PROJECT REPORT

OF

AIR COOLER MANUFACTURING UNIT

PURPOSE OF THE DOCUMENT

This particular pre-feasibility is regarding Air Cooler 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**	20.44	Rs. In Lakhs
8	**Means of Finance**		
i)	**Own Contribution**	2.04	Rs. In Lakhs
ii)	**Term Loan**	14.40	Rs. In Lakhs
iii)	**Working Capital**	4.00	Rs. In Lakhs
9	**Debt Service Coverage Ratio**	2.51	
10	**Break Even Point**	0.28	
11	**Power Requiremnet**	15	KW
12	**Employment**	10	Persons
13	**Major Raw Materials**	Galvinised Steel Sheets, Cooler Parts, Cooler Pump, Cooling pads, Connection wires & PVC or Rubber pipes, Screws & nuts	

14 Details of Cost of Project & Means of Finance

Cost of Project

Particulars	Amount (In Lacs)
Land	Owned/Leased
Building & Civil Work	Owned/Leased
Plant & Machinery	14.50
Furniture & Fixture	0.50
Other Misc Assets	1.00
Working Capital Requirement	4.44
Total	**20.44**

Means of Finance

Particulars	Amount (In Lacs)
Own Contribution	2.04
Term Loan	14.40
Working capital Loan	4.00
Total	**20.44**

1. INTRODUCTION

An **air cooler** is a cooling device used to maintain the temperature of given space by performing cooling with humidification process. Air Coolers basically consist of body, fan, water pump and control switch etc.

An exhaust fan is mounted inside a cooler housing and vertical sides of the cooler housing are fitted with cooling pad. These pads are kept wet with the help of water pump. Rotation of fan mounted inside the body draws air from all the three sides through wet pads. Thus, air gets cooled by evaporation of water and which is blown into the room. Air coolers have advantages such as, they are easy to maintain, budget friendly, and portable, compared to air conditioners. Types of air coolers are -

Personal coolers: This type of air cooler is made for smaller spaces and they provide good portability. These are often called 'mini air coolers' too. These coolers are well known for energy saving and also cleans the air in your surroundings to provide fresh, cool air that gives you comfort against sweat and heat.

Tower air coolers: Tower coolers can give cooling in greater spaces, and in lesser time as they circulate air vertically. The air coolers are intended to be just about as calm as could be expected and make less noise.

Window air coolers: As the name proposes, window air coolers are ideal to be introduced on the window outline. The unit contains a tank that is outside the house when introduced and it occupies no room inside the house. In spite of the fact that it occupies negligible room on the divider it gives great cooling to the room. Window air coolers are dependable as they are planned with superior plastic bodies and incorporate honeycomb pads.

Desert air coolers: Desert air coolers are suitable for places where humidity is low and the temperature is high. These coolers also work on the principle of evaporating heat from water and pushing cool air. As such conditions are mainly found in desert areas.

2. PRODUCT DESCRIPTION

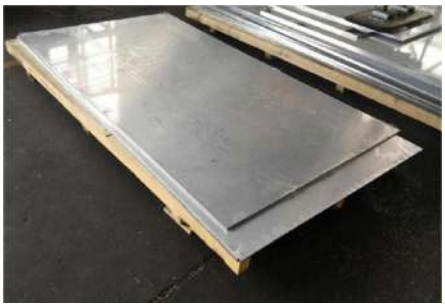
2.1 PRODUCT USES

These air coolers are suitable for places where humidity is low and the temperature is high. These air coolers are easy to maintain, budget friendly, provide good air flow and portable hence it is used for domestic use, animal shelter, for agricultural controlled atmosphere facilities etc.

2.2 RAW MATERIAL REQUIREMENT

The main raw materials required for manufacturing Air Cooler are as follows:

- Galva1nized steel sheet- This sheet come with zinc coating and zinc coat helps to prevent corrosion.



- Cooler Parts- Exhaust fan, cooler motor, cooler switches etc. provided in cooler kit. The switches are used to on off operation or to control the air flow.

- Cooler pump- The pump brings water to the evaporative cooling pads.

- Cooling Pad - When the hot air passes through these pads, the heat is absorbed by the water spread on pads.

- Cable/wires- Power cable, connecting wires etc.

- Other- PVC or rubber Pipes, Screws, nuts etc.

4.3 MANUFACTURING PROCESS

This process can be broken down into following steps:

- Raw material procurement
- Metal part fabrication
- Assembly – 1) Internal parts assembly
  2) Final assembly
- Testing

Raw material procurement:

The GI steel sheet around 2-5 mm thickness, cold rolled, recantaguler shape will be purchased along with other required raw material. The quantity of raw

materials will be handled. Quality checking will be done. Sorting of raw material as per their types will be performed. And later material will stored in raw material inventory.

