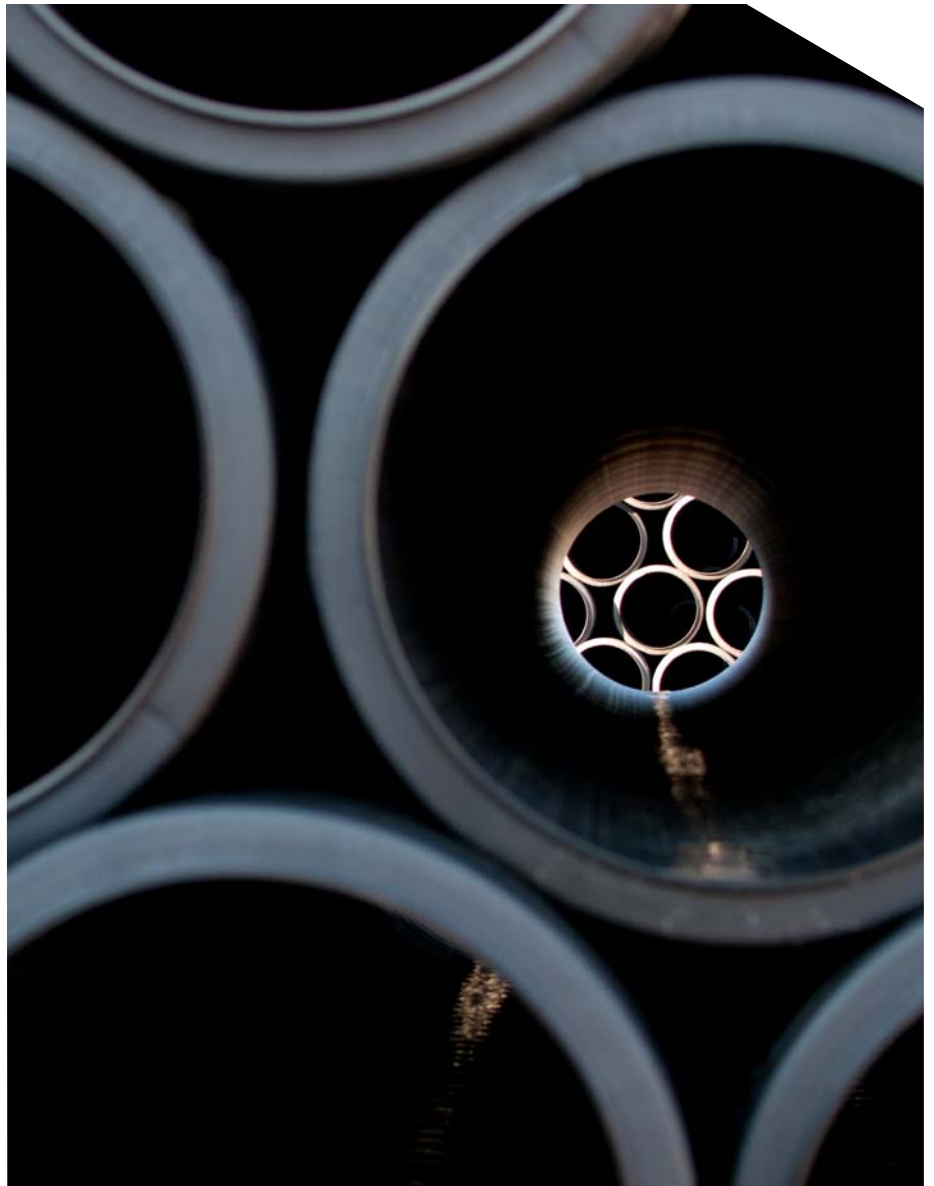


DRAINAGE SOLUTIONS AND WATER TREATMENT /

HDPE PIPE (BOSS) PRODUCT GUIDE

PROVEN PERFORMER
IN MUNICIPAL, INDUSTRIAL
AND FORESTRY
PIPE APPLICATIONS

Fast installation
Flexible
Lightweight
Strong and durable
Quick on-site cutting



High density polyethylene (HDPE) BOSS pipe is a proven performer in the municipal, industrial and forestry pipe markets. Engineered for gravity flow systems, a wide range of BOSS pipe designs are available to meet specific standard and project requirements. The performance advantages of HDPE include:

Strength

The corrugated exterior provides this product with an inherent minimum pipe stiffness of 320kPa or 210kPa

