

ANSI/ASHRAE 15-1994
SAFETY CODE FOR MECHANICAL REFRIGERATION

This code applies generally to mechanical refrigeration (including air-conditioning) and heat pumps and to new systems i.e. installed after this code, to parts or components added after the code, to systems after a change of refrigerant, and to parts or components replaced if they are not identical in function. The code stipulates that:

Each machinery room shall contain a detector, located in an area where refrigerant from a leak will concentrate, which shall actuate an alarm and mechanical ventilation at a level not greater than the corresponding TLV-TWA.

In all Industrial Occupancy Buildings such as Factories and Colds Stores with high probability systems you are required to use detectors in all areas where refrigerant from a leak will be concentrated so as to provide a warning at a concentration not exceeding the TLV-TWA.

In the case of ammonia systems, the machinery room is not required to meet Class 1, Division 2 of the National Electrical Code, provided that the machinery room is fitted with a vapour detector that will automatically start the mechanical ventilation at a detection level not greater than 1000ppm.

Combustion equipment may be installed in the same machinery room as refrigerant containing equipment if a refrigerant vapour detector is employed to shut down the combustion process in the event of a refrigerant leak.

Detectors shall be tested periodically in accordance with manufacturers specifications and the requirements of the jurisdiction having authority.

With air-conditioning, in the case of Public Assembly, Residential, Commercial, and Large Mercantile occupancy direct systems are permissible provided that the total charge does not exceed the allowed quantity of refrigerant per occupied space as shown in Table 1 in the code (this is an extract from ASHRAE Standard 34). This value is reduced by 50% for Institutional occupancy.

However the code states that these rules do not stand alone and hence, as is the case in Europe under EN 378, taking special precautions, such as fitting leak detectors in each occupied space to ensure that the limits in Table I in the code are not exceeded should allow an increase in the allowed quantity of refrigerant. The limits in Table 1 can be adhered to either by providing a local or remote supervised alarm so that occupants may leave the space, by activating ventilation or by activating valves to isolate the leaking unit thus preventing further leakage. Furthermore the Table 1 values are based on a single event with a complete discharge into the occupied space. Refrigerant detectors installed in the space can prevent this occurrence and hence the limits should not apply in those circumstances.