

ASHRAE Technical FAQ

ID 24

Question Where can I find more design information on a new refrigerant?

The [2013 ASHRAE Handbook - Fundamentals](#) has two chapters devoted to refrigerants. Chapter [F29](#) provides a general discussion of the different refrigerants, and Chapter [F30](#) provides pressure-enthalpy diagrams and summary tables of the thermodynamic and transport properties of the more common refrigerants. Chapters [R06](#), [R07](#), and [R12](#) of the [2014 ASHRAE Handbook - Refrigeration](#) provide information on refrigerant system chemistry, the control of moisture, and lubricants for use with refrigeration systems. The "NIST Reference Fluid Thermodynamic and Transport Properties Database ([REFPROP, Standard Reference Database 23](#)), Version 9.0", provides more detailed properties for 39 pure fluids, 35 predefined mixtures (such as R410A) and allows the user to obtain properties for any arbitrary mixture with up to 20 components.

Answer

[ASHRAE Standard 34-2016](#) defines the nomenclature used to name refrigerants and provides safety (flammability and toxicity) classifications for 53 pure fluids and 45 blends. These classifications are referenced by [ASHRAE Standard 15-2016](#), which defines allowable refrigerants in different applications. The "NIST Leak/Recharge Simulation Program for Refrigerant Mixtures ([RELEAK, Standard Reference Database 73](#)), Version 4.0," allows the user to conduct fractionation analyses on refrigerant blends. Extensive data on lubricants and materials compatibility are available in the reports resulting from the Materials Compatibility and Lubricants Research Program of the Air-Conditioning and Refrigeration Technology Institute, similar work continues under the ARTI Research Program, see: www.ahrinet.org/site/508/Resources/Research

Some of the equipment and refrigerant manufacturers provide their customers design data and/or computer programs for their equipment and fluids. When new refrigerants (especially blends) are introduced, design data can be obtained from the refrigerant manufacturer.

The handbook and other publications may be purchased and/or individual chapters of the handbook may be purchased and downloaded on-line at our website, www.ashrae.org or by calling 1-800-527-4723 in the USA and Canada or 1-404-636-8400 worldwide.

[NIST](#) - National Institute of Standards and Technology, www.nist.gov
[ARTI](#) - Air-Conditioning and Refrigeration Technology Institute,
www.ahrinet.org/site/508/Resources/Research.

[ASHRAE Standard 34-2016](#), "Designation and Safety Classification of Refrigerants", plus [ASHRAE BOD approved addenda](#).

ASHRAE Pubs [ASHRAE Standard 15-2016](#), "Safety Standard for Refrigeration Systems", plus [ASHRAE BOD approved addenda](#).

[2013 ASHRAE Handbook - Fundamentals](#), Chapter [F29](#) & [F30](#)

[2014 ASHRAE Handbook - Refrigeration](#), Chapters [R06](#), [R07](#), & [R12](#)

Topic References Refrigerants, Thermodynamic properties, Transport properties, Lubricants

	Cognizant ASHRAE Committees	Refer to Organization
1	TC 3.1	NIST
2	TC 3.2	ARTI
3	TC 3.3	
4	TC 3.4	
5	SSPC 34	