

Pressurized vs. Atmospheric Deaerators

The following discussion relates to the virtues of pressurized deaerators over the atmospheric type.

1. The pressurized deaerator, such as Spray, Spray Scrubber, Packed Column, and Tray types, is more accepted by consulting engineers, architects and knowledgeable users. This point is illustrated by that fact that of the three major atmospheric type deaerators manufactured in this country, only one remains actively in business. Further, even this company has broadened their scope by adding pressurized deaerators to their line. Our Spray/Scrubber, Pressurized type deaerator is of the original, time-proven design.
2. A major argument by the atmospheric competition is actually based on a weakness. The fact that they have a large exit port for dissolved gasses allows the escape of great amounts of steam as well. This is certainly a detriment in these days of rapidly rising fuel costs.
3. The fact that the atmospheric unit is fully vented limits the water temperature to a maximum of 212° F (at sea level). This not only leaves the effluent vulnerable to re-contamination by non-condensable gasses, but increases the thermal shock on the boiler.
4. Another weakness touted by the competition as an advantage is the fact that their tanks have some sort of lining. This in itself, is an admission that their deaerator is ineffective since they cannot even keep corrosion from occurring within its walls. If this system truly deaerated as ours does, there would be no need for any linings.
5. It must be pointed out that in order to vent the liberated non-condensables from any system, it is necessary to have a pressure differential. In order to maintain even the slightest differential pressure in a so-called fully vented system, huge quantities of steam must be expended through the vent, supposedly carrying the non-condensables with them.
6. An atmospheric system requires the use of a two-section tank, transfer pumps, a spray manifold with many small spray valves, steam injection tubes, heat exchangers and many other items not required in a pressurized system. This additional equipment increases, not only initial expenditures, but maintenance and operating costs as well. The standard spray/scrubber type deaerator has but one moving part, the spray valve, which requires little or no maintenance. The remainder of the system is based on the natural flow and counter-flow of steam and water within the deaerator at controlled velocities. None of this requires any mechanical parts that can wear or otherwise interfere with the proper operation of the system.

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7. The heat exchanger required by the atmospheric type deaerator is usually installed on the transfer pump discharge to super-heat the feedwater prior to entering the deaerating section. The heating efficiency across the tubular exchanger is not as great as our direct contact of steam and water.
8. Our pressurized deaerator is built in accordance with ASME code for unfired pressure vessels which sets uniform, high quality limits on the vessel. Since this is not required in an atmospheric unit, the quality of the tank is sacrificed. Further, the user can enjoy the peace of mind knowing our system has been tested by rigid procedures and guaranteed by the American Society of Mechanical Engineers to meet these standards.
9. The atmospheric system has no provision for utilizing flash or turbine exhaust steam which, if available, would have to be wasted.

We have attempted to present this information factually and objectively.