



INDUSTRIAL PIPE FITTINGS, LLC

SPIROLITE® ENGINEERED ODOR CONTROL SYSTEMS



Municipal
Wastewater
Industrial
Process
Composting
Facilities
Biofilters



SPIROLITE MUNICIPAL AND INDUSTRIAL ODOR CONTROL PIPING

Municipal wastewater treatment plants, industrial processes and composting facilities can be assured of trouble free transport of foul air with Spirolite High Density Polyethylene (HDPE) Odor Control Piping. Fittings and fabrications are manufactured to your specifications, ensuring that the piping provided meets your system requirements.

Industrial Pipe Fittings brings the most experience in the industry to the pipe and custom fabrication market. In response to demand for high quality products, IPF has grown into the leading manufacturer of large diameter gravity and low pressure piping, and fabricated HDPE structures.



Utilizing high quality materials, leak tight joints, unmatched fabrication capacity, stringent quality control, and fast user-friendly field installations, its no wonder Spirolite is the industry choice for the most demanding odor control projects. Whether you are designing a new system or a complex addition to an existing system that transports foul air to scrubbers, adsorption units, or bio-filters, Spirolite piping can provide a long-lasting, integrated system.

HDPE Premium Resin

- High Quality Stress Rated Resin with no fillers or Post-Consumer Resins.
- Chemical and Corrosion Resistant
- Excellent Weatherability
- Tough and Durable
- Highly Resistant to Stress Cracking
- Long Service Life



Photo courtesy of Earth Tech and Project Western Contractors

Pipe and Fittings

- Sizes from 1/2" through 120" Diameter
- Elbows
- Tees
- Wyes
- Concentric and Eccentric Smooth Reducers
- Plugs and Caps
- Spool Pieces

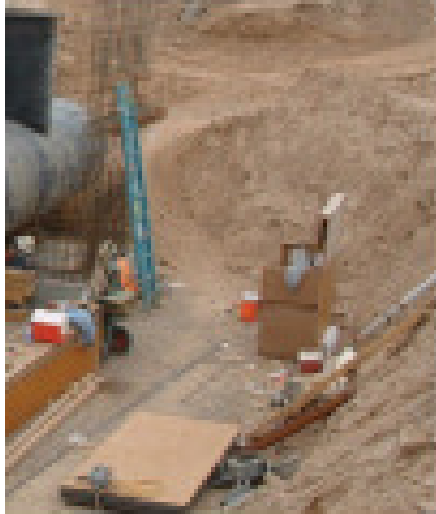
Joining Options

- Elastomeric Gasketed Bell and Spigot Joints
- Closure Bells that allow for easy field adjustments
- Flange Hubs and Convuluted D.I., Stainless Steel, or coated backup rings
- Fabricated HDPE Flanges for low load bearing connections, Customer shapes and drilling available
- Thermal extrusion welded joints



Complete Gasketed System

- Tight Elastomeric Gasketed Joints Easily Installed in All Weather Conditions
- Joints Meet Stringent ASTM D3212 Testing
- Easy Field Adjustments—Gasketed Closure Joints Allow for Field Adjustment of Fitting Without Time Consuming, Difficult and Potentially Hazardous Hand Lay-ups of Joints



