

# **STONE CRUSHER**

## **1. INTRODUCTION:**

Crushed stone is also known as metal jelly. Crushed stone is segregated into various sizes viz. 35mm, 20mm, 12mm etc. for different uses. Crushed stone aggregates are used for construction of roads, bridges, housing, industrial building construction and other cement based products like RCC pipes, PSC poles, pre-moulded slabs, frames and beams etc. for fabrication.

## **2. PRODUCT & ITS APPLICATION:**

Stone crushing industry is an important industrial sector in the country. The crushed stone is then used as raw material for various construction activities i.e. construction of roads, bridges, buildings and canals. Over the last 10 years, the Construction sector has been registering strong growth rates in the range of 7-8%. Housing and construction is one of the major drivers of growth in more than 40 allied industries including STONE CRUSHING. In addition, for the building of roads, flyovers and bypasses, there is a mass and consistent need of crushed stone across the country. Several projects are in progress and are being commenced shortly which will have high demand of crushed stone all over the country. In order to make up the backlog and meet the projected requirements for the next 20 years, overall housing construction has to raise 500,000 housing units per annum. The area under consideration is badly affected by the earthquake and rehabilitation and reconstruction is in process. This process leads to construction of roads, bridges, new houses; markets, etc. resultantly gear up construction activities and more use of crushed stones. Construction of Diamir-Basha Dam and Kohala Hydro –Electric Project are also synergic factor for this project. The aforementioned facts and statistics provide enough evidences, assuring a steep and continuous growth vis a vis investment opportunity in the STONE CRUSHING business. There are increasing allocations from budget in the Public Sector Development Projects of Pakistan.

There is sufficient skilled labor available at less cost to run the project. The raw material is abundantly available. If the machinery needs to be imported there are less import duties. The availability of initial depreciation made the project pragmatically five years tax free. There is need to employ latest and modern exploration techniques and machinery. The lack of coordination among various mineral sector agencies is also point of concern for the stone crushing industry.

### **3. DESIRED QUALIFICATIONS FOR PROMOTER:**

Graduate in any discipline. Promoter with high skill of chemical processing and having contacts with building and construction industries is advantage.

### **4. INDUSTRY LOOK OUT AND TRENDS**

At present, most of the mining crushing and industrial sand making plant produced a lot of limestone powder waste (limestone powder content is high). This not only pollute the environment, and the raw material waste is serious. It is imperative to find a reasonable solution to deal with limestone powder waste "waste into treasure".

The results show that the limestone powder as the admixture of concrete has the effect of improving the concrete structure, enhancing the workability of anti - sulphate attack ability of concrete under low temperature. In recent years, limestone powder into the concrete as a binder has become the hot topic and development trend in the concrete industry.

Commercial concrete mixing plant generally uses 325 mesh limestone powders; the sieving rate is not less than 85%. The research shows that C30 ~ C50 limestone powder for concrete can be produced completely.

## **5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:**

Stone Crushing Industry is an important industrial sector in the country engaged in producing crushed stone of various sizes depending upon the requirement which acts as raw material for various construction activities such as construction of Roads, Highways, Bridges, Buildings, and Canals etc. It is estimated that there are over 12,000 stone crusher units in India. The number is expected to grow further keeping in view the future plans for development of infrastructure of roads, canals and buildings that are required for overall development of the country. In India, the Stone Crushing Industry sector is estimated to have an annual turnover of Rs. 5000 crore and is therefore an economically important sector. The sector is estimated to be providing direct employment to over 500,000 people engaged in various activities such as mining, crushing plant, transportation of mined stones and crushed products etc. Most of these personnel are from rural and economically backward areas where employment opportunities are limited and therefore it carries greater significance in terms of social importance in rural areas. It is a source of earning for uneducated poor unskilled rural people. Since it is an allied industry of the construction sector, growth in construction sector may be considered as proxy for the growth in stone crushing sector, The market scope for crushed stone is found to be encouraging in local market with the increased demand from building industry & construction fields. There is also a sufficient demand from Government. Contractors for laying of roads and construction of industries etc. The entry in the target market is easy and there is a narrow gap in the supply and demand, which is expected to grow in the coming years. Stone Chips are primarily used in construction activities including Building, Roads, and Bridges etc. Since the area is undergoing tremendous infrastructure development work. Apart from above the Road Construction work under P.W.D., P.M.G.S.Y increased vast scope for this unit. Looking at the huge demand potential, easy marketing is possible.

