PVC Piping Systems for HDD and Other Trenchless Applications

FERGUSON Waterworks
429 Troy Avenue • Colchester, Vermont 05446
Phone (802) 655-3505 • Fax (802) 655-7943
www.ferguson.com
Nobody expects more from us than we do™

TerraBrute® CR

MUNICIPAL SYSTEMS

AWWA C900 PRESSURE PIPE SYSTEMS FOR POTABLE WATER AND SEWER APPLICATIONS

100mm – 300mm
4" – 12"

IPEX

We Build Tough Products for Tough Environments®

TERRABRUTE® CR TRENCHLESS

THE MISSING LINK IN YOUR TOTAL PVC PIPING SYSTEM

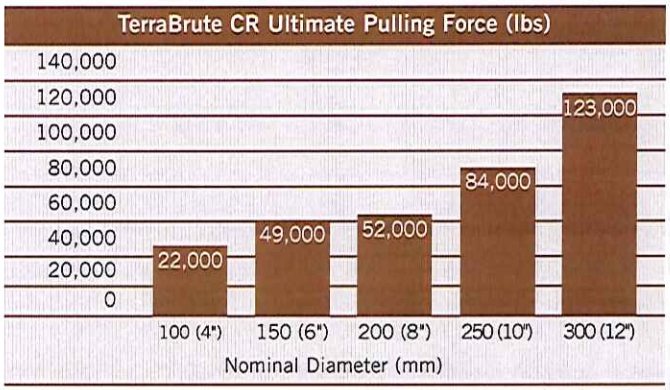
TOTAL PVC PIPING SYSTEM ENGINEERED FOR HDD

Engineered for Horizontal Directional Drilling (HDD) and other trenchless applications, TerraBrute® CR is a 100% non-metallic, AWWA C900 PVC pressure pipe system. Non-corroding and installation friendly, TerraBrute CR allows you to standardize on PVC throughout your potable water and sewer infrastructure. Whether you're using open-cut or trenchless methods, there are no more problems matching materials and couplings. No more butt fusion equipment headaches. No more surprises.

HIGHEST PULL STRENGTH AVAILABLE

Developed in consultation with leading trenchless technology research experts, and rigorously tested in the field, TerraBrute CR trenchless PVC pressure pipe easily withstands the high tensile and bending forces that occur during HDD and other types of trenchless installation.

TerraBrute CR's patented non-metallic "ring-and-pin" gasketed joint design outperforms all other restrained PVC pipe joints on the market, providing more than twice the pull strength of other HDD systems – up to 120,000 lbs. for 300mm / 12" pipe. Unlike competing square-shoulder designs, TerraBrute CR's rounded bell shoulders slide by roots, rocks and other debris that can protrude into the borehole. And unlike HDPE, TerraBrute CR requires no relaxation time before installation of fittings or services.



These ultimate load values were calculated using a semi-empirical design method derived at the University of Western Ontario and verified by laboratory testing. A safety factor of 2:1 should be applied to account for the combined tensile and bending loads associated with HDD applications.

Dimensions of TerraBrute CR Pipe

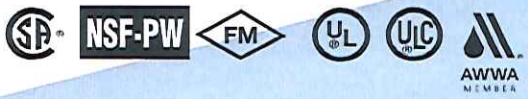
Nominal Diameter		Pressure Rating (2:1 safety factor)	Max Outside Diameter (Bell OD)		Avg Internal Diameter	
mm	in	psi	mm	in	mm	in
100	4	305	165	6.49	104	4.09
150	6	305	230	9.06	149	5.87
200	8	235	288	11.33	204	8.03
250	10	235	355	14.00	250	9.84
300	12	235	416	16.36	297	11.69

TerraBrute CR's larger internal diameters, compared to HDPE pipe, provide the same hydraulic performance usually with one size smaller pipe, saving on material costs.

"TerraBrute CR is the result of many years of research into the use of PVC pipes in HDD applications. The new non-corroding, locking joint design enables TerraBrute CR to enter new applications while maintaining the high tensile strength and bending radius of the original TerraBrute."

