PROJECT PROFILE

ON

Surgical Masks

NAME OF THE PRODUCT : Surgical Masks

PRODUCT CODE (ASICC) :

QUALITY & STANDARD : ISO 16603 and
ISO 22612:2005

PRODUCTION CAPACITY : Quantity (In Pcs) : 1,12,00,000 Pcs.
Value (In Rs.) : 3,12,00,000/-

MONTH & YEAR OF PREPARATION : June, 2020.

PREPARED BY : **MSME - Development Institute,**
Ministry of MSME
Government of India
107, Industrial Estate, Kalpi Road,
Kanpur- 208012 (U.P.)
Tele. 2295070-73 (EPBAX)
Tele/Fax No.: 0512- 2240143
Email: dcdi-kanpur@dcmsme.gov.in
Webebsite: msmedikanpur.gov.in

PROJECT PROFILE
ON
Surgical Masks

1. INTRODUCTION:

Surgical masks, once simply a strip of cloth tied around the face of a doctor or nurse, are today manufactured using non-woven fabrics made from plastics like polypropylene, Melt blown fabric and Sun bond fabric to filter and protect. They are also available in many different styles and grades depending on the level of protection the user requires. Surgical masks are designed to keep operating rooms sterile, preventing germs from the mouth and nose of a wearer from contaminating a patient during surgery. Although they have seen a rise in popularity among consumers during outbreaks such as the corona virus, surgical masks are not designed to filter out viruses, which are smaller than germs. Certain masks are designed for higher risk environments than others. It's important to remember, however, that a mask alone will not provide protection from COVID-19. Masks, gloves, and other PPE are needed in combination to protect the wearer, as well as basic practices such as hand washing and not touching the face. Different type of Masks used are as under:

1.1 **N-95 respirator masks** (named because they filter out 95% of small particles) are designed for the highest-risk environments, such as surgery or other situations where sprays and aerosols carrying the virus are commonly emitted. N95s consequently provide the strongest protection against illness as they stop viruses and bacteria from reaching the wearer. These masks seal the area around the face completely when properly fitted, but they make breathing more of an effort.

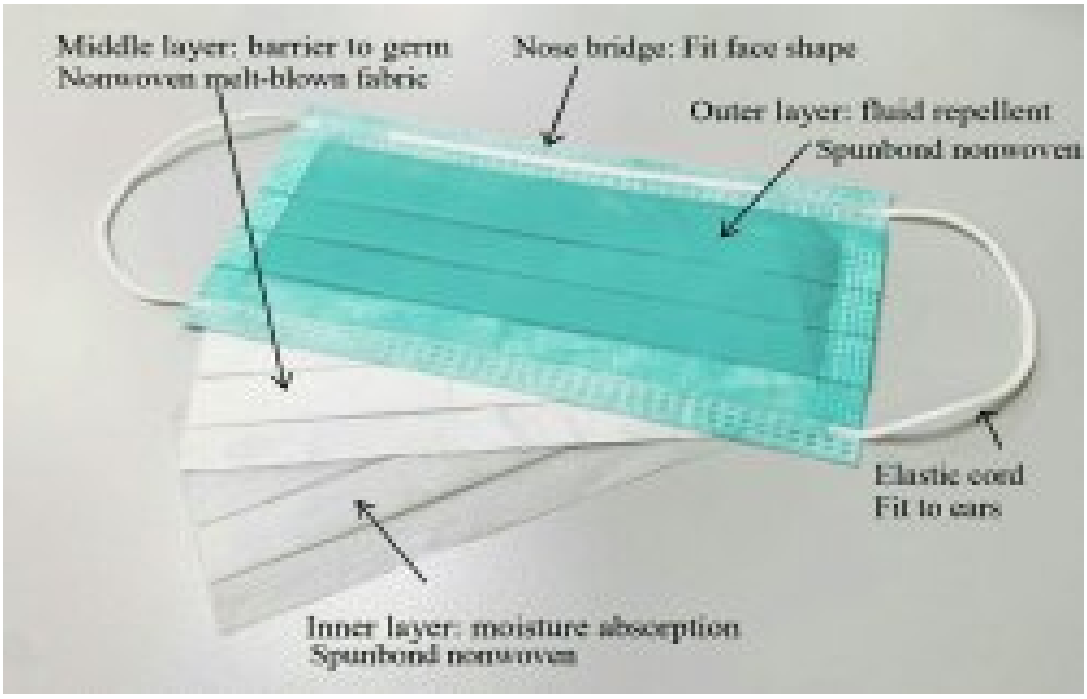
1.2 **Surgical masks** are made for lower risk medical situations, and are designed to stop the spread of germs from the wearer. Because of their loose fit to the face, matter can get around the edges of the mask and still enter the nose and mouth, so they do not provide the same level of protection as an N95. Additionally, the filtering pores in the mask aren't small enough to stop viruses. However, these masks do protect against spray, large droplets, and splashes, and they keep the wearer's germs from spreading to other people.

