

A close-up photograph of a person's hands wearing heavy-duty work gloves, filled with a large quantity of fine, dark-colored aggregate material. The background is a blurred outdoor setting. The image is overlaid with a red-to-yellow gradient on the left side.

Metso:Outotec

High pressure grinding rolls

HRC™ 8

HRC™ 800

HPGR for high-quality
manufactured sand and
aggregate production



HPGR for high-quality manufactured sand and aggregate production

Whether you are looking to produce high-quality manufactured sand, turn waste materials into sellable products or work with difficult feed materials, the Metso Outotec HRC™ 8 and HRC™ 800 are the perfect machines for those applications.

Produce manufactured sand

The demand for economical and efficient ways to produce crushed sand is growing, as natural sand deposits located near growth centers are being depleted and environmental regulations are getting stricter. As a result, manufactured sand is becoming a high-demand commodity.

HRC 8 and HRC 800 takes manufactured sand to the next level by providing a simple yet robust design, a low cost of operation, and improved product shape and gradation.

Turn waste materials into high-quality sellable products

These machines are suitable for specific difficult applications where materials that are waste from the crushing and screening process can be reprocessed to obtain good high-quality sellable products.

Overcome difficult applications

HRC 8 and HRC 800 design offers a unique and efficient crushing effect and can work in difficult applications with low crushability feed materials (very hard), moisture, clay and

high fines content without creating any packing or crusher overload.

Maintain high-quality with low cost per ton

HRC 8 and HRC 800 produces the highest quality products with improved shape and relatively low energy and wear parts consumption. It delivers unbeatable performance in aggregates, manufactured sand, mining, industrial minerals and recycling applications with the lowest possible cost per ton.

Less power consumption in sand production compared to other technologies for the same volume of net product

up to 50% less



Robust HRC™ high pressure grinding rolls (HPGR)

HRC™ 8 and HRC™ 800 are based on a high-pressure grinding roll (HPGR) technology and are optimized for the demanding requirements of high-quality manufactured sand and aggregates production.

HRC 8 and HRC 800 uses a method of inter-particle comminution by drawing in a bed of material between two rotating rollers. They compress the feed material between two rotating rollers, one of which is in a fixed position and another roller that is floating. The two rotating rollers generate such a high pressure that it grinds the feed material to the desired smaller grain size.

Higher availability & reliability

HRC 8 provides an optimal crushing force with the use of adjustable hydraulic cylinders and variable speed.

One can also adjust the speed and pressure of HRC depending on the material conditions and application requirements. Pressure influences the reduction ratio and speed influences the throughput.

The feed chute arrangement allows for the crushing cavity to operate under chock feed condition all the time optimizing the rolls wear pattern and even load distribution on the surface of the rolls.

The patented Arch-frame differentiates from traditional HPGR equipment with its anti-skewing features that eliminate variation in product gradation and prevents bearings from being damaged due to misalignment.

Versatile product gradation

HRC 8 and HRC 800 offers easy and very versatile adjustable product gradation. The product gradation does not depend much on the adjusted space between the rolls but on the chock feed condition and the constant pressure. Pressure can be adjusted to regulate the product gradation curve.

This feature facilitates the customer to meet any product gradation specification requirements in manufactured sand.

Energy efficiency

Thanks to the ability to handle a continuous stream of material, HPGRs are considered to be energy efficient grinding machines in general.

HRC equipment goes a bit further. They direct the feed material straight to the crushing zone and adjust the speed and pressure in order to avoid wasting energy.

HRC 8 and HRC 800 can achieve energy efficiency up to 90% depending on the process configuration and product specification. This is possible because the HRC technology can minimize the circulating load to the crusher compared to other technologies in similar applications.

Environmentally friendly

HRC 8 and HRC 800 are designed to be environmentally friendly with minimized noise and dust emissions.

Robust HRC™ high pressure grinding rolls (HPGR)

Reduced operating costs

HRC grinding rolls are known for the robustness and longevity of wear components. It gives excellent wear life of the rolls and less downtime with easy replacement of rolls.

