

# SIMPLIFIED REFRIGERANT CONVERSION USING R434A (RS-45)

## REFRIGERANT CONVERSION CASE STUDY

GAS SERVEI S.A. would like to thank the supermarket property owners and the installation company "FREDVIC S.L.", for their valuable collaboration in the introduction of the new line of environmentally friendly refrigerant gases. The aforementioned supermarket chain has always shown keen interest in the development of better environmental solutions, in regards to supermarket equipment.



Location: Barbera del Valles (Barcelona)  
 Owner: Private  
 Installation Company: Fred Vic S.L.  
 Date: Thursday 14 January, 2010

Purpose of conversion: Both the supermarket chain owner and the installation contractor were preoccupied by the legislation on chlorinated-fluoro-hydrocarbons (CFHCs) particularly, with CFHCs 22 (R22). Moreover, the supermarket-chain owner and the service contractor, having extensive experience using other "drop-in" refrigerants, available in the local market, decided to gauge R434A (RS-45) performance. The decision to look into R434A (RS-45) is due in part to recent trends of use in the Spanish market and its proven reputation as an effective and readily available refrigerant, without the requirements of existing installation modifications or adapters. R434A (RS-45) refrigerant gas has similar toxic and flammable properties, such as R22.

The refrigerant conversion took a total turnaround service time of 3 hours.

### INSTALLATION



Equipment: 3 compressors – "Blitzer 5.2" equipped with constant positive centrifuge turbine condensers.  
 Refrigerant Type: R22  
 Lubricant: Mineral Type, SUNISO 3 GS. (ISO-32)  
 Installation: 1999  
 Refrigerant Capacity: 55Kg (121 Lbs.)

### CONVERSION SEQUENCE:

08:30: Initiate existing R22 refrigerant capture, using a "Ritchie (Yellow Jacket) rated with ½ HP electronic leak detector and pump" and an "OXYTR 520 A rated with 1 HP pump unit". A total of 55 Kg of R22 was obtained and stored in special "GAS-SERVEI S.A." collection bottles.



10:00: Once all of the R22 was removed from the target refrigerator, the pumps were disconnected, leaving a final pressure on the refrigerator lines of 0.44 Bar.

At this time, the temperature (Ta) inside the fridge raised to 12°C (53.6°F)



10:12: Recharge with R434 A (RS-45) starts. A total of 50 Kg was used. (Incomplete charge)

10:30: The first charge of R434 A (RS-45) ends. Immediately after the end of the refrigerant first charge; the temperature inside the fridge drops from + 12°C (53.6°F) to + 2°C (35.6°F). The refrigerator unit's amperage raised considerable, as the refrigerator was being recharged.



10:45: The refrigerant adjustments ended, completing a full charge of 55 Kg (121 Lbs.)



Through a level gauge on one of the compressors, the lubricant level was noted to be low and proceeded to top-off with universal oil POE (9-Life) viscosity 32.

Possible leaks were confirmed with an electronic leak detector "RITCHIE (YELLOW JACKET)" model GRT 69366 with sensitivity of 0.85 gr. and total system stabilization is verified.

11:00: Once the refrigerator unit's temperature and pressure were checked, the refrigerant conversion is finished. The system's amperage was checked the next day. The amperage (load) comparison between R22 and R434 A (RS-45) was found to be very similar.

**COMPARISON**

Refrigerant Type:	R22	RS-45	Difference
Time:(hours)	08:30Hrs	23:00Hrs	2.5 Hrs
Evaporation Temperature (°C):	-10	-10	0
Condensation Temperature: (°C)	+40	+40	0
Working Temperature (Ta in °C):	+1	+1	0

**CONCLUSION:**

We have proved the great cooling efficiency of refrigerant R434 A (RS-45), since it has reached a working temperature of + 1°C with great speed compared to the original R22 refrigerant. In this particular case study, the joints in the refrigerator were compatible with the PFC used. There was no need to regulate the expansion valve.

**CONVERSION CONTROL**

Day 01-14-10: Optimum performance. There are no reported incidents.

Day 01-15-10: No reported incidents.

Day 04-06-10: No reported incidents and the system continuously run in optimum conditions.

**The refrigerant conversion was done without need to shutdown the supermarket!**

Technical support provided by the Technical Department of:  
FRED VIC, GAS-SERVEI, S.A., REFRIGERANTS SOLUTIONS & GRIT



In conclusion, this refrigerant conversion is considered to be as a success, based on the data provided in this case study.

Note: Information provided by: Gas-Servei S.A. [www.gas-servei.com](http://www.gas-servei.com)



**REFRIGERANT SOLUTIONS LIMITED**

8 MURIESTON ROAD, HALE, ALTRINCHAM, CHESHIRE WA15 9ST  
Tel: (+44) (0)161 926 9876 Fax: (+44) (0)161 926 9875 Email: [rs@refsols.com](mailto:rs@refsols.com) Web: [www.refsols.com](http://www.refsols.com)