

A-2000™ PVC Pipe for Sanitary Sewers



Engineered for Performance

Contech® Engineered Solutions' A-2000™ represents the leading edge in sanitary sewer pipe technology with an impressive record of field-proven performance. The latest in technology and engineering design has been coupled with time-proven materials and construction practices to increase overall system performance, while offering a more cost-effective solution.

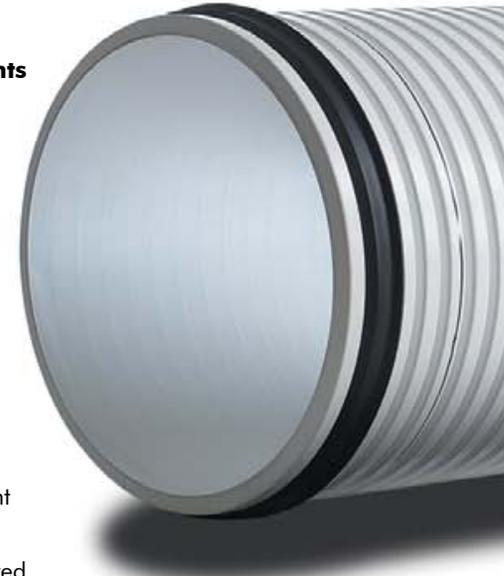
With millions of feet successfully installed, A-2000's superior strength, joint tightness and overall quality have made it a standard in the industry. More importantly, A-2000 has proven itself in a variety of applications, including sanitary sewers, storm sewers and subdrainage systems since 1984.

Patented gasketed joints

A-2000's tight, patented double-sealing gasketed joint contributes to the integrity of the complete sewer system. Joint tightness greatly exceeds the requirements of ASTM D3212. In fact, in joint deflection tests (as described by ASTM D3212), A-2000 stays tight under deflections as great as 40% (8 times the required 5% deflection of ASTM D3212).

A-2000 provides an extra measure of reliability, not only to meet installation tests, but also to provide continued watertight performance throughout the life of the system.

A-2000 gaskets meet the requirements of ASTM F477.



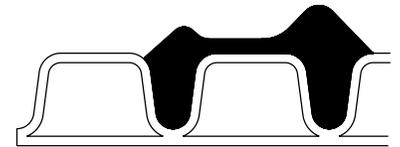
A Standard in the Industry

Engineered to withstand tough conditions

A-2000 is a seamless profile wall pipe extruded with a smooth interior and corrugated exterior. Made from polyvinyl chloride (PVC) compound, 12454, the most widely accepted sewer pipe material, A-2000 provides excellent durability and resistance to abrasion and scour. It withstands corrosive attack from both acidic and alkaline soils and is unaffected by chemicals found in normal sewage.

Engineered for gravity flow applications to installed depths exceeding 30 feet*, A-2000 should be specified whenever you consider using PVC sewer pipe. It has passed rigorous testing and meets the requirements of ASTM Specifications F949 and F794.

A-2000 pipe and fittings are available in 4" through 36" diameters. Standard lengths include 12-1/2' (4"-10" diameters), 14' (12"-36" diameters). A-2000 (12"-36" diameter) pipe is also available in 22' lengths.



The double gasket is fitted into the first two full corrugation valleys on the spigot end.



Field modifications with A-2000 are quick and easy. The annular (vs. spiral) corrugated exterior creates a cutting "guide" to provide even, square pipe cuts every time. A-2000 can be easily cut with a hand or power saw. No spigot end chamfering or beveling is required. No gaskets are wasted because they are easily removed and attached on the pipe spigot.

* Depending on specific job site conditions, A-2000 can and has been successfully installed deeper than 30 feet. Call your Contech Sales Representative for specific recommendations regarding design and installation.



Superior long-term performance

Unlike many PVC sewer pipes, A-2000 is manufactured from a low filler PVC compound. Using cell class 12454 compound (per ASTM D1784) with less than 5 pph (parts per hundred of PVC resin) calcium carbonate filler, A-2000 provides excellent long-term performance. The more than 30-year performance history of PVC sewer pipe has been based on low filler PVC compound 12454, much like that used in PVC water pressure pipes, which helps to ensure long-term strength properties and creep resistance.

