

NAPCA Bulletin 12-78-04

EXTERNAL APPLICATION PROCEDURES FOR PLANT APPLIED FUSION BONDED EPOXY (FBE) COATINGS AND ABRASION RESISTANT OVERLAY (ARO) 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.
 - vi. FBE—Fusion bonded epoxy pipe coating
 - vii. ARO—Abrasion resistant overlay coating

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 fusion bonded epoxy to the exterior of pipe to be placed underground.

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. Removal of such contaminants shall be as agreed between the Applicator and the Company.
- 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.
- d. When the roughness of the pipe surface is such that the normal coating rate will be impaired or will result in coated pipe that will be in non-conformance with these specifications, at the Company's option, the Applicator shall take whatever steps necessary to rework the pipe surface and/or add additional coating thickness to the pipe so as to provide coated pipe which can be processed at a normal rate and which will comply with these specifications. The cost of reworking the pipe surface and/or applying additional coating thickness will be agreed upon in advance by the Applicator and Company and paid for by the Company.

5. **Materials and Workmanship**

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**

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.
- d. Time/temperature limitations for FBE Powders shall be in accordance with the Manufacturer's recommendations.

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 Near-White metal finish in accordance with SSPC-SP-10 or NACE #2 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 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 recleaned.
- 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 recleaned.
- i. Surface imperfections such as slivers, scabs, laminations, burrs and weld spatter shall be removed by hand filing or light grinding as long as such removal does not:
 - i. Adversely affect the quality of pipe cleaning.
 - ii. Adversely affect the normal production rate of the plant.

9. **Coating Application (FBE)**

- a. The pipe shall be heated to a temperature within the tolerances recommended by the Manufacturer of the coating material to be applied. The pipe shall not be heated to a temperature in excess of 600 degrees F at any time during the process. Blue oxide formation shall not be used as an indicator that maximum temperature has been exceeded or that damage to steel properties has occurred.
- b. The pipe shall be monitored for proper temperature prior to coating by use of a temperature sensitive crayon.
- c. Coating material shall be applied uniformly utilizing the best commercial practices and in such a manner so that the minimum cured film thickness is that specified by the Company.
- d. The coating shall be applied to the full length of each pipe except for a "cutback" of not less than 0.5 inches (1.27 cm).