HDPE
Drainage Products

ADS

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Advanced Drainage Systems

The science of materials engineering has totally changed the complexion of many Canadian industries. Nowhere is this more evident than in the construction market, where plastics are outperforming and outlasting traditional materials in a wide range of applications.

Without doubt, the workhorse of construction plastics is high-density polyethylene (HDPE). The company that has led the development of HDPE for drainage products is Advanced Drainage Systems, Inc., with a record of painstaking research and breakthrough applications dating back to the 1960s.

Today, more than ever, ADS pipe, fittings and structures are becoming one of the preferred products throughout the stormwater drainage industry. The distinctive green stripe on the pipe is your assurance of the best in quality and service from a leader in plastic drainage products.

Markets We Serve

HDPE drainage products are used in a wide variety of end-use applications:

- Storm and sanitary sewers
- Retention/detention systems
- Highway drainage
- Agriculture
- Recreation
- Mining
- Onsite wastewater treatment
- Landfills and waste management
- Residential drainage
- Timber

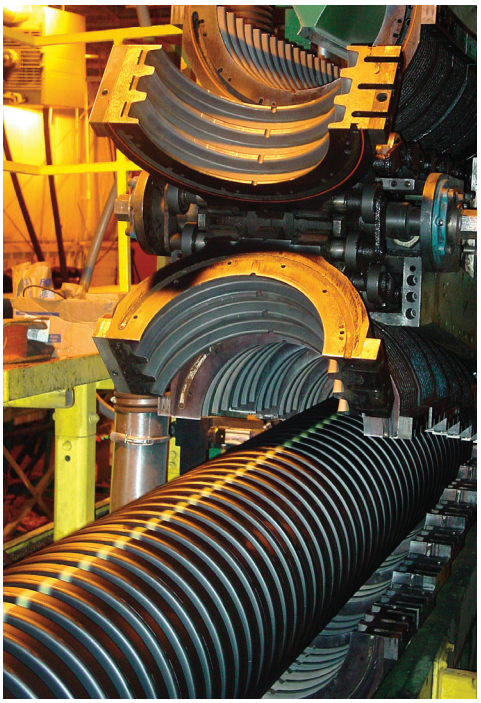
High Density Polyethylene: The Preferred Pipe Material

Pipe is generally divided into two categories: rigid and flexible. Rigid pipe is commonly defined as a pipe that does not deflect more than 2% without structural distress, and as such, it must be designed to carry the majority of the load directly. Examples are concrete, clay, and cast iron. Flexible pipe will accept at least 2% deflection without structural distress. Steel, aluminum and thermoplastics fall into this category. We can further divide flexible pipe into elastic materials represented by thermoplastic materials.

High density polyethylene drainage pipe has been in use since the 1950s. In this relatively brief period, HDPE has been the subject of exhaustive laboratory tests and field experiments. In real-world installations, the product has built an impressively successful record of trouble-free performance.

Today, we see an accelerating trend among construction engineers to replace steel and concrete piping with polyethylene because of its superior mechanical and chemical properties and cost-effective handling characteristics.

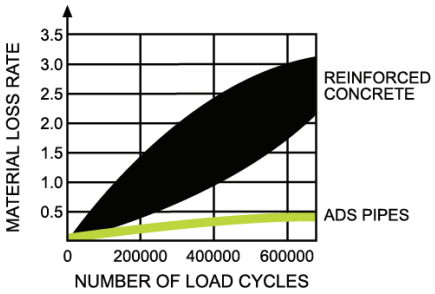
1. **Structural strength.** HDPE's toughness and flexibility enable it to withstand deep fill heights and extended live loads. ADS pipe is engineered to exceed all the AASHTO LRFD structural design requirements for earth and live loads. Tests at Utah State University show that heavy soil loads will fracture the wall of rigid pipe, but under identical conditions, will produce only moderate deflection in flexible polyethylene pipe. HDPE will not crack or break during proper installation, and maintains its impact strength at sub-zero temperatures.
2. **Abrasion resistance.** The chart to the right indicates that the material loss rate of HDPE is only 15% to 25% that of reinforced concrete under controlled experiments. Decades of in-situ testing and real-world installations have demonstrated polyethylene's interior toughness. It is used successfully with harsh mining and dredging slurries and is virtually immune to damage from even the most aggressive sewer cleaning tools.