Metal part fabrication:

Here cooler body is made from steel metal. Grills, front panel, top cover, back side, base part, corner pillars with slots will be formed by machines and workers. As per the design specifications, GI sheet is sheared by using guillotine shearing machine, then Punch machine is used to make slots in metal as per requirement like to maintain proper ventilation for grills, then sheet will be bent by using bending machine. Cutting machine is used to cut corners of sheet. And for assembling these parts can be riveted together or can be joined by welding, for which welding apparatus will be used.

Assembly

1) Internal parts assembly-

After preparing the cooler body parts; base and front parts will be dispatched to next assembly line along with internal parts of cooler. First fan will be mounted at internal side of front panel of cooler. After that water pump, power switch, control switch will be fitted. Wiring connections for fan, switches, motor, and controller will be done and tested. After finishing internal parts assembly, it will be ready for final assembly.

2) Final assembly-

Grills will be placed in front of fan to guide the wind to where air will move, then cooling pads will be attached with vertical sides, water pipes will be attached to distribute equal water for cooling pad, then vertical sides, back side

and top cover will be assembled together. At last cooler will be painted to give it desired colour. And then it will dispatch for testing.

Testing

Assembled cooler is tested as per the requirement of ISO: 2000.

The basic requirements of the tests are as below:

- Insulation Resistance Test - The insulation resistance between all electrical circuits when measures at normal room temperature with measure of 500 V DC should be not less than 1 Mega Ohm.
- Operational Efficiency Test - Air delivery and air-cooling efficiency for various capacities of air coolers shall be within the limits.

- High Voltage Test - The electrical insulation all electric circuits shall be able to withstand high voltage tests of 1000V rms for single phase motors applied for not less than 2 seconds.

3. PROJECT COMPONENTS

3.1 Land /Civil Work

The land require for this manufacturing unit will be approx. around 2500-3000 square feet. We have not considered the cost of Land purchase & Building Civil work in the project. It is assumed that land & building will be on rent & approx. rental of the same will be Rs.30000.00 to 40000 per month.

3.2 Plant & Machinery

This manufacturing unit will be semi-automatic type and the capacity of this plant will be dependent on the number of factors like total numbers of machines we are using in unit, how much pieces of remote the plant produces daily etc.

- **Guillotine shearing machine**

A guillotine is a machine tool that used to cut steal sheet metal. The machine may be foot powered, less commonly hand powered, or mechanically or hydraulically powered. It works by first clamping the material with a ram. A moving blade then comes down across a fixed blade to shear the sheet. Mechanical shears are faster in full cycle mode. Mechanical shears have simpler mechanisms to maintain and repair making up time longer and downtime shorter.

- **Power Press machine**

Power Press is a functional sheet metal machine that is utilized for bending, cutting, pressing and forming work piece into different sizes and shapes. This press machine will be used to cut steel into the desired shape required to make cooler body parts.

- **Metal cutting machine**

Metal cutting machines are machine tools used for cutting out parts of metal.

- **Bending machine**

Bending machine used for bending and straightening metal sheets and strips.

- **Drill machine (Portable)**

It used for drilling holes whilst assembly of cooler takes place.

- **Gas welding apparatus**

The gas welding is used for joining metal sheets and plates having thickness of 2 to 50 mm.

- **Air compressor with spray gun**

This can be used for paint the cooler body. Paint sprayers can override bumps, cracks, gaps.

Tools like measuring tape, wire, cable strippers, screwdrivers, electronic pliers, crimping tools, thermal wire strippers, cable cutters etc. will be required.

- **Tools requires for testing:**

Air flow & temperature measuring apparatus.

1) Anemometer

An anemometer is a device used for measuring wind speed and direction

2) Insulation tester

It's an electrical meter used to determine the condition of the insulation on wire and motor windings.

7. LICENSE & APPROVALS

- Obtain Trade License from the local authority.
- MSME Udyam online registration.
- GST Registration
- Company registration (optional)
- Factory license

