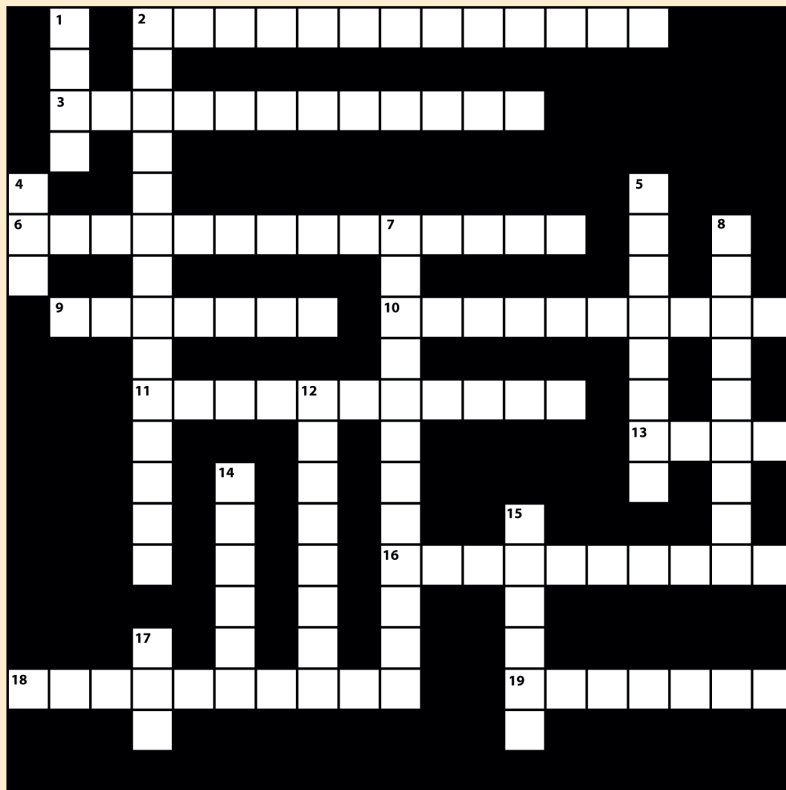


Take the HVAC CHALLENGE™

BY STEVEN G. LIESCHEIDT, P.E., CSI-CCS, CCPR

▶ Refrigerant System Chemistry



ACROSS

- Refrigerant 134a is an example of this category of refrigerants.
- These are usually more physiologically and chemically reactive than fluorinated hydrocarbons.
- Mixtures that include R-32 that are promoted as a replacement for R-22 and R-502.
- After the stator of an electric motor is wound, it is usually treated with this by a vacuum-and-pressure impregnation process for form-wound high-voltage motors.
- Wire enamels in refrigerant vapor typically exhibit this loss with increasing temperature.
- The active ingredient in anti-wear additives is typically this or sulfur or both.
- This organization publishes D2519 *Test Method For Bond Strength of Electrical Insulating Varnishes By The Helical Coil Test*.
- This is caused by the rapid change in pressure and temperature after a wire enamel is exposed to R-22.
- This is the reverse reaction of an ester and water that produces an alcohol and an organic acid.

- Used extensively in large, open-type compressors for industrial and commercial applications.

DOWN

- Hydrochlorofluorocarbon.
- R-245ca that is considered as a chlorine-free replacement for R-11.
- Chlorofluorocarbon.
- This flammability ratio is the maximum amount of flammable component that a mixture can contain and still be nonflammable, regardless of the amount of air.
- Propane, n-butane, isobutene, and blends of these.
- This is usually not a problem in hermetic systems using hydrocarbon oils because no oxygen is available to react with the lubricant.
- The effect of refrigerants on these usually decreases as the amount of fluorine in the molecule increases.
- These esters are widely used as lubricants

- This organization publishes *Standard 34 – Number Designation and Safety Classification of Refrigerants*.
- This organization publishes *Standard 700 – Specifications For Fluorocarbon Refrigerants*.

To brush up on the facts behind this month's clues, refer to Chapter 5 ("Refrigerant System Chemistry") in the 2006 *ASHRAE Handbook – Refrigeration*.

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