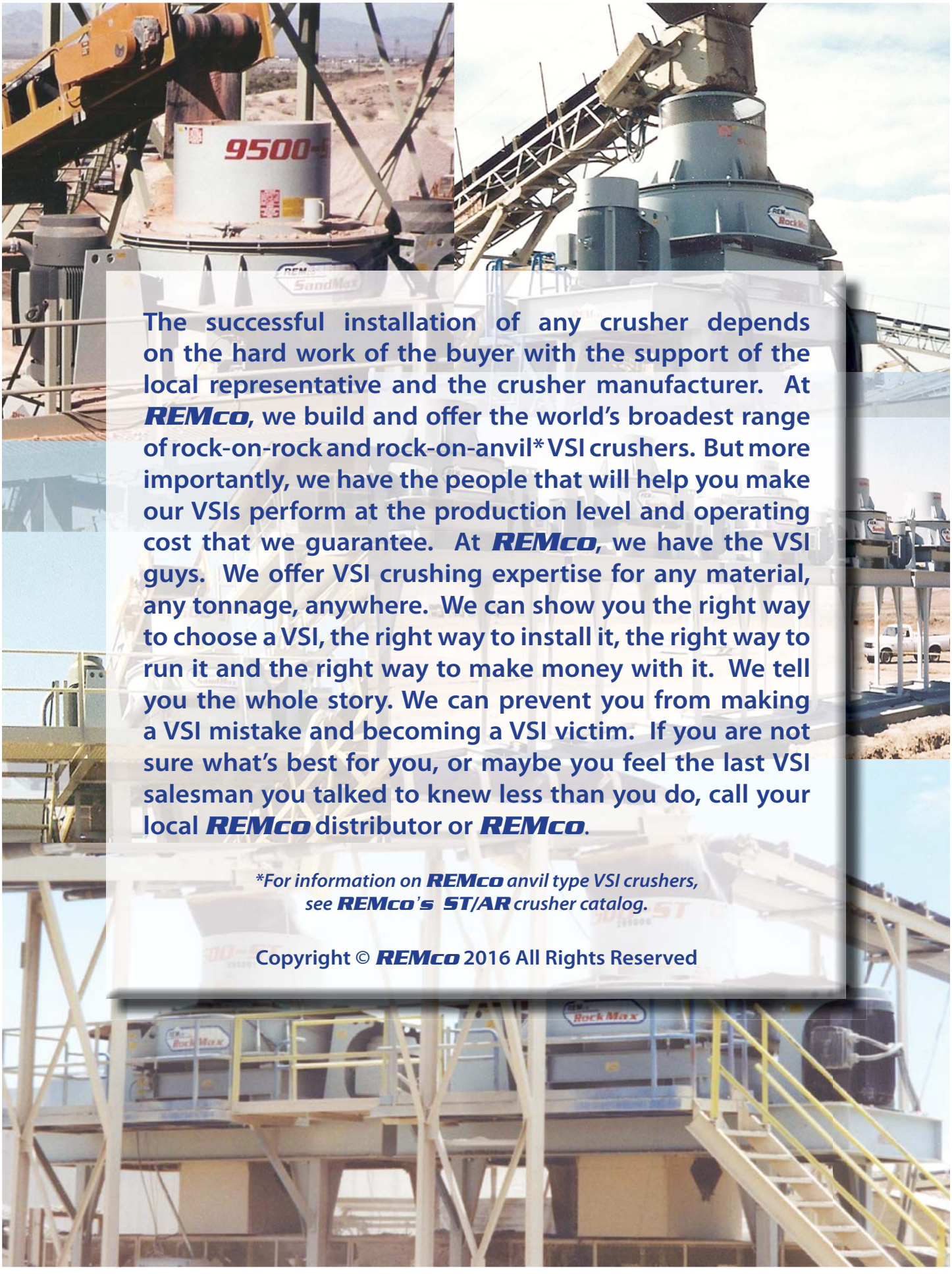

REMco
ROCK ENGINEERED MACHINERY CO. INC.
RockMax
& SandMax
VSI Crushers
www.remcovsi.com
2016 Edition

REMco

. . . Rock Engineered Machinery Company is a corporation based in Livermore, California USA. It was founded by machinery and rock processing professionals in 1983, and is now a leader in reduction technology and know-how. ***REMco*** manufactures the broadest line of fully autogenous rock-on-rock VSI crushers for the reduction of hard, abrasive rocks and ores. Our machines serve the needs of the construction material, mining and industrial mineral producers. We also offer rock-on-anvil VSI machines for limestone and less aggressive materials. The materials produced by our machines are cubical, well-graded, sound, mid-range aggregates, specification sands and other fine sizes.

At ***REMco***, we understand that size reduction equipment generates revenue for its owner, our customer. Our crushers are designed using top quality materials and the latest design techniques. We provide the best possible technical support in order to achieve customer satisfaction and attain the lowest crushing cost per net ton.

In this catalog we provide you with the information you need to determine what model machine is best suited for your crushing task. When you have selected what you feel is best from the information contained herein, please contact ***REMco*** for application guidance and to discuss what else you must consider to realize the best return from your crusher dollar investment.



The successful installation of any crusher depends on the hard work of the buyer with the support of the local representative and the crusher manufacturer. At **REMco**, we build and offer the world's broadest range of rock-on-rock and rock-on-anvil* VSI crushers. But more importantly, we have the people that will help you make our VSIs perform at the production level and operating cost that we guarantee. At **REMco**, we have the VSI guys. We offer VSI crushing expertise for any material, any tonnage, anywhere. We can show you the right way to choose a VSI, the right way to install it, the right way to run it and the right way to make money with it. We tell you the whole story. We can prevent you from making a VSI mistake and becoming a VSI victim. If you are not sure what's best for you, or maybe you feel the last VSI salesman you talked to knew less than you do, call your local **REMco** distributor or **REMco**.

For information on **REMco anvil type VSI crushers, see **REMco**'s **ST/AR** crusher catalog.*

Ever since man began to build, he has sought quality sand. Sand that has rounded particles, sand that has a full range of well-graded sizes, sand that gives strength and beauty in what man builds.

From the ancients to the present, good natural sand deposits have been exploited and depleted. Now we must crush rock to produce sand for our modern structures. No crushing job is more difficult than producing quality man-made sand. Prior to the ***REMco SandMax***, a wide range of crusher models had been applied to the task with limited success. The challenge of a quality product, in specification, with good cubical particle shape and with the desired F.M. (fineness modulus) has caused many crusher failures.

High strength sand comes from hard rock and hard rock is where the ***REMco SandMax*** beats all other crushing machines. For versatility of use, net tons of product, total cost to run, ease of installation, smoothness of operation, reliability and hassle-free performance, the ***REMco SandMax*** is superior to all others.

REMco SandMax®

Producing quality specification sand requires more than a crusher, it requires knowledge, a well designed material processing circuit and the willingness to understand that sand production is more than rock crushing. At ***REMco***, we can teach you how to make sand.

REMco RockMax®

VSI Impact Crushing has been proven to be the most efficient method of size reduction when processing rocks, ores or minerals. The reason for this is because it is the best way to transfer energy from the drive motors to the material being reduced. Impact crushers have fewer moving parts and less mechanical loss when compared to compression machines such as cone crushers.

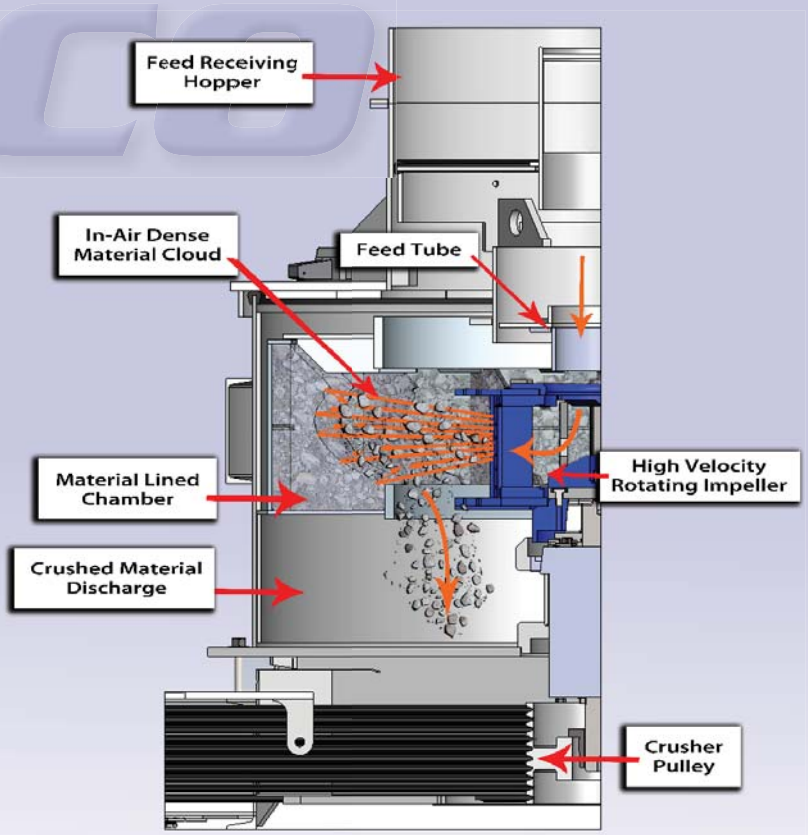
In the past, the limits on impact crushers have been their high cost of operation when the material is hard and abrasive. Historically, hard rock such as granites, quartzites and other materials with high abrasive content have caused severe wear on the crushing members of vertical shaft impact crushers making them prohibitively expensive to operate.

