PROJECT REPORT

Of

DIATOMACEOUS EARTH POWDER

PURPOSE OF THE DOCUMENT

This particular pre-feasibility is regarding Diatomaceous earth powder Manufacturing unit.

The objective of the pre-feasibility report is primarily to facilitate potential entrepreneurs in project identification for investment and in order to serve his objective; the document covers various aspects of the project concept development, start-up, marketing, finance and management.

[We can modify the project capacity and project cost as per your requirement. We can also prepare project report on any subject as per your requirement.]

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PROJECT AT GLANCE

1	**Name of Proprietor/Director**	XXXXXXXX	
2	**Firm Name**	XXXXXXXX	
3	**Registered Address**	XXXXXXXX	
4	**Nature of Activity**	XXXXXXXX	
5	**Category of Applicant**	XXXXXXXX	
6	**Location of Unit**	XXXXXXXX	
7	**Cost of Project**	24.63	Rs. In Lakhs
8	**Means of Finance**		
i)	**Own Contribution**	2.46	Rs. In Lakhs
ii)	**Term Loan**	17.55	Rs. In Lakhs
iii)	**Working Capital**	4.62	Rs. In Lakhs
9	**Debt Service Coverage Ratio**	2.85	
10	**Break Even Point**	39%	
11	**Power Requiremnet**	20	KW
12	**Employment**	8	Persons
13	**Major Raw Materials**	Diatomaceous earth stones or ores and packaging material	

14 Details of Cost of Project & Means of Finance

Cost of Project **Amount in Lacs**

Particulars	Amount
Land and building	Owned/Leased
Plant & Machinery	18.00
Furniture & Fixture	1.00
Other Misc Assets	0.50
Working Capital Requirement	5.13
Total	**24.63**

Means of Finance

Particulars	Amount
Own Contribution	2.46
Term Loan	17.55
Working capital Loan	4.62
Total	**24.63**

DIATOMACEOUS EARTH POWDER PRODUCTION UNIT

1. INTRODUCTION

Diatomaceous earth is a naturally occurring, soft, siliceous sedimentary rock that can be crumbled into a fine white to off white powder. It has a particle size ranging from more than 3 μm to less than 1 mm, but typically 10 to 200 μm. Diatomaceous earth (DE) is a silicon dioxide ($SiO_2 \cdot nH_2O$) mineral made up of fossilized single-celled algae called diatoms. Diatom silica is available from two sources: from culturing diatoms, which is expensive and has limited scalability, and from fossilized Diatomaceous earth minerals available in large quantities from the mineral industry. Depending on the granularity, this powder can have an abrasive feel, similar to pumice powder, and has a low density as a result of its high porosity. The typical chemical composition of oven-dried diatomaceous earth is 80–90% silica, with 2–4% alumina (attributed mostly to clay minerals), and 0.5–2% iron oxide. Diatomaceous earth consists of fossilized remains of diatoms, a type of hard-shelled protist. It is used as a filtration aid, mild abrasive in products including metal polishes and toothpaste, mechanical insecticide, absorbent for liquids, matting agent for coatings, reinforcing filler in plastics and rubber, anti-block in plastic films, porous support for chemical catalysts, cat litter, activator in blood clotting studies, a stabilizing component of dynamite, a thermal insulator, and a soil for potted plants and trees like bonsai. Diatomaceous earth is often processed by grinding, drying, and classifying the material into a powdery dust-like form. The basic processing of DE includes milling, possible purification, drying, and calcination to reduce moisture and make it a fine, talc-like powder, or dust.

2 PRODUCT DISCRIPTION

2.1 PRODUCT USES

Diatomaceous earth powder is used in the FNCG products industry. It may be used to remove unwanted material from drinking water. It is also used as a filler or to prevent the formation of lumps in foods, medicine, paints and plastics, and pet litter. Diatomaceous earth is used as part of various chemical tests. It is also used as an insecticide. Diatomaceous earth is may be used as a source of silica, for treating high cholesterol levels, for treating constipation, and for improving the health of skin, nails, teeth, bones, and hair. Diatomaceous earth can be used to brush teeth and also to remove unwanted dead skin cells.

