Centigrade Refrigeration

Refrigeration in the Retail Food Industry

"As a contribution to the availability of food for a constantly growing population demanding quality products from the retail food industry, Centigrade Refrigeration provides solutions in refrigeration focusing on energy efficiency and food safety."

According to engineering and refrigeration specialists, supermarkets and FMCG wholesalers can spend up to 50% – 60% of their energy bill on refrigeration. Interfering with refrigeration systems can lead to food safety issues, which is why energy managers and store owners are often reluctant to make big changes to their most energy-hungry components. However, if stores are willing to invest in energy-efficient systems, the value to the business is clearly visible.
An effective refrigeration system used to be all that mattered. If it kept your produce cold and fresh, it was doing its job. But that's not nearly enough anymore. Your refrigeration and freezer units need to be efficient at energy savings, as well as keeping your produce at the right temperature, with minimal fluctuations, and for longer. Product longevity, shelf-life, and your energy bill are at stake.

South Africa is in the process of phasing out greenhouse refrigerants, and by 2024 new HCFC installations will be banned. All new systems will need to run on natural refrigerants such as R290 (propane), R600a (iso-butane), and R744 (CO2). CO2 (R744) refrigerant is a sustainable, non-toxic, non-flammable refrigerant. It has no effect on global warming in case of leakage and it has Ozone Depletion Potential (ODP) 0 and Global Warming Potential (GWP) 1.

CO2 is leading the way as the cleanest, safest, and most easily available option, and the advancements in this technology have seen massive improvements in both costs and efficiencies. According to Wayne Dedekind, SPAR Group Development Manager, "The latest trans-critical ejector systems show efficiencies 18% better than any previous HCFC plant."

Currently, as the phase-out of refrigerants in accordance with the Montreal Protocol continues, and with the strong support natural refrigerants currently enjoy, we may well find ourselves with the following options: ammonia, carbon dioxide, iso-butane and propane." In terms of using propane refrigerants, he adds, "A propane chiller option can provide a practical route to both operational efficiency (to reduce electrical consumption), as well as lower direct emissions (from leaking or discharged refrigerant)."

With Europe embracing propane (a major UK supermarket chain recently converted to propane as their preferred refrigerant), thanks to its excellent thermodynamic properties that lead to high energy efficiency), Laidlaw expects South Africa to follow suit.

He says, “Propane has good compatibility with materials commonly used in the construction of refrigeration and air conditioning equipment and is relatively inexpensive. It can be stored and transported in steel cylinders in much the same way as other common refrigerants.”

Although its flammability does mean additional health and safety rules will need to be followed, Laidlaw believes this is not outside the scope of existing technicians. “The current skills set for our technical personnel is in line with systems using propane. The only additional aspect will obviously be the flammability. This should be in line with the minimum requirements as laid down by the South African Refrigeration and Air Conditioning Contractor’s Association (SARACCA). The various levels of registration of personnel working with refrigerants must include all of the aspects of the use of hydrocarbons, ammonia, carbon dioxide, and, in fact, all refrigerants,” he concludes.

Retrofit or new?
In terms of retrofitting to optimise your refrigeration, reduce energy, and keep temperatures constant, fitting doors to your refrigeration and freezer units is a viable option.

The argument for closed units says that without doors, all your precious cold air is escaping, necessitating increased energy consumption from your refrigeration units, and making your aisles chilly, which means you’re burning money on heating your store as well. Closed units improve product shelf life by ensuring more reliable temperature stability. This in turn results in a reduced need for defrost cycles to remove ice from the refrigerator coils, as well as a more stable temperature inside the cabinet during these cycles.

Doors can also help stabilise temperatures during power outs, an important consideration for South African stores who are set to face increased loadshedding.
Globally the use of closed cabinets in new designs and through retrofitting has already become common practice.

"Our goal is to offer the best solution, analyzing all the alternatives and proposing the most efficient, reliable and sustainable to the client."