MAY 2018 ISSUE

REMCO ROCK ENGINEERED MACHINERY CO. INC.

ROC'N

REMCO OPERATORS COUNCIL NEWSLETTER

Manufacturing Premier Sands

Advanced VSI technology boosts production of high-value, crushed-quartz golf course sand

Renowned for their pure white manufactured sands, The Hayden Group, Inc. of Sheridan, Arkansas, provides high-value, crushed-quartz sand to high-end golf course bunkers throughout the South, the Midwest, and beyond. The company is blessed, as they say, with the local abundance of "a brilliant quartz" that they mine year-round on their 800-acre operation.

"is kicked up on bunker shots" along the PGA tour. "Golf course superintendents like the aesthetics of the sand, plus its superior drainage and packing capabilities. And, the players say that the golf ball sits high on the sand, making for an easier, better shot," says Will Hayden.

To meet an ever-growing demand, the company

Figure 1: *The Hayden Group has two Series 1025 VSI crushers in place in Arkansas, where it produces its Premier White sand that appears in bunkers on PGA tour golf courses.*

Since the bright, white sand is such a spectacular, radiant contrast to the emerald greens of the golf course, the product is highly-valued. "We sell it as soon as it hits the ground," says Will Hayden, the chief operating officer for the company. His father, Darrell Hayden established the mining operation in 1989, and remains the company's president and CEO. As seen on TV, their Premier White™ Sand

recently upgraded and expanded its crushing operations. Two of its three crushing plants employ advanced-technology vertical shaft impact (VSI) crushers that deliver higher durability and uptime; ease of maintenance; lower wear parts costs; best particle shape results; and greater production output. "Bottom line, our new VSI crushers have allowed us to nearly double our daily and annual

production output," says Hayden.

Crushing Upgrade

Hayden credits their success to the unique mineral properties of their deposit; efficient washing and screening operations; a little luck with the weather; and importantly, a 5/8-inch-minus feed material that's cost-effectively pulverized into a superior manufactured sand by the new VSI crushers. "The way these crushers process this feed material is a big part of what makes our finished product one of the top three bunker sands in the U.S.," says Hayden.

Figure 2: *Golf course superintendents appreciate the aesthetics of the Hayden Group's bunker sand (top circle) and its drainage qualities. While the swimming pool industry benefits from the round pebbles, produced by the VSI (bottom circle).*

Manufactured by REMco, a Series 1025 SandMax VSI Crusher (with 150 HP motor) was installed at the Hayden operation in 2016, with a second unit purchased shortly thereafter for a new plant. The REMco headquarters, its North American manufacturing operations, and its materials test crushing facilities are located in Livermore, California.

"For us, it's quality over quantity. We're not a high-volume operation like typical sand plants. Instead, it's all about timing. That's crucial, and REMco has designed these crushers to operate very efficiently," says Hayden. He adds that their first new 1025 SandMax VSI replaced an older REMco 5500 SandMax that had been installed in 2002. "We got more than 15 years of reliable service from that machine, and yet we found that we could extend its service life by applying it to a different, and less abrasive application," he says, explaining that they formed another new plant and a new application around the older REMco crusher, which currently processes a smaller, less abrasive top size feed to produce "a more affordable linen-color golf sand" – a new and growing profit center for the company.

At their two main plants, the new SandMax VSI crushers process all the Premier Sands™, as well as a white pebble product that the company sells to the swimming pool industry for high-quality, crystal-like pool finishes. Each of the crushing plants operate in a closed-circuit, allowing the operation to easily attain a consistent flow rate on every product that is processed.

Advanced VSI Technology

"Advanced VSI technology allows these new crushers to cost-effectively surpass the tonnage of older models," says Mike Howell, who serves as the Central Regional Manager for REMco. From initial consultation through installation and operation, Howell supplies ongoing support to producers throughout his region.

Howell stresses that new rotor and chamber technology is key to advancements that boost productivity. "REMco has designed its VSI with a two-step, tapered rotor boss that's bolted-on and removeable. This essentially protects and preserves the longevity of the rotor itself," he says.

