

NAPCA Bulletin 3-67-94

EXTERNAL APPLICATION PROCEDURES FOR HOT APPLIED COAL TAR COATINGS TO STEEL PIPE.

1. **General**

- a. These specifications may be used in whole or in part by anyone without prejudice, if recognition of the source is included. The National Association of Pipe Coating Applicators (NAPCA) assumes no responsibility for the interpretation or use of these specifications.
- b. The intended use of these coatings is to provide corrosion protection for buried pipelines. Above ground storage of coated pipe in excess of 6 months without additional Ultraviolet protection is not recommended.
- c. The following definitions apply:
 - i. Applicator - The contractor who applies the coating to the pipe.
 - ii. Company - The purchaser of the coated pipe or the entity for whom the Applicator coats the pipe.
 - iii. SSPC - The Steel Structures Painting Council.
 - iv. NACE - NACE International.
 - v. Manufacturer - The company that makes the coating materials which are applied to the pipe.
- d. The Company, when placing orders, shall specify his requirements by referring to the applicable specification symbol in NAPCA Specification Designation for Enamel Coating 1-65-94.

2. **Scope**

- a. The Applicator shall furnish all labor, equipment and material required, shall prepare all surfaces to be coated and shall apply the coating to all surfaces to be coated.
- b. Corrosion protection, as provided under this specification, is furnished by the application of hot applied enamel to the exterior of pipe to be placed underground. The Company shall specify the reinforcement or wrapper material by referring to the applicable NAPCA specification symbol in Bulletin 1-65-94 and, where desired, the Company may define the exact wrapper to be used.

3. **Pipe Conditions**

- a. Pipe delivered to the Applicator for coating shall be free of protective oils, lacquers, mill primer, dirt or any other deleterious surface contamination which may affect the application of the coating. The pipe surface shall be as free as possible from scabs, slivers and laminations.
- b. Any paint markings or stenciling of the pipe surface shall be of the type and thickness that can be removed easily during normal surface preparation.

4. **Handling of Bare Pipe**

- a. Proper equipment for unloading, handling, and temporary storage of bare pipe shall be

- used to avoid any damage to the pipe or pipe ends.
- b. If internally coated pipe is received at the Applicator's plant, care shall be taken to avoid damage to the internal coating or the obliteration of the internal pipe markings during any phases of work covered by this specification. Internal coatings must be capable of withstanding the processing conditions necessary for the application of the external coating.
 - c. The Applicator shall visibly inspect the pipe upon receipt for damage such as dents, flat ends, and bevel damage. Any damage observed at this point shall be noted on the inbound tally, and the Company shall be informed within 24 hours of receipt of the pipe. Any non-visible defects such as slivers, scabs, laminations, burrs, dents, etc. will be observed after the pipe is blast cleaned and at the Company's request, removed as an extra work item.

5. Material and Workmanship

- a. All material furnished by the Applicator shall be of the specified quality. All work shall be done in a thorough workmanlike manner. The entire operation of pipe receiving, stockpiling, surface preparation, coating application, storage and loadout shall be performed under the supervision of and by experienced personnel skilled in the application of protective coating.

6. Equipment

- a. The Applicator's equipment shall be in such condition as to permit the Applicator to follow the procedure and obtain results prescribed in these specifications.

7. Coating Material

- a. All coating materials, including repair or patch materials, purchased or used under these specifications, shall be packaged in suitable and approved containers. The containers shall be plainly marked with the name of the Manufacturer, type of material and batch or lot number where applicable. Bulk shipments shall be allowed provided the above information is included in the bill of lading.
- b. The coating material shall be packaged in containers suitable to keep the contents clean and dry during handling, shipping and storage. Storage and handling conditions shall be in accordance with the Manufacturer's recommendations.
- c. Precautions shall be taken during the handling, shipping and storage of all materials to prevent damage to the containers that would result in contamination of the coating materials. All contaminated, or otherwise damaged materials shall be discarded.

