



R-513A refrigerant

Future-ready and climate-friendly refrigeration dryers

KAESER meets the requirements of the F-gas Regulation (EU 517/2014)

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The implementation of the EU F-Gas Regulation 517/2014 poses significant challenges for manufacturers, service providers and equipment operators. You as an operator need to be particularly aware of the changes to ensure timely planning of investments and optimal long-term decisions. After a thorough examination of the issue, KAESER is offering operators supply security now and in the future with the switch to the climate-friendly refrigerant R-513A for all current and future models.

Purpose of the F-gas Regulation

The purpose of the mandatory European F-gas Regulation **EU 517/2014** is to address climate change by minimising emissions of fluorinated greenhouse gases (F-gases). As F-gases are used in commercial and industrial refrigeration systems, the regulation imposes requirements on companies that manufacture, operate and service such equipment.

F-gases and refrigeration dryers

Refrigeration dryers require a refrigerant to function. The refrigerants on the market today are all fluorinated greenhouse gases (F-gases). If they are emitted into the surrounding air, for example in case of a leak, they have a substantial impact on climate change. Consequently, the EU wishes to reduce emissions by driving refrigerants with a serious impact on climate change out of the market and promoting the use of more climate-friendly alternatives.

Quantifying the climate-friendliness of F-gases

Two parameters are used to assess the climate friendliness of fluorinated greenhouse gases. First: the global warming potential (**GWP**). This indicates the impact of 1 kg of an F-gas on global warming as compared to 1 kg of CO₂. The lower the GWP, the more climate friendly the gas in question is considered to be. Another key factor is the **CO₂ equivalent**. That is because the climate impact depends not only on the GWP, but also on the amount used. The CO₂ equivalent is the product of the GWP and the mass of the greenhouse gas, and thus represents the “climate-weighted mass” of an F-gas.

Example:

10.2 kg of the refrigerant R-404A has a CO₂ equivalent of $3.922 \times 10.2 \text{ kg} = 40 \text{ tons}$.

Consequences of the F-gas Regulation for manufacturers, service providers and operators

In future, the use of high-GWP refrigerants in maintenance and repair work will be prohibited. Refrigeration dryers using refrigerants with high GWPs cannot be offered on the market in the EU as of 2020. A mandatory quota system will force refrigerant manufacturers and importers of refrigeration dryers to make a gradual transition to more climate-friendly refrigerants. This process is referred to as the **phase-down** (see Fig. 2).

Refrigerant	Global warming potential (GWP)
R-404A	3922
R-407A	2107
R-410A	2088
R-407C	1774
R-134a	1430
R-513A	631

Fig. 1: Comparison of global warming potential (GWP) of various refrigerants

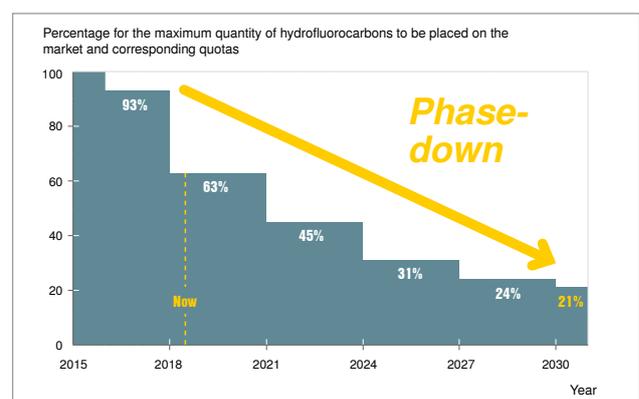


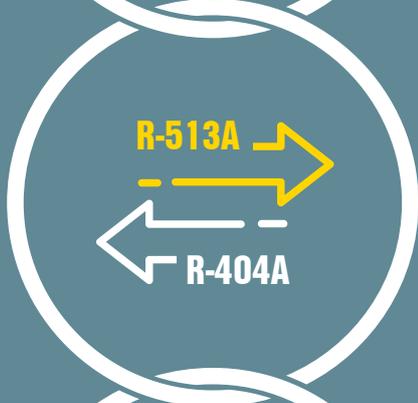
Fig. 2: Reduction of peak volume (CO₂ equivalent) in the EU (phase-down)

Future-ready refrigeration drying **KAESER recommends:**



1) **When purchasing new equipment, R-513A dryers should be used**

New dryers should use R-513A as the refrigerant or should at least be tested and prepared for it. R-513A is equivalent to R-134a and is non-flammable. Because refrigerant manufacturers will supply R-513A over the lifetime of refrigeration systems, KAESER will adjust its product range accordingly in 2019. If necessary, however, R-513A can also be used in current models. This means that you, the equipment operator, are on the safe side.



2) **Replacing older R-404A dryers**

The replacement of older R-404A dryers by new systems should be planned now and implemented in the near future. R-404A will likely be subject to substantial price rises and increasing scarcity. To avoid unnecessary costs and ensure uninterrupted availability of your compressed air supply, we advise making the switch early. That is the only way to minimise the risk of costly downtime.



3) **Prevention – through certified service**

System operators should have a certified company available to service refrigeration equipment. This service provider should conduct regular inspections and leakage checks to anticipate and eliminate problems before they occur and to reduce or avoid the use of refrigerants. This applies in particular to older systems for which the switch to a new refrigerant is not cost-effective.



4) **Keeping an eye on R-407C and R-410A dryers**

It is advisable to monitor the availability of these high-GWP refrigerants. In view of the coming scarcity of refrigerants, it is uncertain for how long it will be possible to continue repairing R-407C and R-410A dryers. As a result, operators should be planning to make replacement investments in the medium term. KAESER has suitable solutions on hand and will be pleased to provide detailed information and advice.



KAESER has put together detailed information and answers to key questions in a position paper. It is available at:

www.kaeser.com/refrigerants



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With innovative products and services, KAESER KOMPRESSOREN's experienced consultants and engineers help customers to enhance their competitive edge by working in close partnership to develop progressive system concepts that continuously push the boundaries of performance and compressed air efficiency.

Moreover, the decades of knowledge and expertise from this industry-leading system provider are made available to each and every customer via the KAESER group's global computer network.

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