## **6. RAW MATERIAL REQUIREMENTS:**

Raw materials required for this project is granite stone boulders of various sizes. Basic raw material is boulder and same shall be obtained from rocks. Hard Lime and granite Stone will

be used as raw material for manufacturing crushed stone. Raw stone could be purchased directly from the excavator (quarry lease holder) or crusher may hold his own quarry lease to produce raw stone. It is recommended to obtain a quarry lease holding to avoid any possible threat in procuring raw stone as well as to keep the project economically stable. For the proposed project, a total of 15,000 C.ft. of Hard Lime/granite Stone would be the daily requirement. This requirement could sufficiently be fulfilled from the obtained quarry site over a period of years.

## **7. MANUFACTURING PROCESS:**

It is advantageous if the crushed stone unit is set up near the queries where the granite boulders of various sizes are available for the crushing unit. The wastage from the granite industry will be of much use to the crushed stone unit. The granite stones of various sizes are fed into the jaw crushers for size reduction. Depending on the desired output size of the crushed stone, the raw materials may be fed to one or two jaw crushers in a sequence. Then these crushed stones are passed on to the rotary screen for size gradation. Material is handled through a belt conveyor to the different places of operation. The main machinery involved in the stone crushing industry is Hammer Crusher, Screen, Conveyors etc. The process involved is to feed the stone in to the Hammer Crushers to make it further smaller in size as required by the customer. In the hammer crusher, the stone is crushed. The crushed stone is screened to separate the produce in different sizes by the separator. The crushed stone is conveyed by the conveyors to trucks for transport to the market place or storage area.

## 8. MANPOWER REQUIREMENT:

Sr. No.	Designation of Employees	Salary Per Person	Monthly Salary ₹	Number of employees required				
				Year-1	Year-2	Year-3	Year-4	Year-5
	<b>Variable Labour:</b>							
1	Machine Operators	12,000	24000.00	2	2	2	2	2
2	Helpers	8,000	64000.00	8	8	8	10	10
	<i>sub-total</i>		88000.00	10	10	10	12	12
	<b>Fixed Staff:</b>							
1	Production supervisor	15,000	15000.00	1	1	1	1	1
2	Accounts/Stores Asst	12,500	25000.00	2	2	2	3	3
3	Office Boy	9,000	9000.00	1	1	1	1	1
	<i>sub-total</i>		49000.00	4	4	4	5	5
	<b>Total</b>		137000.00	14	14	14	17	17

## 9. IMPLEMENTATION SCHEDULE:

The project can be implemented in 4 months' time as detailed below:

Sr. No.	Activity	Time Required ( <i>in months</i> )
1	Acquisition of premises	1.00
2	Construction (if applicable)	1.00
3	Procurement & installation of Plant & Machinery	1.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required ( <i>some activities shall run concurrently</i> )	4.00

**10. COST OF PROJECT:**

Sr. No.	Particulars	₹ in Lacs
1	Land	5.00
2	Building	15.00
3	Plant & Machinery	15.20
4	Furniture, Electrical Installations	1.52
5	Other Assets including Preliminary / Pre-operative expenses	1.82
6	Working Capital	40.00
	<b>Total</b>	<b>78.54</b>

**11. MEANS OF FINANCE:**

Bank term loans are assumed @ 75 % of fixed assets. The proposed funding pattern is as under:

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	21.51
2	Bank Finance	57.03
	<b>Total</b>	<b>78.54</b>

**12. WORKING CAPITAL CALCULATION:**

The project requires working capital of ₹ 40.00lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	20.00	0.25	5.00	15.00
2	Receivables	8.00	0.25	2.00	6.00
3	Overheads	12.00	100%	12.00	0.00
4	Creditors	-		0.00	0.00
	<b>Total</b>	40.00		19.00	21.00

