



**INSTALLATION  
GUIDE AND CHECKLIST**

**CLOCK SPRING® COIL PASS METHOD**

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## REPAIR INFORMATION

### General Data

Date: \_\_\_\_\_

Repair ID #: \_\_\_\_\_

Clock Spring Serial #: \_\_\_\_\_

**Adhesive** Lot #: \_\_\_\_\_

Activator Batch #: \_\_\_\_\_

(Blue)

Expiry Date: \_\_\_\_\_

**Filler** Lot #: \_\_\_\_\_

Activator Batch #: \_\_\_\_\_

(Salmon)

Expiry Date: \_\_\_\_\_

Pipe Temperature: \_\_\_\_\_

Ambient Temperature: \_\_\_\_\_

### Pipeline Data

Location: \_\_\_\_\_

Pipe Diameter: \_\_\_\_\_

Wall Thickness: \_\_\_\_\_

Pipe Grade: \_\_\_\_\_

Pipe Type: \_\_\_\_\_

(ERW, DSAW, EFW, Seamless, Etc.)

Operating Pressure: \_\_\_\_\_

Installation Pressure: \_\_\_\_\_

Coating Type: \_\_\_\_\_

### Defect Data

Defect Type: \_\_\_\_\_

Defect Dimensions: \_\_\_\_\_

(Length, Width, Depth)





# INSPECTION CHECKLIST

The following items should be verified by Pipeline Inspectors not participating in the Clock Spring installation, to confirm that key aspects are being completed.

## Pre-Installation Inspection

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- Repair Information is recorded correctly on the form provided in the Installation Guide.
- Adhesive and filler are within expiry dates.
- Surface preparation of the repair area meets NACE #3 standards or equivalent.
- Ambient and pipe surface temperature are recorded correctly.
- Installation guidance marks are made to ensure a 2-inch (50 mm) margin beyond either side of the defect.
- Pipe condensation is removed as needed using acetone and contact spray at the defect location.



## INSPECTION CHECKLIST (CONT.)

### Installation Inspection

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- Appropriate amount of activator is mixed with adhesive and filler materials.
- Filler layer in defect area, along longitudinal seam, and leading edge of the starter pad is adequate. (Filler should extend at least 2 inches (50 mm) above and below longitudinal seam, the entire distance between installation guidance marks.)
- Sufficient adhesive coverage is applied to the entire pipe surface, filler layer, and starting pad.
- Installers continuously confirm adequate adhesive application on the bottom quadrant of the pipe.
- Installers continuously confirm good Clock Spring sleeve fit to the pipe at the 6 o'clock position.
- Adequate adhesive coverage is applied to the Clock Spring laminate as wrapping progresses.



## INSPECTION CHECKLIST (CONT.)

### Sleeve Tightening

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- Velcro strap on cinch bar is in good condition.
- Steady pressure is applied throughout tightening.
- Leading edge has not pulled away from starter pad causing the coil to spin.

### Completion Inspection

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- Installers remove extruded filler and adhesive from both edges of the Clock Spring.
- Installers should verify there are no gaps or voids between wraps or between pipe and sleeve.
- After adhesive has cured, verify hardness with either durometer (40 Shore A) or thumbnail print.
- Metallic marker bands are placed upstream and downstream of the repair area, if desired.
- Repair is coated as a standard repair. Opaque coating is used for aboveground piping.



## CLOCK SPRING KIT CONTENTS

1. Clock Spring Sleeve
2. Accessory Kit
3. Adhesive
4. Adhesive Activator (Blue)
5. Filler
6. Filler Activator (Orange)



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## MINIMUM PPE

The following list is the recommended minimum PPE while installing Clock Spring. It is not intended to supersede installer or site requirements.

1. Safety Glasses
2. Hard Hat
3. Steel-toed Boots
4. Rubber Gloves
5. Disposable VOC Mask (optional)
6. TYVEK Suit (optional)

### REQUIRED



### OPTIONAL



## PREPARE PIPE SURFACE

1. In the event of adverse weather conditions cover the repair area, if necessary.

For severe weather conditions or if condensation persists on the pipe surface, refer to the Clock Spring Training Manual or contact Clock Spring Company, L.P., for assistance.

2. Remove pipe coating, corrosion residue, primer, and adhesive by sandblasting or grit blasting from an area extending 4 to 6 inches (102 to 152 mm) from either side of the area to be repaired.



