Pre-feasibility Study

N95 AND SURGICAL MASK STITCHING/MANUFACTURING UNIT

May 2021

"The figures and financial projections are approximate due to fluctuations in exchange rates, energy costs, and fuel prices etc. Users are advised to focus on understanding essential elements such as production processes and capacities, space, machinery, human resources, and raw material etc. requirements. Project investment, operating costs, andrevenues can change daily. For accurate financial calculations, utilize financial calculators on SMEDA's website and consult financial experts to stay current with market conditions."

Small and Medium Enterprises Development Authority
Ministry of Industries and Production
Government of Pakistan

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2. EXECUTIVE SUMMARY

A surgical face mask, also known as a medical face mask or a respirator, is a personal protective equipment worn by health professionals during medical procedures. It prevents airborne transmission of infections between patients and/or treating personnel by blocking the movement of pathogens[1] (primarily bacteria and viruses) shed in respiratory droplets and aerosols into and from the wearer's mouth and nose.

An N95 face mask (are also called as respirator) is a respiratory protective device designed to achieve a very close facial fit and very efficient filtration of airborne particles. The N95 filters 95% of air particles and is made from synthetic polymer fibers.

Typically, quite impermeable to moisture, the mask acts as an additional barrier for the airway and is not usually designed (unless N95-rated) to completely prevent the wearer from inhaling smaller airborne pathogens, but could still be protective by filtering out and trapping most of the droplets that carry them. There is a predominance of evidence that surgical masks protect both the wearers (by filtering the inhaled air) and the bystanders (by blocking down forceful exhalations from the wearer that can spread pathogens afar).

This “Pre-feasibility Document” provides details for setting up N95 and Surgical Mask Stitching/Manufacturing Unit. N95 masks are mainly used in healthcare facilities, whereas, surgical masks are used in both health sector and also by general public. The unit is proposed to be located in Karachi, Lahore, Islamabad, Peshawar, Rawalpindi, Quetta, Faisalabad, Sialkot, Hyderabad, Gujranwala, Multan or any other major city of Pakistan. These cities are preferred for the proposed unit due to easy availability of raw materials and skilled labor required for the manufacturing unit. These areas are also recommended due to their large populations and presence of majority of private and public sector hospitals in these cities.

The proposed unit is assumed to manufacture 4.48 million N95 masks and 15.68 million surgical masks in a year. Initially, during the first year of operations, the project is estimated to manufacture masks at 40% of its total installed capacity, which is equal to 1.79 million N95 masks and 6.27 million surgical masks. The manufacturing capacity is assumed to increase at a rate of 5% per annum with a cap at 85% of total capacity; achieved in tenth year of operation. High return on investment and steady growth of business is expected with the entrepreneur having some prior experience or education in the related field of business.

The proposed project will be set up in a rented building having an area of 2,250 sq. ft (10 Marla). The project requires a total investment of PKR 12.19 million. This includes capital investment of PKR 8.96 million and working capital of PKR 3.24 million. The project will be established using 100% equity financing. The Net Present Value (NPV) of project is PKR 48.92 million with an Internal Rate of Return (IRR) of

[1] Microorganism that causes or can cause disease

68% and a Payback period of 2.02 years. Further, the proposed project is expected to generate Gross Annual Revenues of PKR 81.54 million in 1st year after coming into operations, Gross Profit (GP) ratio of 20% to 22% and Net Profit (NP) ratio ranging from 8% to 12% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 13% i.e., 566,007 units for N95 masks and 21% i.e., 3,279,767 units for surgical masks with gross revenue of PKR 29.65 million in a year for both.

The proposed project may also be established using leveraged financing. At 50% financing at a cost of KIBOR+3%, the proposed unit provides Net Present Value (NPV) of PKR 70.56 million, Internal Rate of Return (IRR) of 73% and Payback period of 1.86 years. Further, this project is expected to generate Net Profit (NP) ratio ranging from 9% to 12% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 10% i.e. (4,480,000 units) for N95 masks and 16% i.e. (15,680,000 units) for surgical masks with breakeven revenue of PKR 23.81 million for both.

The project will generate direct employment opportunity for 12 to15 people. The legal business status of this project is proposed as “Sole Proprietorship”.

3. INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs", SMEDA has carried out ‘sectoral research’ to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives. Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need-based capacity building programs of different types in addition to business guidance through help desk services.

National Business Development Program for SMEs (NBDP) is a project of SMEDA, funded through Public Sector Development Program of Government of Pakistan.

The NBDP envisages provision of handholding support / business development services to SMEs to promote business startup, improvement of efficiencies in existing SME value chains to make them globally competitive and provide conducive business environment through evidence-based policy-assistance to the Government

of Pakistan. The Project is objectively designed to support SMEDA's capacity of providing an effective handholding to SMEs. The proposed program is aimed at facilitating around 314,000 SME beneficiaries over a period of five years.