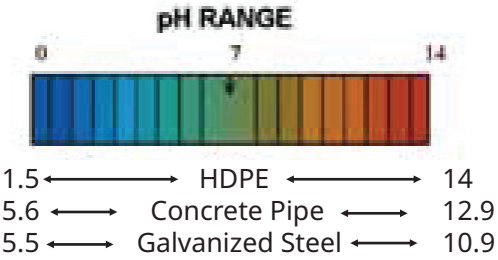
Additional Information Available

1. *ASTM D3350, standard Specification for Polyethylene Plastics Pipe and Fittings Materials*
2. *ADS Tech Note 4.01, Chemical Resistance of Polyethylene and Elastomers*
3. *ADS Water Management Drainage Handbook, Durability Section*
4. *"Practical Approach to the Study of Polyolefin Weatherability", R.J. Martinovich and G.R. Hill*

3. **Light weight.** Polyethylene weighs 50 to 75% less than comparable steel pipe and is about one-tenth the weight of concrete. This translates into easier handling, smaller work crews, reduced heavy equipment requirements, and improved safety.
4. **Chemically inert.** HDPE is highly resistant to corrosion and is immune to galvanic and electromechanical reaction. As seen in the diagram to the right, polyethylene can safely be used with soils or effluent with a pH range of 1.5 to 14.



Average Abrasion Values



Corrosion Resistance

HDPE Pipe Durability

HDPE pipe's durability is demonstrated by this highway cross drain installed in 1981 near an abandoned strip mine. The metal pipe used prior to this time had to be replaced every few years due to the highly acidic (pH range was between 2.5 to 4.0) and abrasive runoff from the mine To this day, the polyethylene cross drain shows no sign of needing replaced.

N-12 Smooth Interior Pipe

N-12 pipe has built an impressive service record in storm water and other drainage applications where hydraulics are important and durability is critical. The pipe is offered in diameters from 100-1500 mm (4”-60”) in 6 m (20’) lengths and also in 4 m (13’) lengths for smaller trench boxes.

Corrugated Exterior Adds Strength

The natural toughness of HDPE is enhanced by the corrugated exterior which increases the structural strength of N-12 pipe. It is designed for use under both CL-625 and E-80 live loads. Fill height tables are available in the ADS Water Management Drainage Handbook. Field research done in Ohio and Pennsylvania has placed HDPE pipe under 12 m (40’) and even 30 m (100’) of fill. Even under some harsh backfill conditions, N-12 pipe has continued to give outstanding performance.

Smooth Interior Provides Superior Flow

In order to meet the most demanding hydraulic requirements, N-12 pipe is manufactured with a smooth inner wall. This design insures maximum flow capacity, and HDPE’s resistance to abrasion and corrosion will sustain this capacity for years into the future. With a recommended 0.012 rating, the pipe is ideal for applications requiring low Manning’s “n” values.

Convenience on the Jobsite

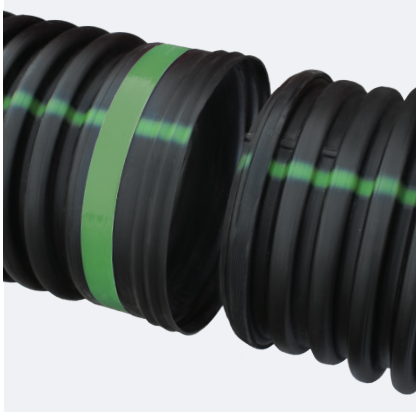
N-12 pipe’s light weight leads to a number of job site economies: more pipe per delivery truck, easier handling, smaller crews, less heavy equipment, less pipe damage, and better safety. The pipe cuts easily and requires no beveling for joining.

Additional Information Available

1. *CSA B182.8 Pipe*
2. *CSA B182.11 Installation*
3. *BNQ 3624-120 Pipe*
4. *BNQ 1809-300 Installation*
5. *ASTM Installation Specification D2321*
6. *ASTM Gasket Specification F477*
7. *ASTM Joint Specification D3212*
8. *AASHTO Pipe Specification M252*
9. *AASHTO Pipe Specification M294*
10. *ADS Water Management Drainage Handbook, Structures Section*
11. *ADS Tech Note 1.01, dual wall HDPE Perforation Patterns*
12. *ADS Water Management Drainage Handbook, Retention/Detention Section*
13. *Ohio University Deep Burial Study*
14. *PennDOT Deep Burial Study*

