



**Refrigerant Solutions Ltd**

## **RS-44 COMMERCIAL WINDOW AIR CONDITIONER TRIAL**

Tests were carried out on a window air conditioner 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**

	<b>R-22</b>	<b>RS-44</b>
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.