

A Normetex Model 15 m³/hr Water Vapor Pumping Test

M. D. Fowley, T. J. Steeper, and J. E. Klein*

Savannah River National Laboratory, Aiken, SC U.S.A.

Normetex vacuum pumps are commonly used in tritium facilities for evacuation and transfer of gases. In ITER and other applications, some process streams will contain various amounts of water vapor. Metal bellows pumps are known to fail quickly when the water content of the inlet gas is sufficiently high to form condensate in the bellows of the pumps. It was unknown if Normetex pumps would condense water inside the pump and also fail the pump.

Tests were performed using a Model 15 m³/hr Normetex vacuum pump to determine if pump performance degraded after pumping a humid gas stream. An air feed stream containing 30% water vapor was introduced into the pump for 365 hours with the outlet pressure of the pump near the condensation conditions of the water. Performance of the pump was tested before and after the water vapor pumping test and indicated no loss in performance of the pump. The pump also appeared to tolerate small amounts of condensed water of short duration without increased noise, vibration, or other adverse indications. The Normetex pump was backed by a dual-head diaphragm pump which was affected by the condensation of water and produced some drift in operating conditions during the test.