


[total care specific solution]





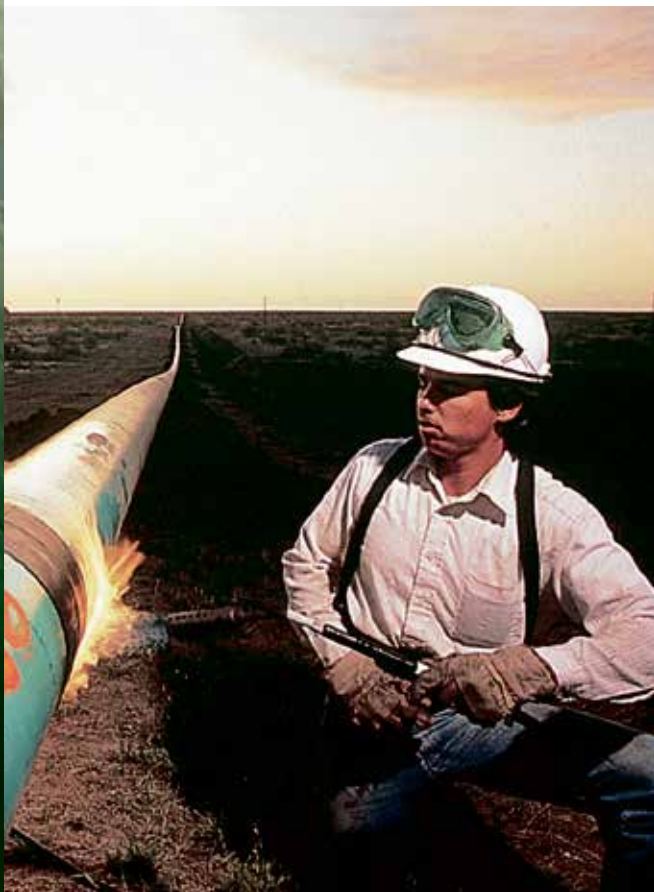
Covalence® is part of Seal For Life Industries, which is the name of a closely associated group of companies engaged in preventing and combating corrosion in the broadest possible sense. Seal For Life is the statement through which we demonstrate our thinking about the concept of 'people, planet, profit' – as well as about the quality and therefore the lifespan of our solutions. It shows what we think about markets, complete solutions, cost of ownership, the often sensitive infrastructures within which we work, and about our sustainable cost-effective solutions.

Welcome to Seal For Life Industries.

Why use Covalence®?

Covalence® heat shrink force technologies provide strong mechanical strength performance and corrosion protection for oil, gas and water transmission pipelines. With technology born of the atomic age, shrink sleeves are unique in their ability to perform safely and efficiently.

- Covalence has 40+ years of proven in-service performance
- Systems conform to all pipe diameters
- Mastic-coated sleeves balance performance, economy and ease of installation
- Excellent resistance to cathodic disbondment, hot water immersion, thermal aging and soil stress at maximum-rated operating temperature
- Dimpled pattern provides a “permanent change” indicator for proper heat application
- Cost effective installation



 **Covalence**[®]

Heat Shrinkable Technology



What is Covalence®?

Covalence® sleeves are offered in a two-layer and three-layer construction that compliment a wide range of pipe coating applications both onshore and offshore. The Covalence® DIRAX system is a patented three-layer formulation designed specially for HDD installations. Covalence® also provides sleeves for sealing in the district heating and cooling markets.

Covalence® heat shrink sleeves meet all relevant global standards (ISO, EN, AWWA, NACE, GOST) ensuring suitability for pipeline applications and special field conditions. Covalence® sleeves come in various thicknesses and can accommodate any diameter pipe. Easy-to-understand installation instructions are shipped with every product and clear product labeling allows rapid on-site identification.

Two-Layer Heat Shrink Sleeve System

The Covalence® two-layer sleeve system consists of a first layer of a pressure sensitive adhesive and a second layer of irradiated cross-linked polyethylene backing. The two-layer system is widely used with Fusion Bonded Epoxy (FBE), coal tar, epoxy, polyurethane and 3 layer polyethylene (3LPE) mainline coatings. (Wire) Brush cleaning is suitable for all Covalence two-layer systems.

