AA THREAD SEAL TAPE, INC.

Polyethylene Encasements for Ductile Iron Pipe

Overview

A brief outline of polyethylene encasements and their benefits

AA THREAD

Polyethylene Encasements for Corrosion Control

Polyethylene encasements are proven to be an easy, economical, and low maintenance corrosion protection system for iron pipe. Protection is achieved simply by encasing the pipe with a tube or sheet of loose polyethylene at the trench immediatly before installation.

Polyethylene encasement is an engineered corrosion control system using specially designed material with minimum mechanical requirements; i.e. strength, elongation, propagation tear resistance, impact resistance, and dielectric strength, that are specified in national and international standards. Recycled polyethylene is not used in the manufacture of the film.

Installation of polyethylene encasements is fast and easy. No special training in required and it can be done right at the job site, creating a lower cost, but highly effective, corrosion control system.

Another important aspect of polyethylene encasements's corrosion protection is that research has shown the buried film does not degrade over time and compromise the system. After test-site exhumations and in-service inspections of exposure times up to 45 years, samples of the film have been returned to the DIPRA laboratory and tested. In every case, the film exceeded the minimum physical requirements as defined in ANSI/AWWA standard C105/A21.5 at the time of installation.

The efficiancy of polyethylene has sometimes been dismissed due to its simplicity. However, polyethylene encasement is as effective as other corrosion control systems in all soils tested.

Every roll is hand inspected to ensure a constant quality is acheived. Every roll meets the standards set by ANSI/ AWWA C105/A21.5. Our film is run thicker than what is required to guarantee a product that meets specifications.

Once installed, polyethylene acts as an unbonded film that prevents direct contact of the pipe with corrosive soil. Although polyethylene encasement is not a watertight system, the weight of the earth and backfill and surrounding soil after installation prevents any significant exchange of groundwater between the wrap and the pipe. Although some groundwater typically will seep beneath the wrap, the water's corrosive character-istics are soon delpleted by initial corrosion react-tions, usually oxidation.

The polyethylene film provides an essential impermeable barrier that restricts the access of additional oxygen to the pipe surface and the diffusion of corrosion products away from the pipe surface.

REFERENCES

ANSI AWWA C105/A21.5. American National Standard for Polyethylene Encasement for Ductile Iron Pipe Systems. Catalog No. 43105. AWWA Denver, CO.

DIPRA (Ductile Iron Pipe Research Association), 2002. Century Club. *Ductile Iron Pipe News*, Fall/Winter. Birmingham, AL.

AWWA (American Water Works Association). *Journal AWWA, June 2005. Corrosion and corrosion contol of iron pipe; 75 years of research*. By Richard W Bonds, Lyle M Barnard, A Michael Horton and Gene L Oliver.

DIPRA (Ductile Iron Pipe Research Association), 1999. *Polyethylene Encasement Installation Guide*.

Types of Polyethylene Encasement

LINEAR LOW DENSITY POLYETHYLENE

Our polyethylene encasements are made from 100% virgin polyethylene with approximately 3% carbon black added for coloring and ultra-violet protection. It is gauged to 8.5 MIL to maintain the minimum 8 MIL required by the AWWA standard. Sample batch tests constantly monitor required specification targets. The material is available in perforated lengths of 20' and 22' for easy tear off and no waste at roll ends.

Meets ANSI/AWWA C105/A21.5

CROSS LAMINATED H.D. POLYETHYLENE

This film is extruded from virgin high density polyethylene resins, molecularly orientated through a stretching process, then two single ply layers are laminated biodirectionaly. The grain orientation of each layer are run at 90 degrees of each other, which produces a high strength material. It is then finished through a heated ribbing process, which produces an even stronger finished product. This material has exceptional resistance to punctures and tears during the installtion process.

Meets ANSI/AWWA C105/A21.5

Polyethylene Encasement Installation Tips

Polyethylene sleeves are placed on Ductile Iron pipe to prevent corrosion. It does not have to be sealed watertight, but it should be installed so that no dirt or bedding materials comes in contact with the pipe. All lumps of clay, mud, cinders, etc., on the pipe surface should be removed before the pipe is covered with polyethylene. If the polyethylene is damaged, it must be repaired before the trench is backfilled.

Small holes or tears can be repaired with a piece of tape placed over the hole. Large holes or tears should be repaired by taping another piece of polyethylene over the hole. PVC Pipe Wrapping Tape is the best choice for repairs. Do not use Duct Tape, as it breaks down over time.

Overlaps, ends, and repairs can be held in place with tape of plastic tie straps until the trench is backfilled.

Other general tips for proper installation include:

- When lifting polywrapped pipe with a back-hoe, use a fabric-type "sling" or padded cable to protect the polyethylene.
- When installing polywrap below the water table or in areas subject to tidal action, seal as thoroughly as possible both ends of each polyethylene tube with adhesive tape or plastic tie straps at the joint overlap. Also, place tape or plastic tie straps around the pipe at 2 foot intervals.

