Covalence®
Heat Shrinkable Technology
SEALFORLIFE

PRODUCT DATA SHEET

COVALENCE® DIRAX

Product Information

Product description: The DIRAX system is a wrap-around heat-shrinkable sleeve reinforced with fiberglass. DIRAX is designed to protect girth welds against corrosion and is the optimum joint protection for PE and FBE coated pipes used in directional drilling applications. The reinforcement gives the backing greater wear resistance.

Construction: Three-layer system

- *First layer*: Liquid epoxy, solvent-free two-component.
- *Second layer*: High shear strength copolymer adhesive.
- *Third layer*: Thick, fiberglass reinforced, radiation cross-linked polyethylene.
- *Additional component*: Wear Cone as extra protection against pull-through forces, of the same construction as the main sleeve.

During installation, the epoxy is applied to the prepared pipe surface and the heat-shrinkable sleeve is immediately wrapped around the joint over the wet epoxy. Heat is then applied to the sleeve, which shrinks to form a tight fit around the joint. While curing, the epoxy forms strong mechanical and chemical bonds to the pipe surface & to the copolymer adhesive layer. The radiation cross-linked outer layer forms a tough barrier against mechanical damage and moisture transmission. A wear cone is then applied over the leading edge of the sleeve.
Note: DIRAX is not suitable for "Push Through" applications.

Features:

- Highly resistant to shear and peel forces induced by soil and thermal movements.
- DIRAX offers abrasion and wear resistance at pull-through comparable to mill coatings.
- Wear cone protects leading edge of sleeve against pull-through forces.
- Sleeve applied over wet epoxy---there are no curing or waiting times /formation of strong mechanical & chemical bonds.
- Superior cathodic disbondment and hot water immersion resistance.
- Pre-attached closure patch.
- Low preheat requirements.

Benefits:

- The DIRAX is tough!
- Provides a monolithic coating system.
- Provides additional strength and security---increases reliability.
- Allows fast application---saves time! Ensures high performance!
- Offers the optimum barrier protection against corrosion.
- Allows fast and easy application.
- Makes installation faster and saves time.

Product selection guide	
Max operating temperature	65C (149°F).
Compatible line coatings	PE, FBE
Min. preheat temperature	70°C (158°F)
Recommended pipe preparation	Sa 2½
Soil stress restrictions	None
Performance	EN 12068 Class C60 UV

Product properties

Backing		
Property	*Test method*	*Typical value*
Bursting strength	DIN 30672	2350 N
Adhesive		
Property	*Test method*	*Typical value*
Softening Point	ASTM E-28	94°C (201°F)
Lap shear	ASTM D-1002	528 psi
Lap shear	EN 12068 @10mm/min.	0.40 N/mm^2 @ 60°C (140°F)
Installed sleeve		
Property	*Test method*	*Typical value*
Peel to Steel	ASTM D-1000 EN 12068 @10mm/min.	104 pli 11 N/mm
Specific coating resistance	DIN 30672, 100 days immersion	6x10^8 Ωm^2
Impact resistance	ASTM G-14 EN 12068, class C	170 in.lb Pass 15 J
Indentation resistance	ASTM G-17 EN 12068, class C	Pass 3.1 mm* @ 60°C (140°F)
Cathodic disbondment	ASTM G-8, 30 days EN 12068, 30 days	0.170" (4.33 mm) 0 mm radius @ 60°C (140°F)- self healing
Resistance to UV radiation followed by bursting strength	EN12068	Reduction in bursting strength <25% of the original value

** Remaining coating thickness*

Note: The typical values in this data sheet are based on lab prepared samples.
Values shown are not to be interpreted as product specifications.

Product thickness	mm	in
Backing as supplied	1.85	0.073
Backing fully free recovered	2.30	0.091
Adhesive as supplied	1.20	0.047
Wear cone (incl.adhesive) as supplied	3.05	0.120

Order information

Covalence® DIRAX type products are available as a kit, containing
- A Uni-sleeve (pre-cut sleeve with pre-attached closure patch)
- A wear cone (also pre-cut with pre-attached closure patch)

Dirax is installed with S1239, S1301-M or S1401 2-component epoxy primer which has to be ordered separately.