The smooth inner wall provides longitudinal stiffness, which enables alignment and grade maintenance in the trench during installation

Impact resistant

With ease, BOSS pipe takes the knocks and bumps of handling, moving and installation, due to the combination of non-brittle HDPE and a unique corrugated exterior

This also allows BOSS pipe to sustain impact in both warm weather usage and cold weather installations

UV resistant

Pipe contains a minimum of two per cent carbon black additive to protect the product from ultraviolet light

The additive gives BOSS pipe maximum weather resistance in applications where there is expected to be continuous elemental exposure

Abrasion resistant

Abrasion is the wearing down of a pipe material's surface, caused by an abrasive bed load (gravel, rock or sharp stones) carried by the flow

Tests indicate that HDPE pipe is highly resistant to abrasion, with a significant advantage over other pipe materials in both acidic and abrasive environments

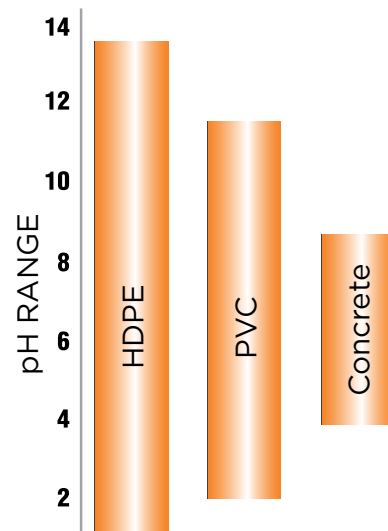
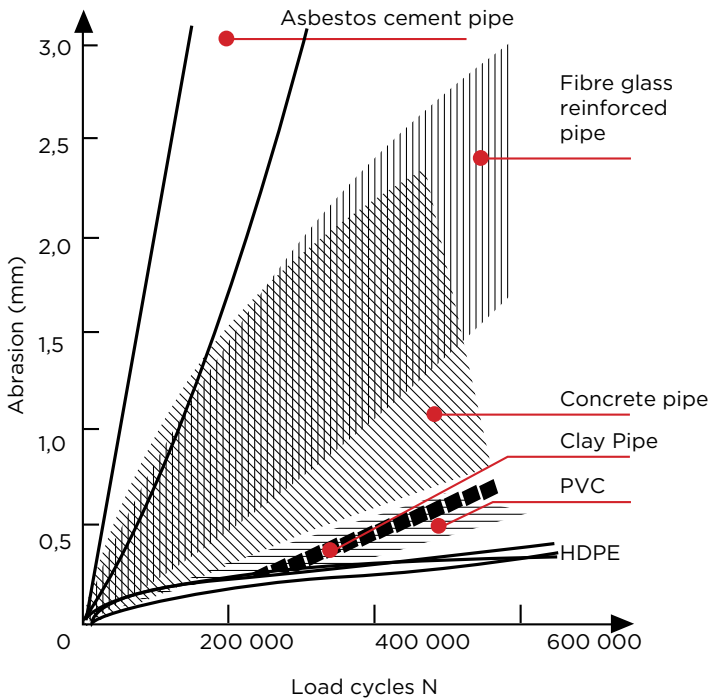
TYPICAL APPLICATIONS

- Road culverts
- Storm sewers
- Stormwater detention systems
- Structure relines

Chemical resistant

HDPE has the highest level of chemical resistance of all traditional sewer product chemical conditions

BOSS pipe brings the gravity flow sewer market the same exceptional performance that HDPE has exhibited in other applications—remaining tough and resistant under conditions that could seriously damage pipe made of other conventional materials



HDPE material provides excellent resistance to both acidic and alkaline environments with strong acids through all bases, pH 1.25 to 14

ADVANTAGES FOR THE CONTRACTOR

The design and construction of BOSS products offers a distinct weight advantage over conventional sewer pipe. They provide ease of handling, positioning, installing and connecting that conventional pipes can not match.

