WELCOME
Condensing vs. Non-Condensing Gas Appliances
Gas Non-Condensing Furnace

- Burners are ignited
- Blower motor is turned on
- Cool or return air enters, is filtered and blown through furnace heat exchanger
- Heat from the combustion chamber goes through the heat exchanger
- Air absorbs heat and is passed out through supply duct
- Exhaust gasses are vented out through type B vent to roof
Non-Condensing Furnace Installation

• Requires type B metal vent up to and through the roof

• Requires indoor combustion air

• Should have minimal professional maintenance

• Minimum 80% efficient
Gas Condensing Furnace

- Second heat exchanger used to heat the air from condensed exhaust gases
- Less expensive venting (Usually PVC) on new construction
Condensing Furnace Installation

• Requires PVC venting
• Will not connect to existing venting when replacing existing furnace
• Most models are direct vent (does not require indoor combustion air)
• Can require annual professional maintenance
• Minimum 90% efficient
• Many homes utilize a combination venting system through a chimney where the WH & Furnace share a vent.

• In existing homes where an older non-condensing Furnace is replaced by a 90+ efficiency appliance, an “Orphaned Water Heater” can occur.

• When the new condensing furnace is vented directly outside, the remaining vent for the WH is drastically oversized and serious CO concerns may arise.

• Methods to address this problem can be a major financial constraint.
Orphaned Water Heater

Connected to oversized flue

Liner installed through flue
Gas Non-Condensing Water Heaters

- Cold water enters through the inlet and is released at the bottom
- The gas burner heats the water
- Warm water rises and exits through the outlet pipe
- Exhaust from burner exits through a baffled flue and is vented outside (type B vent)
Standard Storage-Type Water Heater Installation

• Requires 6” of clearance for type B ventilation
• 4 - 6 sq ft ground space
• Requires indoor combustion air
• Seamless installation when replacing existing water heater (reconnect to existing structures)
• Should be flushed by homeowner annually
• Requires very little other maintenance
Gas Condensing Water Heater

• Hot exhaust gases are captured and utilized to heat the water in addition to main burner

• Less expensive venting in *new construction*

• Cannot connect to existing venting when replacing old WH

• More Efficient

• Low NOx (Nitrogen Oxides) Emission
Condensing Water Heater Installation

- Requires PVC venting, no clearance to combustibles (some models may be direct vent)
- 4 - 6 sq ft ground space
- Requires new venting when replacing existing water heater
- May not require indoor combustion air
- Annual professional maintenance recommended
<table>
<thead>
<tr>
<th>AFUE (Annual Fuel Utilization Efficiency)</th>
<th>VENTING</th>
<th>BASIC OPERATION ENHANCEMENTS</th>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
</table>
| **80-83**  
**Mid Efficiency** | • Traditional metallic piping and/or chimney liner  
• Utilize existing venting on remodel/upgrade  
• Fan-assisted draft  
• Should be through roof | • Electronic Ignition  
• Fan induced Draft  
• Small Diameter Flue  
• Several fan/burner controls | • Retrofits are simple  
• Less expensive  
• Less maintenance  
• Proven/familiar designs | • Cannot be direct vent  
• Consume more fuel  
• Produce more byproducts |
| **90+**  
**High Efficiency** | • Must be vented according to manufacturer’s instructions.  
• Most likely require PVC  
• Can be direct-vent or fan-assisted draft  
• Can be through wall | • Sealed Combustion chamber  
• Utilize second heat exchanger to extract heat from flue gas  
• Lower temp flue gas  
• Condensing  
• Many fan/burner controls | • Consume less fuel  
• Produce less unwanted byproducts  
• Easier install on new construction | • More expensive  
• More maintenance  
• Newer designs not as well proven  
• More parts to break  
• Condensate disposal  
• Orphaned WH |
THANK YOU