

## WORLD-WIDE INNOVATION with refrigerant RS-50 (R442A)

### SAROUL TMC: Manufacturer of Independent Electrical Cooling Units for Food and Medical Transportation.

#### DESCRIPTION OF THE PRINCIPLE

The solution Saroul offers is truly innovative. Indeed, TMC makes use of the vehicle's alternator/generator (Light Commercial Vehicles or Industrial Vehicles) to supply electricity. This electricity is then stored in high-capacity stationary batteries. As soon as the engine is switched off, the batteries provide the vehicle's cooling unit with the necessary energy, for up to 8 hours and according to the cooling requirement, whether negative or positive, the volume of the trailer, the number of times the doors are opened and closed and the number of stationary batteries fitted.

The user can therefore maintain the temperatures set and avoid all risk of interrupting the cold chain.

With a noise level of below 60 dB(A), TMC is suitable for city deliveries.

Available in two versions, namely Trans Medical Cooling (medical) and Trans Market Cooling (for food), TMC has been in operation since 2009 in LCV and IV fleets such as Bio Trans, Flash Logistique, Kaplan, Santrans and even in Rewe in Germany.

#### INTERVIEW WITH PHILIPPE SAROUL

Presentation by **Philippe Saroul**, the manager:

*We have manufactured a positive and negative cooling system, which is 100% electric and environmentally-friendly, called TMC. This product is designed and implemented in France, and it is suitable for application in both the medical and foodstuff industry. We have already outfitted several thousands of light commercial and heavy goods vehicles of up to 19 tonnes.*

*The 19-tonne vehicle presented at SOLUTRANS in November 2015 is a worldwide innovation in terms of cooling.*

#### What are the benefits of the TMC system:

**P. Saroul:** There are many benefits:

- There is no interruption in the cold chain.
- Fuel economy of 90% (for a sprinter, 2,000km/day means saving 15,000 litre/gasoline/ annum, in other words approximately €12,000/year).
- Stopping time regulations observed, increased safety, comfort for drivers.
- Price similar to traditional system with independent diesel unit.
- Unbeatable silent operation.

➤ Minimal maintenance.



## DESCRIPTION OF INSTALLATION

- A 12 or 24 V Lithium ion battery from 100 to 600A depending on the desired operating range.
- A specifically adapted Inverter system transforms direct current into alternating current at 50Hz.
- A scroll or rotary compressor of 2,000W to 3,000W at -20°C.
- An evaporator and a direct expansion air/air condenser.

The system initially designed to operate with R404A is now filled with R442A (RS-50).

## WHY CHOOSE R442A (RS-50)?

**P. Saroul:** *to anticipate the future ban on the use of R404A in 2020, we decided to use RS-50 owing to its superior thermodynamic performance levels.*

*We discovered RS-50 in early 2015. We tested it in classic units and immediately realised that the cooling capacity of RS50 was much higher than that of R404A, especially at low temperatures. Our regular supplier suggested we use R452A (XP44) but the tests we performed didn't show significant improvements on R404A.*

*On the other hand, thanks to the improved cooling capacity of RS-50, we have the option either to increase the operating range of the batteries or reduce their quantity, or even reduce the size of our compressors, thereby making us more competitive.*

*CEMA FROID conducted the type approval of the units according to the ATP protocol in force. Our customers therefore get the benefit of better technology, minimising costs and CO<sub>2</sub> emissions at the same time.*

*We currently already have over 100 systems operating on RS-50, and this is just the beginning.*

## WHY THIS TECHNOLOGICAL BREAK?

**P. Saroul:** *Our customers in the medical transportation industry such as TSE, Biotrans notified us of their need to maintain constant temperatures for their various products, whatever the conditions. In fact, regulations make stopping cooling engines obligatory, which has a direct effect on the continuity of cold production, for instance during ferry navigation times, at fuel stations, during breaks, during docking of trailers...*

*We began devising a solution in 2008. We have now perfected a reliable, high-performance system that accommodates all the needs of such tasks. To date, we have sold several thousands of units across France.*



## IN CONCLUSION: HOW DO YOU SEE THE FUTURE?

**P. Saroul:** *Our system has rapidly been established as the leader in the highly controlled medical transportation industry. Our quality and reliability results now also appeal to the chilled food transportation industry. The 4 benefits are increased operating range, savings on costs and fuel, silent operation and reliability.*

*Our customer, PICARD, has ordered several lorries, one of which was presented at the Solutrans trade fair in Lyon in November 2015. Our system is fitted on a Cherreau trailer on a 19-tonne Scania hybrid Biodiesel lorry.*

*Below is a photo of the test performed at -30°C*



This lorry was presented at COP21.

<http://www.transportissimo.com/njs-faramia-seduit-par-les-moteurs-gnc/>

This worldwide première involves a 19-tonne lorry fitted with an independent cooling unit filled with RS-50, which is battery operated, and can reach temperatures of -30°C. It makes city centre deliveries possible in a super-silent way, maintaining an unbroken cold chain and reducing the diesel consumption of the cooling unit by 90%.