The anti-skewing arch frame design prevents bearings from being damaged due to misalignment, which will also save effort and resources.

Safe and ease of maintenance

The key to improving safety during maintenance is to minimize the need for maintenance.

With HRC HPGR, downtime has been reduced by using robust components and high-pressure rock-on-rock crushing enables long wear life of the manganese tires and energy-efficient operations.

The patented split shaft allows for the tires to be replaced quickly, without full machine disassembly, making the changeout of wear components easy and effortless.

Crusher is also encapsulated with guards to eliminate the risk for the operators during operation - operator cannot access the moving parts. In case of uncrushable in the feed accumulator in the hydraulic system avoid breakdown.

The required service is made easy with a simple design that allows changing the critical parts easily.



Higher availability &
reliability



Reduced operating
costs & less downtime



Safety & ease of
maintenance



Flexible operating
parameters

Designed for the aggregate industry

HRC™ 8 and HRC™ 800 high pressure grinding rolls are the ideal machines for the aggregate industry where fine products must meet a defined end-product specification.

Ideal for producing manufactured sand

HRC 8 and HRC 800 are particularly productive in producing manufactured sand for asphalt and concrete production. The quality of manufactured sand can be adjusted and optimized, which reduces the amount of cement and asphalt in the mix of concrete or asphalt.

HRC 8 and HRC 800 deliver a perfectly cubical shape for concrete and asphalt sands. They also produce more fines with fewer unwanted microfines in the final product compared to other technologies in manufactured sand.

- Ideal shaping (cubical or angular)
- Gradation according to customer needs
- Fine particles

Turn waste materials into products

These machines are suitable for specific difficult applications where materials that are waste from the crushing and screening process (materials with low mass gradings, difficult to crush by a VSI or other types of compression crushers) can be reprocessed to obtain good high-quality sellable products.

In some applications, the non-saleable waste materials can be processed by the HRC 8 or HRC 800 to correct the gradation curve and particle shape, converting them into high-value sellable products.

Turn difficult feed into a valuable product

HRC 8 and HRC 800 crushers work in applications where other crushers cannot. They can handle small in size and very difficult feed materials, that are difficult to process by any other technology, with high abrasiveness, low crushability, moisture, fines, even clay and turn them into a valuable product.

Some of those products may need a further process to remove the excess of ultra fines (<0.075 mm) already in the feed, wet or dry, depending on the final use of the end product.

Soft and hard rock applications

- Manufactured sand
- Gravel pits, pea gravel
- Asphalt sand
- Concrete sand
- Industrial minerals
- Recycling
- Re-crushing waste materials





1. Turn waste materials into sellable products
Improved shape
2. Improve the efficiency of the (existing) sand manufacturing process
Better reduction and less circulating load
3. Optimize the cost of the sand manufacturing operations
Lower energy and wear consumption
4. Cope with tough applications and conditions
Small top feed sizes and a high % of fines in the feed
5. Do all the above in an environmentally friendly way
Minimized noise & dust

5

reasons to select
HRC™ 8 &
HRC™ 800



This solution is Planet Positive

Planet Positive portfolio focuses on the most impactful technologies in our sustainable offering. Out of four focus areas, this solution creates value and positive impact on the following:

Energy efficiency and emissions
HRC 8 and HRC 800 consume less energy than any other technology in the same application to obtain the same net product volume.

HRC equipment can convert quarry waste into a sealable product, reducing the pollution from earth moving equipment doing the double handling of those large volumes of waste materials. At the same time, since it replaces the use of natural sand, it saves the loading and hauling of natural sand to the cities avoiding fuel burning and pollution.

Even more, HRC equipment produces such good quality sand that it reduces the demand of water and cement in the concrete mix, and also in asphalt.



