

COVALENCE[®] HTLP60-HP

Product Information

A girth weld protection system for three-layer coated pipes.

Product description: Covalence[®] HTLP60-HP system is a wrap-around heat-shrinkable sleeve which replicates the structure and performance of mill-applied three-layer PE coatings. HTLP60-HP also has excellent compatibility and has been extensively used on many other mill-applied coatings (see below).

- **Market:** Oil and gas pipelines.
- **Application:** Bends, elbow, fittings and T's, girth weld, pipeline rehabilitation, field applied (ODT).

Construction: Three-layer system

- **First layer:** Liquid epoxy, solvent-free two-component.
- **Second layer:** High shear strength copolymer adhesive.
- **Third layer:** Radiation cross-linked, high density polyethylene with permanent Change Indicator (PCI).

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.

Features:

- Fully resistant to shear forces induced by soil and thermal movements.
- Sleeve applied over wet epoxy, allowing formation of strong mechanical & chemical bonds.
- Superior cathodic disbondment and hot water immersion resistance.
- Fully reconstructs the coating of three-layer coated pipes.
- Dimpled backing provides a "permanent change" indicator for application of heat.

Benefits:

- The HTLP is tough & lasts as long as a 3-layer, mill-applied coating.
- Allows fast application combined with high performance!
- Offers the optimum barrier protection against corrosion.
- HTLP systems allow the pipeline to have a virtually monolithic coating system.
- Ensures correct application heat & allows easy post-heat inspection. Reliable inspectability at any time.

Product selection guide

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

Product properties Covalence[®] HTLP60-HP

Backing		
Property	Test method	Typical value
Tensile strength at break	ASTM D 638	3300 psi (22.8 MPa)
Elongation at break	ASTM D 638	600%
Hardness, Shore D	ASTM D 2240	57
Shrink force	ASTM D 638, 150°C (302°F)	40 psi
Dielectric strength	ASTM D 149	900 V/mil (35 kV/mm)
Moisture absorption	ASTM D 570	0.04%
Adhesive		
Property	Test method	Typical value
Softening point	ASTM E 28	107°C (225°F)
Lap shear	EN 12068 @ 10 mm (0.4")/min	0.22 N/mm ² @ 60°C (140°F)
Installed sleeve		
Property	Test method	Typical value
Peel to steel	EN 12068 @ 10 mm (0.4")/min	7 N/mm
Cathodic disbondment	EN 12068 28 days, @ 60°C (140°F)	5 mm radius
Hot water immersion	ASTM D 870 120 days, @ 60°C (140°F)	No delamination, no blisters or water ingress
Soil stress creep resistance	TP-206 65°C (149°F)	0.003 mm (0.0001 in)
Low temperature flexibility	ASTM D 2671-C	-40°C (-40°F)
Impact resistance	EN 12068, Class C	> 15 J *
Indentation resistance	EN 12068, Class C @ 60°C (140°F)	Residual thickness > 0.6 mm *

* Construction /1.0-1.5 or thicker.

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

Designation /...	/B	/1-1.5*	/1.2-1.5*	/C
Backing as supplied	0.75 mm (0.030 in)	0.75 mm (0.030 in)	0.90 mm (0.035 in)	1.04 mm (0.041 in)
Backing fully free recovered	1.00 mm (0.039 in)	1.00 mm (0.039 in)	1.20 mm (0.047 in)	1.40 mm (0.055 in)
Adhesive as supplied	1.00 mm (0.039 in)	1.50 mm (0.060 in)	1.50 mm (0.060 in)	1.50 mm (0.060 in)

