ECONO FROST
REFLECTIVE NIGHT COVERS

Summary of Test Results

Advantages of Low Emissivity Materials to Products in Commercial Refrigerated Open Display Cabinets

A paper presented before the Institute of Refrigeration at the Faculty of Environmental Science and Technology, The Polytechnic of the South Bank, London, S.E. 1
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The following is a summary of the study as titled above.

Low Emissivity

Emissivity is the ability of a surface to emit radiant energy compared to that of black body at the same temperature and with the same area. Full copies of the report can be obtained by calling our toll free number.

The objective of this study was to research the benefits of using low emissivity materials such as aluminum foil at the opening of refrigerated display cases to retard the effects of warming from the surrounding store temperatures external of the display case.

Many materials were compared by the researchers with the conclusion that aluminum was superior in reflecting heat radiation. Aluminum was 20 times more effective in maintaining optimum temperature throughout the display case than other materials such as white plastic or non-reflective materials like linoleum or synthetic films. Aluminum night covers reduced the energy consumption of refrigeration compressors and improved the shelf life of perishable merchandise. Test highlights are as follows:

Test Conclusion

- 95% of all heat transfer was a result of radiation from the mass of warm air in the store into the open refrigerated display cases.
- Temperatures were monitored on products placed within open display cases. It was established that the products near the exposed front of the case were warmer by 7° to 8° C. (12° to 15° F.) than products placed farther in the back of the case. Open refrigerated display cases showed a gradient of temperatures inside. It was observed that products were degraded more rapidly from constantly changing storage temperatures. Maintaining stable temperatures throughout the case during closed hours significantly reduced premature spoilage and thus extended product shelf life.
- Various materials were used as night covers, but heat reflective aluminum was the only material that maintained the most stable temperature throughout the display case. Aluminum proved to have the lowest emissivity.

- Non-heat reflective night cover materials had a very small benefit through some prevention of convection of ambient air from mixing with the cold air in the display case. The aluminum night covers contributed more than triple the amount of energy savings compared against these materials.
- The reason most manufacturers of open refrigerated cases have not provided night covers with their equipment is because the night cover materials previously proposed were made of plastic or similar materials that did very little to save energy or protect merchandise against heat radiation.
- When using aluminum heat reflective night covers the savings in electric consumption of the display cases was 37% to 41% depending on the type of refrigerated case and the store environment.