8. Surface Preparation

- a. Before blasting, all oil, grease, mill lacquer and other deleterious material on the surfaces of the metal to be coated shall be removed by suitable means.
- b. In cold weather or any time when moisture tends to collect on the steel, the pipe shall be uniformly warmed for sufficient time to dry the pipe prior to cleaning. The pipe temperatures shall be maintained at least 5 degrees F above the dew point during the cleaning and coating operations. Pipe temperature shall not exceed 160 degrees F as a result of preheat.
- c. Pipe surfaces shall be blast cleaned to a Commercial Blast metal finish in accordance

with SSPC-SP-6 or NACE #3 requirements.

- d. NACE, Swedish Pictorial, SSPC or other mutually agreed upon standards shall be used to judge the degree of cleaning.
- e. A consistent abrasive working mix shall be maintained by frequent additions of small quantities of new abrasive commensurate with consumption. Infrequent large quantity additions of abrasive shall be avoided.
- f. Following cleaning and prior to coating the pipe, abrasive remaining on the outside and loose contamination on the inside of the pipe shall be removed by air blast, vacuum or other suitable methods. If air is used, the air should be dry and free of contaminants, and all particles removed from the surface shall be collected in such a manner as not to contaminate clean pipe.
- g. Following cleaning and prior to coating, the pipe surface shall be inspected for adequate cleaning and surface condition. Pipe not properly cleaned shall be rejected and re-cleaned.
- h. Blast cleaned pipe surfaces shall be protected from conditions that would allow the pipe to flash rust before coating. If flash rusting occurs, affected pipe shall be re-cleaned.

9. **Priming**

- a. Immediately after cleaning, all blasted surfaces shall be free of dust, grit and other foreign material and shall be primed by brushing, spraying or other suitable means to produce an effective bond between the metal and subsequent coating. No primer shall be applied to a wet surface.
- b. The use of primer that becomes contaminated with foreign substances or has thickened through evaporation of the solvents shall not be permitted.
- c. The minimum and maximum allowable drying time of the primer between application of primer and application of the coating shall be in accordance with instructions issued by the Manufacturer of the primer. If the coating is not applied within the maximum allowable time after priming as required, the pipe shall be re-cleaned and reprimed.
- d. After application, the primer coat shall be uniform and free from floods, runs, sags, drips or bare spots. Any bare spots shall be reprimed. All runs, sags, floods or drips shall be removed by brushing or scraping and the bare areas, if any, shall be retouched. Suitable measures shall be taken to protect wet primer from contact with moisture, dust or other foreign matter.

10. **Coating Application**

- a. Coating materials may be delivered in hot bulk or solid forms. The coating shall be heated in approved heating kettles equipped with accurate and easily read thermometers, mechanically agitated, and covered with proper lids.
- b. The coating shall be maintained moisture and dirt free at all times prior to and at the time of heating and application.
- c. The coating shall be loaded into the kettles in pieces of suitable size for the melting equipment used. When the Applicator receives hot material in bulk, the holding kettles shall be operated in accordance with the Manufacturer's instructions.
- d. In heating the coating material, the charge will be melted and brought to application temperature without injury to the coating material. The temperature of application shall not exceed that which is recommended by the Manufacturer.

- e. The primed pipe surface shall be dry and clean at the time the coating is applied.
- f. External coating shall be applied by spraying, flooding, or pouring in such a manner as to maintain the specified thickness. The coating shall overlap the preceding spiral, producing a continuous coat free from defects. The thickness of the coating shall be as specified in NAPCA Specification Designation for Enamel Coating 1-65-94.
- g. If specified, the fiberglass innerwrap shall be of uniform width for spiral application. It shall be applied simultaneously with coating at a nominal lap of 1/2-inch and a minimum lap of 1/4-inch. All fibers shall be completely covered. Sufficient tension shall be applied to the glass to embed it in the outer 1/2 of the coating. Fiberglass shall meet the specifications of NAPCA Bulletin 5-69-94, Table 1.
- h. If specified, the pipeline felt shall be applied mechanically to the pipe so as to be positively bonded to the coating. It shall be of uniform width for spiral application. It shall be applied neatly and smoothly with a nominal lap of 1/2-inch and a minimum lap of 1/4-inch and shall be free of wrinkles and buckles. Pipeline felt shall meet the specifications of NAPCA Bulletin 5-69-94, Table 2.
- i. Unless otherwise specified, a spiral wrapping of heavy kraft paper shall be applied over the coating surface prior to final inspection.
- j. Other outerwraps specified shall be applied in accordance with the Manufacturer's specifications. Refer to the specifications in NAPCA Bulletin 5-69-94, Table 3 for some common outerwraps.