Cross Laminated HDPE Joint Wrap

10 MIL XLAM HDPE JOINT WRAP

Joint Wrap Rolls

Item #	Size
75020JW	20" X 100'
75030JW	30" X 100'

Pre-Manufactured Tubes

Item #	Pipe Dia.	Qty/Box
750JW6-8	6" - 8"	12
750JW10-12	10" - 12"	12
750JW14-16	14" - 16"	6
750JW18-20	18" - 20"	6
750JW24	24"	6

PHYSICAL PROPERTIES

Test	C105/A21.5 Min. Req.	AA Thread
Thickness	4 MIL or 101 gsm	10.5 MIL 250 gsm
Elongation	100% (D882 MD & TD)	MD 800% TD 800%
Impact Resistance	800 grams (ASTM D1709)	1,000 grams
Propagation Puncture Tear	N/A (D2582 MD & TD)	MD 15,000g TD 15,000g

****ULTIMATE corrosion protection for all mechanical joints****

- Strongest protection available against punctures and tears where they are most likely to happen due to sharp metal from sheared bolt heads
- Exceeds ANSI/AWWA C105/A21.5 minimum requirements for thickness, elongation and impact resistance
- 2 1/2 times thicker than our 4 MIL XLAM HDPE material
- Made from 100% virgin High Density Polyethylene resins
- Easy installation

JOINT WRAP INSTALLATION GUIDELINES

STEP 1

Cut a piece of joint wrap long enough to wrap around the joint. If the joint wrap is not wide enough to overlap the polyethylene sleeves by at least 1 foot, cut a long enough piece to wrap the joint in a spiral pattern.

STEP 2

Secure one end of the joint wrap with tape and proceed to wrap the sheet around the joint, making a snug but not tight fit. Secure the other end of the wrap to itself with tape. Use tape to secure the sides of the wrap so soil will not come in contact with the joint.

STEP 3

Make sure any tears in the polyethylene are repaired with tape or another piece of polyethylene secured over the damaged area. The best tape to use to repair damages and to secure slack is PVC pipe wrapping tape.

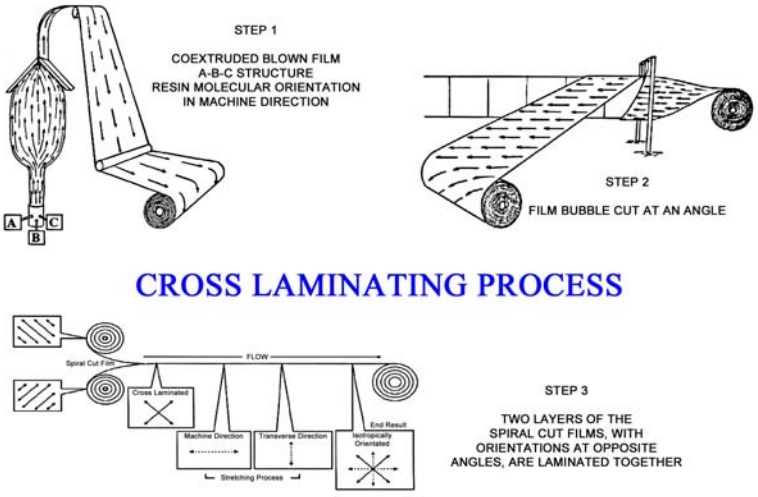
Cross Laminated High Density Polyethylene

4 MIL X-LAM POLYWRAP

Item #	Pipe Dia.	Tube Size	Lbs.
75002	up to 8"	20" X 440'	36
75005	10" - 14"	30" X 220'	27
75008	16" - 20"	41" X 200'	34
75010	24"	54" X 200'	45
75011	30"	67" X 200'	54
75012	36" - 42"	81" X 100'	34
75013	44"	95" X 100'	39
75014	48" - 60"	108" X 100'	45

PHYSICAL PROPERTIES

Test	C105/A21.5 Min. Req.	AA Thread
Thickness	4 MIL or 101 gsm	4.6 MIL 110 gsm
Tensile Strength	6300 psi (ASTM D882) MD & TD	MD 7593 psi TD 8986 psi
Elongation	100% (D882 MD & TD)	MD 615.3 % TD 388.7 %
Dielectric Strength	800 V/MIL (ASTM D149)	1306 V/MIL
Impact Resistance	800 grams (ASTM D1709)	868 grams
Propagation Tear Resistance	255 grams force (ASTM D1922 MD & TD)	MD 771 gf TD 972 gf
Propagation Puncture Tear	N/A (D2582 MD & TD)	MD 9556 g TD 7890 g



The above diagram shows the process in which our high density cross laminated polyethylene encasements are made. The process also includes a unique step where through special heating, a ribbing is formed. This unique ribbing, offered only in our encasement, gives an added "extra layer of strength."