Example	DIRAX-16000-24/1K	
	Designation	**Standard ordering options**
16000	Outside pipe diameter (mils)	3.500"-18.000" (DN80-DN1200)
24	Sleeve width (in)	12" (300 mm)*, 17" (430 mm)*, 24" (600 mm)*, 34" (863 mm)*
/1K	Number of primer kits required	1, 2 or 3 200ml epoxy kit according to size (to be ordered separately)
	Wear cone	Width 3" = 3.125" (80 mm) (included)
		* *nominal width*

General information

Application table	Sleeve cut lengths and appropriate closure patch widths depend on the pipe size, see latest application table AT-DIRAX
Installation guide	For proper product installation, see latest installation instruction AG-DIRAX.
Handling	Handle with care. Keep boxes upright.
Storage	Store indoor, clean and dry, away from direct sunlight in a cool place below +50°C. Unlimited shelf life.

Information

Documentation	Extensive information is available on our web-site. Application instructions and other documentation can be obtained by contacting our head office, from our local distributor or by sending an email to **info@sealforlife.com**
Certified staff	Application of the described coating system should be carried out by certified personnel.

SEALFORLIFE Industries
PART OF THE BERRY PLASTICS ENGINEERED MATERIALS DIVISION

Seal For Life Industries LLC
Franklin, MA, USA
Tel: +1 508 918 1600
Toll Free: +1 800 248 7659
Fax:+1 508 918 1905
franklin@sealforlife.com

Seal For Life Industries Mexico S de R.L. de C.V.
Tijuana, Mexico
Tel USA: +1 858 633 9797
Fax USA: +1 858 633 9740
Tel Mx: +52 664 647 4397
Fax Mx: +52 664 607 9105
mexico@sealforlife.com

Seal For Life Industries Stopaq B.V.
Stadskanaal, the Netherlands
Tel: +31 599 696 170
Fax: +31 599 696 177
info@sealforlife.com

Seal For Life Industries BVBA
Westerlo, Belgium
Tel: +32 14 722 500
Fax: +32 14 722 570
belgium@sealforlife.com

Seal For Life India Private Ltd.
Baroda, India
Tel: +91 2667 264 721
Fax: +91 2667 264 724
india@sealforlife.com

Covalence
Heat Shrinkable Products

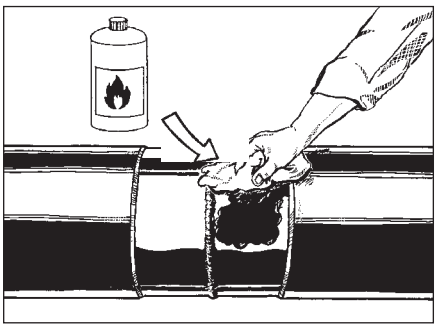
DIRAX

Installation instructions

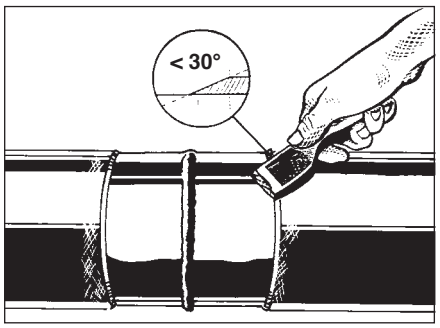
AG-DIRAX-REV12-DEC10-LEXPS-0070

Materials and equipment
- Appropriate size DIRAX kit
- Epoxy primer kit (type S1239 or S1301M)
- Propane torches plus accessories (or equivalent)
- Temperature measurement equipment with contact pyrometer
- Standard safety equipment as prescribed by local regulations
- Heat resistant gloves
- Painter's knife
- Flat silicone roller

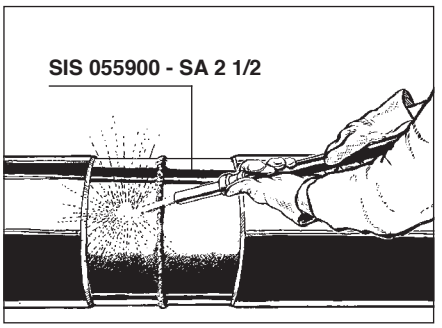
Notes:
- For pipes 16" (400 mm) and larger, two equipped installers are recommended.
- The surface to be covered by the DIRAX should be free from all foreign materials such as dirt, rust, oil, grease and moisture.
- If the pipe is not already factory bevelled, bevel the line coating edges on both sides of the welded joint to 30° or less.



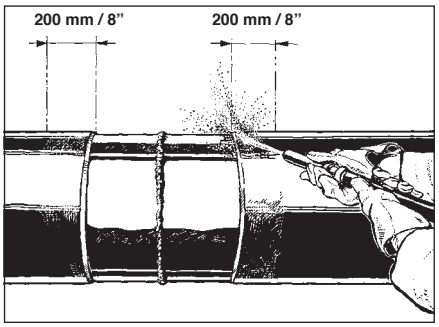
Clean exposed steel and adjacent pipe coating to be covered by DIRAX sleeve. Remove all contaminants such as oil. Use a solvent that contains no grease or oil type materials.



