

**ROTOPACTOR M.D.**  
**(Sand Making Machine) (Patent Applied for)**  
**:: Sand Manufacturing Plant ::**



Lay out of sand manufacturing plant is similar to Stone crushing plant. It consist of Feeding hopper, Rotopactor, Sand Screen, conveyors/ elevators, electrical prime movers and controls, etc. For manufacturing Sand at large scale it is manufactured directly from bigger size stones up to 500 mm size. This bigger stones should be crushed to minus 8 mm for feeding in Rotopactor.

For reducing the stone to minus 12 mm particles, Big size stone crushers are employed. For making Sand from stone up to 500 mm feed size, A primary crusher is employed to break the stone in minus 75 mm pieces. These –75 mm pieces are further broken in Secondary crusher. Here the size is made below 40mm. This minus 40mm is further reduced to minus 12 mm size in V.S.I Crusher, and then finally it is crushed in Rotopactor and sand is manufactured.

Small machines can be used along with Stone crusher units, Where Grit and fine particles are waste. With Two crushers a 15 ton per hour capacity machine can be installed.

Generally 20mm metal and sand are having demand. Other size metal is not selling fast. A special arrangement can be recommended. One 20X12 Crusher, One V.S.I. Crusher of Capacity 30 Tons per hour, and a Rotopactor can give about 15 tons metal and 15 tons sand per hour. The Crusher is set for crushing minus 40 mm crushed size, this is then fed to V.S.I. Crusher, where it is reduced and 20 mm metal is separated, and remaining is crushed below 10mm, which is further crushed to make Sand. This arrangement can give more production more economically than two crushers. The 20mm metal such produced is having cubical shape. ( Cubical metal gives good strength to concrete.

The Rotopactor is a specially designed machine for manufacturing of the sand from grit. It is having a Rotating Disc, which throw the stone particles at vigorous velocity, which collides with annular rings. It breaks and rebounded in up ward direction. Again it falls down making a complete screen of stone particles. The new particles thrown from rotor, collides against these screen and breaks the stone into finer particles.

The design of the Rotopactor disc and annular ring is of very special type, which give very efficient result. The maximum collision is stone on stone. In the process the final particle are of cubical shape and its sharp edges are rounded off. The stone particles are ejected from the Rotor due to centrifugal force at a particular angle, which strikes with the annular ring (anvil ring ) and diverted in circular path. The kinetic energy of the particles makes it move in a designated path. Next particles coming are colliding on these particles so as a results bigger particles breaks in to small pieces. These small particles roles around while moving in a circular path. The residual kinetic energy is utilized in giving good surface texture of the particle. The edges are rounded and surface became smooth.

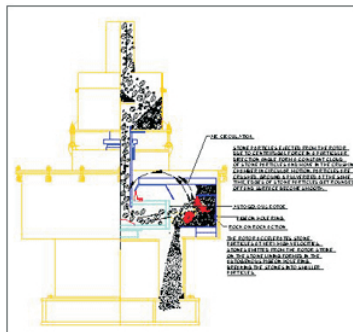
In this process fine dust particles are produced below 75 microns, Presence of these finer particles in sand gives more plasticity to sand. Finer particles are not more than 3 to 4 percent from hard Rock. From the outlet of the machine in operation these are emitted from the machine, which creates pollution. A small quantity of water sprinkled over the feed material, makes these fine particle to stick over the sand, so reduces the pollution. The water should be small quantity, not more then 60 to 75 ltrs. for 100 cft sand. More water will creates jamming of the machine and coating of water over stone gives cushioning effect so reduces the production. The capacity of the machine is a factor of H. P. available and depends upon the hardness of the raw material and feed size. Softer material and smaller the feed size gives more Production.

