LIBERTY COATING COMPANY

QUALITY PLAN

FOR

PRITEC® APPLICATION

DOCUMENT NO: QP-05

REVISION – 0

JULY 9, 2001

REVIEWED BY:

Q.C. DEPARTMENT: _____

DATE: _____

APPROVED BY:

VICE PRESIDENT & COO: _____

DATE: _____

1.0 MANAGEMENT RESPONSIBILITY

The Vice President has the responsibility and the authority to manage all personnel who perform and verify work affecting quality. It is the Vice President's responsibility, along with the plant Quality Control Inspectors, to:

a) initiate action to prevent the occurrence of product nonconformity;

b) identify and record any product quality problems;

c) initiate, recommend, or provide solutions through designated channels;

d) verify the implementation of solutions;

e) control further processing, delivery, or installation of nonconforming product until the deficiency or unsatisfactory condition has been corrected.

2.0 SPECIFICATION REVIEW

Each specification shall be reviewed by Sales, Operations, and Quality Assurance to ensure that:

a) the requirements are adequately defined and documented;

b) any requirements differing from those in the tender or this quality plan are recorded on the Quality Control Procedure Form;

c) Liberty Coating Company, LLC has the capability to meet specified requirements.

Records of such reviews shall be made a permanent part of the project file. In addition, it is the responsibility of the sales department to formally request a pre-production meeting and supply minutes of such meeting.

3.0 PURCHASING

3.1 Purchasing Data

All purchasing documents shall contain data clearly describing the coating materials ordered, including, where applicable:

a) the type, class, style, grade, or other precise identification;

b) the title or other positive identification, and applicable issue of specifications, process requirements, and other relevant technical data.

3.2 Verification of Purchased Material

Liberty Coating Company has obtained the understanding from our suppliers that we, Liberty Coating Company, reserve the right to verify at source or upon receipt that purchased materials conform to specified requirements. Verification by Liberty Coating Company shall not absolve the supplier of the supplier's responsibility to provide acceptable materials nor shall it preclude subsequent rejection.

3.3 Material Identification and Traceability

It is the responsibility of the Vice President or his designated representative to identify the purchased materials from applicable specifications or other documents.

Where traceability is a specified requirement, individual materials or batches shall have unique identifications and their identifications shall be recorded and made a part of the project file.

4.0 INSPECTION AND TESTING

4.1 Receiving Inspection and Testing

4.1.1 Inspection of purchased materials shall be carried out at the plant site, on receipt, to assure that they conform to procurement documents.

4.1.2 Each container of material received shall be clearly labeled with product designation, batch or lot number, and safety hazard communication labels. All containers of material must be received in adequate condition to keep the contents clean and dry during handling and storage.

4.1.3 Material certifications, obtained from the supplier, may be deemed as adequate evidence of conformation for materials not listed in the quality plan.

4.1.4 Butyl Adhesive Undercoat – Each individual lot (as determined by the material supplier) must be tested for flow rate in accordance with ASTM D1238. Flow rate results must be within the material manufacturer's specified range of acceptance.

4.1.5 Polyethylene Outer Jacket – Each individual lot (as determined by the material supplier) must be tested for flow rate in accordance with ASTM D1238. Flow rate results must be within the material manufacturer's specified rate of acceptance.

4.2 In-Process Inspection and Testing

4.2.1 Surface Preparation

4.2.1.1 Pipe shall be visually inspected for oil, grease, and loosely adhering deposits. Such deleterious material must be removed prior to blast cleaning.

4.2.1.2 The rust grade of the pipe surface shall be recorded at least once per hour. The determination of rust grade shall be in accordance with SSPC-VIS1.

4.2.1.3 The measurement of ambient conditions shall be measured and recorded at the blast cleaning station at lest two times per shift. These measurements will include: air temperature, relative humidity, and dew point.

4.2.1.4 The pre-blasted pipe surface temperature will be measured and recorded at least once per hour to verify that the pipe surface temperature is at least 5°F above dew point.

4.2.1.5 The degrees of blast cleaning shall be continually monitored and must meet or exceed a commercial blast as described in SSPC-SP6, or NACE 3, unless otherwise agreed to in writing (see Section 2.0).

4.2.1.6 The surface profile, as determined by press-o-film replicating tape and micrometer, shall be measured and recorded at least once per hour. The surface profile must be within the range of 1.5 to 4.0 mils, unless otherwise agreed to in writing (see Section 2.0).

4.2.1.7 When Pritec® shall be applied over DSAW pipe that has not had the weld seam ground down, a strip of pipeline tape must be applied to the weld seam. The tape shall be visually inspected to verify that the tape has been firmly applied, covers, and conforms to the weld seam.

4.2.2 Coating System Application

4.2.2.1 Butyl Adhesive Undercoat – The butyl adhesive undercoat shall be applied to cleaned pipe by side extrusion at a temperature between 280°F and 340°F. Multiple layers, overlapped a minimum of 0.25", shall be used to achieve the specified thickness. The minimum acceptable butyl adhesive undercoat thickness shall be specified in the Quality Control Procedure. The butyl temperature and overlap measurements shall be recorded at least once per hour.