2.2 MANUFACTURING PROCESS

The manufacturing process is as follows-

Raw material procurement
Processing
Packing
Testing

Raw Material Procurement

The raw materials are checked strictly as per established quality standards and requirements. Individual supplier assessment and supplier rating are done depending upon the rejection levels at the incoming quality control stage. Preliminary testing of the facility should be carried out by the facility operator to standardize the equipment performance and correct any deficiencies encountered during the testing. The raw material should be stored in a well-organized area. To store raw material and processed products efficiently, can also develop a sound warehouse at infrastructure. Also, to keep a proper track of incoming and outgoing stock can dissect this warehouse in various units. The warehouse should be installed with all the amenities that are required for the safe and easy storage of offered minerals and allied products. Moreover, this warehouse shall be looked after by professionals who will ensure that the required amenities are upgraded on regular basis to ensure that vendors don't have to face any trouble with the storage of products.

Powder Making Process

The basic processing of DE includes milling, possible purification, drying, and calcination to reduce moisture and make it a fine, talc-like powder, or dust.

1. **Material unloading:** Raw material will be unloaded by crusher. Responsible for the quality and safety of products, the process of loading and unloading consists of loading and unloading goods properly. Loads should be spread as evenly as possible, during both loading and unloading. Uneven loads can make the vehicle or trailer unstable. Loads should be secured, or arranged so that they do not slide around. After unloading, material testing will be done. Where chemical and physical tests will conduct.
2. **Crushing:** After raw material quality testing, the final raw DE is sent for crushing. It will crush bulky raw material in small size**.** Here DE is crushed by a hammer crusher to the size required which is suitable for grinding it. After that through the elevator crushed materials are put in the hopper for grinding.
3. **Grinding:** In manufacturing diatomaceous earth from DE stones, the crude is quarried or milled using a grinder. In this process, the raw material will be ground for particle size reduction. The crushed diatomaceous earth is elevated into a hopper by bucket elevator from which the diatomaceous earth is transported through the vibrating feeder evenly and continuously into the grinding chamber for the grinding. The rollers oscillate outward to press the ring because of the centrifugal force and the shovel scoops up the diatomaceous earth, send to the middle between the ring and roller to accomplish the grind. A grinder uses a mechanical action to break the material and reduce it to the powder form or required size.
4. **Screening:** After this, the ground diatomaceous earth is carried by the air from the blower into the powder separator or vibrator for screening. The fine diatomaceous earth powders are blown into the cyclone powder collector and are poured out through the output-powder valve as the final products, and diatomaceous earth after the screening will be recycled back into the grinding chamber for regrinding. The set's airflow system is closely sealed up and circulated under conditions of negative and positive pressure.
5. **Heating:** If moisture is present in powder, then it will take to the oven, and the material will be brought to the proper moisture content.

6. **Packaging:** After the moisture has been removed the powder is then tested and sent for packaging. The powder will be weighted and it will be packed by a powder packaging machine. A worker will load premade bags manually at regular intervals into the bag infeed magazine, which must be carefully shingled to ensure proper loading into the bagging machine. These bags will then be conveyed to the interior of the machine one by one by a bag feeding roller. The machine measures/weighs the powder product to be dispensed into each bag. The filling head dispenses consistent amounts of the powder product into each bag. And later bag will be zipped or sealed by the same machine.


Material unloading & testing


Material feeding


Grinding


Screening


Fine powder


QC & Packing

Testing

- Quality Control: brightness or whiteness, abrasiveness, absorptive capacity, silica content will be tested. Chemical test, Physical test, Density, Moisture content. Foreign material detection, Powder quality will be tested here.

3. PROJECT COMPONENTS

3.1 Land /Civil Work

The land required for this manufacturing unit will be approx. around 1,000-1,500 square feet. Land Purchase and Building Civil Work Cost have not been considered as part of the cost of project. It is expected that the premises will be on rental and approximate rentals assumed of the same will be Rs. 20,000 per month.

- Workshop Area- This area includes the setup and foundation space for all equipment's, work floor area, etc. Total workshop area is approx. 700 Sqft.

