RS-44 COMMERCIAL WINDOW AIR CONDITIONER TRIAL

Tests were carried out on a window air condtioner at the test site of Refrigerant Services Inc in Dartmouth, Halifax, Canada between August 2000 & October 2001 in which R22 was replaced by RS-44. The existing mineral oil in the system was retained for use with RS-44 and no changes were made to the hardware

SYSTEM SPECIFICATIONS:

7000 BTU window air conditioner
Manufacturer: Friedrich
Model no: ZQ07A10A
Serial no: Laek 01680
Number of months in service: 0 (new and unused)
Nominal cooling capacity: 7000 BTU
Voltage: 115/1/60
Operating refrigerant charge: 11.1 oz (315 grams)
Oil type: mineral oil 150 viscosity
Expansion device: capillary tube
Compressor type: hermetic

MODIFICATIONS TO SYSTEM:

No modifications were made to the system for this trial.

STAGE 1 OF COMMERCIAL WINDOW AIR CONDITIONER TRIAL

The system was operated for several hours with the original R22 charge. Baseline data was recorded including :

Voltage, amperage, suction pressure, suction temperature, discharge pressure, discharge temperature, evaporator temperature, ambient temperature, evaporator return and supply air temp, and condenser discharge air temperature.

STAGE 2 OF COMMERCIAL WINDOW AIR CONDITIONER TRIAL

The R22 charge was recovered and the system evacuated. An equal amount by weight of RS-44 was charged into the system and the system was operated. The same data as stage 1 was collected for comparison purposes.

	RECORDED DATA R-22	RS-44
Suction pressure	3.66	3.03
Suction temperature	18.3	14.5
Discharge pressure	14.69	14.69
Discharge temperature	74	63
Liquid line temperature	31	30
Ambient temperature	25	25.6
Ambient humidity	60%	56%
Condenser outside temperature	38	38
Amperage	5.72	5.58
Voltage	114	114
Evaporator temperature	3	4
Evaporator temperature difference	15	16.1
Superheat	9.1	15.4

Note: pressures in bars gauge, temperatures in Celsius, all readings are averages over several hours of operation.

GENERAL OBSERVATIONS:

(1) Suction pressure was approximately 0.6 bar lower with RS-44.

(2) Discharge temperature was 15% lower with RS-44.

(3) Energy usage was slightly lower with RS-44 and no measurable change in performance or capacity.

(4) Oil return was good.

CONCLUSIONS

(1) After conversion, equal or slightly better operational performance was achieved with no modifications to the system.

(2) Significantly lower discharge temperatures after conversion could improve compressor reliability and extend compressor life especially during high ambient temperatures.

(3) There appeared to be improved energy efficiency using RS-44.

(4) No problems were encountered with oil return.