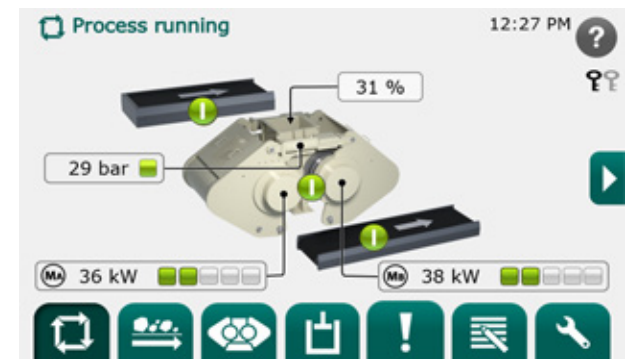
HRC crusher automation

HRC 8 and HRC 800 are available with Metso Outotec crusher automation which controls and monitors crusher and ancillary equipment helping to achieve the best performance and protection to the machine maximizing uptime and safety. Crusher automation is provided as a complete package, including fully automated hydraulic circuit controls, hydraulic unit motor starters and electrical cabinets. The proven and tested software can be set up for application specific conditions, and the whole system is not just easy to install and commission, it's easy to use, too. In addition, the equipment can be controlled by remote control for improved safety and comfort.

Continuous monitoring and control minimize risks Metso Outotec HRC automation helps to prevent costly downtime by monitoring operating pressure, temperatures, rollers RPM and other key parameters in your crusher. The protection is activated in steps, starting from informative warnings, then progressing to inform and log data for operational improvement, troubleshooting, and eventually shutting down the crusher to protect it whenever needed.

Consistent performance

Crushing optimization helps to provide constant throughput at all times. IC crusher automation provides instant process information to the operator. The automatic feed rate control helps to maintain the optimal material level in the crusher, which helps you to achieve and maintain the best performance at all times.



Parts and services

Genuine Metso Outotec OEM wear and spare parts are the best choice to minimize maintenance issues and increase longevity.

Our global distribution logistics network ensures that Metso Outotec OEM spare and wear parts are available when you need them.

With both standard and engineered-to-order parts, Metso Outotec can ensure that you have the support your crushers need.