Three-Layer Heat Shrink Sleeve System

The Covalence® three-layer sleeve system consists of an initial epoxy primer layer with a second layer of a hot melt adhesive and a top layer of irradiated cross-linked polyethylene or polypropylene backing. Covalence® three-layer sleeves are designed for use with three-layer PE or PP mainline coatings. Blast cleaning is required for Covalence® three-layer systems.



Since 1957

Reliability and performance

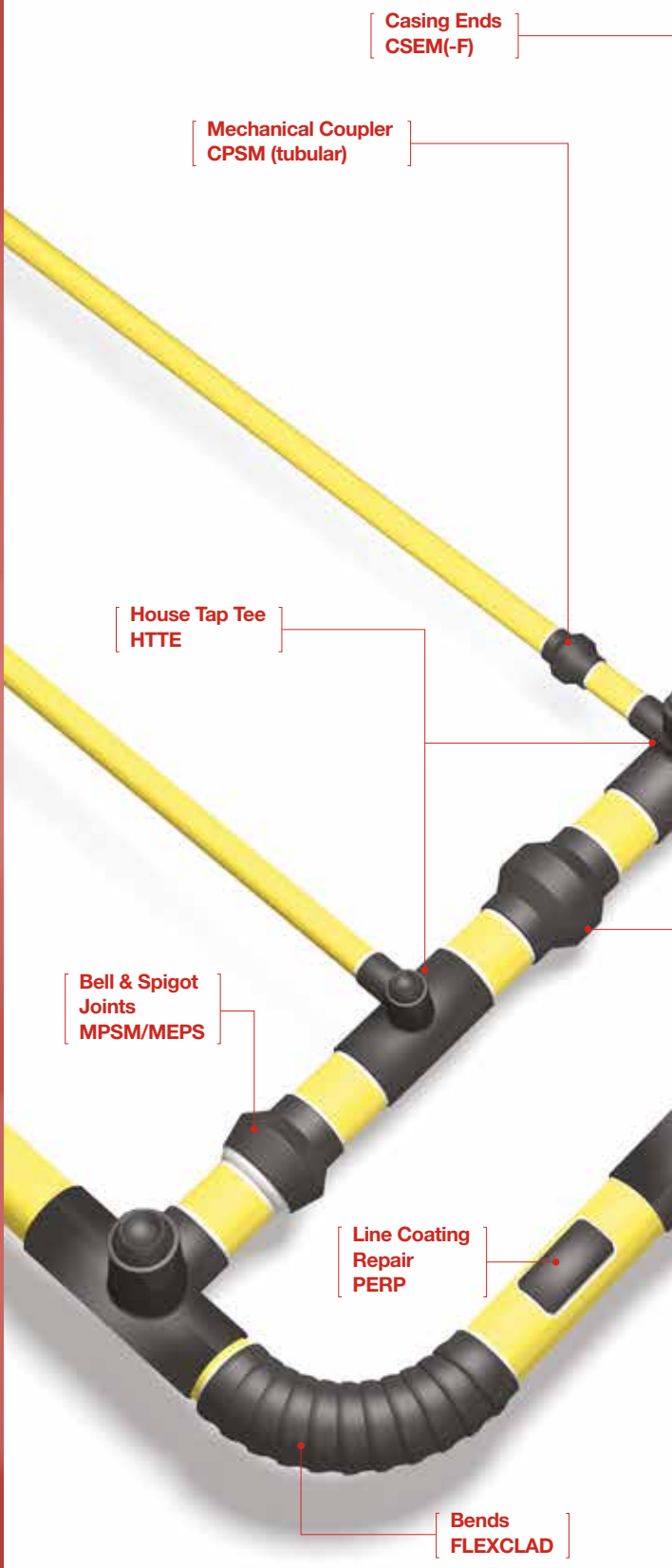
Covalence® has over 40 years of experience in the development and manufacture of heat-shrinkable products. Continuous improvement ensures state-of-the-art performance. Approval by testing agencies around the world guarantees suitability for individual applications and field conditions.