The ***REMco*** innovation of combining extra heavy-duty vertical shaft impactor design with autogenetic (rock lined) crushing chambers and rotors has lowered the wear part operating cost of a ***RockMax VSI*** to a level equal to or less than a fine head cone crusher producing the same size product.

Don't believe it? Try us.
Remember. . .
With a *REMco* VSI Crusher. . .
the rock never wins!!!

The REMco Autogenetic Crushing Process

ROCK-ON-ROCK reduction of all material feeds is achieved by high velocity energy transfer which commences as the rock feed enters the feed tube. At this point it is moving by gravity. When the incoming continuous ribbon of rock particles passes over the center distribution plate of the rotor, it is divided into separate multiple streams. These are forcefully impacted on the trailing edge of the autogenous waves at the center of the rotor port exit. As the material begins its path through the rotor, it is being compressed by the rising centrifugal forces created by the rotor's rotation. This multi-layered stream of rock is abraded, compressed and pulverized against the rock waves which are formed and held in place by the radial rotor walls. The unique geometry of the REMco multi-port rotors intensifies the inter-particle comminution with multiple collisions and a variety of forces acting on the individual rock pieces as they proceed through the rotor. After the high velocity rock exits the rotor, with a ***REMco VSI***, you have a choice, ***SandMax*** or ***RockMax***.



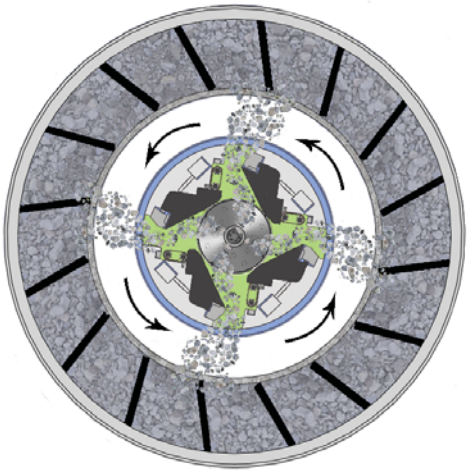
SUPERIOR ROCK-ON-ROCK CRUSHING PERFORMANCE

REMco impact crushers are designed for crushing the widest range of rocks, ores and minerals into fine cubical products. ***REMco*** crushers with their unique high performance multi-port rotor designs, variable density chambers, and the widest operating speed range have expanded the application capabilities of VSI crushers. REMco has advanced VSI crushing technology for rock-on-rock reduction by performing thousands of crushing tests in its testing facility. This has resulted in a unique application accuracy by adjusting the design variables to suit the user's specific requirements. This guarantees the right crusher for the job, eliminating guessing and user disappointment.

Typical SandMax
Fine Rotor / Fine Chamber

LOWEST CRUSHING COST

REMco has continued to lower the wear parts cost per net finished ton of product. Fully autogenous (rock-on-rock) designs provide the lowest product cost per ton. This is especially true when the desired product size is below 3/8" (10 mm). Even in the hardest, siliceous rocks and ores, ***REMco VSI*** crushers are the most affordable fine crushing units. ***REMco*** machines will make products that cannot be made by cone crushers, hammermills or other crushers at an affordable cost. ***REMco*** rock-on-rock VSI crushers can routinely be operated in closed circuits to produce a product of minus 1 mm or less.



Typical RockMax
Coarse Rotor / Coarse Chamber

THE IMPORTANCE OF SPEED

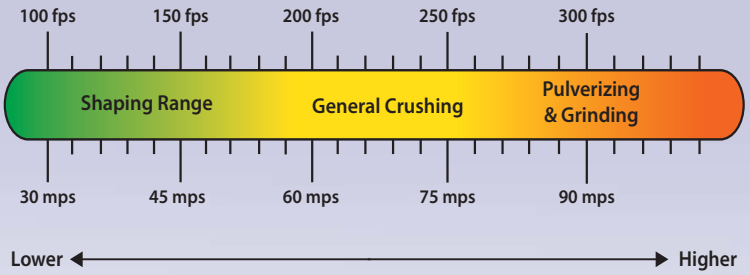
ALL IMPACT TYPE CRUSHING MACHINES USE SPEED TO CRUSH! While there are many factors that affect the crushing efficiency of impact crushers, the most important is the velocity of the material. This determines the amount of crushing which is done and the overall grading of the crusher discharge. Generally, the faster the material is accelerated, the greater the amount of crushing that is achieved. For this reason, it is essential that the impact crusher used have a wide operating speed range to accommodate a broad spectrum of material types and feed gradings.

REMco vertical shaft impact crushers have the broadest operating range of all VSI crushers. Please refer to the rotor velocity scale chart. For material reduction, the general velocity range is for particles traveling from 100 feet per second to 325 feet per second. This velocity scale is divided into three basic ranges. These are:

Shaping Speed – ***100 to 175 feet per second (30 mps to 53 mps).*** At this speed tumbling, rubbing and mild impacts shape the stone. Soft materials can often be reduced at these lower speeds which produce superior aggregate shape in all particles fed to the crusher. Very hard rocks may only be mildly cubed at these speeds.

General Crushing Speed – ***175 to 250 feet per second (53 mps to 75 mps).*** This is the crushing range for producing typical aggregate products for construction materials. Severe impact, high attrition and compression of the rock stream cause particle failure. This results in a significant production of smaller particles when compared to those being fed to the crusher. Usually it is best to experiment with speed within this range because the fracture characteristics of rocks vary widely. To get good crushing with a balance of recycle load and controlled production of fines, it is only necessary to achieve the threshold speed of fracture and additional speed consumes extra power raising energy cost and often generating undesirable size distribution in the crusher discharge.

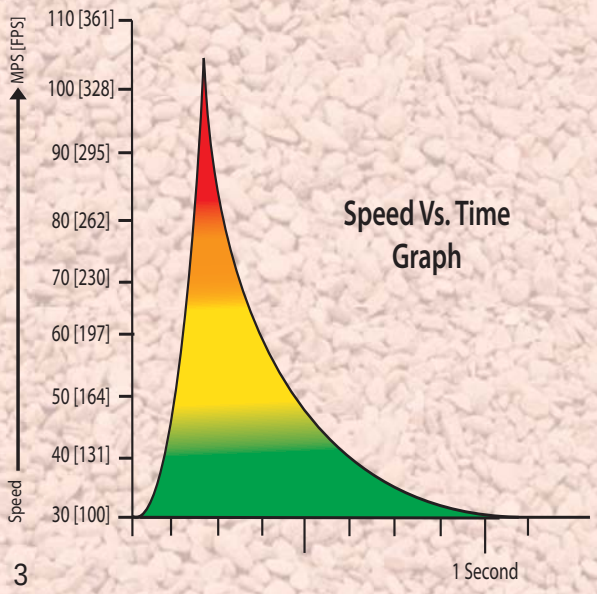
Rotor Velocity Scale



Fine Grinding and Pulverizing – ***250 to 325 feet per second (75 mps to 100 mps).*** Speeds above 250 feet per second are reserved for applications where pulverizing and grinding of the material is desired. At these higher speeds, it is possible to produce manufactured sand and many industrial mineral products requiring fine sizes, in many cases smaller than 1 millimeter. These applications require care, technical knowledge of processing and experience in good processing circuit design, so that the highest production of the needed fine product can be achieved without excess energy consumption and with acceptable overall operating cost.

Whether your crushing requirement is for shaping, general crushing or grinding and pulverizing, a ***REMco VSI*** can be custom applied to make your product. Contact ***REMco*** for guidance.

How is Speed Applied in a REMco VSI?