Spare parts

- Frame parts
- Shafts
- Mechanical Seals
- Hydraulic systems

Wear parts

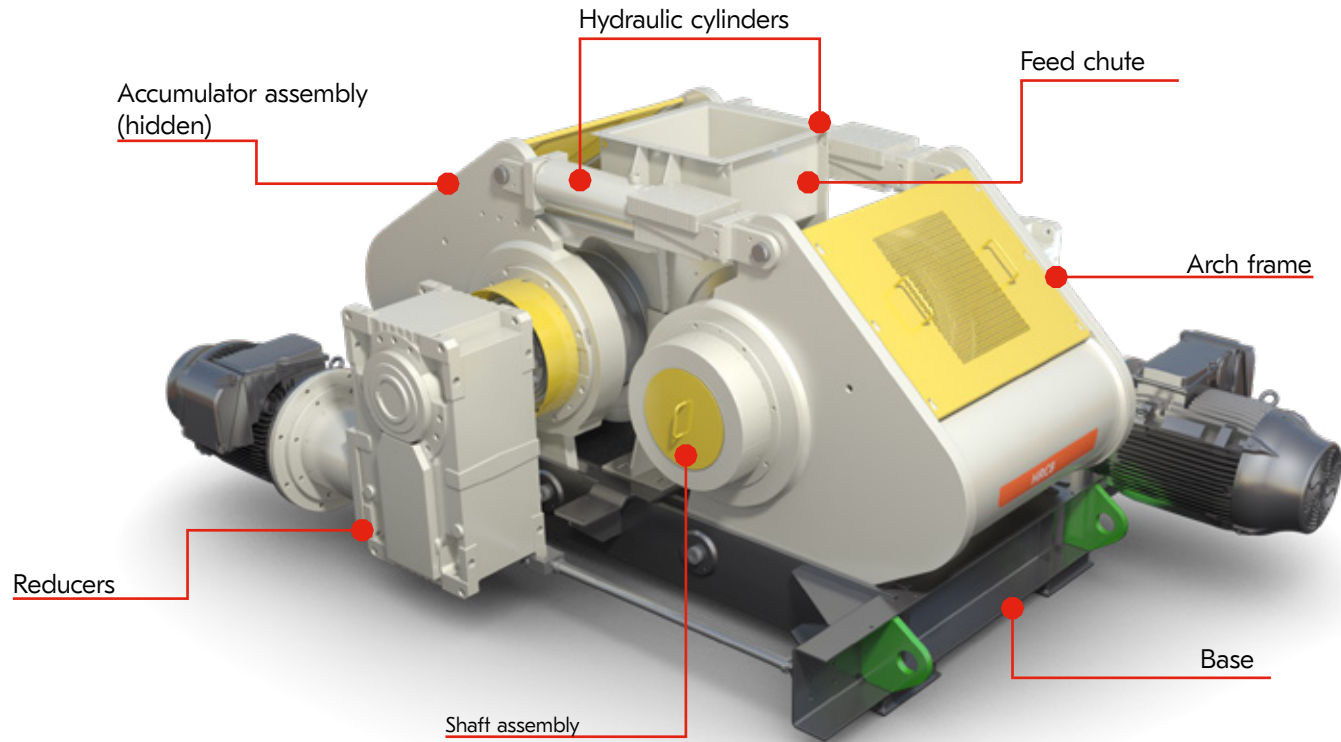
- Rolls
- Cheek plates
- Liners

Helpful service tools

HRC 8 and HRC 800 are delivered with safe-to-use tools for maintenance tasks. This includes a shaft lifting tool, shaft removal tool for quicker and safe shaft replacement. All these tools are standard delivery from Metso Outotec.