Combining a quality PVC compound for long-term strength, a high pipe stiffness, a top-performing joint and a smooth-flowing interior, makes A-2000 an excellent choice for your sewer system, both initially and for years to come.

Excellent deflection control

A-2000 provides a minimum stiffness of 46 psi. When installed in accordance with ASTM D2321, A-2000 provides excellent shape control (performance). Its **seamless** design eliminates the possibility of seam separation (splitting) associated with helically wrapped thermoplastic pipe.

Superior hydraulics

Even though A-2000 and solid wall PVC pipes have an accepted Manning coefficient of 0.009, visual inspection illustrates A-2000's superior flow characteristics. Its smooth, glossy interior, coupled with joint and fitting designs that minimize the recess at the bell, help ensure uninterrupted flow. The smooth interior also provides better self-cleaning action, so there is less sliming and lower maintenance costs. The lower Manning coefficient of A-2000 can result in smaller diameters or flatter grades.



A-2000



Competitive PVC



Concrete

When compared with concrete, typical solid wall PVC pipe and other PVC profile wall pipe, you can see how A-2000's smooth, glossy interior provides superior flow and better self-cleaning action.

Economy

Engineered for efficiency and savings

A-2000 can reduce your costs three ways: initial purchase price, installation costs and maintenance costs.

The corrugated design of A-2000 is cost-efficient. It is engineered to provide long-term service and performance as well as potential material cost savings over other conventional sewer pipes.

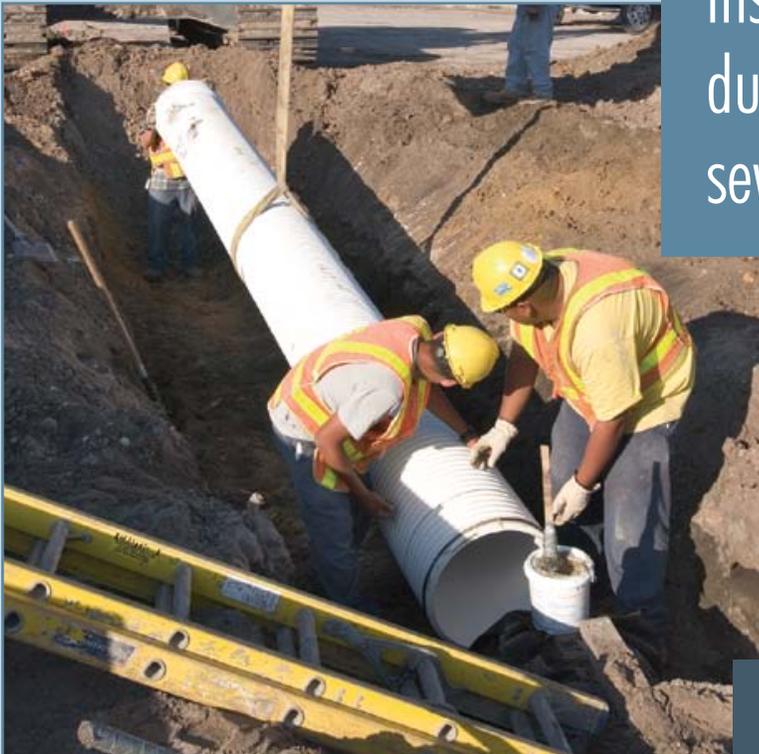
During installation A-2000 saves time with a combination of features that makes installation faster and easier. A lighter handling weight and easy-to-stab joint are just two of the many benefits. Field cuts are easily made and the spigot doesn't require field chamfering. With a gasketing system that is reusable, field cut sections aren't wasted. These benefits help keep projects on schedule. Plus, A-2000 is often laid with smaller than normal crews—a real savings!

After installation and testing, A-2000 continues to save money. Its smooth interior makes it easy to clean and reduces the possibility of stoppages. Superior joints and gaskets stay tight, controlling infiltration and root penetration. A-2000's low filler PVC compound also helps to ensure long-term strength and performance.



