



REFRIGERANT CONVERSION GUIDE



R-452A
REFRIGERANT

Advanced Efficient Green



THERMO KING'S F-GAS STRATEGY

FUTURE PROOFING YOUR BUSINESS

Thermo King has invested heavily in the development of innovative technologies that minimise environmental impact while giving uncompromised performance and reducing operating costs.

Leveraging their 75-plus years of experience and the expertise of the Ingersoll Rand group, Thermo King has researched the most suitable alternative to R-404A, the refrigerant most commonly used in road transport today.

THE RESULT IS R-452A, A HYDROFLUORO OLEFIN (HFO) BASED BLEND OFFERING AN IMMEDIATE REDUCTION IN ENVIRONMENTAL IMPACT OF 45%.

NEW REFRIGERANT

45%

immediate reduction in
environmental impact

R-452A

WHAT IS DRIVING THIS CHANGE FROM R-404A?

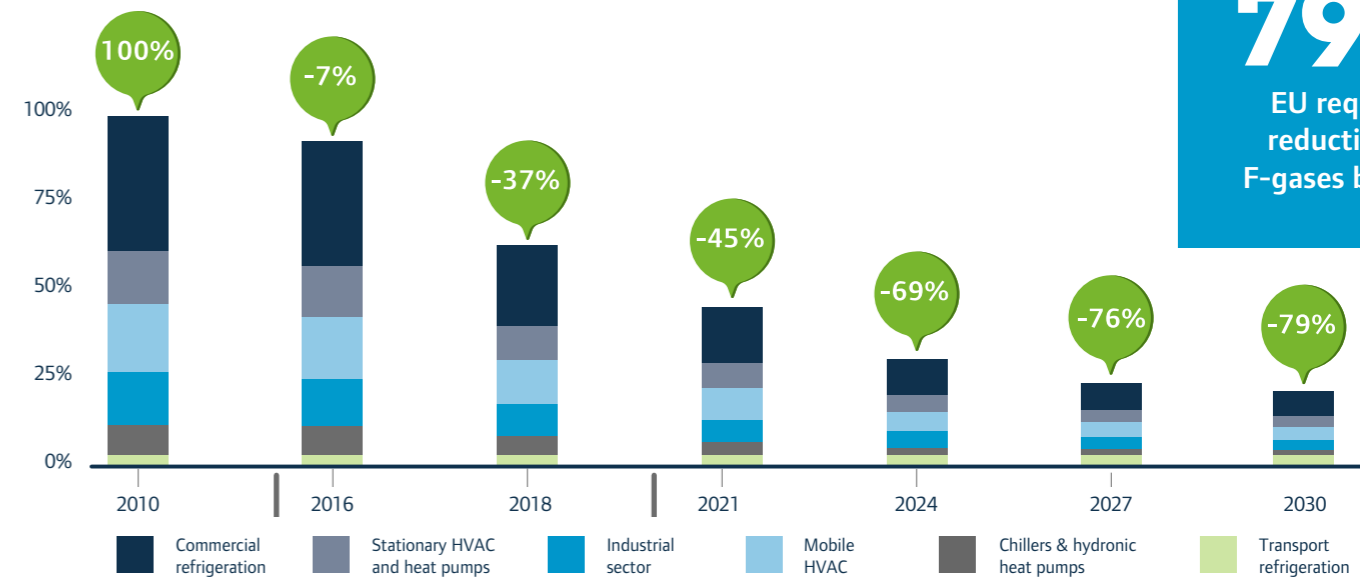
New European legislation is coming into effect with the purpose of minimising the environmental impact of fluorinated refrigerants (HFC's or F-gases) including those commonly used in transport refrigeration such as R-404A.

The target is to reduce the CO₂ equivalent impact of F-gases incrementally, achieving 79% reduction by 2030 (see chart). The regulations also cover the handling of F-gases and their use in both existing and new equipment.

WHEN IS IT CHANGING?

The EC Regulation 517/2014 (F-GAS revision 2015) becomes law in January 2015. A gradual phasing out of F-gases is scheduled from that date onward.

