Commercial Pellet Systems and Pellet Storage

Heating the Midwest
October 2016
Agenda

- Specifications
- Pellet boiler designs/features
- Boiler controls
- Pellet storage
- Potential customers
Specifications

• ASME certified pressure vessels
  – or Atmospheric systems
• Made in the USA
  – or imported
## Commercial Boilers

<table>
<thead>
<tr>
<th>Scale</th>
<th>&lt; 350 MBTU</th>
<th>350-3,500 MBTU</th>
<th>&gt; 3,500 MBTU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small scale</td>
<td>Residential</td>
<td>Schools</td>
<td>Schools</td>
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<tr>
<td></td>
<td>Churches</td>
<td>Hotels</td>
<td>Nursing Homes</td>
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<tr>
<td></td>
<td>Small Commercial</td>
<td>Community Center</td>
<td>Hospitals</td>
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<tr>
<td></td>
<td>Greenhouses</td>
<td>Greenhouses</td>
<td>Campuses</td>
</tr>
<tr>
<td></td>
<td>Poultry/Hog Barns</td>
<td>Poultry/Hog Barns</td>
<td>District Heat</td>
</tr>
</tbody>
</table>
Underfed stoker

WoodMaster CS/A Series
Hot Water- Pellet or Chip boiler

- Outlet Water
- Tube Nest
- Nest Door
- Central Pipe
- Sight Glass
- Firebox Door
- Secondary Air Fan
- Primary Air Fan
- Burner Box
- Combustion Chamber
- Chimney
- Water Inlet
- Hopper
- Fuel
- Agitator
- Upper Auger
- Burner Auger
- Motor & Gearbox
Fixed grate - top feed

Pellet feed from internal hopper
Into rotary valve onto fixed grate.

Downdraft gasification technology
Fixed Grate - top feed

Pellets delivered by auger to Fire pot
Combustion Chamber

Ceramic lined for increased heat in combustion chamber
Combustion Chamber

Primary and secondary air for better combustion

www.woodmaster.com
Vertical fire tube
Horizontal Fire Tube

WoodMaster CS/A Series
Hot Water- Pellet or Chip boiler
Turbulators

- Angular
- Twisted tape
- Coil

**THE TURBULATOR**
Improving Heat Transfer Efficiency
At the Least Cost

**Turbulator Configurations**
Turbulators are available in a variety of configurations to fit most tube sizes and are used in many types of heat exchange equipment.

**APPLICATIONS**
- Shell & Tube Heat Exchangers
- Firetube Boilers
- Radiant Heaters
- Immersion Heaters
- Line Heaters
- Cast Iron Sectional Boilers
- Hot Water Heaters
Fire tube Cleaning

- **Soot blowing**
  - Pneumatic blast, 60psi

- **Motorized**
  - Motor driven, 1/turbulator or multiple

- Frequency determined by intervals or by fuel consumption
- Minimizes manual cleaning
- Maintains boiler efficiency for longer period of time
Sootblowing

hoses deliver compressed air from Blue air receiver to fire tubes

Each hose pre-set to blast group of fire tubes
Motorized

#11 indicates the motors for fire tube cleaning
#12 indicates fire tubes
Ash Extraction

- Complete ash system to ash barrel
- Automatic
- Cleaning frequency by time or lbs
Ash extraction

Smaller commercial boilers will be equipped with ash box

Less ash with smaller boilers, not as many pellets being consumed
Particulate separation

- Cyclone to reduce particulate emissions
- Removed through rotary valve into ash extraction

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Boiler controls

- Touch screen PLC
- Building management
- Web enabled, online management
- Easy navigation
Boiler controls

- Alarm sending/history
- Determine who gets alerts
- View history of customers alerts to see how well the system is maintained
Commercial Furnaces

- 130 kW and 230 kW (up to 780,000 Btu/hr)
- Wood pellets or chips
- Automatic fuel feeding, ash extraction and soot blowing
- Made in the USA
GS/A Cut-away

WoodMaster GS/A Series
Hot Air Furnace - Wood Pellet or Chip

- Tube Nest
- Nest Door
- Central Pipe
- Sight Glass
- Combustion Chamber
- Primary Air Fan
- Burner Box
- Air Fans
- Burner Auger
- Rotary Valve
General Boiler Layout

NOTE:
1. ALL CLEARANCES ARE RECOMMENDATIONS, EACH INSTALLATION REQUIRES PROPER ENGINEERING
Intermediate Pellet Hopper

Designed to meter pellets in from bulk silo

Reduces amount of fuel to remove if problem occurs

Equipped with capacitive sensor and Water deluge/sprinkler valve
Pellet storage

- Up to 4 ton
- Indoor application, basement/shop/garage
- Manual, auger, or pneumatic fill
Pellet storage

- 20’ sea container conversion
- Pneumatic deliver
- Auger fuel feed to boiler
Pellet storage

- Bulk pellet storage to be determined by pellet supplier and boiler output
- Install bulk silo larger than local delivery truck to keep system operational
Pellet Delivery

- Pneumatic
Pellet Delivery

• Auger truck
Pellet Delivery

- Bulk sacks
  - Pellets filled manually or by auger
  - Lower delivery costs
Potential customers
Potential customers

United States Forest Service
Walker, MN
wood pellet boiler conversion
Potential customers
Potential customers

Schaefer’s Gardens
Triangle, NY
wood pellet boiler conversion
Yellowknife is taking positive steps to reduce their carbon footprint. With multiple wood pellet boilers operating in Yellowknife, they are displacing hundreds of thousands of gallons of fuel oil each year.
Thank You!

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