- Inventory Area- This area includes the storage space for all the raw materials and finished goods. Total inventory area is approx. 400 Sqft.
- Office Area – This space includes staff working region, their accommodation space. Total workshop area is approx. 200 Sqft. This may be considered above the ground floor.
- Parking Space, Electric Mounting Space, and Others. This could be approx. 100 Sqft.

Land and building requirement may vary depending on the size of project

3.2 Plant & Machinery

3.2.1 Crusher

Crusher is used to crush raw Diatomaceous earth stones in small size.

- **Grinder**

This grinder is used to grind Diatomaceous earth into powdery form.

- **Screener**

  This screener is used to remove fine, ferrous contaminants from dry powder. Circular vibratory screeners can sift, de-dust, and classify a wide range of powders, eliminating any unwanted solids and ensuring consistent and reliable processing.

- **Moisture Removal Oven**

  This oven is used to remove moisture content from Diatomaceous earth powder.

- **Powder Packaging Machine**

  This machine is used for automatic weighing and bagging the DE powder**.** A powder bagging machine is versatile equipment that does two fundamental processes.

Dispensing powders into premade bags and tightly sealing the bags or pouches shut. The machine is loaded with bags that are already formed into their end shape (premade). The bags are then fed into the machine where they are opened, filled with product, and sealed shut.

Other Equipment and machineries

- Bucket Elevator
- Belt conveyers
- Storage Hopper
- Vibrating feeder

S No.	Name of the machineries	Qty	Cost (INR)
1.	3 Roller Pulvarising Mill consisting of following		15,25,000
a)	Automatic Vibrator System	1	
b)	Cyclone Dust Collector	1	
c)	Jaw Crusher	1	
d)	Hopper	1	
TOTAL			15,25,000
ADD: GST @ 18%			2,74,500
TOTAL COST INCLUSIVE OF GST			**17,99,500**

Note: The aforesaid cost of Plant and Machinery is inclusive of GST and other transportation cost.

4. LICENSE AND APPROVALS

i. MSME Udyam online registration.
ii. GST Registration
iii. BIS Certification
iv. ISO Certification
v. NOC from the Pollution control board

PROJECTED BALANCE SHEET **(in Lacs)**

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
Liabilities					
Capital					
Opening Balance		4.69	7.37	10.15	12.87
Add:- Own Capital	2.46				
Add:- Retained Profit	5.23	7.68	9.79	11.72	13.55
Less:- Drawings	3.00	5.00	7.00	9.00	10.50
Closing Balance	4.69	7.37	10.15	12.87	15.93
Term Loan	15.60	11.70	7.80	3.90	-
Working Capital Limit	4.62	4.62	4.62	4.62	4.62
Sundry Creditors	3.14	3.60	3.51	3.57	3.83
Provisions & Other Liabilities	1.00	1.50	1.80	2.16	2.59
TOTAL :	**29.04**	**28.78**	**27.88**	**27.12**	**26.96**
Assets					
Fixed Assets (Gross)	19.50	19.50	19.50	19.50	19.50
Gross Depriciation	2.90	5.37	7.47	9.25	10.77
Net Fixed Assets	**16.60**	**14.13**	**12.03**	**10.25**	**8.73**
Current Assets					
Sundry Debtors	4.18	4.97	5.59	6.25	6.94
Stock in Hand	4.08	4.84	5.44	6.07	6.73
Cash and Bank	0.48	0.34	0.81	0.75	0.32
Loans and advances/other current assets	3.70	4.50	4.00	3.80	4.25
TOTAL :	**29.04**	**28.78**	**27.88**	**27.12**	**26.96**