3. If the area cannot be sandblasted, use a hand grinder with a 24 to 80 grit disk. Wire brushing is not recommended. Confirm pipe surface meets NACE #3 standards or equivalent.



## PREPARE PIPE SURFACE (CONT.)

4. Wipe repair surface with MEK or Acetone. Do not use any other type of solvent during these repairs. Handle these highly flammable liquids with care, per their material safety data sheets.
5. Dry-apply 2 to 3 wraps of the Clock Spring sleeve(s), centered over the repair area with at least 2 inches (50 mm) on either side of the defect. Mark the sleeve edges for future reference and remove the sleeve(s).



## INSTALL CLOCK SPRING SLEEVE

1. Attach the starter pad, centered within the marked repair area and 4 to 6 inches (102 to 152 mm) from the primary defect area, with the “easy peel” end toward the ground. Do not remove the second peel layer yet.



### TRAINER TIP:

**Place starter pad on the pipe before mixing chemicals. Mixing chemicals should be the last step before the repair.**

2. For deformation defects or extensive cluster corrosion, refer to the Clock Spring Training Manual for single wrap mold instructions.



## INSTALL CLOCK SPRING SLEEVE (CONT.)

- Knead filler packet and both activator packets with thumbs to soften.
- Determine the correct amount of activator to use for the filler and adhesive, based on the chart found on the filler packet, the adhesive quantity chart below, and the higher temperature measured (ambient or pipe surface).

Installation Temperature		Adhesive Quantity (grams)					Approximate	
		650	1200	1700	2400	3000	Working Time (minutes)	Cure Time (hours)
°C	°F	Activator Quantity (grams)						
0	32	80	150	215	300	380	45	2.5 - 3
10	50	65	120	180	245	310	45	2.5 - 3
21	70	50	95	160	190	240	45	2.5 - 3
27	80	40	75	105	145	180	45	2.5 - 3
32	90	35	70	100	135	170	35	2 - 2.5
38	100	35	60	100	120	150	23	1.5 - 2
43	110	35	60	100	120	150	22	1.5 - 2
49	120	35	60	100	120	150	21	1.5 - 2



## INSTALL CLOCK SPRING SLEEVE (CONT.)

5. On a flat surface, such as cardboard scrap, squeeze out the tube of filler and mix with the orange activator until uniform in color, with no streaks (approximately 2 to 3 minutes).



**Partially Mixed**



**Completely Mixed**



## INSTALL CLOCK SPRING SLEEVE (CONT.)

6. Premix the adhesive, then mix with the blue activator until uniform in color, with no streaks, following the guideline below.

Premix adhesive  
in can for  
**30** seconds.

Add activator  
and mix for  
**60** seconds.

Scrape sides  
and mix for  
**90** seconds.



**Partially Mixed**



**Completely Mixed**



## INSTALL CLOCK SPRING SLEEVE (CONT.)

7. If pipe coating in the area contains zinc or coal tar, apply a small sample of the adhesive to verify the repair surface is adequately cleaned. If the adhesive changes from **blue to green**, the area needs to be cleaned again, or adhesive will not cure properly.

Working time begins once activator is mixed. For more detailed mixing instructions and cleanup, disposal, and storage requirements for these materials, see the Clock Spring Training Manual.





## INSTALL CLOCK SPRING SLEEVE (CONT.)

8. Use the putty knife to generously apply and compress filler into all voids, along both edges of the longitudinal weld, and to the edge of the starter pad.
9. Confirm that filler extends a few inches beyond the starter pad edge and at least 2 inches (50mm) above and below the longitudinal seam.



### TRAINER TIP:

**You can never use too much filler.**



## INSTALL CLOCK SPRING SLEEVE (CONT.)

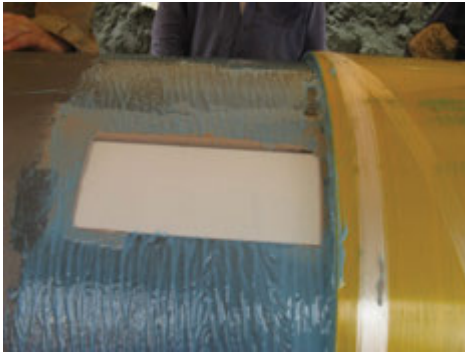
10. Pour adhesive mixture into the application tray.
11. Use the roller to apply adhesive to the entire pipe surface to be repaired, including starter pad and filler material.