Gasket Material Options

- Synthetic Polyisoprene (standard)
- Neoprene
- EPDM
- Nitrile

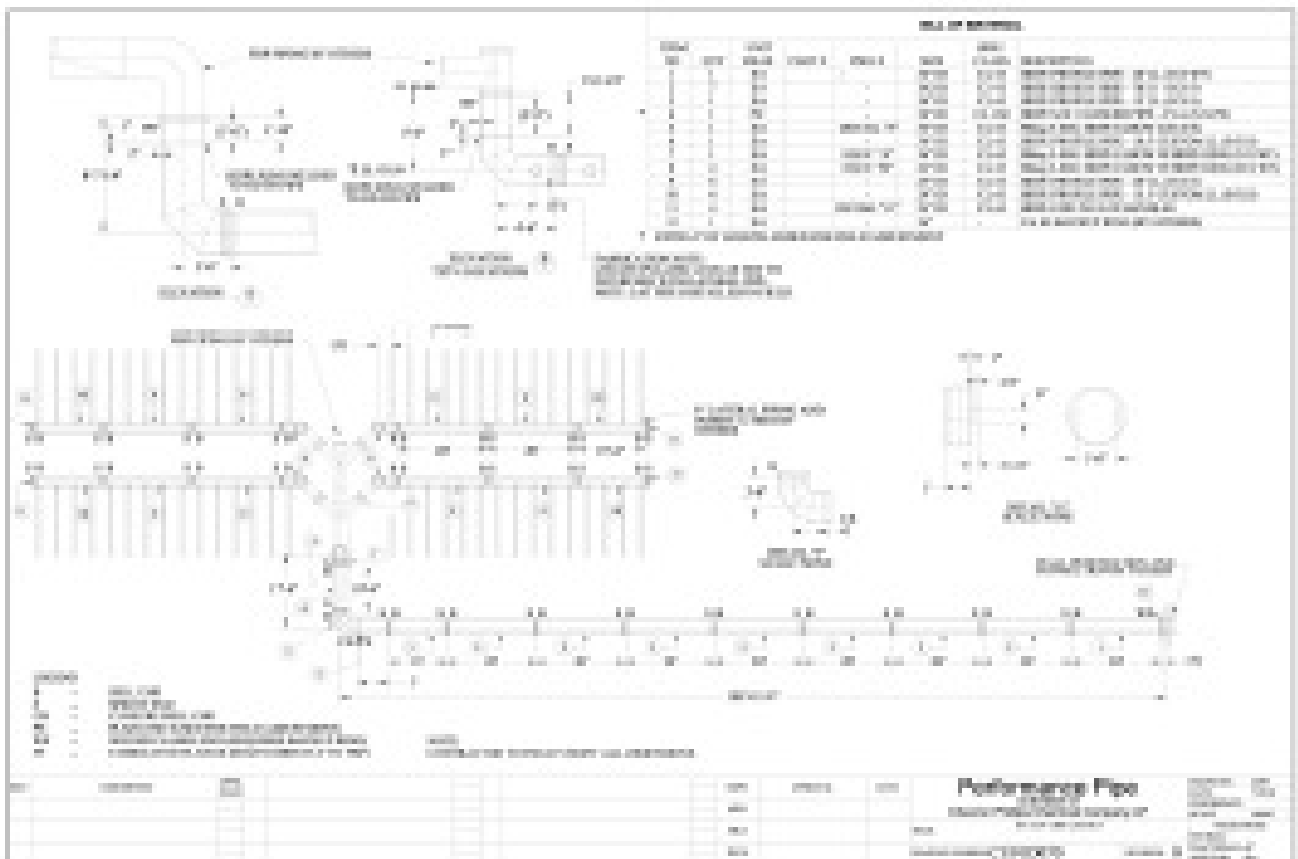


IPF INDUSTRIAL
PIPE FITTINGS, LLC

Advantages of Engineered Submittal Drawings

- ◆ Reduce Engineer's Submittal Review Time.
 - Drawings are Compatible with the Plan and Profile of the Project.
 - Drawings have Detailed Dimensions and Location of Pipe and Fittings.

- ◆ Reduce Contractor's Installation Time and Cost.
 - Pipe and Fittings Labeled per the Bill of Materials on the Drawing and Used In Conjunction with the Drawing aid in Installation.