PROJECTED CASH FLOW STATEMENT **(in Lacs)**

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
SOURCES OF FUND					
Own Margin	2.46				
Net Profit	5.44	8.50	11.30	14.06	16.69
Depriciation & Exp. W/off	2.90	2.47	2.10	1.79	1.52
Increase in Cash Credit	4.62	-	-	-	-
Increase In Term Loan	17.55	-	-	-	-
Increase in Creditors	3.14	0.47	- 0.09	0.06	0.26
Increase in Provisions & Other liabilities	1.00	0.50	0.30	0.36	0.43
TOTAL :	**37.11**	**11.93**	**13.61**	**16.27**	**18.89**
APPLICATION OF FUND					
Increase in Fixed Assets	19.50				
Increase in Stock	4.08	0.76	0.60	0.63	0.66
Increase in Debtors	4.18	0.79	0.62	0.66	0.69
Increase in loans and advances	3.70	0.80	- 0.50	- 0.20	0.45
Repayment of Term Loan	1.95	3.90	3.90	3.90	3.90
Drawings	3.00	5.00	7.00	9.00	10.50
Taxation	0.21	0.83	1.52	2.34	3.13
TOTAL :	**36.63**	**12.07**	**13.14**	**16.33**	**19.33**
Opening Cash & Bank Balance	-	0.48	0.34	0.81	0.75
Add : Surplus	0.48	-0.14	0.47	-0.06	-0.43
Closing Cash & Bank Balance	**0.48**	**0.34**	**0.81**	**0.75**	**0.32**

PROJECTED PROFITABILITY STATEMENT **(in Lacs)**

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation %	**55%**	**60%**	**65%**	**70%**	**75%**
SALES					
DIATOMACEOUS EARTH POWDE	78.38	93.21	104.90	117.18	130.07
Total	**78.38**	**93.21**	**104.90**	**117.18**	**130.07**
COST OF SALES					
Raw material cost	49.50	54.00	58.50	63.00	67.50
Electricity Expenses	2.64	2.88	3.12	3.36	3.60
Depreciation	2.90	2.47	2.10	1.79	1.52
Wages & labour	10.44	12.53	15.03	18.04	21.65
Repair & maintenance	0.39	0.93	1.31	1.76	2.15
Consumables	1.18	1.40	1.57	1.76	1.95
Packaging cost	0.98	1.35	1.68	1.99	2.21
Cost of Production	68.03	75.56	83.32	91.69	100.58
Add: Opening Stock	-	3.92	4.66	5.24	5.86
Less: Closing Stock	3.92	4.66	5.24	5.86	6.50
Cost of Sales	64.11	74.82	82.73	91.08	99.93
GROSS PROFIT	**14.27**	**18.39**	**22.16**	**26.10**	**30.13**
Salary to Staff	2.88	3.31	3.81	4.38	5.04
Interest on Term Loan	1.72	1.52	1.09	0.66	0.23
Interest on working Capital	0.51	0.51	0.51	0.51	0.51
Rent	2.34	2.69	3.09	3.56	4.09
Selling & Administration Expenses	1.37	1.86	2.36	2.93	3.58
TOTAL	**8.82**	**9.89**	**10.86**	**12.04**	**13.45**
NET PROFIT	5.44	8.50	11.30	14.06	16.69
Taxation	0.21	0.83	1.52	2.34	3.13
PROFIT (After Tax)	5.23	7.68	9.79	11.72	13.55

CALCULATION OF D.S.C.R

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
CASH ACCRUALS	8.13	10.14	11.89	13.51	15.08
Interest on Term Loan	1.72	1.52	1.09	0.66	0.23
Total	9.85	11.66	12.98	14.17	15.31
REPAYMENT					
Instalment of Term Loan	1.95	3.90	3.90	3.90	3.90
Interest on Term Loan	1.72	1.52	1.09	0.66	0.23
Total	3.67	5.42	4.99	4.56	4.13
DEBT SERVICE COVERAGE RATIO	**2.68**	**2.15**	**2.60**	**3.11**	**3.70**
AVERAGE D.S.C.R.					**2.85**

