Covalence®
Heat Shrinkable Products

Corrosion protection solutions for oil, gas and water transmission pipelines

Built-in performance
Reliable installation
Proven track-record
That's quality!

- Girthweld sleeves
- Coating repairs
- HDD sleeves
- High temperature line coatings
- Tools and accessories

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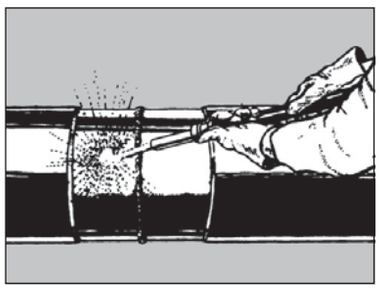
BERRY PLASTICS™ CORPORATION
AND SUBSIDIARIES
CORROSION PROTECTION GROUP

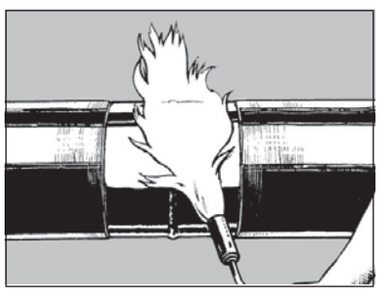
Reliable installation

(Easy as 1, 2, 3)

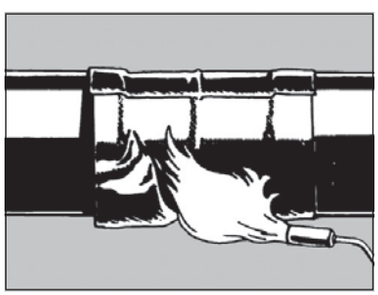
All pipeline coatings need to be correctly installed in order to achieve long-term, corrosion-free service. Installing heat-shrink sleeves is very simple – the essential 3 steps are:



Step 1. Surface preparation
Blast-clean the steel to SA 2½ and sweep-blast adjacent line coating to roughen-up the surface. On certain sleeve types power wire brushing is allowed.



Step 2. Preheat joint area
Most sleeves require a steel preheat of 50°C – 80°C (122°F – 176°F). This is easy to achieve using propane gas torches. Induction heating can be used for sleeve types requiring a preheat temperature greater than 150°C (302°F). NOTE: 3-layer sleeves require the application of liquid epoxy after preheat.



Step 3. Shrink the sleeve
Using a propane torch, heat is applied to the sleeve, which has been wrapped around the preheated area. Every part of the sleeve needs to receive a minimum amount of heat. The Permanent Change Indicators (PCI) give guidance to the applicator both before and after shrinking.

Dimpled or embossed backing as Permanent Change Indicator

Smooth backing after application heat.

Dimpled backing before application heat.

PCI (Permanent Change Indicators)
The majority of Covalence® Heat Shrinkable Sleeves have at least one Permanent Change Indicator. Using a propane torch, heat is applied to the sleeve, which has been wrapped around the preheated area. Every part of the sleeve needs to receive a minimum amount of heat. The Permanent Change Indicators (PCI) give guidance to the applicator both before and after shrinking.

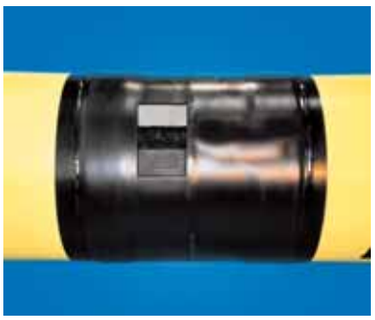
Reliable inspectability

(Before, during and after installation)

Effective inspection is the key to success of any coating program. In addition to holiday inspection, a thorough visual inspection of every sleeve is strongly recommended. The dimpled backing of Covalence® Heat Shrinkable Sleeves makes inspection easy and reliable. The dimples disappear with sufficient application heat. Provided that the surface has been properly prepared and sufficiently preheated, no dimples means that the sleeve is properly installed. If dimples are still visible, more application heat is required.

