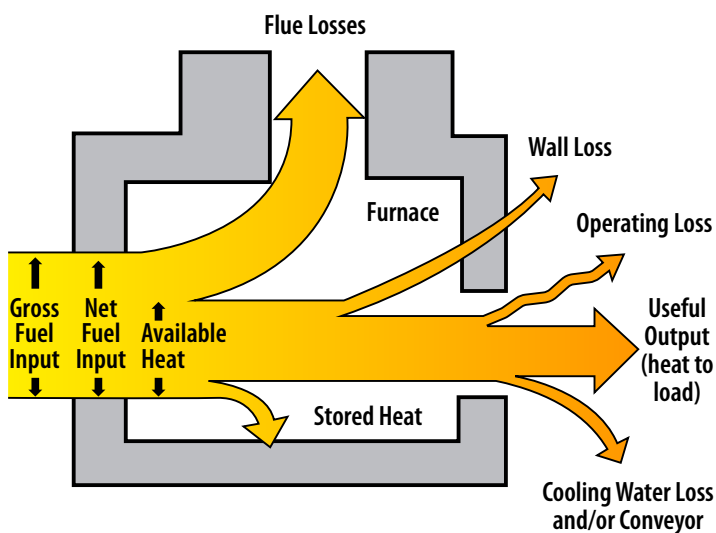


Process Heating System *Info Card*

Top 10 Energy Conservation Measures

1. Check and optimize burner air-to-fuel ratios
2. Consider oxygen-enriched combustion
3. Check and clean heat transfer surfaces
4. Reduce air infiltration in furnaces
5. Install furnace pressure controllers
6. Reduce radiation losses from heating equipment
7. Install waste heat recovery systems on fuel-fired furnaces
8. Preheat combustion air
9. Use flue gases to preheat loads
10. Use waste heat for external processes

Energy Loss Diagram in a Fuel-Based Process Heating System



Resources

- Improving Process Heating Systems Performance: A Sourcebook for Industry by US Department of Energy
- Process Heating Assessment and Survey Tool (PHAST) by US DOE

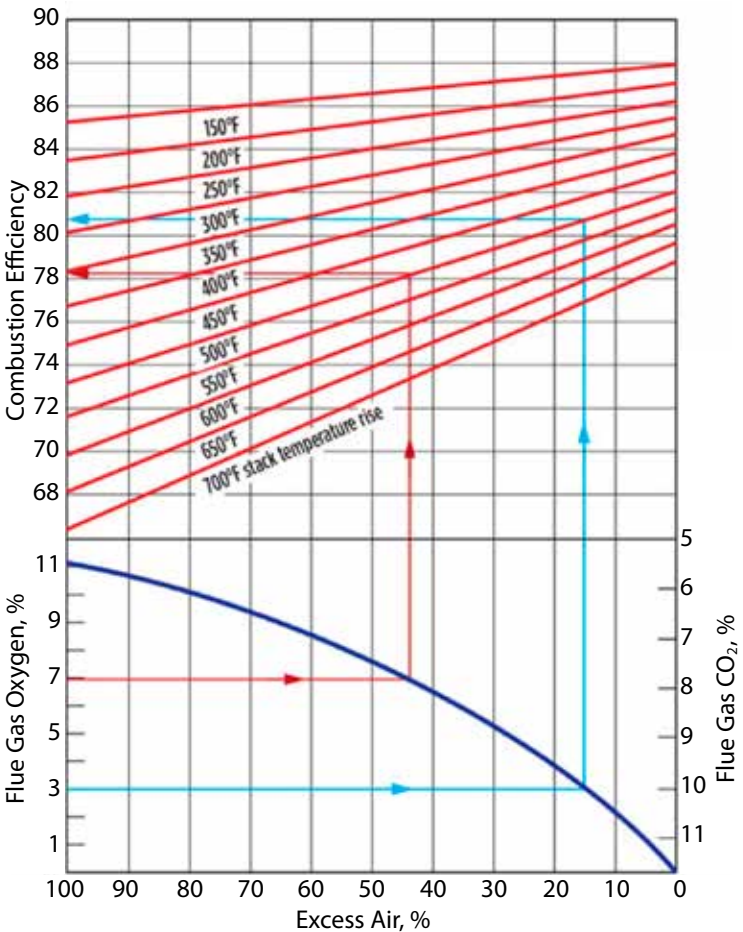
betterbuildingsolutioncenter.energy.gov

Process Heating System *Info Card*

Percent Fuel Savings Gained from Using Preheated Combustion Air

Furnace Exhaust Temp (F)	Preheated Air Temperature (F)					
	600	800	1,000	1,200	1,400	1,600
1,000	13%	18%	NA	NA	NA	NA
1,200	14%	19%	23%	NA	NA	NA
1,400	15%	20%	24%	28%	NA	NA
1,600	17%	22%	26%	30%	34%	NA
1,800	18%	24%	28%	33%	37%	40%
2,000	20%	26%	31%	35%	39%	43%
2,200	23%	29%	34%	39%	43%	47%
2,400	26%	32%	38%	43%	47%	51%

Natural Gas Combustion Efficiency Curve



Source: Energy Management Handbook, 4th Edition, Fairmont Press 2001