

# SECTION 43 42 34

## FIBERGLASS (FRP) DOME COVERS

Revision 1.0 — April 2026

**PROJECT TEMPLATE:** This document is provided as a specification template. Contact RPS Engineering at 847-931-1950 to collaborate with our team on completing project-specific load requirements and specifications for your facility.

### PART 1 — GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Fiberglass reinforced plastic (FRP) dome covers for wastewater treatment tank applications, including all accessories, hardware, and anchorage.

#### 1.2 SUBMITTALS

A. Shop drawings in accordance with submittal procedures, including:

1. Available colors
2. Design calculations
3. Dimensional drawings showing anchor locations and location and size of all openings.

B. Manufacturer's experience certification.

C. Certification of laminate confirming minimum properties per Section 1.3C. Test results shall be from an independent testing laboratory and shall not be more than five (5) years old.

#### 1.3 QUALITY ASSURANCE

A. Manufacturer shall certify a minimum of five (5) years' experience in producing FRP tank covers.

B. Design calculations shall be based on given diameter, span, and loading conditions. Calculations shall be certified by a professional engineer licensed in the state where the dome is installed and experienced in FRP design.

C. Submit test results of the laminate from an independent testing laboratory confirming values used in design. Results shall not be more than five (5) years old. Test results shall confirm the minimum laminate properties listed in the project-specific design calculations.

#### 1.4 SYSTEM DESCRIPTION

A. Design cover for the following loads and International Building Code (IBC) 2021:

1. Dead Load — weight of the structure and all material attached to and supported by the structure.
2. Snow Load — Flat roof snow load (pf) per ASCE 7-22 Section 7. Ground snow load (pg), importance factor (I), thermal factor (Ct), and exposure factor (Ce) shall be per project location and jurisdiction. Designers shall also design for balanced and unbalanced sloped roof snow loads per ASCE 7-22 Sections 7.4 and 7.6.

3. Wind Load — Design per ASCE 7-22 Chapter 26–27 using project-specific wind speed from the updated wind speed maps. Wind exposure category and importance factor per project requirements.
  4. Design safety factor of 3:1 for allowable stress for all load combinations.
- B. Materials shall be suitable for continuous exposure to hydrogen sulfide (H<sub>2</sub>S) gas and other corrosive byproducts of wastewater treatment environments.
- C. Functional Requirements:
1. Design for expansion and contraction over an ambient temperature range of -20°F to 100°F. Allow for heat build-up under cover.
  2. Horizontal thrust loads shall not be transmitted to tank wall.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle components in accordance with manufacturer's recommendations.

## 1.6 WARRANTY

- A. Warrant fabricated FRP dome cover for materials and workmanship for one (1) year from date of substantial completion.

## PART 2 — PRODUCTS

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### 2.1 MANUFACTURERS

- A. RPS Engineering
1. 1300 Crispin Drive, Elgin, IL 60123
  2. Phone: 847-931-1950 | Fax: 847-931-4274
  3. [www.rpsengineering.com](http://www.rpsengineering.com)
  4. Woman-Owned Business
- B. Plan layouts, weights, and pertinent specification language used in the design have been based upon RPS Engineering.
- C. All equipment called for in this section shall be supplied by a single manufacturer or authorized sales representative to assure uniform quality, ease of maintenance, and minimal parts storage.

### 2.2 MATERIALS

- A. Resin:
1. Thermosetting polyester designed for temperatures ranging from -30°F to 140°F; capable of continuous exposure to hydrogen sulfide (H<sub>2</sub>S) gas, corrosive gases, and vapors from wastewater treatment environments.
    - a. Barcol hardness: 30–40
    - b. Specific gravity: 1.05
    - c. Flexural strength: 12,500 PSI
    - d. Flexural modulus: 520,000 PSI

- e. Tensile strength: 6,500 PSI
    2. Corrosion resistant.
    3. Contain no bulk extenders or fillers.
    4. Add ultraviolet inhibitors to entire laminate for translucent color selections.
  - B. Gel Coat: Thermosetting polyester designed for constant exposure to outside environment; resist ultra-violet degradation; color to be selected by Owner.
    1. Barcol hardness: 40–42
    2. Specific gravity: 1.128
    3. Flexural strength: 17,600 PSI
    4. Flexural modulus: 550,000 PSI
    5. Tensile strength: 9,500 PSI
  - C. Glass Reinforcing: Chopped strand, woven roving and/or unidirectional roving equal to Owens Corning, CertainTeed, FGI, PPG or equal; treated with a finish compatible with the resin being used.
  - D. Hardware: Type 316 stainless steel.

