

1st Build

Take extensive Videos,
photos, and notes. See
EkoPichPrototypeLogs.doc



Defiant Heat! Ceramic Heating Core

Detailed Instructions

Also see:

DefiantHeatOverview.PDF



1 Prepare Pieces

1.1 Create & Apply Templates

- Create full-size, reuseable templates according to the diagrams on last page. Label each piece with marker pen.
Material ideas: strong construction paper, cardboard, wood.
- Pin your pre-made templates onto the refractory boards. Trace all pieces with a colored marker. Add name to each piece (Riser, ...)

1.2 Execute the Cuts

- Put on respirator, safety goggles, and gloves.
- Use sharp utility knife or fine-toothed hand saw to cut pieces.

Ceramic boards are fragile!
Cut carefully
Handle with care



1.3 Arrange the Work Area

- Lay out the refractory board pieces on a clean workbench. Group by category: Base, Firebox Walls, Bridge Plugs, and Riser. Group all split bricks. Gather spare bricks or other heavy rectangular blocks to form a mold supporting the loose pieces



2 Build the Lower Unit (Firebox & Tunnel)

2-1 Anchor the Foundation

- Set down the **Base Board**. Use bricks or other suitable straight edges to hold the core shapes in place.
- Using small nails or pins, attach the two **Side Boards** and the two **End Boards** vertically to the base board. Move outer bricks to hold boards in place.

2-2 Insert Internal Fill Blocks

- Slide the **Inner Split Bricks** into position inside the trough to shape the internal floor.



3 The Combustion Bridge & Feed Tube

- Secure the two upper **Side Boards** containing the 5 cm x 19.5 cm corner cutouts. This creates your vertical fuel feed entry.
- Slide the two **Bridge Plug Boards** into the cutouts. This forms the restrictive throat or "bridge"



4 Constructing the Heat Riser

Using pins and plumbers tape, if desired, join the long edges of the four **Riser Boards**. Press them securely together to form a square opening to match the burn tunnel surface area of the lower assembly

5 Assemble the Full Combustion Core

- Working outdoors, prepare a solid, level surface with adequate clearance from any flammable surface. The surface should be fireproof or protected with metal sheeting, bricks, etc.
- Place the riser over the lower section to insure equal dimensions of the opening.
- Using a long level, be sure the bottom section is level and the riser is vertical.
- Concentrate test assembly on securely fastening the two sections at the point where they join. Depending on final assembly desired, this could include pinning or nailing (small finishing nails) the joint, encasing the lower section and at least 1/3 of the riser with loose bricks, concrete blocks, or other heavy material to keep the assembly secure.

CAUTION!

Working with Ceramic Fibers, Rock Wool, etc.

Handle ceramic fiber carefully.

- Use hand tools whenever possible.
- Frequently clean the work area with HEPA filtered vacuum or wet sweeping to minimize the accumulation of debris.
- Do not use compressed air for clean-up.

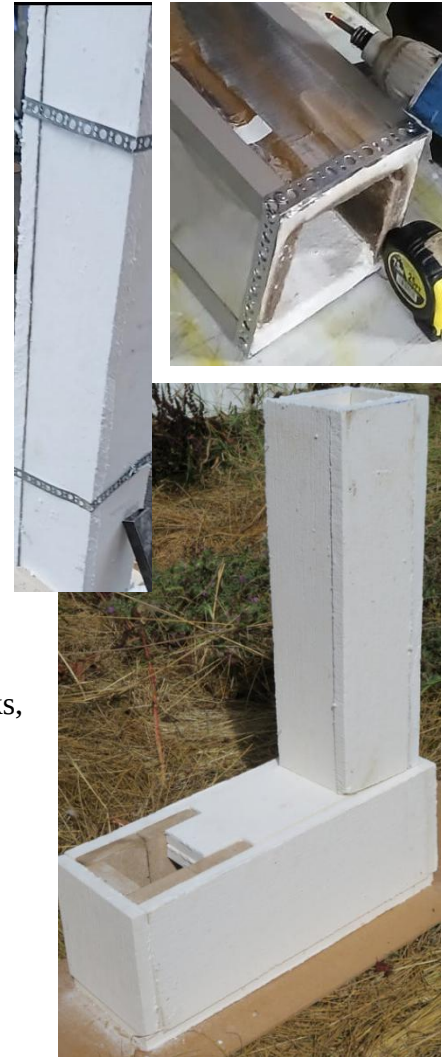
Wear industrial leather gloves & work clothes, which are loose fitting at the neck & wrists.