REPAYMENT SCHEDULE OF TERM LOAN							
					Interest		11.00%
Year	**Particulars**	**Amount**	**Addition**	**Total**	**Interest**	**Repayment**	**Closing Balance**
1st	Opening Balance	-					
	1st month		17.55	17.55	-		17.55
	2nd month	17.55	-	17.55	0.16	-	17.55
	3rd month	17.55	-	17.55	0.16	-	17.55
	4th month	17.55	-	17.55	0.16	-	17.55
	5th month	17.55	-	17.55	0.16	-	17.55
	6th month	17.55	-	17.55	0.16	-	17.55
	7th month	17.55	-	17.55	0.16	0.33	17.23
	8th month	17.23	-	17.23	0.16	0.33	16.90
	9th month	16.90	-	16.90	0.15	0.33	16.58
	10th month	16.58	-	16.58	0.15	0.33	16.25
	11th month	16.25	-	16.25	0.15	0.33	15.93
	12th month	15.93	-	15.93	0.15	0.33	15.60
					1.72	**1.95**	
2nd	Opening Balance						
	1st month	15.60	-	15.60	0.14	0.33	15.28
	2nd month	15.28	-	15.28	0.14	0.33	14.95
	3rd month	14.95	-	14.95	0.14	0.33	14.63
	4th month	14.63	-	14.63	0.13	0.33	14.30
	5th month	14.30	-	14.30	0.13	0.33	13.98
	6th month	13.98	-	13.98	0.13	0.33	13.65
	7th month	13.65	-	13.65	0.13	0.33	13.33
	8th month	13.33	-	13.33	0.12	0.33	13.00
	9th month	13.00	-	13.00	0.12	0.33	12.68
	10th month	12.68	-	12.68	0.12	0.33	12.35
	11th month	12.35	-	12.35	0.11	0.33	12.03
	12th month	12.03	-	12.03	0.11	0.33	11.70
					1.52	**3.90**	
3rd	Opening Balance						
	1st month	11.70	-	11.70	0.11	0.33	11.38
	2nd month	11.38	-	11.38	0.10	0.33	11.05
	3rd month	11.05	-	11.05	0.10	0.33	10.73
	4th month	10.73	-	10.73	0.10	0.33	10.40
	5th month	10.40	-	10.40	0.10	0.33	10.08
	6th month	10.08	-	10.08	0.09	0.33	9.75
	7th month	9.75	-	9.75	0.09	0.33	9.43
	8th month	9.43	-	9.43	0.09	0.33	9.10
	9th month	9.10	-	9.10	0.08	0.33	8.78
	10th month	8.78	-	8.78	0.08	0.33	8.45
	11th month	8.45	-	8.45	0.08	0.33	8.13

	12th month	8.13	-	8.13	0.07	0.33	7.80
					1.09	**3.90**	
4th	Opening Balance						
	1st month	7.80	-	7.80	0.07	0.33	7.48
	2nd month	7.48	-	7.48	0.07	0.33	7.15
	3rd month	7.15	-	7.15	0.07	0.33	6.83
	4th month	6.83	-	6.83	0.06	0.33	6.50
	5th month	6.50	-	6.50	0.06	0.33	6.18
	6th month	6.18	-	6.18	0.06	0.33	5.85
	7th month	5.85	-	5.85	0.05	0.33	5.53
	8th month	5.53	-	5.53	0.05	0.33	5.20
	9th month	5.20	-	5.20	0.05	0.33	4.88
	10th month	4.88	-	4.88	0.04	0.33	4.55
	11th month	4.55	-	4.55	0.04	0.33	4.23
	12th month	4.23	-	4.23	0.04	0.33	3.90
					0.66	**3.90**	
5th	Opening Balance						
	1st month	3.90	-	3.90	0.04	0.33	3.58
	2nd month	3.58	-	3.58	0.03	0.33	3.25
	3rd month	3.25	-	3.25	0.03	0.33	2.93
	4th month	2.93	-	2.93	0.03	0.33	2.60
	5th month	2.60	-	2.60	0.02	0.33	2.28
	6th month	2.28	-	2.28	0.02	0.33	1.95
	7th month	1.95	-	1.95	0.02	0.33	1.63
	8th month	1.63	-	1.63	0.01	0.33	1.30
	9th month	1.30	-	1.30	0.01	0.33	0.98
	10th month	0.98	-	0.98	0.01	0.33	0.65
	11th month	0.65	-	0.65	0.01	0.33	0.33
	12th month	0.33	-	0.33	0.00	0.33	-
					0.23	**3.90**	
	DOOR TO DOOR	60	MONTHS				
	MORATORIUM PERIOD	6	MONTHS				
	REPAYMENT PERIOD	54	MONTHS				

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