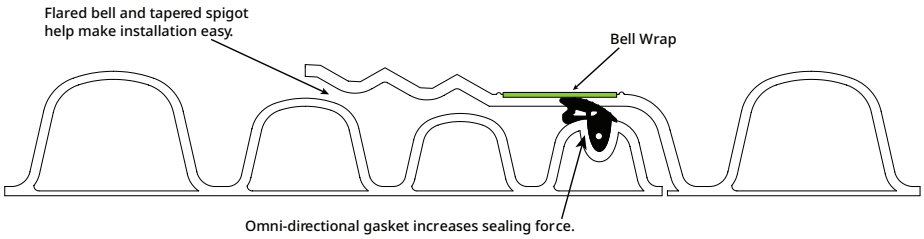
Watertight System

In the early 1990s, ADS pioneered the watertight joint for corrugated polyethylene pipe. Continuing development has resulted in today's N-12 WT IB pipe with a superior built-in bell-and-spigot joint. The design is based on the flared bell and tapered spigot of N-12 ST IB pipe, with important differences. A patented gasket meeting ASTM F477 is factory installed into the spigot, increasing its sealing force as hydrostatic pressure increases. An exterior bell wrap provides a quick visual indicator to customers and inspectors that a watertight product is being used.



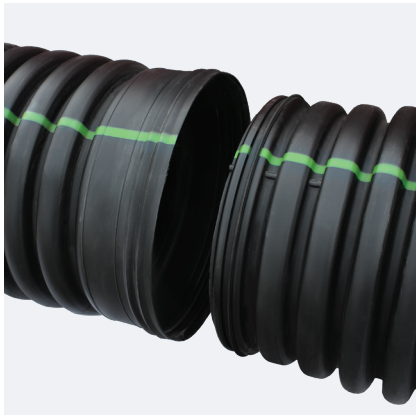
N-12 WT IB

N-12 WT IB Watertight Joint



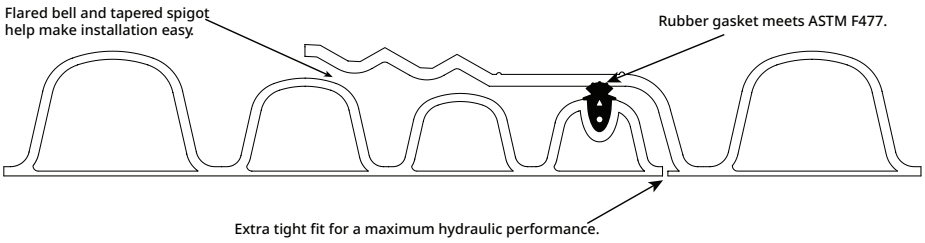
Soil-Tight System

Continuing its commitment to investment in new technologies, ADS has developed polyethylene pipe joining systems unparalleled in the corrugated pipe industry. Today's N-12 pipe provides unsurpassed joint integrity with built-in bell joints and fast push-together installation.



N-12 ST IB

N-12 ST IB Soil-Tight Joint



Single Wall Pipe

ADS single wall corrugated HDPE pipe is ideal for drainage projects where flexibility, light weight, and low cost are important. It is available in 75-375 mm (3”-15”) diameters. Single wall pipe is sold in coils for agriculture applications up to 375 mm (15”) diameter.

Multiple Drainage Applications

ADS pipe has been used for decades on farms, golf courses, parks and playing fields to keep surfaces dry by channeling away excess underground moisture. Homeowners find it to be an economical, easy-to-install solution to all kinds of residential drainage problems: downspout runoffs, foundation and window well drains, driveway culverts, and wet spots on the lawn. ADS single wall pipe is also used for highway edge drains and other construction applications where efficient installation and durability are important.

Perforated and Non-Perforated

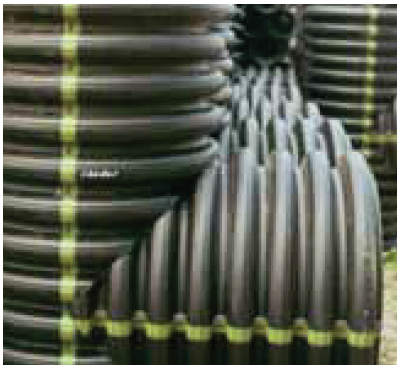
For subsurface water movement or leaching action, ADS pipe is offered with uniform slots and drilled holes. Non-perforated pipe is available when water must be moved by gravity flow from one point to another.