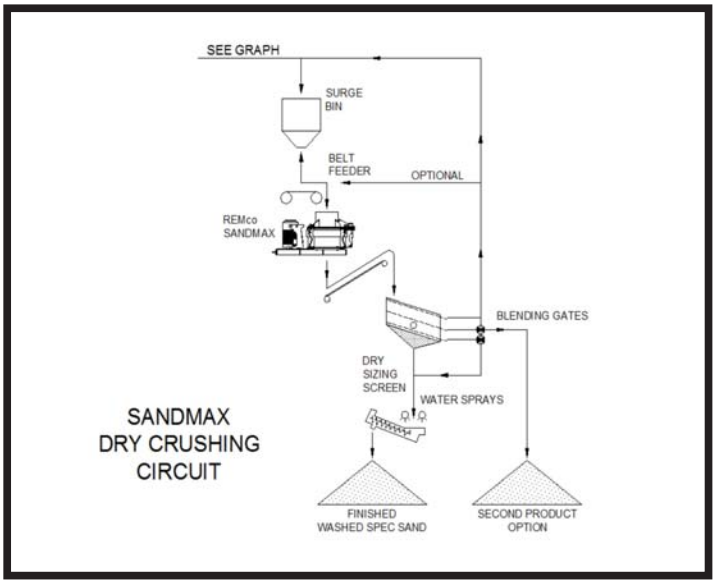


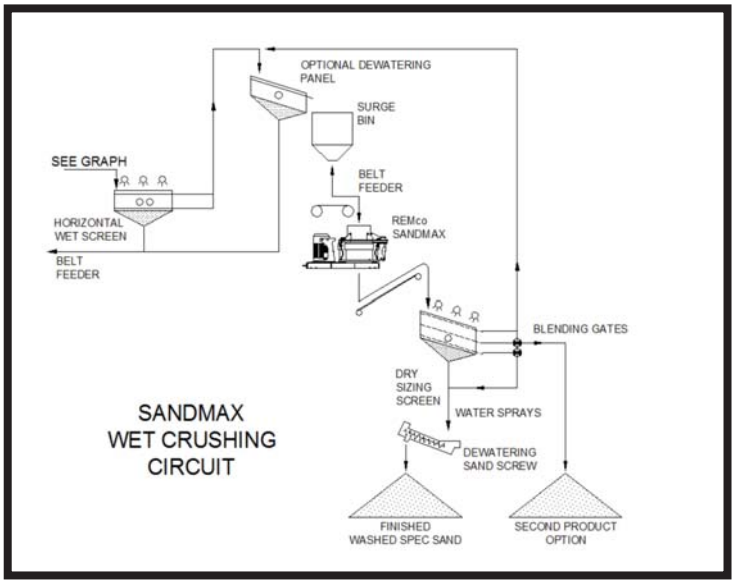
REMco VSI crushers use a rotating impeller that acts as a rock pump to accelerate and impart speed onto the rock particles which are fed to it. Depending on the model and particular application, the rotor configuration can be varied to suit. A common feature of all ***REMco*** rotors is their unique internal construction, using the most efficient port configuration to accelerate the incoming feed stream and divide it into multiple flows. As the rocks are fed to the crusher, each particle experiences a rapid acceleration and deceleration in microseconds. This fills the crushing chamber with a violent rock cloud. Depending on the desired product, the crushing forces applied can be controlled by the operating speed of the machine. This speed control when combined with a variety of crushing chamber features results in optimum crushing efficiency for the power employed.

In a limited number of cases, hard rocks may only be shaped at crushing speeds and soft rocks can often be crushed at shaping speeds. ***REMco VSI*** crushers for… any rock, any speed, anywhere.

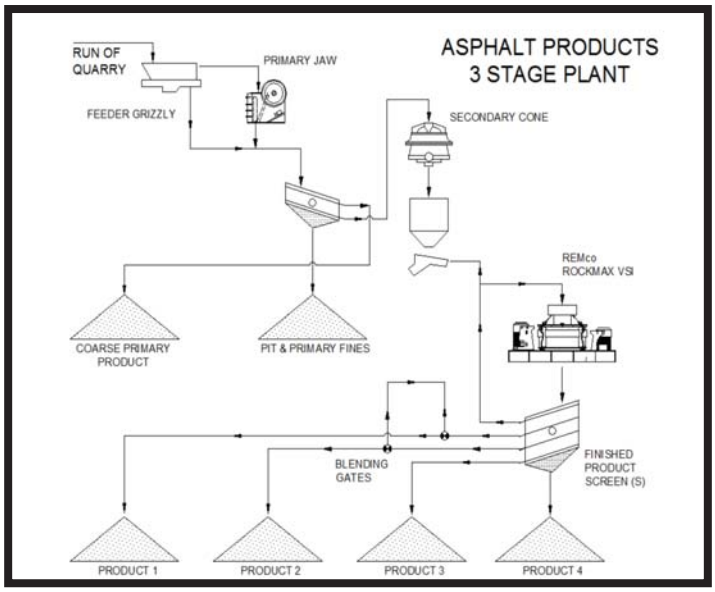
SUGGESTED REMco VSI CIRCUIT ARRANGEMENTS

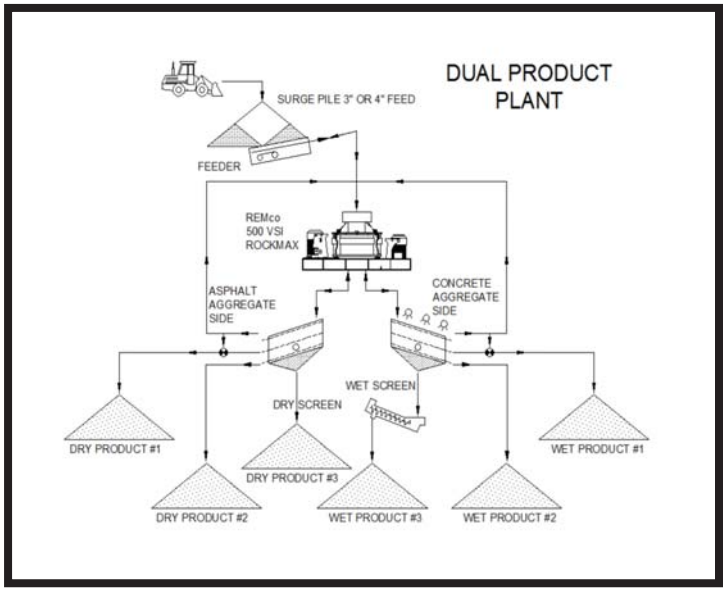
A variety of proven circuit arrangements can be made regardless of the sand specification required for either wet or dry materials. ***REMco SandMax*** crushers will produce a finer discharge grading than all other VSI crushers. Additionally, control of the grading curve can be achieved by changing chamber type and rotor configuration. Different materials will respond to the variables of the machine in different ways.





To achieve the best crushing and shaping results, ***RockMax*** crushers should be operated as 3rd or 4th stage finish product producers. ***REMco RockMax*** crushers are configured to handle coarser feeds and produce a higher percentage of their discharge in the middle range sizes. ***RockMax*** crushers use different chamber inserts, lower operating RPMs and coarse crushing rotors and chambers.





Note: It is recommended that all circuits using a ***REMco VSI*** be arranged to include protection from uncrushables by using magnets or metal detectors. Ample size vibrating screens are necessary for optimum crusher performance. Using a surge preceding the crusher and a variable rate feeder will enhance performance, maximize production and provide the lowest wear cost per ton.

REMco SANDMAX & ROCKMAX CRUSHERS

CAPACITY TABLE IN TONS PER HOUR (2,000 LBS.) AS MEASURED AT **POINT A** OF BASIC VSI CIRCUIT
OPEN CIRCUIT, SINGLE PASS, TONS THROUGH THE CRUSHER, 100% SINGLE FLOW THROUGH ROTOR, NO BYPASS

REMco VSI COMPLETE MODEL RANGE CAPACITY TABLE						
TOTAL DRIVE POWER	ALL OF THESE MODELS ARE OF SINGLE DRIVE (SD) ONE MOTOR DESIGN				THESE MODELS ARE OF DUAL DRIVE (DD), TWO MOTOR DESIGN	
	SERIES 310 SD	SERIES 1025 SD	SERIES 1530 SD	SERIES 4060 SD	SERIES 5080 DD	SERIES 9150 DD
30 hp	15 - 20					
40 hp	30 - 35					
50 hp	35 - 40					
60 hp	40 - 45					
75 hp	60 - 70					
100 hp	80 - 90	80 - 90				
125 hp	100 - 110	100 - 110				
150 hp		130 - 140	130 - 140			
200 hp		160 - 180	160 - 180			
250 hp		220 - 240	220 - 240			
300 hp			260 - 280			
350 hp			300 - 340	300 - 340		
400 hp				360 - 400		
500 hp				430 - 480	430 - 480	
600 hp				550 - 600	550 - 600	
700 hp					600 - 650	
800 hp					650 - 750	650 - 750
1000 hp						700 - 850
1200 hp						850 - 1000
1500 hp						1000 - 1500

Note 1: The capacities shown in this table are for crushing sound, competent stone having a crushed bulk density of 100 lbs. per cubic foot. Larger, angular feeds will reduce capacity; finer, cubical feeds will increase capacity. When crushing to produce improved shape, slower speeds may be utilized. This may increase the crusher feed rate and lower the reduction.

