

L. F. Manufacturing, Inc.
FIBERGLASS VALVE VAULT SPECIFICATION

Specification # LFVV001

A.1 GENERAL: Fiberglass reinforced polyester valve vault shall be manufactured from commercial grade polyester resin or other suitable polyester or vinyl ester resins, with fiberglass reinforcements. Valve Vault shall be a one piece unit manufactured to meet or exceed all specifications of A.S.T.M. D-3753 latest addition as manufactured by L.F. Manufacturing, Inc., Giddings, Texas, 1-800-237-5791 or an approved equal

A.2 GENERAL:

Resin: The resins used shall be a commercial grade unsaturated polyester resin or other suitable polyester or vinyl ester resin.

Reinforcing Materials: The reinforcing materials shall be commercial Grade "E" type glass in the form of continuous roving, and chop roving, having a coupling agent that will provide a suitable bond between the glass reinforcement and the resin.

Interior Surfacing Material: The inner surface exposed to the chemical environment shall be a resin-rich layer of 0.010 to 0.020 inch thick. The inner surface layer exposed to the corrosive environment shall be followed with a minimum of two passes of chopped roving of minimum length 0.5 inch (13 mm) to maximum length of 2.0 inch (50.8 mm) and shall be applied uniformly to an equivalent weight of 3 oz/ft. Each pass of chopped roving shall be well-rolled prior to the application of additional reinforcement. The combined thickness of the inner surface and interior layer shall not be less than 0.10 inch (2.5 mm)

Wall Construction Procedure: After inner layer has been applied, the vault wall shall be constructed with chopped roving process.

Exterior Surface: For a UV inhibitor the resin on the exterior surface of the vault shall have gray pigment added for a minimum thickness .125 in.

Stubouts and Connections: Upon request stubouts maybe installed. Installation of SDR PVC sewer pipe must be performed by sanding, priming, and using resin fiber-reinforced hand layup. The resin and fiberglass shall be same type and grade as used in the fabrication of the fiberglass vault

Bottom: Fiberglass valve vault shall have an open bottom. Vault shall be installed by inserting the vault into a concrete base or crushed stone base.

Fillers and Additives: Fillers, when used, shall be inert to the environment and valve vault construction. Sand shall not be accepted as an approved filler. Additives, such as thixotropic agents, catalysts, promoters, etc., may be added as required by the specific manufacturing process to be used to meet the requirements of this standard. The resulting reinforced-plastic material must meet the requirements of this specification.

A.3 MANUFACTURE: Valve Vault cylinders, manway reducers, and connectors shall be produced from glass fiber-reinforced polyester resin using a combination of chop and continuous filament wound process.

Interior Access: All valve vaults shall be designed so that a ladder or step system can be supported by the installed valve vault.

Manway Reducer: Manway reducers will be concentric with respect to the larger portion of the valve vault.

Cover and Ring Support: The valve vault shall provide an area from which a grade ring or brick can be installed to accept a typical metal ring and cover and have the strength top support a traffic load without damage to the valve vault.

A.4 REQUIREMENTS:

Exterior Surface: The exterior surface shall be relatively smooth with no sharp projections. Hand-work finish is acceptable if enough resin is present to eliminate fiber show. The exterior surface shall be free of blisters larger than 0.5 inch in diameter, delamination or fiber show.

Interior Surface: The interior surface shall be resin rich with no exposed fibers. The surface shall be free of crazing, delamination, and blisters larger than 0.5 inch in diameter and wrinkles of 0.125 inch or greater in depth. Surface pits shall be permitted if they are less than 0.75 inch in diameter and less than 0.0625 inch deep. Voids that cannot be broken with finger pressure and that are entirely below the resin surface shall be permitted if they are less than 0.5 inch in diameter and less than 0.0625 inch thick.

Repairs: Any valve vault repair is subject to meet all requirements of this specification.

Valve Vault Length: Valve Vault lengths shall be in 6 inch increments +/- 2 inches.

Diameter Tolerance: Tolerance of inside diameter shall be +/- 1% of required valve vault diameter.

