



自動販売機庫内風量の最適化と部品信頼性向上

—自動販売機における庫内品温の安定化—

Optimization of Airflow in the Compartment of Vending Machine and Reliability Improvement of the Parts

—Stabilization of Temperature of the Products in Vending Machine—

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In the vending machine industry, it is essential to save energy out of concern for the environment and reduce costs in order to reduce equipment expenses. We are developing vending machines that meet these requirements by using quality engineering to develop the fans needed to heat and cool the products and the peripheral structure of the fans, specifically by performing a parameter design of the control panel that controls the airflow. The structure that controls the airflow was first evaluated by simulation. The ideal function of directing a rectified airflow to the exit of the air passage was considered, the necessary functions were studied from visualization information of the simulation, and they were assigned to an L_9 orthogonal array to narrow down the candidate structures. Next, to finalize the parts of the structure that could not be analyzed by simulation, a simplified test device was fabricated, improvement items were assigned to an L_{18} orthogonal array, and an evaluation was done on the basis of the two functions of airflow volume and temperature. From a factor effect diagram of the S/N ratio and sensitivity, optimal conditions were found from the levels that could satisfy both functions and levels related to volume manufacturability and cost, and these results were incorporated before volume production began.

Key words : parameter design, simulation, visualization information, function decomposition, simple test equipment, temperature, air flow, quality engineering, S/N ratio

1. 研究目的

缶飲料自動販売機は、「エネルギーの使用の合理

化に関する法律」(省エネ法)の特定機器に指定され、弊社はこれに対応した自動販売機の開発を実施している。

近年の自動販売機は、環境に配慮した省エネルギーの対応と設備費削減のための低コスト化が必要であり、消費電力量の削減とコストダウンが自動販売

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