

# Fiber Reinforced Plastic PARSHALL FLUMES

Revised 8-12-2024.

1. REFERENCE SPECIFICATIONS, CODES, AND STANDARDS
  - a. ANSI/AWWA F101 – AWWA Standard for Contact-Molded, Fiberglass-Reinforced Plastic Wash Water Troughs and Launderers.
  - b. ASTM D256 – Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
  - c. ASTM D570 – Standard Test Method for Water Absorption of Plastics.
  - d. ASTM D638 – Standard Test Method for Tensile Properties of Plastics.
  - e. ASTM D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  - f. ASTM D2583 – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impresser.
  - g. All references shall be for the latest revision.
  
2. SUBMITTALS
  - a. Units
    - i. All submittals, specifications, drawings, brochures, installation instructions, descriptive literature, etc. shall have all units of measurement in both Imperial and SI units.
  - b. Drawings
    - i. Project specific drawings, showing:
      1. Critical dimensions.
      2. Joints, connections, fasteners.
      3. Sizes, spacing, and locations of structural members, ribs, anchoring clips, and dimensional bracing.
      4. Materials and thicknesses of construction.
  - c. Specifications
    - i. Project specific specifications.
  - d. Receiving, Handling, and Storage Instructions
  - e. Installation Instructions
  - f. Operation and Maintenance Instructions
  - g. Product Warranty
  - h. Test Data
  
3. RECEIVING, HANDLING, AND STORAGE
  - a. Receiving
    - i. Inspect for damage.
      1. All parts should be inspected upon delivery to the site, noting any missing items or visible damage.
      2. Verify that the interior flow surfaces have not been damaged or otherwise marked during transit.

3. Flanges, anchor clips, and dimensional bracing should also be inspected.
  4. For smaller boxed items make sure to verify that all packaging seals are in place and that there is no visible damage to the packaging.
- ii. Investigate for order correctness and count.
    1. Once the order has been received review the packing list against what has been received. Should any item not appear to be present, or the configuration of the items does not match the description on the packing list, contact National Manufacturing Water Treatment Products immediately.
    2. Small connection hardware (nuts, bolts, etc.) not attached to the flumes ship in individual boxes – with those contents clearly marked.
- b. Handling
- i. Flumes are specialty items and are fabricated to strict dimensional tolerances. While rugged and designed for a long service life, flumes must be handled with care. Flow surfaces are particularly important and in handling flumes this should always be kept in mind.
  - ii. When cranes, hoists, and other machinery are used to lift flumes or flume sections, spreader bars and lifting straps should always be used. When performing any overhead lift, all lifting eyes must be used in conjunction with good rigging practices. Rigging and lifting sequences and schedules of equipment are solely the responsibility of the Contractor.
  - iii. Chains, ropes, and the like should never be used to move or position any flume as they may damage the fiberglass laminate.
- c. Storage
- i. Flumes not intended for immediate installation may be stored until the site is ready for their installation.
  - ii. Flumes should only be stored in a location that is clean, level, and protected from construction traffic.
  - iii. When shipped on pallets, flumes should be left on those pallets until such time as they are installed.

#### 4. MANUFACTURER

- a. The supplier of flume shall be:

National Manufacturing Water Treatment Products 7870 West Ridge Road Fairview,  
PA 16415 [dvorse@nationalcomposites.com](mailto:dvorse@nationalcomposites.com)

#### 5. WARRANTY

- a. Flumes shall be warranted to be free of defects in workmanship and materials for one (1) year.
- b. The warranty period shall begin from the date of shipment.

## 6. SYSTEM DESCRIPTION

### a. Configuration

#### i. Single flume

##### 1. Size:

a. \_\_\_\_\_-inch Parshall flume.

##### 2. Construction:

- a. One-piece construction (1-48-inch Parshall flumes).
- b. Two-piece construction, with connection hardware (60-96-inch Parshall flumes).
- c. Three-piece construction, with connection hardware (120-144-inch Parshall flumes).

### b. Materials of Construction

#### i. Fiberglass reinforced plastic laminate.

##### 1. Isophthalic polyester laminating resin:

a. Low HAP.

b. Properties shall meet or exceed:

- |                                   |             |
|-----------------------------------|-------------|
| i. Tensile Strength (ASTM D638)   | 14,000 psi  |
| [96.53 MPa].                      |             |
| ii. Flexural Strength (ASTM D790) | 22,000 psi  |
| [151.7 MPa].                      |             |
| iii. Flexural Modulus (ASTM D790) | 900,000 psi |
| [6.205 GPa].                      |             |
| iv. ANSI/AWWA F101                | Type II.    |
| v. Barcol Hardness (ASTM D2583)   | 30.         |
| vi. Water Absorption (ASTM D2583) | <0.15%.     |

##### 2. E-glass:

- a. Minimum of 30% of laminate content by weight.
- b. Silane coupling agent.

##### 3. Laminate thickness:

a. Floor:

- i. 1/4-inch [0.635 cm] (1–48-inch Parshall flumes).
- ii. 1 3/8-inches [3.49 cm], with 1-inch [2.54 cm] thick encapsulated reinforcing core (60-144-inch Parshall flumes).

b. Sidewalls:

- i. 1/4-inch [0.635 cm] (1–48-inch Parshall flumes).
- ii. 3/8-inch [0.935 cm] (60-144-inch Parshall flumes).

#### ii. Gel coat:

1. All surfaces must be gel coated.
2. 15 mil cured thickness.
3. U.V. inhibitors in all gel coat formulations, regardless of application or installation location.
4. Color:
  - a. Interior surfaces: NPG ISO Gelcoat white gloss.

- iii. Dimensional bracing:
    - 1. Equal leg pultruded fiberglass laminated to the exterior.
      - a. Or equal for structural stiffness.
  - iv. Flanges:
    - 1. Integral top and end flanges:
      - a. 2-inches [5.08 cm] wide (minimum) (1-9-inch Parshall flumes).
      - b. 3-inches [7.62 cm] wide (minimum) (12-84-inch Parshall flumes).
      - c. 4-inches [10.16 cm] wide (minimum) (96-144-inch Parshall flumes).
- c. Dimensional Tolerances:
- i. Flume throat dimensions shall be plus or minus:
    - 1. 1/16-inch [1.59 mm] (12-inch or smaller Parshall flumes).
    - 2. 3/32-inch [2.38 mm] (18-24-inch Parshall flumes).
    - 3. 1/4-inch [6.3518 mm] (36-96-inch Parshall flumes).
    - 4. 1/2-inch [12.7 mm] (144-inch Parshall flumes).
  - ii. Other flume dimensions shall be plus or minus:
    - 1. 1/8-inch [3.18 mm] (24-inch or smaller Parshall flumes).
    - 2. 1/2-inch [12.7 mm] (36-96-inch Parshall flumes).
    - 3. 1-inch [25.4 mm] (120-144-inch Parshall flumes).
- d. Flow
- i. Staff gauge
    - 1. High visibility, direct read level gauge with black letters.
    - 2. Gauge shall be surface applied gauges to the flume.

## 7. EXECUTION

- a. Examination
  - i. Verify that the flume dimensions are correct and that the site conditions are suitable for installing the flume.
- b. Installation
  - i. The flat floor of the flume should be set upstream.
  - ii. Clean the flow surfaces.
  - iii. Remove all trash and debris, leaving the site in a clean condition.