



### ***Field Service Bulletin***

## **Corrosion of Heaters Due To Chlorinated Solvents Model(s) Affected: All Residential & Commercial Units**

It has been known for many years that chlorinated solvents used in dry-cleaning plants, when vaporized and passed through a gas flame, would corrode steel parts of a gas furnace or water heater.

In recent years, other chlorinated hydrocarbon compounds (i.e. trichloroethylene, perchloroethylene, etc.) have been introduced for use as degreasing agents in the industry and as dry-cleaning agents in dry-cleaning plants and self-service dry-cleaning stores. In the same manner, vapors from these solvents when passed through a gas flame will decompose to corrode the steel in gas fired equipment.

Combustion air for gas fired equipment can also be contaminated by any of the common chloro-fluoro-hydrocarbon refrigerants known under the trade names of Freon, Genetron, etc., and as from refrigeration systems. However, the greatest source of air contamination from these compounds is from their use as pressurizing agents for spray cans of insecticides, paints, hair treatment, and "beauty" solutions. Because of the latter two items, the air in beauty salons is generally contaminated to some extent. Restaurants frequently install refrigeration equipment in rooms or areas with gas fired water heaters resulting in the same condition.

Chlorinated compounds in trace amounts are not in themselves detrimental to metals. However, damage to metals will take place when the vapors are mixed with combustion air and burned with gas. Under this condition, chlorine is liberated from the vapors. In turn the chlorine combines with water vapors condensed out of the flue gases to form hydrochloric acid. This is the corrosive element that attaches the steel parts of the heat exchangers on gas-fired equipment.

In water heaters, the corrosive attaches occur where flue gases contact the steel parts such as the flue baffle, collector box and draft hood assemblies on commercial type water heaters; draft hoods and vents on other water heater types. Evidence of such corrosive attaches can be observed by scale accumulation at the bottom of the flue gas ways or by scaling and perforation in the flues and/or in the collector box and draft hood assembly, and in the venting system.

Corrosion will occur with a minimal amount of chlorinated compounds in the atmosphere – greater amounts will accelerate the corrosion. Unpredictable draft conditions often cause confusion in that some installations in remote units will corrode with greater rapidity than those near the source of the contamination. Or, due to the pattern of air currents, a unit will corrode faster than another at its side.

The only effective way to prevent corrosion in gas fired equipment installed in establishments using chlorinated compounds is to provide an uncontaminated source of combustion air. This can be done by providing 100% outside combustion air to the equipment; locate the equipment in an uncontaminated area, or isolate the use of chlorinated materials.

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