

Accepted Manuscript

Title: Refrigerants used in the Portuguese Food Industry: Current Status

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PII: S0140-7007(17)30293-1

DOI: <http://dx.doi.org/doi: 10.1016/j.ijrefrig.2017.07.013>

Reference: IJIR 3714

To appear in: *International Journal of Refrigeration*

Received date: 15-12-2016

Revised date: 13-6-2017

Accepted date: 22-7-2017

Please cite this article as: Bruno J. Cardoso, Francisco B. Lamas, Adélio R. Gaspar, José B. Ribeiro, Refrigerants used in the Portuguese Food Industry: Current Status, *International Journal of Refrigeration* (2017), <http://dx.doi.org/doi: 10.1016/j.ijrefrig.2017.07.013>.

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Refrigerants used in the Portuguese Food Industry: Current Status

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HIGHLIGHTS

- Current status of the refrigerants used in the Portuguese Food Industry is presented
- The restrictions imposed by EU Regulation No. 517/2014 affecting the use of refrigerants are discussed
- R404A is used by 40% of the analysed companies, while R22 is found in nearly 25%
- Replacements for R404A and R22 are reviewed and summarized
- Satisfactory alternatives for R22 and R404A are available, with lower GWP and higher efficiency

Abstract

Owing to environmental problems arising from the use of refrigerants, first the ozone depletion and later the global warming, various refrigerants have been banned and established their phase-out deadlines through some international protocols, being the Montreal and Kyoto Protocols two of the most famous. This paper intends to make a characterization of the most currently-used refrigerants in the Portuguese food industry, through a sample of 148 companies gathered in a nationwide survey. It also aims to analyse not only the environmental impacts of these refrigerants, but also the restrictions that these companies may incur according to the EU Regulation No. 517/2014, such as maintenance and service bans or cap and phase-down on the supply. Finally, and according to other researches and tests reports, some possible replacements for two of the most commonly-used refrigerants (R404A and R22) which are being phased-down, are summarized. According to the research, there are some satisfactory mid-term and long-term alternatives available for R22 and R404A having much lower GWP, allowing systems to achieve higher efficiencies and in turn, lower environmental impacts during their service life.

Keywords: Refrigeration Systems; Food Industry; ODP; GWP; Refrigerant Replacement

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