Dr. Erez Allouche, Louisiana Tech University

TerraBrute® CR is manufactured from pipe certified to the following standards:



CORROSION RESISTANT

The new, non-metallic, "ring-and-pin" configuration of TerraBrute CR PVC pressure pipe offers complete corrosion resistance. The plastic "ring" is designed as two half rings for ease of installation and comes complete with the "pins" ready for insertion creating a strong, locking joint.

PROVEN PERFORMANCE

Pressure rated in excess of 200 psi, TerraBrute CR delivers the superior strength and corrosion resistance you've come to expect from our Blue Brute pressure pipe, along with the ability to absorb the underground shear and flexure stresses that occur in buried applications.

PROVEN COMPATIBILITY

TerraBrute CR trenchless PVC pipe is designed for total compatibility with your municipal system. Connections can be made with standard PVC CIOD fittings, direct tapped couplings or standard service saddles. Repair and handling techniques are the same as for any AWWA PVC pressure pipe.

PROVEN JOINING SYSTEM

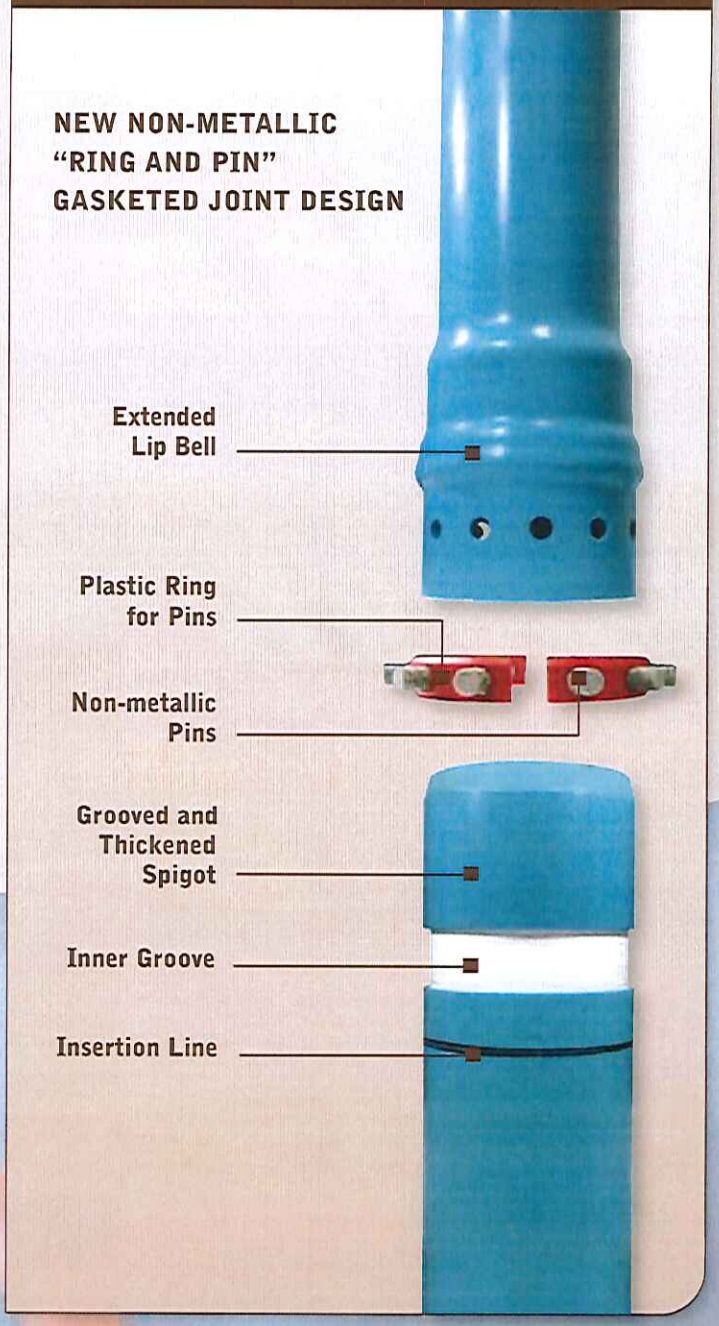
Based on our gasketed bell and spigot design, proven through years of service in the field, the TerraBrute CR joint is rated at many times the pressure rating of the pipe. And unlike competing coupling joints, the TerraBrute CR joint has been specially engineered to deliver the highest pull strength safety factors in the industry for HDD applications.

