

Did You Know?

Modern Refrigerant's Efficiency & Challenges



Refrigeration is essential in various industries, from food preservation to HVAC systems. The efficiency of refrigeration systems plays a vital role in energy consumption, environmental impact, and operational costs.

Evolution of Refrigerants

Traditional Refrigerants

Early refrigerants like CFCs (Chlorofluorocarbons) were highly effective but posed significant environmental risks, leading to their phase-out.

Modern Refrigerants

Newer refrigerants such as HFCs (Hydrofluorocarbons), HFOs (Hydrofluoroolefins), and natural alternatives like CO₂ and ammonia offer better performance but come with their own challenges.



Hydrocarbons – A Sustainable but Flammable Option

- Examples: R290 (Propane) and R600a (Isobutane)
- **Benefits:** Eco-friendly refrigeration solutions with negligible global warming effects
- **Challenges:** Their flammability restricts their use in most regions

CO₂ (R744) – A High-Pressure Challenger

- Operates at pressures exceeding 100 bar in trans critical systems
- **Benefits:** Its cost-effectiveness and eco-friendliness make it increasingly popular in commercial and automotive refrigeration
- **Challenges:** Requires specialized equipment

R410A-Efficient but Demanding

- An hydrofluorocarbon (HFC) refrigerant
- **Benefits:** R410A is a high-efficiency refrigerant with no temperature glide and greater cooling capacity
- **Challenges:** Operational pressures are nearly twice as high, requires larger compressors and strengthened piping

Low-GWP Refrigerants for a Greener Future

- Refrigerants like R1234yf and R32, are replacing traditional HFCs
- **Benefits:** Maintain high efficiency while drastically reducing their impact on global warming
- **Challenges:** Flammability, high operating pressures, and increased system costs

Our Expertise

PMG Engineering specializes in delivering end-to-end engineering design and project management services for the food industry.

Our services include Engineering design, process design, procurement and contracting, project management, appropriate equipment selection, and compliance with safety and regulatory standards, ensuring optimal performance and energy efficiency.

Partner with PMG to build world-class food factories that meet global standards of engineering and food safety

ABOUT PMG

BUILD **WORLD CLASS** FOOD FACTORIES

At PMG, we offer complete solutions from design to commissioning, specializing in food factory construction that meets global standards.

NEW DESIGN

EXPAND

UPGRADE

CORE VALUES

Safe-by-Choice | **Objectivity** | **First-time Quality** | **Ownership** | **Maximize Value** | **Reliable & Trustworthy Business**

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