- Two-layer and three-layer constructions complement wide range of pipe coatings
- Top quality hotmelt, copolymer coated sleeves resist elevated pipe operating temperatures and soil stresses on all pipe diameters
- Mastic-coated sleeves balance performance, economy and ease of installation
- Three-layer sleeves with epoxy primer and hotmelt copolymer have excellent resistance to both cathodic disbondment and hot water immersion even at maximum rated operating temperature
- Fiber-reinforced sleeves withstand the high stresses of directional drilling
- Self healing adhesive flows to automatically repair minor mechanical damage
- Dimpled backing providing a patented “permanent change” indicator for application of heat

Training and education

SFL is a manufacturer and a renowned provider of turnkey services. SFL is available to apply SFL products directly onto your projects with or without your own technicians. Alternatively, SFL is available to train your technicians in the use and application of SFL products.

Where are Covalence[®]



[Casing Ends
CSEM(-F)]

[Mechanical Coupler
CPSM (tubular)]

[House Tap Tee
HTTE]

[Bell & Spigot
Joints
MPSM/MEPS]

[Line Coating
Repair
PERP]

[Bends
FLEXCLAD]

products used?



[Directional Drilling Sleeve
DIRAX]

[Flange Coupler
FCTS/FCWS(-F)]

[Wrap Around 2 Layer
Shrink Sleeve
WPC]

[Tubular Shrink Sleeve
TPSPM]

[Wrap Around 3 Layer
Shrink Sleeve
HTLP]

[Blocking Tee
BLOT]

[House Tap Tee
HTTE]



Step 1



Step 2



Step 3

Installation

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 21/2 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 Indicator (PCI) gives guidance to the applicator both before and after shrinking.



PCI (Permanent Change Indicator)

The majority of Covalence® Heat Shrinkable Sleeves have a 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 Indicator gives guidance to the applicator both before and after shrinking.

Low installation cost

- No primer required for two-layer products – install directly on cleaned, preheated surface
- No waiting for primers to cure – install three-layer sleeves directly over wet epoxy primer
- Simple tools such as hand brush, power brush or blast-cleaning, propane torches
- WPC and HTLP products available in Unisleeve construction – with pre-attached closure patch
- Easy-to-understand installation instructions are shipped with every product, while clear product labeling allows rapid on-site identification

Product selection guide

Corrosion protection – Girth Weld Straight Joints				
Max. pipe operating temp. (°C)	Compatible pipe line coating type	Recommended pipe diameter	Soil conditions	Pipe method
TUBULAR PRODUCTS				
				
45	Bitumen, CTE, CAT, FBE, PE	2" – 12"	Stable	Open
65	Bitumen, CTE, CAT, FBE, PE, PP	1" – 8"	Stable	Open
WRAPAROUND PRODUCTS				
				
30	Bitumen, CTE, CAT, FBE, PE, PP	3" – 20"	Stable	Open
40	Bitumen, CTE, CAT, FBE, PE	3" – 20"	Stable	Open
50	CTE, CAT, FBE, PE	> 3"	Stable & unstable	Open
60	CTE, CAT, FBE, PE, PP	> 3"	Stable & unstable	Open
65 (85 for offshore under infill)	CTE, CAT, FBE, PE, PP	3" - 20" > 3" (offshore)	Stable	Open offshore
65	Bitumen, CTE, CAT, FBE, PE	> 3"	Stable & unstable	Open
80 (100 for offshore under infill)	Bitumen, CTE, CAT, FBE, PE, PP	> 3"	Stable & unstable	Open offshore
85	CTE, CAT, FBE, PE	> 3"	Stable & unstable	Open offshore
120	FBE	> 3"	Stable & unstable	Open offshore
120	PP	> 3"	Stable & unstable	Open offshore
120	PP	> 3"	Stable & unstable	Open offshore
SPECIAL APPLICATIONS				
50	Bitumen, CTE, CAT, FBE, PE	> 3"	Stable & unstable	Open WAB
50	Bitumen, CTE, CAT, FBE, PE	> 3"	NA * (offshore)	Offshore
60	FBE, PE	> 3"	Stable & unstable	Direct drilling
60	PP	> 3"	Stable & unstable	Direct drilling

* NA: not applicable

** WAB: Welding After Backfill








Selecting the proper sleeve

Project specifications and local standards must be considered when specifying a shrinkable sleeve.