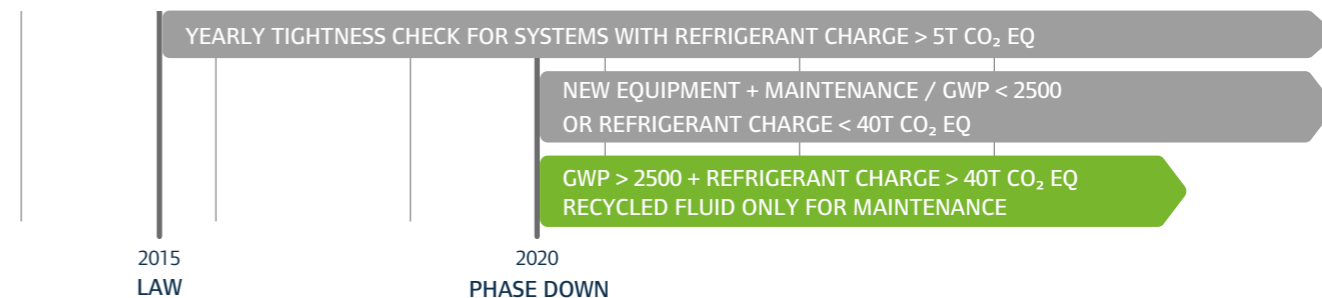
USAGE OF HFC-GASES PER APPLICATION



79%

EU required reduction of F-gases by 2030

TRANSPORT APPLICATIONS: F-GAS APPLICABLE FOR VEHICLES ABOVE 3.5 TONS ACROSS EU28 ZONE



HOW WILL IT AFFECT TRANSPORT COMPANIES?

Refrigerated transporters need to understand the impact of these changes on their business, especially when planning future investment in equipment. The main changes affecting the refrigerated transport sector (representing around 2% of the total F-gas usage) are:

- Only certified technicians will be allowed to install or service refrigeration systems
- Periodical refrigeration circuit tightness checks must be performed
- After 2020, recycled refrigerant must be used for maintenance

YOUR THERMO KING DEALER CAN PROVIDE A FULL ASSESSMENT OF THE IMPACT OF THIS LEGISLATION ON BOTH YOUR CURRENT FLEET AND FUTURE EQUIPMENT.



WHAT MAKES THERMO KING'S SOLUTION THE RIGHT CHOICE?

The benefits of using R-452A as a long term field conversion solution for R-404A are clear:

UNIT PERFORMANCE

- No loss of performance and reliability in terms of refrigeration capacity, pull-down and fuel efficiency

ENVIRONMENTAL TAX IMPLICATIONS

- Thermo King's unique micro-channel coil technology combined with the low GWP of R-452A reduces environmental warming and therefore limits the impact of future taxes based on environmental impact such as carbon taxes



COST OF OWNERSHIP

- No increase in operating costs
- Improved predictability of future maintenance costs
- No component changes: R-452A is a straight field conversion solution for all existing truck and trailer refrigeration units
- Limits risk of future price increases and supply shortages of HFC refrigerants
- Refrigerant convertibility helps ensure the long-term viability and residual value of operator's equipment today
- Easy to retrofit and less consuming, which means it needs to be changed less frequently and reduces operating costs

CORPORATE IMAGE

- A clearly stated refrigerant conversion strategy will reassure your customers that environmental responsibility is your prime concern and that your approach is proactive
- R-452A is a class A1 refrigerant denoting lowest toxicity and non-flammability, making it a safe product that will put your clients' minds at rest
- You can start publicising your strategy soon: your Thermo King Dealer is ready to talk with you now and Thermo King products will be available with R-452A from 2015

SERVICES AVAILABLE TO YOU THROUGH THE DEALER NETWORK:

- Refrigerant handling by certified maintenance personnel
- Periodic refrigeration circuit tightness check
- Conversion of existing fleet to low GWP refrigerant
- Sourcing new equipment with low GWP refrigerant law in January 2015
- A gradual phasing out of F-gases is scheduled from that date forward



WHERE DO I START?

The Thermo King Dealer network has been fully trained and certified in all relevant aspects of the new F-gas regulations. You may need an expert assessment of the impact of the legislation on your operation or you may want to actively reduce the environmental impact of your fleet. In either case, your Thermo King Dealer is ideally positioned to help.

Thermo King has developed a suite of ThermoKare Service Contract Solutions so you can maintain your focus on your core business alone. These solutions will allow you to eliminate non-core tasks such as maintenance planning, scheduling, invoice interpretation and general fleet administration.

You can also opt for an 'all-risk package' offering complete peace of mind and predefined fixed costs, with assurance of a consistent service level.

Our experts will analyse your fleet requirements and recommend the most suitable service agreement. Once you have selected a programme, your equipment will receive regular inspection, preventative maintenance and proper calibration. Potential problems will be prevented before they occur. You choose your level of coverage so you know exactly which services and parts are covered.

BY CONTACTING YOUR THERMO KING DEALER TODAY, YOU CAN TAKE THE FIRST STEP TOWARDS FUTURE-PROOFING YOUR BUSINESS.





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Thermo King® is a brand of Ingersoll Rand. Ingersoll Rand (NYSE:IR) advances the quality of life by creating and sustaining safe, comfortable and efficient environments. Our people and our family of brands — including Thermo King®, Trane®, Ingersoll Rand®, Club Car® and Schlage® — work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; secure homes and commercial properties; and increase industrial productivity and efficiency. We are a \$14 billion global business committed to a world of sustainable progress and enduring results.



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