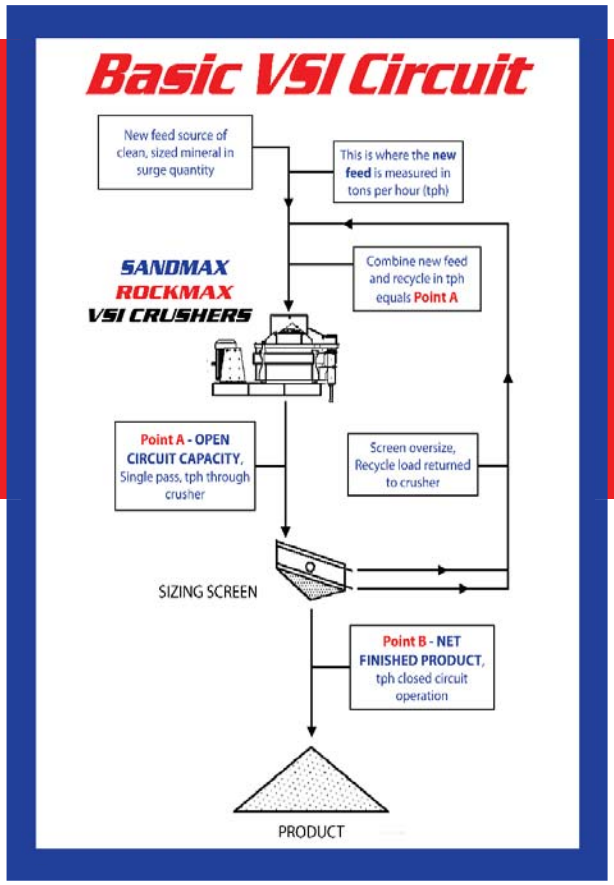
Note 2: Rock feed containing excess amounts of water, clay, soil or dirt will cause reduced crusher performance.

Note 3: This catalog covers **REMco VSI** crushers that do not use any form of cascade or by-flow around the rotor. For information on dual flow designs, please contact **REMco.**

Note 4: The standard recommended drive power range as shown above can be increased or decreased for each model subject to application requirements. When altering the drive power range beyond that shown above, please contact **REMco** for approval and application guidance.

Selecting REMco VSI Impactor Crushing Capacities

To select the correct crusher for your application, please refer to the Basic VSI Circuit diagram. ***REMco*** impact crushers have two distinct capacities. These are measured at different points in the circuit. Understanding this circuit flow is key to proper crusher model and drive power selection.



Reduction Ratio

For ***REMco*** crushers, the reduction ratio is calculated as the relationship of the maximum feed size to the desired product size. For example, with a feed of -2" and a product requirement of -1/4", the reduction is 2.0 ÷ 0.250 = 8. Maximum recommended reduction ratios for ***REMco*** crushers are ***SandMax*** – 16:1and ***RockMax*** – 8:1. Exceeding the recommended ratio will interfere with circuit balance and may reduce production.

CAPACITY TABLE IN TONS PER HOUR - CLOSED CIRCUIT OPERATION
TONS OF NET SCREEN UNDERSIZE AS MEASURED AT POINT B

SANDMAX PRODUCTION RATING BY DRIVE HORSEPOWER (KW)

FEED TOP SIZE FOR FINE, MEDIUM AND COARSE FEEDS ARE FOR ALL PARTICLES HAVING A MAXIMUM, ONE-WAY FEED DIMENSION AS SHOWN BELOW									
FEED SIZE	**FINE 3/8" – 1" / 10 – 25 mm**			**MEDIUM 1" – 2" / 25 – 50 mm**			**COARSE 2" – 3" / 50 – 75 mm**		
PRODUCT SIZE	**3/8" (10mm)**	**1/4" (6mm)**	**3/16" (4.75mm)**	**3/8" (10mm)**	**1/4" (6mm)**	**3/16" (4.75mm)**	**3/8" (10mm)**	**1/4" (6mm)**	**3/16" (4.75mm)**
DRIVE POWER									
30 hp **40 hp** **50 hp**	6 – 8 8 – 10 13 – 15	5 – 7 6 – 8 9 – 11	3 – 5 5 – 7 7 – 9						
60 hp **70 hp** **100 hp**	17 – 22 30 – 35 43 – 48	13 – 19 25 – 30 37 – 42	11 – 16 22 – 27 32 – 37	15 – 20 28 – 33 32 – 37	13 – 18 23 – 28 33 – 38	10 – 15 18 – 23 27 – 32			
125 hp **150 hp** **200 hp**	60 – 65 72 – 77 90 – 95	50 – 55 60 – 65 75 – 80	43 – 48 52 – 57 65 – 70	55 – 60 65 – 70 80 – 85	46 – 51 55 – 60 65 – 70	38 – 43 45 – 50 55 – 60			
250 hp **300 hp**	120 – 130 145 – 155	100 – 110 120 – 130	90 – 100 100 – 110	110 – 120 125 – 135	90 – 100 105 – 115	80 – 90 95 – 105	100 – 110 115 – 125	85 – 95 95 – 105	70 – 80 80 – 90
350 hp **400 hp** **500 hp**	170 – 180 200 – 210 235 – 245	145 – 155 170 – 180 200 – 210	125 – 135 145 – 155 170 – 180	155 – 165 185 – 195 200 – 210	130 – 140 155 – 165 180 – 190	110 – 120 130 – 140 155 – 165	135 – 145 160 – 170 240 – 290	125 – 135 190 – 240 200 – 240	100 – 110 115 – 125 130 – 140
(2) 300 = 600 hp **(2) 350 = 700 hp** **(2) 400 = 800 hp**	290 – 340 300 – 350 350 – 400	240 – 290 280 – 330 310 – 360	200 – 250 210 – 260 220 – 270	260 – 310 280 – 330 300 – 350	220 – 270 230 – 280 240 – 290	180 – 230 190 – 240 200 – 250	220 – 270 240 – 290 250 – 300	180 – 230 210 – 260 220 – 270	150 – 200 170 – 220 190 – 240
(2) 500 = 1,000 hp **(2) 600 = 1,200 hp** **(2) 750 = 1,500 hp**	400 – 500 420 – 520 500 – 600	290 – 390 350 – 450 450 – 550	250 – 350 300 – 400 350 – 450	320 – 420 400 – 500 450 – 550	260 – 360 300 – 400 360 – 460	220 – 320 275 – 375 300 – 400	260 – 360 350 – 450 400 – 500	230 – 330 300 – 400 350 – 450	210 – 310 250 – 350 270 – 370

Note: For KW power rating, multiply HP x 0.746 = KW.

ROCKMAX PRODUCTION RATING BY DRIVE HORSEPOWER (KW)

FEED TOP SIZE FOR FINE, MEDIUM AND COARSE FEEDS ARE FOR ALL PARTICLES HAVING A MAXIMUM, ONE-WAY FEED DIMENSION AS SHOWN BELOW									
FEED SIZE	**FINE 3/8" – 1" / 10 – 25 mm**			**MEDIUM 1" – 2" / 25 – 50 mm**			**COARSE 2" – 3" / 50 – 75 mm**		
PRODUCT SIZE	**3/4" (20mm)**	**1/2" (13mm)**	**3/8" (10mm)**	**1" (25mm)**	**3/4" (20mm)**	**1/2" (13mm)**	**1 1/2" (40mm)**	**1" (25mm)**	**3/4" (20mm)**
DRIVE POWER									
75 hp **100 hp** **125 hp**	45 – 50 65 – 70 90 – 95	40 – 45 55 – 60 80 – 85	35 – 40 50 – 55 70 – 75						
150 hp **200 hp** **250 hp**	110 – 115 130 – 140 185 – 195	95 – 100 110 – 120 160 – 170	80 – 85 100 – 110 130 – 140	95 – 105 130 – 140 160 – 170	85 – 95 110 – 120 140 – 150	70 – 80 95 – 105 120 – 130	- - 150 – 160	- - 130 – 140	- - 110 – 120
300 hp **350 hp** **400 hp** **500 hp**	220 – 230 265 – 275 320 – 330 370 – 380	200 – 210 230 – 240 280 – 290 330 – 340	170 – 180 200 – 210 240 – 250 280 – 290	190 – 200 235 – 245 280 – 290 325 – 335	170 – 180 200 – 210 240 – 250 275 – 285	140 – 150 165 – 175 200 – 210 240 – 250	180 – 190 220 – 230 260 – 270 300 – 310	155 – 165 190 – 200 220 – 230 260 – 270	130 – 140 155 – 165 185 – 195 220 – 230
(2) 300 = 600 hp **(2) 350 = 700 hp** **(2) 400 = 800 hp**	460 – 500 510 – 550 570 – 620	410 – 450 280 – 320 500 – 550	350 – 390 380 – 420 430 – 480	390 – 430 450 – 490 500 – 550	350 – 390 380 – 420 430 – 480	290 – 330 320 – 360 360 – 410	380 – 420 410 – 450 450 – 500	320 – 360 350 – 390 380 – 430	270 – 310 290 – 330 310 – 350
(2) 500 = 1,000 hp **(2) 600 = 1,200 hp** **(2) 750 = 1,500 hp**	600 – 650 740 – 790 900 – 1,000	550 – 600 650 – 700 850 – 950	475 – 525 575 – 625 700 – 800	550 – 600 650 – 700 850 – 950	475 – 525 575 – 625 700 – 800	400 – 450 475 – 525 600 – 700	520 – 570 625 – 675 750 – 850	440 – 490 520 – 570 680 – 780	360 – 410 450 – 500 550 – 650

