



The use of Thermal Imaging in Retail and Food Applications

Facilities managers in retail stores and warehouses have become familiar with the benefits associated with the use of thermal imaging in their planned preventive maintenance regimes associated with the equipment within their premises; the technology enables the appropriate maintenance to be carried out before complete breakdown occurs and consequently reduces equipment downtime and minimizes the associated impact on profits. Just as with these (normally electrical and mechanical applications, the simple use and low cost of the current generation of thermal imagers make them the ideal tool for a host of other applications with the retail sector. Whereas all retail organizations can benefit from the use of the technology to monitor the efficiency of their HVACR (Heating, Ventilation, Air Conditioning and Refrigeration) systems and to locate and quantify the extent of heat loss from the structure with consequent benefits in energy conservation – there are particular benefits to be gained in the food processing and distribution industries.

Energy Conservation and Environmental Control

Thermal imaging is a technique for creating an image of a scene based on the invisible thermal radiation emitted from an object. This technology lends itself to the detection and location of hot spots in buildings – an essential requirement for all those involved in energy conservation. The thermographer will be able to quickly perform a survey, which will highlight problems within the fabric of the building; many of these will represent major sources of energy loss.

Examples are:

- Missing or non-existent insulation
- Moisture Damage
- Thermal Bridges
- Drafts due to ill-fitting doors and windows etc
- Anomalous pipes, radiators, ducts and other HVAC equipment

The use of thermal imaging will thus make a major contribution to the function of the facilities manager. This will help to ensure that the building is well run and maintained and will result in reduced running costs.

Food Processing and Distribution

Thermography already plays an important part in monitoring product quality in the food manufacturing industry because of the wide variety of temperature controlled operations. The ability to use non contact means to monitor and control temperature critical product – whether moving or static – is invaluable, for example, in preventing handling problems such as melting, sticking and clogging of conveyors, in detection of foreign bodies and incorrect mixes of ingredients, and in the control of cooking or sterilization processes.

The technology is now becoming increasingly important throughout the distribution chain for perishable food materials, where the industry must maintain very tight control of temperatures if waste is to be reduced and shelf life or sell by dates maintained or increased. Power outages can be catastrophic in the warehouse, the retail outlet or the delivery vehicle; the use of thermal imaging in the preventive

maintenance program will minimize the instances of power loss.

The temperature control of frozen and fresh food is also critical. Small temperature rises above 5^oF (-15^oC) for frozen food for even a short time can reduce product quality, reduce storage time or sell by date and increase the safety risk. Consequently thermal imaging is now becoming a vital component in food retail, where it can be employed to monitor, for example:

- Accuracy of temperature control in all freezers, chillers and cool cabinets
- Effectiveness of all doors and seals in the above units
- Control of tolerances across all cabinets etc
- Temperature control of hotplates, ovens etc in delis and bakeries
- Insulation deficiencies in all food canteens, cabinets etc.

Regular monitoring of these features can reduce the threat to food safety, increase the potential shelf life and sell by date of the product, and reduce energy consumption.

Thermography

Infrared thermography is one of the most important sensing technologies to be applied to the detection and monitoring of manufacturing and production equipment. Until recently this sophisticated technology was prohibitively expensive, being driven primarily by military applications; over the last few years, however, the technology has improved and it has been introduced to high volume commercial and professional applications by innovative companies such as Wahl. This has brought the price down to a level, which is opening up a host of new applications.

Thermal imagers measure the infrared energy emitted by surfaces remotely and are consequently extremely simple to operate as no physical contact is necessary. Many facilities have employed thermographers to carry out inspections every 6 or 12 months; the cost of the equipment and its ease of use mean that these inspections can now be carried out as and when required by the organizations own maintenance staff. Appropriate thermal imager no longer need to cost \$45,000 or more; for example the comprehensive range of imagers from Wahl starts from less than \$2,500 – less than the cost of a single survey from a thermographer.