4.2.2.2 Extruded Polyethylene Outer jacket – The polyethylene outer jacket shall be applied by side extrusion at a temperature between 450°F to 575°F. Multiple layers, overlapped a minimum of 0.5", shall be used to achieve the specified thickness. The Quality Control Procedure. The polyethylene temperature and overlap measurements shall be recorded at least once per hour.

4.2.3 Coating, Visual, and Thickness Inspection

4.2.3.1 The coating shall be routinely monitored to ensure that no detrimental defects occur.

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4.2.3.2 The total system coating thickness shall be measured, as determined by a magnetic or electromagnetic coating thickness gauge, at three locations along each pipe measured. The coating thickness range (low to high) shall be recorded once per hour unless otherwise stated in the Quality Control Procedure. The minimum total system thickness shall be specified in the Quality Control Procedure. Any coating having a total system thickness less than that listed in the Quality Control Procedure shall be identified. Inspector may, at his discretion, allow acceptance of localized thin spots or require over coating.

4.2.3.3 The individual coating thickness shall be determined at least once per hour. A piece of the polyethylene outer jacket shall be removed from the cutback area, the butyl adhesive undercoat shall be removed and the plastic thickness shall be measured with dial calipers. The individual coating thickness shall be determined by subtracting the plastic thickness from the total system thickness (as measured in Section 4.2.3.2.) the resulting difference shall be the butyl adhesive undercoat thickness. These values shall be recorded at least once per hour.

4.2.4 Electrical Inspection of Cured Coating

4.2.4.1 All coated surface shall be 100% electrically inspected with a DC type holiday detector equipped with an audible and visual signaling device.

4.2.4.2 The holiday detector shall be set to the voltage listed in the Quality Control Procedure.

4.2.4.3 Defects located by electrical inspection shall be marked to facilitate location and repair.

4.3 Final Inspection and Testing

4.3.1 Testing

4.3.1.1 Testing shall be performed and analyzed at the plant site by Liberty Coating Company unless otherwise agreed to in writing (see Section 2.0).

4.3.1.2 A peel resistance test, in accordance with Liberty Coating Company test method QTM-010, shall be performed on at least once pipe per 4 hours of production.

4.3.2 Final inspection is complete when all specified inspections, test, and reporting as outlined in the quality plan have been carried out, and that data meets the specified requirements**.**

4.4 Inspection and Test Equipment

Liberty Coating Company shall control, calibrate, and maintain inspection, measuring, and test equipment, whether owned by Liberty Coating Company, on loan, or provided by the purchase, to demonstrate the conformance of product to the specified requirements. Equipment shall be used in a manner which ensures that measurement uncertainty is known and is consistent with required measurement capability. All inspection, measuring, and test equipment used by Liberty Coating Company for final inspection and testing shall be calibrated and adjusted against certified equipment having a known valid relationship to nationally recognized standards. Calibration frequency and records shall be maintained as required by the quality plan.

4.4.1 Calibration of the dry film thickness gauge shall be conducted at the beginning and midpoint of each shift. Calibration shall be performed by using a National Bureau of Standards non-magnetic coating standard with a thickness within 20% of the specified coating thickness. Results of the calibration shall be recorded.

4.4.2 Calibration of the holiday detector shall be conducted at least once per shift utilizing a crest volt meter. Results of the calibration shall be recorded.

4.5 Inspection and Test Status

4.5.1 All coated pipe that has passed final inspection shall be appropriately stenciled and recorded on outbound tally sheets as accepted.

4.5.2 Coated pipe that does not pass final inspection shall be appropriately color coded on the exterior surface and recorded on outbound tally sheets as either "on hold", "repair", or "rejected".

4.5.3 It is the responsibility of the quality control inspector to verify conforming or nonconforming products and their appropriate disposition.

4.6 Control on Nonconforming Products

4.6.1 Purchased Materials

4.6.1.1 Any materials delivered that do not conform to procurement documents shall be marked and segregated from use.

4.6.1.2 Any materials delivered that are not in compliance with 4.1.2 of the quality plan shall be marked and segregated from use.

4.6.1.3 Any lot of butyl adhesive undercoat that does not pass the flow rate test shall be marked and segregated from use.

4.6.1.4 Any lot of polyethylene outer jacket that does not pass the flow rate test shall be marked and segregated from use.

4.6.2 Surface Preparation

4.6.2.1 Pipe found to be contaminated with oil, grease, or loosely adhering deposits shall be marked and segregated from use until cleaned in accordance with SSPC-SP1 or other specially approved and documented procedure.

4.6.2.2 Pipe surface temperature found to be less than 5°F above dew point must be preheated to at least 5°F above the dew point prior to blasting.

4.6.2.3 Any blasted pipe that does not meet the requirements of Sections 4.2.1.5 and 4.2.1.6 shall be identified and

subsequently re-blasted to meet the requirements of Sections 4.2.1.5 and 4.2.1.6.