Note: The capacities shown in these tables are in short tons, 2,000 lbs., and are neither maximum nor minimum. Tonnages shown are based on processing sound rock, stone, or ore in a well designed processing circuit with proper feed controls and adequate screening. Many factors affect capacity, such as individual fracture characteristics, type of rotor, size of drive motor(s), feed moisture content, etc. Producing multiple sizes simultaneously will reduce total net tons of finished product. All capacities are based on 100% screening efficiency.
For kilowatt power ratings multiply horsepower figures by 0.746.

Controlling the top size of the feed is important in order to achieve optimum performance from *REMco VSI* crushers. Generally, the bigger the crusher, the larger its feed size capability. When choosing a crusher model, its capacity can be influenced by the largest particle in the intended feed. For accurate selection of the rotor configuration as well as the chamber arrangement, and to achieve the lowest crushing cost, do not exceed the maximum feed sizes shown here.

SandMax Feed Size Chart

HP	MAX FEED SIZE
30 - 75	1" – 25 mm
100 - 200	1 ½" – 40 mm
200-300	2" – 50 mm
300 - 400	3" – 75 mm
500 - 600	3" – 75 mm
700 - 800	3" – 75 mm
1200	3" – 75 mm
1500	3" – 75 mm

RockMax Feed Size Chart

HP	MAX FEED SIZE
30 - 75	1 ½" – 40 mm
100 - 200	2" – 50 mm
300 - 400	3" – 75 mm
500 - 600	4" – 100 mm
700 - 800	4" – 100 mm
1200	4" – 100 mm
1500	4" – 100 mm

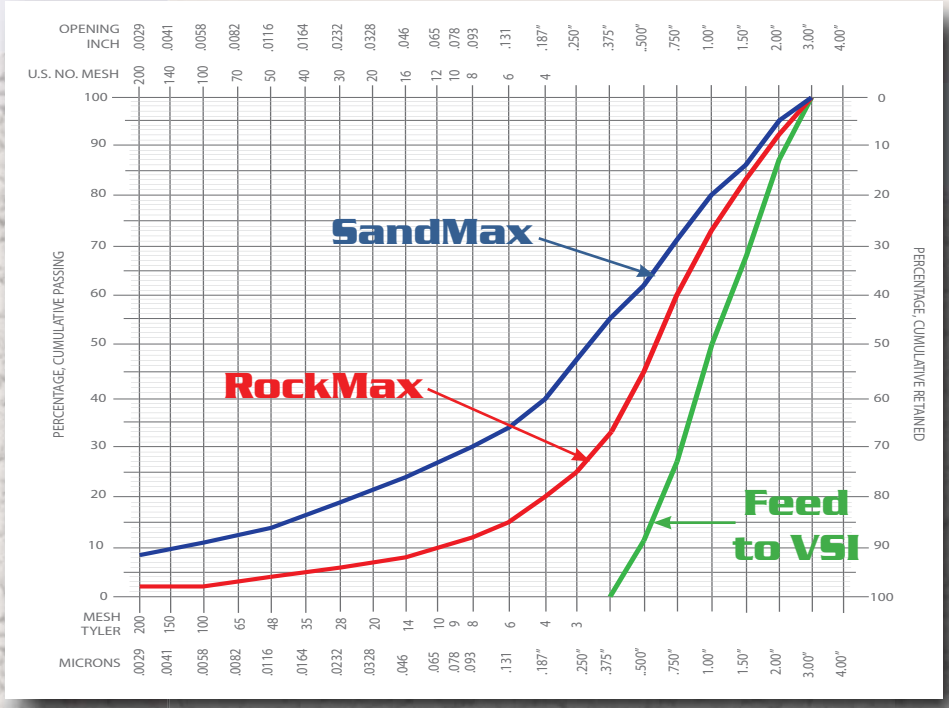
REMco VSI Crusher Discharge Grading Information

REMco SandMax VSI crushers are designed to produce a finer discharge grading than other VSI machines. Control of the discharge grading curve can be achieved by adjusting rotor velocity (RPM), altering chamber volume and the density of the chamber load. **SandMax** machines use larger diameter rotors with more ports. Additionally, control of microfines production can be achieved by altering rotor geometry and chamber insert details.

REMco RockMax VSI crushers are configured to handle coarser feeds and produce a higher percentage of their discharge in the middle size range. **RockMax** VSI crushers use different chamber inserts, lower operating RPMs and accept coarser feeds. The larger models are capable of feed sizes smaller than 100 mm (4″). **RockMax** crushers are recommended when differential crushing or shaping is the principal reduction task.

The discharge grading of a **REMco** VSI crusher is dependent on many factors. When all of these are considered, using the correct application process, a **REMco** VSI can be configured to any 3rd or 4th stage minerals reduction task.

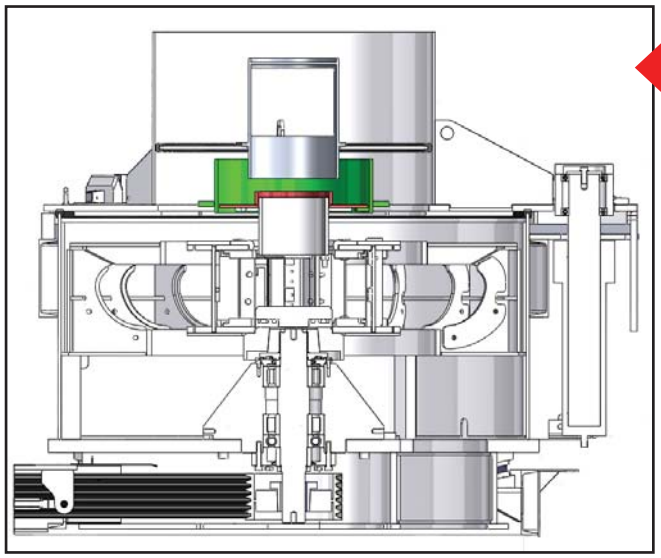
The discharge of rock-on-rock machines will contain some particles which may range in size up to the original feed size. All particles fed will experience some reduction. This makes the rock-on-rock type of chamber best for producing cubically shaped particles. Rock-on-rock chambers produce very consistent discharge gradings because there is little or no chamber wear. There is no discharge grading loss due to the wearing of rotor parts.



Due to their great versatility and model range, **REMco** crushers can be custom configured to the crushing task. The above graph illustrates the variation that can be expected in the discharge grading from the two different **REMco** crusher types when processing the same feed.

REMco cautions prospective crusher users not to depend on typical catalog gradings when seriously considering their crusher selection. A formal crushing test is strongly recommended prior to final model and type of VSI selection.

To determine your specific material crushing characteristics and crusher discharge grading by running a formal crushing test, contact **REMco**.



Typical internal cross section of
REMco SandMax/RockMax
with a rock-on-rock chamber.

REMco crushers utilize advanced geometry designed rotors of multiple ports and multiple heights. These rotors are available in short, standard and tall designs to suit specific application requirements. This provides the greatest versatility and broadest application range for **REMco VSI** crushers. **REMco VSI crushers use 3, 4, 5 or 6-port enclosed rotor designs.**

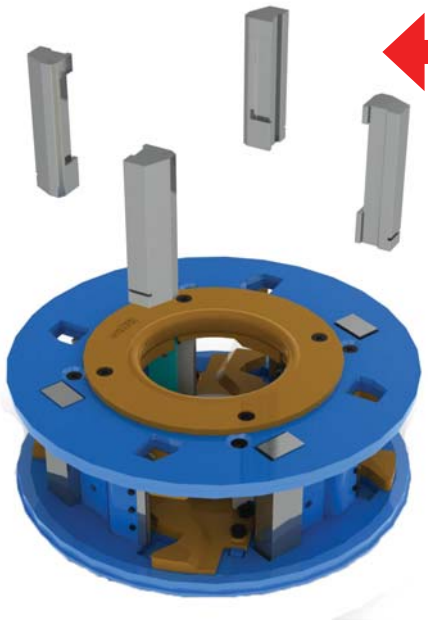


Figure 1 – The **REMco** design uses drop-in type tungsten tips for ease of replacement and low cost operation. Multiple grades of tungsten are readily applied for maximum wear life depending on rock type. No bolts are used to hold the tungsten tips in place.

