Mt. Savage Specialty Refractories

THE BUZZ
MT. SAVAGE
SPECIALTY REFRACTORIES
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Getting Hot? Find out how to cast your Mt. Savage castables in the hot weather. These tricks will help you keep your cool! Page 3

Refractory Raw Material suppliers are hurting but they are keeping their prices high, how are they doing that? Page 4

Dr. Dirt is back answering your refractory questions. Page 4

Mt. Savage Specialty Refractories

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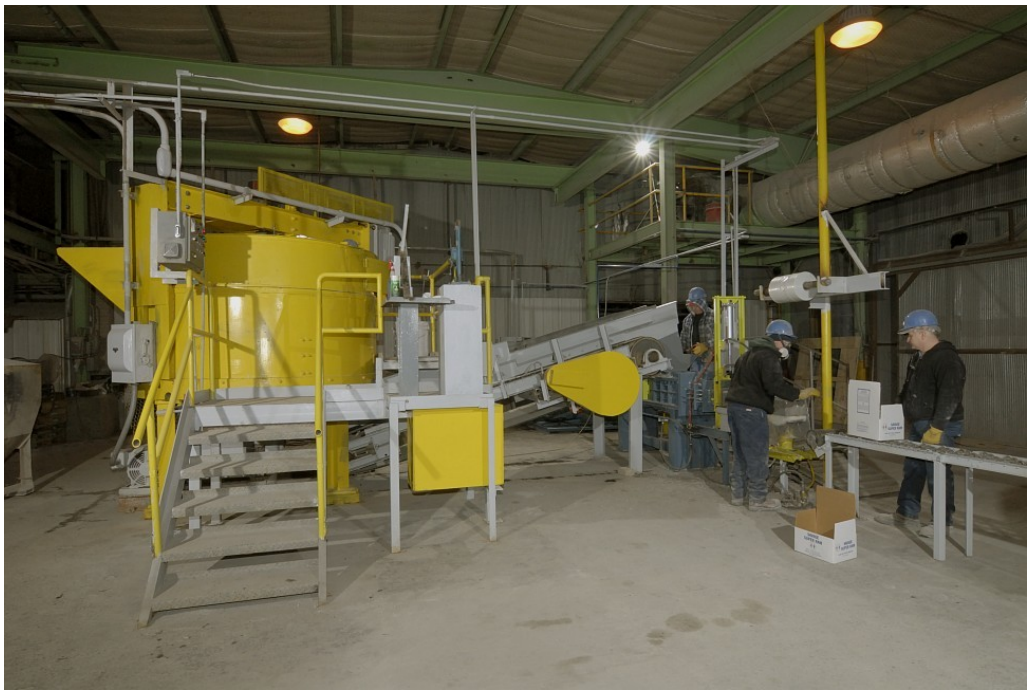
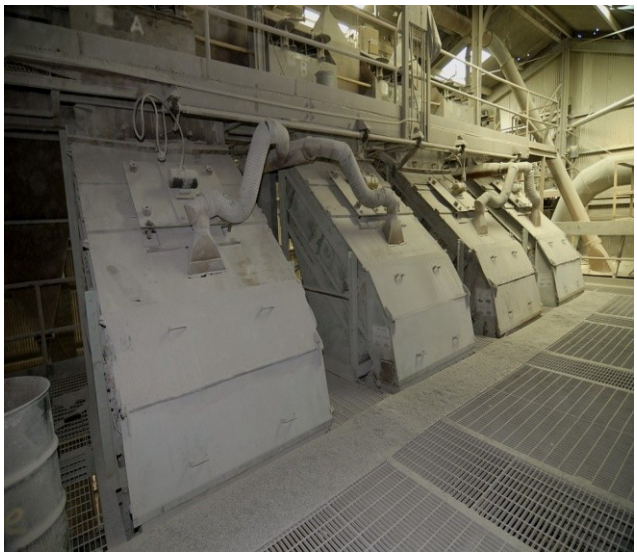


