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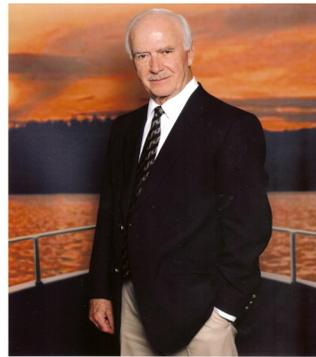
OCTOBER 2009

MSSR President Retires

Jerry Zawatski, founder of Mt. Savage Specialty Refractories (MSSR), has retired as President after 33 years in that position. Jerry founded Mt. Savage Specialty Refractories in 1975 at a single plant in Mt. Savage MD. He set up a relationship with Mt. Savage Firebrick and developed manufacturing capabilities to make castables, gunning mixes, plastics, mortars, precast shapes and slip cast and fired pieces. In 2002 Jerry acquired the refractory plant in Curwensville, PA which became MSSR's volume producer of shotcrete and low cement castables.

Jerry graduated from Penn State University in 1961

with a degree in Industrial Engineering. After a stint in the Marines, Jerry moved on to the refractory industry. Jerry was always good



Jerry Zawatski

at putting things together with little money and when the steel collapse of the early 80's hit, this ability allowed MSSR to survive

and later prosper and grow. Jerry will continue using these skills as a Engineering Consultant as MSSR continues to expand its production capabilities.

Jerry was succeeded as president by Gus Hughes, aka Dr. Dirt. Gus has 30 plus years of experience in the industry including research, marketing, sales, and administration. Gus strives to continue the high level of integrity brought to the market place by Jerry and continue the growth MSSR has demonstrated in the market. "I have big shoes to fill", says Gus, "but our team was left with wonderful assets to work with."

Hot Stuff

In August of this year, MSSR completed a successful installation at Giant Cement in Harleysville, SC. Cement installations are usually done in the winter when cement demand is at its lowest. This year, of course, is a strange one, and Giant had put off their repairs until absolutely necessary and August it was.

With 200 feet of elevation

and over 300 feet of pipe and hose needed to do this job, it would have been challenging enough in the best of conditions. Add to that the 97 degree heat and the challenge became very serious.

MSSR planned ahead and made the material with exceptional working time. This is made possible by use of the **ULTRA-SET**

activator system that takes care of the set and allows longer working times. The installation was completed in 18 hours and 12 hours later there was heat on the kiln! Quick Fire fibers allowed for rapid heat up without spalling and cement was being produced 24 hours later. Remember to ask your MSSR agent about special conditions!

SAVAGE RAM BLUE



In the late 1970's, a flood of cheap bauxite started to arrive on the shores of the United States from China. This bauxite was much less expensive than the bauxite that had been used in the U.S. from Guyana in South America. It was different, however, in that it contained less silica. When calcined this develops less mullite and has more porosity than the South American bauxite. When used in 80-85% alumina plastics it tended to make the plastics more crumbly and less cohesive. Using domestic 70% alumina bauxitic kaolins from Georgia or Alabama producers could make an easy ramming product that was much more cohesive. One smart manufacturer decided to put a blue dye in the product to differentiate it from the 85% alumina products that installers hated to work with. The concept worked well enough that to this day some installers insist that the plastic be blue so that they know they aren't trying to sneak any of that bauxite based plastic in on them. Mt. Savage now offers **SAVAGE RAM BLUE** along with its standard 70% alumina plastic **SAVAGE RAM 70M**.

SAVAGE RAM 70M has always been a consistent easy to use 70% alumina phosphate bonded plastic. Partially because of the domestic aggregate used in this product combined with the special Savage phosphate bonding system, this mix has always been one of the easier plastics to install. Now made at the new low cost processing system at Curwensville, PA, it is not only easy to use, but is also very competitive with other 70% alumina plastics. Finally, for those people with workers used to blue, we can also make it blue!

It is important to know that the blue dye does nothing to the properties or consistency of the **SAVAGE RAM 70M**. It is simply a reminder to the workers that they are not using any of that Chinese bauxite based plastic that tends to crumble under their hammer, particularly when installing it overhead. Thus whether you get **SAVAGE RAM 70M** or **BLUE**, you are assured a consistent, easy to install plastic that works in a variety of applications.