Contech's A-2000's light weight makes it easy to handle in the field.

A-2000 offers material and installation cost savings vs. ductile iron and solid wall sewer pipe systems



A-2000's unique gasketed joint design allows easier field assembly. Pipe diameters of 4"-18" can be joined by hand, without the use of mechanical equipment.

Compatibility

Compatible with your sewer system

A-2000 is manufactured to the exact dimensional requirements of ASTM F949 to ensure joint performance and system compatibility. Unlike some other profile wall sewer pipe specifications (i.e. ASTM F794 and F1803), ASTM F949 provides inside and outside diameter control, sealing, and bell and spigot depth dimensions. This is your assurance that all pipes manufactured to ASTM F949 are compatible—fittings fit, and jointing is ensured now and in the future.

A-2000 sewer systems are compatible with ASTM D3034 sewer pipe laterals. Mainline fittings are available with either A-2000 branch hubs or D3034 branch hubs. Either lateral system can be specified without requiring field-installed adapters.

A complete package of field repair items and saddle taps are provided. However, fast, permanent repairs can also be made using many materials typically used to repair ASTM D3034 pipe. Flexible rubber adapters are compatible to allow insertion of A-2000 or D3034 repair sections. Even saddle taps can be made using D3034 saddles with approved off-the-shelf adhesives or gaskets. For large diameters, Inserta Tees® are also suitable.

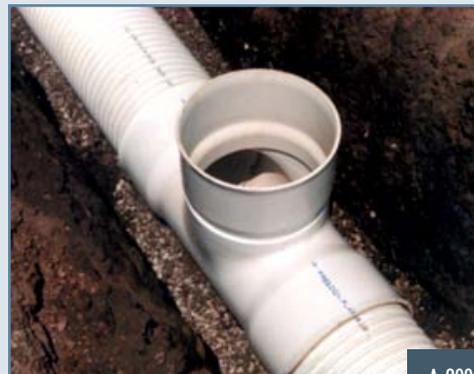
Maintenance crews don't need to inventory special repair items, and, since A-2000 provides the same inside diameters as ASTM D3034 (SDR 35) pipe, deflection testing can be accomplished using SDR 35 mandrels. Connections to DWV, clean-outs, etc., are made with the same type adapter as solid wall pipes. For special connections, adapters are available from Contech and several other standard sources.



Standard flexible rubber connectors are compatible to allow use of A-2000 or SDR 35 repair sections.



SDR 35 saddle on A-2000 pipe



A-2000 tee fitting

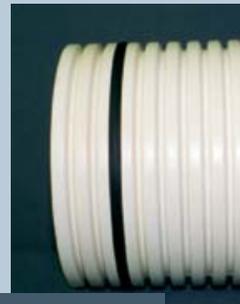
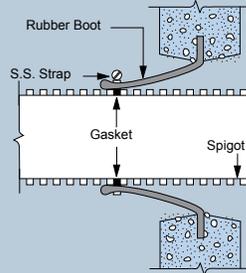
A-2000 is fully compatible with other solid wall PVC piping systems

Manhole Connections

Boot (i.e. Press Seal PSX or Press Boot)



Use a Contech manhole gasket for 12"-36" A-2000. For 8" - and 10" - diameter pipe, use a standard A-2000 double sealing gasket.



12"-36" manhole gasket

Nominal Diameter	Average Outside Diameter
4"	4.30"
6"	6.42"
8"	8.60"
10"	10.79"
12"	12.80"
15"	15.66"
18"	19.15"
21"*	22.59"
24"*	25.58"
30"*	32.15"
36"*	38.74"