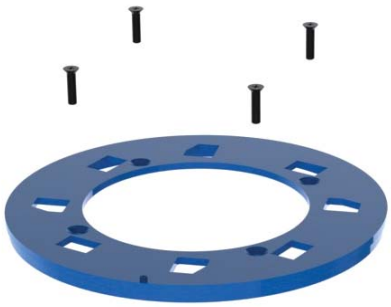


Figure 2 – **REMco** rotors do not require extensive repair welding of the rotor body. The rotor is protected by one-piece hardened AR steel wear disks, top and bottom. These are smooth, reducing air drag and are easy to replace after providing long wear life.

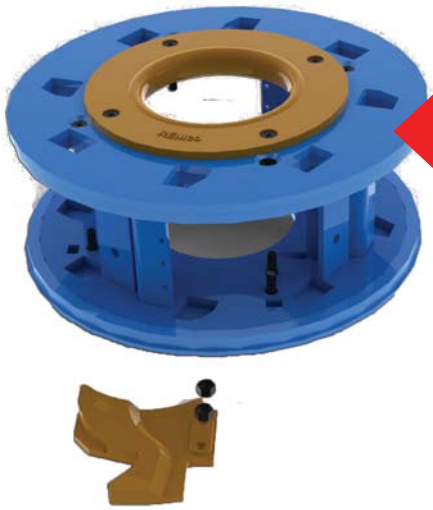


Figure 3 – By using relatively small, very hard chrome iron or steel wear castings, rotor weight is reduced, lowering power demand. This lowers energy cost and wear parts replacement cost. Rotor wear plates are bolted in place to maintain internal balance and prevent shifting during operation.

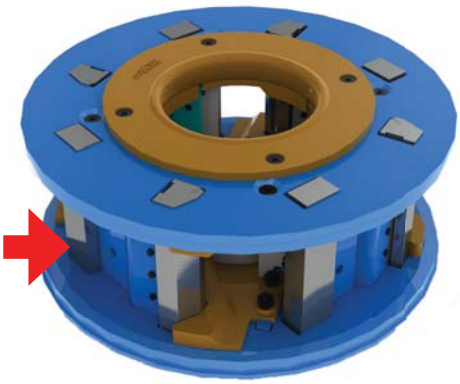


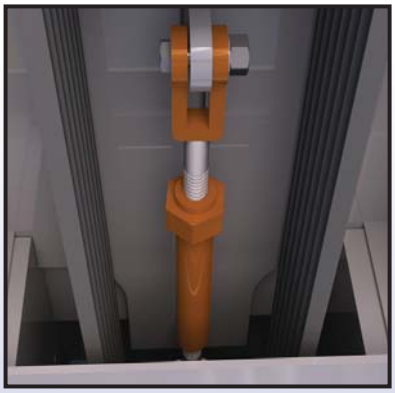
Figure 4 – The complete assembly of **REMco** rotors is designed for maximum tonnage throughput, lower power demand, grading control, ease of balance and wear parts replacement. This provides the user with maximum machine availability.

STANDARD FEATURES

Some of the Many Plus Value Features on *REMco* Crushers

REMco offers six design series for its models with over 40 configurations to fit any crushing job.

Hydraulic lift assembly for quick and safe access when inspecting or servicing the crusher.



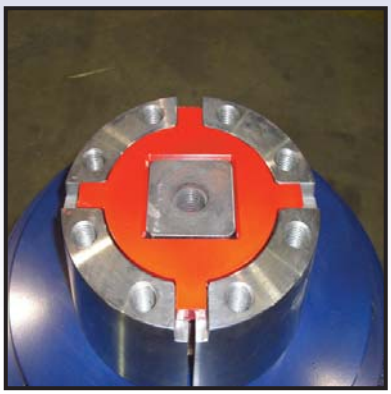
Dual acting heavy-duty ratchet jack for fast, clean and easy v-belt tensioning on Series 4060 and 5080.

REMco crushers are pre-wired for interlock switches, vibration protection and safety compliance.

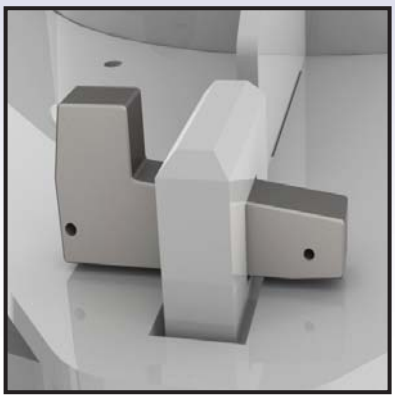
Standard support frame provides superior stability and ease of installation on any structure.

Four self-centering vibration isolator mounts for smooth operation and protection of drive motors and surrounding equipment.

Oil lubrication 3.0 with tank and all safety sensors. Including heating and cooling of lube oil.



Patented cross-key design for locking rotor to mainshaft. Eliminates damage or failure of the shaft from incorrect assembly.



Heavy-duty, hammer-driven steel wedges, secure the crusher top during operation and provide easy, quick access for service.

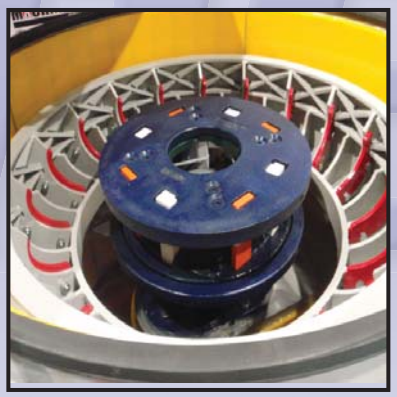
OPTIONAL ACCESSORIES

Some of the Many Plus Value Features on *REMco* Crushers

REMco offers installation kits that include support legs, skids, discharge hoppers and safety service platforms.

Electric or manual service hoists can be used on ***REMco's*** optional service crane.

Electric motor solid state starters are available for all size drive motors in any voltage and current requirements.



REMco 's unique, variable volume autogenetic crushing chamber inserts with deep well pockets and adjustable gusset protectors.

REMco offers a full range of drive motors with suitable electrical characteristics for heavy-duty crusher use.

For optimum product control, variable frequency drive (VFD) controllers are available for all motor sizes in single and dual drive models.

Basic or custom portable trailers are available for all ***REMco*** model sizes.

REMco also supplies complete portable plants for all models.

For continuous or multi-shift operations, ***REMco*** Conqueror rotors provide the longest possible wear life and uptime.

