

# Application of Multi-temperature Refrigerated Container to Improve the Distribution of Cold Logistics

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## Abstract

The multi-temperature refrigerated container is a bran-new technique, which can be setup on different temperatures, and preserve goods from losing temperature within almost 24 hours. Consequently, carriers can utilize such a container to hold and deliver different temperature goods to customers in general trucks. This paper formulates the above situation to the Multi-temperature Refrigerated Container Vehicle Routing Problem (MRCVRP), and proposes a two-stage heuristic which consists of modified savings algorithms to construct the initial solution and improve it by sequentially executing four interchange heuristics. To compare the performance of the MRCVRP with that of the classical VRP, a bank of 60 instances, modified from the Solomon's VRPTW benchmark instances, is adopted. Computational results reveal that MRCVRP generates significantly lower routing distance than VRP. Such a finding identifies that the MRCVRP could offer an effective and efficient alternative to improve the performance of multi-temperate fresh-keeping delivery service and cold logistics.

Keyword : cold logistics, multi-temperature Refrigerated Container, heuristic algorithm