Furnace & Boiler Maintenance

Ventilation for Combustion Systems

Anytime you maintain, retrofit, or replace a gas heating system you also need to be concerned with air quality. Combustion air is needed by all oil and gas heating systems to support the combustion process. This air is provided in some homes by unintentional air leaks, or by air ducts that connect to the outdoors. The combustion process creates several byproducts that are potentially hazardous to human health and can cause deterioration in your home. You can protect yourself from these hazards, as well as maintain energy efficiency, by ensuring that your chimney system functions properly and that your gas heating system is properly ventilated. In some cases, installing a sealed-combustion furnace or boiler can also help.

Chimneys

Properly functioning chimney systems will carry combustion byproducts out of the home. Therefore, chimney problems put you at risk of having these byproducts, such as carbon monoxide, spill into your home. Most older gas furnaces and boilers have naturally drafting chimneys. The combustion gases exit the home through the chimney using only their buoyancy combined with the chimney's height. Naturally drafting chimneys often have problems exhausting the combustion gases because of chimney blockage, wind or pressures inside the home that overcome the buoyancy of the gases. Atmospheric, open-combustion furnaces and boilers, as well as fan-assisted furnaces and boilers, should be vented into masonry chimneys, metal double-wall chimneys, or another type of manufactured chimney. Masonry chimneys should have a fireclay, masonry liner or a retrofitted metal flue liner. Many older chimneys have deteriorated liners or no liners at all and must be relined during furnace or boiler replacement. A chimney should be relined when any of the following changes are made to the combustion heating system: When you replace an older furnace or boiler with a newer one that has an AFUE of 80% or more. These mid-efficiency appliances have a greater risk of depositing acidic condensation droplets in chimneys, and the chimneys must be prepared to handle this corrosive threat. The new chimney liner should be sized to accommodate both the new heating appliance and the combustion water heater by the installer. When you replace an older furnace or boiler with a new 90+ AFUE appliance or a heat pump, the heating appliance will no longer vent into the old chimney, and the combustion water heater will now vent through an oversized chimney. This oversized chimney can lead to condensation and inadequate draft. The new chimney liner should be sized for the water heater alone, or the water heater in some cases can be vented directly through the wall.

Ventilation Concerns

Some fan-assisted, non-condensing furnaces and boilers, installed between 1987 and 1993, may be vented horizontally through high-temperature plastic vent pipe (not PVC pipe, which is safely used in condensing furnaces). This type of venting has been recalled and should be replaced by stainless steel vent pipe. If horizontal venting was used, an additional draft-inducing fan may be needed near the vent outlet to create adequate draft. Floor furnaces may have special venting problems because their vent connector exits the furnace close to the floor and may travel 10 to 30 feet before reaching a chimney. Check to see if this type of venting or the floor furnace itself needs replacement. If you smell gases, you have a venting problem that could affect your health. Contact your local utility or heating contractor to have this venting problem repaired immediately.

Trust Master Clean & Green Maintenance Process

General Condition

- **Visual Inspection:** Inspect for leaks, soot, rust, rot, corroded electrical contacts and frayed wires. For furnace (forced-air) and boiler (hot-water) also inspect chimney, ductwork or pipes, dampers or valves, blower or pump, registers or radiators, the fuel line and the gas meter or oil tank.
- **Heat Cycle:** Run through a full heating cycle to ensure plenty of combustion air and chimney draft. Test for sufficient draft and also test the air for carbon monoxide with smoke pencil tester. Check operational control sequence, including safety controls and thermostat. See notes for system date measurements.

Clean Maintenance

- **Air Filter:** Replace air filter and clean filter compartment as necessary.
- **Blower Wheel (s) and Assembly:** Check condition of blower wheel and clean as necessary.
- **Main Burners:** Inspect main burners for dirt accumulation and clean as necessary. Check burner flame for proper characteristics including gas and air adjustment adjust as necessary.
- **Heat Exchanger:** Inspect combustion chamber/heat exchanger condition and remove dirt and scale accumulation as necessary.

System Safety Check & Diagnostics

- **Blower Motor & Assembly:** Oil (pump if boiler) and clean as needed; replace belt (s) if necessary. See notes for system date measurements.
- **Inducer Motor:** Check for optimal operation. See notes for system date measurements.
- **System Igniter:** Check pilot/igniter for optimal operation; clean pilot as necessary. See notes for system date measurements.
- **Flame Sensor / Pilot:** Check safety timing and replace thermocouple, as necessary. See notes for system date measurements.