

COMMERCIAL PROPANE APPLICATIONS: FURNACES

FACT SHEET

Commercial gas furnaces are self-contained units that supply heated air to condition a wide variety of buildings. Many commercial HVAC designs use commonly available propane furnaces to efficiently and effectively heat commercial spaces.

PERFORMANCE

Propane furnaces offer great flexibility in both the type and capacity of the equipment, which makes them a good fit for many different commercial buildings. Smaller residential-scale units can range in capacity from 44,000 Btu/h up to 180,000 Btu/h with efficiency levels of 80 percent to 98.5 percent AFUE. Larger units with capacities greater than 225,000 Btu/h are measured by their Thermal Efficiency [ET], and can reach capacities greater than 1 million Btu/h.

A critical feature of these furnaces is their ability to condition different zones of a building. This allows the use of multiple, smaller furnaces [often packaged as Roof Top Units or RTUs] to be installed to meet the heating needs of just one part of a building. Zoning offers improved efficiency and temperature control in the space, as well as modularity that can simplify installation and maintenance.

High efficiency propane furnaces — generally those with efficiency levels above 90 percent AFUE — capture additional heat from the combustion gasses and use this to increase the heat transfer of the furnace for greater efficiency. Many high efficiency propane furnaces are two-stage or variable speed units, so the furnace heats the building

steadily and comfortably. And the heated air leaving the furnace is significantly warmer than temperatures offered by electric heat pumps.

ENERGY EFFICIENCY

The propane furnace is a versatile unit capable of meeting the heating demand of any commercial space. Lower capacity propane furnaces can even qualify for Energy Star's Most Efficient label, which translates to energy savings of 20 percent or more on energy costs over a standard furnace.

In addition to high efficiency equipment, properly sized furnaces and RTUs help to optimize efficiency by reducing energy costs and increasing the life of the equipment.

ENERGY CONSUMPTION AND COSTS

High efficiency propane furnaces can provide energy, cost, and carbon savings in both new and existing buildings. To show these benefits, TABLE 1 compares a high efficiency propane furnace with a heat pump with a HSPF of 7.7 with electric resistance backup heating in a typical 3,600-square-foot retail space. Due to the large variety of commercial heating applications and the range of building sizes, this example was chosen to reflect a small commercial building or even a single zone within a larger commercial building.



APPLICATIONS FOR USE

- Office Space
- Retail
- Multifamily Buildings
- Schools
- Restaurants
- Medical Buildings
- Warehouses

AT A GLANCE

- Offer flexibility in both type and capacity of equipment.
- Steady, comfortable, warmer heat than electric heat pumps.
- Capacity from 44,000 Btu/h up to more than 1 million Btu/h.
- Efficiency levels of 80 percent to 98.5 percent AFUE.

ENVIRONMENTAL

As the example in the table illustrates, propane heating systems can offer a much smaller carbon footprint than other commercial heating options. CO₂ emissions from heat pump RTUs are highest during the coldest months, when these units will rely more on electric resistance backup heating. This form of heating is inefficient, and in areas where electricity is generated from coal-fired power plants this translates into heavier CO₂ emissions. By comparison, an RTU with a propane furnace providing some or all of the heating will produce lower CO₂ emissions — often on the order of 50 percent lower, as the example shows.



TABLE 1 HIGH EFFICIENCY PROPANE FURNACE VS. STANDARD HEAT PUMP

REGION	HEATING SYSTEM	ANNUAL ENERGY COSTS ^{a, b}	ANNUAL CO ₂ EMISSIONS FROM HEATING ^c
Northeast	Propane Furnace — Energy Star Most Efficient	\$2,500	8.5 tons
	Heat Pump [air source] — Standard Efficiency	\$2,611	17.5 tons
Midwest	Propane Furnace — Energy Star Most Efficient	\$2,713	9.0 tons
	Heat Pump [air source] — Standard Efficiency	\$3,313	16.7 tons
Northwest	Propane Furnace — Energy Star Most Efficient	\$2,681	8.9 tons
	Heat Pump [air source] — Standard Efficiency	\$3,623	17.4 tons

Notes:

- Assumed rates \$0.15 kW for electric and \$2.00 per gallon for propane.
- Energy rates vary. Please check eia.gov/ for the most up to date national energy cost. Commercial property owners should also consider the electric Demand Charge (\$/kW) in estimating their unit costs. Heavy electric demand at any given time, as would be the case with heat pumps, will increase Demand Charges.
- CO₂ emissions from system operation, in tons per year. The average car emits 5-8 tons of CO₂ a year. Lower is better.

FOR MORE INFORMATION

To learn more about commercial furnaces and the Propane Education & Research Council, visit buildwithpropane.com.

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The Propane Education & Research Council was authorized by the U.S. Congress with the passage of Public Law 104-284, the Propane Education and Research Act (PERA), signed into law on October 11, 1996. The mission of the Propane Education & Research Council is to promote the safe, efficient use of odorized propane gas as a preferred energy source.