

CLASS "P" – PACKED COLUMN TYPE

MECHANICS OF DEAERATION

Studies indicate that to inhibit corrosion in a steam system, the oxygen content must be limited to a maximum level of .01 ppm. (.0075 cc/l). A true deaerator will reduce the oxygen to the .005 cc/l level and the carbon dioxide to zero. A further benefit of this process is the simultaneous pre-heating of the feed water. A packed column deaerator is tailored to fit the power cycle and operating conditions of the actual plant in which it will be installed. It is important that these maximum loads are not exceeded.

The modern deaerator has evolved into a two stage device. The effluent first enters the pre-heater stage where it is heated to a temperature approaching that of the operating steam pressure.

The feed water then enters the second stage, packed column where the liquid changes direction constantly as it flows down thru the packing shaking out the remaining traces of gas. This action assures the maximum contact time between the steam and water and forces the remaining traces of oxygen and carbon dioxide to the surface of the liquid where they are liberated from the water.

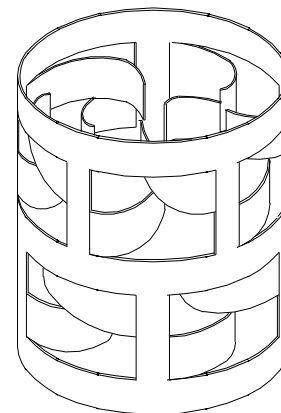
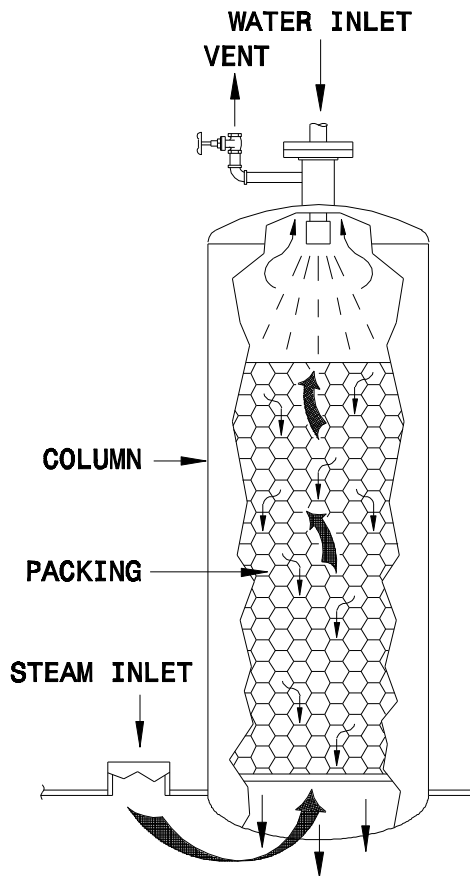
Non-condensable gasses must be evacuated from the deaerator at a rate equal to their liberation. A vent condenser is utilized to concentrate the non-condensables gasses and condense the carrier steam, thereby avoiding unnecessary steam venting.

OPERATION

Incoming water first enters the deaerator through the spray valves directed downward into a steam atmosphere in the first stage pre-heater section. There the water is heated to within two degrees of the steam temperature in the deaerator. This is accomplished by spraying the incoming water through self-adjusting spray valves designed to produce a uniform, thin, continuous film thru all load conditions. These efficient valves assure a constant temperature and uniform gas removal.

From the first stage the pre-heated water containing traces of dissolved gasses flows into the second stage or packed column. This section consists of high efficiency stainless steel packing to a predetermined, optimum level. The effluent flows downward, finding its way through the packing while being brought into direct contact with an abundance of fresh, gas-free steam. The steam enters this stage at the base of the column and is mixed with the pre-heated water as it rises up diametrically opposed to the falling water. Here direct physical contact adds to the liberation of the dissolved gasses from the effluent. Very little steam is condensed here, as incoming pre-heated water has a temperature approaching that of the steam. The water leaving this stage, now completely deaerated and heated to the steam temperature corresponding to the pressure within the vessel falls into the storage section where it remains ready for use.

The steam, after passing through the column, continues upward into the vent condenser where most of it is condensed leaving the non-condensable gasses to escape through the vent to atmosphere.



**HIGH EFFICIENCY
S.S. PACKING**