Additional Information Available

1. *Pipe Specification BNQ 3624-110*
2. *Pipe Specification BNQ 3624-115*
3. *ASTM Pipe Specification F405*
4. *ASTM Installation Specification F667*
5. *ASTM Installation Specification F449*
6. *ASTM Installation Specification D2321*
7. *AASHTO Pipe Specification M252*
8. *AASHTO Pipe Specification M294*
9. *ADS Water Management Drainage Handbook, Specification Section*
10. *ADS Tech Note 1.02, single wall HDPE Perforation Patterns*

Couplings and Fittings

ADS offers the industry's most complete selection of joining systems for gravity-flow pipe. Our fittings are available in both singlewall and N-12 dual wall categories.

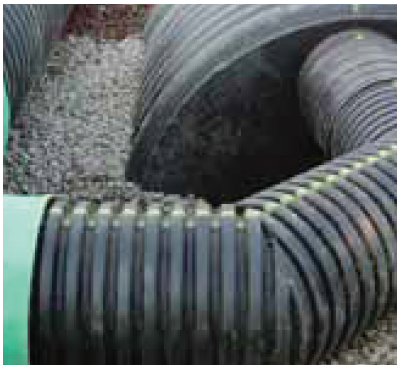


Standard Drainage Couplers and Fittings

ADS single wall fitings are made of high-density polyethylene materials and are most commonly used in residential, commercial and agricultural applications. N-12 dual wall fittings, with their smooth interior walls, offer exceptional hydraulics and strength. N-12 dual wall fittings are available in soil-tight and water-tight options.

Small Diameter N-12 Fittings

ADS offers a full complement of injection molded fittings in 100-300 mm (4"-12") sizes. These fittings are available in both watertight models, which include an F477 gasket for attaching to the spigot end of the pipe and soil-tight styles with cleats in the bells of the fittings. Item selection includes couplers, reducing couplers, tees, wyes, sweeping tees, 45° elbows, and 90° elbows.



The addition of these fittings results in an all HDPE watertight or soil-tight piping system from 100-1500 mm (4"-60") diameters. There is no need to switch to SDR-35 PVC pipe in sizes under 375 mm (15"), particularly since polyethylene offers several significant benefits over PVC.

Linear Drains

Duraslot and Duraslot XL linear drains are designed to remove sheet flow as it flows across paved or cleared areas or as it collects in low spots. A heavy duty aluminum slot is mounted on top of N-12 corrugated polyethylene pipe to provide lightweight, corrosion-resistant performance.

Duraslot linear drains cost less than other systems, which can support vehicular traffic and is easy to install. Three meter (10') lengths can be handled without heavy machinery and are quickly set in place.

Pipe diameters range from 100-900 mm (4"-36") and are complemented by a complete line of fabricated fittings. Slots are available in 60 mm (2.5") or 150 mm (6") height slots with neutral slope, or variable height slots with custom slopes to meet project needs.

StormTech Chambers

StormTech has thousands of chamber systems in service throughout the world. All StormTech chambers are designed to meet the most stringent industry performance standards for superior structural integrity. The StormTech system is designed primarily to be used under parking lots, roadways and heavy earth loads, which saves valuable land and protects water resources for commercial and municipal applications. In our continuing desire to answer designers' challenges, StormTech has expanded the family of products providing engineers, developers, regulators, and contractors with additional site specific flexibility.

Advanced Performance for Greater Long-Term Reliability

StormTech developed a state of the art chamber design through:

1. Collaboration with world-renowned experts of buried drainage structures to develop and evaluate the structural testing program and product design
2. Designing chambers to exceed AASHTO LRFD design specifications for CL-625 (HS-20) live loads and deep burial earth loads
3. Subjecting the chambers to rigorous full scale testing under severe loading conditions to verify the AASHTO safety factors for live load and deep burial applications
4. Designing chambers to conform to the product requirements of CSA B184.2 and ASTM F2418 (polypropylene chambers) and CSA B184.1 and ASTM F2922 (polyethylene chambers); design requirements of CSA B184.0 and ASTM F2787 ensuring both the assurance of product quality and safe structural design

What StormTech Chambers Can Provide

- Large capacity that fits very tight footprints
- A proven attenuation solution
- The robust continuous true elliptical arch design
- Polypropylene and polyethylene resins tested using ASTM standards
- Injection molded
- Third party tested and patented StormTech Isolator® Row PLUS
- Incorporates traditional manifold/header designs
- Open chamber design

StormTech Chamber Options

StormTech offers a variety of chamber sizes so the consulting design engineer can choose the chamber that is best suited for the site conditions and regulatory requirements. We provide plan layout and cost estimate services at no charge for consulting engineers and developers. We also have a StormTech designtool to help with layouts at adspipe.com/stormtech/design-tool.