* Minimum order quantities apply

General order information			General order information (continued)	
Covalence® HTLP type products are available – As cut piece (pre-cut with separate closure patch) – As Uni-sleeve (pre-cut with attached closure patch) – As a roll (closure patches to be ordered separately) Select sleeve width that will overlap onto the mill-applied coating by 50 mm (2 inches) minimum on each side of the weld joint. Take a 10% shrinkage during installation of sleeve into account when calculating minimum sleeve width.			Recommended primer HTLP60-HP type products are installed with S1301-M epoxy primer . Epoxy primers are ordered separately. For more ordering information on epoxy primers see application tables DS-S1301M. As field application of primers may vary, consult a Seal For Life Representative or Authorized Distributor for rate of coverage guidance.	
			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.	
Cut piece / Uni-sleeve			Information	
Example	HTLP60-HP-16000X17/B/(UNI)		Documentation	
	Designation	Standard ordering options	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	
60	Operating temperature (°C)	60 (=65°C (149°F))	Certified staff Application of the described coating system should be carried out by certified personnel.	
16000	Outside pipe diameter (mils)	2.375 – 100.000 (DN50 – DN2500)		
17	Sleeve width (in) (Sw)	17 (17.75" or 450 mm)* 20 (20.25" or 514 mm)* 24 (23.50" or 600 mm)*		
/B	Product thickness	/B /C		
UNI	Designates pre-attached closure patch	Optional		
			* nominal width	
Roll form (closure patch to be ordered separately)				
Example	HTLP60-HP-20X100/C-RL			
	Designation	Standard ordering options		
60	Operating temperature (°C)	60 (=65°C (149°F))		
20	Roll width (in) (Sw)	17 (17.75" or 450 mm)* 20 (20.25" or 514 mm)* 24 (23.50" or 600 mm)*		
100	Roll length (ft) (SI)	100 ft (= 30 m)		
/C	Product thickness	/B /C		
			* nominal width	
Closure patches (to be ordered separately)				
Example	WPCP-IV-4X17			
	Designation	Standard ordering options		
4	Patch width (in) (Pw)	4 (100 mm) 6 (150 mm) 8 (200 mm)		
17	Patch length (in) (Pl)	17 (17.75" or 450 mm)* 20 (20.25" or 514 mm)* 24 (23.50" or 600 mm)*		
			* nominal width	

Sleeve cut lengths and appropriate closure patch widths depend on the pipe size and product construction, see latest application AT-GIRTHWELD.

For proper product installation, see latest installation instruction.



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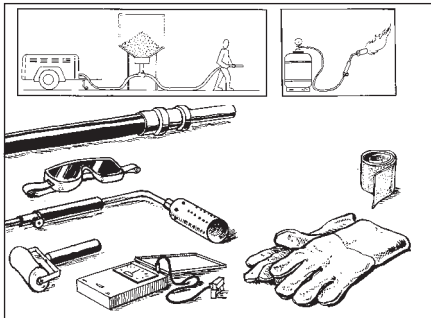
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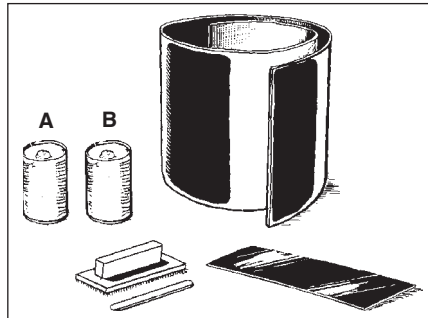
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Materials and equipment

1. Appropriate size HTLP60 sleeve and WPCP-IV closure, S1239 epoxy primer either in small or bulk kits, with the appropriate epoxy pump, mixing sticks, approved applicator pad, protective gloves.
2. Torch
3. Propane tank with recommended regulator, hose and gauge.
4. Contact pyrometer
5. Siliconized hand roller (straight)
6. Calibrated epoxy pumps (if applicable)
7. Standard safety equipment such as gloves, goggles, hard hat, etc.
8. For larger jobs epoxy primer can be supplied in bulk kits.