Versatile Configurations Spirolite® Offers Custom Fabrications To Fit Your Requirements (You Draw it, We Build It)



Spirolite® Pipe's Outstanding Features Include:

- Experience in Both Above and Below Grade Applications
- Large Diameter Range (18" - 120")
- Chemical and Corrosion Resistant
- Excellent Weatherability
- Tough and Durable
- Highly Stress Crack Resistant
- Long Service Life
- Standard and Custom Fabrications to Fit Your Project
- Tight Elastomeric Gasketed Joints Easily Installed in All Weather Conditions
- Easy Field Adjustments-Gasketed Closure Joints Allow for Field Adjustment of Fitting Without Time Consuming, Difficult and Potentially Hazardous Hand Lay-ups of Joints
- Lightweight-Does Not Need Heavy Equipment Other Products Require
- Easily Modified to Meet Future Requirements

Model Specification SPIROLITE Profile Wall HDPE Pipe and Fittings for Odor Control

The user may choose to adopt part or all of this Model Specification; however, the user should ensure that all parts used are appropriate for the user's purpose. See notice below.

- 1 General Terms and Conditions:
 - 1.1 Scope: This specification covers requirements for profile wall high-density polyethylene (HDPE) pipe and fittings for the control of odorous exhaust air (odor control) systems.
 - 1.2 Engineered and Approved Plans: The installation and construction of odor control pipe and fittings shall be performed in accordance with engineered construction plans for the work prepared under the direction of a Professional Engineer.
 - 1.3 Referenced Standards: Where all or part of a Federal, ASTM, ANSI, AWWA, etc., standard specification is incorporated by reference in these Specifications, the reference standard shall be the latest edition and revision.
 - 1.4 Licenses and Permits: A licensed and bonded General Contractor shall perform all odor control piping construction work. The Contractor shall secure all necessary permits before commencing construction.
 - 1.5 Inspections: All work shall be inspected by an Authorized Representative of the Owner who shall have the authority to halt construction if, in his opinion, these specifications or standard construction practices are not being followed. Whenever any portion of these specifications is violated, the Project Engineer or his Authorized Representative, shall, by written notice, order further construction to cease until all deficiencies are corrected. A copy of the order shall be filed with the Contractor's license application for future review. If the deficiencies are not corrected, performance shall be required of the Contractor's surety.
- 2 High Density Polyethylene Pipe and Fittings:
 - 2.1 Qualification of manufacturers: The manufacturer shall have manufacturing and quality control facilities that are capable of producing and assuring the quality of the odor control piping and fittings required by these specifications. The manufacturer's production facilities shall be open for inspection by the owner or his Authorized Representative.
 - 2.1.1 Profile wall high density polyethylene pipe and fittings shall be furnished by a manufacturer with a minimum of 10 years experience in the United States in the manufacture of profile wall polyethylene pipe meeting ASTM F 894 and HDPE fittings fabricated from pipe meeting ASTM F 894.
 - 2.2 Approved Manufacturers: Manufacturers that are qualified and approved by the Project engineer are listed below. Products from unapproved manufacturers are prohibited.

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 - 2.3 Polyethylene Materials: Materials used for the manufacture of polyethylene pipe and fittings shall be high density polyethylene in accordance with ASTM F 894 requirements with a cell classification of 335444C per ASTM D-3350. Upon request, a manufacturer's physical property data sheet shall be supplied.
 - 2.3.1 Black material shall contain a minimum of 2% carbon black for long-term protection against UV degradation. The base resin used in the manufacture of the product shall contain a high quality antioxidant package.

NOTICE. This publication is for informational purposes and is intended for use as a reference guide. It should not be used in place of the advice of a professional engineer. This publication does not contain or confer any warranty or guarantee of any kind. Industrial Pipe Fittings has made every reasonable effort towards the accuracy of the information contained in this publication, but it may not provide all necessary information, particularly with respect to special or unusual applications. This publication may be changed from time to time without notice. Contact Industrial Pipe Fittings to ensure that you have the most current edition.