 **TRAINER TIP:**  
Always roll adhesive in a  
downward direction.

## INSTALL CLOCK SPRING SLEEVE (CONT.)

12. Remove the top peel layer from the starter pad.



13. Secure the leading edge of the Clock Spring sleeve to the starter pad.

14. Firmly press the sleeve onto the starter pad and check it is anchored to the pipe.



### TRAINER TIP:

**After attaching leading edge to the starter pad, have the second installer firmly pull the coil from the other side to make sure it stuck to the starter pad.**



## INSTALL CLOCK SPRING SLEEVE (CONT.)

15. Make sure the sides of the sleeve are aligned with the reference marks created earlier.
16. Make sure there is enough filler along the sleeve's leading edge to ensure a solid connection with the second layer of Clock Spring.



## INSTALL CLOCK SPRING SLEEVE (CONT.)

17. Apply adhesive to the Clock Spring outer surface while wrapping the sleeve around the pipe.



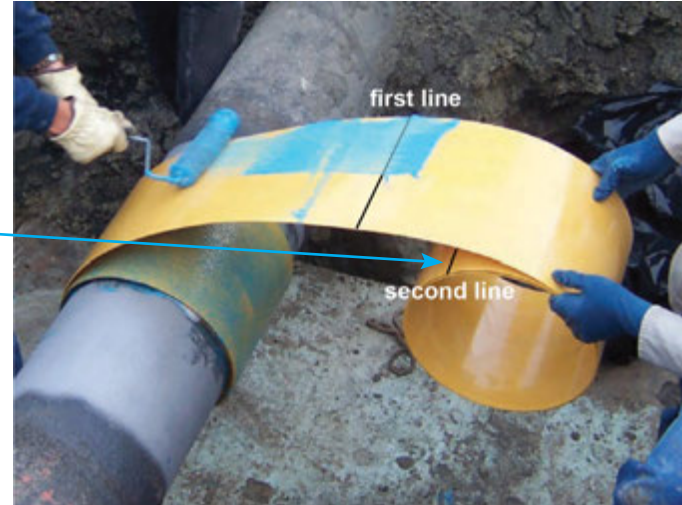
## INSTALL CLOCK SPRING SLEEVE (CONT.)

18. Continue wrapping the Clock Spring sleeve around the pipe and applying adhesive until the **second** black identifying line appears.



### TRAINER TIP:

Apply adhesive 1 inch (25 mm)  
beyond this second black line.



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## INSTALL CLOCK SPRING SLEEVE (CONT.)

19. Carefully position the final layer of sleeve around the pipe.
20. Align the edges of the sleeves using wooden blocks.



### TRAINER TIP:

**If the coil is misaligned use a rubber mallet and tap the wooden blocks along the coil's edge.**



## TIGHTEN CLOCK SPRING SLEEVE

1. Center the Velcro strip 6 to 12 inches (152 to 304 mm) from the trailing edge of the Clock Spring sleeve.
2. Secure cinch bar strap to the Velcro strip.



### TRAINER TIP:

**Use your rubber mallet or clean side of the wooden block to lock in the Velcro.**



### TRAINER TIP:

**Before attaching the cinch bar the strap length can be adjusted as required.**

3. Position the cinch bar.





## TIGHTEN CLOCK SPRING SLEEVE (CONT.)

4. Apply steady pressure of about 80 to 100 ft lbs (11 to 14 kg m).
5. Hold for about 1 minute, until excess material extrudes from the Clock Spring edges.
6. Maintain pressure and have your partner wrap filament tape around the sleeve at least 5 times, approximately 1 inch (25 mm) in from each edge.



## COMPLETE INSTALLATION

1. Remove extruded filler and adhesive from both edges of the sleeve using the putty knife.
2. Visually inspect the installation to ensure wraps are tight and fit snugly around the entire pipe circumference, with no voids or spaces between wraps, or between sleeve and pipe.



## COMPLETE INSTALLATION (CONT.)

3. Wait approximately 2 hours for adhesive to cure.
4. Check for a minimum hardness of 40 on the Shore A scale. Clock Spring must be removed if adhesive is not hard enough. If a hardness tester is not available, it is adequate to verify that a thumbnail does not leave an indentation.
5. Treat the repaired area with external coating, just like a standard pipe repair. Clock Spring is UV sensitive; coating applied to aboveground pipe repairs must be opaque.
6. If desired, fit metallic bands upstream and downstream of the repair to allow detection by magnetic flux leakage inspection tools. Refer to the Marker Band Installation Manual for detailed instructions.



### TRAINER TIP:

**No special coating is needed on the coil.**





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