### 13. LIST OF MACHINERY REQUIRED:

A detail of important machinery is given below: Power Requirement: 200 HP

Sr. No.	Particulars	UOM	Qty	Rate (₹)	Value
					(₹ in Lacs)
	<b>Plant &amp; Machinery / equipments</b>				
<b>a)</b>	<b>Main Machinery</b>				
i.	Jaw crusher 400X225mm 25HP	NOS.	1	520000	5.20
ii.	Jaw crusher 350x150 mm 25HP	Nos	1	450000	4.50
iii.	Rotary screens for 35 mm,	Nos	1	300000	3.00
<b>b)</b>	<b>Ancillary machinery</b>				
i.	Belt conveyor with 15 HP motor	Nos	1	100,000	1.00
ii.	Pollution control cyclonic dust	NOS.	1	150000	1.50
	<i>sub-total Plant &amp; Machinery</i>				<b>15.20</b>
	<b>Furniture / Electrical installations</b>				
a)	Office furniture	LS	1	100000	1.00
<b>Sr. No.</b>	<b>Particulars</b>	<b>UOM</b>	<b>Qty</b>	<b>Rate (₹)</b>	<b>Value</b>
b)	Stores Almirah	LS	1	15,000	0.15
c)	Computer & Printer		L. S.	37000	0.37
	<i>sub total</i>				<b>1.52</b>
	<b>Other Assets</b>				
a)	preliminary and preoperative				1.82
	<i>sub-total Other Assets</i>				1.82
	<b>Total</b>				<b>18.54</b>

All the machines and equipment are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to have modern and flexible designs. It may be worthwhile to look at reconditioned imported

machines, dies and tooling. Some of the machinery and dies and tooling suppliers are listed here below:

- Kamdhenu Agro Machinery  
Plot No. 6, Near Power House,  
Wathoda Road, Wathoda  
Nagpur - 440035  
Maharashtra, India
  
- Future Industries Private Limited  
Shed No. 15, Ambica Estate,  
Corporation Municipal Plot,  
Opposite Sadvichar Hospital,  
Naroda, Ahmedabad - 382330,  
Gujarat, India
  
- The Global Pharma Equipments  
Star Industrial Estate,  
D-32, Naik Pada,  
Near Hanuman Mandir,  
Opposite Dwarka Industrial Estate,  
Vasai East, Vasai - 401208,  
Maharashtra, India



#### 14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	90.00	105.00	120.00	135.00	150.00
3	Raw Materials & Other direct inputs	₹. In Lacs	73.18	85.37	97.57	109.76	121.96
4	Gross Margin	₹. In Lacs	16.82	19.63	22.43	25.24	28.04
5	Overheads except interest	₹. In Lacs	5.14	5.47	6.11	6.30	6.43
6	Interest	₹. In Lacs	5.70	5.70	3.80	2.85	2.28
7	Depreciation	₹. In Lacs	10.64	7.60	5.32	3.80	3.42
8	<b>Net Profit before tax</b>	₹. In Lacs	<b>-4.66</b>	<b>0.86</b>	<b>7.20</b>	<b>12.28</b>	<b>15.91</b>

The basis of profitability calculation:

The growth of selling capacity will be increased 10% per year. (This is assumed by various analysis and study; it can be increased according to the selling strategy.)

Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per litre. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 14 -15 % depending on type of industry.

#### 15. BREAK-EVEN ANALYSIS:

The project shall reach cash break-even at 30.20 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	150.00
2	Variable costs	₹. In Lacs	121.96
3	Fixed costs incl. interest	₹. In Lacs	8.71
4	$BEP = FC / (SR - VC) \times 100 =$	% of capacity	31.07%

## **16. STATUTORY / GOVERNMENT APPROVALS**

As per the allocation of business rules under the Constitution, labour is in the concurrent list of subjects. It is dealt with by the MOLE at the Central and Departments of Labour under State Governments in respective States / UTs. The MOLE has enacted workplace safety and health statutes concerning workers in the manufacturing sector, mines, ports and docks and in construction sectors.

Further, other Ministries of the Government of India have also enacted certain statutes relating to safety aspects of substances, equipment, operations etc. Some of the statutes applicable in the manufacturing sector are discussed below:

### **The Static and Mobile Pressure Vessels (Unfired) Rules, 1981**

These (SMPV) Rules are notified under the Explosives Act, 1884. These rules regulate storage, handling and transport of compressed gases. These rules stipulate requirements regarding construction and fitments, periodic testing, location, fire protection, loading and unloading facilities, transfer operations etc. in respect of pressure vessels whose water capacity exceeds one thousand litres. These rules are enforced by the Chief Controller of Explosives under the Ministry of Industry and Commerce, Govt. of India (PESO).