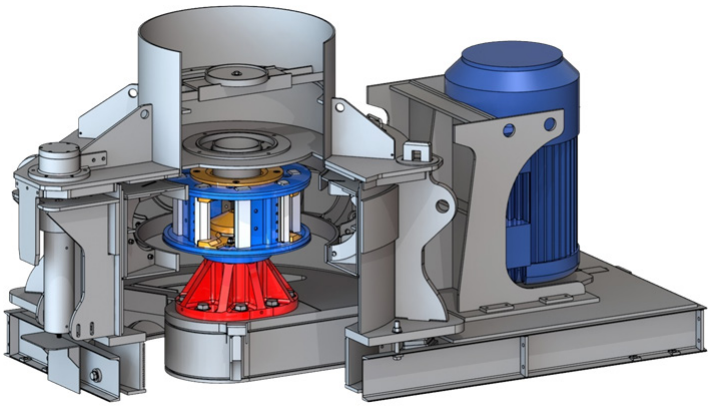

Figure 3: *A cutaway of the REMco Series 1025 VSI Crusher.*

"The new VSI also features a tighter crushing chamber that's engineered to significantly increase production," adds Howell. He explains that the SandMax rock-on-rock crushing chambers are more closed and achieve a denser particle cloud within the crusher. This allows for a greater concentration of the crushing energy, which produces a finer discharge. "This high crushing velocity reduces material recycle and increases production capacities of a desired finished product with the best particle-shape results," he says.

Wear parts costs are also reduced on the new VSI. When operating previous competitive models, Hayden says that they were always replacing wear parts on a weekly basis. "Now, we get more than 200-hours on our wear plates. We do replace our tips weekly, but that only takes the crew about ten minutes to do," he says.

Lastly, Hayden says that they experienced user-friendly operation with the new VSI crushers right from the start. The installation of the new crushers was seamless, he says, with the use of REMco's modular installation kit. "While a crusher might take up to two days to install, the kit cut our basic installation prior to electrical hook-up to under seven hours," he says.

Figure 4: *Keeping both player and greens supervisor perference in mind, The Hayden Group leverages its local quartz effectivly to fill bunkers at top courses around the nation. Above is an aerial view of the crushing plant.*

Ease of Maintenance

"The reduction of maintenance downtime and labor has also played a big part in our productivity," says Hayden. He likes the hydraulic lift incorporated into the REMco VSI. "Older-style crushers required the costly and time-consuming use of a crane to lift off the crusher lid. Removing the lid from our new VSI takes about five minutes. It makes it so fast and easy to do inspections," he says, adding that he also saves time in scheduled maintenance. "While an older-style crusher required frequent manual greasing of the bearings, the new VSI uses oil lubrication for the bearings," he says.

"For us, advanced VSI technology," says Hayden, "has resulted in nearly doubling the number of truckloads of finished product per day, while also doubling the total tonnage of saleable products per year. We had record-setting sales last year, and 60-to 70-percent growth rates in the demand for our main product lines."

By: Carol Wasson (04/2018)

Crushin'it since 1983

REMco ***SandMax, RockMax,*** and ***ST/AR*** VSI crushers are recognized around the world for their production of fine aggregate and sand to meet customer expectations for specification, finished TPH, and operating cost. Guaranteed!

- C33 Concrete Sand
- Specialty Sand Products
- Cubical particle shape
- High fracture face count
- Increased finished product durability
- Balanced plant production

REMco RockMax

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GO PRO AND GET IT DONE

Size reduction and separation equipment designed for years of reliable service in aggressive aggregate environments. Primary jaw crushers, secondary and tertiary cone crushers, vibrating feeders and screens, REMco's PROline can solve your processing and budget challenges at the same time.

- Fixed installation
- Optional modular skid mount
- Optional portable mount

REMco PROscreen

REMco PROjaw

REMco PROcone

Backed by 5 year manufacturer warranty

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Contact REMco for details

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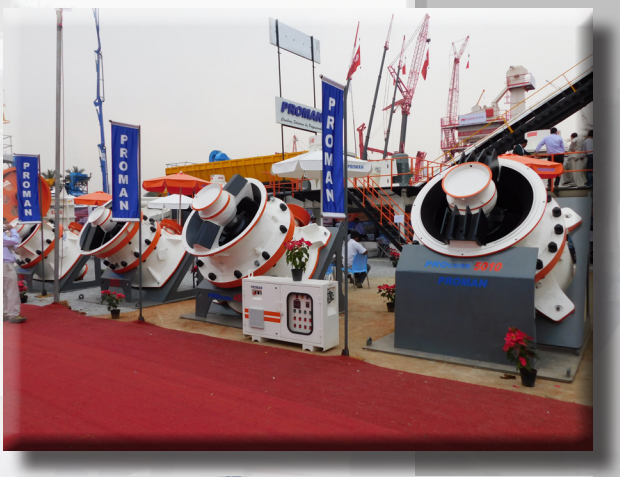
WORLDWIDE PRODUCTS OF REMco - AN AMERICAN COMPANY