1.3 **Cloth masks** are appropriate for lower risk environments outside of medical facilities. These masks do not have fine enough weave to filter out viruses, but they can stop the spread of spray from coughs or sneezing. They can also be used over surgical masks or respirators to help preserve the mask underneath. Consumers are recommended to wear these masks while in places where it's difficult to remain six feet apart, like grocery

stores. However, it's important to wash cloth masks regularly in a washing machine since the moisture from a person's breath can breed germs in the cloth over time. It's also important to try to fit the mask as much as possible to the face without large gaps.

1.4 **Other masks** such as painter's or dust masks are designed to block larger particles than viruses from entering the nose and mouth, so they do not provide the same level of protection as an N95 medical respirator. However, they, like cloth masks, can help keep spray and droplets from potentially infected people contained.

It is worth noting that masks have specific shelf lives depending on the conditions and climate in which they are stored, so it's important to ensure the masks are stored properly and in good condition. Since masks come in different sizes, it's also important to ensure that one should use mask of appropriate size, since masks of the wrong size cannot create a proper seal and therefore will compromise their users.



View of 3 layers, Elastic cord and Nose wire/bridge

2. MARKET POTENTIAL:

The unprecedented spread of corona virus worldwide, most notably in Asia, Europe and North America, is driving the demand for disposable surgical masks. Disposable surgical masks are extensively used in the healthcare sector. The proliferating OPD sessions and surgeries on a daily basis across the globe are anticipated to drive product demand within the healthcare sector. The function of disposable surgical masks is to reduce or eliminate the chances of being affected by potential environmental contaminants. Disposable surgical masks are typically made from non-woven fabric and are usually available in a multi-layer (two- or three-layer) form.

Disposable surgical masks are popular among health care professionals who constantly attend patients or perform surgeries. These masks protect health care professionals from harmful bacteria that may ooze out either in the form of aerosols and liquid droplets from patient's mouth. The virus or harmful bacteria can also get spread in the form of body fluids or infectious blood. Thus, these masks act as a protective barrier and help eliminate or reduce the chances of cross-contamination among surgeons and patients.

The demand for disposable surgical masks is likely to be driven by the rising popularity of online shopping platforms. In this regard, Amazon.com, Inc. and eBay Inc. are among the biggest online players contributing significantly to the distribution of the product. Furthermore, the popularity of online sales has been creating a healthy demand for disposable designer surgical masks, most notably among affluent consumers worldwide. Such trends are expected to sustain throughout the forecast timeframe.

A key factor challenging the growth of the industry is the rising prevalence of counterfeit products both in physical stores and on online platforms. The counterfeit masks are usually made in unsterile sweatshops that were previously used to manufacture designer jeans or fake handbags. In this regard, there have been instances of numerous producers labelling their products with fake brand names of reputed medical supply manufacturers, such as 3M. Such factors are expected to restrain market growth throughout the forecast period.

