KITCHEN APPLIANCES

1. INTRODUCTION:

Home appliances are electrical and mechanical operated mechanisms / machines which accomplish kitchen and household functions,such as cooling/heating, cooking or cleaning. These home appliances are called white goods, kitchen appliances or Consumer or brown goods.

The appliances used in the kitchen includes juicers, electric mixers, meat grinders, coffee grinders, deep fryers, herb grinders, food processors,electric kettles, waffle irons, coffee makers, blenders and dough blenders, rice cookers,toasters, stoves, ovens, microwave ovens and induction cookers and exhaust chimney / hoods. Other appliances like dishwashers, water heaters, washing machines, trash grinders/ compactors, refrigerators, air conditioners, lighting systems and even water pumps are part of the kitchen/ home appliances range.

2. PRODUCT & ITS APPLICATION:

The kitchen appliances that are popular as per the latest trend are included here for consideration. Other appliances must be considered by the entrepreneur depending on production facilities planned.

Induction cooker:

It heats a cooking vessel by magnetic induction, instead of by thermal conduction from a flame, or other heating element. Induction cooking is quite efficient, as it emits less waste heat into the kitchen, can be quickly turned off, and has safety advantages compared to gas stoves. Cook tops are also usually easy to clean, and the cook-top itself does not get very hot.

Inductive heating directly heats the vessel; very rapid increases in temperature can be achieved. Because the induction effect does not directly heat the air around the vessel, it offers energy efficiencies. The electronics and induction coil is cooled by air blower to safe level.

Microwave oven:

It heats and cooks food by exposing it to electromagnetic radiation in the microwave frequency range. Microwaves inducemolecules in the food to rotate and produce thermal energy in a process known as dielectric heating. Microwave ovens heat foods efficiently because excitation is fairly uniform in the high water content food item. Microwave ovens are popular for reheating previously cooked foods and cooking a variety of foods.

A variant of the conventional microwave is the convection microwave oven, made using combination of a standard microwave with radiant heat or convection heat source for customized cooking. It allows food to be cooked quickly, yet come out browned or crisped, as from a convection oven. Cookware used in a microwave oven has to be selected carefully as they have to be transparent to microwaves viz ceramic stone wares and certain plastic wares. The microwaves heat the food directly and the cookware is indirectly heated by the food.

Food Processors: These appliances normally have multiple functions, depending on the placement and type of attachment or blade. These functions normally include:

- Slicing/chopping fruits and vegetables
- Grinding items such as nuts, seeds, spices, meat, or dried fruit
- Shredding or grating cheese or vegetables
- Pureeing / emulsifying
- Mixing and kneading dough

The primary difference is that different food processors use interchangeable blades / disks attachments rather than a fixed blade and several blade rotation speed control are provided to make it multipurpose. The type of blade configuration and the rotation speed can give multiple operations on food items like mixing, grinding, cutting, etc. Mixers help automate the repetitive tasks of stirring, whisking or beating. When the beaters are replaced by dough kneading blades/ hook, a mixer may also be used to knead. They also have interchangeable bowls like wider and shorter, etc. of more proper shapes and sizes to suit the solid or semi-solid foods. Some variants of food processors designed for specific types of tasks are described here below:

- **Mixers and Blenders**: These are kitchen appliances used to mix, blend or emulsify food and other substances. A stationary blender consists of a blender jar with a rotating metal blade at the bottom, powered by an electric motor in the base. There is an immersion blender configuration available that has motor on top connected by a shaft to a rotating blade at the bottom. It can be used with any container.

- **Dough Mixer:**It is used for kneading large quantities of dough. It is electrical motor driven akneading bar in the center of the bowl. For automation, it is provided with timers and various controls speeds and bowl reversal action to suit the user's needs.

- **Stick blender**: It is a very handy blender as it has no container of its own, but instead has a mixing head with rotating blades that can be immersed in a container like bowls containing hot items.

Toaster: It is a small electric appliance designed to brown sliced bread by exposing it to radiant heat, thus converting it into toast. The most common household toasting appliances are the pop-up toaster and toaster oven. Toasters have a control to adjust how much the appliance toasts the bread.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Any ITI, Diploma or Graduate with some background in manufacturing or marketing.

4. MARKET POTENTIAL AND MARKETING ISSUES. IF ANY:

Kitchen appliances are now widely used in nearly all urban & semi-urban household, restaurants, fast food joints & eateries. They are also widely used in canteens, hospitals, cafeterias & laboratories. Different types and capacity range of appliances are now being used for conventional domestic use as also for larger kitchens. Products range is wide for use in residential kitchens to large commercial kitchen of Hotels, restaurant, eateries, and public facilities like canteens, hospitals etc.