REMco VSI at EXCON India

EXCON is the largest Indian construction equipment show with over 500 exhibitors both locally and internationally. It is the largest event for construction equipment in South East Asia. Through their exclusive manufacturing and sales license with REMco, Proman displayed many REMco SandMax and RockMax VSI crushers from 100hp to 800hp for eager Indian customers.



With the REMco VSI complimenting their other processing equipment, Proman is able provide innovative crushing and screening solutions for high quality, cubical, aggregates, finished sands for concrete and specialty sands in most any configuration, wet, dry, fixed turnkey plant, wheel or track mounted portable systems to a busy Indian construction materials market.

Proman presented EXCON visitors with an impressive display of over 2 dozen machines. Everything from primary, secondary, and tertiary crushers to washing and sizing equipment. Coupling their equipment with engineering know-how, Proman provided their customers a complete processing solution.

Managing Director Mr. R.S. Raghavan states that Proman has participated at EXCON from the very beginning and has found that their products have been well received by visitors, as it is focused strongly on construction and infrastructure.

REMco's President Kevin Cadwalader was in attendance and in support of the REMco product to provide technical assistance along with the Proman staff. This exhibition is held every two years, and has grown significantly over the last decade, making it one of the premium gatherings for crusher manufacturers.

This booming growth is representative of the increasing interest in developing infrastructure throughout Asia.

- REMco Team

Tech Talk

Service and Maintenance tips for REMco crusher operators

REMco: Broken Tip versus Worn Tip

Typical Rotor Tungsten Tip Wear Pattern

All REMco rotors use tungsten tips. These tips are drop in and are located on the outer edge of the rotor. The tips protect the edge of the rotor wall from the force and abrasion of the rock exiting the rotor. All tungsten tips should be visually inspected daily to ensure the crusher is ready to run for the next shift. Once the tungsten is worn through or broken, the remaining life of the tungsten tip is unpredictable. While all REMco rotors have a backup tip to prevent damage to the rotor wall, backup tips are not intended for extended use and should only be used as a safety device in the event of primary tip failure during normal operation.

Figure 1 (above): *Tungsten tips will normally wear in a smooth even arc shape.* ***Figure 2 (below):*** *The best way to determine tip wear is to actually measure it.*

When the proper tungsten grade is applied, normal wear is concentrated in the center of the tip and can be measured by placing a straight edge from top to bottom of the tip (figure 1) and the wear can then be readily measured(figure 2). Normal feed rates will cause a smooth even wear pattern in the center of the tip. Low feed rates can cause the wear pattern to ride high or low on the tip depending on the feed size. Typically, small feeds will ride high, and larger feeds will ride low. Depending on your specific REMco rotor and REMco tungsten tip, the usable wear life of the carbide is between 3/4" and 1 – 1/8". Contact REMco for details on your tip part number.

It is easy to spot a broken tip when you know what to look for. A broken tip will have an abrupt gouge in the tungsten rather than the smooth wear indicated above (see Figure 3). Another tell tail sign is when one or two tips are damaged and the remaining tips indicate normal wear.

Figure 3: *The picture above shows the difference between a broken tip (left) versus a worn tip (right)*

Top 3 Reasons for Tip Breakage

The most common factors for breakage or chipping of the tungsten is due to feed size or tramp material and rogue oversize.