BLACK JACK RAM 80

While we are talking about plastic, the new line at Curwensville has opened up capacity at our existing line at Mt. Savage MD and we have expanded the plastics we offer from that location. One plastic that demands a lot of special attention that we couldn't properly address when we were making all the plastics at Mt. Savage was silicon carbide plastics. These special materials take long clean outs and special attention to detail to make properly and we at Mt. Savage felt we do not want to do anything unless we can do it right. Well, the Curwensville line now allows us the luxury of doing silicon carbide right and we are offering our first silicon carbide plastic, **BLACK JACK RAM 80**.

This plastic is an 80% silicon carbide, phosphate bonded material that offers exceptional thermal conductivity. In comparison to 85% alumina plastic, this material would have four times the conductivity. This is important in applications such as repairing or lining studded boiler tubes where you want to protect the tubes but you want as much transfer of heat from the boiler to the tubes as possible.

Still, no matter how good the thermal conductivity of the plastic, it doesn't do any good if you can't install it. **BLACK JACK** plastics are made with the same binder systems as other Mt. Savage plastics which give excellent cohesiveness and shelf life. Recent improvements in the Mt. Savage line have made clots hold together better making it easier to ram. Silicon carbide is very expensive, Mt. Savage wants to make sure none of this plastic is wasted at the job site because it doesn't knit properly. Contact your local Mt. Savage representative for a sample today!



Buzzi says:
"Curwensville is
waiting for your
plastic orders"

Thermal Conductivity



Cement kiln towers use two component linings to reduce heat flow

Thermal conductivity is the measure of how much heat will be transferred through a material at a given temperature. The higher the thermal conductivity, the more heat is transferred through the lining. The units are complicated combinations of Btu's per area per inch that don't make much sense to the layman, but as long as the units are the same, lower numbers mean better insulation and higher numbers mean more conductivity. When saving heat within a furnace insulation value, thus low numbers, are desirable. In some cases, like protective coatings on boiler tubes, high conductivity is desirable, so high numbers are preferred.

There are two major ways that the thermal conductivity of refractories is determined. One is called the calorimeter

method and the other is called the hot wire method. In the calorimeter test, a panel of refractory is placed in a furnace. One side of the panel is heated to a given temperature. The temperature is held until the other side of the sample stops going up and reaches a steady state temperature. From this, one can calculate the thermal conductivity at this point. As thermal conductivity changes with temperature, this reading is related to the mean temperature between the hot face and the cold face of the panel. Thus, if the hot face was 1500°F and the cold face 500°F then the mean temperature would be 1000°F. The temperature of the hot face would then be changed and a new thermal conductivity and mean temperature determined.

The hot wire technique is run with, well, a hot wire. A wire is inserted into the center of a sample and heated to a given temperature. The electricity is cut to the wire and the temperature of the wire is

measured over time. The faster it cools down, the higher the conductivity. Some smart mathematician has worked out a formula that equates the decay curve (how fast it cools off) of the temperature with the refractory's thermal conductivity. The hot wire method is cheaper and faster than the calorimeter method and thus more often used.

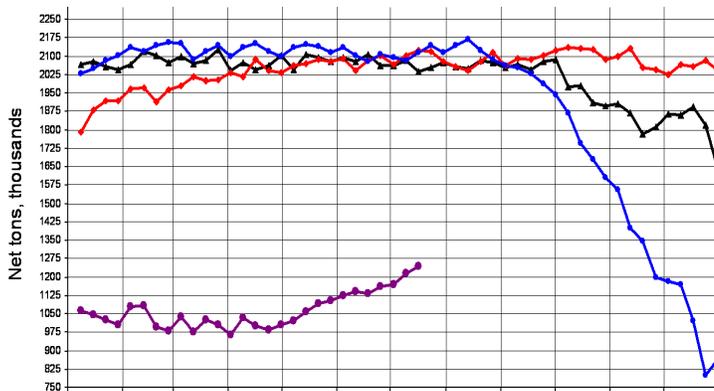
Both methods are reproducible in generating thermal conductivity numbers and are very good at comparing one material versus another. They do, however, tend to generate different numbers. The reason often cited is that the calorimeter method has a temperature gradient in which the conductivity will vary. The hot wire at the point of the wire is a single temperature point so proponents of the hot wire method say it is more accurate. The numbers generated from the hot wire method tend to be about 10% lower than the calorimeter method. When comparing the thermal conductivities of two products, it is important to know how the test was run.