- 2.4 Elastomeric Gaskets: Elastomeric gaskets shall comply with the non-pressure requirements of ASTM F477.
- 2.5 Lubricant: The joint assembly lubricant shall have no detrimental effect on the gasket or on the pipe.
- 2.6 Polyethylene Pipe and Fittings:
- 2.6.1 Polyethylene pipe shall be manufactured in accordance with ASTM F 894 and shall have integral bell and spigot joints meeting ASTM D 3212.
- 2.6.2 Polyethylene fittings shall be fabricated from sections of pipe meeting ASTM F 894 using extrusion welding. Fittings shall be constructed with integral bell and spigot joints that are compatible with the pipe.
- 2.6.3 Threaded outlets and caps for pressure and temperature measurement shall be provided as specified in approved shop drawings.
- 2.6.4 Custom fabricated pipe and fittings shall be manufactured in accordance with shop drawings that are approved by the Engineer prior to fabrication.
- 2.6.5 To ensure joint quality and compatibility, the same manufacturer shall produce pipe and fittings.
- 3 Joining
- 3.1 Field joining shall be by bell and spigot joints meeting ASTM D 3212 that are sealed using a elastomeric profile gasket that fits in a machined circumferential groove in the spigot, or by gasketed flanges.
- 3.2 Joints shall be aligned and assembled in accordance with the manufacturer's instructions.
- 3.3 Flanged connections: Option A, HDPE Plate Flange to be drilled in field to match mating hole pattern: Option B, Wound Flange with back-up ring meeting an ANSI B16.1, 125-lb. Drilling pattern. Flange gaskets shall be full faced, 3/8-in thick rubber or elastomer of 60-durometer hardness.
- 4 Handling, Construction and Installation
- 4.1 Unloading and transport shall be performed in accordance with instructions provided by the delivery driver. Pipe and fittings shall be handled with lifting and equipment that is of proper capacity and in safe operating condition. Pipe and fittings shall not be pushed, pulled, rolled or dropped off the truck. All pipe and fittings shall be examined before installation and no piece that is found to be defective or damaged shall be installed. Damage occurring after installation shall be corrected at the installer's expense in accordance with the Engineer's instructions and the manufacturer's recommendations.
- 4.2 Underground Installation: Underground installations using open cut and burial techniques shall be performed in accordance with ASTM D2321 and ASTM D1668 or as specified by the project engineer. The contractor shall observe all appropriate safety requirements in accordance with local, state and federal codes and regulations.
- 4.3 All pipe and fittings shall be clean and undamaged before installation. When pipe laying is not in progress the open ends of the pipeline shall be closed by watertight plugs or other approved means. Good alignment shall be preserved in laying. The deflection at joints shall not exceed the deflection limits recommended by manufacturer. Where crossing utilities are encountered when opening the trench, pipe and fittings as necessary to reroute odor control system piping or crossing utility piping shall be provided.
- 4.4 Pipe trenches shall be kept free from water during pipe laying and joining, and until sufficient backfill has been placed to prevent floatation of the pipe. Provide ample means and devices to promptly remove and dispose of all water entering the trench.
- 4.4.1 Where the Engineer determines that the maximum ground water level will be at or below the pipe springline for the service life of the pipeline, the pipe shall be backfilled according to Figure 4.4.1, Dry Installation Bedding Requirements.