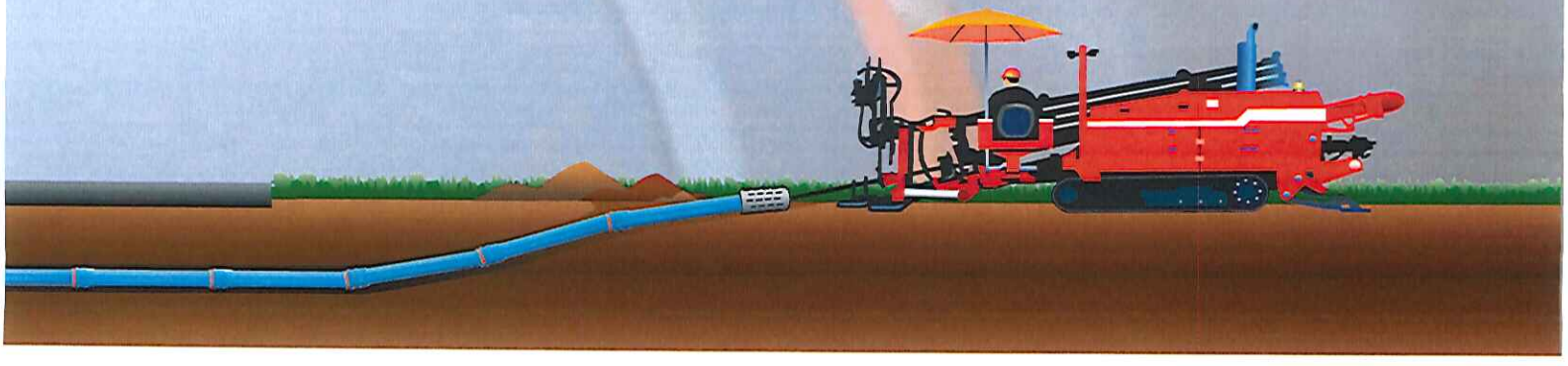
FAST AND EASY JOINT ASSEMBLY

Unlike butt fusion or electrofusion joining methods used with HDPE pipe, TerraBrute CR requires no expensive equipment or special installer training. Because pipe segments are assembled during pullback operations, pipe stringing is eliminated. Assembly time for a 300mm / 12" TerraBrute CR joint is typically less than five minutes.

TerraBrute® CR

NEW NON-METALLIC "RING AND PIN" GASKETED JOINT DESIGN





IDEAL TERRABRUTE CR APPLICATIONS

BRIDGE CROSSINGS

TerraBrute CR's unique "new non-metallic ring-and-pin" joint design provides for easy installation in non-HDD applications where traditional butt fusion techniques would be difficult – such as this span of suspended pressure pipe installed beneath a busy roadway bridge.

ROAD CROSSINGS

TerraBrute CR is ideally suited for short drilling projects where existing structures cannot be disturbed – such as under busy highways, roads and intersections where you connect to PVC pipes.

URBAN CENTERS

Because TerraBrute CR can be assembled segmentally just before entering the borehole, projects take up less space in restricted urban areas, compared to the long strings of pipe typical with conventional PVC and HDPE installations.

JOINT ASSEMBLY

1 Lubricate and assemble joint as for standard PVC pressure pipe.

2 Insert spigot up to the insertion line, aligning the internal ring and the pin holes.

3 One Ring at a time, place ring over pin holes and tap pins in until they bottom out on the inner groove.

4 Ready to begin pulling pipe.

Complete this card and fax it back to us at (905) 403-1124.

Name

Title | Dept.