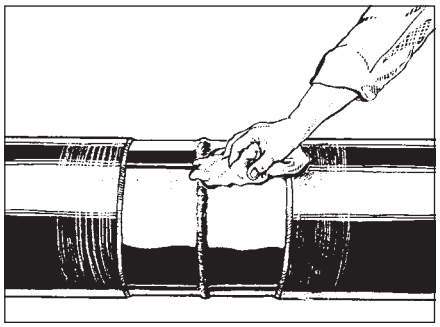
If not factory beveled, chamfer the adjacent pipe coating to an angle of preferably 15°, maximum 30°. Inspect the edge of the existing pipe coating. Disbonded sections have to be trimmed of and the coating edge has to be beveled again. To avoid possible contamination, it is recommended to use a scraper.



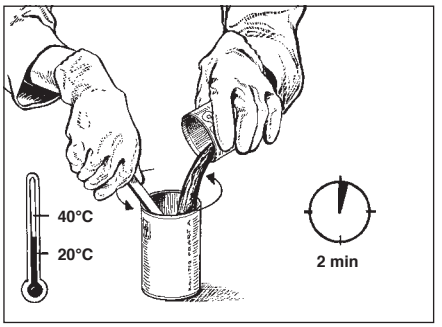
Grid blast or sand blast the steel surface to remove loose and foreign materials. The surface should be cleaned to SIS 055900 - SA 21/2.



Grid or sand blast the adjacent pipe coating over a distance of at least 200 mm (8"). The total width should be approximately 50 mm larger than the width of the supplied DIRAX sleeve.
Note: prior to blasting, it is recommended to preheat the exposed steel to 40 - 50° C to avoid flash rust formation.

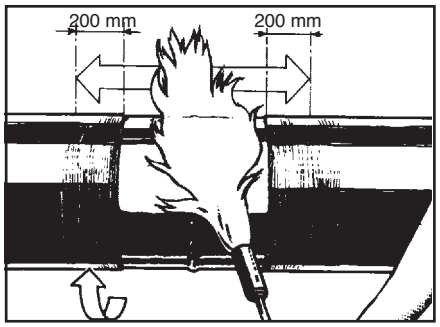


Wipe the surface to remove dust and remaining blasting material. Use a clean dry cloth or air blow.

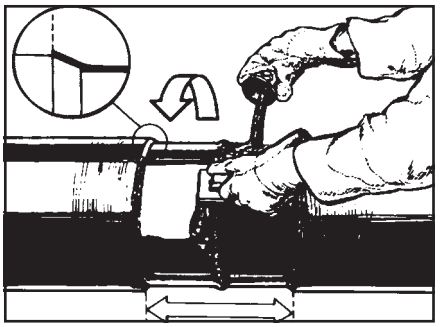


Dose the two component epoxy. Use pre-dosed epoxy kits or use calibrated epoxy pumps.
For pre-dosed epoxy kits, pour content of can B into can A and mix for approximately 1 minute. For easy disposal, it is recommended to pour this mixture back into can B and mix for another 30 seconds. As such, the remaining epoxy in both cans will cure and can be easily disposed off. Follow local regulations for safe disposal.
Mixed epoxy primer has a pot life of approximately 30 minutes at ambient temperature. As long as the epoxy primer is still liquid, it may be used.
For easy mixing and dispensing, the epoxy primer should be used at a temperature of min. 18° C. When necessary, keep the epoxy primer at a heated place or use an epoxy heater.

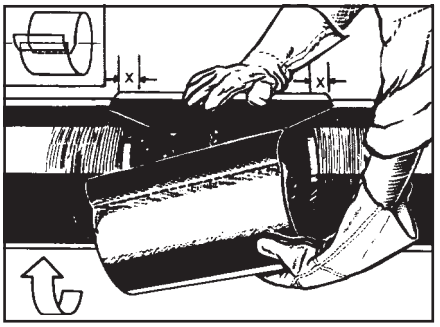
DIRAX



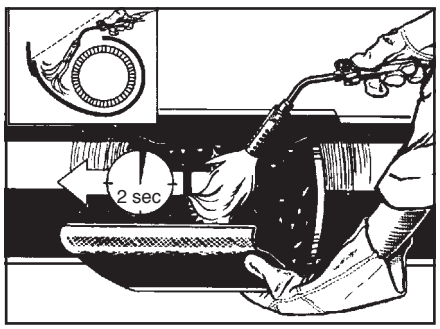
Preheat the bare steel surface and adjacent coating to minimum 70°C (160°F), using propane torches. Adjust flame length to approximately 20" (500 mm). In cold conditions extra heavy preheat torches can be used. Check preheat temperature with a contact pyrometer.



