



TECHNICAL BULLETIN

REPLACEMENT REFRIGERANTS IN R22 & R134A WATER CHILLERS

Conversion of water chillers operating on R134a or R22 to a suitable replacement will depend very much upon the type of chiller barrel or evaporator.

The following is a general guide, but the final decision may depend upon an inspection of each chiller to determine its suitability.

Suggested R134a & R22 alternatives in the common types of water chillers:

- (1) Single pass refrigerant, single pass water, counter current flow, DX, tube in tube, tube in shell or plate type.
[RS-51 \(R470b\) for R134a chillers and RS-44b \(R453A\) for R22 chillers](#)
- (2) Multi pass refrigerant or water, DX , tube in shell.
[RS-45 \(R434A\)](#)
- (3) Flooded chillers.
[RS-45 \(R434A\)](#)

The main differences between RS-44b/51 and RS-45 are that RS-45 has a higher capacity and lower temperature glide (near azeotropic). The mass flow rate of RS-45 is higher so that the expansion device on the chiller will need to accommodate a higher liquid flow rate similar to the liquid flow rate of R404A.

RS-45 is the only replacement for R22 which can match the performance in flooded systems satisfactorily. RS-45 can be used in any type of chiller if these chillers can accommodate the higher flow rate.

RS-44/51 and RS-45 have considerably lower discharge temperatures than R22, have a safety classification from ASHRAE of A1, namely low toxicity and non-flammable under all conditions of flammability, and are compatible with mineral oil, alkylbenzene and POE lubricants.

Date: April 2025

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