Rising consumer awareness regarding airborne infections has been creating a healthy demand for the product, most notably for personal use. In this respect, a rise in outbreaks as regards airborne diseases in the recent past has been contributing significantly to the demand for disposable face masks among the general public. A trend that has been gripping the market is the increasing consumption of surgical masks for personal use.

The offline segment emerged as the largest in 2019, with a market share of 80.7%. This segment is likely to retain its pole position in coming years. Numerous brands prefer to sell their products through drug stores and pharmacies as these stores showcase a wide variety of disposable surgical masks. From a consumption standpoint, visiting these stores helps consumers compare different products in terms of material used and quality.

E-commerce has significantly changed the shopping habits of people as it offers benefits such as door-step delivery, substantial discounts, and availability of a wide range of products through one platform. Key players in the market are increasingly launching e-commerce websites, most notably in emerging markets owing to the rising popularity of online shopping among millennial and young population.

According to WHO, currently, more than 64 Lakh people worldwide are infected with Corona (COVID-19). In the context of the novel corona virus (2019-nCoV) outbreak, the World Health Organization recommends the use of masks in home and health care settings. This in turn increases demand for surgical marks.

Increase in elderly population, increase in adoption of surgical mask in the general population and surge in prevalence of contagious and chronic diseases such as tuberculosis and asthma along with the rise in the number of medical device manufacturing companies and rapid developments in nonwovens production technology is poised to contribute in the growth of the surgical mask market. Increasing focus toward preventing hospital-acquired infections and improvement in healthcare infrastructure & service are also some of the factors that are contributing in the growth of the surgical mask market.

3. BASIS & PRESUMPTIONS:

i) The scheme is based on demand raised in the domestic market as well as Export market in sufficient quantity.

ii) The salary and wages are taken as per prevailing Govt. Norms.

iii) The margin money is taken as 25% of the total project cost.

iv) The rate of interest in the project profile has been calculated as 12% per annum of the total capital investment.

v) The time period for achieving full-envisaged capacity utilization is taken as 6 Months.

vi) The cost of plant and machinery are taken on the basis of prevailing rates in the market.

vii) The depreciation on Plant & Machinery is taken as 10% due to the nature of work.

4. Implementation Schedule:

S.No.	Activities	Period
1.	Preparation of Project Profile	1 month
2.	Selection of Site.	1 month
3.	Registration with DIC and other formalities	½ month
4.	Availability of loan by financial institutions	3 months
5.	No Objection Certificate from Pollution Control Board	½ month
6.	Procurement of Plant & Machinery	1½ months

7.	Electrification & Installation of Plant & Machinery	½ month
8.	Recruitment of Labour & Staff	½ month
9.	Trial Production	½ month
10.	Commercial production	½ month

Keeping in view the overlapping of some of the activities the total time of around 5 to 6 months will be needed to commence production.

5. TECHNICAL ASPECTS:

5.1 Manufacturing of Surgical masks:

Common Surgical masks are mainly composed of three layers of non-woven fabric. The inner layer is a common non-woven fabric, which is mainly used to absorb the moisture and moisture released by the wearer; the outer layer is a waterproof non-woven fabric, which is mainly used to isolate the liquid sprayed by the patient; the filter layer in the middle is used for the polypropylene melt-blown non-woven fabric treated with electrets serves as a barrier against germs. The core material of medical masks is polypropylene melt blown non-woven fabric after electret treatment. The filtering mechanism of medical masks is Brownian diffusion, entrapment, inertial collision, gravity sedimentation and electrostatic adsorption. The first four are physical factors, that is, the characteristics of the non-woven fabric produced by the melt blown method, the filterability is about 35%; this is not up to the requirements of medical masks, we need to electrotype the material and let the fiber Charged and used static electricity to capture the aerosol where the new corona virus is located. Surgical face masks are made with non-woven fabric, which has better bacteria filtration and air permeability while remaining less slippery than woven cloth. Surgical masks are made up of a multi-layered structure, generally by covering a layer of textile with non-woven bonded fabric on both sides. Non-wovens, which are cheaper to make and cleaner thanks to their disposable nature, are made with three or four layers. These disposable masks are often made with two filter layers effective at filtering out particles such as bacteria above 1 micron. The filtration level of a mask, however, depends on the fiber, the way it's manufactured, the web's structure, and the fiber's cross-sectional shape. Masks are made on a machine line that assembles the nonwovens from bobbins, ultrasonically welds the layers together, and stamps the masks with nose strips, ear loops, and other pieces.