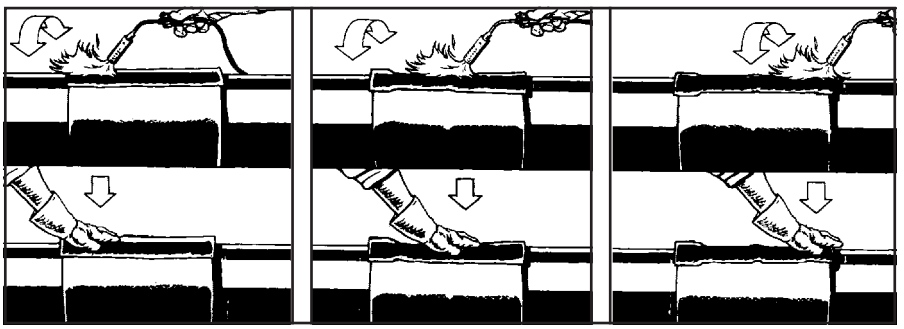
Using the supplied applicator pad, apply the mixed epoxy primer over the entire surface to be covered. (When PE line coating is used, no primer should be applied over the polyethylene line coating.)



Immediately after application of the epoxy primer, and while the epoxy primer is still wet, loosely wrap the DIRAX sleeve centrally around the welded joint.
If present, remove the protective release plastic from the adhesive side of the DIRAX sleeve.
Wrap the sleeve (adhesive side down) around the area to be coated. Make sure the sleeve overlaps the end of the inner layer by at least 50 mm (2”).

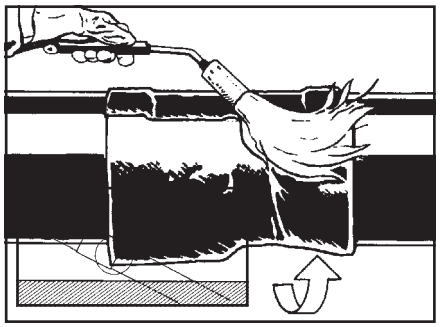


Preheat the inside adhesive layer just next to the closure for a few seconds, and press down on the sleeve end to make it stick to the other end.

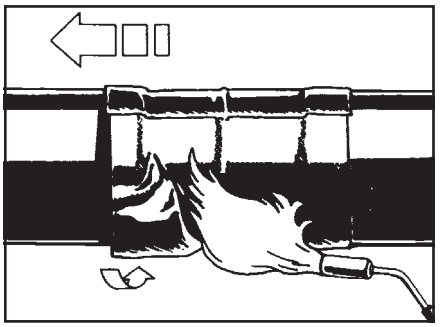


Using a propane torch with a flame length of approximately 500 mm (20”), start heating one end of the closure area.

Immediately pat it down firmly with a gloved hand. Continue heating and patting every 10 cm (4”) until the whole patch area is finished.

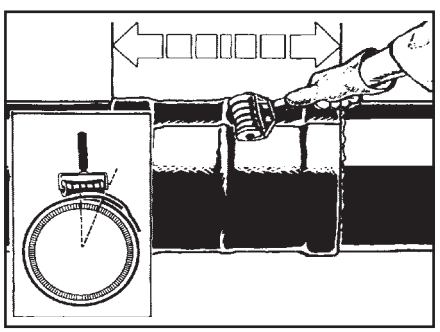


Start heating the sleeve at the side of the leading edge, the side that first comes in contact with the ground forces. Move the torch continuously in a paint brush motion all the way around the sleeve.

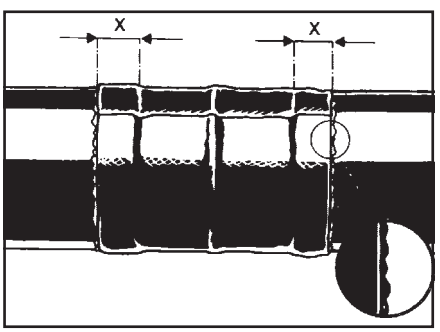


After you have finished heating the side at the leading edge, recover the remainder of the sleeve by heating toward the other end of the sleeve.

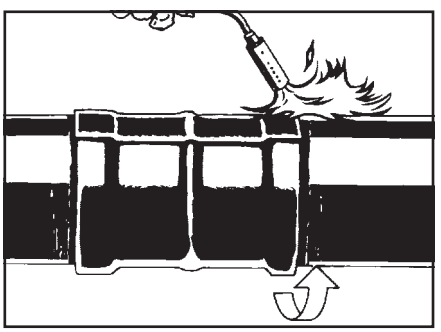
During shrink down, check adhesive flow with finger occasionally. Wrinkles should disappear automatically.



