Executive Summary: Refrigerant Use in Industrial Process Air Conditioning (IPAC) Cabinets and Chillers

Purpose

This document explains why the continued use of the refrigerant **R-513A** in Industrial Air Conditioners for electronic enclosures and chillers **remains necessary, safe, and compliant with European Union requirements 2027 and beyond.**

Key Takeaway

The continued use of R-513A in Industrial Air Conditioners used on electronic enclosures and chillers in 2027 and beyond is justified, necessary, and aligned with EU regulatory and safety objectives.

Regulatory Context

The EU F-Gas Regulation (EU) 2024/573 restricts the use of industrial air-conditioning equipment and chillers containing refrigerants with a Global Warming Potential (GWP) of 150 or higher after 1 January 2027 in the EU market. The regulation explicitly allows exemptions according to annex IV of the regulation where a refrigerant above 150 GWP is required to meet safety requirements. In that situation the GWP limit is 750.

Why Industrial Air Conditioners for Enclosures and Chillers require a non-flammable Refrigerant

Industrial Air Conditioners are self-contained cooling systems installed in close proximity to electrical and electronic equipment that is installed within an electronic enclosure. These enclosures inherently contain potential ignition sources due to the electronics within them and the fact that they are sealed. The chillers are installed in close proximity of potential ignition sources. As a result:

- Flammable refrigerants (A2L or A3) introduce a possible fire and explosion risks
- Leakage into electrical compartments cannot be fully prevented
- Even extensive redesign cannot eliminate all critical safety hazards

For these reasons, flammable refrigerants are not a viable and safe option for this application.

Compliance with Safety Standards

Industrial Air Conditioners and chillers using R-513A fully comply with applicable European safety standards, including:

- EN 378 (Refrigeration safety and environmental requirements) (Industrial Air Conditioners and Chillers)
- EN 60335-2-40 (Product safety for electrically driven air-conditioning equipment) (Industrial Air Conditioners)
- EN 60204-1:2018 (Electrical equipment of machines) (Chillers)

These standards impose fundamentally different and significantly more restrictive requirements for flammable refrigerants. Applying those requirements to Industrial Air Conditioners for electronic enclosures and chillers using flammable refrigerants would require disproportionate changes and still would not achieve an equivalent level of safety.

Conclusion

Industrial Air Conditioners and chillers using R-513A (which has a GWP below the 750 limit) provide a safe, reliable, and energy-efficient refrigerant solution. The continued use of R-513A is necessary to meet mandatory safety requirements and is consistent with the safety exemption allowed under the EU F-Gas Regulation.

At present, no alternative refrigerant can deliver the same level of safety and performance without introducing unacceptable risk or disproportionate cost.

If you have further questions please contact customer.care@pfannenberg.com