Company

Address

City | State/Province

ZIP/Postal Code | Phone

Fax | E-mail

Company classification:

- ❑ Architect/Design Firm
- ❑ Builder/Developer
- ❑ Operator/Plant Maintenance
- ❑ Contractor
- ❑ Distributor/Wholesaler
- ❑ Engineering Firm
- ❑ Government
- ❑ OEM - Product(s) Manufactured: _____
- ❑ Utility
- ❑ Other: _____

Product interests:

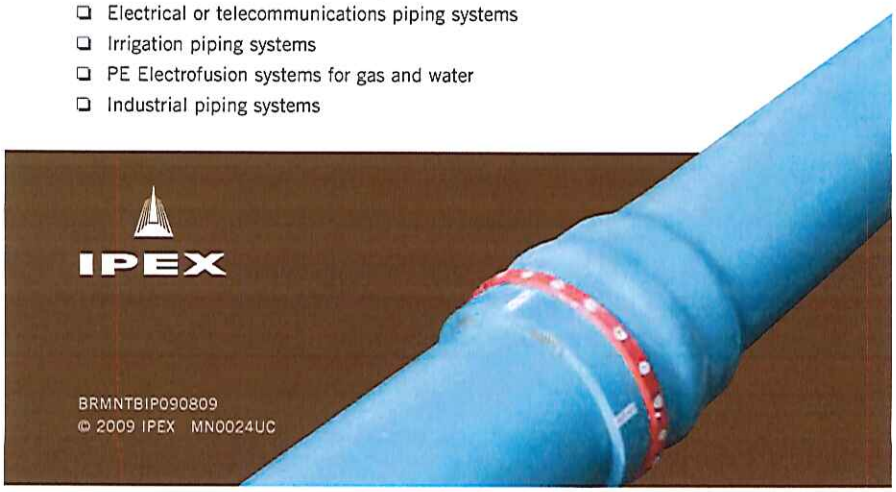
- ❑ PVC Pressure Systems
- ❑ PVC Sewer Systems
- ❑ Irrigation Systems
- ❑ Piping Systems for Water and Waste Water Treatment Plants
- ❑ Sewage Force Mains
- ❑ Service Pipe and Compression Fittings

I would like:

- ❑ PVC Pressure System Design
- ❑ PVC Sewer System Design
- ❑ Surge Pressures in PVC
- ❑ Installation Guide
- ❑ Longevity of PVC
- ❑ Hydraulics of PVC Pipe
- ❑ How PVC compares to other materials

I would also like to know about other IPEX products:

- ❑ Plumbing and mechanical piping systems
- ❑ Electrical or telecommunications piping systems
- ❑ Irrigation piping systems
- ❑ PE Electrofusion systems for gas and water
- ❑ Industrial piping systems



MUNICIPAL PRESSURE PIPING SYSTEMS

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IPEX Big Brute™ and Blue Brute™ Pressure Piping Systems

PVC Pressure Systems manufactured to AWWA and CSA Standards

Big Brute™ 14" – 48" (350 mm – 1200 mm), AWWA C905 and CSA Standards

Blue Brute™ 4" – 12" (100 mm – 300 mm), AWWA C900 and CSA Standards

Designed for municipal applications, Big Brute™ and Blue Brute™ systems deliver superior strength with corrosion resistant performance and the ability to flex without damage.

IPEX municipal pressure piping systems are made with a high-strength, high-impact PVC compound, allowing them to perform even under high traffic loads and deep burial conditions.

For applications involving potable water, irrigation systems, or sewage forcemains, IPEX municipal systems offer the lowest break rate of any pipe material.

Blue Brute fittings are injection molded and are even tougher than the pipe. Injection molded Blue Brute fittings have a wall thickness 125% larger than SDR18 pipe, and custom-made fabricated fittings are wrapped with a tough layer of fiberglass for extra protection.

Proven in tough North American climates for over 50 years, IPEX PVC pipe, fitting and valve systems have an established track record of performance.

