Low Charge Ammonia Boosts Energy Efficiency

The R404A based refrigeration systems of a warehouse owned and operated by a food distributor in tropical Queensland, Australia, was replaced with a centralized low charge ammonia system. The specific energy consumption (kilowatt hours per cubic meter per year) was thereby reduced by 57 percent. The total low temperature and medium temperature design refrigeration loads are 45 and 48 kilowatt respectively – this corresponds to the capacities of a medium-size supermarket. Another important feature is the relatively low NH_3 inventory of less than 250 kilograms with less than 2 kilograms operating inventory in the two freezer air coolers.

The energy efficiency increase of the new NH_3 installation indicates that the replacement of existing dilapidated HFC (Hydrofluorocarbons) based facilities may be financed through energy cost savings. In addition, the longevity (technical life) of an NH_3 based refrigerating solution is in the range of >30 years, hence exceeding the life expectancy of standard HFC based solutions by approximately a factor of two.

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