5.1.1 **The formal production process of medical masks:** Hang the non-woven raw materials on the mask sheeter rack, and the machine will produce it automatically

after debugging. The mask sheet will come out, and then the mask sheet will be transferred to the ear band machine for spot belting. After production, it is sterilized by ethylene oxide and left for 7 days to volatilize. The specific process is as follows:

(i) Combine three layers of non-woven fabric: Three different non-woven fabrics were placed on the fixed support on the production line and neatly stacked together by the laminator above. There is a trumpet-shaped feeding port here, and a string of wires is continuously passed through the trumpet to the laminating machine.

(ii) Stitch the metal wire fixed by the nose clip into the laminated three-layer non-woven fabric: The nose clip must be pinched to the bridge of the nose when wearing, so that wearing the mask will be firm. Otherwise, without this structure, nose leak is more serious, the seal is not tight, and the protection effect is affected. The wire is matched and conveyed along one side of the non-woven fabric, then the next edge is rolled, and the back is stitched, and the wire is stitched in.

(iii) Folding mask: The masks have uniform size specifications. The folds introduced in the surgical masks ensure that all people have the proper fitting on their nose, mouth and chin. In order to create a crease and better processing in subsequent processes, it is flattened by roller attached in machine.

(iv) Fix the hanging ear rope to the four corners of the mask with the thermoforming device: In order to strengthen the binding strength of the rope and the mask body, it is necessary to fix the ear loop with heat pressing device.

(v) Disinfection: If it is an ordinary mask, it does not need to be sterilized, but for medical use surgical masks should be sterilized with disinfectant like ethylene oxide. The masks are placed in an environment of 400 mg / Ltr of ethylene oxide, and alkylation was applied to the hydroxyl group to make the microbial macromolecules inactive to achieve the purpose of sterilization.

5.2 Production Capacity (Per Annum)

Quantity (In Pcs.)	: 1,20,00,000
Value (In Rs.)	: Rs.3,12,00,000/-

5.3 Motive Power Requirement:

7.00 KWH

5.4 Pollution Control:

The unit is non-polluting hence intimation to Pollution Control Board is sufficient.

5.5 Energy Conservation:

Careful and efficient use of maximum capacity of plant with proper time management will conserve sufficient energy.

6. FINANCIAL ASPECTS:

6.1 Fixed Capital:

6.1.1 Land & Building :

300 Sqr. Mtrs. @ Rs. 700/- Sqr. Mtr.	2,10, 000/-
Built up Area - 200 Sq. Mtrs. @ Rs. 5000/ Sq. Mtrs.	10,00,000/-
Total approximate cost of Land & Building =	**Rs. 12,10,000/-**

6.1.2 Machinery & Equipment

Sl. No.	Description	Qty.(Nos.)	Amount (Rs.)
1.	Automatic Surgical Mask Making Machine	1	21,00,000/-
2.	Ear Loop Spot Wielding Machine	3	6,00,000/-
3.	Packing Machine	1	60,000/-
4.	Misc. Equipments	LS	1,00,000/-
5.	Installation charges @ 10%	-	2,00,000/-
6.	Office furniture & equipments	LS	50,000/-
	Total:		**31,10,000/-**