BIG BRUTE™

BLUE BRUTE™

IPEX

TOLL FREE U.S.: (800) 463-9572 TOLL FREE CANADA: (866) 473-9462

www.ipexinc.com

Key features include:

- **Corrosion-proof Performance**
  Big Brute and Blue Brute systems are immune to corrosion from aggressive soils and galvanic action.
- **Superior Hydraulics**
  The glass-like finish of PVC reduces friction losses and eliminates the tuberculation common in iron pipes. As a result, pumping costs are reduced and water quality is maintained.
- **Cast Iron Outside Diameter (CIOD)**
  Blue Brute and Big Brute systems are manufactured with a cast iron outside diameter (CIOD). This is compatible with waterworks valves, appurtenances and restrainers.
- **Bottle-tight Joints, Removable Gaskets**
  IPEX's patented gasket system not only withstands many times the rated system pressure, but also withstands full vacuum pressures. The unique removable gasket system allows special oil-resistant (nitrile) gaskets to be easily installed when working in contaminated soils.
- **Third-party Certification**
  All IPEX municipal systems are certified to CSA B137.2. or B137.3., as applicable. In addition, Big Brute and Blue Brute systems have Factory Mutual approval and Underwriter's Laboratories (ULI and ULC) listings.

Pressure Classes vs. Pressure Ratings

Water distribution systems normally consist of smaller diameter pipes 4" - 12" (100 mm – 300 mm) with many connections, taps, bends, valves, hydrants and other appurtenances. As a result, pipes in this size range are referred to by their pressure class. Pressure classes are defined in AWWA C900 and include a 2.5:1 safety factor for pressure, and a 2 ft/s (0.6 m/s) guideline for surge allowance. IPEX's Blue Brute adheres to this standard.

Conversely, larger diameter transmission pipes 14" - 48" (350 mm - 1200 mm) are grouped by pressure rating. A pressure rating as defined in AWWA C905 includes a 2:1 safety factor, which is more appropriate for larger diameter pipes. Big Brute conforms to this standard.

AWWA C900 governs smaller water distribution systems pipes, while AWWA C905 governs larger diameter transmission pipe. All sizesadhere to the CSA B137.3 standard which recommends a 2:1 safety factor for both distribution and transmission applications.

Pressure Classes and Ratings

Note that these classes and ratings are extremely conservative. For instance, the minimum burst pressure for IPEX DR 18 pipe is 755 psi, but the pipe routinely withstands over 1000 psi.

Dimension Ratio	Pressure Class	Pressure Rating
14	200	305
18	150	235
25	100	165
32.5	N/A*	125
41	N/A*	100
51	N/A*	80

*Not manufactured in 4" - 12" (100 mm – 300 mm) sizes

TOLL FREE U.S.: (800) 463-9572 TOLL FREE CANADA: (866) 473-9462
www.ipexinc.com

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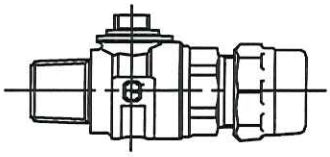
http://www.cambridgebrass.com