At less than 10% the weight of concrete pipe throughout the full range of products, BOSS pipe affords the contractor these important benefits:

Savings on installation

BOSS pipe's weight requires less manpower and lighter machinery to transport, handle and connect it

Fittings and accessories

BOSS pipe comes complete with a full range of fittings—both moulded and adaptive are available, as well as an extensive selection of made-to-order fabricated fittings to suit special project needs

Faster installation

Standard lengths (6m) are easy to handle and installed using minimal equipment

Comparative production rate monitoring shows that BOSS pipe is installed nearly 25% faster than the same diameter concrete pipe

Quick on-site cutting

BOSS pipe can be trimmed to length in seconds, using cutting tools found on most municipal construction sites

Safer handling

At less than 10% the weight per metre compared to concrete pipe, BOSS pipe provides both the handler and the installer with a big safety advantage

Impact toughness

BOSS pipe is highly resistant to the rigors of installation handling in Canada's tough environment

BOSS pipe can be installed with confidence in the hottest of summer or the coldest of winter conditions



BOSS 2000 - VARIOUS SIZES TO ACCOMODATE ALMOST ANY PROJECT



BOSS 2000 - DETAIL OF 300MM

INSTALLATION GUIDELINES

The key to the successful installation of BOSS pipe is the achievement of stable and permanent support through the selection and compaction of proper embedment materials.

Complete guidelines and procedures can be found in "Recommended Practice for Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings" under CSA B182.11.

1. Foundation preparation

The pipe must rest on a smooth, stable foundation, free of rocks and clumps

2. Bedding

Bedding should consist of compacted well-graded granular material, levelled to the proper grade

3. Haunching

Haunching should be the same material as bedding, placed and compacted in successive lifts of 150mm, up to the springline of the pipe

Compact to 95% Standard Proctor Density

4. Initial backfill

Backfill should be the same material as for haunching, extending from the springline to 300mm above pipe crown

For pipe diameters less than 300mm, this dimension may be reduced to one pipe diameter, but not less than 150mm

Compact to 95% Standard Proctor Density

5. Final backfill

Select native materials may be used, depending on the application

Do not place large rocks or clumps within 600mm of pipe



BACKFILLING BOSS 2000



COMPACTOR PREPARING THE SOIL FOR HDPE PIPE INSTALLATION



LOWERING HDPE PIPE INTO PLACE

HEIGHT-OF-COVER TABLE

Minimum / Maximum

Nominal Diameter	Minimum Cover CL-625 ¹ or HS-25 ¹	Minimum Cover E-80 ³	Maximum Cover 320kPa Pipe Stiffness ⁴	Maximum Cover 210kPa Pipe Stiffness ⁴
mm	mm	mm	mm	mm
100	300	600	11,900	9,000
150	300	600	11,900	9,000
200	300	600	11,900	9,000
250	300	600	11,600	9,000
300	300	600	10,600	9,500
375	300	600	10,600	9,500
450	300	600	11,900	9,100
525	300	600	11,000	9,500
600	300	600	11,300	10,700
750	300	600	14,100	10,700
900	300	600	14,100	10,700

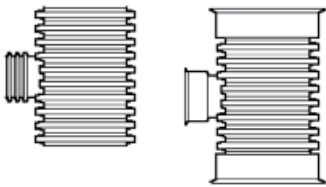
NOTE

1. CL-625 is CSA S6 Truck Loading
2. HS-25 is AAHSTO HS-25 Truck Loading
3. Cooper E-80 Railway Loading
4. Empirical evidence suggests that maximum cover shown above may be very conservative. Reference: "Performance of High Density Polyethylene Pipe Under High Fill" by Daniel Adams, Tennyson Muindi and Ernest Selig, Department of Civil Engineering, University of Massachusetts, April 1988

EASY TO USE FITTINGS

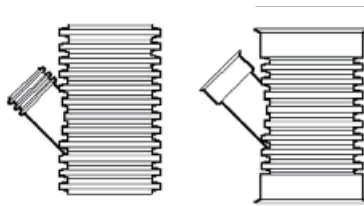
Tees

Plain End Belled



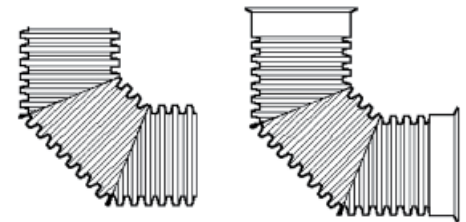
45° Y

Plain End Belled



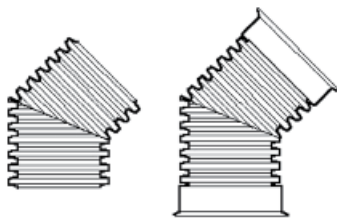
90° Elbow

Plain End Belled



45° Elbow

Plain End Belled



Reducers

Eccentric Concentric



JOINING SYSTEMS

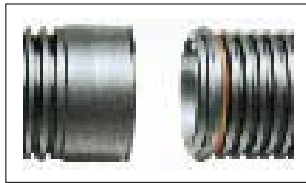
Water Tight

Ultra Stab® 75 (CSA B182.8)

The coupler incorporates a Styrene-Butadiene Rubber (SBR) gasket which offers water tight joint integrity. It is intended for water tight applications in which the system will keep water in or out under normal gravity flow operating pressures. The joints are available CSA certified to CSA B182.8 and are lab tested to 75kPa in accordance with ASTM standard D3212.