All our material listed above meets ANSI/AWWA C105/A21.5

Common Tapes to Use with Polyethylene Encasements

Item #	Pipe Dia.	Qty/Case
60211	10 MIL 2" X 100' Blk Pipe Wrap Tape	36
60221	10 MIL 4" X 100' Blk Pipe Wrap Tape	18
70911	2" X 55 Yd. Field Lok Printed Tape	36

Linear Low Density Polyethylene Encasements

8 MIL BLACK POLYWRAP

Item #	Pipe Dia.	Tube Size	Lbs.
70001	up to 8"	20" X 400'/20' Perf.	57
70002	up to 8"	20" X 440'/22' Perf.	63
70003	8" - 10"	24" X 400'/20' Perf.	68
70004	8" - 10"	24" X 440'/22' Perf.	76
70005	12" - 14"	30" X 200'/20' Perf.	43
70006	12" - 14"	30" X 220'/22' Perf.	47
70007	16" - 18"	37" X 200'/20' Perf.	53
70008	16" - 18"	37" X 220'/22' Perf.	58
70009	20" - 24"	54" X 200'/20' Perf.	77
70010	20" - 24"	54" X 220'/22' Perf.	84
70011	30"	67" X 140'/20' Perf.	67
70014	30"	67" X 154'/22' Perf.	74
70015	36" - 42"	81" X 110'/22' Perf.	63
70013	48"	95" X 110'/22' Perf.	75
70018	54" - 60"	108" X 110'/22' Perf.	84

8 MIL GREEN POLYWRAP

Item #	Pipe Dia.	Tube Size	Lbs.
70001GRN	up to 8"	20" X 300'/No Perf.	41
70005GRN	12" - 14"	30" X 200'/No Perf.	43
70007GRN	16" - 18"	37" X 200'/No Perf.	53

8 MIL PURPLE POLYWRAP

Item #	Pipe Dia.	Tube Size	Lbs.
73001PUR	up to 8"	20" X 200'/No Perf.	27
73005PUR	12" - 14"	30" X 200'/No Perf.	43
73007PUR	16" - 18"	37" X 200'/No Perf.	53

8 MIL BLUE POLYWRAP

Item #	Pipe Dia.	Tube Size	Lbs.
77020BLU	up to 8"	20" X 400'/No Perf.	57
77030BLU	12" - 14"	30" X 200'/No Perf.	43
77037BLU	16" - 18"	37" X 200'/No Perf.	53
77054BLU	20" - 24"	54" X 200'/No Perf.	77

Linear Low Density Polyethylene Encasements

PHYSICAL PROPERTIES

Test	C105/A21.5 Min. Req.	AA Thread
Thickness	8 MIL	8.5 MIL
Tensile Strength	3600 psi (ASTM D882) MD & TD	MD 4595 psi TD 4410 psi
Elongation	800% min. (ASTM D882) MD & TD	MD 1073% TD 1126%
Dielectric Strength	800 V/MIL (ASTM D149)	1946 V/MIL
Impact Resistance	600 grams (ASTM D1709)	1189 grams
Propagation Tear Resistance	2550 grams force (ASTM D1922) MD & TD	MD 4462 gf TD 5539 gf

Linear Low Density Clear Polyethylene Encasements

8 MIL CLEAR POLYWRAP

Item #	Pipe Dia.	Tube Size	Lbs.
72002	up to 8"	20" X 440'/22' Perf.	63
72006	12" - 14"	30" X 220'/22' Perf.	47

12 MIL CLEAR POLYWRAP PRINTED "WATERLINE"

Item #	Pipe Dia.	Tube Size	Lbs.
76002	up to 8"	20" X 220'/22' Perf.	47
76006	12" - 14"	30" X 220'/22' Perf.	72
76008	16" - 18"	37" X 220'/22' Perf.	87
76010	20" - 24"	54" X 110'/22' Perf.	63

Polyethylene Encasement Installation Guidelines

STEP 1
Clean all dirt, cinder, etc., from the surface of the pipe. Cut the polyethylene two feet longer than the pipe. Slip the polyethylene over spigot end and bunch together

STEP 2
Dig bell holes at joint locations, lower pipe into trench and make up the joint.

STEP 3
Move cable hoist to bell end of pipe and lift the end enough to slip the polyethylene along the pipe.

STEP 4
Pull the polyethylene forward from previous joint over the bell and secure in place.

STEP 5
Pull the polyethylene from new pipe over this same bell, providing a double layer of polythylene and secure in place.

STEP 6
Take up slack in the tube along the pipe barrel; making a snug, but not tight fit. Fold over on top of pipe and secure in place about every 3'.

STEP 7
Make sure any tears in the polyethylene are repaired with tape of another piece of polyethylene secured over the damaged area.

STEP 8
Backfill the trench according to the specification, being careful not to damage the polywrap.

Other Products:

PVC Tapes

PTFE Thread Seal Tapes

PTFE Universal Joint Sealants

Industrial Tapes and Related Products

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