REMco SUPERMAX VSI CRUSHERS

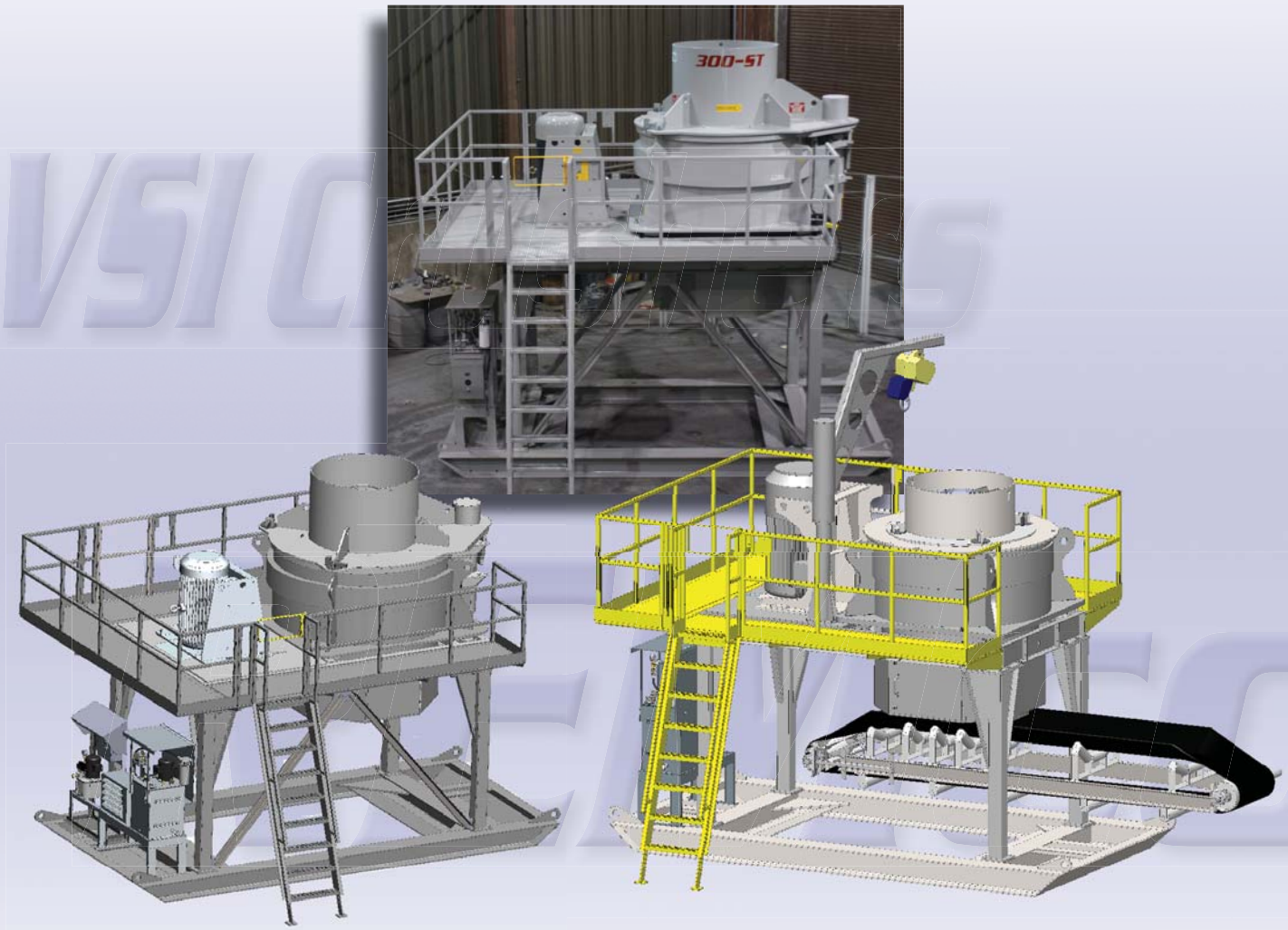
REMco custom builds special large machines when applications require very high capacities. These machines are designated as **SuperMax** models and are configured in any one of the basic designs.

These crushers are generally powered with two motors in dual drive configurations. The **SuperMax** models operate at 1,000 hp to a maximum of 1,500 hp. REMco has built a number of these units with excellent performance results. **SuperMax** models have been in service since 1998.

SuperMax models are complete with all normal accessories such as oil lubrication, spare rotors, installation kits, and the **REMco SmartBox** systems. Additionally, the **SuperMax** can include any number of special or unique features as requested by the customer. The **SuperMax** is usually applied in third or fourth stage crushing applications where large quantities of products are required.

Typical Single Drive Arrangements for Stationary Installation

As an alternate to a complete wheel-mounted, mobile crushing plant, ***REMco*** installation kits are a money-saving way of putting the crusher to work.



Proper installation of a new VSI into an existing or new crushing plant is ***key*** in achieving optimum performance and lowest cost operation. ***REMco*** offers economical installation kits which provide all the necessary supporting components to complete the installation of ***all REMco VSI models and sizes***. These kits also allow for quick relocation of the crusher, if needed, as they mount on simple concrete pads or firm, level ground. Ready access for fast, safe inspection and maintenance of the crusher is also provided. ***REMco*** kits minimize dust emissions and can be fully wired for lubrication, motors and motor starters. They can be delivered semi-assembled to the plant site from the factory, and be ready to operate in less than a day.

VSI CRUSHER MANAGEMENT SYSTEM

SmartBox . . .
Systems Monitoring And Recording Technology . . .
The future is here. Improved operating control for maximum production at the highest quality.

The **REMco VSI SmartBox** crusher HMI controller provides consistent real time information about the machine's operating performance. **SmartBox** monitors and records all critical elements including:

- Monitors and displays real time temperature of all bearings
- Records oil tank temperature
- Drive motor AMP / KW draw
- Monitors all crusher vibration levels
- Records no loads / full load RPM
- Run down time feature
- All safety switches functions
- Lube system operation
- All system alarm notification signals
- Historical data logging, 365 days
- Custom designed historical printout
- Emergency stop function
- On screen alarm page trouble shooting guide
- Integrated system operator's manual
- Factory recommended settings for the system
- Provides scheduled maintenance alerts
- Records all maintenance
- USB flash-drive accessibility
- Monitors rotor wear parts

Optional System Features:
- Temperature sensing of all motor phases
- Temperature sensing of all drive motor bearings
- Crushing chamber temperature sensing

Optional System Integration:
- Can be integrated to an existing plant control system

Optional Monitoring Features:
- Real time alarm notification sent by text / email*
- Smartphone APP or iPad viewer*
- **REMco** Diagnostic services*

Optional Multiple Crusher Monitoring:
- 15" HMI touch screen
- Multiple crusher monitor in central location

The operating data is gathered and processed through the HMI that is supplied with the system, providing real-time readouts of all operating limits.

SmartBox … The ultimate crushing machine management system.

SmartBox programming custom to each installation. This includes monitoring of all wear parts for protection against sudden wear parts failure.

SmartBox … the latest technology in crushing machine management for the modern producer. Improving product quality and production rate by managing operation and maintenance of the crusher. **SmartBox** … diagnoses mechanical problems while they are still small, preventing interruption of crusher operation and unscheduled down time. **SmartBox** … alerts operating personnel and provides management with continuous feedback on crusher utilization and performance.

SmartBox … a quick return on your investment in crusher control.

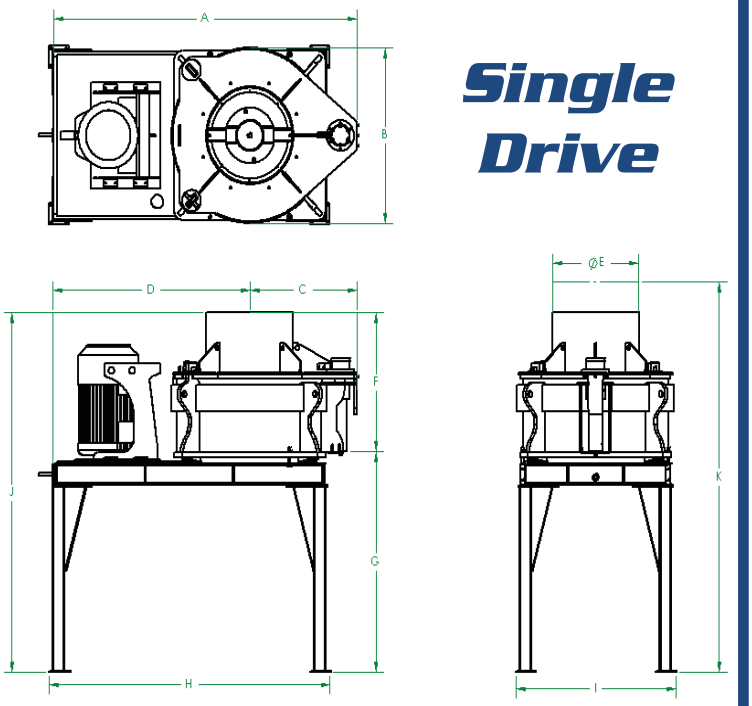
US patent No. 7,489,254 ~ Foreign patents pending

Typical Computer Screen Capture of **SmartBox** System in Operation.
**Requires Internet connection*

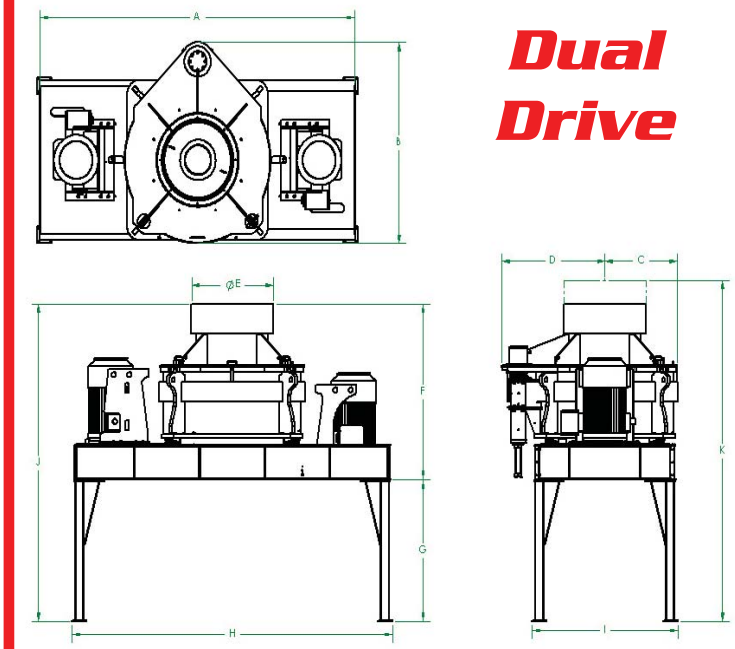
General Clearance and Installation Dimensions