HRC™ 8 – simple design for maximum performance

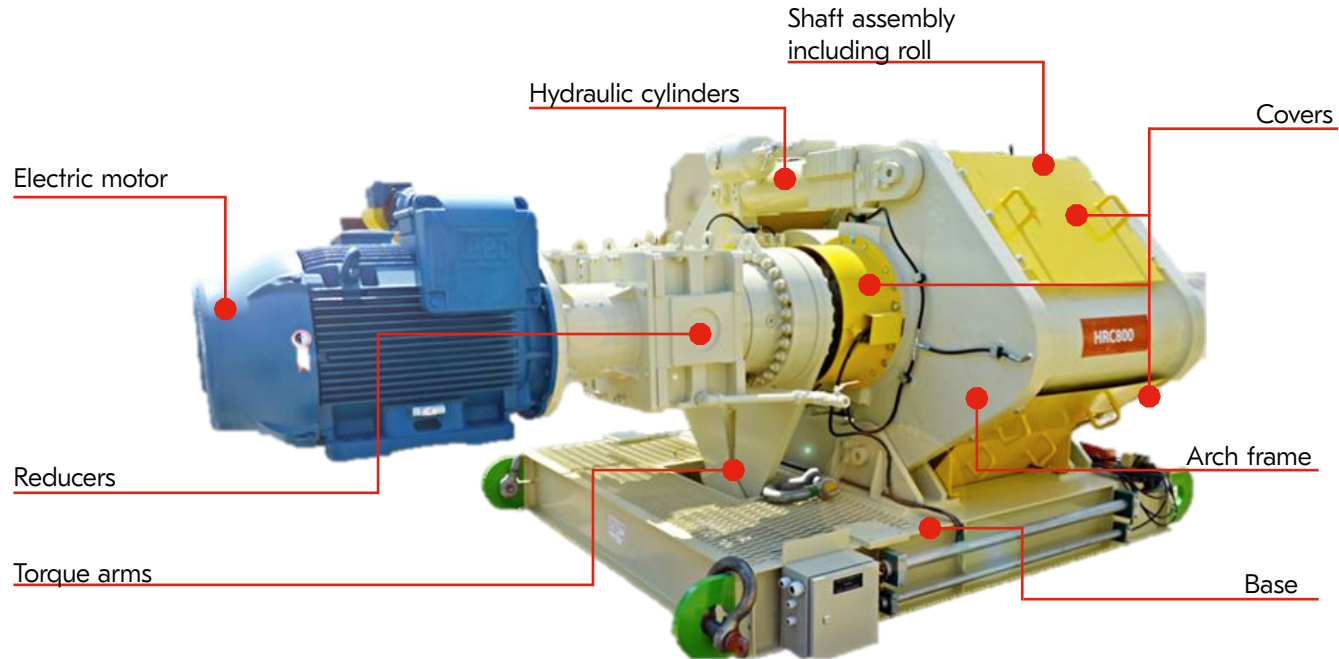


Roll Dimensions Dia x Width	Installed power	Unit weight	Maximal Roll Speed (RPM)	Top size*	Typical Capacity**	Max specific press force	Crusher dimensions LxWxH
800 x 500 mm	2 x 75 kW	12.9 t	30.2	32 mm	60 - 90 tph	2.5 N/mm ²	2.8 x 3.9 x 1.7 m