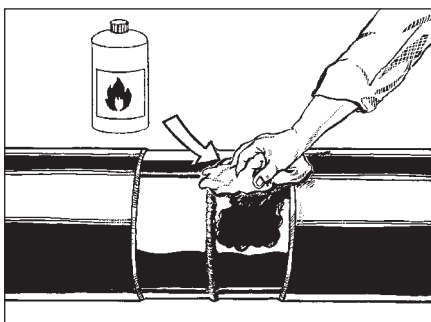


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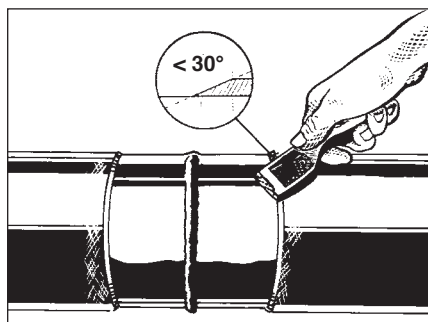
Installation must be done according to local regulations and usual safety precautions.

This installation instruction is intended for the HTLP60 system to be installed on pipes coated with fusion bonded epoxy (FBE), coal tar enamel (CTE), 2 or 3 layer PE.

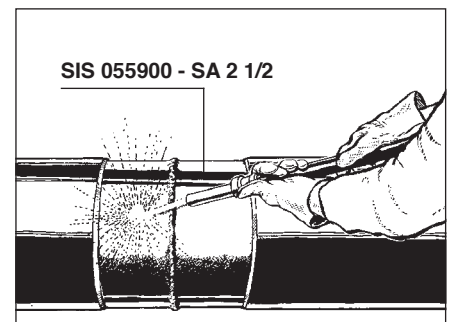
For the selection of joint protection materials for other pipe coatings, see product selection guide or contact the nearest Sales Office.



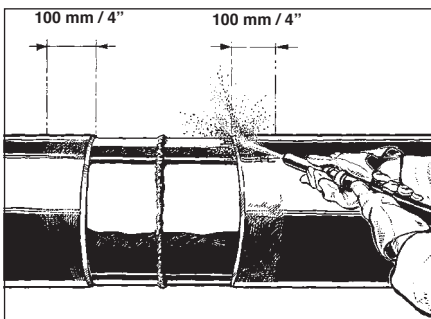
1. Clean exposed steel and adjacent pipe coating to be covered by HTLP60 sleeve. Remove all contaminants such as oil. Use a solvent that contains no grease or oil type materials.



2. 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 off and the coating edge has to be beveled again. To avoid possible contamination, it is recommended to use a scraper.

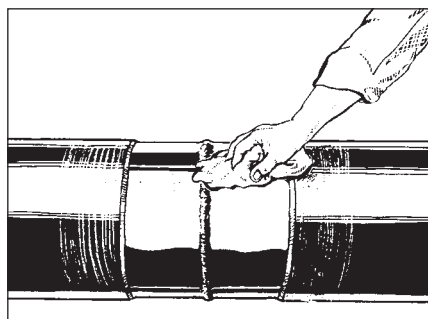


3. Grid blast or sand blast the steel surface to remove loose and foreign materials. The surface should be cleaned to SIS 055900 - SA 2 1/2.



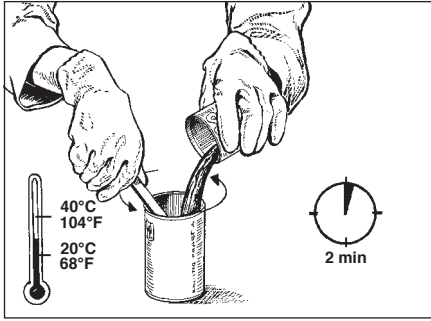
4. Grid or sand blast the adjacent pipe coating over a distance of at least 100 mm (4"). The total width should be approximately 50 mm (2") larger than the width of the HTLP60 sleeve.

Note: prior to blasting, it is recommended to preheat the exposed steel to 40 - 50° C (104 - 122°F) to avoid flash rust formation.