Where abnormally high dust concentrations occur, use appropriate PPE:

- As necessary, wear goggles or safety glasses with side shields
- NIOSH/FFP2 respirators should be provided for use on a voluntary basis
- For low dust concentrations Respiratory Protection is not required
- Soiled clothes should be cleaned to remove excess dust before being taken off (e.g. use vacuum cleaner, not compressed air).
- Wash work clothes separately

See Material Safety Data Sheet (MSDS)
for more safety guidelines & handling protocols.

ceramicfiber.net/MSDSCeraTex.pdf
morganadvancedmaterials.com/media/1o4hzvnl/203-eu-english.pdf



6 Fire Tests

WARNING! AVOID HEAT INJURY OR DAMAGE AT TOP OF RISER EXIT!

Be certain the two components are properly secured for a test fire.

No heat will escape through the core boards themselves, but the point where the two sections join must be stable, carefully aligned and secured so no heat escapes.

All heat should be directed up to the opening at the top of the rise.

- **Follow J-Tube Fire Guidance at all times.** The system is unique in many respects. Traditional fire-lighting and maintenance do not apply.
- Use a laser pyrometer, if possible, to check for hot spots at various times during & after the firing. Test under various conditions. Experiment with different starters, kindling, and firewood for at least an hour. Record (video & notes)
- After the final core casing is in place, the final test fire should be run for 2-3 hours.

Firing Tactics

- **Pre-Heat the Chimney:** Drop a small piece of burning newspaper or cardboard directly into the base of the chimney riser just before lighting the main firebox. This warms the exhaust stack and forces air to start moving upward.
- **Use Micro-Burns:** Do not overload the firebox. You only need a 30-to-45-minute sustained burn with small, dry sticks to capture peak core temperatures (**650°C–1100°C+**) and verify that the core materials hold up. Be certain to use dry wood. Kindling and slow-burn, homemade “logs” of sawdust, coffee grounds, or cotton pads – compressed with melted wax – make great starters. Light and push into the burn tunnel to encourage draw. Watch and listen for the horizontal flames shooting through the tunnel with a rockety whoosh sound, the signature of a “rocket heat” system!
- **Track Ambient Temperature:** Record the exact outside air temperature in your log right next to your stove metrics. Engineers evaluating your data will appreciate knowing the precise conditions under which the draft was achieved.



Casing & Final Seals for Portable Designs

Insulated Seal, Hinges, Sheet Metal Wrapping, Handles

- aluminum sheeting specs - TBD
- Wrap the ceramic core assembly tightly with aluminum sheeting, using corner braces to secure.
- Use thermal glue to attach stove rope to inner bottom edge of riser. Follow instructions for the glue. Be sure there is a tight seal between the two sections. Screw on latches to all four sides of the bottom of the riser and align catch lates to bottom tunnel assembly to insure a tight fit. Wait 24 hours before first fire test and follow any other glue guidance. Rope may need to be added to the bottom opening as well. It is critical that no heat escape at this junction for most uses.
- If desired, mount metal burner frame on top of riser to safely elevate cooking pan or pot above heat exit.



NOTE

This portable version has not been constructed here in Ukraine yet. The materials are easily sourced, but precise descriptions and quantity are not listed in this document yet. A prototype still needs to be constructed to test the validity of the design. Please contact us if you are interested in this project.

Signal

WhatsApp

Telegram



Materials List Portable EkoPich

Slide	Item	Size	# needed	Cost@	SubTotal
3, 11, 12	refractory boards ~2.5 cm thick	1m x 1m	2		
3	Split (thin) firebricks		10		
3,	rope seal, 538°C, 14 mm	2 m			
3	stove rope adhesive		1		
4, 5	Chimney pipe (see slide 4)				
8	Tools & PPE*				
9	infrared (IR) thermometer				
10	Aluminum sheeting				
10	Handles		2		
10	Hinges		4		
10	L-shaped bracing (need to calculate)				
10	Corner pieces		8		
				TOTAL COST:	

* NOTE:

