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Pipe Material Inspection for Non-Hygienic Product or Raw Material

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(From a letter dated September 1, 2003 in response to ongoing discussions on this topic)

Your e-mail of 8/29/03 addresses 4 topics with regard to piping material that comes in contact with non-hygienic product or raw material: Material Documentation, Material Inspection, Control of Material, and Installation Verification.

While these topics make up the sum of quality control inspections for piping they are independent of one another and should be considered individually. The following is an attempt at summarizing each of the above topics:

1. Piping Material Documentation (Material Certification, MTR's, Certification of Compliance)
   a. Material Certification: Within the Mill Test Report is a Heat Analysis. The Heat Analysis is an analysis of each heat of steel to determine the percentages of the elements, or its chemical composition.
   b. Mill Test Report (MTR): Under the ASTM standard for each material is the option to request the Mill Test Report. The MTR may contain the following: Heat No., Heat Analysis, Product Analysis, Tensile Properties, Bend test acceptable, flattening test acceptable, Hydrostatic test pressure, Non-destructive electric test method, Impact test results, and other elected test results.
   c. Certificate of Compliance: The C of C is similar to an MTR, in that it provides certification of chemical composition for elastomers and non-metallic pipe materials. While the C of C will seldom provide the chemical composition of its formulation, which is usually proprietary, it will typically include a batch number that will provide that kind of information should it ultimately be required.

2. Material Inspection
   a. There are three types of material inspection:
      i. Receipt Inspection (or Receipt Verification) for manufactured pipe components: The Contractor is responsible for inspecting piping components upon receipt at their shop or site location. The percentage of those components inspected and the degree to which they are inspected needs to be defined by the Owner.
      ii. In-Process Inspection: This inspection is carried out prior to, during, and after fabrication at the location or locations of the Contractor's pipe fabrication by a third party inspector. The percentage of welds and material inspected and the degree to which they are inspected is defined by ASME minimum requirements and the Owner.
      iii. Installation Verification: (See item #4 below.)

3. Control of Material in stock, during fabrication and installation
   a. The Contractor shall control pipe and piping components prior to fabrication, and during fabrication. This requires two separate control guidelines:
      i. To provide a high degree of control for stocking and retrieving pipe and piping components all material of different composition or manufacture method shall be kept separated (do not intermix A53 with A106 carbon steels, do not mix A53 Tp F with A53 Tp S and stainless and other alloys should be completely segregated by distance and handling methods from ferrous material) with well posted markers on bins and racks identifying the specific material.
      ii. Stainless and other alloys for general piping, as well as sanitary piping shall be completely isolated from ferrous material. All tooling shall be segregated as well to prevent cross contamination.

4. Installation Verification
    a. This inspection is carried out on the installed piping system by a third party inspector. A two-phase guideline should be developed for this effort either prior to, or in conjunction with the third-party inspector. The first phase would be to check everything prior to insulation or painting such as material stampings, valve model numbers, flange stampings, etc. The second phase would be to check the final covering such as insulation or paint.

The above documentation requirements and quality control inspection aspects apply to all piping. The difference lies in the degree to which they are applied to the various Categories of piping. In creating the non-hygienic product or raw material Category a Company now has three basic Categories of fluids, aside from the ASME Categories. They are General Piping, Non-Hygienic Product or Raw Material, and Hygienic Product or Raw Material. Within each of the Categories are further breakdown designations of Utility, Chemical, and Process fluids.

While hygienic specifications define documentation and inspection requirements for hygienic piping the specifications for non-hygienic piping generally do not go into the same degree of detail for General Piping and Piping for Non-Hygienic Product or Raw Material. Guidelines for these two non-hygienic Classifications should be developed. In doing so the criterion needs to be established for the inspection requirements of these two Classifications followed by development of the guidelines themselves.

END OF LETTER