



TEST SYSTEM for AUTOMOTIVE A/C HOSE ASSEMBLIES



The brazed joints of aluminum tubes used in hose assemblies for automotive air conditioners are helium leak tested in this automated system to a helium leak rate equivalent to 0.4 oz/yr of R134a leakage from 300 psig into atmosphere. The system has two chambers with phased cycles to provide a production rate of 144 tubes/hr. In the test, three tube parts, which are used to make a single hose assembly, are loaded into one of the chambers, which is then evacuated while the tubes are pressurized to 300 psig with a helium-nitrogen mixture. A helium mass spectrometer is used to detect and quantify any helium leakage from the parts into the chamber

The PC-controlled system provides a fully automated test cycle starting with connecting and sealing to the ends of the tubes and continuing through the final pass/fail decision, avoiding operator error and subjectivity. When a leak is detected, the system automatically performs a sorting routine to determine which tube is leaking and requires removal of that part first, in order to minimize sorting errors. The PC, which receives commands from the operator via a barcode scanner, also collects and stores test data, and each part that passes the leak test is stamped to identify the test date, shift, and chamber.