Onsite Septic

Arc® Leaching Chambers

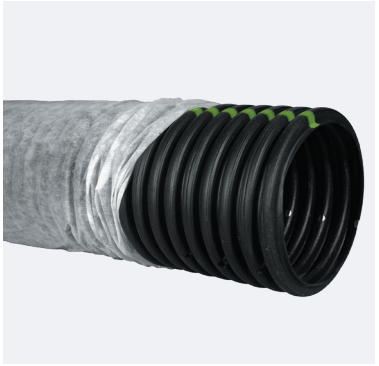
Easy-to-install, injection-molded plastic leaching chambers feature a true corrugated design for unmatched load-bearing strength and the largest open bottom and louvered infiltrative surface area of any chamber. The chambers feature a 20° integral articulating joint ideal for either straight or contoured leach field applications. Chambers will accommodate both gravity-fed and pressure-dosed systems. The design incorporates a modified post-and-dome engagement mechanism for added strength at critical joint connections, a universal inlet/outlet end cap, and inspection vent ports on every unit with easy-to-remove knockouts. Convenient 1.5 m (5’) lengths are easy to handle and units are quickly installed by one person into trench or bed applications.

Leaching Chambers

SB2® Gravel-Less Leach Bed Pipe

In many areas, the SB2 system can be a cost-effective alternative to conventional leach beds. The product consists of 200 mm (8”) or 250 mm (10”) single wall corrugated polyethylene pipe with specially located perforations wrapped with non-woven geotextiles.

The outside diameters of the pipe provide an equivalent of 0.18-0.27 m^2 (2-3 ft^2) of soil absorption area per lineal foot. The location of the drain holes (60° off the bottom center line) provides added sludge storage capacity, which increases retention time. The protective wrap is sonically welded to the tubing and allows free passage of effluent to the soil while limiting soil particle infiltration.



SB2 Gravel-Less Pipe

ADS 3000 Triple Wall® Pipe

Using state-of-the-art extrusion technology, this three-layer HDPE pipe has unprecedented beam strength, far exceeding the stiffness requirements of ASTM F810. A co-extruded smooth inner wall and corrugated center section is covered by an extrusion-laminated white outer wall. A deep bell coupling is spun-welded to the pipe and is designed to fit all standard 100 mm (4”) sewer and drain fittings. Triple Wall pipe’s exceptional stiffness permits assembly on work stands and its light weight allows for one-man installation. It is produced in 100 mm (4”) diameters in 3 m (10’) lengths, either solid or with standard 16 mm (⅝”) perforations set 120° apart.

ADS 300 Triplewall Pipe

Septic Stack

Available in configurations of 9, 11, and 13 pipes, Septic Stack units allow for exceptional soil contact without the use of gravel. The Septic Stack units function as a trickle filter, dispersing effluent into the voids in and around the specially-banded ADS pipe. This pipe is engineered with holes and slots, allowing it to collect and disperse the effluent as it passes over the pipe’s corrugations. ADS Septic Stack Systems are available for use in both residential and commercial applications. Contact your local Health Department or County Sanitarian for information on which sizes meet your provincial and local requirements.

Septic Stack

Water Quality Units

ADS underground Water Quality Units have become an increasingly efficient solution for treating storm water. These durble, lightweight structures have been specifically designed for fast installation and easy maintenance.

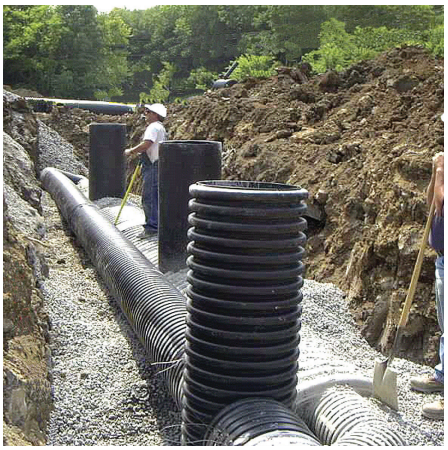
Water Quality Units are designed to manage the quality of water discharged during a storm by removing sediments and hydrocarbons. A typical design involves an underground pipe assembly using weir plates and velocity control devices to separate out suspended pollutants. The system features access risers for easy cleaning and maintenance and a bypass system to prevent re-suspension of captured pollutants by storms greater than the first flush.