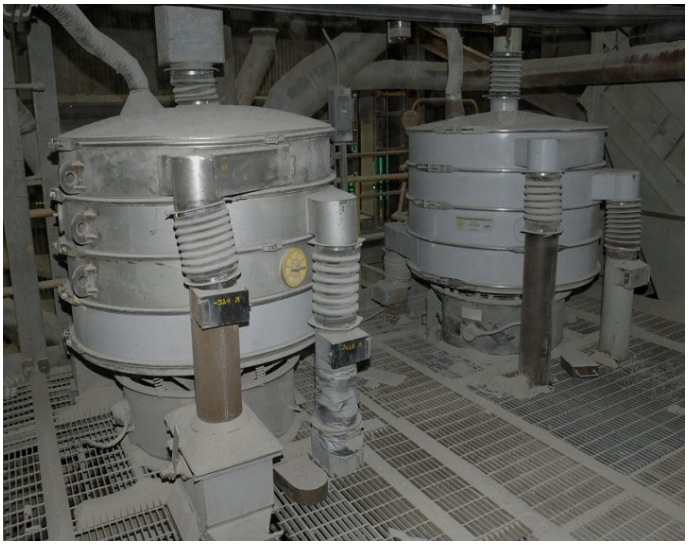
The New Plastic Line is now open at Curwensville, PA. This operation was designed with quality, production, and cost in mind, giving MSSR a low cost plastic production facility. This, combined with the tremendous work ethic and experience of the Curwensville work force should make MSSR a major player in the refractory plastic market. In March of 2009, the first plastic was produced on this new line. For more information, see the article and pictures on pages 2 and 3.

NEW PLASTIC LINE OPEN

In March 2009, a brand new plastic line was christened at Curwensville, Pennsylvania. For years, our Mt. Savage, Maryland plant made high quality plastics to fill out the line of specialty products that they could offer. The line at Mt. Savage, however, was never meant to be a high production, low cost line to compete for volume projects. It was, and will continue to be, a line to allow contractors to purchase mixed truckloads of all the general refractories they need. The new Curwensville line opens with attitude! The high production nature of the Curwensville facility allows for lower processing and handling costs enabling MSSR to address all of our customers.

The low cost production of plastic, as with any refractory material, starts with the processing of raw materials. The Curwensville facility is a completely integrated specialty refractory facility that has the capability of receiving bulk refractory product by rail, then crushing, grinding, and sizing it to proper screen fractions. The cost savings of being able to do this is significant, making Curwensville one of the lowest cost refractory specialty plants in the industry.





Pictured above are the two-step screening stations at the Curwensville plant, allowing the plant to size raw materials and keep costs to a minimum.

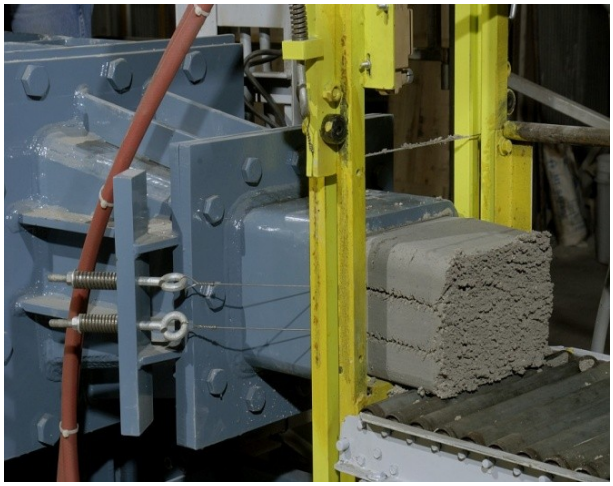
Plastic Line

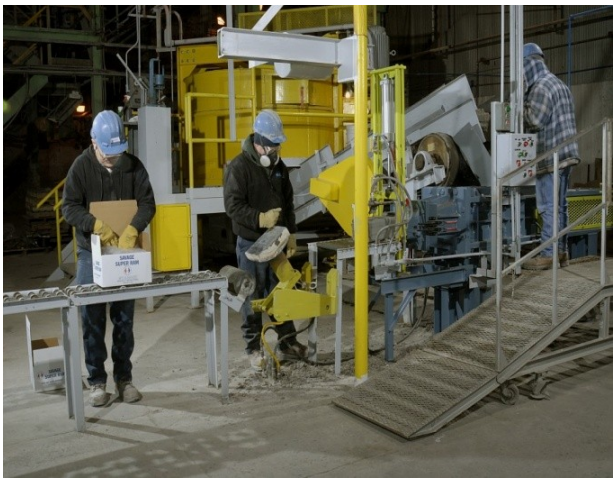
The plastic line might be new at Curwensville, but making plastics is certainly not a new thing to most of the workers there. In a short count, we came to the conclusion that the plant personnel have a combined 200 plus years of experience making plastics in the industry. This dedicated work force is determined to make the finest and highest value plastics in the industry, particularly after being told that the company they used to work for is making plastics right down the road. At MSSR, we will put our work force in terms of experience and motivation against any in the world. Remember, this is the work force that produced over 50,000 tons of shotcrete over the past four years without one bag being returned! Their record speaks for itself!