REMco SINGLE DRIVE VSI Models												
CRUSHER SERIES		A	B	C	D	E	F	G	H	I	J	K
310	INCHES	104	62	31	73	30	59	84	63	99	125	157
	METRIC	2638	1575	787	1851	762	1486	2137	1588	2518	3623	3974
1025	INCHES	114	66	44	82	30	56	97	120	72	153	167
	METRIC	2903	1684	1107	2071	768	1418	2461	3044	1829	3880	4235
1530	INCHES	152	75	54	99	43	68	98	137	75	165	179
	METRIC	3870	1907	1363	2505	1092	1720	2479	3467	1904	4200	4556
4060	INCHES	171	88	70	101	56	83	102	144	90	185	199
	METRIC	4352	2244	1777	2574	1409	2098	2600	3651	2285	4698	5054

Single Drive



Dual Drive



REMco DUAL DRIVE VSI Models												
CRUSHER SERIES		A	B	C	D	E	F	G	H	I	J	K
5080	INCHES	213	120	48	72	55	104	87	227	109	192	206
	METRIC	5410	3035	1206	1828	1384	2651	2219	5953	2755	4877	5226
9150	INCHES	270	270	75	58	58	88	96	192	142	214	228
	METRIC	6864	684	1905	1480	1480	2095	2438	4883	3594	5441	5798

The dimensions shown are approximate and subject to change. Do not use for construction. Request a certified installation drawing prior to designing the crusher support. **REMco** reserves the right to change these dimensions without prior notice.

REMco Customer Services

When a new crushing circuit is being considered it is important to determine the crushing characteristics of the rock or mineral to be processed. Proper testing can establish the design parameters for new crushing plants to ensure that the desired product quantity and quality can be reliably produced by the equipment selected.

The only way to predict crushing costs with certainty is to establish the abrasion rate of the material to be crushed. From the softest limestone to the roughest silica, wear rates and the resulting crushing costs can be ascertained by a ***REMco*** crushing test.

REMco provides crushing tests to prospective buyers of ***REMco*** crushers. These crushing test services are generally performed on a no-charge basis for standard tests or a fee basis for more extensive testing . ***REMco*** uses a Series 320 Model 200 VSI with 75 hp and VFD drive for these tests. This crusher can be arranged in a wide variety of configurations for test purposes. For accuracy in testing, it is essential that the right quantity of material be provided. For more information about these services, please visit **www.remcovsi.com**.

SPECIFICATIONS

SERIES MODEL	310	1025	1530	4060	5080	9150
DRIVE MOTOR ARRANGEMENT	Single	Single	Single	Single	Dual	Dual
HP RANGE	30 - 125	100 - 250	150 - 350	350 - 600	600 - 800	900 – 1,500
ROTORS: NUMBER of PORTS	3 / 4 / 5	3 /4 / 5	3 / 4 / 5	3 / 4 / 5	4 / 5 / 6	4 / 5 / 6
ROTOR DIAMETERS	18" / 23"	23" / 25"	30" / 32" 35"	30" / 32" 37" / 39"	32" / 37" 39" / 42"	32" / 37" 39" / 42"
MAX. CRUSHING VELOCITY	305 FPS	305 FPS	315 FPS	315 FPS	315 FPS	300 FPS
ROCK TYPE CHAMBER	Fine /Coarse	Fine /Coarse	Fine /Coarse	Fine /Coarse	Fine /Coarse	Fine /Coarse
NUMBER OF ANVILS – ST/AR MODEL	15	16	17 / 18	18 / 20	19 / 21	19 / 21
APPROX. SHIPPING WEIGHT	13,000 lbs.	14,000 lbs.	30,000 lbs.	40,000 lbs.	45,000 lbs.	67,000 lbs.
ACCEPTABLE MAX. FEED SIZE	1.5" / 40 mm	2.0" / 50 mm	3" / 75 mm	3" / 75 mm	4" / 100 mm	4" / 100 mm

ACCESSORIES

O = OPTIONAL S = STANDARD N/A = NOT AVAILABLE

SERIES MODEL	310	1025	1530	4060	5080	9150
CRUSHER TOOLS	S	S	S	S	S	S
BALANCING MACHINE	S	S	S	S	S	S
TEMP. SAFETY SYSTEM	S	S	S	S	S	S
INTERNAL AIR TRANSFER	N/A	N/A	S	O	O	S
SUPPORT LEGS	O	O	O	O	O	O
SKID FRAME	O	O	O	O	O	O
SAFETY SERVICE PLATFORM	O	O	O	O	O	O
VIBRATION PROTECTION	S	S	S	S	S	S
DISCHARGE HOPPER	O	O	O	O	O	O
DUST COLLECTOR	O	O	O	O	O	O
SMARTBOX	O	O	O	O	O	S
HYDRAULIC ACCESS	S	S	S	S	S	S
NON-SUPPLY HYDRAULICS	O	O	O	O	N/A	N/A
ELECTRIC MOTOR STARTERS	O	O	O	O	O	O
AUTOMATION	O	O	O	O	O	O
VARI-SPEED CONTROL	O	O	O	O	O	O
OIL LUBRICATION	S	S	S	S	S	S
SERVICE CRANE / MANUAL	O	O	O	O	O	N/A
SERVICE HOIST ELECTRIC	O	O	O	O	O	O

SandMax/RockMax

IMPORTANT APPLICATION INFORMATION AND GUIDELINES

- The capacities shown in this catalog are for all models of REMco fully autogenous VSI (rock-on-rock) crushers only and are neither maximum nor minimum. Tonnages shown are based on processing material in a well-designed processing circuit with automated feed controls and adequate screening. Many factors affect capacity, such as rock hardness, type of rotor used, number of rotor ports, rotor RPM, size of drive motor(s), feed moisture content, etc. For metric capacities, multiply by factor of 0.9.
- The sand capacities shown in this catalog must be adjusted to allow for removal of all excess minus 100 mesh by wet or dry process. Microfines production is mainly influenced by the grain structure and crushing characteristics of the rock.
- ***REMco*** recommends conducting a crushing test prior to applying ***SandMax/RockMax*** crushers, designing a crushing plant or manufactured sand circuit. Contact REMco for details or visit ***www.remcovsi.com*** to schedule such a test.
- Water in feed in excess of 3 to 5 % will reduce crusher performance, cause chamber packing, raise power demand and increase parts wear thereby raising the operating cost.
- Maximum recommended feed size will vary dependent on type, hardness and shape of rock or ore to be crushed. Larger, angular feeds will reduce capacity; finer, cubical feeds will increase capacity. All feed size designations shown are for a maximum one-way dimension of the rock pieces. A well-graded feed consisting of coarse, medium, and fine particles is essential for best crusher performance and lowest wear parts cost.
- ***SandMax/RockMax*** crushers can be operated in open or closed circuit. Closed circuit operation will produce the best results when crushing for optimum particle shape. Closed circuit operation will also yield the greatest net product and the best final product grading. Closed circuit operation is recommended for all manufactured sand applications and other products of a fine size.
- The information contained in this catalog is provided as an application aid to assist the buyer/producer in maximizing the potential of ***SandMax/RockMax*** crushers. No performance guarantees are expressed or implied. To determine the effect of individual conditions, contact ***REMco***.

The above applies to all ***SandMax/RockMax*** models shown in this catalog. REMco reserves the right to change the capacities and specifications contained herein without prior notice.

REMco
ROCK ENGINEERED MACHINERY CO. INC.

Any Material, Any Tonnage, Anywhere. . .

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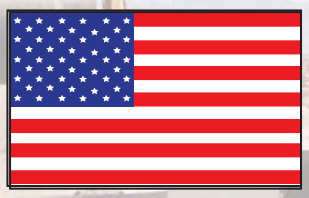

REMco ALSO OFFERS SPECIAL CRUSHER DESIGNS FOR MINING, CONSTRUCTION MATERIALS AND THE INDUSTRIAL MINERALS INDUSTRIES.

CONTACT *REMco* FOR DETAILS.

REMco ST/AR

REMco SuperMax

REMco GlassMax

REMco VS/4G

REMco VSG

REMco OreMax

REMco machines are manufactured under the following United States patents - Patent #7,427,042; Patent #7,489,254; Patent # 7,607,601; SA Patent #2008/05183 Additional International patents apply.

MANUFACTURED BY:

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