6.1.3 Total Fixed Capital

1.	Land & Building	Rs.	12,10,000/-
2.	Plant & Machinery	Rs.	31,10,000/-
		Total: Rs.	**43,20,000/-**

6.2 Working Capital (Per Month)

6.2.1 Staff & Labour

Sl. No.	Description	No.	Salary (Rs.)	Total (Rs.)
1.	Manager	1	15,000/-	15,000/-
2.	Operator	1	12,000/-	12,000/-
3.	Unskilled Worker	3	10,000/-	30,000/-
4.	Clerk/Store keeper	1	10,000/-	10,000/-
5.	Chowkidar	1	10,000/-	10,000/-
			Total:	77,000/-
	+ Perquisites @ 15% of total salary =			11,550/-
			Total:	**88,550/-**

6.2.2 Raw Material (PM)

Sl. No.	Description	Quantity	Rate (Rs.)	Value (Rs.)
1.	Non Woven Fabric	1000 Kg.	150/- Kg	1,50,000/-
2.	Melt Blown Fabric	1000 Kg.	1450/- Kg	14,50,000/-
3.	Spun bond Fabric	1000 Kg.	150/- Kg	1,50,000/-
4.	Ear Loop	2,00,000 Mtrs	0.50/Mtr	1,00,000/-
5.	Nose Wire	25,000 Mtrs	0.50/Mtr	12,500/-
6.	Packaging Material L.S.			30,000/-
			Total:	**18,92,500/-**

6.2.3 Utilities

Sl. No.			
	Electricity 7 KWH @ Rs.6.00/Unit	Rs.	15,000/-
	Water	Rs.	1,000/-
	Total:	**Rs.**	**16,000/-**

6.2.4 Other Contingent Expenses (PM)

Sl.No.	Particulars	Rs.	Total
1.	Postage & Stationery	Rs.	1,000/-
2.	Telephone	Rs.	1,000/-
3.	Advertisement & Publicity	Rs.	5,000/-
4.	Transportation	Rs.	10,000/-
5.	Consumable Stores	Rs.	2,000/-
6.	Repair & Maintenance	Rs.	3,000/-
7.	Insurance	Rs.	3,000/-
8.	Miscellaneous Expenses	Rs.	5,000/-
	Total:	**Rs.**	**30,000/-**

6.2.5 Total Working Capital

Sl.No.	Particulars	Rs.	Total
1.	Staff & Labour	Rs.	88,550/-
2.	Raw Material	Rs.	18,92,500/-
3.	Utilities	Rs.	16,000/-
4.	Other Contingent Expenses	Rs.	30,000/-
	Total:	**Rs.**	**20,27,050/-**

6.2.6 Total Working Capital for 2 months= Rs 40,54,100/-

6.3 Total Capital Investment:

Sl.No.	Particulars	Rs.	Total
i)	Fixed Capital	Rs.	43,20,000/-
ii).	Working Capital for 2 month	Rs.	40,54,100/-
	Total:	Rs.	83,74,100/-
	Say:	**Rs.**	**83,75,000/-**

7. Machinery Capacity Utilisation:

The capacity in first year is calculated as 80% of total capacity of Plant & Machinery.

8. FINANACIAL ANALYSIS

8.1.1 Cost of Production (Per Annum)

Sl.No.	Particulars	Rs.	Total
1.	Recurring expenditure per annum	Rs.	2,43,24,600/-
2.	Depreciation on Machinery & Equipments @ 10%	Rs.	3,00,000/-
3.	Depreciation on Office Furniture & Equipment @ 20%	Rs.	10,000/-
4.	Depreciation on Building @ 5%	Rs.	50,000/-
5.	Interest on Total Capital Investment @ 12%	Rs.	10,05,000/-
	Total:	**Rs.**	**2,56,89,600/-**

