

"Monster Burner" and Melting Furnace

(This burner easily melts cast iron!)

Designed by [Rupert Wenig](#), and submitted by [Robert Grauman](#).

● This is a corker of a burner that has been perfected by Rupert Wenig. It is an enlarged version of my 'Reil Burner,' but Rupert deserves all the credit for this one since I never dreamed that the burner design I posted could ever melt cast iron if scaled up. These guys up in Alberta enlarged the burner and then used it in a melting furnace built to the Gingery design. It easily melted 17 pounds of cast iron! The following images show the burner, the furnace, and the results of their cast iron melt. The burner also was used to melt aluminum, 2 kg in 10 minutes, and brass, 6 kg in 19 minutes, ... very impressive times. The cast iron took a little longer. The top link is the burner design drawing of the "Monster Burner" by Rupert Wenig. I should add that the "Tee" pipe coming off the side of the burner tube in the images is just a support handle to mount it in the furnace. If you are considering this burner, be sure to look at the [Minimongo Burner](#) too before making a final decision as to what burner to use.

Foundry Melt Logs

Melt Logs

Preface

This is a copy of an e-mail sent to me which describes a number of melts, including a 17 pound cast iron melt, using the new upscaled version of my "Reil" burner. It is self explanatory. If you wish to contact any of the guys in this communication please return to my [Forge and Burner Design Page](#) to the section about the "Monster Burner" and there are e-mail links there. Thank you.

Thius additional communication was received from Rupert just prior to me posting this log;

Hello Ron,

I ran a test heat yesterday (first time in the rain) to confirm my suspicions. The melt I did was aluminum as the feature was to test the burner which I did inside (due to the rain) with the doors open for ventilation. The ceiling gets too hot when the burner is run at the higher pressures. After consulting with Robert, we decided to change the text on Donald's web page to show the correction, which reflects the operating range of the burner.

Quote:

"The burner operated satisfactorily at fuel pressures from 10 psi and up to 25 psi. It was unstable at pressures below about 6-8 psi, and hasn't been tried above 25 psi yet."

End quote.

Rupert

Hello Ron,

Attached is a report submitted to our local email group by my friend Rupert Wenig on a melt of iron in a Gingery gas fired crucible furnace, fired with a modified Reil burner. The burner uses a 1-1/4" pipe for a burner tube, and Rupert has spun a fitting for the bell, which allows him to adjust the airflow in the burner. He has drilled the orifice #54.

Hi Robert,

<snip unrelated stuff>

Instead of writing about it,I am attaching a copy of my foundry log. I will try to be more elaborate if there is anything which is not clear.

--

yvt

Rupert Wenig

RR.2, Box 1 Building an uniflow engine

Camrose, Alberta, Canada Bore 1.25"

T4V 2N1 Stroke 1.5"

rwenig@cable-lynx.net Flywheel dia. 7"

ICQ #32409359 Foundry Log

Date: 1 May, 1999

Pattern: 8" Lathe face plate

Metal: Cast iron- old auto exhaust manifolds broken up

Atmospheric conditions: Temp. +8 C, wind- slight

Bottle contents: about 1/3 full (100 lb. bottle)

I note propane quantity in bottle as it affects any possible freeze up time. Some frost did show on the bottle during the last part of the heat. I had thought of providing external warmth to the bottle but didn't.

Furnace settings used: propane pressure- 20 lb.

: air valve setting- about 3/4 open

Crucible used: #8 Starrbide

Amount of metal (cast iron) melted- 17 lb. weighed after the pour was completed and cooled.

Started the heat with a 5 min. warm up time at low flame to warm up the crucible as it hadn't been used for a while then went to full heat and added metal (1-2 lb.pieces) as the melt progressed. Things seemed slow at first but the melting speed sure increased toward the end of the heat. Metal was added according to the following time chart:

09:20 ignition time (crucible full of metal pieces)+ 1 crushed BBQ brickette

09:25 full heat

09:40 first sign of melting

09:55, 10:09, 10:14, 10:19, 10:23, 10:26

10:33 heat considered complete as the crucible appeared full but was fooled

by the grunge. I think I could have added a bit more metal.

Fuel consumption: about 10 lb.

Pour was a bit short of metal but left the casting in the green sand mold to cool just in case the casting would be useable. It is. I removed it about 6 hrs later, then after another hour tried machine it. So far so good.

Rupert

In a separate message to another member of our group, Rupert provided details of his burner. **The "D" mentioned by Rupert is the pipe diameter.**

We have empirically worked out some relationships in these burners, which seems to work for our purposes.

Hi Rod,

The burner pipe size is 1-1/4" black pipe 9D long. The coupling (air inlet) is 1-1/4" by 2-1/2" (with air valve). The fuel orifice (see my previous pictures for appearance) is spaced 1/2D from the inlet end of the 1-1/4" pipe. There is no flame end pipe. The burner is positioned tight into the furnace with about 1" of pipe on the tangent side inside the refractory.

The burner seems to operate satisfactory at fuel pressures from 15 lb and up to 25 lb. It is unstable at pressures below about 12 lb. I haven't tried it above 25 psi yet.

