

## R434A (RS-45) SIMPLIFIES RETROFITS

### RETROFIT CASE STUDY

GAS SERVEI, S.A would like to thank the owner of Matadero Frigorífico Avinyó and its authorised maintenance engineer, Mr. Melchor Faja, for the trust shown in this product.

This meat company has always had great interest in developing the best environmentally solutions possible for their facilities.



Location: Avinyós (Barcelona)  
Maintenance engineer: Melcior  
Date: Saturday 28 May 2010

Reason for the conversion: The owner was worried about legislation on HCFCs particularly HCFC-22 present within its facilities and based on the different proposals received, including Ammonia and R-507, wanted to see the behaviour of R-434A (RS-45) owing to this being a solution recently available in Spain which is rapid, simple, economical and with very low glide, no losses of cooling capacity and a solution which is very safe. There was no need to make any changes to the installation and the product has the same characteristics as HCFC-22 in terms of toxicity and flammability

The various conversions were carried out in different stages at a time when it was necessary to replace the refrigerant owing to the appearance of leaks. The recovered and subsequently recycled R-22 was used to maintain the other rooms.

***REFRIGERANT SOLUTIONS LIMITED***

**The Refrigerant Specialists**

**INSTALLATION A:**

Equipment: 2 100 CV STAL rotary screw compressors.  
 Provision of Oil separator  
 Room temperature: 0° C / 1° C  
 Original Refrigerant: R-22  
 Original oil: Mobil Gargoyle Arctic SHC 226F mineral type  
 Age of the installation: year 1989  
 R-22 Original weight: 400 kg  
 Liquid phase recovery time: 2 hours through two 1 CV TR520A model recovery machines  
 Emptying time: 0 min, the R-22 vapour phase was eliminated.  
 Change of seals: yes, on the compressors.



**INSTALLATION B:**

Equipment: 1 75 V GRASSO 6 cylinder piston compressor  
 Provision of Oil separator  
 Room temperature: Air conditioned  
 Original Refrigerant: R-22  
 Original oil: Mineral  
 Age of the installation: year 1990  
 R-22 Original weight: 300 kg



**INSTALLATION C:**

Equipment: 4 50 CV Copeland BVM 8 cylinder compressors  
Defrosting by hot gas  
Room temperature: 0° C  
Original Refrigerant: R-22  
Original oil: POE  
Age of the installation: year 2001  
R-22 Original weight: 450 kg

**RESULTS OBTAINED WITH R-434A (RS-45) IN ALL CASES**

Yield: significantly greater  
Consumption: similar  
Condenser: improved performance

**ADVANTAGES OVER OTHER ALTERNATIVES: (SPEED, EFFICIENCY, LOWER INVESTMENT)**

- Due to the working pressures of R-434A which are less than 24 bar, it was not necessary to change the safety valves and other parts calibrated to 24 bar as would have occurred when changing to R-404A, R-507, R-422A or R-428A.
- Owing to the fact that the R-434A is compatible with mineral oil, the installations using this oil have not required changing to a POE oil, as would have occurred with R-404A, R-507, R-407C or R-427A thereby reducing the conversion time, oil cost, appearance of new leaks and use of very hygroscopic oils.

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- R-434A does not have any loss of cooling power compared to R-22 as would occur with R-422D, R-417A, R-424A, R-407C or R-427A.
- Due to its low temperature glide of 1.5°C, in the case of leakage it can be directly replaced without the need to extract the remaining refrigerant owing to the fractionation of the mixture as would happen with R-407C and R-427A.
- Owing to the good condensation obtained, it has not been necessary to change the condensers or make any change in this regard as would occur with R-404A and R-507.
- The owner can continue to use this A1 safety group product, thereby avoiding the use of toxic products such as ammonia which, among other things, also requires a major overhaul of all its installations.

## CONCLUSION

Due to the good results and parameters obtained with R-434A and also given that it is the most economic and best solution, Matadero Frigorífico Avinyó has been able to satisfactorily comply with current legislation without major investment having to be made in new equipment.



Authorised installer Mr. Melcior Faja and Lluís Giralte Jr. from the technical department of Gas-Servei S.A.