Coating Method	Recommended pipe preparation	Mechanical resistance class	Climate conditions	Coating layers	Product
In trench	Brushing, low preheat	Medium (B)	SEA	2	TPS
In trench	Brushing, low preheat	High (C)	SEA & LAND	2	TPSM-C30
In trench	Brushing, low preheat	High (C)	SEA	2	WPC-C30
In trench	Brushing, low preheat	Medium (B) & high (C)	SEA	2	WPC(T)
In trench	Brushing, high preheat	High (C)	SEA & LAND	2	WPC-C50
In trench	Brushing, low preheat	Medium (B) & high (C)	SEA & LAND	2	WPC-E
In trench/ shore	Brushing, low preheat	Medium (B) & high (C)	SEA & LAND	2	WPC-65M
In trench	Gritblasting, low preheat	Medium (B) & high (C)	SEA & LAND	3 (extra epoxy layer)	HTLP60 (-HP)
In trench/ shore	Brushing, high preheat	Medium (B)	SEA & LAND	2	WPC-100M
In trench/ shore	Gritblasting, low preheat	Medium (B) & high (C)	SEA & LAND & DESERT	3 (extra epoxy layer)	HTLP80 (-HP)
In trench/ shore	Gritblasting/ high preheat Brushing when under in-fill	Medium (B)	SEA & LAND & DESERT	2	WPC-120
In trench/ shore	Gritblasting/ high preheat Brushing when under in-fill	Medium (B)	SEA & LAND & DESERT	2	PPS120(0S)
In trench/ shore	Gritblasting, induction preheat/ force curing	Medium (B) & high (C)	SEA & LAND & DESERT	3 (extra epoxy layer)	HTLP-PP
In trench/ 3**	Brushing, low preheat	Medium (B)	SEA & LAND	2	WATER WRAP
shore	Brushing, low preheat	NA * (extra outside coating)	NA* (offshore)	2	WPCZ
ctional ng	Gritblasting, low preheat	High (C)	SEA & LAND	3 (extra epoxy layer)	DIRAX, ROCS 60E
ctional ng	Gritblasting, low preheat	High (C)	SEA & LAND	3 (extra epoxy layer)	DIRAX-PP

Product selection guide

Corrosion protection – Bell & Spigot Joints

Bell & Spigot (B & S) configuration	Design
TUBULAR PRODUCTS 	
TYTON, B & S	
TIS-K, UNIVERSAL B & S	
WRAPAROUND PRODUCTS 	
TYTON, B & S	
TIS-K, UNIVERSAL B & S	
TIS B & S	

Corrosion protection – Line Coatings



Max. operating temperature °C	Product
80	RAYCLAD80
120	RAYCLAD120

Corrosion protection – Line coating repair



Max. operating temperature °C	Surface damaged area	Compatible pipe line coating type
60	No bare steel	PE
120	No bare steel	PP
60	< Ø 10": 100 mm x 100 mm Ø 10" - Ø 28": 150 mm x 150 mm > Ø 28": 300 mm x 300 mm	PE
80	< Ø 10": 100 mm x 100 mm Ø 10" - Ø 28": 150 mm x 150 mm > Ø 28": 300 mm x 300 mm	PE
120	< Ø 10": 100 mm x 100 mm Ø 10" - Ø 28": 150 mm x 150 mm > Ø 28": 300 mm x 300 mm	PP
60	Specials < Ø 10": 100 mm x 100 mm Ø 10" - Ø 28": 150 mm x 150 mm > Ø 28": 300 mm x 300 mm	PE

Note: For damaged areas bigger than the above mentioned repair should be done by

Corrosion protection – Bends



Recommended pipe diameter	Compatible pipe line coating type	Max. operating temperature
1" – 2"	Bitumen, CTE, CAT, FBE, PE	50
1" – 12"	Bitumen, CTE, CAT, FBE, PE	50
> 3"	Bitumen, CTE, CAT, FBE, PE	65
> 3"	CTE, CAT, FBE, PE	85
> 3"	FBE, PP	120



Recommended pipe diameter	Product
3" – 24"	MPSM
4" – 16"	TISK
6"	MEPS (36% shrinkage) HEPS (45% shrinkage)
4"	TISKW-F (wraparound)
4"	TISW-F (wraparound)



Pipelaying method	Climate conditions	Product
Open trench/offshore	SEA & LAND	PERP-MELTSTICK
Open trench/offshore	SEA & LAND	PP-MELTSTICK
Open trench/offshore	SEA & LAND	PERP
Open trench/offshore	SEA & LAND & DESERT	PERP80
Open trench/offshore	SEA & LAND & DESERT	PERP-PP
Horizontal drilling/offshore	SEA & LAND	PERP60E

For sleeves, see girth weld selection table.