31.5" x 20"	2 x 100 HP	28,440 lbs	30.2	1.25"	66 - 99 Sh.T	362.6 psi	110" x 153" x 66"

* Varies per application.

** Varies per application, values based on nominal equipment speed, values are for machine throughput.

HRC™ 800 – higher pressure for more reduction

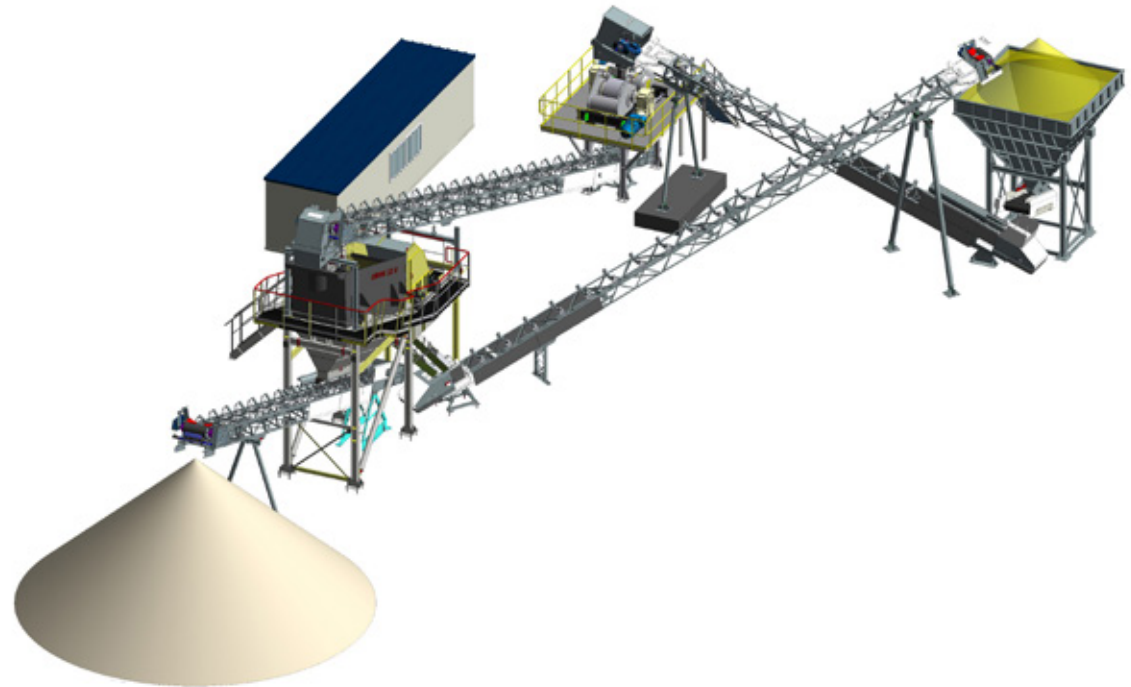
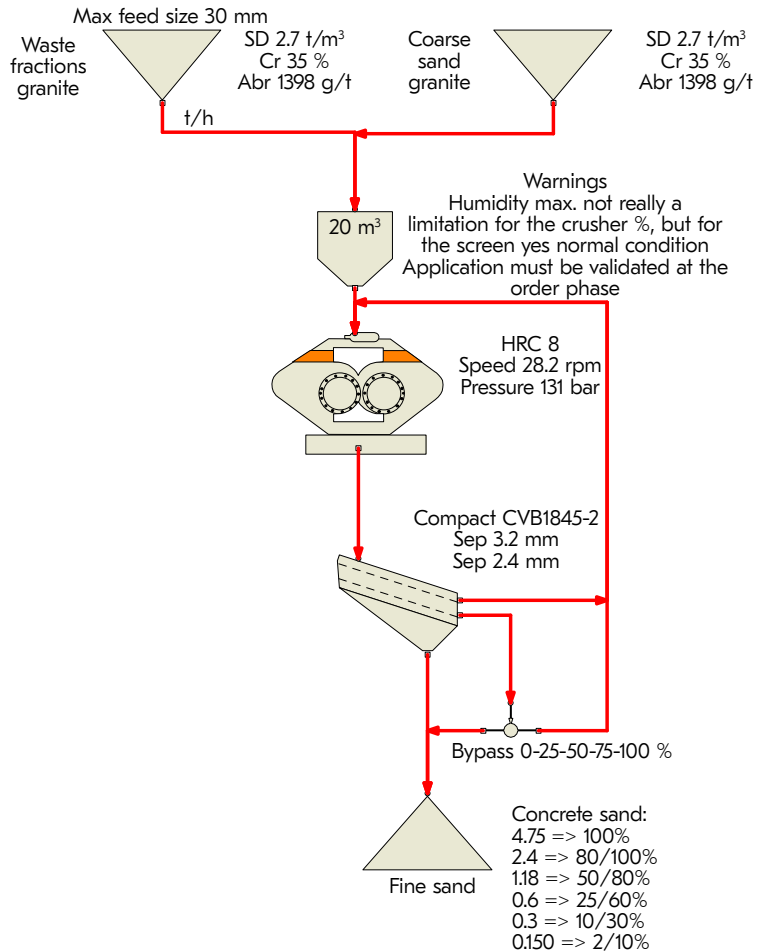


