

# Masonry heaters for the owner builder

One of the key requirements for the home my wife and I built in the far south of New South Wales was a masonry heater to ward off the winter chills. We had seen these on European travels but first experienced one in practice when snowed up in a high mountain lodge while on a late season walk in the Italian Dolomites. With a few bits of packing case, old egg boxes and the like, a fire that lasted for about an hour or so kept the lodge and everyone in it warm for the day; more than that, we could sit comfortably with our backs against it while damp latecomers dried their clothes on top.

## Finding the heater

Seeking such a marvellous creation in Australia proved to be an exercise in futility. Despite being invented over four hundred years ago and developed in various forms around the northern hemisphere, they seemed not to have made it to Australia. Given the number of our citizens from backgrounds where they are common, this is surprising. It seems that some have been built ad hoc but have never achieved commercial numbers. As we were to discover, this has much to do with the usually custom-built (and thus very expensive) nature of masonry heaters.

Our research had also shown that not only were masonry heaters very pleasant

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to experience, they were also highly efficient in getting the most out of the fuel put into them and equally efficient in minimising any pollution that might result. This obvious win-win was added to when we eventually discovered the masonry heaters sold by Temp-Cast of Canada, which come as a core unit kit of refractory material around which buyers could fashion masonry surrounds to suit their house style and personal preferences.

## Importing

Further enquiries indicated good reports for these units and to satisfy our own questions we took advantage of a Canadian holiday to visit the Temp-Cast factory. Having seen them made, we were even more impressed with the masonry heater. We organised to import one of these units for our home. We found other

*Below left: Doors, seals, cement and the flue transfer box.*

*Below: Precast refractory components.*

*Below right: Firebox base slab and rear flue channel.*

interested parties and shipped in an initial five heaters, one of which went all the way up to Queensland.

We had chosen a heater with a bake-oven as an optional extra. The idea of throwing in a pizza or loaf of bread after the firing of the heater was appealing.

Everything came neatly packaged on a palette. The refractory components were numbered for identification, though the distinctive shapes and the comprehensive assembly instructions made that easy. In addition, all the required doors, cement and seals were included along with a steel transfer box to ease the connection between the heater and the flue. We sourced the standard 200mm stainless steel locally.

## Slab

Preparatory work involved the construction of a concrete slab to support the three tonnes or so of the completed heater; in our case this included a brick chimney up to two-storey height. We chose to raise our heater by a course of block work to bring the firebox to eye level, which also enabled us to construct a raised seat in front. As we were building on a slope I was able to construct an ash drop beneath the slab, though this can also be fashioned at ground-slab level.







## Assembly

Assembly of the core proved very easy. We did a 'dry-run' first to ensure that we knew what we were doing, and then assembled it all with a smear of fire cement between each piece. It is important to ensure that everything remains level and plumb at this stage. I was less than fastidious and had a little tweaking to do as a result. Some cutting with an angle grinder was required to fit the flue transfer box as this can be fitted to either side or even to the rear as required.

When the core was assembled it was held together with ratchet straps whilst the cement set, as the exterior 'cheeks' are not keyed to the inner core. The recommended way is with plastic strapping, which can be left in place but I didn't have this facility.

The finished core was then faced with cardboard panels. This unlikely material



*Above: Completed heater at the end of a burn.*

*Below left: Firebox complete and secondary combustion chamber started.*

for a heater is a simple and effective way of providing an expansion gap between the core and the masonry facing. It remains in place, isolated from the combustion process.

## Creative finishes

Where the creativity and imagination of the builder is set free is in facing the core. This can be done with any masonry material. We chose brick; but stone, slate, render or tiled finishes are used widely. We found a rustic double height brick from Boral that suited the style of our home and also suited my amateur bricklaying skills.

The recommended facing thickness is 110mm: any thinner and heat stress in the facing can result; any thicker and the heater takes longer to come up to temperature (though also retains the heat longer). We built ours against a 300mm thick rammed earth wall, which gave a substantial increase in our thermal mass and provides heating to the guest bedroom beyond. Heaters must be spaced away from any combustible walls but this retains all their heat in the room in which they are constructed.

The fire door, air intake door and cleanout doors (largely redundant) were built into the facing as work progressed. This keeps it structurally separated from the core to avoid expansion issues. The oven door is attached to the core via a steel plate, the brickwork being trimmed around it.

The formation of the arched brickwork was my own creation with the angle grinder in overdrive; I basically made it up as I went along. A rendered finish would not require the same attention to detail as everything is hidden. We added a recess for some custom made fire irons from our friend Philippe at Galba Forge and faced the level surfaces with some green(ish) slate. This is probably the only detail I would change; a thicker material would have been far more pleasing, but to change it now will require some very dusty brick cutting.

## How it works

In use, the heater is a delight. The firebox is stacked to the top with wood and burned from the top down. In an hour the whole load is engaged and in about two and a half hours it has burned down to the glimmer you see in the picture without a trace of soot in the firebox. What isn't visible is the heat radiating from the entire structure, which continues for another twelve to eighteen





*Above: Core completed prior to facing.  
Left: Facing begun and fire door in place.*

hours depending on the environment in which it has been built. Although we could burn it more than once a day we have never needed to. A hot glowing fire enjoyed in the evening leaves heat radiating all night and a warm space to breakfast in next morning.

Widespread use of masonry heaters could solve the pollution problems in areas like Armidale, Launceston or Tuggeranong and give the wood burning public a far improved experience on the away. Not to mention the fact that, according to CSIRO data, wood burning releases less atmospheric CO<sub>2</sub> than any other heating fuel apart from hydro-electricity. But wherever they are used, those who have enjoyed them would never want any other form of wood heater. ♦

*For those who want more background, a web search for 'masonry heaters' will bring a wealth of information. Alan now imports and sells Temp-Cast heaters via his website: [www.heavenlyheat.com.au](http://www.heavenlyheat.com.au)*



#### Links & resources

##### ♦ Temp-Cast

Fully modular wood-fired masonry heaters.  
[www.tempcast.com](http://www.tempcast.com)

##### ♦ Heavenly Heat

Efficient, low emission wood burners.  
[www.heavenlyheat.com.au](http://www.heavenlyheat.com.au)  
02 6493 6080

##### ♦ Galba Forge

Specialising in the decorative and rare art-form of plaited iron. Cobargo, NSW.  
02 6493 7153. [www.galbaforge.com.au](http://www.galbaforge.com.au)