Built-in performance

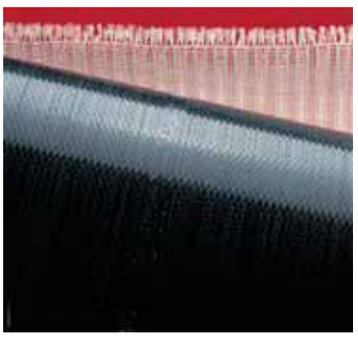
Covalence® Heat Shrinkable Sleeves are the most widely used solution for the corrosion protection of girth welds on buried steel pipelines. The sleeves consist of a tough, high-density, radiation cross-linked polyethylene, coated with a hotmelt or mastic adhesive. Covalence® sleeves combine ease and reliability of installation with the highest levels of built-in performance.



HTLP with cut-out showing 3 layers
Our 3-layer sleeves with epoxy primer are fully compatible with multi-layer main coatings and result in a virtually monolithic system.

HTLP-PP after 100 cycles in soil stress test at 110°C (230°F)
Covalence® 3-layer heat-shrinkable sleeves have excellent resistance to both cathodic disbondment and hot water immersion resistance, even at maximum operating temperature. They fully resist shear forces induced by soil and thermal movements.

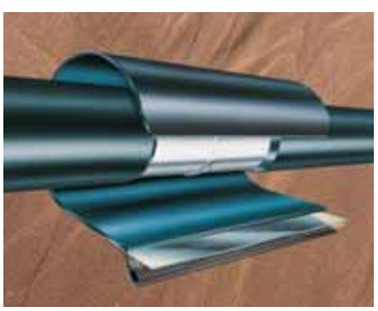
WPC-C50 installation on big pipe
Our range of 2-layer mastic coated sleeves balance performance, economy and ease of installation.
No primer required, simple tools as hand or power brush, propane torches, etc.



Fiberglass-reinforced backing
Fiberglass-reinforced sleeves withstand the high stresses of directional drilling.

DIRAX application for river crossing
The special glassfiber reinforced sleeve gives the material a high abrasion resistance while remaining flexible to follow bending radius.

PERP application on factory coated PE pipe
Heat-applied repair patches with their excellent adhesion to commercial, factory-applied coatings provide a virtually monolithic coating repair of high quality.



Unisleeve (one-piece) wraparound sleeve
Pre-attached closure for faster and easier installation.

WPC100M in offshore application
The combination of a one piece sleeve (unisleeve) and fast shrink response allows rapid and reliable installation under lay barge conditions, with or without joint in fill systems.

WATERWRAP on large diameter water pipes
Special formulated low preheat adhesive makes WATERWRAP suitable for internal welding application under approved conditions.

Girth weld straight joints – Selection table for heat shrinkable products

By checking the appropriate parameters, you can easily select the proper product.

Max. pipe operating temp. (°C/°F)	Compatible pipe line coating type	Soil conditions	Pipelaying method
0°C – 120°C (0°F – 248°F)	Fusion Bonded Epoxy (FBE) Polyethylene (PE) Polypropylene (PP) Coal Tar Enamel (CTE) Cold Applied Tape (CAT)	**Stable:** Low soil stresses **Unstable:** Shifting soil conditions, Significant pipe motion relative to soil	Open trench Directional drilling Offshore
TUBULAR PRODUCTS			
30°C (86°F)	FBE, PE, CTE	Stable	Open trench
65°C (149 °F)	FBE, PE, CTE, PP	Stable	Open trench
WRAPAROUND PRODUCTS			
30°C (86°F)	FBE, PE, CTE, CAT	Stable	Open trench
40°C (104°F)	FBE, PE, CTE, CAT, AE	Stable	Open trench / offshore
60°C (140°F)	FBE, PE, CTE, CAT	Stable and unstable	Open trench / offshore
65°C (149°F) 93°C (199°F) offshore under infill	FBE, PE, PP, CTE, CAT, AE	Stable	Open trench / offshore
65°C (149°F)	FBE, PE, PP, CTE	Stable and unstable	Open trench / offshore
80°C – 100°C (176°F – 212°F) for offshore applications	FBE, PE, PP, CTE, CAT, AE	Stable and unstable	Open trench / offshore
80°C (176°F)	FBE, PE, CTE	Stable and unstable	Open trench / offshore
120°C (248°F)	FBE, PE, CTE	Stable and unstable	Open trench / offshore
120°C (248°F)	PP	Stable and unstable	Open trench / offshore
120°C (248°F)	PP	Stable and unstable	Open trench / offshore
SPECIAL APPLICATIONS			
60°C (140°F)	FBE, PE	Stable and unstable	Directional drilling
50°C (122°F)	FBE, PE, CTE, CAT	Stable	Open trench

