

CO₂: End-user Driven Change in Vending Machines and Other Applications

For Manufacturers of Point-of-Sale Refrigeration Equipment such as Vending machines, CO₂ is being considered as an HFC replacement, following the consumer market trend of “going green” and acting as a way to reach and expand their customer base by demonstrating attention to environmental concerns. This is in contrast to traditional commercial and even domestic refrigeration marketing, where little attention is paid to particulars such as the type of refrigerant a refrigerator uses. Other applications include centralized refrigeration systems for Supermarkets, which may combine CO₂ with Ammonia in the heat transfer process.

While flammability is not an issue like it is with Hydrocarbons (e.g. R290 & R600), with Carbon Dioxide, also known as R744, there are issues related to high pressures that can cause some concern among refrigeration manufacturers looking at changing to CO₂. Most of these involve design specifications, but also include manufacturing feasibility. Specifically, the higher critical point of CO₂ makes it more difficult to handle the gas as you would other refrigerants. In comparison, the critical point of R134a is 590 psia (or 210° F), while the critical pressure of CO₂ is 1,067 psia (88°F). Concerns over in-field repair feasibility also exist, possibly creating the need for machines to be serviced at the manufacturer’s facility rather than by a traditional HVAC service technician.

Traditional volumetric metering devices aren’t rated for the high pressure required of CO₂, so a mass-flow meter with a suitable rating must be used instead, adding to the cost of charging the gas. Other components such as the filling head, valves, etc. must also be of a suitable design. As far as the working environment is concerned, adequate ventilation is all that is required to prevent the increase of atmospheric concentration which could result in mild health concerns. CO₂ need not be reclaimed and can simply be vented.

While CO₂ equipment is a reality of this era of alternative refrigerants, uncertainties over the future of its market share still exist.

Please contact Gordon Purkis at VTech for more information (404-432-1629) or g.purkis@vtechonline.com