Roll Dimensions Dia x Width	Installed power	Unit weight	Maximal Roll Speed (RPM)	Top size*	Typical Capacity**	Max specific press force	Crusher dimensions LxWxH
800 x 500 mm	2 x 110 kW	18 t	30.2	32 mm	86 - 120 tph	4.5 N/mm ²	2.7 x 4.3 x 2.5 m
31.5" x 20"	2 x 147 HP	39,683 lbs	30.2	1.25"	95 - 132 Sh.T	652.7 psi	106" x 169" x 98"

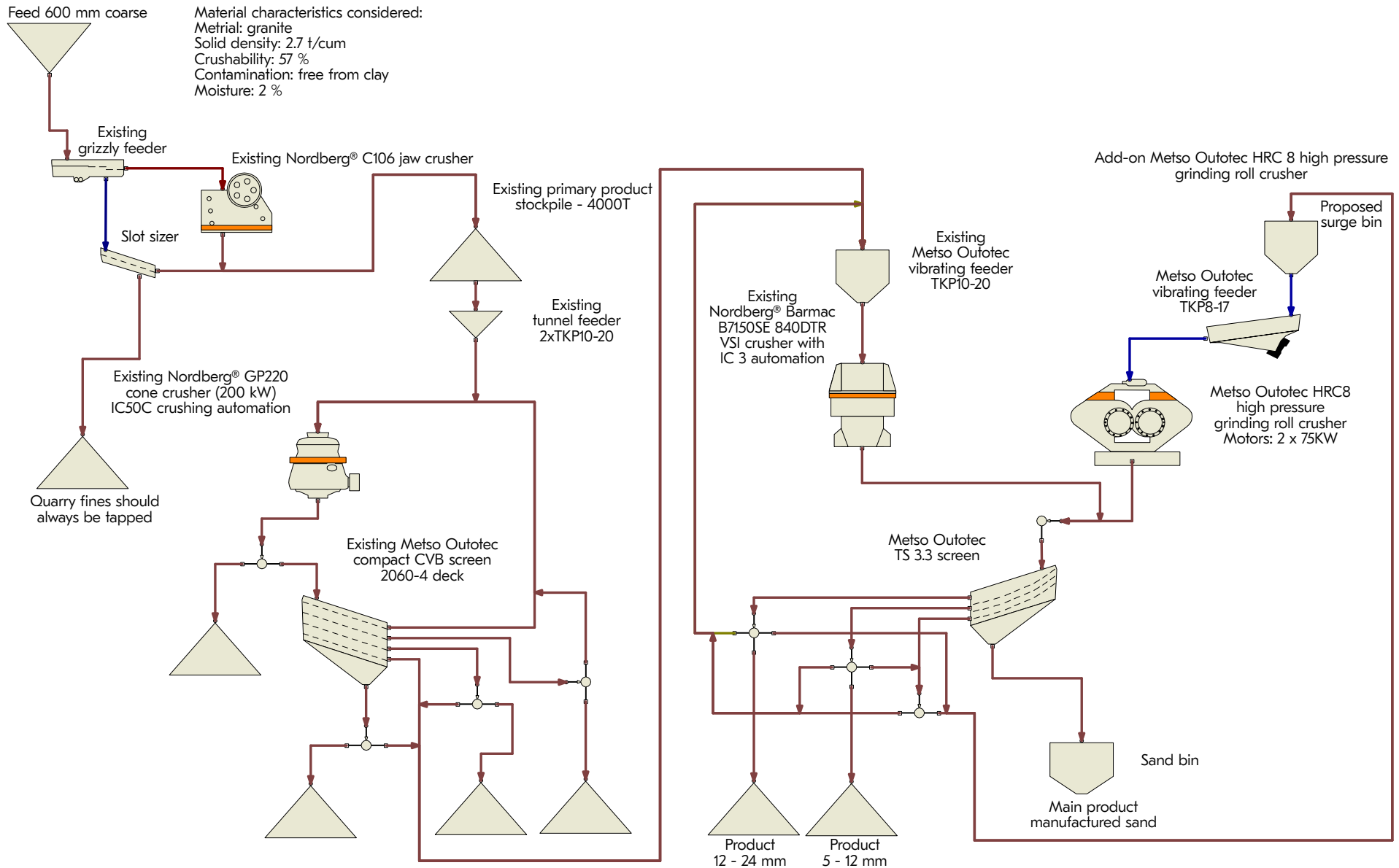
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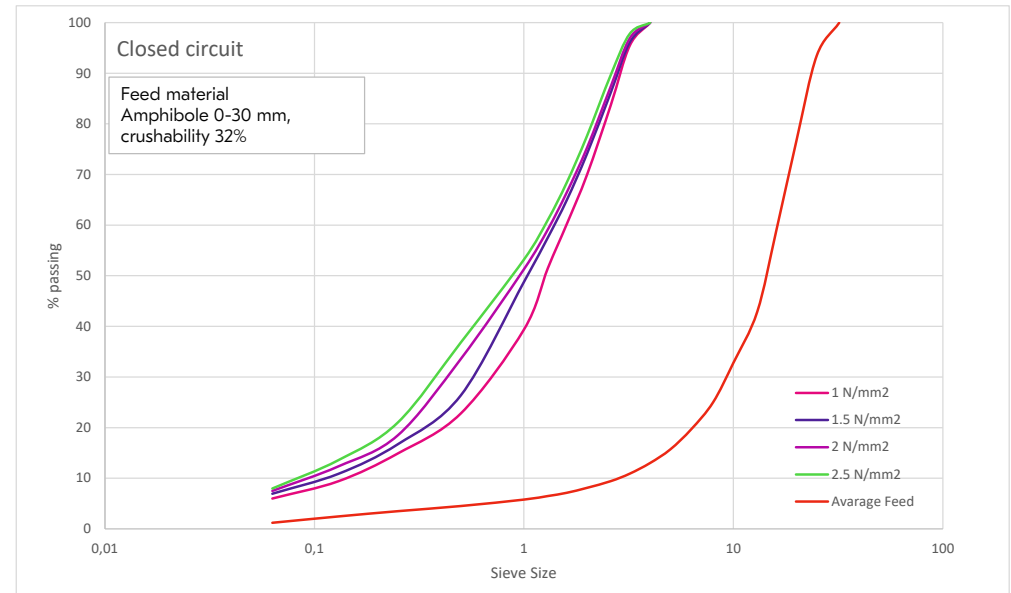
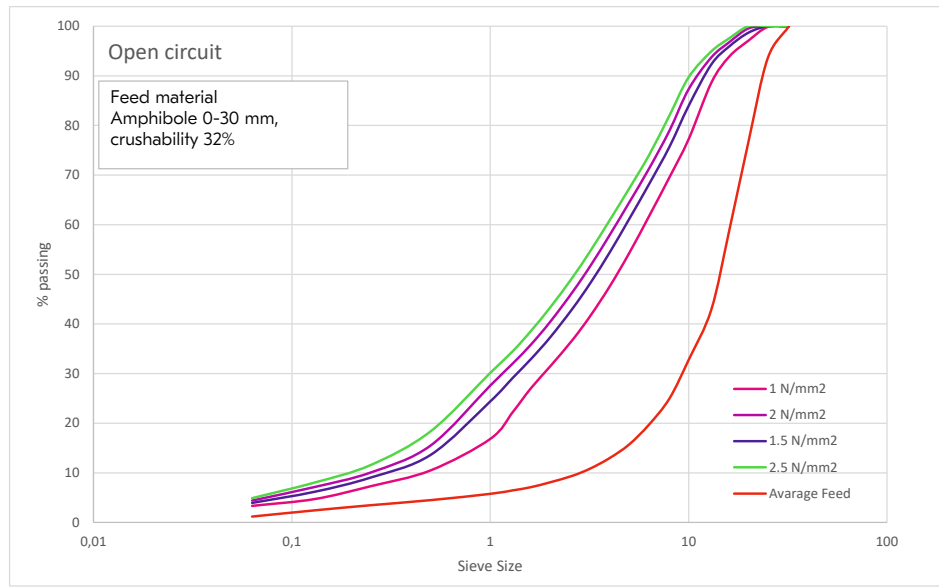
HRC typical installation