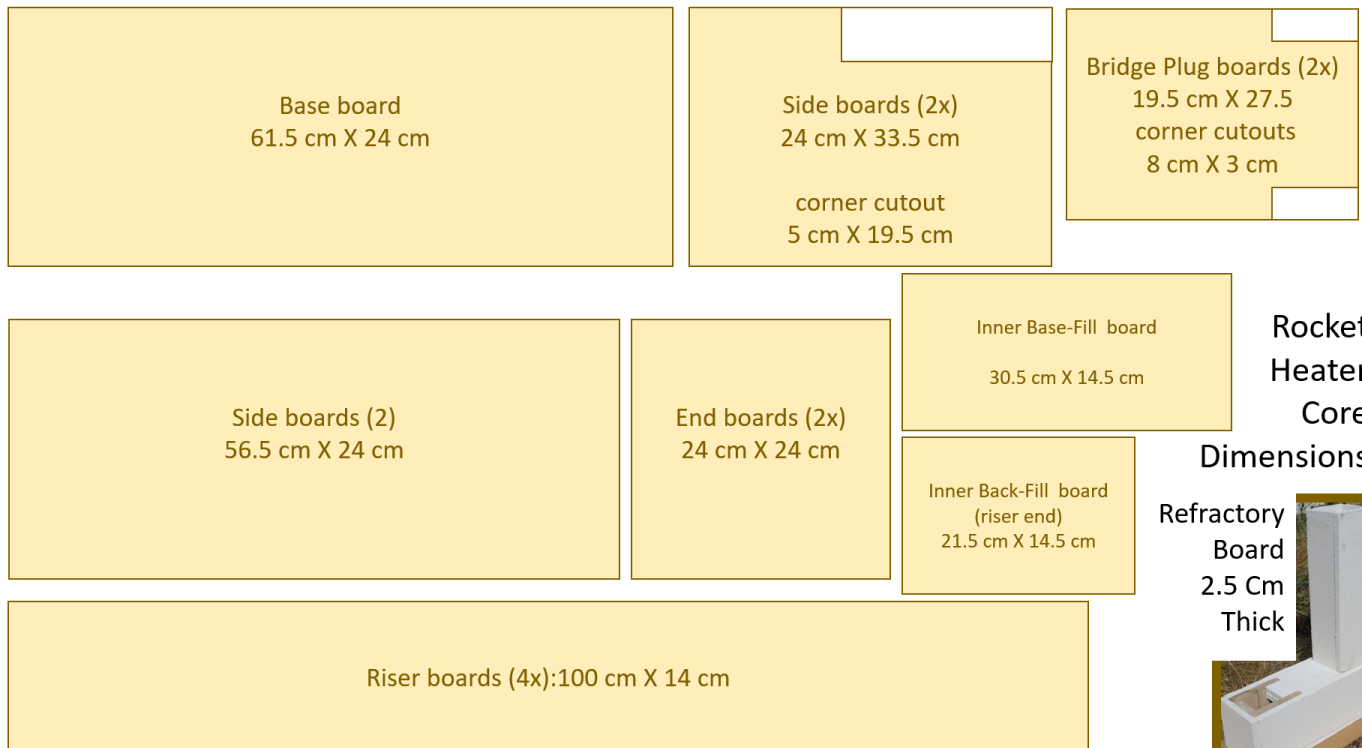
Tools and PPE are discussed in various documents and should be discussed during preparation of materials list. Some tools and a high-quality respirator (P3 / N95) which is strongly recommended when cutting ceramic boards are available on loan.