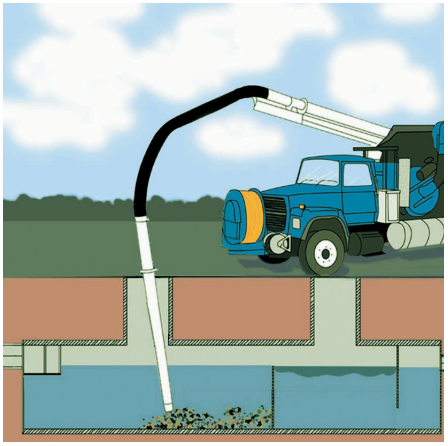
Proven Effectiveness

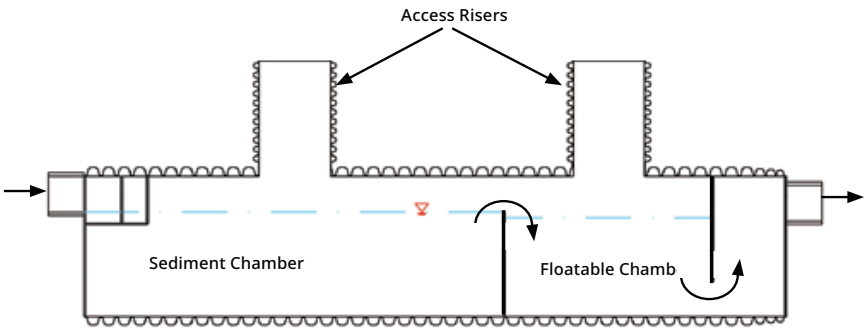
Field and laboratory tests have consistently verified the performance of ADS Water Quality Units.

- Installed units in Davidson County, Tennessee, showed a mean TSS removal efficiency of 91.4%
- Sediment removal lab tests in Massachusetts at varying flow rates yielded efficiencies from 81.9% to 90.3%
- Oil capture was measured by an independent laboratory under a range of flow volumes. The mean capture rate was 79.8%

Complete test reports are available from ADS.





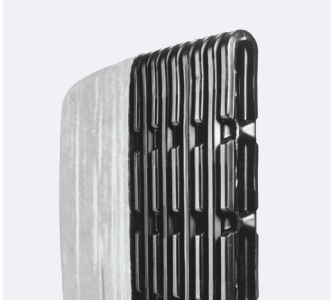


Additional Information Available

1. *ADS Tech Note 1.03, Storm Water Quality Unit EPA Phase II, Best Management Practices*
2. *ADS Tech Note 1.04, "Testing of Storm Water Quality Units"*
3. *ADS Installation Guide, IG 2.01, WQU Installation Guide*
4. *ADS Installation Guide, IG 2.02, WQU Inspection and Maintenance*

AdvanEdge Pipe

AdvanEdge is a panel-shaped pipe in 300 mm (12”) height and in coils up to 30 m (100’). The primary benefit of its panel design is quick drainage response after introduction of water, making it ideal for time-critical applications such as high-traffic road and track beds. Other uses include building foundation drainage, golf courses, airports, athletic fields, runways, railroad track ballast, and perimeter “curtain” drainage for landfills and leaching fields.



Designed with a Difference

Competitive panel shape products depend on the tensile modulus of a geotextile wrap to maintain an open-flow channel. When this low-modulus fabric collapses, the waterway is obstructed reducing its hydraulic efficiency.

AdvanEdge pipe does not rely on the geotextile for structural support. Its strength is derived from a corrugated cylinder maintained by pillars located strategically throughout the core. The result is a series of oval-shaped sections with all-direction strength. This completely enclosed waterway with fewer projections allows AdvanEdge to function as a pipe, discharging more water to the outlet.

ADS Polyflex Pipe

ADS PolyFlex pipes are a leader in today’s water markets. The high-density polyethylene pipe is distinguished from the competition by its flexibility, light weight and durability.