### **The Manufacture, Storage and Import of Hazardous Chemicals Rules (MSIHC), 1989**

These MSIHC Rules are notified under the Environment (Protection) Act, 1986. These rules are aimed at regulating and handling of certain specified hazardous chemicals. The rules stipulate requirements regarding notification of site, identification of major hazards, taking necessary steps to control major accident, notification of major accident, preparation of safety report and on-site emergency plan; prevention and control of major accident, dissemination of information etc. These rules are notified by the Ministry of Environment and

Forests (MOEF) but enforced by the Inspectorates of Factories of respective States / UTs in the manufacturing sector.

### **The Factories Act, 1948 and State Factories Rules**

The Factories Act, 1948 is very comprehensive legislation dealing with the matters of safety, health and welfare of workers in factories. The Act places duties on the occupier to ensure safety, health and welfare of workers at work. Some of the salient provisions of the Act include:

- Guarding of machinery
- Hoists and Lifts; Lifting Machines and Appliances
- Revolving Machinery
- Pressure Plant
- Excessive Weight
- Protection of Eyes
- Precautions against dangerous fumes, gases etc.
- Explosive or inflammable dust, gas etc.
- Precautions in case of fire
- Safety of buildings and machinery
- Permissible limits of exposure of chemical and toxic substances
- Entrepreneur may contact State Pollution Control Board where ever it is applicable.

## **17. BACKWARD AND FORWARD INTEGRATIONS**

Chemical companies often become integrated and undergo other activities outside the chemical industry. Increased competition prompts many companies to reduce supply chain costs by looking outside the chemical sector at suppliers and customers. While most companies within the chemicals sector primarily produce chemicals, some companies also conduct other manufacturing activities. The exact proportion of chemicals sector companies that are integrated with other sector activities is unknown, but many companies actively seek

vertical integration. Many manufacturers pursue vertical integration to secure suppliers and customers for their products.

Mergers and acquisitions are a common way for companies to undertake new chemical ventures. By purchasing their chemical suppliers, some manufacturers secure future chemical feedstock for their products or other chemicals that they use in manufacturing. The company making the purchase obtains valuable expertise and equipment. Some mining and petrochemical production is more cost-effective when integrated within a chemical company. Energy and feedstock costs are often a significant expense for chemical companies. Integrating chemical production with activities that secure supplies of chemical feedstock and energy is relatively common as chemical companies grow. Chemical companies are located near mines, oil fields, ammonia factories and water supplies. This reduces transportation costs and increases the reliability of supplies by reducing the distance between feedstock and the factory.

Some companies, such as Sino-Coking Coal and Coke Chemical Industries Incorporated, own their mines. BHP Billiton operates a broad range of mines and is primarily a mining company. It does, however, also produce petrochemical feedstock for the chemical industry and therefore operates within the chemical industry as well. These companies technically operate within both the chemical and mining industries in their normal business operations.

Integrating a chemical company with other activities provides several direct benefits for the company and is becoming increasingly common. High energy costs necessitate greater control of energy resources and minimal reliance on expensive transportation. Chemical companies experience volatile profitability due to fluctuations in feedstock and energy expenses. Some companies control this volatility through careful supply chain management and by charging supply surcharges. Actively researching and developing alternative feedstock and energy supplies helps the company reduce costs.

Vertical integration supports these activities by eliminating redundant activities at multiple companies and increasing efficiency. By consolidating activity among multiple, similar operations, chemical companies achieve cost savings that contribute to higher profitability.

End products are often very profitable, and some chemical companies purchase their former customers to take advantage of the marked-up prices of products further along in the supply chain.

Integration may become more common for many chemical companies as competition strengthens and traditional feedstock becomes more expensive. Market demand for chemical feedstock increases as emerging market economies grow and result in increased consumer spending around the world.

## **17. TRAINING CENTERS AND COURSES**

There is no such training required to start this business but, basic chemical bachelor's degree is plus point for enterpriser. Promoter may train their employees in such specialized institutions to grow up the business. There are few specialised Institutes provide degree certification in chemical Technology, few most famous and authenticate Institutions are as follows:

1. Department of chemical LD college of engineering  
No.120, Circular Road, University Area, Navrangpura,  
Opposite Gujarat University, Ahmedabad, Gujarat 380015
2. MIT College of chemical Engineering, Pune  
Gate.No.140, Raj Baugh Educational Complex,  
Pune Solapur Highway,  
Loni Kalbhor, Pune – 412201  
Maharashtra, India

Udyamimitra portal ( link : [www.udyamimitra.in](http://www.udyamimitra.in) ) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

**Disclaimer:**

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.