This old joke seems very pertinent to our times. Is that a light at the end of the tunnel or a train ready to run us down? Mt. Savage has weathered the recession fairly well and we know why. Our customer base consists of many small, well run companies that have shown a tremendous ability to persist in this economy while many others have not. Our vendors have indicated to us that we are down much less than our competition, and for that we are grateful. In general, the end of summer is showing some signs of life and there are some reasons for optimism.

The steel industry has hit bottom and is climbing out. The chart below shows that the fourth quarter of 2008 (blue) and the first half of 2009 (purple) had steel production off 50% from previous years. The trend is a slow steady climb and recent reports show this trend is continuing and accelerating.

STEEL PRODUCTION CURVE



Automotive sales, thanks partly to the cash for clunkers program, have increased significantly as well. GM on August 19th called back over 3,000 workers in Ohio, Indiana, and Michigan. Automotive inventories are at a 25 year low and people are looking to buy. Is this temporary? In July, sales of existing houses, aided by government tax incentives, grew at a 7% annual rate, the third straight month of growth.

With manufacturing capacity at historic lows, even the power industry had cut back repair work. With the increase in factory output, many power plants will be forced to do the repairs they put off in the spring. This should supply a boost to both Mt. Savage and their customer base.

The cement industry also put off a lot of outages and this winter they will have to fix their kilns or shut them down. There seems to be some disagreement on how much the stimulus package is helping the cement industry as the government appears to be holding up the money, but hopefully that will have a positive effect on outage work this winter.

Project work is still being delayed in most cases, but there is some movement on some of them. Power plants are moving forward along with some municipal incineration and even some steel projects. Meanwhile, customers are repairing old furnaces as needed and they have put off repairs about as long as they can, so maintenance business is picking back up. All in all it is not the rosier of scenarios for us, but it does appear to be looking up some. MSSR will support its customers in any way possible and together I am sure we will get through this.

Ask Dr. Dirt

Dear Dr. Dirt,

On MSSR data sheets for Ultra-Tek's, you call them castables and shotcrete mixes, what does MSSR base their data on?

Matt in Altoona, PA

Dear Matt,

Yes. The answer for MSSR is that it doesn't matter. Our data is generally run on pump cast consistency. We run standard checks for properties comparing shotcrete data and cast data at self leveling consistency. Though statistically insignificant (ok, enough big words for the day), the shotcrete density and strength numbers actually average

higher shotcreted than for cast samples for the same product! The reason we suspect this is the case is the **ULTRA-SET** binder reaction that is unique to this patented system. Other companies use soluble alkaline salts to activate their castable. As this reacts very quickly, it turns the castable into a sticky mass before it can hit the wall. To maximize density, they often suggest using high air pressure like you would in a gunning mix. Mt. Savage's **ULTRA-SET** activator is not a solution, it is a suspension. Because of this, it takes a little longer to react with the castable and the castable tends to go on wet. After a few seconds on the wall, long enough for the material to flow and densify, the material stiffens and

holds in place. This densification in layers is the same as the self leveling reaction in pump castables, and our data proves this. Don't try this with Brand X, Dr. Dirt knows from experience that this is not true of at least some of our competitor's brands! Of course, the best properties are obtained from vibration casting any of these castables. This is how many of our competitor's generate their data sheets. When comparing numbers on ours, it is important to note that these are self leveling, not vibrated and equivalent to shotcreted numbers. Our vibration cast numbers are stronger and denser yet, and the West Virginia Wizard (technical director Craig Felton) is in the process of generating a whole family of vibration cast properties to add to our data sheets. **Dr. Dirt**