.
 - Written requests should be prepared for clarifications or interpretations of performance or design criteria for submittal to engineer or contractor.
 - Preparation of design calculations verifying compliance of FRP Floor Panel System with requirements of the Contract Documents should be supervised.
 - Signing and sealing all calculations.
 - Design of FRP Floor Panel System was performed in accordance with performance and design criteria stated in the Contract Documents should be certified

- Installer Qualifications
 - Retain a single installer trained and with record of successful experience in installing FRP Floor Panel Systems.
 - Installer shall have record of successfully installing F FRP Floor Panel Systems in accordance with recommendations and requirements of manufacturer, or shall provide evidence of being acceptable to the manufacturer.
 - Installer shall employ only tradesmen with specific skill and successful experience in the type of Work required.
 - When requested by the engineer, submit name and qualifications of installer with the following information for at least three successful, completed projects:
 - Names and telephone numbers of owner and architect or engineer responsible for each project.
 - Approximate contract cost of the FRP Baffle Wall Systems for which installer was responsible.

B. System Manufacture

1. EDGENG
2. If Contractor wished to furnish an alternate system manufacturer, Contractor shall first make written application to Engineer for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by Engineer in evaluating the proposed substitute.

C. Source Quality Control:

- FRP Floor Panel System manufacturer shall prepare all Shop Drawings and other submittals (except for delegated design submittals, when professional engineer is retained by other than FRP Floor Panel System manufacturer) for all components furnished under this Section.
 - Components shall be specifically constructed for specified service conditions and shall be integrated into overall assembly by FRP Floor Panel Systems.
7. Warranty

Minimum of one year for the materials and for the workmanship of the fabricated product, after the installation with a maximum of eighteen months would be the general warranty for these FRP Floor Panels.

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8. Material Handling

- At the time of delivery, all materials shall be inspected for shipping damage.

The freight company and the Manufacturer shall be notified immediately of any damage or quantity shortages.

- The Contractor shall protect FRP materials from cuts, scratches, gouges, abrasions, and impacts. When lifting FRP materials, spreader bars shall be used (not wire slings unless materials are fully protected). FRP components shall not be dragged across one another unless separated by a non-scratching spacer.

9. Installation

- Before placing and attaching components, the contractor shall confirm the alignment and location of FRP Floor Panels and its base structure.

All bearing surfaces must be level, flat, clean and free of debris.

- Erection shall proceed according to sequence shown on the approved drawings.
- Contractor shall install pads, curbs or piers to modify uneven or sloped concrete surfaces to create a flat, level surface for FRP Floor Panel System attachment.
- Contractor shall field cut materials as required and shown on the Manufacturer's drawings.
 - Contractor shall seal field cut edges with NSF approved material.
 - Contractor shall install Panels and connections as shown on the approved layout drawings. Field modifications (cuts, copes, holes, etc.) unless shown on the drawings are not allowed without the manufacturer's written approval.
 - Before placement of Floor panels, contractor shall check alignment and location of framing members and existing structure.
 - Contractor shall adjust FRP Floor Panels for proper bearing and alignment.