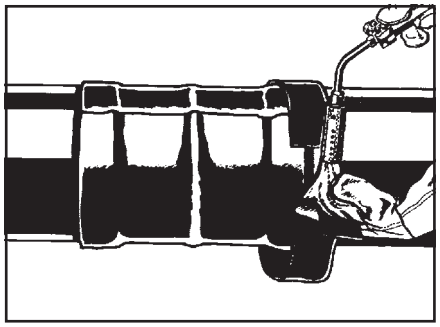
After the DIRAX sleeve has shrunk into the joint area and while it is still hot and soft, run a small hand roller over it to push out any trapped air.
Pay particular attention to the weld and cutback area. Reheat areas if necessary.



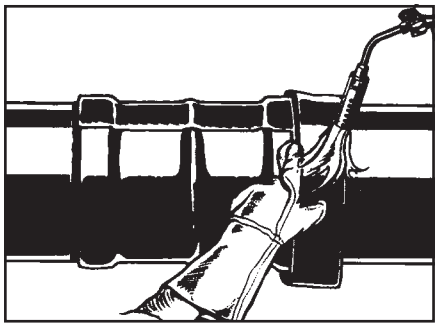
The sleeve is fully recovered when all of the following have occurred:
- The sleeve has fully conformed to the pipe and adjacent coating.
- There are no cold spots or dimples on the sleeve surface.
- Weld bead profile and other step downs can be seen through the sleeve.
- Adhesive flow is evident on both edges, after sleeve is cool.



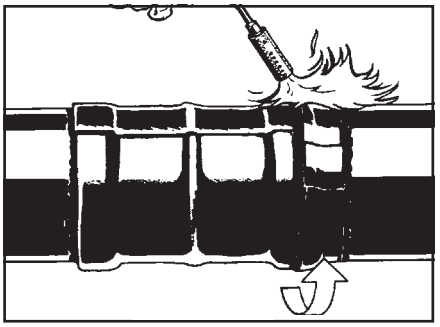
An 80 mm (3.2”) wide sacrificial sleeve is installed on the leading edge to function as a wear cone during pull thru of the pipe.
Start by heating the leading edge area to 70°C (160°F).



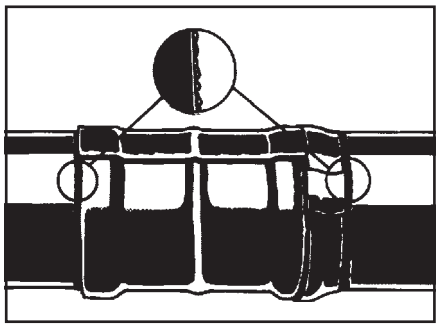
Wrap the leading edge sleeve over the transition DIRAX - mill coating. Make sure that the closure is placed away from the main sleeve closure. Preheat the inside adhesive layer just next to the closure for a few seconds. Press down to make it stick to the other sheet end.



Heat the closure area and immediately pat it down with a gloved hand.



Shrink the leading edge sleeve down by moving the torch all the way around the pipe in a paintbrush motion. Make sure the sleeve has fully shrunk and adhesive flow is evident on both edges.



Smooth down the edges of the sleeve with the silicone hand roller.
Sleeve is fully recovered when all the following have occurred:

- The sleeve has fully conformed to the pipe and adjacent coating.
- There are no cold spots or dimples on the sleeve surface.
- Weld bead profile and other step downs can be seen through the sleeve.
- Adhesive flow is evident on both edges after sleeve is cool.

Before the DIRAX can be exposed to the soil forces the joint should be cooled down to ambient temperature.

Headquarters
Franklin, MA, USA
Tel: +1 508 918 1714
US Toll Free: +1 800 248 0149
Fax: +1 508 918 1910
CPG@berryplastics.com

Houston, TX, USA
Tel: +1 713 676 0085
US Toll Free: +1 888 676 7202
Fax:+1 713 676 0086
CPGH@berryplastics.com

Tijuana, Mexico
Tel USA +1 858 633 9797
Fax US: +1 858 633 9740
Tel Mexico: +52 664 647 4397
Fax Mexico: +52 664 607 9105
CPGTJ@berryplastics.com

Westerlo, Belgium
Tel. +32 14 722500
Fax +32 14 722570
CPGE@berryplastics.com

Baroda, India
Tel: +91 2667 264721
Fax: +91 2667 264724
CPGIN@berryplastics.com