

# Recommended Specifications

Furnish and install one (1) Lockwood Model \_\_\_\_\_ SS two-stage, spray scrubber deaerator with internal vent condenser and integral storage section. The deaerator shall be rated at \_\_\_\_\_ pounds per hour (outlet capacity including condensed steam). The deaerator shall be guaranteed to:

1. Heat the feedwater to the saturation temperature corresponding to the steam pressure within the heater.
2. Reduce feedwater oxygen content to 0.005 cc/liter as determined by the Heat Exchange Institute method, Winkler method, or any modifications outlined by the ASTM.
3. Reduce the free carbon dioxide in the feedwater to zero as determined by the APHA method.
4. Operate with minimum noise at all flow rates from 3 percent to 100 percent of outlet capacity.

The deaerator shall be constructed of SA-516 Grade 70 carbon steel plate with a minimum thickness of 1/4", designed for \_\_\_\_\_ PSIG pressure in accordance with the latest revision of the ASME Code, and shall be so stamped. The deaerator shall include 316 cast stainless steel spray valve(s) with 303 stainless steel spring(s), an internal direct contact stainless steel vent condenser, and a final stage steam scrubber. Deaerator shall provide \_\_\_\_\_ cubic feet of storage ( \_\_\_\_\_ gallons) measured to the overflow level. This storage shall be equivalent to \_\_\_\_\_ minutes of the rated outlet capacity. Deaerator shall be operable from \_\_\_\_\_ PSIG.

The entire assembly shall be factory pre-assembled and shall consist of the following components:

1. One (1) \_\_\_\_\_ pound/hour horizontal deaerator with the following accessories:
  - a. One (1) - sentinel relief valve.
  - b. One (1) - vent valve.
  - c. One (1) - water level gauge glass assembly with shut-off cocks and protective rods to cover the full water level travel.
  - d. One (1) - vacuum breaker.
  - e. Two (2) - stainless steel dial thermometers with separable sockets.
  - f. One (1) - pressure gauge with syphon pipe and cock.
  - g. One (1) - (mechanical) (pneumatic) make-up water valve with controller, strainer, and by-pass assembly.
  - h. One (1) - self contained overflow trap.
  - i. One (1) - pressure reducing valve and strainer for steam supply to deaerator.
  - j. Adequately sized atmospheric back pressure relief valve(s).
  - k. One (1) - high water alarm switch.
  - l. One (1) - low water alarm switch.

All above components shall be prepiped with the exceptions of the steam supply valve, inlet steam strainer, and back pressure relief valve(s). Piped assemblies may be removed to facilitate shipping.

2. Heavy structural steel support stand for elevating deaerator above pumps to avoid pump cavitation. Deaerator may be removed from support stand to facilitate shipping.
3. \_\_\_\_\_ boiler feed pumps (turbine type for intermittent service) (centrifugal type for intermittent/continuous service), each mounted on heavy support base integral with tank support stand, driven by \_\_\_\_\_ HP, \_\_\_\_\_ RPM, \_\_\_\_\_ V, \_\_\_\_\_ phase, 60 Hz (open, drip-proof) (totally enclosed, fan cooled), ball bearing motor. Each pump shall be sized to deliver not less than \_\_\_\_\_ GPM of 230°F water against a total discharge pressure of \_\_\_\_\_ PSIG.
4. Interconnecting piping between deaerator storage vessel and boiler feed pumps, to include shut-off valves.
5. NEMA 12 control cabinet complete with motor starters, (disconnect switches) (fuse blocks) (circuit breakers), control transformer, alarm relays, alarm silencer button, alarm horn, lights, etc. Wiring to be in accordance with the National Electric Code.

The deaerator shall be selected based upon the following condition:

1. \_\_\_\_\_ PSIG make-up water supply.
2. \_\_\_\_\_ PSIG saturated steam supply.
3. \_\_\_\_\_ PSIG maximum boiler design pressure.
4. Make-up water to deaerator to be approximately \_\_\_\_\_ % of total inlet flow at \_\_\_\_\_ °F.
5. Low pressure condensate to deaerator shall be approximately \_\_\_\_\_ % of total inlet flow at \_\_\_\_\_ °F.
6. High pressure condensate to deaerator shall be approximately \_\_\_\_\_ % of total inlet flow at \_\_\_\_\_ °F.

Any deviations from, or exceptions to, the above specifications must be clearly stated in the bid. Otherwise, bidder will be expected to furnish equipment exactly as specified herewith. All components shall be furnished by one manufacturer for single responsibility. The equipment shall be guaranteed to be free from defects in material and workmanship for a period of fifteen (15) months after shipment or twelve (12) months from date of installation, whichever period shall first expire.

---

The specifications contained in this bulletin were effective at the time of publishing. Lockwood Products, Inc. reserves the right to discontinue products at any time or to change specifications or design without incurring any obligation.

---

## LOCKWOOD PRODUCTS, INC.

4450 Commerce Drive, S.W.

P.O. Box 43961

Atlanta, Georgia 30336

Local (404) 505-2520 • WATS (800) 365-1500 • FAX (404) 505-2518