CLOCK SPRING®

INSTALLER TEST

Applicant: _____Date: _____
Company: _____Location: _____
Mailing Address:_____
_____
Evaluation for: □ Installer Certification □ Installer Re-Certification
Phone Number:_____SSN_____
Training Instructor:_____

1. Applicant must have received instructions on installation procedures by a certified trainer and have completed "hands-on" training with a certified trainer to be eligible to take the written examination.

2. Revalidation of installer certification is required annually (any 12 month period) from last certification. Revalidation may be accomplished by: (i) written examination or (ii) training refresher course with associated costs.

3. All written reference information (installation manuals, notes, specification sheets, etc.) may be used by the applicant during the examination.

4. Mail or fax examination for scoring to:

   Clock Spring Company, L.P.
   14107 Interdrive West
   Houston, TX 77032
   Fax: 281-590-9528

5. A minimum score of 80% is required in order to attain certification or re-certification.

NOTE: The references to Clock Spring shall be abbreviated as "C/S".

True or False

T	F	Only certified installers may instill C/S for pipe repair?
T	F	The C/S system may be used to repair pipe with up to 80% wall loss subject to GRI Wrap?
T	F	The C/S system may be used to repair defects associated with general corrosion, dents and gouges?
T	F	The C/S system can be used to repair cracks?
T	F	The C/S system may be installed over any type of pipe coating?
T	F	To repair dents and gouges, all sharp edges must be removed?
T	F	A coal tar coating helps to cure the C/S adhesive?
T	F	Gasoline or diesel fuel may be used as a solvent?

T F The C/S must extend a minimum of 2” beyond both sides of the defect area?

T F The C/S system is a permanent repair for external defects with up to 80% wall loss?

Multiple Choice

1. Which application is **NOT** suitable for the use of C/S?

    A. General Corrosion defects (80% max. through wall defect)
    B. “Blunt” mechanical defects
    C. Sharp gouges
    D. Girth weld zone repair
    E. Defects associate with bends & elbows with centerline radius curvature ≥3D

2. The key steps to a proper C/S installation are:

    A. Pipe preparation
    B. Applying filler to the defect, all tented areas and the leading edge of the starter pad
    C. Putting on plenty of adhesive
    D. Attaching the C/S to starter pad and aligning the edges of the C/S
    E. Tightening down the C/S
    F. Sealing all edges
    G. All of the above
    H. A & B
    I. C, D & E

3. Which of the following defect type(s) are permanently repairable with C/S?

    A. Internal
    B. External
    C. Both

4. After the C/S is installed, the pipe will be restored to _____of original strength in the repair zone.

    A. less than 80%
    B. 80%
    C. at least 100%

5. _____defects that are repaired with C/S are considered to be temporary.

    A. Internal
    B. External

6. _____is the standard for the degree of cleanliness for the pipe preparation.

    A. Thumbnail test & anchor pattern
    B. NACE #3 & an anchor pattern
    C. NACE #1
    D. Wipe with acetone

7. If you can not sandblast, which of the following is recommended to prepare the pipe for a C/S installation?

    A. A hand grinder with 24-80 grit sandpaper or disk and solvent wipe with Acetone or MEK
    B. Burn coating with gasoline
    C. Only wire brush pipe surface
    D. Cut coating off with a knife and solvent wipe with Acetone or MEK
    E. None of the above

8. Coal tar may be used as a coating after the C/S adhesive has cured.

    A. True
    B. False

9. If the existing pipe coating is fusion bonded epoxy, just abrade with sandpaper and solvent wipe with Acetone or MEK before applying the C/S.

    A. True
    B. False

10. The adhesive kits and filler kits are provided in pre-portioned quantities with the quantity dependent on the size of the C/S to be installed.