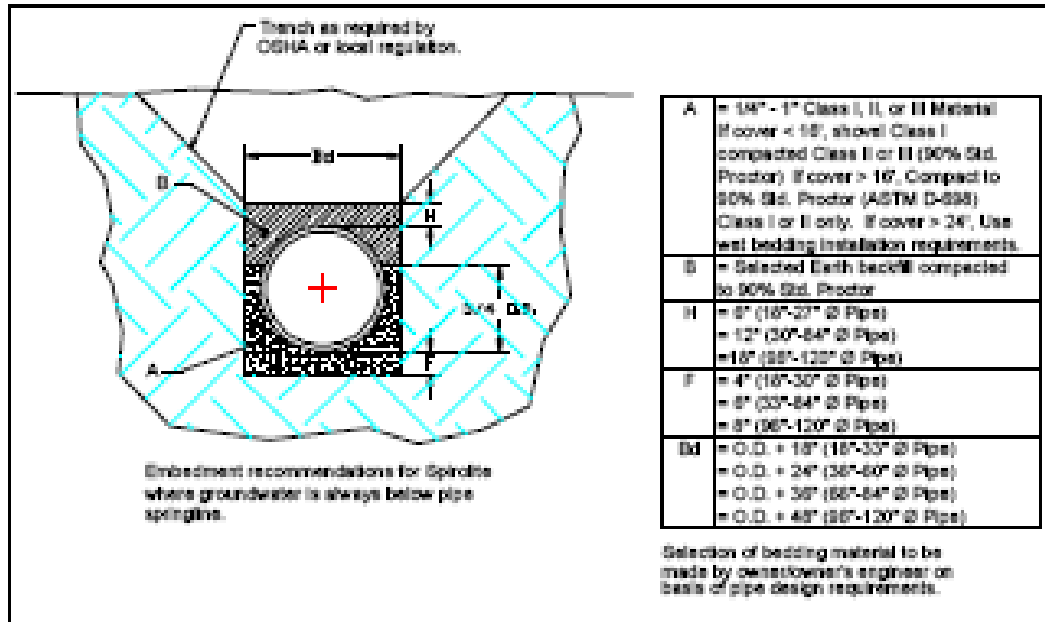
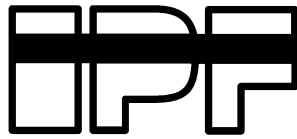


Figure 4.4.1 Dry Installation Bedding Requirements

4.4.2 Where the Engineer determines that the ground water level may be above the pipe springline during the service life of the line, the pipeline shall be backfilled in accordance with Figure 4.4.2 Wet Installation Bedding Requirements.

