



THE BUZZ

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"Stinger" to the Rescue

Mountain Innovation

The large Research departments of the old giant U.S. refractory companies are a thing of the past. The shrinking refractory market took care of that. Does that mean refractory innovation is also gone? Not necessarily. Smaller and medium sized refractory companies still have a strong incentive to offer something new and different as they attempt to obtain a larger share of a shrinking pie. Mt. Savage is no exception and we are quite proud of the innovative products that we have brought to market.

Q-TEK Gunning Mixes are a unique two component phosphate bonded system that is

taking several industries by storm. Both the properties and ease of installation are superior to the one component dry phosphate bonded systems at a fraction of the single component price. The result is the same as gunned plastic without all the danger, mess, rebounds, and laminations. Industries looking at this technology include the steel reheat furnace market, the cement industry and the zinc recycle industry. Why ever ram a plastic wall again?

What Mt. Savage calls **NC Bond**, binding with alumina instead of calcium aluminate, has been around for a



ULTRA TEK 70 NC Wall Cast with top section Shotcreted

while. Suppliers have addressed some of the drawbacks to this system making it a very viable refractory binder. Mt. Savage has combined this with its standard shotcrete technology to make the first NC Bonded

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Dr. Dirt Bullet Points

- * Mt. Savage has become a leader in New Product Technology
- * A water booster pump is even more critical in the winter when additives dissolve slower!
- * Have chlorine in your gas stream? Get the cement out, MSSR has 4 different ways to do that!

The Buzz Bee

The Old Buzz Bee has retired. Mt. Savage Specialty Refractories has become the fastest growing refractory company in the U.S. and we feel a more aggressive image was needed to portray that.

The new Bee reflects how Mt. Savage products charge in and are ready to take care

of even the toughest refractory problems. So, as "Buzzi" says goodbye, please welcome "Stinger" to the Buzz Newsletter.

If you need a tough problem solved, contact your local MSSR representative to discuss your refractory issues!



Buzzi says "good bye"

Innovation, continued

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Castable/Shotcrete products in the world. The NC Bond is particularly good in chlorine environments and can be combined with high purity alumina aggregate to be effective in fluorine environments also (**ULTRA-TEK 100 NC**). NC versions have been developed for the cement industry and other industries seeing high chlorine concentrations in their gas stream.

Another refractory company had developed a colloidal silica based product gunning mix that allows for excellent chemical resistance and fast dry-out. To

that, Mt. Savage says kudos. Taking it one step further, Mt. Savage developed a single component silica gel bonded product known as **ULTRA-TEK PDQ**. This unique product guns extremely well and offers similar acid and alkali resistance as well as fast dry out compared to colloidal silica gun mixes and castables without the fuss of trying to work with a two component system. Reports are it guns a whole lot better than the two component mix as well

What's next out of Mt. Savage's secret mountain laboratory? Who knows what is locked into the head of the evil genius that works there, we are only glad he is on our side!



A gunned Q-TEK wall looks just like a rammed plastic wall, minus the laminations

Gunning and Temperature

Way back when Dr. Dirt was a wet behind the ears engineer (and that was long time ago), the recommended gunning procedure for "gunning castables" was to predampen then allow to age for 20 or 30 minutes before placing into the gun. With today's gunning technology, that sounds almost laughable, but back then, it worked. The reason it worked is the flowability of castable is dependent on the pH. As the castable ages, cement starts to dissolve in the predampening water and raises the pH. The higher the pH, the less the castable flows and the stickier the material becomes. Thus, by aging the material, the pH is higher, the material sticks better, though poorly by modern standards.

Today, there is no need to age good gunning mixes, in fact, many gunning mixes are designed to be gunned without predampening. The reason is that additives are put into a gunning mix to raise the pH of the mix, which makes it sticky soon after water hits it. These additives are usually very soluble and dissolve in the gunning mix very quickly. They are also responsible for making the material stick on the wall. In a well designed gun mix, such as ULTRA-

TEK, the additives are designed to take a second or two to dissolve, allowing some flow and densification of the product before becoming too viscous to move.