PROJECTED BALANCE SHEET **(in Lacs)**

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
Liabilities					
Capital					
Opening Balance		2.75	4.27	6.60	9.36
Add:- Own Capital	2.04				
Add:- Retained Profit	3.60	5.28	6.83	8.51	9.58
Less:- Drawings	2.90	3.75	4.50	5.75	6.50
Closing Balance	2.75	4.27	6.60	9.36	12.44
Term Loan	12.80	9.60	6.40	3.20	-
Working Capital Limit	4.00	4.00	4.00	4.00	4.00
Sundry Creditors	2.21	2.65	3.13	3.65	4.21
Provisions & Other Liabilities	0.50	0.55	0.61	0.67	0.73
TOTAL :	**22.25**	**21.07**	**20.73**	**20.87**	**21.38**
Assets					
Fixed Assets (Gross)	16.00	16.00	16.00	16.00	16.00
Gross Depreciation	2.38	4.40	6.12	7.58	8.83
Net Fixed Assets	**13.63**	**11.60**	**9.88**	**8.42**	**7.17**
Current Assets					
Sundry Debtors	2.54	3.14	3.71	4.33	5.00
Stock in Hand	3.64	4.33	5.10	5.92	6.81
Cash and Bank	1.45	0.49	1.04	2.21	2.40
Loans and advances/other current assets	1.00	1.50	1.00	-	-
TOTAL :	**22.25**	**21.07**	**20.73**	**20.87**	**21.38**

PROJECTED PROFITABILITY STATEMENT **(in Lacs)**

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation %	**35%**	**40%**	**45%**	**50%**	**55%**
SALES					
AIR COOLER	76.13	94.11	111.22	129.82	149.97
Total	**76.13**	**94.11**	**111.22**	**129.82**	**149.97**
COST OF SALES					
Raw material cost	47.25	56.70	66.99	78.14	90.26
Electricity Expenses	2.52	2.90	3.33	3.83	4.41
Depreciation	2.38	2.02	1.72	1.46	1.25
Wages & labour	7.80	8.58	9.44	9.44	9.91
Repair & maintenance	1.14	1.18	1.11	1.30	1.50
Consumables	0.76	1.88	3.34	5.19	6.75
Cost of Production	61.85	73.26	85.93	99.37	114.08
Add: Opening Stock	-	2.06	2.44	2.86	3.31
Less: Closing Stock	2.06	2.44	2.86	3.31	3.80
Cost of Sales	59.79	72.88	85.50	98.92	113.59
GROSS PROFIT	**16.34**	**21.23**	**25.72**	**30.90**	**36.39**
	21.46%	**22.56%**	**23.12%**	**23.80%**	**24.26%**
Salary to Staff	5.04	5.80	6.67	8.00	9.60
Interest on Term Loan	1.42	1.25	0.89	0.54	0.19
Interest on working Capital	0.44	0.44	0.44	0.44	0.44
Rent	4.32	4.54	4.99	5.74	6.89
Selling & Administration Expenses	1.52	3.76	5.56	7.14	8.25
TOTAL	**12.74**	**15.78**	**18.55**	**21.86**	**25.36**
NET PROFIT	3.60	5.45	7.17	9.04	11.03
	4.73%	**5.79%**	**6.45%**	**6.96%**	**7.35%**
Taxation	-	0.17	0.34	0.53	1.45
PROFIT (After Tax)	3.60	5.28	6.83	8.51	9.58

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

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
SOURCES OF FUND					
Own Margin	2.04				
Net Profit	3.60	5.45	7.17	9.04	11.03
Depriciation & Exp. W/off	2.38	2.02	1.72	1.46	1.25
Increase in Cash Credit	4.00	-	-	-	-
Increase In Term Loan	14.40	-	-	-	-
Increase in Creditors	2.21	0.44	0.48	0.52	0.57
Increase in Provisions & Other liabilities	0.50	0.05	0.06	0.06	0.07
TOTAL :	**29.13**	**7.96**	**9.42**	**11.08**	**12.90**
APPLICATION OF FUND					
Increase in Fixed Assets	16.00				
Increase in Stock	3.64	0.70	0.77	0.82	0.89
Increase in Debtors	2.54	0.60	0.57	0.62	0.67
Increase in loans and advances	1.00	0.50	- 0.50	- 1.00	-
Repayment of Term Loan	1.60	3.20	3.20	3.20	3.20
Drawings	2.90	3.75	4.50	5.75	6.50
Taxation	-	0.17	0.34	0.53	1.45
TOTAL :	**27.67**	**8.91**	**8.88**	**9.92**	**12.71**
Opening Cash & Bank Balance	-	1.45	0.49	1.04	2.21
Add : Surplus	1.45	-0.96	0.55	1.17	0.19
Closing Cash & Bank Balance	**1.45**	**0.49**	**1.04**	**2.21**	**2.40**

CALCULATION OF D.S.C.R

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
CASH ACCRUALS	5.98	7.30	8.55	9.97	10.83
Interest on Term Loan	1.42	1.25	0.89	0.54	0.19
Total	7.39	8.54	9.44	10.52	11.02
REPAYMENT					
Instalment of Term Loan	1.60	3.20	3.20	3.20	3.20
Interest on Term Loan	1.42	1.25	0.89	0.54	0.19
Total	3.02	4.45	4.09	3.74	3.39
DEBT SERVICE COVERAGE RATIO	**2.45**	**1.92**	**2.31**	**2.81**	**3.25**
AVERAGE D.S.C.R.					**2.51**