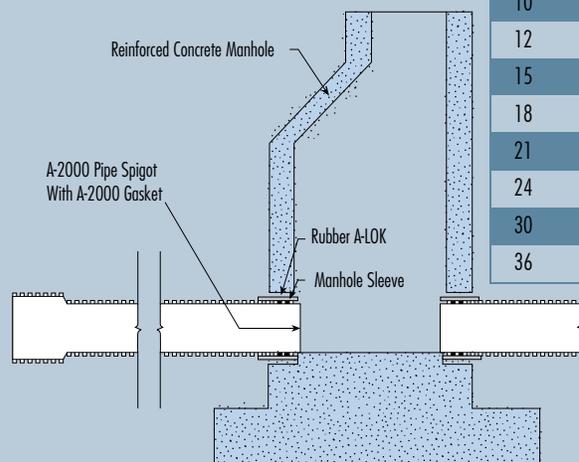
*For 21" diameter and larger pipe, the boot manufacturers recommend using two stainless steel clamp assemblies (with two screws per assembly) per boot. Clamps should be positioned evenly around the boot groove with the screws staggered so that the take-up pressure is equalized. Tighten screws of the outside clamp in an alternating pattern to the recommended torque on final screw. Check all screws again to ensure equal compression of both clamps.



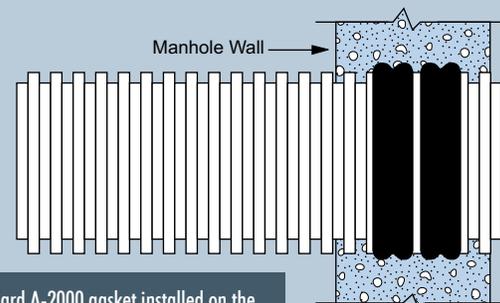
Where manholes are manufactured with A-LOK type connections, use a manhole sleeve with the recommended A-LOK ring number.

A-2000 Manhole Connector (Waterstop type)

Flexible manhole connections are recommended. For cast-in-place concrete bottoms, precast bottoms with "mouse hole" or similar pipe-to-manhole entry that does not incorporate a flexible connection, use two standard A-2000 double gaskets for 8" - and 10" - diameter pipe, positioned on the pipe in the center of the manhole wall with the leading (the lower) edge of the gaskets in adjacent corrugations, then concrete grout or seal the pipe/manhole connection as required. For pipe with diameters of 12" - 36" inches, use one standard A-2000 double gasket, positioned on the pipe in the center of the manhole wall, with the leading (lower) edge of the gasket closest to the inside of the manhole.



Dia.	A-LOK Ring No.
8	310
10	380
12	440
15	525
18	640
21	750
24	855
30	1100
36	1310



A standard A-2000 gasket installed on the spigot serves as a waterstop. Two gaskets are required for 8" - and 10" diameter pipe.

Additional A-2000 Products

A2™ Liner Pipe for rehabilitating aging structures

Using the proven double wall A-2000 design, Contech developed A2 Liner Pipe for sliplining deteriorating pipelines, eliminating the need for disruptive open trench replacement.

A2 Casing Liner Pipe for crossing under highways/railroads

Crossing under a highway or railroad is common with new sanitary or storm sewer construction. Typically, crossings are accomplished by boring and installing a casing pipe. The sewer (carrier) pipe is then installed inside the casing.

By using the “no-bell,” constant outside diameter design of A2 Liner Pipe for the carrier pipe, downsizing of the casing can result in a significant cost saving. In addition, A2 Liner Pipe can be supplied with runners (spacers) already attached, eliminating the need and cost to attach them in the field.

A-2000 perforated pipe for subdrainage systems

Contech A-2000 perforated pipe (4"-36" diameters) has several important features that make it the designer's first choice for subsurface drainage systems:

- 46 psi pipe stiffness for deflection control.
- Smooth interior for improved hydraulic capacity.
- Double wall design that provides essential beam strength for improved alignment and installation grade control.
- Positive gasketed jointing system.

A-2000 Drainage Pipe

Contech PVC double-wall pipe is the latest in drainage pipe technology and engineering design. A-2000 Drainage Pipe, available in 4"-36" diameters, combines the proven durability and corrosion resistance of PVC, plus a smoother interior for improved hydraulics, tight rubber gasketed joints, light weight, and long lengths (14' or 22') for easier handling and less costly installation.