CAMBRIDGE BRASS

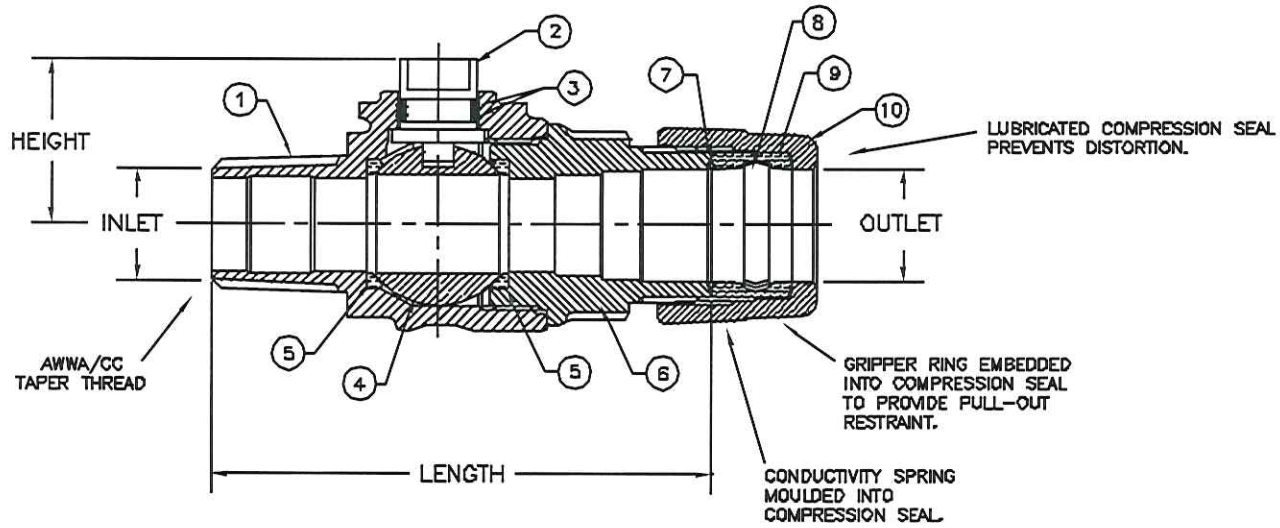


MODEL NO. 301NL

AWWA (CC) x CB COMPRESSION

CORPORATION MAIN STOP
BALL STYLE

AWWA/CC TAPER THREAD INLET BY CB COMPRESSION FOR COPPER OR PLASTIC TUBING (CTS) OUTLET



PARTS AND MATERIAL:
1. VALVE BODY: CAST BRASS, ALLOY C89833
2. STEM: STAINLESS STEEL, TYPE 303
3. O-RING: NITRILE RUBBER
4. BALL: CAST BRASS, NO LEAD
5. SEATS: TEFLON
6. ENDBODY: CAST BRASS, ALLOY C89833
7. CONDUCTOR SPRING: BRASS
8. GRIPPER: STAINLESS STEEL, TYPE 302
9. COMPRESSION SEAL: NITRILE RUBBER
10. TAILNUT: CAST BRASS, ALLOY CB3500

FEATURES:
- MANUFACTURED IN COMPLIANCE WITH AWWA STANDARD C800-05 (ASTM B-584, UNS NO CB9B33).
- CSA CLASSIFIED TO ANSI/NSF STANDARD 61-8.
- BLOWOUT PROOF DESIGN.
- 300 PSI WORKING PRESSURE.
- BODY PROVIDES LARGE, RUGGED FLATS FOR PROPER INSTALLATION.
- FULL 360 DEGREE ROTATION.

Cambridge Brass considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice.

VALVE SIZE	CATALOG NO.	INLET AWWA/CC	OUTLET CB COMP.	LENGTH	HEIGHT	APPROX. WT. LBS.
3/4"	301NL-A3H3	3/4"	3/4"	4.05"	1.33"	1.8
1"	301NL-A4H4	1"	1"	4.59"	1.51"	2.8
1 1/4"	301NL-A5H5	1 1/4"	1 1/4"	6.37"	2.17"	8.2
1 1/2"	301NL-A6H6	1 1/2"	1 1/2"	6.49"	2.17"	7.5
1 1/2"	301NL-A6H7	1 1/2"	2"	6.53"	2.17"	8.2
2"	301NL-A7H7	2"	2"	6.78"	2.47"	

Submitted by:

POWERSEAL

MODEL 3490MJ

FABRICATED STAINLESS STEEL TAPPING SLEEVE SPECIFICATION SHEET

Branch Gasket
Hydro TwinSeal® dual o-ring design incorporating both hydrostatic and mechanical forces to affect a dynamic seal.

Shell Gasket
1/4" thick Nitrile (Buna-N, NBR) Check-O-Seal with multi o-ring sealing ribs from 100% new rubber to ensure performance under varying pressures with superior storage characteristics. Suitable for oils, acids, alkalies, most Hydrocarbon Fluids (aliphatic), potable water and many chemicals within a temperature range of -40° to +212° F. SBR may be substituted.

Bolts & Nuts
Type 304 (18-8) Stainless Steel per ASTM A193 and A194. NOTE: Stainless Steel hex nuts are furnished with fusion bonded coating to prevent seizing and galling.

Outlet
Type 304 (18-8) Stainless Steel per ANSI 21.11.

Fabrications
Type 304 (18-8) Stainless Steel per ASTM A240.

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