Dr. Dirt says the number one thing you can do to assure good gunning is use a water booster pump!

Some things to remember when shooting a modern gun mix. Water pressure is key to dissolving the additive. As a successful installation depends on dissolving of the additive; low water pressure can leave part of the additive undissolved and thus ineffective. This can lead to higher rebounds or material slumping off the wall while the refractory manufacturer's name gets yelled in vain. Often a bad gunning job can be turned into an easy gunning job with the simple addition of a water booster pump.

Temperature also plays a factor in

gunning success. As with almost all chemicals, the rate that the additives dissolve is temperature dependent. The colder it is, the slower the rate of dissolution. Thus, a product that guns extremely well in the summer may not gun well under the same circumstances when it is cold. Getting heat on the gun mix, using hot water, and higher water pressures will often help. If none of these tricks work, predampening the product will usually put you over the edge, as long as you keep the material warm enough to not freeze the water. Again, this is because you are dissolving some of the additive and getting the sticking process started.

High temperature gunning is not usually a problem except for the poor people working. Products that do not require predampening usually work very well in higher temperatures. One caution, under higher temperatures, these products can often be successfully gunned with lower water pressures. One thing to remember, mixes that gun very well in hot weather, might not gun as well in cold, so buy that water pump!

New Screening Capacity

As was stated in the front of this newsletter, over the past couple of years, Mt. Savage has been one of the fastest growing refractory companies in the country. This increased business in 2012 stressed the ability of equipment to keep up at our Curwensville facility. An engineered study indicated that the bottle neck for production was the plant's screening capacity. Though we had crushing capacity of 30 tons an hour (and back up crushing of 15 tons an hour more), our screening operation could only handle 6 ton an hour.

Thus, Mt. Savage invested a half million dollars to increase screening capacity. A large Midwestern screen deck was purchased and moved into the system. This deck matches our grinding capacity of 30 tons an hour. This was installed in November of 2012 and as of January is the heart of Mt. Savage's grinding and screening operation.

Along with the screen deck, additional equipment was purchased for bagging to allow Curwensville to send bagged

fractions to our Mt. Savage plant. This will allow both plants to produce material with the same screen fractions, assuring higher consistency between operations.

As business continues to grow, more capacity improvements are being explored including increased batching capacity and the addition of additional shifts. Find a way to challenge us, we will find a way to get it made!



This three stage screen deck is now screening operating 4 stories above the plant floor

New Salesman for Pittsburgh Region

Continuing the trend of hiring the best people available to better serve our customers, Mt. Savage is proud to announce the hiring of John "Jack" Fanning to the MSSR sales team. Jack has more than a couple years of experience in sales and marketing of refractories and anchors. He has worked both in the steel industry and the industrial market selling brick and monoliths for a number of years. Jack will be based in Pittsburgh and call on

Western PA and NY, Eastern Ohio, West Virginia, and part of Maryland.

This will allow us to move MSSR's hard working salesman, Jeff Gahagan, from Youngstown to Indianapolis, allowing him to call on the market from Kentucky to Wisconsin and Missouri to Western Ohio. Coupled with Jack moving into Eastern Ohio, this will allow MSSR to supply better and more consistent service to a wider customer base.

Still not getting the attention you need? How can we help? As we have said, MSSR is growing from a regional to a national refractory company and we know that better service and products are needed to do that.

Better equipment will only help the customer if it is combined with better technology and better service

Plastic Line Update

In 2011 Mt. Savage opened a new plastic line at the Curwensville plant, capable of much higher capacity than the Mt. Savage plant equipment. This increased capacity allowed MSSR to address much larger opportunities. The softer plastic generally used on smaller jobs served by the Mt. Savage plant had some installation issues in large wall construction. Thus, we addressed these consistency issues based on significant customer feedback.



