



**NASSAU COUNTY FIRE COMMISSION
OFFICE OF THE FIRE MARSHAL**

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FIRE MARSHAL BULLETIN

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Hazards of New Refrigerants

Most legacy refrigerants found in air conditioners, refrigerators/freezers and industrial applications were non-flammable and relatively non-toxic but were not environmentally friendly. Anhydrous ammonia, which is found in many ice-skating facilities, cold storage locations and food manufacturing/warehouses, is highly toxic and although it does not fit the definition of a flammable gas as per USDOT regulations, this material will burn and does have published LEL (lower explosive limit) & UEL (upper explosive limit) values.

The new generation of refrigerants which means to be more environmentally friendly present a new danger to first responders as most new refrigerants are flammable gases and are transported as liquified flammable gases.

These new refrigerants may be encountered in home appliances such as refrigerators and/or freezers, central air conditioning and/or "split" system units or combination air conditioning/heat pump units. While not present in large quantities in these systems, first responders should be aware of this new hazard that may be present, especially during a structure fire. More concerning to first responders may be encountering these flammable gases during transportation incidents involving HVAC contractors or at fixed facilities, especially at HVAC contractor offices, warehouses and equipment suppliers where bulk amounts of these products may be present.

Common Legacy Refrigerants

R12: found in A/C units & refrigerators, chemical: dichlorodifluoromethane
UN 1028, USDOT 2.2, Non-flammable Gas, LC50: >760,000ppm, this material was banned in 1994

R22: found in A/C units & refrigerators, chemical: chlorodifluoromethane
UN 1018, USDOT 2.2, Non-flammable Gas, LC50: >300,000ppm, this material will be banned by 2030

R134A: found in refrigerators & automotive A/C, chemical: 1,1,1,2 tetrafluoroethane
UN 3159, USDOT 2.2, Non-flammable Gas, LC50: >500,000ppm

R410A: found in A/C units & refrigerators, chemical: difluoromethane + pentafluoroethane blend
UN 3163, USDOT 2.2, Non-flammable Gas, LC50: >520,000ppm, aka Puron, this material will be phased out by 2025

New Refrigerants

R290: found in some Energy Star appliances, chemical: propane
UN 1978, USDOT 2.1, Flammable Gas, LEL = 2.2%, UEL = 9.5%

R32: found in A/C units & heat pumps, chemical: difluoromethane
UN 3252, USDOT 2.1, Flammable Gas, LEL = 13%, UEL = 33%

R454B: found in A/C units & heat pumps, chemical: difluoromethane + tetrafluoropropene blend
UN 3161, USDOT 2.1, Flammable Gas, LEL = 11.3%, UEL = 23.6%, aka Puron Advance

R600: found in some commercial refrigeration and used as R134A replacement, chemical: isobutane
UN 1969, USDOT 2.1, Flammable Gas, LEL = 1.5%, UEL = 8.5%

The Nassau County Fire Marshal's Office is addressing the storage of these materials at fixed facilities as the New York State Fire Code allows UNLIMITED amounts of an inert gas like a legacy refrigerant but sets strict limits on the storage of flammable gases like the new refrigerants. (NYSFC Chapters 50, 53, 58 and 61)

The Nassau County Fire Prevention Ordinance also addresses the storage, use and sale of flammable gases through storage limitations, permit requirements and gas detection systems for leaks. (NCFPO Article 6 and Article 7)