



Refrigeration Developments  
and Testing Ltd

# RD&T Case Study

## A novel multi-temperature refrigerator

Company: Adande Refrigeration

### Background

Adande's Ian Wood contacted Judith Evans when he realised he needed help on a project idea he had been working on for some time. After widespread searching Ian had identified that refrigerators with multiple compartments that had variable temperature control were not available. He therefore had the idea of creating a refrigerator with multiple compartments that could store food at any temperature the user required in each compartment. He also realised that most refrigerators had an inherent design flaw, that when the refrigerator door was opened all the air fell out and was replaced by warm ambient air, which warmed the food. Combining these two ideas, Ian came up with the concept of the VariCool refrigerator.

The VariCool would store food within 4 independently controlled drawers that, when opened, would keep the cold air inside the refrigerator. Each drawer would be able to operate at the desired temperature, allowing users flexibility between chilled, frozen or ambient storage. The drawer units would be fully insulated and sealed to prevent airborne contamination of odours or bacteria and a data logging system would record temperatures for comprehensive due diligence and food safety records.

Further ideas quickly followed. Not only would each drawer have its own microclimate it would also be possible to remove the drawers and use them as insulated boxes, enabling food to be maintained at the correct temperature during storage or transport.

### Development of the VariCool refrigerator

The VariCool refrigerator was developed over several years with a Mark I unit being developed for testing that was based on a conventional refrigeration system as at this stage the main development work was focused on the design of the drawers and control of the system. During the work, three Mark I units were built and were installed into catering premises and tested to determine how well they operated in a busy commercial kitchen.

After the Mark I unit was developed into an effective product suitable for limited production and sales, Adande began design and development of the Mark II VariCool refrigerator. This unit was based around a novel refrigeration system using capillary tube expansion and a low pressure receiver, which was patented. The unit underwent extensive testing and development before being produced commercially by Adande. The Mark II VariCool unit had advantages over the original unit in terms of reduced production costs, ease of manufacture and improved performance.

### Project outcome

Adande has developed further refrigerator models and now produce models with variable number of drawers, slim line units and units with varied drawer sizes, suitable for differing product requirements. Adande has grown very rapidly since developing the VariCool and were awarded the European Award for 'Distinguished Development Design 2003' by The European FCSI (Foodservice Consultants Society International). They have received further endorsement of their product from numerous satisfied customers who have found that VariCool has transformed the way in which they store and handle food in kitchens. The VariCool has been awarded the following:

- 2008/9 CESA/FCSI UK & Ireland – Most Sustainable Foodservice Equipment award.
- 2010/11 FCSI Worldwide – Manufacturer of the year.



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