Перелік матеріалів Портативна ЕкоПіч

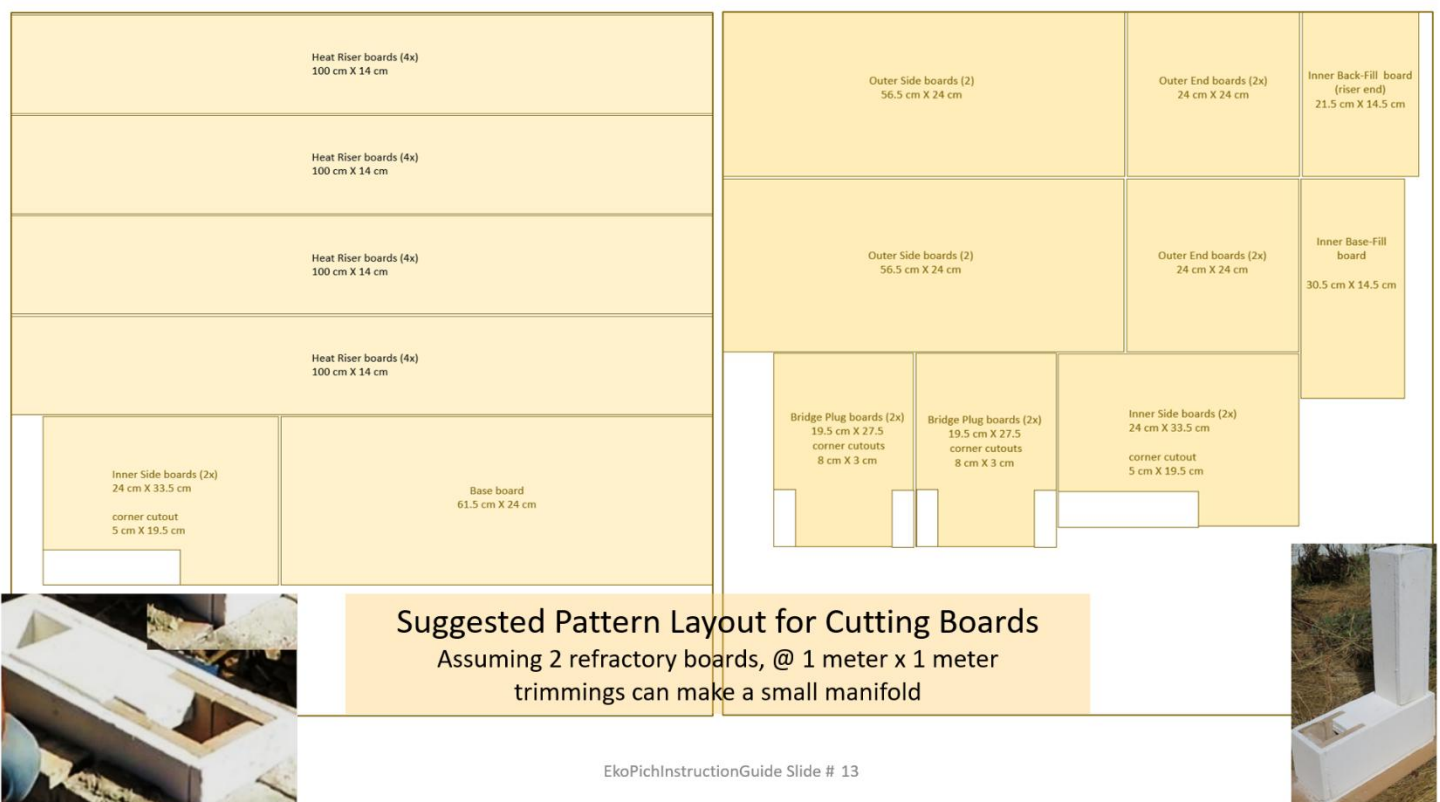
Slide	Item	Size	# needed	Cost@	Sub Total
3, 11, 12	Вогнетривкі плити (керамічні) товщиною ~2.5 см	1m x 1m	2		
3	Лещадна (тонка) вогнетривка цегла		10		
3,	Пічний ущільнювальний шнур, 538°C, 14 мм	2 m			
3	Клей для пічного шнура (термостійкий)		1		
4, 5	Димохідна труба (див. слайд 4)				
8	Інструменти та ЗІЗ *				
9	Інфрачервоний (ІЧ) термометр / пірометр				
10	Алюмінієвий лист (листовий алюміній)				
10	Ручки		2		
10	Завіси (петлі)		4		
10	L-подібні кутики / профілі (потребують розрахунку)				
10	Кутові елементи (накладки)		8		
				TOTAL	

* ПРИМІТКА

Інструменти та ЗІЗ детально описані в різних документах, і їх варто узгодити під час підготовки переліку матеріалів. Деякі інструменти, а також високоякісний респіратор (класу Р3 / N95), який наполегливо рекомендується використовувати під час різання керамічних плит, можна взяти в тимчасове користування (під позику).



EkoPichInstructionGuide Slide # 12



EkoPichInstructionGuide Slide # 13