11. **Inspection and Testing**

- a. The entire procedure of applying the protective coating material as herein specified will be rigidly inspected from the time the bare pipe is received until the coated pipe is loaded on the carrier for shipment.
- b. If the Company designates an Inspector, the Inspector shall be provided free access to the Applicator's plant at any time during any operation involving the pipe with the right to inspect and to accept or reject work performed.
- c. The Applicator's Quality Control Inspector shall be responsible for stopping operations when conditions develop which could adversely affect the quality of the completed work.
- d. Although the principal purpose of the coating inspection by the Company and the Applicator is to insure compliance of the coating with these specifications, such inspection shall also include examination for previously undetected defects in the pipe, pipe surface or on the pipe ends. Pipe having such defects shall be set aside for subsequent repair or replacement by the pipe supplier and for any necessary coating repair. Recoating or coating repair that may be necessary by reason of these defects in the pipe which do not involve fault on the part of the Applicator shall be done at the Company's expense.
- e. When Company's Representative exercises Company's right of approval at the Applicator's plant, the Company's Representative shall conduct final inspection on the Applicator's out-bound rack. Accepted pipe shall be presumed to be produced as specified unless test results indicate a discrepancy.
- f. **Coating Thickness Measurements**
 - i. An appropriate film thickness gauge, calibrated to the National Bureau of Standards' Certified Coating Thickness Calibration Standards shall be used to

- perform coating thickness measurement.
 - ii. The coating thickness shall meet or exceed the agreed upon minimum coating thickness. All joints which fail to meet the minimum coating thickness test shall be recoated or repaired.
 - g. Electrical Inspection
 - i. Holiday inspection of the entire coated surface shall be performed with an approved high voltage Holiday Detector to indicate any flaws, holes, breaks or conductive particles in the protective coating.
 - ii. The Holiday Detector shall have sufficient D.C. voltage and be equipped with a positive signaling device. The search electrode shall be made of conductive rubber, or other applicable material. The Holiday Detector shall be operated in such a way as to audibly and/or visually detect the presence of all holidays.
 - iii. The voltage to be used shall be as set forth in the table below.

Minimum Test Voltages		
32 nd Inch	Mils	Test Volts
2	62	9,800
3	94	12,100
4	125	14,000
5	156	15,000
6	188	17,100

12. Repair Procedures

- a. All defects disclosed by the Holiday Detector and other obvious defects shall be repaired by the Applicator.
- b. Holidays which are the result of slivers, scabs, laminations, or other steel conditions beyond the control of the Applicator shall be repaired at the Company's expense.
- c. Areas of repair to the coating shall be holiday inspected by the Applicator on a 100 percent basis.

13. Coated Pipe Handling, Storage and Loading Requirements

- a. Pipe shall be stored, handled and transported in a manner to prevent damage to the pipe walls, beveled ends and the coating.
- b. Storage racks shall be so designed as to protect the coated pipe from standing water, direct soil contact, and sharp or hard objects that might damage the coating.
- c. The coated pipe shall be shipped using sufficient and proper dunnage to adequately protect the pipe and coating.
- d. All pipe shipped by rail shall be loaded in accordance with API Specifications RP 5L1, Latest Edition.

14. Supplementary Details Supplied by the Company

When possible, the Company shall supply the following supplemental information:

- a. Length and diameter of pipe.
- b. Grade, wall thickness and/or weight per foot of pipe.
- c. Source and approximate shipping date from the pipe mill.
- d. Method of shipment from the mill.
- e. Approximate shipping date to the destination.
- f. If pipe is to be stored, the approximate length of time it is to be stored.
- g. Length, style and post preparation of cutback.
- h. Minimum weight per car or truck required to protect lowest outbound rate.
- i. Name and type of carrier.
- j. Stacking and/or loading instructions.