

## Green sand for moulding; Pros & Cons.

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### Topic:

**GREEN SAND.** Notes from issue 03 **The Hot Metal ezine.**

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From the very early times of metal casting, sand has been the main medium used by the foundry industry for creating moulds. Green sand is made from various grades of clean silica sand, and additions of bentonite, coal dust, and tempered with clean water.

It has been noted that naturally bonded moulding sands were found in various locations. Albany sand was used extensively by commercial metal foundries. This sand appeared to have the correct grade of sand and natural clay, that when tempered with the right amount of water, was almost equal or better than green sand which was especially mixed for the purpose.

I have read various hobby foundry group posts where people have searched along creek banks and other places looking for this elusive wonderful natural moulding sand.

I must admit, even I was tempted to scour along rivers in my area to look for "The natural bonded moulding sand".

After finding what looked like natural clay bonded sand. I took it home & dried it out, sieved it, and then carefully retempered it with water in the hope that it would serve the purpose.

This was well over a decade ago, I now know better. No matter how much, and how hard I tried to mould with it, it just wouldn't work.

After much stuffing around trying to use this river sand for moulding, I gave up on it. Being a novice at the time, trying to do reasonable moulds that would lift from a pattern and "Hold" together while preparing the mould proved fruitless.

To try and pour some decent metal castings in this sand ended up being one of the most frustrating periods during the first tentative steps into the world of hobby metal casting.

Shortly after this exercise, I made contact with a foundry sand supplier in a major city about 2.5 hours away, the rep arranged to send up three 25KG bags of green sand ready to start moulding with.

The first moulding session with this "fresh" green sand was a pure delight, it rammed hard, lifted from the pattern easily (which happened to be a go kart wheel rim half) and the sand held together while it was prepared, finished, & closed ready to pour.

To make green sand requires a mulling machine, it is possible to make an effective Muller if you have the construction and engineering skills required to do this.

Commercial mullers have a large bowl, which has a heavy wheel inside the bowl attached to an arm, it also has scraper blades or mouldboards which act as lifters to turn the compressed sand over as the bowl rotates and the heavy wheel compresses the green sand mix.

This rolling and turning action compresses the sand particles and the bentonite together, depending on how well this blending or mulling is done, will determine how good your green sand will be.

After the mulling is done and the sand is prepared for moulding work, you must ensure that the correct amount of water or moisture is added to the sand, the correct amount is normally about 4 to 6%.

Making a good mix of green sand takes quite a bit of time, depending on the quantity of green sand being mixed, the sand, bentonite, and coal dust are placed into the bowl with a certain percentage of water, the heavy wheel rolls and compresses the sand and bentonite together, the bentonite is the binding agent, with out this binding property you would not be able to ram your sand moulds successfully.

The number of commercial foundries using green sand these days is probably a lot less than even a decade ago, so the chances of finding enough for your hobby foundry needs may not be easy. But if you look hard enough I'm sure you will find some, somewhere.

#### **PROS:**

Green sand is cheapest form of moulding sand available.

It is easy to learn the correct moulding techniques.

It is very easy to recondition. (If you use a motorised riddle)

Green sand is easy to store.

Will keep for weeks in sealed plastic garbage bins.

Rammed moulds will keep for a reasonable time.

Green sand is still the most economical way to make sand moulds, even for small production runs.

#### **CON'S.**

Getting harder to find.

Difficult for the hobby caster to make green sand that has the right qualities. (due to lack of mulling equipment) It is essential to use a muller while making your sand.

Green sand is laborious to recondition by hand.

Will dry out if not kept well sealed.

Clay bond (bentonite) will slowly degrade and end up as burnt clay fines in sand. Burnt clay fines can render green sand useless, as it clogs the sand, and removes its ability to breath (permeability) thus promoting gas pinholes and porosity in castings.

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**The Petro Bond Users Guide:** All the info you'll ever need to use Petro-Bond moulding sand

**How to Build Crucible lifting tongs.**

**How to build accurate sand mould boxes.** Both of these ebooks will save you a bundle when you start to make your tools and equipment.

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