

“As Saudi Arabia’s leading refrigeration company, CGS is driving energy efficiency gains and lower environmental impact by adopting latest generation refrigerants from Honeywell, delivering significant total system cost savings to customers in the process. In particular, Honeywell’s Genetron Performax® LT (R-407F) provides a smooth and cost advantageous transition from R-22 / R-404A.”

- Yahia Henblasse, Refrigeration Engineering Manager, CGS

## CGS Qualifies Genetron Performax® LT (R-407F) For Cold Storage Application

### THE NEEDS

CGS was contracted by Himmah Logistics to install and commission a new refrigeration plant at a cold storage facility in an arid industrial area of Riyadh.

CGS set strict refrigerant criteria:

- Better system efficiency than R-404A with similar operating temperatures and pressures
- Better environmental performance than R-404A (lower GWP, non-ozone-depleting, nonflammable, low-toxic)
- Better performance than R-404A in high ambient and peak temperatures
- Near drop-in replacement for R-404A with minimal system modification



With R-22 being phased out for its ozone depleting potential (ODP) under the Montreal Protocol, the refrigeration industry in the Kingdom of Saudi Arabia (KSA) is looking for energy efficient alternatives, particularly with a rise in power costs and the withdrawal of local subsidies.

R-404A is one option, but although it is non-ozone-depleting, it is not as energy efficient as R-22 and comes with high global warming potential (GWP). Leading refrigeration company CGS looked for a better alternative for a new cold storage logistics project – and found Honeywell’s Genetron Performax® LT (R-407F), a near drop-in alternative to R22 and R-404A. It offers significant efficiency gains, is non-ozone-depleting, and has a lower GWP.

## CASE STUDY RESULTS



Machine Room

**“As the Kingdom aims to reduce demand for energy consumption in line with Saudi Vision 2030, it will be imperative for the refrigeration industry to adopt refrigerants that help them achieve goals for energy savings and reduced environmental impact”**

*- Ajay Katyal, Marketing Manager, Honeywell*

### THE SOLUTION

CGS engineers worked with Honeywell to prove the credentials of Genetron Performax® LT as a near drop-in replacement for R-22 and R-404A, with a specific focus on system efficiency, capacity, mass flow and environmental impact.

Genetron Performax LT (R-407F) is approved by major manufacturers of compressors, valves and other components, meaning it can be handled safely by technicians and contractors with no major changes.

CGS specified Genetron Performax LT R-407F for its Himmah cold storage project, without the need for any system modification. The LT and MT system is designed to serve five rooms @ -25°C and +4°C, with a total cooling area of 3,400 m<sup>2</sup>. In addition, three loading areas and a machine room needed to be maintained at 15°C and 25°C, bringing total MT and LT cooling capacities to 415KW and 354KW respectively. The refrigeration system is equipped with Bitzer screw compressors, Guntner air-coolers, BAC evaporative condensers and Danfoss controls.

### THE BENEFITS

The storage, handling and charging of Genetron Performax LT R-407F was the same as R-404A and, within two weeks of commissioning, the system was fully stabilized and is working to the required performance criteria.

### THE RESULTS

Genetron Performax LT is expected to deliver system energy savings of 183MWh\* per year over an equivalent R-404A system, leading to an annual cost savings of about SAR 55100\*\* in annual electricity bills

- 50% mass flow (kg/h) improvement over similar R-404A installations, resulting in considerable reductions in capital expenditure
- GWP 55% lower than R-404A
- Near drop-in replacement for R-404A, without any need for modification to equipment, installation procedures or commissioning timelines

## Proving the Value of Genetron Performax® LT in High-Ambient Temperature Regions

Using the Himmah project as a benchmark, the performance of R-407F was compared with R-404A in a detailed assessment programme, using LT and MT system evaporating temperatures of -8°C and -32°C respectively, and a condensing temperature of 36°C.

The analysis confirmed Genetron Performax LT as a lower GWP refrigerant and near drop-in replacement for R-404A for commercial refrigeration systems in KSA and other high ambient temperature regions. It also highlighted the significant energy efficiency benefits of R-407F and its lower capital and operating costs thanks to its lower system mass flow.

CGS is satisfied with the performance of Honeywell Genetron Performax LT R-407F and has already started using it as a refrigerant of choice for other projects, a strong indication of refrigerant acceptability in the region.

Total Refrigeration System Summary		
Refrigerant	R-407F	R-404A
System heat rejection (kW)	566	562
System mass flow (kg/h)	1172	1137
System efficiency (EER)	2.34	2.24

\*Assuming 80% duty cycle at rated conditions;

\*\* Electricity price @SAR0.3/KWh

**“In the wake of rising energy prices in the Kingdom, we were looking for ways to reduce our energy costs. Hence, the decision to move to Genetron Performax® LT was an easy one considering the terrific energy savings it offers over R-404A system”**

*- Ahmed Al Shabbir, Cold Store Manger  
Himmah Logistics*



Refrigeration Rack System

**For more information:**

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