## 2.3 COMPONENTS

- A. Fiberglass compression ring with removable bolt-on cover and aluminum gravity ventilator.
- B. Integral fiberglass tension ring.
- C. Lifting Lugs:
  1. Embed lifting lugs at balance points in each segment.
  2. Suitable for handling, installing, and removing each panel segment.
- D. Furnish neoprene sponge gaskets for radial joints and back flange of dome roof segments.
- E. Integrally molded drip lip near the periphery of each panel segment to prevent condensate from seeping onto tank wall exterior.

## 2.4 ACCESSORIES

- A. Appurtenances shall be formed on separate suitable molds and fitted into proper openings cut in the finished panel. All attachments shall be glassed from both the interior and exterior of the panel to assure maximum strength.
  1. Personnel Hatches (when required):
    - a. Dimensions: 30 inches tall by 24 inches wide.
    - b. Hinges and latches: Type 316 stainless steel.
    - c. Provide on all dome segments not scheduled for aluminum air intake louvers.
  2. Aluminum Air Intake Louvers:
    - a. Quantity: As required.
    - b. Dimensions: 24 inches by 24 inches.
    - c. Adjustable ventilation louvers with bird/bug screen.
  3. Location of appurtenances shown on drawings.
- B. Dormer Entries (Optional):
  1. Furnish one fiberglass entry dormer on each cover to accommodate personnel doors.
  2. Personnel Doors:

- a. Dimensions: 3 feet wide by 7'-0" high.
  - b. Doors to have a 2-pound density polyethylene core with wood reinforcements at the hinges and lockset and fiberglass skin.
  - c. Hinges and lockset: Type 316 stainless steel.
  - d. Key locksets to match other buildings.
  - e. Heat trace door frame to prevent freezing (when required):
    1. 8 watts per foot.
    2. 120 VAC NEC Class 1, Division 1, Group D, explosion proof.
    3. Provide heat trace manufacturer's explosion proof connection kits and end kits.
- C. Skylights:
1. Provide skylight areas if specified on drawings.
  2. Skylight area (each) and location as specified on drawings.
  3. Areas shall be un-gel coated and sealed with parafinated wax resin containing UV inhibitors.

## 2.5 FABRICATION

- A. Laminate Sequence:
1. Interior surface shall be the corrosion barrier consisting of 10–20 mils C-veil at 10 percent glass content.
  2. Surfacing veil shall be supported by 80 mil thickness of chopped strand E-glass.
  3. Structure shall consist of alternating layers of woven roving and chopped strand to complete the required thickness.
  4. Total laminate thickness shall in no case be less than the design allowable for a 3:1 safety factor.
  5. Exterior surface shall be an exterior grade gel coat with ultra-violet protection. A parafinated wax additive shall be used in conjunction with gel coat to eliminate air inhibition (14–18 mils thick).
  6. Cut edges or drilled holes shall be de-burred and resin or gel coat sealed.
- B. Interlocking panels shall be weather-tight with stainless steel bolts on 3-foot centers on each joint between panels. Design molds such that each panel is cast in one piece, without bolting or bonding.
- C. Compression ring and tension member shall be FRP.
- D. Gasketing for radial joints and back flange of dome roof segments shall be neoprene sponge.

## PART 3 — EXECUTION

### 3.1 ERECTION

- A. Erect equipment in accordance with manufacturer's instructions.
- B. Install a 3/8-inch by 6-inch gasket between cover and wall.
- C. Anchor cover to wall with stainless steel anchor bolts. Stainless steel washers of a suitable size shall be used to avoid localized stresses in bolting.

### **3.2 FIELD QUALITY CONTROL**

- A. Manufacturer's authorized representative shall supervise critical installation procedures as necessary, inspect final installation, and perform any final adjustments.

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**END OF SECTION 43 42 34**