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

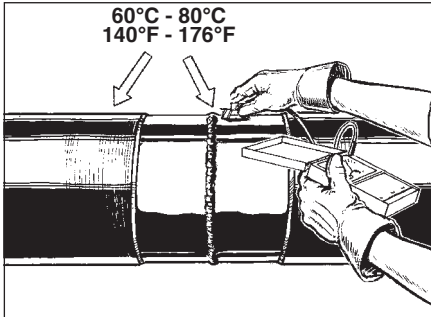
HTLP 60



6. 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. **Using small epoxy primer kits.** Open cans A and B, pour all contents of can B into can A. Stir thoroughly the mixed epoxy for 1 minute. After use 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.



8. Check the preheating temperature with a contact pyrometer or an indicator strip. Certain temperature markers can cause contamination and therefore their use should be avoided.

For easy mixing and dispensing, the epoxy primer should be used at a temperature of min. 18° C (64°F). When necessary, keep the epoxy primer at a heated place or use an epoxy heater.

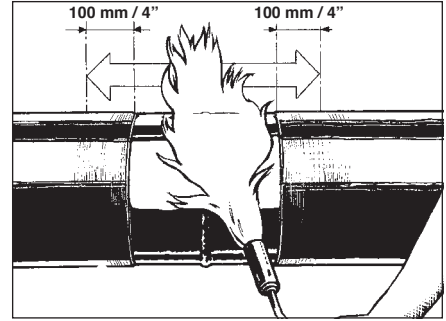
Using bulk epoxy primer kits.

Bulk epoxy primer should be used at a minimum of 18°C (64°F), if not keep it in a heated place or use the epoxy primer heater. Attach the precalibrated epoxy pump A to drum A, and pump B to drum B. Pump B has a pre-installed spacing ring.

The correct mix ratio is obtained with one full stroke of A and one full stroke of B. This will dispense a mixture that has two parts of A and one part of B by volume.

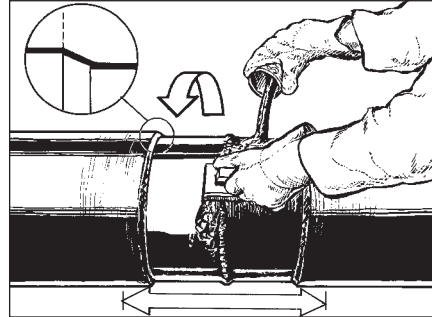
Refer to epoxy installation instructions, additional information is available upon request. After use follow local regulations for safe disposal.

IMPORTANT: Always use one stroke of A and one stroke of B to get the correct mix ratio of two parts A and one part B by volume.



7. Adjust the torch to a yellow topped blue flame of approximately 500 mm (20") long. Preheat the steel and the adjacent pipe coating to 60° C (140°F) minimum, 80° C (176°F) maximum. Preheating of the surface reduces the installation time and ensures proper bonding.

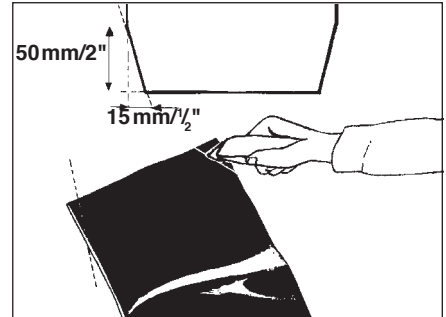
Make sure that all necessary items including mixed epoxy primer are in close proximity before starting preheating. In bad weather conditions, use proper shielding such as a wind shield in windy conditions or a well ventilated tent in the case of rain.



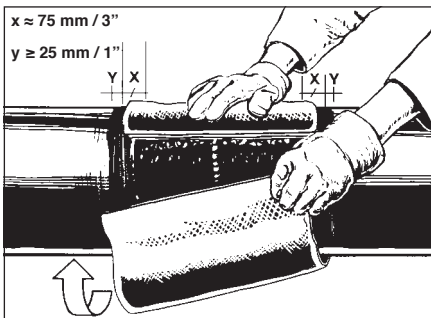
9. Immediately after preheating, apply the mixed epoxy primer to the bare steel and the adjacent pipe coating using an applicator pad.

