Building a Masonry Stove for Efficient Wood Heat

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Jan. 12, 2013
What we’ll cover

1. Why Use a Masonry Stove?
   - Brief history
   - My reasoning, my limitations

2. Design Considerations

3. Basic Stove Components and Terms

4. Construction Sequence

5. Resources

6. Questions?
Why Use a Masonry Heater?

**Brief History**

- Northern Europe – variety of stove types
- Looking for more efficient use of wood
- Burn hot, fast and “clean” - store heat in large mass
Smoke Path Diagram

– many different patterns depending on model
Why Use a Masonry Heater?

My Reasoning

Renewable fuel source – very efficient and clean

Back-up for gas, initially, then primary with more building envelope advances?
Why Use a Masonry Heater?

My Limitations
I’m certainly no expert on masonry heaters.....
Location in house not ideal, but best for us
I like using scraps...
Design Considerations

Stove placement
- Relative to floor plan?
- Required clearances?
- Chimney location?
- Where do you want to direct heat to?

New construction versus retrofit

Foundation
- Finished stove weighs 5000-6000 lbs, depending
- Combustion Air

Steel bracing – earthquakes

Advanced planning helpful....
Basic Stove Components - Terminology

Core
Veneer
Combustion Air
Hearth
Cleanouts
Bake Oven
Foam Glass
Core

Pre-cast blocks
High-temp concrete
made from refractory cement
Veneers

Term for Outer Layer

Many options:

- Tile over concrete block
- Soapstone
- Other stone – river rock or granite, etc
Veneers
Foundation Considerations

- Core Weight – 3700 lbs for me
- Veneer Weight – 3000 lbs minimum
- Example – from Empire Masonry Stoves
  - Thin 4” Prefab veneer = 3100 lbs
  - Brick 8” veneer = 5800 lbs
  - Natural stone 9” veneer = 7200 lbs
Construction - foundation
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Construction - foundation
Construction – stove base

- Refractory Bricks
- Foam Glass
Construction – Core Assembly
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Firebox
Construction – Core Assembly Dry Run
Construction – Back Veneer
Construction
Core Assembly
Construction – Core Assembly (Smoke Paths)
Construction – Steel Bracing
Construction – Bracing, brick ties
Construction – bracing
Construction – Chimney connection

- Can go out top or side
Construction – Veneer
Construction – Veneer
Construction – Veneer
Construction – Veneer
Construction – Door
Construction – Cleanouts
Need dry wood!

Bake Ovens

Smaller versions
Some temps during firing

Outside Chimney 275 F

Face of Glass 680 F
Veneer Temps
10 hours AFTER Firing

Degrees F
(Imagine no flames)

And 225F inside burn chamber
Resources

- Dan Givens – Stonecastle Masonry – 907-474-3465
- Harry Aulman – Talkeetna
- Masonry Heater Association – mha-net.org
- Alaska Insulation Supply, EJ Bartels
- Alaska Masonry Heat – 3 Stores – Tulikivi stoves
Questions?

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