Recommended pipe preparation	Coating layers	Product
Surface cleaning Abrading, brushing or gritblasting **Minimum recommended pre-heat temperature:** 20°C – 230°C (68°F – 446°F)	**Two-layer (2)** Adhesive + PE **Three-layer (3)** Epoxy + adhesive + PE	
Brushing / 60°C (140°F)	2	TPS
Brushing / 50°C (122°F)	2	TPSM-C30
Brushing / 50°C (122°F)	2	WPC-C30 (-E)
Brushing / 60°C (140°F)	2	WPCT, WPC/B, WPCZ
Brushing / 80°C (176°F)	2	WPC-C50
Brushing / 70°C (158°F)	2	WPC65M, WPCZ65M
Gritblasting / 70°C (158°F)	3 (extra epoxy layer) Not on PP line coating	HTLP60
Brushing / 100°C (212°F)	2	WPC100M
Gritblasting / 80°C (176°F)	3 (extra epoxy layer) Not on PE line coating	HTLP80
Gritblasting / 230°C (446°F)	2	WPC120
Gritblasting / 190°C (374°F)	2	PPS120
Gritblasting / 190°C (374°F) Induction Coil	3	HTLP-PP
Gritblasting / 70°C (158°F)	3 (extra epoxy layer) Not on PE line coating	DIRAX, ROCS60E
Brushing / 20°C (68°F)	2	WATERWRAP

Proven track-record

Berry Plastics CPG has more than 50 years experience in the development and manufacturing of heat-shrinkable products. Our Covalence® Heat Shrinkable Sleeves have been used on most of the major transmission pipelines laid during that time. Here is a small selection from our extensive track record.

- Bolivia to Brazil Gas Line, 3,000 km of 32" pipe, 250,000 WPCT sleeves
- Argentina to Chile Gas Lines, 4 crossings of the Andes, 110,000 HTLP60 sleeves
- North Sea Zeepipe, 1,560 km of 40" pipe, 120,000 WPCZ sleeves
- Russia Gazprom, 800 km of 56" pipe, 72,000 HTLP60 sleeves
- Oman Gas Pipeline, 500 km of 48" pipe, 45,000 HTLP80 sleeves
- Saudi Arabia Shayba Pipeline, 670 km of 48" pipe, 28,000 HTLP80 sleeves
- China Lang-Chen-Yu Line, 1,000 km of 14"-20" pipe, 90,000 HTLP60 sleeves
- Italian Gas Lines, 1,000 km of 48" pipe, 92,000 HTLP60 sleeves
- India Kandla to Bathinda, 1,440 km of 14"-22" pipe, 120,000 HTLP60 sleeves
- India HBJ, 1700 km of 36" pipe, 140,000 HTLP/WPC80 sleeves

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The leading global partner in protecting the integrity of critical infrastructure.

BERRY PLASTICS CORPORATION™ AND SUBSIDIARIES

CORROSION PROTECTION GROUP

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