HRC with VSI combination to increase sand production in existing circuit



HRC in open and closed circuit



* Curves shown here are for indicative and display purpose only. Those may vary as per actual process and site condition.

Case: LOGO Durango, Mexico

HRC 8 increase sand production and ensure flexibility



Challenge

Increase sand production by re-crushing 19 mm and 12 mm gravel rock which is completely unsalable waste material for customer. Customer plant was not producing enough sand for internal needs, and they were buying it from competitors.

To increase and ensure asphalt sand fines (200 mesh /0.075 mm) content to a minimum 15% (in Mexico asphalt plants want to get filler together with sand).

Deliver consistent quality of produced sand for concrete and asphalt sand to reduce cement and asphalt consumption respectively.

Solution

HRC 8 was introduced in the circuit to perform a demo by feeding 19 mm top rock size feed from the stockpile: 60% < 16 mm on feed, very clean with no fines below <15 mm.

Recirculating +6 to -9 mm rock with ST 3.8 Double deck screen helped to increase sand production.

Conducted various tests with different rolls speed, start gap and pressure to achieve the product gradation and production rate as per customer requirements.

Metso Outotec HRC technology is a very versatile machine to minimize or maximize the <200 mesh (0.074 mm) content in the final product and to achieve different manufactured sand product gradations adjusting the operating gap and specially the operating pressure.

Results

HRC 8 process adjustable to customer's sands needs, quality and production volume, it depends on the combinations of the crusher setting parameters.

Flexible operation, especially when there is not enough quantity of fines present in the feed, closed circuit operation with oversize recirculation helps to fill up voids in crushing chamber, also reducing the start gap helps in the process.

Not too many parameter options can be adjusted to control the ultra-fines production, this characteristic depends more on the feed material properties, but with the wide range of operating pressures, the HRC technology is the best option for those requirements.