The total width of the primer should be 50 mm larger than the width of the HTLP60 heat shrinkable sleeve.

Visually check the surface and ensure all bare steel and line coating is covered by the epoxy primer.



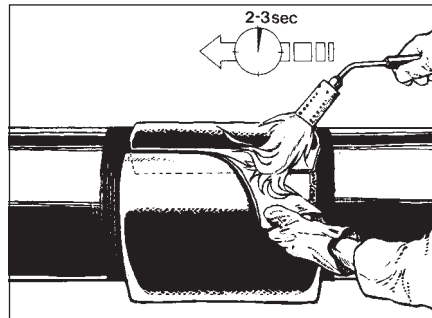
10. If not factory cut, cut the corners of the underlying end of the sleeve to approximately 15 mm x 50 mm (1/2"x2").



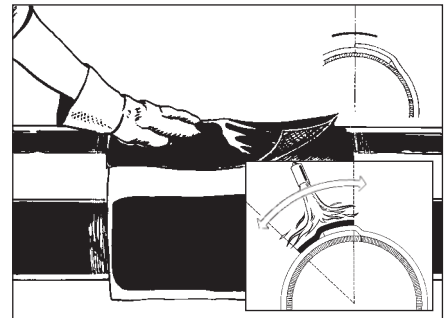
11. Immediately after the application of the epoxy primer, and while the epoxy primer is still wet, loosely wrap the HTLP60 sleeve centrally around the welded joint.

The edge of the sleeve with the trimmed corners should be on the pipe first. The sleeve should overlap in the 10 to 2 o'clock position and the overlap of the sleeve onto itself should be at least 50 mm (2").

The sleeve should be wrapped around the joint leaving a gap of minimum 25 mm (1") between the bottom of the pipe joint and the sleeve.



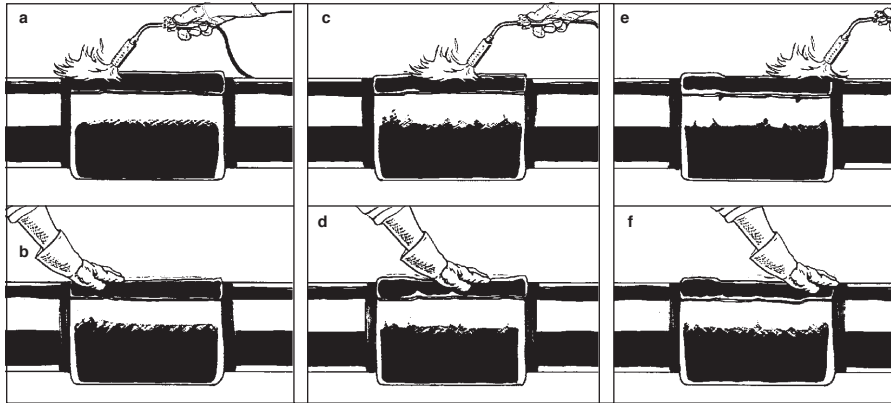
12. Gently heat the inside of the overlapping sleeve edge and press down onto the opposite sleeve and with a gloved hand.



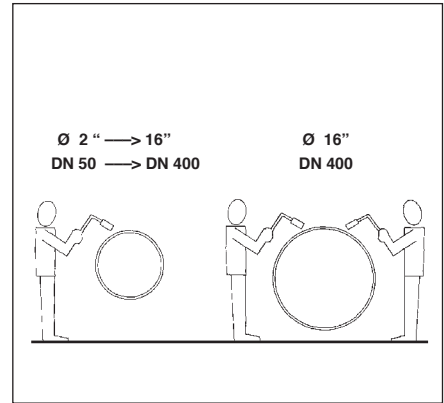
13. Heat the inside of the closure patch for 1 - 2 seconds. Position it evenly over the edge of the heat shrinkable sleeve. Press it down firmly.