The new plastic line uses an existing batching facility, a reconditioned plastic mixer with new feed lines and a brand new high pressure extrusion system. A flip table and exit line complete the picture. Other cost saving procedures were put in place during the design that allow for the lowest possible cost with the highest possible production rates all while not sacrificing quality in the least. Though put together in an economical way, quality and production rates were seriously considered during the design and set up of this new facility.

The line at Curwensville can handle the complete line of plastics that Mt. Savage makes. That includes fireclay mixes (**SAVAGE SUPER RAM** and **SAVAGE SUPER RAM AS),** mullite based plastics (**SAVAGE RAM 60, 60 AS, and 70-M**), and high alumina plastics (**SAVAGE RAM 85 and 90**). As you can see, the line will produce heat set, air set, and phosphate bonded plastics. Small orders will continue to be made at the Mt. Savage facility along with combination orders that combine plastics with brick or lightweights that are not available at the Curwensville facility.

If you have a large need for plastics, get a quote from your local MSSR sales representative. Our goal is to supply the best possible value and we will be particularly competitive for orders over 20,000 lbs. where we will be able to crank up the new line at Curwensville. For more information on the physical properties of Mt. Savage plastics, visit our web site at www.mtsavage.com.





Pictured above are the first clots of plastic being produced in the new facility at Curwensville, PA. Several additional improvements have been added, making this facility a quality, low cost production facility capable of handling all your refractory plastic needs.

Turn Up The Heat

Cold weather can play havoc when installing specialty refractories, but so can the heat. Those refractory guys in the lab say that the best results are when castables are poured between 60 and 80°F. In Pittsburgh and many other parts of the country, that occurs about 8 days a year. Thus most times the contractor is told to make due; however, that is not what Mt. Savage Specialty Refractories would say.

In the heat, the thing that is of most concern, particularly with castables, is flash setting. Everything occurs a little bit faster when things get hot. This is particularly true of high cement conventional castables such as **HEATCRETE 26 ES.** When cement begins to set, it generates heat on its own. This heat can accelerate in high temperatures, and these high cement castables can sometimes get so hot that self-generated steam can crack the material on its own.

Low cement castables, such as **ULTRA-TEK's** are not as vulnerable to high temperatures as they have less cement, and the setting time can be modified by changing the additive package that reacts with the set. Mt. Savage designs its low cement castables with setting behavior that fits the season. Material made in the winter is designed to set faster, but if it sits until summer, the cement becomes less reactive and it will still be good to use. Still, whether using conventional or low cement castables in the summer, it is wise to take some precautions to avoid flash setting, particularly when the temperatures head north of 90°F.

Some of the rules are just common sense. Don't store the castable or gun mix in direct sunlight. Use cool water when casting. Don't let the material sit after mixing, instead place it immediately after mixing. If it gets really hot, or if the material is reacting quickly (like when you are using a competitor's material), there are other tricks to consider. One is to add ice to the mixer. Ice comes in 8 lb. bags which is convenient as it is about a gallon when it melts. Another trick is to keep the mixer clean. Material stuck to paddles over time will start to set and generate heat, acting as a catalyst to the material being mixed. Thus, from time to time clean off the mixer blades when casting multiple batches on a hot day. Make doubly sure the mixer is clean when you start, as material sitting in the mixer over a couple days can still be reactive. If it is very hot, an acid addition such as orange juice, Mountain Dew, or citric acid in a proper proportion can be considered. Remember, however, that too much of any of these additions can have a negative effect on properties, green strength and/or setting time.

Gunning mixes tend to shoot much better in hot weather than in cold, but still, some caution must be taken. As the heat could set the cement in the gunning mix quicker, care must be taken to prevent laminations caused by improper gunning techniques (feathering of the material during gunning). When predampening, don't let the material sit around too long, get it in the gun in a reasonable period of time. Predampening with cool water, particularly when shooting a high cement mix, is a good idea.

Enjoy the summer weather and avoid any flash setting incidents. For large jobs, consider contacting your Mt. Savage Specialty representative to have your castable or shotcrete tailor made to fit your expected weather conditions. Consider low cement products instead of high cement products in the summer to avoid a cement steaming incident. Use ice if it gets really hot, and have a couple liters of Mountain Dew (not diet, it doesn't work as well) on hand to slow the set if things start moving a little too quickly.