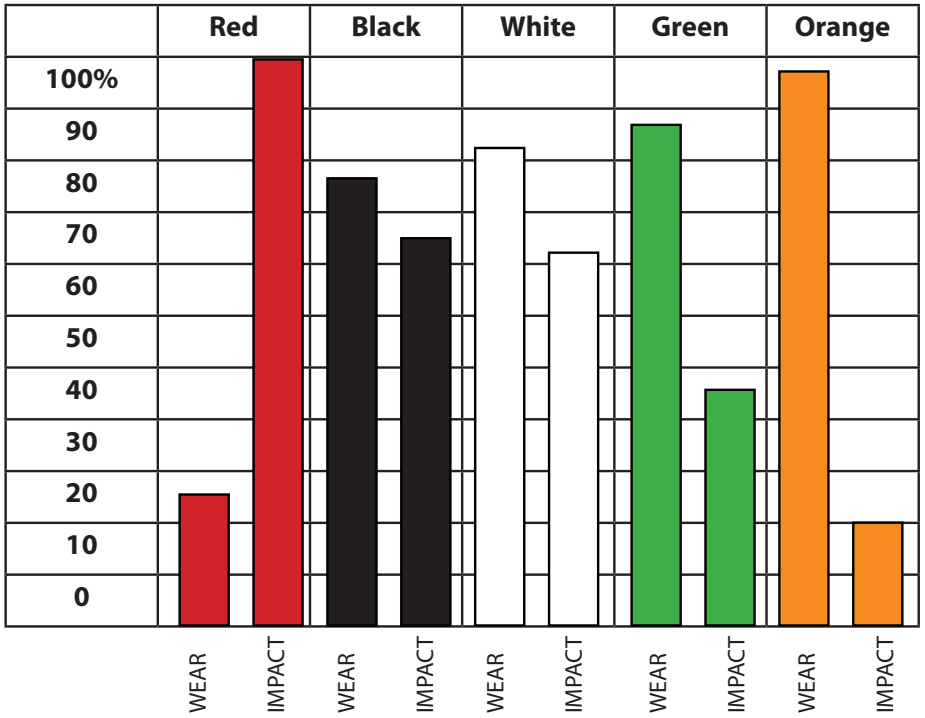
Feed size: Each tungsten grade has a recommended feed size for which it is best suited. Feeding material to the rotor that is in excess of the tip color guidelines (see chart) can cause breakage of the tungsten carbide and premature failure of the tip. The tungsten tip color chart has been developed to provide the operator a guide to balance wear resistances and impact resistances. Small feeds can use harder carbide to increase their wear resistances, however, the impact resistance is reduced. Likewise, larger feeds require greater impact resistances and wear resistances is reduced. Finding the best balance begins with the tip color chart, but is ultimately determined by characteristics of the customer's specific material. Contact REMco for guidance with your specific application details.

Tramp material: Typically, tramp is a generic term and most often associated with metal in the circuit. Sometimes, it is referred to as tramp metal, but really it can be associated with any un-crushable material. Since most tramp is some form of ferrous metal, a correctly placed and sized magnet will remove the majority of this problem material. Some operators elect to use a metal detector which will find both ferrous and non-ferrous metals. Regardless, the installation of metal detectors or magnets will typically solve this problem and will quickly pay dividends in reduced tip costs and downtime.

Rogue oversize: It is a term used for larger than anticipated rock that for all intents and purposes should not be there, however it is and its impact to the tungsten performance is significant. This one percent condition can cause 100 percent of your breakage problem. To determine if your tip breakage is caused by rogue oversize, you need only to watch the incoming feed to discover the odd oversize particles that do not belong. It is REMco's experience that the most common culprit for rogue oversize are; holes in screen media, holes in one or more chutes, and unprotected loader fed bins, however, the list of possibilities as you can imagine, is endless.

Tungsten Grade Selection Guide for REMco Tungsten Tips

The chart below shows relative wear & impact resistance by tip grade color.



Feed Composition for Tungsten selection (feed size maximum one way dimension)

Grade / Color	Red	Black	White	Green	Orange
Round Natrual - 100 % passing	4.0" 100 mm	3.0" 75 mm	2.5" 64 mm	1.0" 25 mm	0.375" 10 mm
Crushed Broken - 100 % passing	5.0" 127 mm	4.0" 100 mm	3.0" 75 mm	1.5" 38 mm	0.5" 13 mm

Note: Feed moisture in excess of 3% will reduce wear life of the tips

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Announcements

We are pleased to announce another addition to the REMco Family. Effective April 2018, REMco has hired Mr. Marty Waldorf as the new **Great Lakes Region Sales Representative** covering the states of Michigan, Indian, Illinois, Wisconsin, Minnesota, and Iowa.

Marty comes to us with many years of capital equipment sales and rock plant experience. Join with me in welcoming Marty to the REMco team.

REMco

This newsletter is produced for REMco users and its intent is to make your life easier! We want to hear what has been happening with the REMco crusher in *your plant*. Send us your questions, comments and job stories today!

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