    A. True
    B. False

11. To determine the quantity of activator to mix with the adhesive and filler, the following information is required.

    A. The type of existing pipe coating
    B. The relative humidity
    C. The ambient and pipe temperature
    D. None of the above

12. Prior to sealing the edges of the C/S with adhesive, all excess filler must be removed.

    A. True
    B. False

13. The C/S adhesive will typically cure in approximately _____ hour(s).

    A. ½
    B. 1
    C. 1-1/2
    D. 2

14. To determine if the adhesive cure is sufficient for applying a pipe coating, the adhesive must reach a minimum hardness of_____.

    A. 40 on a Shore A scale
    B. 60 on a Shore A scale
    C. 80 on a Shore A scale
    D. Granite

15. When installing multiple C/S's on a straight section of pipe, the maximum gap allowed between C/S's is _____inch (es).

    A. ¼
    B. ½
    C. 1
    D. 2

16. When repairing corrosion associated with a girth weld, the following method(s) are acceptable:

    A. Grinding off the weld cap and installing a standard 8-wrap C/S according to standard procedures
    B. Apply a 4-wrap C/S on both sides of the weld, mold filler over the weld, then install a standard 8-wrap C/S centered over the weld
    C. Apply a standard 8-wrap C/S on both sides of the weld, mold filler over the weld, then install a standard 8-wrap C/S centered over the weld.
    D. All of the above
    E. A & B
    F. A & C

17. Cracks in the girth weld may be repaired with C/S.

    A. True
    B. False

18. When repairing corrosion associated with a girth weld, the following limits apply:

    A. Defect depth must not exceed 50% wall loss and may only encompass 30% of the pipe circumference
    B. Defect depth must not exceed 50% wall loss and may only encompass 50% of the pipe circumference
    C. Defect depth must not exceed 80% wall loss and may only encompass 50% of the pipe circumference
    D. None of the above

19. Single wrap molds should be used to mold the filler over the girth weld

    A. True
    B. False

20. When making a bend repair, install the first unit in the middle of the defect and work outwards.

    A. True
    B. False

21. When making a bend repair, the maximum gap allowed on the outside of the bend (extrados) between C/S's is _____ inch(s).

    A. ¼
    B. ½
    C. ¾
    D. 1

22. When making a bend repair, additional filler should be ordered and the material must be applied to both the inside and outside of the bend.

    A. True
    B. False

23. A standard width C/S can be used to repair any type of bend regardless of the bend radius.

    A. True
    B. False

24. What is "edge effect"?

    A. The nervousness experienced by the installer
    B. The re-enforcement provided by the C/S extends beyond the physical edge of the C/S
    C. The pipe section immediately beyond the physical edge of the C/S is weaker than any other section of the pipe
    D. All of the above

25. The C/S filler material is_____.

    A. Easily substituted with "Bondo" putty
    B. A high compressive material
    C. Placed in the defect areas, all tented areas and on the leading edge of the starter pad.
    D. A load transfer material which will, when cured, provide a load transfer path to the C/S
    E. All of the Above
    F. B, C & D

26. The C/S restores the _____ of the pipe.

    A. Axial Strength
    B. Compressive Strength
    C. “Hoop” Strength

27. When dealing with condensing pipe, the following step(s) should be taken:

    A. Solvent wipe pipe surface, allow solvent to flash and quickly attach starter pad **or** use contact spray adhesive, then proceed with attaching the starter pad
    B. After attaching the starter pad, solvent wipe the pipe surface prior to applying adhesive
    C. A & B

28. When cold temperatures exist and frost is present on the pipe surface, the following step(s) should be taken:

    A. Adjust activator quantity per charts for the adhesive and filler
    B. Solvent wipe pipe surface, allow solvent to flash and quickly attach starter pad **or** use contact spray adhesive, then proceed with attaching the starter pad
    C. After attaching the starter pad, solvent wipe the pipe surface prior to applying adhesive
    D. All of the above

29. A pipe coating is recommended on the outside of a cured C/S.

    A. True
    B. False

30. The only two solvents allowed during pipe preparation & ancillary cleaning of the C/S are:
    A. MEK and Gasoline
    B. Diesel fuel and Acetone
    C. MEK and Acetone