4.6.3 Pritec® Application

4.6.3.1 Butyl adhesive undercoat that does not meet the range of application temperature shall not be used.

4.6.3.2 If the butyl adhesive has an overlap of less than 0.250 inches the extruder shall be immediately adjusted to maintain a minimum of 0.250 inch overlap.

4.6.3.3 Polyethylene outer jacket that does not meet the range of application temperature shall not be used.

4.6.3.4 If the polyethylene outer jacket has an overlap of less than 0.500 inches the extruder shall be immediately adjusted to maintain a minimum of 0.500 inch overlap.

4.6.4 Coating, Visual, and Thickness Inspection

4.6.4.1 Any coated pipe that does not pass the required specifications in Section 4.2.3 shall be identified and either repaired in accordance with Liberty Coating Company Repair Methods RM-001, RM-002, or RM-003, or over coated. Pipe that required over coating must have the original coating cut and removed at least 5" from the original cutback before over coating.

4.6.4.2 Coated pipe that is found to have detrimental irregularities, low thickness, or loss of adhesion shall either be over coated or accepted in writing by the purchaser. Pipe that required over coating must have the original coating cut and removed at least 5" from the original cutback before over coating.

4.6.5 Electrical Inspection of Coating

4.6.5.1 Coated pipe that is found to have excessive holidays shall be over coated or accepted by the purchaser in writing. Pipe that required over coating must have the original coating cut and removed at least 5" from the original cutback before over coating.

4.6.6 Testing

4.6.6.1 A coated pipe that does not pass the peel resistance test, as required in Section 4.3.1.2, shall be marked and segregated from accepted pipe.

4.6.6.2 An additional peel resistance test according to Section 4.3.1.2 shall be performed. This sample will be tested in an attempt to reproduce the results of the failed sample. Should this test pass, the pipe shall be accepted.

4.6.6.3 Should the retest sample fail, additional peel resistance tests on previously coated pipe shall be performed in an attempt to narrow the window of failed samples.

4.6.6.4 All test samples and windows of failed production pipe shall be either re-coated or accepted in writing by the purchaser.

4.6.7 All coated pipe that fails any inspection outlined in Section 4.2.3 shall be appropriately documented and reported to the Vice President.

4.7 Corrective Action

Liberty Coating Company maintains established procedures for:

a) investigating the cause of nonconforming products and the corrective action needed to prevent recurrence;

b) analyzing all processes, work operations, concessions, quality records, service reports, and customer complaints to detect and eliminate potential cause of nonconforming products;

c) initiating preventative actions to deal with problems to a level corresponding to the risks encountered;

d) applying controls to ensure that corrective actions are taken and are effective;

e) implementing and recording changes in procedures resulting from corrective action.

5.0 Handling and Storage

5.1 Handling

5.1.1 Pipe shall be inspected upon receipt for damage such as dents. Any obvious damage observed at this point will be noted on the receiving report and proper authorities notified.

5.1.2 Proper equipment for handling, unloading, and storage of pipe shall be used to avoid damage.

5.1.3 Coated pipe shall be sufficiently cooled before handling.

5.1.4 If coated pipe is handled by hook line, hooks shall be padded to prevent contact damage to pipe. Hooks and slings shall not be banged into the pipe surface.

5.2 Storage

5.2.1 Stored pipe shall be stacked in a manner to prevent egging, buckling, or other stress related damage.

5.2.2 Pipe shall not be stored directly on the ground. Pipe racks shall be sufficient height to prevent water from contaminating the interior and exterior of the pipe and shall be constructed to allow water to drain from each joint of racked pipe. All rows shall be restrained to prevent joints from rolling.

5.2.3 Bare pipe shall be elevated at least six inches off the ground on earth berms covered with polyethylene sheeting or a sufficient number of timber skids, properly spaced and leveled to support the pipe without damage.

5.2.4 Coated pipe shall be elevated at least six inches off the ground on earth berms or a sufficient number of timber skids properly spaced and leveled to support the pipe without damage.

6.0 Quality Records

6.1 Identification and Filing

All data obtained in accordance with Section 4.0 of this quality plan shall be recorded on appropriate forms and made a permanent part of the project file. Copies of such data shall be made available to the purchaser.

6.2 Storage

Quality records shall be stored and maintained for 3 years in such a way that they are readily retrievable in facilities that provide a suitable environment to minimize damage and prevent loss.

7.0 Internal Quality Audits

Liberty Coating Company carries out a comprehensive system of planned and documented internal quality audits to verify whether quality activities comply with planned arrangements and to determine the effectiveness of the quality system.
Internal quality audits include the following activities or areas are reported on:

a) organizational structures;

b) administrative and operations procedures;

c) personnel, equipment, and material resources;

d) work areas, operations, and processes;

e) items being produced (to establish degree of conformance to standards and specifications);

f) documentation, reports, record keeping.

Internal quality audits are carried out on a quarterly basis when appropriate. Audit findings, conclusions, and recommendations are submitted in documentary form to the President of Liberty Coating Company and the Vice President.