Load Rating: The complete valve vault shall have a minimum dynamic-load rating of 16,000 lbs. when tested in accordance with A.S.T.M. 3753 8.4 (note 1). To establish this rating the complete valve vault shall not leak, crack, or suffer other damage when load tested to 40,000 lbs. and shall not deflect vertically downward more than 0.25 inches at the point of load application when loaded to 24,000 lbs.

Stiffness: The valve vault cylinder shall have the minimum pipe-stiffness values shown in table below when tested in accordance with A.S.T.M. 3753 8.5 (note 1).

LENGTH - FT.	F/AY - PSI
3 - 6.5	0.75
7 - 12.5	1.26
13 - 20.5	2.01
21 - 25.5	3.02
26 - 35	5.24

Soundness: In order to determine soundness, apply an air or water pressure test to the valve vault test sample. Test pressure shall not be less than 3 psig or greater than 5 psig. While holding at the established pressure, inspect the entire valve vault for leaks. Any leakage

through the laminate is cause for failure of the test. Refer to A.S.T.M. 3753 8.6.

Chemical Resistance: The fiberglass valve vault and all related components shall be fabricated from corrosion proof material suitable for atmospheres containing hydrogen sulfide and dilute sulfuric acid as well as other gases associated with the wastewater collection system.

A.5 PHYSICAL PROPERTIES:	Hoop Direction	Axial Direction
a. Tensile Strength (psi)	18,000	5,000
b. Tensile Modules (psi)	0.6×10^6	0.7×10^6
c. Flexural Strength(psi)	26,000	4,500
d. Flexural Modules (psi)	1.4×10^6	0.7×10^6
e. Compressive (psi)	18,000	10,000

A.6 TEST METHODS: All tests shall be performed as specified in A.S.T.M. 3753 latest addition, section 8. Test method D-790 (see note 5) and test method D-695

A.7 QUALITY CONTROL: Each completed valve vault shall be examined for dimensional requirements, hardness, and workmanship. All required A.S.T.M. 3753 testing shall be completed and records of all testing shall be kept and copies of test records shall be presented to customer upon formal written request within a reasonable time period.

A.8 CERTIFICATIONS: As a basis of acceptance the manufacturer shall provide a independent certification which consists of a copy of the manufacturer's test report and accompanied by a copy of the test results stating that the valve vault has been sampled, tested, and inspected in accordance with the provisions of this specification and meets all requirements.

A.9 SHIPPING and HANDLING: Do not drop or impact the fiberglass valve vault. Fiberglass valve vault may be lifted by inserting a 4"x 4"x 30" timber into the top of valve vault with cable attached or by a sling or "choker" connection around center of valve vault, lift as required. Use of chains or cables in contact with the valve vault surface is prohibited.

A.10 CONCRETE:

Concrete Bottom: Lower valve vault into wet concrete until it rests at the proper elevation, with a minimum of 4 inches of fiberglass valve vault inserted into the wet concrete. Then move valve vault to plumb. If required by the engineer, concrete may be used around reducer section for buoyancy.

A.11 BACKFILL:

Backfill Material: Unless shown otherwise on drawings and approved by the engineer, sand, crushed stone, or pea gravel shall be used for backfill around the valve vault for a minimum distance of one foot from the outside surface and extending from the bottom of the excavation to the top of the reducer section. Suitable material chosen from the excavation may be used for the remainder of the backfill. The material chosen shall be free of large lumps or clods, which will not readily break down under compaction. This material will be subject to approval by the engineer.

Backfill Procedure: Backfill shall be placed in layers of not more than 12 loose measure inches and mechanically tamped to 95% Standard Proctor Density, unless otherwise approved by the

engineer. Flooding will not be permitted. Backfill shall be placed in such a manner as to prevent any wedging action against the fiberglass valve vault structure.

A.12 MARKING and IDENTIFICATION: Each valve vault shall be marked on the inside and outside with the following information:

1. Manufacturer's name or trademark
2. Manufacturer's factory location
3. Manufacturer's serial number
4. Total length