8.1.2 Turn Over (Per annum)

S. No.	Item	Rate (Rs. Per Surgical Mask)	Value
1.	Sale of 1,20,00,000 Surgical Masks	2.60/- Per Pc.	3,12,00,000/-
		Total:	**Rs.3,12,00,000/-**

8.1.3 Net Profit Per Year (Before Tax)

Profit = Turn Over (-) Cost of Production

3,12,00,000/- (-) 2,56,89,600/- = Rs. 55,10,400/-

8.1.4 Net Profit Ratio on Sales (Per Year)

$$\frac{\text{Net profit X 100}}{\text{Turn Over}} = \frac{\text{55,10,400/- X 100}}{\text{3,12,00,000/-}} = \textbf{17.66\%}$$

8.1.5 Rate of Return (Per Year)

$$\frac{\text{Net profit X 100}}{\text{Total Capital Investment}} = \frac{\text{55,10,400/- X 100}}{\text{83,75,000/-}} = \textbf{65.79\%}$$

8.2 Break Even Point

8.2.1 Fixed Cost (Annual of 4 months per season):

1	Depreciation on Machinery & Equipments @ 20%	Rs.	3,00,000/-
2	Depreciation on Office Furniture & Equipment @ 20%	Rs.	10,000/-
3	Depreciation on Building @ 5%	Rs.	50,000/-
4	Insurance	Rs.	36,000/-
5	40% of Salary & Wages (of 4 months per season)	Rs.	4,25,040/-
6	40% Other Contingent Expenses(of 4 months per season)	Rs.	1,44,000/-
7	Interest on Total Capital Investment @ 12%	Rs.	10,05,000/-
	Total Fixed Cost:	**Rs.**	**19,70,040/-**

8.2.2 Break Even Point:

$$\frac{\text{Fixed Cost} \times 100}{\text{Fixed Cost + Profit}} = \frac{19,70,040/- \times 100}{19,70,040/- + 55,10,400/-}$$

$$\frac{19,70,040/- \times 100}{2,15,87,440} = \mathbf{26.33\%}$$

9. Addresses of Machinery & Equipment Suppliers:

1. **Vimla Tradind Company.**
   Sri Plaza UGF-5 Shaheed Path Shaheed Vihar, Opposite Ambedkar University, Lucknow-226025, U.P. India
2. **Ocean Extrusion Private Ltd.**
   Office No. 11-15, Wing A, First Floor, Barcelona Complex
   Odhav, Ahmedabad - 382415, Gujarat, India
3. **Aman Impex**
   Plot No. 801, Paul Colony, Nala Road Near Gas Agency Back Side, Rohini, New Delhi - 110085, Delhi.
4. **Sunface Machine India**
   No. 17/49, Geeta Colony,
   Delhi - 110031, Dist. Delhi, Delhi
5. **Kamtronics Technology Pvt. Ltd.**
   A-6, Plot No. 14 & 15, DLF Industrial Area, Moti nagar, New Delhi - 110015,

10. Address of Raw Material Suppliers:

1. **Safex Inc.**

   Shop No 30, Roshanara Road, New Delhi - 110034, Delhi

2. **J R Jindal Infraprojects Private Ltd.**

   No. 23, Ram Mandir Lane, Vasant Kunj, New Delhi - 110070, Delhi

3. **Silver Fitration.**

   Survey No. 211, Plot No. 6, Near Ravi Techno Forge, Essen Road, Veraval - Shapar, Veraval Shapar, Rajkot - 360024, Gujarat.

4. **Sai Surgical**

   Ground Floor, Gat No. 274, Kalewadi, Hadapsar Saswad Road, Pune - 412307, Dist. Pune, Maharashtra.

5. **Eccon Industries.**

   Ground Floor 15, Block C, Omaxe NRI City Center, Pari Chowk, Greater Noida - 201310, Dist. Gautam Budh Nagar, Uttar Pradesh

****