Other info in another message.

Rupert

Rupert provided additional details about the orifice in his burner in yet another message. We are using the Bordeaux modification to your burner. Ruperts gas assembly consists of a 1/8" gas inlet tube into a 1/8" tee in the center of the bell. The other end of the tee is supported by a capped 1/8" nipple. A brass plug is screwed into the tee, and is prepared as below:

Hello Robert and All,

Sorry about not including the jet info. I'm not sure if the procedure makes a difference but I'll include it.

If you remember from the pictures I sent awhile back, my jet is made from a brass hex plug. I drilled in from the threaded end with a 5/32 drill until I was about 1/8" from the top. Then I drilled through with a #54 drill. All drilling done from the threaded end. Then I used a taper reamer to clean the hole (not to enlarge it). Last I used a small countersink to remove only the sharp jagged edge from the orifice hole on the top side.

Rupert

Another member of our group (Bob MacDonald) has more or less copied Ruperts' burner, and this is a report on his results, again in a Gingery furnace.

Hi Gang,

After reading about Rupert's success with his new burner, I decided to be a copy cat. Assembled the pieces with two minor differences. I drilled the orifice .050" as I didn't have a #54 and I didn't build the air valve.

Once everything was together I put the burner tube in the furnace so the end of the tube was at the wall mid point and light it. Well it didn't burn worth a damn. Pushed the tube into the furnace untill the end of the tube was almost even with the inner wall. The flame was now completly out of the tube and it made such a sweet roar.

Foundry log follows

First heat

Air temp.....+10C

Wind.....Light

Metal.....Aluminum

Quantity.....2 Kilo

Propane pressure.. 20 Lb

Furnace.....Cold

Crucible.....Cold

Metal.....Cold

Start.....16:51

Pour.....17:01

Second heat

Air temp.....+10C

Wind.....Light

Metal.....Brass

Quantity.....6 Kilo

Propane pressure.. 20 Lb

Furnace.....Warm

Crucible.....Cold

Metal.....Cold

Start.....17:06

Pour.....17:25

I think 19 minutes to melt 6 Kilo of brass is very respectable.

Bob "Damn those chips are hot" MacDonald

So many projects, so little time.

Shop located in Sunny Spruce Grove, Alberta

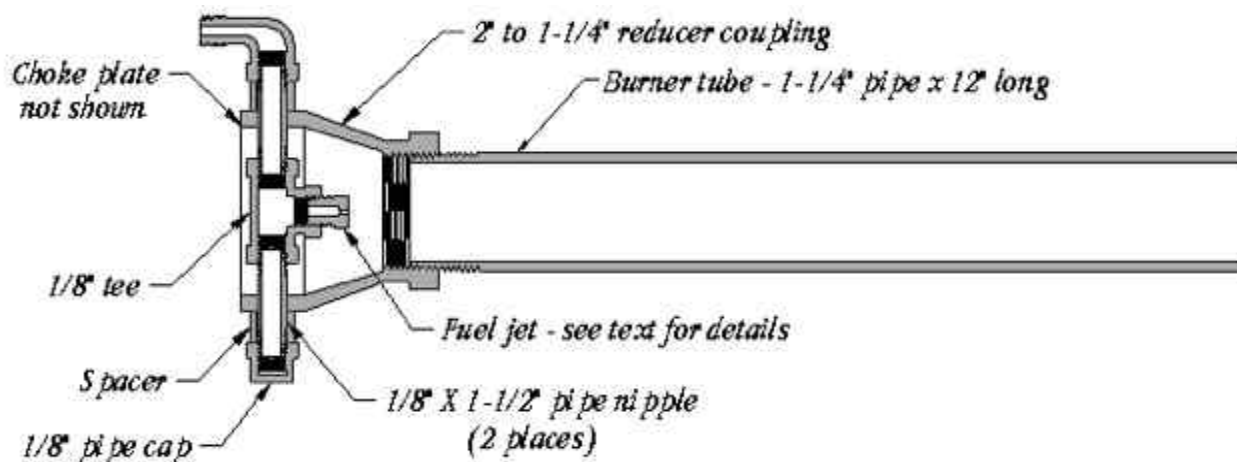
Yet another member of our group (Dale Gillespie) has built a mini crucible furnace from two refractory lined 2 kg coffee cans. He assembled a mini Reil burner by walking around a hardware store, screwing plumbing fittings together until it looked right, keeping in mind the empirical relationships we have established. I believe he used 1/2" pipe for the burner tube, but I have only seen photos to date. He was able to make a melt of aluminum in 7 minutes from a cold start, and brought a casting he had made that afternoon to our monthly meeting on Thursday night.

Hope you find this of interest. We hope to get photos and some of the above details on our web site when time allows.

This is a fan letter - no response is required, nor is one expected.

Robert Grauman in Sunny Alberta

Burner Design Schematic



*Crucible Furnace Burner
Designed and Built
by
Rupert Wenig*

Drawn by
Robert Drumm on
10 May 1999

Image of three burners



Gingery Furnace



Hot Interior of Furnace



Pattern and Finished Cast Iron Casting