Ultra-Stab® 75 Coupler BOSS 2000 (100mm - 900mm)

- The bell is lubricated and the gasketed end is pushed in to the orange seating mark
- Lubricant is supplied by Armtec



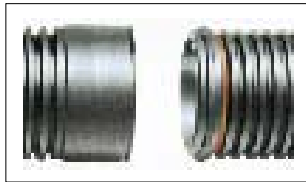
Ultra Stab® 100 (CSA B182.6)

This joining system incorporates an SBR gasket and is intended for water tight applications in which the system will keep water in or out under normal gravity flow operating pressures. The joints are CSA certified to CSA B182.6 and are laboratory tested to 100kPa in accordance with ASTM Standard D3212.

In special applications where hydro carbon contamination or other aggressive effluents are expected, resistant gaskets made from other rubber compounds are specially ordered.

Ultra-Stab® 100 Coupler BOSS Polytite (100mm - 750mm)

- The bell is lubricated and the gasketed end is pushed in to the orange seating mark
- Lubricant is supplied by Armtec



Soil Tight

Non-gasketed joining systems are soil tight and intended for backfill conditions that are not saturated with flowable fines. In these conditions, the pipe joints can simply be wrapped in a "SOCK" of Geotextile.

They offer superior mechanical pull-apart strength and low cost pipe connection.

Insert Coupler

BOSS 1000 (100mm - 200mm)



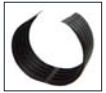
External Double Bell Snap

BOSS 2000 (100mm - 200mm)



External Split Coupler

BOSS 2000 (250mm - 900mm)
(Annular) BOSS 1000 (750mm - 900mm)



Screw-On Couplers

(Helical) BOSS 1000
(150mm - 600mm)



EXTERNAL SPLIT COUPLER

FILTER SOCK

A filter sock bridges pipe perforations and prevents problem sized particles from flowing into the pipe and clogging the drain. Some extremely small (colloidal) particles pass through the sock, and out the drain line suspended in the water. The removal of these particles enhances the soil's permeability near the drain lines.



DETAIL OF A FILTER SOCK



DETAIL OF A GEO SOCK

Geotextiles

A selection of non-woven geotextile sock is also available for critical applications. Armtec also carries a complete line of geotextile products in rolls for a complete trench wrap french drain package. Armtec can recommend material type for all applications.

ORDERING INFORMATION

1. Pipe product desired

- Corrugated interior (BOSS 1000)
- Smooth interior (BOSS 2000 or BOSS Polytite)

2. Solid, perforated, perforated with filter sock, or perforated with non-woven Geotextile

3. Diameter and length required, either total length or length of each piece and number of pieces

4. Pipe stiffness

- 210kPa
- 320kPa

5. Joining system required

- CSA B182.6 Ultra Stab 100 CSA certified to 100kPa pressure (only available in CSA B182.6 and CSA marked)
- CSA B182.8 Ultra Stab 75 CSA certified to 75kPa test pressure (only available in CSA B182.8 and CSA marked)
- Soil tight

Note: No product group offers all three types of joining systems

6. Gasket material

If other than normal sewer conditions apply, such as continued long term hydrocarbon exposure or very aggressive pH conditions please inform us. We can source higher resistant gasket material.

7. Governing Specifications

- CSA B182.6 (Intended for sanitary and other watertight applications)
- CSA B182.8 (Intended for general stormwater management designs)
- OPSS 1840 and 421
- BNQ 3624-110 (Intended for semi-rigid stormwater management designs)
- BNQ 3624-120 (Intended for rigid stormwater management designs)

8. Compliance

- CSA marked
- BNQ marked
- Other, to be specified on order



BOSS 2000 - 900MM PRODUCTION



KAMLOOPS, BC - BOSS 2000

Drawings and product details are for information and/or illustrative purposes only and may vary. Please contact your Armtec representative for the most current product information.



Armtec is a leading Canadian infrastructure and construction materials company combining creative engineered solutions, relevant advice, dedicated people, proven products and a national presence with a local focus on exceptional customer service.

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