

10/21/96

Subject: ANALYSIS OF FURNACE CONDENSATE

INFORMATIONAL BULLETIN

SITUATION:

Concerns are being raised by city / local inspectors regarding disposal of condensing furnace condensate. These officials assume negative affects from furnace condensate being added into residential sewage treatment systems, systems having a septic tank or soil absorption leaching.

The latest variation in condensing furnaces utilizes a single exhaust vent pipe while obtaining its combustion air from within the structure. This type of vent system is different from earlier furnace vent designs. While it is strongly suggested within the furnace installation instructions to avoid contaminated combustion air, the typical condensate composition of the single vent pipe furnace will be slightly higher than a furnace utilizing outside combustion air.

<u>TYPICAL FURNACE CONDENSATE COMPOSITION</u>		
Condensate pH;	3.2 - 4.5 using OUTDOOR AIR 2.2- 4.5 using INDOOR AIR	Neutral pH: 7.0

Condensate Constituent	Average Constituent Levels OUTDOOR - INDOOR	Average Levels at 99.5 Percentile OUTDOOR-INDOOR
ION Constituents:		
Chloride Cl	0.13 ppm vs 1.10 ppm	3.00 ppm vs 26.00 ppm
Fluoride F	0.02 ppm vs 0.21 ppm	0.56 ppm vs 5.00 ppm
Nitrate N02	0.21 ppm vs 1.90 ppm	0.69 ppm vs 6.00 ppm
Nitrate N03	1.02 ppm vs 8.50 ppm	3.33 ppm vs 30.00 ppm
Sulfate S04	0.61 ppm vs 5.50 ppm	1.89 ppm vs 17.00 ppm
Water H2O	remainder	

Previous research reports on condensate disposal have detailed the following conclusions when discharging into a residential sewage system (septic tank or soil absorption leaching). The following summaries were based on the effects of the volume discharged and the characteristics of the condensate system installed.

- (1) Will not have a detrimental effect on the quality of the outflow of the sewage system and or septic tank, improving the quality.
- (2) May increase annual sewage flow the equivalent of 10.5 gallons per day. This is equivalent to 0.14 person at 75 gallons of water use per person per day.
- (3) Due to the large volume of wastewater, a septic system treats each day this amount will neutralize and dilute the furnace condensate keeping any changes to the properties of the system unnoticeable.
- (4) Due to the addition of the condensate into the septic tank, the temperature of the system will be more consistent on a yearly basis and such a system will have slightly higher temperatures as compared to a system without condensate being added. As a result of the condensate being added to the septic system, additional methane gas will be created further reducing organic solids. Septic tank solution pH will remain within the limits of methane producers.
- (5) The additional condensate into the septic system will not overload the sewage system unless the daily sewage flow is previously at or above the capacity of the systems design.
- (6) No long-term detrimental effects or changes will result to the soil characteristics by the addition of the furnace condensate or the soils ability to leach the products from the sewage treatment system.

In some areas, city, state or county ordinances require a pH neutralizer device be installed in line with the condensate drain. Hi-Tech Inc., phone 708-746-2447, offers such a device.

SOLUTION:

Follow the furnace installation instructions and recognize all caution statements pertaining to the need for uncontaminated combustion air. Using contaminated combustion air will result in furnace condensate having stronger acidic levels.

CAUTION

Do not install furnace in a corrosive or contaminated atmosphere. Make sure all combustion and circulating air requirements are followed, in addition to all local codes and ordinances.

Do not use furnace during construction when adhesives, sealers, and / or new carpets are being installed. If the furnace is required during construction, use clean outside air for combustion and ventilation. Compounds of chlorine and fluorine, when burned with combustion air, form acids that cause corrosion of the heat exchangers and metal vent system. Some of these compounds are found in paneling and dry wall adhesives, paints, thinner, masonry cleaning materials, and many other solvents commonly used in the construction process.

CAUTION

Inside air is frequently contaminated by halogens, which include fluorides, chlorides, bromides, and iodides. These elements are found in aerosols, detergents, bleaches, cleaning solvents, salts, air fresheners, adhesives, paint, and other household products. Locate the combustion-air inlet on a direct vent furnace as far as possible from swimming pool and swimming pool pump house.

Excessive exposure to contaminate combustion air will result in safety and performance related problems.