Potable Water Service Pipe (IPS)

ADS PolyFlex Potable Grade (IPS) pipe is certified to meet NSF 14/61 standard. Potable grade is available in diameters between 13-50 mm (½”-2”), with kPa ranging from 551-1379 kPa (80-200 psi) and in various lengths. Applications include, well/pump systems, residential and commercial service and irrigation systems.

Water Service Tubing (CTS)

ADS PolyFlex Water Service Tubing (CTS) pipe is certified to meet NSF 14/61 standard and material conforms to ASTM D3350 requirements. Potable grade is available in diameters between 19-50 (¾”-2”), with a kPa of 1379 (200 psi) and in various lengths. Applications include residential and commercial service, municipal service lines, well/pump systems and farm/ranch systems.

Irrigation Service Pipe

ADS PolyFlex Utility Grade pipe is available in diameters between 13-50 mm (½”-2”), with kPa ranging from 551-862 (80-125 psi) and in various lengths. Applications include agriculture, irrigations systems and home and commercial systems.

Geosynthetics

Geotextiles

Woven and non-woven geotextiles offer a range of styles to fit a variety of subsurface construction applications. Durably constructed of polypropylene, these geotextiles provide permanent, cost-efficient solutions that are completely environmentally compatible. These fabrics are resistant to naturally encountered chemicals, alkalies, acids, and biological degradation and will meet or exceed AASHTO M288 specifications.

Geogrids

ADS BX geogrids are a punched and drawn polypropylene product used in road reinforcement to increase life and reduce maintenance costs. The full line of biaxial geogrids offer high flexural rigidity and high-tensile strength at ribs and junctions.

The biaxial geogrids offer improved roadway solutions based on time-tested design principles. Through confinement, geogrids add strength and stability to the soil layers via confinement of the soil particles. Whether paved or unpaved, biaxial geogrids provide two unique, yet related functions of soil stabilization and base reinforcement.

Erosion Control Mats

ADS offers a complete selection of both degradable and long-term non-degradable erosion control products designed to handle many storm water, drainage or erosion prevention applications. These products can be used to establish vegetation and prevent soil erosion on slopes, storm water channels, stream banks, shorelines and even around pipe inlets/outlets. The long-term products can also be used to replace rock rip-rap or concrete channel linings.

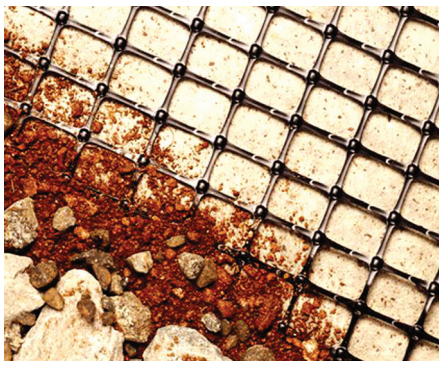
Silt Fences

Used to contain sediment runoff from construction borders and newly graded slopes, silt fence is available in 30 m (100') rolls with pre-assembled hardwood stakes and a choice of fabrics and other options.

Filter Fabric Wraps

Extra-strong synthetic materials are used with perforated drainage pipe to prevent infiltration of fine soil particles while allowing water to flow freely.

1. **Drain Guard®.** Designed for normal handling conditions, Drain Guard is a spunbound nylon wrap with a unique bonding process that provide ultraporous filtration while restraining and stabilizing sandy/silty soils.
2. **ADS Sock.** This is a machine knitted polyester drain envelope that stretches to fit snugly over the pipe. It has extra toughness and flexibility to withstand unusually rough installation and handling conditions.



Additional Information Available

1. *AASHTO M288-90, "Standard Specification for Geotextiles"*
2. *ADS Brochure #10473 "ADS Geotextile Products"*
3. *ADS Brochure #10851 "ADS Geosynthetics Biaxial Geogrids"*
4. *ADS Brochure #10506 "Erosion Control Mats"*

HDPE Product Accessories

Inserta Tee

Inserta Tee is a three-piece service connection consisting of a PVC Hub, Rubber Sleeve and Stainless Steel Band. Inserta Tee is compression fit into the cored wall of a mainline and requires no special tooling. They are designed to connect 50-600 mm (2”-24”) laterals to all known solid wall, profile, closed profile, corrugated pipe and manhole structures manufactured today.