Ask Dr. Dirt

Dear Dr. Dirt: Your competitors show some very high strengths on their data sheets after high temperature re-heats like 2910°F. Mt. Savage data sheets do not show this data, are you ashamed of your numbers? **Tom, Vandalia, MO.**

Dear Tom: I think that data after a high temperature reheat is very revealing and very useful information. Unfortunately, many customers do not know how to interpret it. Please note that it is strength after reheat, not at temperature, two very, very different things. Think about this scenario, you have a castable you heat to 3000°F that is rated at 2600°F like **HEATCRETE 26 ES.** What is going to happen to it? Well, you are going to either completely or partially melt it, forming lots of liquids at temperature. When you cool it down, these liquids will solidify, forming a very strong bond. When you run a strength test on this sample, you will have a very strong number, probably several times stronger than after a 1500°F reheat. Now I ask, is that a good thing? Obviously not. Imagine, however, you have a different product rated at 3200°F and run the same test. During the test, you develop little or no liquids, just a little ceramic sintering (a good thing). You now run strength after reheat, and find it is only a little stronger than after a 1500°F reheat; this is the desirable result. Though it is not an exact correlation, generally speaking, the higher the strength after a high temperature reheat, the lower the strength at that same high temperature. So, next time a competitor's salesman brags about his product's strength after a high temperature reheat, tell him to go into selling used cars.
Dr. Dirt

Dear Dr. Dirt: With as good as low cement gun mixes have become, is there any reason to ever use conventional gun mixes? **Dusty, Charleston, WV**

Dear Dusty: Taking lightweight gun mixes out of the equation, as they are conventional gun mixes, the short answer is rarely. With the cost of calcium aluminate cement going up, the cost difference between the low cement and conventional gun mixes has shrunk to next to nothing. The price per ton for the low cement is often about the same or less than conventional high strength gun mixes and their properties are better. There are heat containment applications where strength is not a factor where conventional gun mixes are more economical (like our **HEATCRETE 28 LI GM**, darn that is reasonable!). The other factor to remember, however, is that not everyone has perfected the low cement gunning technology and some nozzlemen have a bad taste in their mouths from trying to gun some of them. You have obviously been spoiled by shooting Mt. Savage low cement mixes that install easier than most if not all conventional gun mixes. Bully for you.
Dr. Dirt

Buzzi says "Thanks to Elaine Perkowski who has to be the best proof reader in the refractory industry, you should see The Buzz before she gets her hands on it!"

Raw Material Update

At the beginning of the year, almost all raw material vendors raised their prices to reflect increases in commodity costs that occurred last year. Timing, of course, is everything, and the commodity market has since collapsed. So, refractory raw material prices have fallen as well, right? Wrong. Raw material vendors are holding fast to prices saying that these reflect long time cost increases and that they have just been playing catch up. This may be true, but how are they managing to keep these prices up?

Refractory vendors have little competition. During the 1980's, there were three manufacturers of mullite grains from the Georgia, Alabama area that mined and fired product. This kept the industry honest. As cheap Chinese bauxite flooded the market, the demand for these products waned and two of the three manufacturers fled the market, leaving one. When bauxite was no longer cheap, they were able to raise their prices and choices were limited. Bauxite is coming down again, perhaps that will force them to reconsider these price increases, but so far, that has not happened.

Calcined alumina, and a related product, calcium aluminate cement, are almost in the same situation. Though both have several suppliers, all of these suppliers are dependent on the same single source of calcined alumina feed stock. This is obviously the driving factor in the price of both calcined alumina and high purity calcium aluminate cement. Though very important to the refractory industry, the calcined alumina sold by the alumina manufacturers is insignificant to the alumina sold to the aluminum industry and pleas for price relief have fallen on deaf ears. At least one supplier is attempting to develop more calcining capacity that will allow them to at least source their alumina from more than one source. Wish them luck.

Chinese bauxite, after going up approximately 500% in a 5 year period, has finally eased and has come down some. Again, competition is limited. The Chinese have bought the high quality bauxite mines in Guyana so they are not going to allow that bauxite to compete with Chinese sourcing.

Phosphoric acid, another common refractory raw material, had doubled in price. The largest user of this product is the cattle feed industry where they use tens of thousands of tons a year. Refractories are much smaller and have little affect on the market. It has come down some, but not very much.

Mt. Savage is continuing to look at options to supply the best possible value to its customers. Some switches have been easy, some are more difficult. MSSR's goal is to be a consistent refractory supplier for years to come and no chances will be taken on refractory quality for short term gain while risking a long term reputation. Alternate sources of alumina are being constantly evaluated and will be used where it makes sense. Customers can help the situation and ask if they are using the most cost effective product for their application. Perhaps it would make sense to "down grade" to a lower cost product that will still work well in their application. Don't hesitate to ask your informed Mt. Savage representative about alternate products.