Contech A-2000 Storm Sewer Pipe is manufactured per ASTM F949 and F794. When designed in accordance with AASHTO Section 18 methodology and using published 50-year PVC tensile strength values, maximum allowable heights of cover for A-2000 exceed 50' while minimum cover for highway loading (H20) is 12" with Class 1A embedment.

Contech products can solve most sewer or drainage problems. Their strength, durability and economy are proven with nearly a century of research and field performance.



A2 Liner Pipe



A-2000 Perforated Pipe



A-2000 Drainage Pipe



Guide Specification

PART 1 General:

1.01 PVC Profile Wall Sewer Pipe

This specification covers seamless PVC Corrugated Sewer Pipe with a smooth interior for sanitary and storm sewer applications.

1.02 References

- A. ASTM F949—Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings.
- B. ASTM D3212—Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- C. ASTM D1784—Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
- D. ASTM D2412—Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
- E. ASTM F477—Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- F. ASTM D2122—Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.

1.03 Specifications

The specifications contained herein govern, unless otherwise agreed upon between purchaser and manufacturer.

PART 2 Products

2.01 Materials

- A. PVC Compound: Pipe and fittings shall be made of PVC compound having a minimum cell classification of 12454 in accordance with ASTM D1784. Additional fillers (such as calcium carbonate for modulus enhancement) that lower the tensile strength of the compound and change the minimum cell classification shall not be allowed.
- B. Elastomeric Gaskets: Gaskets shall meet the requirements of ASTM F477 and be suitable for the service intended.

2.02 Manufacture and Construction

- A. Pipe: Pipe shall be manufactured as a single extrusion of the smooth inner and the corrugated outer walls. The corrugated exterior profile shall be annular and seamless.
- B. Joints: All pipe joints are of the bell spigot type and will be field connected. The joint shall utilize elastomeric sealing gasket with a double sealing surface design. The watertight joint shall meet the requirements of ASTM D3212.
- C. Fittings: Couplings, elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be molded or fabricated.

- D. Manufacturer: The acceptable manufacturer shall be Contech Engineered Solutions INC. or equal with at least 5 years of manufacturing experience.

2.03 Dimensions

- A. Diameters: The inside and outside diameters of the pipe barrel for 4"-36" nominal diameters shall be in accordance with ASTM F949 when measured in accordance with ASTM D2122.
- B. Lengths: Pipe shall be supplied in standard lengths of 12.5 for 4"-10" diameter and 14 or 22 feet for 12"-36".
- C. Wall Thickness: The minimum wall thickness shall be as stated in Table 1 of ASTM F949 when measured in accordance with ASTM D2122.
- D. Sockets: All socket (bell) dimensions on pipe and fittings shall meet the requirements given in Table 2 of ASTM F949 when measured in accordance with ASTM D2122.

2.04 Testing

- A. Pipes: Pipes shall be manufactured and tested in accordance with ASTM F949.
- B. Joints: Joints shall remain watertight when tested in accordance with ASTM D3212.
- C. Stiffness: The minimum pipe stiffness shall be 46 psi when tested in accordance with ASTM D2412.

2.05 Owner Inspection

- A. The owner or other designated representative shall be entitled to inspect pipes or witness the pipe manufacturing.

2.06 Packaging, Handling and Shipping

- A. Packaging, handling and shipping shall be performed in accordance with the manufacturer's instructions.

PART 3 Execution

3.01 Installation

- A. Bedding, backfill, and general installation requirements should comply with ASTM D2321. The manufacturer shall provide a booklet with detailed instructions on unloading, handling and installing pipe and fittings. Gaskets shall be shipped in a box to prevent damage from UV exposure and handling. Gaskets shall be placed on the spigot end and both spigot and bell ends must be free of debris prior to insertion. Lubricants supplied by the manufacturer will be liberally applied to both the gasket and the interior of the bell. The spigot end will be marked to ensure adequate joining is achieved.



Contech Engineered Solutions LLC is a leading provider of site solution products and services for the civil engineering industry. Contech's product portfolio includes bridges, drainage, retaining walls, sanitary sewer, stormwater, erosion control, soil stabilization and wastewater products.

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800.338.1122

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