In case of a factory supplied pre-attached closure patch, this step is not necessary. Only heat the patch material and maximum one inch of the heat shrinkable sleeve on both sides of the patch.

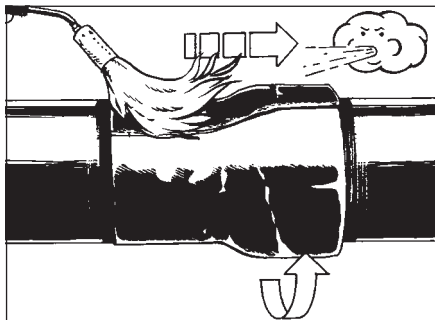
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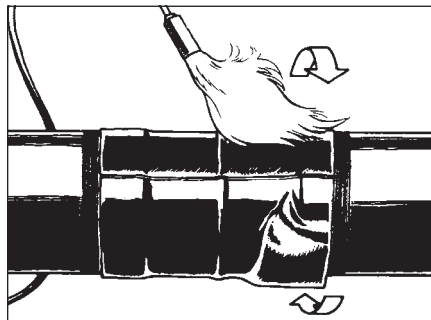
14. Start heating the closure patch from one side and slowly move to the other side while pressing down with a gloved hand to ensure good bonding and eliminate air entrapment. During and after the heating, the fabric reinforcement becomes visible as an indication that the closure patch has been heated to the minimum required temperature.



15. For sleeves for pipes of 400 mm (16") diameter and larger, two installers are recommended.



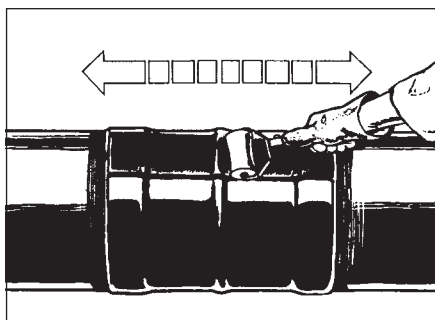
16. Begin heating at the center of the sleeve and heat circumferentially around the pipe using a constant paintbrush motion. Continue heating towards one end of the sleeve, followed by the other. While heating, the embossed or dimpled pattern on the sheet surface should change to a smooth surface. In case of strong wind, begin heating the sleeve from one end of the sleeve, opposite to the wind and heat circumferentially around the pipe, using a constant paintbrush motion. The flame should not be held perpendicular to the sleeve but should be directed towards the shrinking direction.



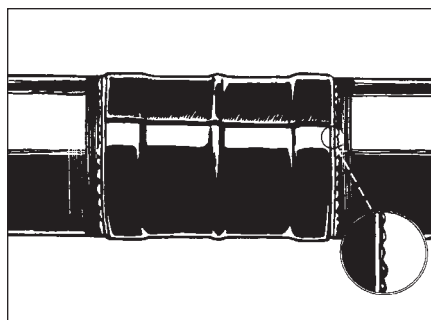
17. Continue heating towards the other end of the sleeve. Ensure that the total sleeve has been heated evenly and has completely shrunk tightly around the pipe.



18. During shrinkdown, occasionally check adhesive flow with finger. Wrinkles should disappear automatically.



19. Possible air entrapments can be reduced to the maximum by post rolling of the sleeve. Immediately after the sleeve has been shrunk onto the joint area and while the sleeve is still hot and soft, roll the entire sleeve with a segmented roller. Start rolling from the weld bead towards the sides forcing possible air enclosures out of the sleeve. Special attention should be given to the longitudinal and circumferential weld bead, the transition of the mill coating and the patch area. If necessary, areas may be reheated to roll out air.



20. The sleeve is fully recovered when all of the following have occurred :

- 1) The sleeve has fully conformed to the pipe and adjacent coating.
- 2) There are no cold spots or dimples on the sleeve surface.
- 3) Weld bead profile can be seen through the sleeve.
- 4) After sleeve is cool, adhesive flow is evident on both edges.
- 5) The pattern on the backing has disappeared and the backing has a smooth surface.