The design of the rotor is very special (patented). The flow through the rotor is positive with less wear. The wear and tear of the rotor is minimized due to stone lining formed inside the rotor. The wear plates are of special design (patented) and made from special material, The material passing over the plates is guided in upwards directions so reduces the wearing of the plates, gives long wear life. All the wearing points are made of special material, gives very long life. Wearing of annular ring is minimized due to the stone screen formed. The wearing out cost of the rotor is less compared to any other machine. Approximately depends upon the feed material. It may vary according to the hardness of the stone, and the feed size.

The wearing of rotor is a critical problem. When the rotor gets worn out it becomes un balance, and creates vibration to the machine. A vibration control; meter is fitted in the machines, which stops the machine automatically when the amplitude of vibration crosses a particular limit. The reason of stopping is indicated on the panel board.

The bearing housing is a very unique design, with oil lubricating system. The complete weight of the Shaft and Rotor is counter balance by Lubricating oil. Complete system is floating in oil. There is very negligible frictional loss. This is a unique technology, Reduces frictional load. Circulating oil lubricates the bearings. The driven shaft is lifted due to oil pressure so the load on the bearings reduces. The heat generated in the bearings is reduced. The heat generated in the bearing is taken by Oil. Oil is cooled in a heat exchanger cooling system by circulating water. Water is cooled in a radiator with air circulating fan. A Temperature control unit is fitted with the machine, which restrict the machine to operate, if due to any reason the temperature of the cooling oil increases the scheduled limit. All this system assures a very long bearing life.

### **Rotopactor M.D. (Sand Making Machine) ( Patent Applied for)**



#### **Site Selection:-**

Sand Machine emits fine particle of dust hence the site for this machine should Be in remote area, where no hazard may cause due to dust pollution. The site should be away from residential area and Agriculture land it is very difficult to control the emission of dust in various processes, and outlets of the machine. The machine should fit in open area. Continuous emission of finer particles of dust from out let, in colloidal state, can be settle down by water spray on the finished sand. The water required per shift is not more than 1500 Liters.

#### **Special Features of Our Sand Machine**

- The sand of cubical particles and rounded edges particles can be manufactured.
- Silt and soil free clean sand.
- Sand of any grade can be manufactured, only by changing the sieve of the screen grade of the sand can be changed. Capacity of the machine if given anywhere should be taken for grade 1 sand. For finer sand, capacity of the machine will decrease accordingly.
- In comparison with river sand machine made sand is having more compressive strength.
- The workability of the mortar increases due to the rounded edges of the sand made by this machine: hence less water cement ratio is possible.
- There are no impurities such as mud, soil, silt, hence less permeability.
- No harsh concrete or honey combs in the concrete, due to better plasticity.
- Very nice finish can be achieved in the work.
- Fine particles of the dust can be removed by controlling the air draft.
- The dust separated is very fine and can be utilized as Sanala (mixing with 1:10 cement), for manufacturing cement tiles, or can be used for burnt brick making. (Soil required for brick making is not easily available. Hence it gives a better substitute for soil. The bricks made out of dust are strong compared to ordinary mud bricks.)

- The capacity of the machine is based on the hardness of the rock and feed size and the HP available. Softer rock and smaller the feed size increases the production.
- The fine dust can also be used for tiles manufacturing, for cleaning powder in stead of dolomite powder.
- The Sand can be manufactured from stone Grit, which is a waste at stone crusher unit or bigger articles from riverbed. The Grit is mainly used in Road making in seal Coat. The consumption is very less, compared to the production every stone crusher produces about 15% Grit. It is headache to the crusher owners. It requires huge space for storage, and turnovers are very less. The grit can be economically used for Sand Manufacturing. It is readily available on all crushers at throw away price. . The yield of the sand from Grit is approximately. By Weight. By Volume. Sand 84%72% Dust 16%31%
- The powers required for the manufacturing of 100 cft. Of sand from grit i) For Cubical sand approximately 13 units. This data is variable according to feed size, voltage stability, hardness of the Stone.
- The complete plant is fully automatic. Only one operator for starting, stopping, And routing maintenance, Greasing etc. is required. One or two Helpers to Clean the space, to collect thrown away particles in process etc. are required.