Using an Inserta Tee for a new or rehab installation allows: reduction in labor and materials, easier grading of mainline, and matching of the internal radius of your pipe or structure for minimal penetration.

Inserta Tee’s traditional lateral connection can be customized for your project needs, ideal for sanitary sewer applications.

Inserta Tee’s Multifits are made for a specific lateral connection and fits a size range of a specific mainline type.

Inserta Tee’s OneFit is an adjustable rubber sleeve that will connect to any mainline pipe type. With far fewer part numbers, local stocking is a breeze. Just pick the type of outlet you need, choose your mainline size range, and you’re ready to go. Inserta Tee OneFit is ideal for stormwater applications.

Applications for Inserta Tee include:

- Storm Sewers
- Roof Drains
- Catch Basin
- Manholes
- Drainage
- Wet Wells
- Sanitary
- Sliplining
- Cured-In-Place Products
- Pipe Bursting
- Irrigation
- Electrical Vaults

HDPE Product Accessories

Nyloplast Surface Drainage Products

Nyloplast engineered drainage structures combine performance proven ductile iron grates with rugged heavy-duty PVC bodies to offer a superior alternative to traditional costly and cumbersome concrete structures. The complete line includes inline drains, drain basins, curb inlet structures, road and highway structures, and various other structure types ranging from 200-900 mm (8”-36”).

All Nyloplast structures are customized to site-specific requirements and their inlet and outlet adapters meet a wide variety of joint tightness requirements, including watertight when correctly installed. The structures are used in commercial and municipal site development, rehabilitation and remediation projects, along with landscaping and recreational applications.

Nyloplast engineered structures are delivered ready to install. No field fabrication or other job site work such as concrete grouting or brick and mortar is required.

Nyloplast Structures

Nyloplast Universal Inline

The Universal Inline, which connects to round, dome and square grates of various designs, comes standard with a 150 mm (6”) hole designed to match the grate inlet capacity and allowing the end user to install without any additional effort. The universal inline can be adjusted on site and connects with all commonly used types of plastic pipes up to 300 mm (12”) diameter.

Nyloplast Inline Drains

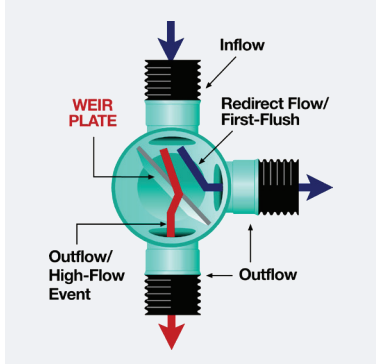
Envirohood™

The Nyloplast EnviroHood is attached to the inside of a catch basin or manhole and is designed to prevent the outflow of floating debris and oil. The EnviroHood helps to improve overall water quality and offers lower installed costs and less intrusive installations than competitive devices. The EnviroHood is easy to clean and highly corrosion resistant for long service life.

Envirohood

Weir Structure

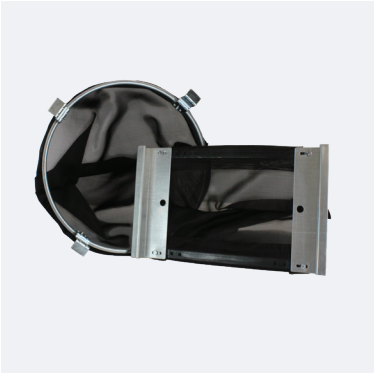
The Weir Structure is a Nyloplast catch basin with a panel or plate device secured inside the structure that is designed to divert inflowing water to a preferred outlet or to regulate the outflow of water from the drainage system.



Weir Structure

FlexStorm Inlet Filters

Provinces across the country now have a universal structural BMP to address the issue of storm sewer inlet protection. The FlexStorm system is inexpensive, configurable and offers more versatility to fit the wide array of drainage structures throughout Canada. The FlexStorm Inlet Filters offer various levels of filtration.



FlexStorm Applications

- Highway and road construction
- Commercial and parking lots
- Residential developments
- Industrial and maintenance

FlexStorm Features

- **Configurable:** Steel frames configure to fit any storm drainage structure.
- **Reusable:** Geotextile sediment bags designed for construction or post-construction applications.
- **Affordable:** Low per-unit cost. Easily installed and maintained with one worker, without additional equipment.
- **Effective:** Works below grade. Built in bypass and overflow feature allows streets to drain with full bag to prevent ponding.

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800-821-6710