The population growth with improved living standard fueling the demand growth and likely to result in huge demand for appliances for new and replacement needs in urban and semi urban areas. There is very good scope for these products.

5. RAW MATERIAL REQUIREMENTS:

Induction cook-top, requires coil of copper wire called litz wire, a bundle of many smaller insulated wires in parallel, a cook top made of copper, glass, nonmagnetic stainless steels, or aluminum that works as housing. A high frequency ~24 kHz alternating current power is supplied by inverter circuit. A thermostat, fan cooling unit for cook top and circuit, a ferromagnetic disk are also required.

For microwave oven a high-voltage power source, electronic power converter, a high-voltage capacitor, a cavity magnetron, magnetron control micro controller, wave guide, cooking chamber made of a sheet metal, a turntable or metal wave guide stirring fan and digital / manual control panel with either an analog dial-type or digital timer and a control panel with LED, LCD display for operation.

A Food Processor, Mixer Grinder, Blender, Kneaders etc. consist of housing, motor, blades, and food container. A bowl usually made of stainless steel aluminum or transparent plastic is used. A fan-cooled electric motor is secured into the housing by way of vibration dampers, and a small output shaft penetrates the upper housing and meshes with the blade assembly. The bowl either fits around the shaft through a rubber coupling or connected to blades through belt or gears. Different types of blades are available for cutting blending, beating, kneading, shredding or slicing blades are manufactured as per design The motor has multiple electronic speed control unit and a selector switch fitted with safety fuses.

All the electronic components and specialized standard components are procured from suppliers as per design and housing, cooking chamber etc. are produced in house. Electronic parts, hardware, components and raw materials are easily available.

6. MANUFACTURING PROCESS:

Induction cook-top assembly consists of coil of copper wire placed under cook top made of copper, glass, nonmagnetic stainless steels, or aluminum. The coil power supply unit like inverter circuit, transformer etc. are placed also placed under the cook top. And a fan cooling unit is also provided with a thermostat attached to cook top control overheating as also for cooking control. A ferromagnetic disk is provided which functions as a conventional hotplate. All the components are assembled and tested as per design specifications.

A microwave oven is assembled by placing the components and sub-assemblies like high-voltage power source, with transformer /electronic power converter, a high-voltage capacitor, magnetron, magnetron control circuit, a short wave guideto couple microwave power from the magnetron into the cooking chamber etc. are placed in metal housing and a cooking chamber. A turntable or metal wave guide stirring fan is placed and all components of circuit are connected with digital / manual control panel having LED, LCD display for operation. Manufacturing operation involves manufacturing the cooking chamber from sheet metal and assembly of magnetron, control circuit and other components.

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Housings for ovens, toaster etc. may be made from sheet metal, die cast metal, rigid plastic etc. The unit may set up sheet metal and machine shop for housing and components, motor winding shop and assembly and testing facilities. Sheet metal housings will involve cutting, shearing, or gas torching, etc., sheet bending on press brakes, punching manual or powered press, and assembly – joining of the pieces by spot and seam welding. Other Processes used

are riveting, threaded fasteners, or bending and crimping and bead formations with help of special machines.

All parts are assembled on an assembly line that is fed with parts and sub-assemblies at specific stations. The final products undergo inspection and testing as per the specifications of design.

7. MANPOWER REQUIREMENT:

The unit shall require highly skilled service persons. The unit can start from 8 employees initially and increase to 23 or more depending on business volume.

Sr No	Type of Employees	Monthly Salary	No of Employees				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	Skilled Operators	16000	8	10	15	18	18
2	Semi-Skilled/ Helpers	7000	12	15	20	25	30
3	Supervisor/ Manager	20000	0	1	1	1	1
4	Accounts/ Marketing	15000	2	2	4	4	6
5	Other Staff	7000	3	6	8	10	12
	TOTAL		25	34	48	58	67

8. IMPLEMENTATION SCHEDULE:

The unit can be implemented within 6 months from the serious initiation of project work.