Temperature (°C)	Mechanical performance	Product
	B	FLEXCLAD
	C	FLEXCLAD-II-C30
	C	MEPS65M, WPC65M, HTLP60
	C	HTLP80
	B	WPC120/PPS120

Product selection guide




Corrosion protection – Tees

Tee configuration	Design	Recommended pipe
Blocking Tee		See product book
House Tap Tee		See product book

Corrosion protection – Accessories



Accessory type	Design	Recommended pipe
Mechanical coupler		½" – 4" > 4"
Flange		1 ½" – 4" > 2"
Anchorplates		90 mm – 560 mm * PE jacket pipe

Sealing – Jacket continuation insulated pipelines (district heating)

	Type joint	Design
Complete joint	Tubular	
End seal (used with oversized casing or shrinkable casing)	Tubular	
	Wrap around	

Sealing – Insulated pipeline end cap



Type joint	Design	Compatible pipe
Tubular		Steel/PE, PEX/PE Steel/PE, PEX/PE
Wrap around		Steel/PE, PEX/PE

Sealing – Sealing of foaming holes

Application method	Compatible material	Product
Torch installation	PE	FOPS

Sealing – Casing ends




Recommend pipe diameter	Product
> 2"	CSEM(-F)

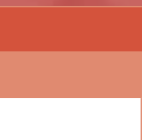


pe diameter	Product
section	BLOT
section	HTTE

pe diameter	Product
	CPSM (tubular) MEPS/HEPS (wraparound)
	FCTS (tubular) FCWS-(F) (wraparound)
*	APPM

	Used on compatible pipe	Product
	PE	Rayjoint
	PE	EasySeal - TPSM-PE
	PE, AI PE, AI	EasySeal - WPSM-PE DualSeal - RJS-E (EN489)

	Product
	DHEC IPEC (big diameters)
	CCS-DHEC



STOPAQ[®]
Self Healing Corrosion Prevention
& Sealant Technology

+

Covalence[®]
Heat Shrinkable Technology

=

**Visco-elastic Shrink
Sleeve Solutions**

Covalence[®]
Heat Shrinkable Technology

+

STOPAQ[®]
Self Healing Corrosion Prevention
& Sealant Technology

=

Sealing

The synergy of Seal For Life Industries

Everyday brings us new opportunities to put the combined synergistic and innovative strengths of our companies into practice wherever required, throughout the world. It's a world that we face with an unequivocal mission which we consider so important that we've named our collective business after it: Seal For Life.

Above or under water, from salty swamps to complex polar operations, Seal For Life offers a number of specialist and proven products. The best approach for many projects is to combine these products, thus delivering a tailor made and optimized solution for each individual project.

Flexible 1 + 1 = 3 principle

We call this the 1 + 1 = 3 principle, which is made possible by the direct and open contacts between our products specialists. It means that Seal For Life can respond rapidly and effectively to any project, no matter what combination of products and specialisms is applied.

**1+1 = 3 principle is made a reality
by Seal For Life Industries.
Seal For Life is the constant factor!**

For more information regarding specifications, track records and other commercial/technical information, please consult us at:

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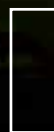
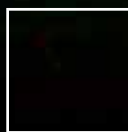
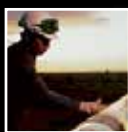
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Seal For Life manufacturing sites:

Kentucky - USA, Tijuana - Mexico, Westerlo - Belgium,

Baroda - India, Stadskanaal - the Netherlands,

Dammam - Saudi Arabia



 **SEALFORLIFE**
Industries

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Heat Shrinkable Technology