

**Topic 01: Co2 Sand Moulding Process.**

**Topic 02: Silicate Sand Moulding Process.**

**Topic 03: Coverall 11 Flux for Aluminium.**

**Myhomefoundry.com**

Articles supplied from back issues of: **The Hot Metal ezine**

**Topic 01:**

### **Co2 MOULDING PROCESS.**

General comments.

Co2 moulding process has many advantages over other forms of sand moulding. But it is not more economical to do than green sand moulding, but moulds can be made to much closer tolerances, which can reduce machining time of castings, this will only appeal to commercial operators, and not be of much concern to the hobby caster, where time taken to do a certain process is not important.

But as green sand gets more difficult to find or make, then this form of mould and core making can be of great benefit for the hobby caster.

**Please study the following points:**

#### **Co2 will allow:**

- 1 A reduction in fuel costs due to the elimination of core drying ovens etc.
- 2 A reduction in the number of mould boxes required for making moulds.
- 3 Cores and moulds are gassed or hardened in situ, lessening the labour involved in mould making.
- 4 Because moulds are hardened with patterns in position, a high accuracy is achieved. With careful moulding practise some castings can be produced with tolerances very close to shell moulding.
- 5 The low cost of equipment required for Co2.
- 6 Existing pattern making equipment can be used.
- 7 A big plus is that NO unpleasant fumes are given off during the pour. Unlike the EPS or expanded styrene method.
8. One of the biggest advantages for the hobby metal caster when using this system, is the total elimination of moisture from the moulding sand (providing it has been stored correctly) The only expense you might encounter is the cost of the Co2 cylinder, regulator, hoses and hand held applicator gun or nozzle. The Co2 system is one of simplicity, which greatly improves casting quality in the home foundry.

**Topic 03:**

### **SILICATE SAND MOULDING PROCESS.**

The self-setting sand moulding process is another moulding system that can be easily utilized in the home foundry. I have personally used this system for the last twelve months to make special cores to be used in conjunction with green sand moulds.

Rarely do you experience a core blow using this system, it is far better than oil baked cores, and easy to use, once you understand the chemistry.

The products I have used have been those manufactured by Foseco; reference to this company was made in our foundry ebooks available from our web site. <http://www.myhomefoundry.com>

I have no connection with this company, but I do endorse their products as amongst the best.

**With this system, all you need is:**

1. Clean dry silica sand (fineness (80 to 120 depending on application)
2. Veloset hardener
3. Silicate resin to be mixed with the sand.
4. Electronic digital kitchen scales. (Yes, you have to be very accurate with your chemical mix)
5. Plastic bucket to mix the sand, silicate & hardener.
6. A small power drill. (For mixing)
7. A 12" X 3/16" steel rod with "T" piece welded to the end.  
(This is the simple mixer to put in the power drill)

With the simple equipment described above, coupled with some careful experimentation with different percentages of silicate and hardener mixed together. Will enable you to arrive at the most suitable mix for your region.

The chemistry is very temperature sensitive, and various retardants or accelerators are available to dial in exactly the correct amount of time required for successful moulding.

If this sounds like it is too much work to get your head around, then believe me when I say it is not, the digital scales are absolutely essential for good results, because you have to have the correct amount of hardener to get the correct reaction with the silicate resin in the sand so that the mould will set.

The reaction will take only about 8 to 14 minutes on a warm day, and a bit longer on a cool day, but you can play with the % mixes to arrive at the right time frame while moulding.

In commercial foundries, they use continuous batching or mixing machines, as a hobby caster you will have to make do with small batch mixing (in a plastic bucket) and it is quite doable.

We are unable to fully explain everything here; the product data sheets are freely available from the companies that manufacture these products.

If you are interested please contact the company nearest you for info & supplies.

## **COVERAL II. FLUX FOR ALUMINIUM**

The addition of flux to your melt is very important; the flux does not dissolve in the melt, but sits on top of the molten metal creating an impervious layer to prevent harmful gasses pick up in the molten melt.

The products mentioned above are well covered in the ebook 3-volume hobby foundry ebook available from our web site.

### **Supply Houses.**

The product described above is available from FOSECO; this company has foundry supply houses in just every country around the globe. No, I don't receive a commission from any sales, but I do value their service and product reliability.

If you have not used the above products I recommend that you do.  
If you cant find foseco in your area, there will be other companies with similar products you can use.

### **A Simple Flux agent for Aluminium**

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Alternative general-purpose flux for Aluminium.

Mix together the following:

Salt: 1 Kg (2.2lbs.)

Borax: 1 KG

Boric acid: 25 KG.

Can't vouch for the effectiveness of the above, but it is used in third world countries when fluxing prior to pouring,

I have also heard of finely crushed charcoal being used as a cover when melting bronze. The best bronze for hobby foundry melting & casting is silicon bronze.

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#### **The complete foundry ebook package consists of:**

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How to build crucible lifting tongs ebook.

All these ebooks have been written by Col Croucher of The Home Foundry Australia.

Fax + 61 3 57 22 4654.

Email: [colin@myhomefoundry.com](mailto:colin@myhomefoundry.com)