Sr No	Activities	Time Required in Months
1	Acquisition of Premises	2
2	Construction (if Applicable)	2
3	Procurement and Installation of Plant and Machinery	2
4	Arrangement of Finance	2
5	Manpower Recruitment and start up	2
	Total Time Required (Activities run concurrently)	6

9. COST OF PROJECT:

The unit will require total project cost of Rs 189.21 lakhs as shown below:

Sr No	Particulars	In Lakhs
1	Land	25.00
2	Building	45.00
3	Plant and Machinery	67.50
4	Fixtures and Electrical Installation	6.85
5	*Other Assets/ Preliminary and Preoperative Expenses*	2.50
6	Margin for working Capital	42.36
	TOTAL PROJECT COST	189.21

10. MEANS OF FINANCE:

The project will require promoter to invest about Rs 79.07 lakhs and seek bank loans of Rs 110.15 lakhs based on 70% loan on fixed assets.

Sr No	Particulars	In Lakhs
1	Promoters Contribution	79.07
2	Loan Finance	110.14
	TOTAL:	189.21

11. WORKING CAPITAL REQUIREMENTS:

Working capital requirements are calculated as below:

Sr No	Particulars	Gross Amount	Margin %	Margin Amount	Bank Finance
1	Inventories	30.20	40	12.08	18.12
2	Receivables	24.52	40	9.81	14.71
3	Overheads	5.76	100	5.76	0.00
4	Creditors	36.79	40	14.71	22.07
	TOTAL	97.26		42.36	54.90

12. LIST OF MACHINERY REQUIRED:

Sr No	Particulars	UOM	Quantity	Rate	Total Value
	Main Machines/ Equipment				
1	Sheet Shearing Machine	Nos	1	200000	200000
2	Laser/ Plasma Profile cutting m/cs	Nos	1	650000	650000
3	Press Brake	Nos	1	250000	250000
4	Hydraulic Press	Nos	1	350000	350000
5	Mech. Power Press	Nos	1	150000	150000
6	Manual Shearing Press	Nos	2	40000	80000
7	Manual Sheet Folding Machines	Nos	2	45000	90000
8	Electrical Motor Winding Shop	Nos	1	650000	650000
9	Electronic Circuit assly and Test Shop	Nos	2	250000	500000
10	Spot Seam Welding M/c	Nos	2	80000	160000
11	Profile Rolling Machine	Nos	1	350000	350000
12	Beading Curling Machine	Nos	1	120000	120000
13	Milling machine	Nos	1	300000	300000
14	Pillar Drill	Nos	2	50000	100000
15	CNC and Traub Lathes	Nos	3	250000	750000
16	Assembly Line with Inspection Stations		1	450000	450000
17	Sand Blasting Machine	Nos	1	150000	150000
18	Pickling and Surface treatment	Nos	1	150000	150000
19	Spray/ Powder Paint Shop	Nos	2	250000	500000
20	Paint Baking oven	Nos	1	200000	200000
	Tools and Ancillaries				
1	Misc. equipment Dies tools etc.	LS	1	500000	500000
2	Hand Tools and gauges	LS	1	100000	100000
	Fixtures and Elect Installation				
	Storage and transport bins	LS	1	250000	250000
	Office Furniture	LS	1	35000	35000
	Telephones/ Computer	LS	1	50000	50000
	Electrical Installation	LS	1	350000	350000
	Other Assets/ Preliminary and Preoperative Expenses	LS	1	250000	250000
	TOTAL PLANT MACHINERY COST				**7685000**

13. PROFITABILITY CALCULATIONS:

Sr No	Particulars	UOM	Year Wise estimates				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	Capacity Utilization	%	40	50	60	70	80
2	Sales	Rs. Lakhs	294.29	367.87	441.44	515.01	588.59
3	Raw Materials & Other Direct Inputs	Rs. Lakhs	241.57	301.96	362.35	422.74	483.13
4	Gross Margin	Rs. Lakhs	52.73	65.91	79.09	92.27	105.46
5	Overheads Except Interest	Rs. Lakhs	19.12	19.12	19.12	19.12	19.12
6	Interest	Rs. Lakhs	15.42	15.42	15.42	15.42	15.42
7	Depreciation	Rs. Lakhs	12.19	12.19	12.19	12.19	12.19
8	Net Profit Before Tax	Rs. Lakhs	6.01	19.19	32.37	45.55	58.74

14. BREAK EVEN ANALYSIS

The project is can reach break-even capacity at 35.44 % of the installed capacity as depicted here below:

Sr No	Particulars	UOM	Value
1	Sales at Full Capacity	Rs. Lakhs	735.73
2	Variable Costs	Rs. Lakhs	603.91
3	Fixed Cost incl. Interest	Rs. Lakhs	46.72
4	Break Even Capacity	% of Inst Capacity	35.44