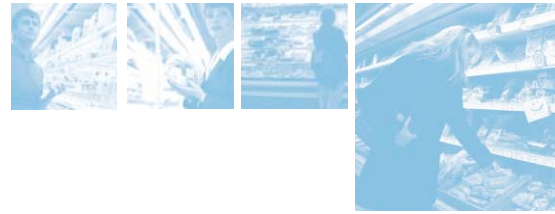


KLEA[®] 407A

Case Study: Forte trial frozen food store with KLEA[®] 407A



Background

Leading International, UK based Hotel, Leisure and Catering Company, Forte plc, has carried out a trial to assess the performance of R-404A against INEOS Fluors' KLEA[®] 407A refrigerant in a cold store at "The Granary" restaurant at Gatwick Airport.

The trial at 'The Granary' cold store was completed as a partnership between INEOS, its distributor Nationwide Refrigeration Supplies (NRS) and refrigeration engineering company, Stangard, a wholly owned subsidiary of Forte.

The equipment

The cold store situated at the rear of "The Granary" restaurant was equipped with a duplex refrigeration system which comprised two Prestcold MALQ 20X BI-75 condensing units. These units were sited in a plant room with a 24 metre pipe run to the evaporators including a 6 metre suction riser. A single control thermostat maintained a cold room temperature of -22°C. The refrigeration plant was originally designed and commissioned with R-502 before retrofit to R-404A and EMKARATE RL 32S polyol ester.

Performance testing

In order to assess the relative system performance of KLEA[®] 407A the system was first instrumented. The retrofit procedure consisted of a system performance and leakage check, followed by reclaim of the R-404A charge. The only work required on the system was routine replacement of the dryer (with a dryer of the same 134a compatible type) and a check on the compressor oil level. The system was reassembled and thoroughly evacuated before recharging with KLEA[®] 407A. Once the system had reached a steady state the operating conditions for KLEA[®] 407A were recorded.

	R-404A	KLEA [®] 407A
Suction pressure (barg)	0.76	0.55
Suction temperature (C)	13.6	14.5
Discharge pressure (barg)	10.38	10.60
Discharge temperature (C)	61.2	69.3
Ambient air temperature (C)	14.3	15.0
Compressor power (kW)	1.90	1.83

Results

The table shows a comparison of measured data, for both R-404A and KLEA[®] 407A operation. The results of the conversion show that the instantaneous power consumption was lower using KLEA[®] 407A by approximately 5 percent. The compressor run times were similar for R-404A and KLEA[®] 407A. Ambient temperature was slightly higher when assessing the performance of KLEA[®] 407A. All other system parameters were comparable between the two refrigerants.

Comments on the trial

John Forte of the Forte Group commented "We are extremely pleased with the result of the trial at Gatwick."

Summary

Changing from R-404A to KLEA® 407A required minimal time and no system modifications. Performance of the system after retrofit is comparable with previously reported values for both refrigerants.

KLEA® 407A has been shown to have advantages over R 404A in this application.

With a low direct warming potential (GWP) and excellent energy efficiency, KLEA® 407A enables customers to achieve the lowest total equivalent warming impact (TEWI) available in this application field.

KLEA[®] 407A



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