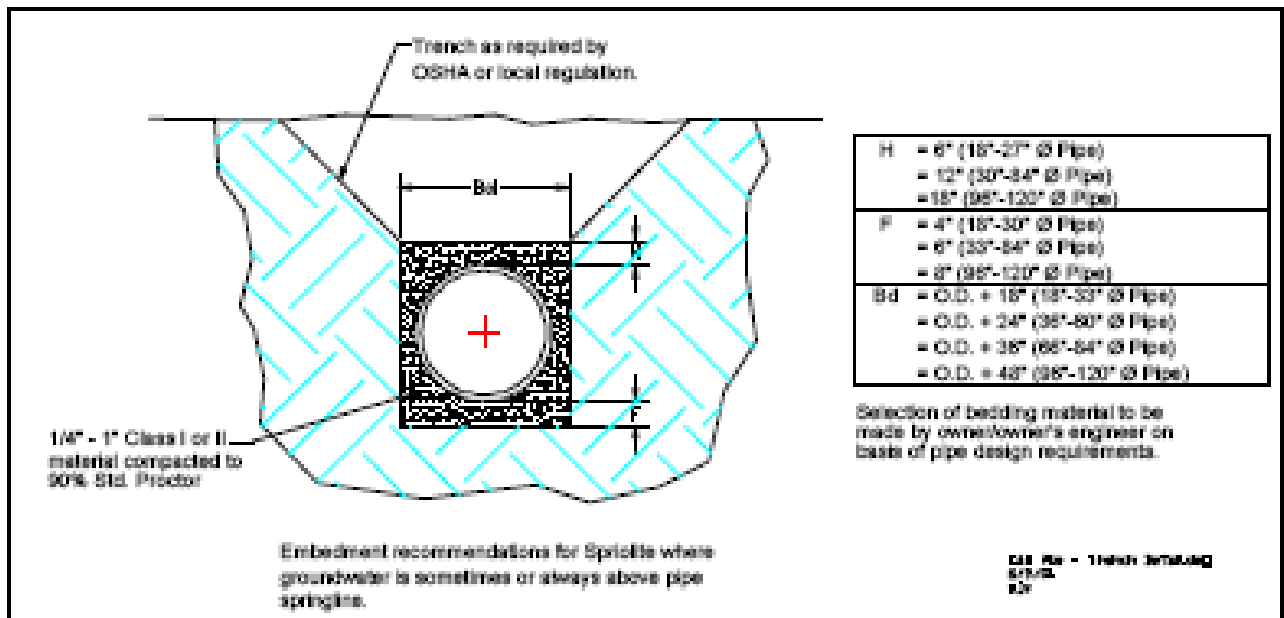


Figure 4.4.2 Wet Installation Bedding Requirements

4.5 Backfilling of trenches shall commence immediately after pipe is placed in the trench.

- 4.6 Shoring, sheeting, or trench shields shall be utilized in such a manner as to minimize disturbance of the backfill material beneath the pipe crown. Where moveable trench shields are used, steps shall be taken not to disturb the pipe embedment.
- 4.6.1 Pipe embedment shall be placed in lifts. Backfill material placed under the pipe haunches shall be thoroughly shovel sliced along the length of the pipe.
- 4.6.2 Where compaction of backfill materials is required, compact by mechanical means such as vibratory sleds, gasoline driven impact tampers, and air driven impact tampers, or other approved means. Compact to a minimum of 90% Standard Proctor or as required by the Engineer.
- 4.7 After completing backfill in the pipe zone, the trench shall be backfilled to grade with native soil. Where pipe is located beneath roads, compact backfill to a minimum of 95% Standard Proctor density. HDPE profile pipe shall not be subject to roller or wheel loads until a minimum of one diameter or 36" (whichever is larger) of backfill has been placed over the top of the pipe.
- 5 Inspections and Tests
- 5.1.1 The Contractor shall conduct leakage tests on the completed pipeline in accordance with either 5.1.2, Infiltration Leakage Inspection or 5.1.3, Exfiltration Leakage Testing. The allowable leakage shall not exceed 10 gallons per pipe diameter inch per mile per day. The Contractor shall furnish all supplies, materials, water (if required), labor, etc., needed to conduct leakage tests. Any leakage, including active seepage, shall be corrected where such leakage exists until the pipeline meets the requirements of this specification.
- 5.1.2 Infiltration Leakage Inspection: The pipeline shall be inspected for infiltration. Inspection may be made following a heavy rain or by flooding the area above the pipe so that water level is eighteen inches or more above the crown of the pipe or as instructed by the Engineer.
- 5.1.3 Exfiltration Leakage Testing: Pipelines shall be tested with low-pressure air in accordance with ASTM F 1417. The time in minutes that is required for the internal air pressure to drop from 3.5 psig to 2.5 psig shall be measured and the results compared with the values calculated in accordance with ASTM F1417, Appendix XI.
- 5.1.4 If any section fails the leakage test, the Contractor shall correct the deficiency and retest that section without additional cost to the Owner.
- 5.2 After completion of any section of the pipe, the grades, joints, and alignment shall be true to line and grade. There shall be no visual leakage and the odor control system shall be completely free from any cracks and from protruding joint materials, sand deposits, mortar, or other materials on the inside to the satisfaction of the Engineer.
- 5.3 Vertical pipe deflection after at least thirty days shall not exceed five percent of the base ID of the pipe per ASTM F894. Deflection shall be checked in accordance with the manufacturer's recommendations by pulling a mandrel through the line, or by measuring vertical inside diameter.
- 6 Cleaning
- 6.1 At the conclusion of the work, the pipeline shall be cleaned to remove all dirt, stones, pieces of wood, and other material that may have entered during the construction period. All debris and obstructions shall be removed.