REPAYMENT SCHEDULE OF TERM LOAN							
					Interest		11.00%
Year	Particulars	Amount	Addition	Total	Interest	Repayment	Closing Balance
ist	Opening Balance	-					
	1st month		14.40	14.40	-	-	14.40
	2nd month	14.40	-	14.40	0.13	-	14.40
	3rd month	14.40	-	14.40	0.13	-	14.40
	4th month	14.40	-	14.40	0.13	-	14.40
	5th month	14.40	-	14.40	0.13	-	14.40
	6th month	14.40	-	14.40	0.13	-	14.40
	7th month	14.40	-	14.40	0.13	0.27	14.13
	8th month	14.13	-	14.13	0.13	0.27	13.87
	9th month	13.87	-	13.87	0.13	0.27	13.60
	10th month	13.60	-	13.60	0.12	0.27	13.33
	11th month	13.33	-	13.33	0.12	0.27	13.07
	12th month	13.07	-	13.07	0.12	0.27	12.80
					1.42	1.60	
2nd	Opening Balance						
	1st month	12.80	-	12.80	0.12	0.27	12.53
	2nd month	12.53	-	12.53	0.11	0.27	12.27
	3rd month	12.27	-	12.27	0.11	0.27	12.00
	4th month	12.00	-	12.00	0.11	0.27	11.73
	5th month	11.73	-	11.73	0.11	0.27	11.47
	6th month	11.47	-	11.47	0.11	0.27	11.20
	7th month	11.20	-	11.20	0.10	0.27	10.93
	8th month	10.93	-	10.93	0.10	0.27	10.67
	9th month	10.67	-	10.67	0.10	0.27	10.40
	10th month	10.40	-	10.40	0.10	0.27	10.13
	11th month	10.13	-	10.13	0.09	0.27	9.87
	12th month	9.87	-	9.87	0.09	0.27	9.60
					1.25	**3.20**	
3rd	Opening Balance						
	1st month	9.60	-	9.60	0.09	0.27	9.33
	2nd month	9.33	-	9.33	0.09	0.27	9.07
	3rd month	9.07	-	9.07	0.08	0.27	8.80
	4th month	8.80	-	8.80	0.08	0.27	8.53
	5th month	8.53	-	8.53	0.08	0.27	8.27
	6th month	8.27	-	8.27	0.08	0.27	8.00
	7th month	8.00	-	8.00	0.07	0.27	7.73
	8th month	7.73	-	7.73	0.07	0.27	7.47
	9th month	7.47	-	7.47	0.07	0.27	7.20
	10th month	7.20	-	7.20	0.07	0.27	6.93
	11th month	6.93	-	6.93	0.06	0.27	6.67
	12th month	6.67	-	6.67	0.06	0.27	6.40
					0.89	**3.20**	

4th	Opening Balance						
	1st month	6.40	-	6.40	0.06	0.27	6.13
	2nd month	6.13	-	6.13	0.06	0.27	5.87
	3rd month	5.87	-	5.87	0.05	0.27	5.60
	4th month	5.60	-	5.60	0.05	0.27	5.33
	5th month	5.33	-	5.33	0.05	0.27	5.07
	6th month	5.07	-	5.07	0.05	0.27	4.80
	7th month	4.80	-	4.80	0.04	0.27	4.53
	8th month	4.53	-	4.53	0.04	0.27	4.27
	9th month	4.27	-	4.27	0.04	0.27	4.00
	10th month	4.00	-	4.00	0.04	0.27	3.73
	11th month	3.73	-	3.73	0.03	0.27	3.47
	12th month	3.47	-	3.47	0.03	0.27	3.20
					0.54	**3.20**	
5th	Opening Balance						
	1st month	3.20	-	3.20	0.03	0.27	2.93
	2nd month	2.93	-	2.93	0.03	0.27	2.67
	3rd month	2.67	-	2.67	0.02	0.27	2.40
	4th month	2.40	-	2.40	0.02	0.27	2.13
	5th month	2.13	-	2.13	0.02	0.27	1.87
	6th month	1.87	-	1.87	0.02	0.27	1.60
	7th month	1.60	-	1.60	0.01	0.27	1.33
	8th month	1.33	-	1.33	0.01	0.27	1.07
	9th month	1.07	-	1.07	0.01	0.27	0.80
	10th month	0.80	-	0.80	0.01	0.27	0.53
	11th month	0.53	-	0.53	0.00	0.27	0.27
	12th month	0.27	-	0.27	0.00	0.27	-
					0.19	**3.20**	

DOOR TO DOOR	60	MONTHS
MORATORIUM PERIOD	6	MONTHS
REPAYMENT PERIOD	54	MONTHS

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