Several trials were made of different consistencies and sent to different customers. After reviewing the performance and installation comments, we believe we have a winner! The designation 40, such as in SAVAGE RAM 85-40, stands for the

stiffer version of Mt. Savage plastic and gives an excellent combination of cohesion, good shelf life, and the ability to not slump when ramming large walls and overhead. For smaller repairs and cracks, the softer version, with a longer shelf life, is still available. Both mixes coming out of Curwensville can be very competitive. All these improvements were based on extensive customer feedback. Yes, we do listen!

Contact your local Mt. Savage representative for pricing and availability.

THE BUZZ

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ASK DR. DIRT

Dear Dr. Dirt, How does refractory concrete get hard? **Randy in Ironton**

Dr. Randy, Hopefully overnight and hard enough to pull the forms! Most refractory concretes contain calcium aluminate cement. When mixed with water, some of both the calcium and the alumina go into solution. The alumina, being much less soluble than the lime, stops dissolving quickly, but the lime continues to dissolve for some time. Calcium oxide (lime) is an alkaline material. That means Ca^+ ions form along with OH^- ions, stripping hydrogen from water. The higher the OH^- concentration, the higher the pH. When the OH^- ions reach a certain level, they will react with the calcium aluminate particles to form a calcium aluminate compound that chains the particles together, thus creating a "set". **Dr. Dirt**

Dear Dr. Dirt; In a reheat furnace I operate, the sidewalls, though in for a long time, are starting to come out in large chunks and need to be replaced. How do I avoid this in the future? **Alex in Gary, IN**

Dear Alex,

Luckily for us refractory suppliers, you won't be able to prevent that from happening completely! One of the most common forms of wear in any number of applications for refractory is thermal stress and shock. Every time you heat a refractory up or cool it down, it grows or shrinks. To make matters worse, it grows or shrinks at a much different rate than the materials that it is attached to, be they ceramic anchors, stainless anchors, insulating back up, or carbon steel walls. This is often the cause of the cracking you see.

One thing that can help is to make sure your sidewall refractory is mullite based and not bauxite based. Bauxite per alumina unit is less expensive and some refractory companies have been known to make their products this way. Mullite products are more volume stable and less reactive at the same alumina content, giving them the ability to withstand thermal cycling to a much better degree. For sidewall construction and repair, I recommend staying with mullite! **Dr. Dirt**

Reheat Furnace Opportunities

Some people think that the steel industry is dead or dying in the United States. Many people are very surprised to find out that the United States made about 100 million metric tons of steel in 2012. Some still think of steel industry as the old mills lining the Monongahela River near Pittsburgh, most of which are long gone.

Steel today is diverse and spread around the country. About half of the steel produced today is made in electric furnaces melting a combination of scrap and metalized iron ore pellets (DRI, HBI, Iron Carbide). So called "mini" mills are not so mini anymore, with some of these electric furnace shops producing over three million tons of steel a year. Though reheat furnaces in "mini" mills are different than in integrated mills, they are more the same than they are different. As most of these shops are non-union and have smaller work forces

than the bigger mills, many opportunities for contract work exist, particularly in reheat furnaces.

Mt. Savage is a major player in the integrated steel reheat market, supplying thousands of tons of shotcrete, hearth castables, plastics, and, most recently Q-TEK Gun Mix. Q-TEK, in fact, has opened the door to a number of reheat furnaces that see the advantage of installing a plastic type product with a



A door being opened to retrieve a reheated steel slab.

third of the labor and installation time. Q-TEK 31 GM was developed in conjunction with a major integrated steel company to replace 70% mullite based plastic that is hand rammed. Initial trials in a bull nose and sidewalls are very encouraging and major installations are planned.

Mt Savage is not, however, a one hit wonder. They also supply shotcrete, NC Castables, and plastics for reheat furnace construction and repair. One major integrated steel customer built two brand new reheat furnaces in 2012 using nothing but MSSR supplied refractories.

Q-TEK Gun Mix is the hottest new product in reheat furnace repair. Now would be an excellent time to team with Mt. Savage and attack the "mini" mill reheat market using a now proven technology that offers significant cost advantages over existing technology.