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September 24, 2021

Joel Hanish
Distributor Principal
Swagelok Minnesota
321 Lake Hazeltine Drive
Chaska, MN 55318

Dear Mr. Hanish,

This correspondence addresses the conformance of Swagelok brand tube fittings to the ASME *Code for Pressure Piping*.

ASME B31.1 2020, *Code for Pressure Piping*, sets forth engineering requirements deemed necessary for safe design and construction of piping systems typically found in electric power generating stations, industrial and institutional plants, heating systems (geothermal, central, and district), and cooling systems. The code is not intended to be used as a design handbook. The code includes:

1. Material specifications and component standards.
2. Requirements for design of component parts and assemblies.
3. Requirements for the evaluation and limitation of stresses, reactions and movements associated with pressure, temperature, and external forces.

Swagelok Company manufactures Swagelok brand tube fittings from bar stock and forgings. The design of these tube fittings is proprietary to Swagelok. All pertinent design documents meet our design standards, which include quality standards. These quality standards are established through Swagelok processes. The Swagelok Quality Assurance manual describes the processes, which include: design reviews, laboratory performance testing, and field performance.

The following statements indicate our conformance to the applicable sections of the ASME code:

Materials

1. Stainless Steel
 - a. Swagelok type 316 stainless steel bar stock fittings are manufactured from material purchased and certified as being in accordance with ASTM A479. This material is a listed material as noted in ASME B31.1, Table A-3.
 - b. Swagelok type 316 stainless steel forged fittings are manufactured from material purchased and certified as being in accordance with ASTM A182. Representative samples of forgings have successfully passed the corrosion test of ASTM A262. This material is a listed material as noted in ASME B31.1 Table A-3.
 - c. Swagelok type 316-ELT stainless steel fittings, straights and shapes, are manufactured from material purchased and certified as being in accordance with ASTM A479. The 316-ELT meets the ASME B31.1 requirements for service up to 1200 °F.

Design

As mentioned earlier, Swagelok brand tube fittings are manufactured to a proprietary design. This is acceptable according to ASME B31.1, paragraph 106.1.

The NPT pipe threads on the pipe ends on these fittings are manufactured based on the requirements of ASME B1.20.1 and SAE AS71051. Swagelok pipe fitting designs have been proven successful in actual performance tests. This is acceptable according to ASME B31.1, paragraph 106.1.

The weld ends on these fittings are manufactured to meet end preparation requirements of ASME B16.25 (Butt Weld). The tube socket weld ends are manufactured to our own design requirements. All the weld end designs have proven successful in actual performance tests. This is acceptable according to ASME B31.1, paragraph 106.1.

Application

- A. Pressure ratings based on the allowable stress mentioned in ASME B31.1, Appendix A, Table A-3, can be found in the Swagelok *Tubing Data Sheet*, MS-01-107. The charts are intended to be used as guidelines. It is the responsibility of the customer to interpret the code for the specific application.
- B. For stainless steel applications, we suggest the use of fully annealed high quality (type 304, 316, etc., seamless or welded and drawn) stainless steel hydraulic tubing conforming to ASTM A213, A269 or equivalent. Stainless steel tubing should be free of scratches and be suitable for bending and flaring.
- C. Swagelok fittings, when installed on the recommended tubing and according to catalog instructions, will provide reliable connections at proof pressure (1.5 times allowable working pressure) without any difficulty.

We hope this information proves beneficial. Please do not hesitate to contact us if we can be of further assistance.

Sincerely,



Gary Bialek
Technical Service Engineer