4. PURPOSE OF THE DOCUMENT

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document/study covers various aspects of project concept development, start-up, and production, marketing, finance and business management.

The purpose of this document is to provide information to the potential investors about "N95 and Surgical Mask Stitching/Manufacturing Unit". The document provides general understanding of the business to facilitates potential investors in crucial and effective investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business setup and its successful management.

Apart from carefully studying the whole document one must consider critical aspects provided later on, which form the basis of any investment decision.

5. BRIEF DESCRIPTION OF PROJECT & SERVICES

This document provides details for setting up an N95 and Surgical Mask Stitching/Manufacturing Unit. Face masks are used for protection from viral infections like COVID-19, H1N1[2] infections. Such masks are also used by people to protect themselves from dust, pollen allergies, and many other bacterial and fungal infections. Face mask covers nose, mouth, and chin which reduces the chances of being affected by viral, bacterial or fungal infection.

Surgical Mask

A surgical mask is a loose-fitting, disposable device that creates a physical barrier between the mouth and nose of the wearer and potential contaminants in the immediate environment. Surgical masks are not to be shared and may be labeled as surgical, isolation, dental, or medical procedure masks. They may come with or without a face shield. These are often referred to as face masks, although not all face masks are regulated as surgical masks.[3]

[2] Influenza A virus subtype
[3] https://www.fda.gov/

How Do Surgical Masks Work?

These 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 electret, serves as a barrier against germs.

What is N95 Mask?

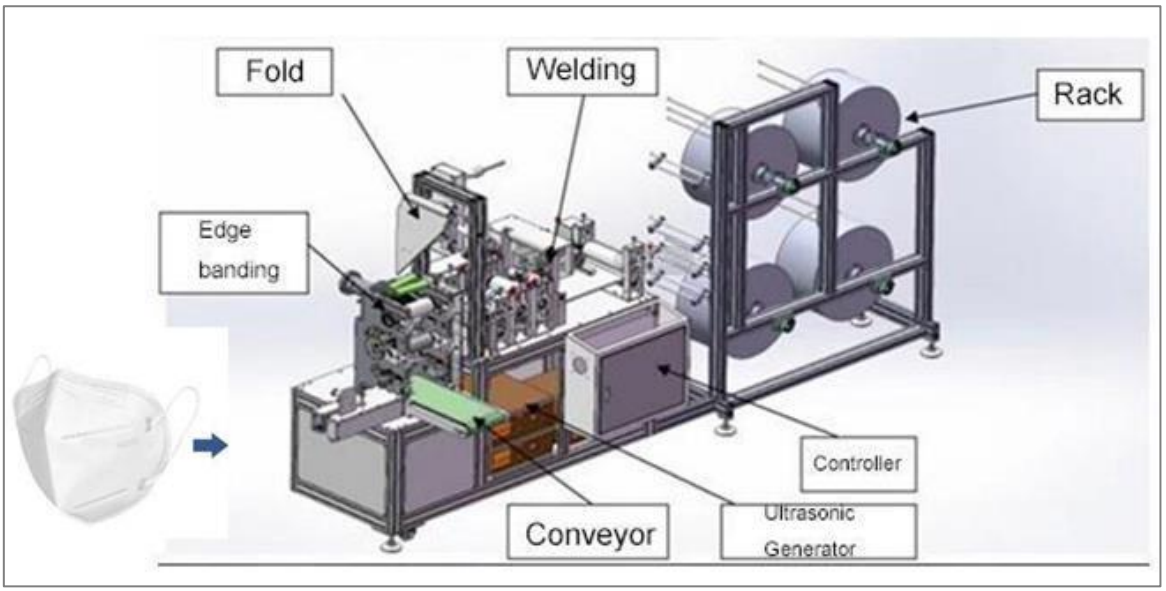
N95 masks are examples of personal protective equipment that are used to protect the wearer from airborne particles and from liquid, which may contaminate the face. N95 provides better filtering and protection from particles. The N95 filters 95% of air particles and is made from synthetic polymer fibers.[4]

How Do N95 Masks Work?

N95 respirators work by filtering out particles due to the structure of their nonwoven material. Particles get trapped as they are forced to make twists and turns through the dense network of the material's fibers, which are as thin as a single micron. These masks also have electrostatically charged material to further attract particles. As particles build up, the mask becomes a more efficient filter. However, the buildup also makes the mask more difficult to breathe through, which is why the masks and filters are made to be disposable.

For manufacturing N-95 masks, a fully automatic machine is used, which has output capacity of 30-50 pieces per minute which is shown in Figure 1.

Figure 1: N95 Mask Manufacturing Machine



[4] Https://www.fda.gov/

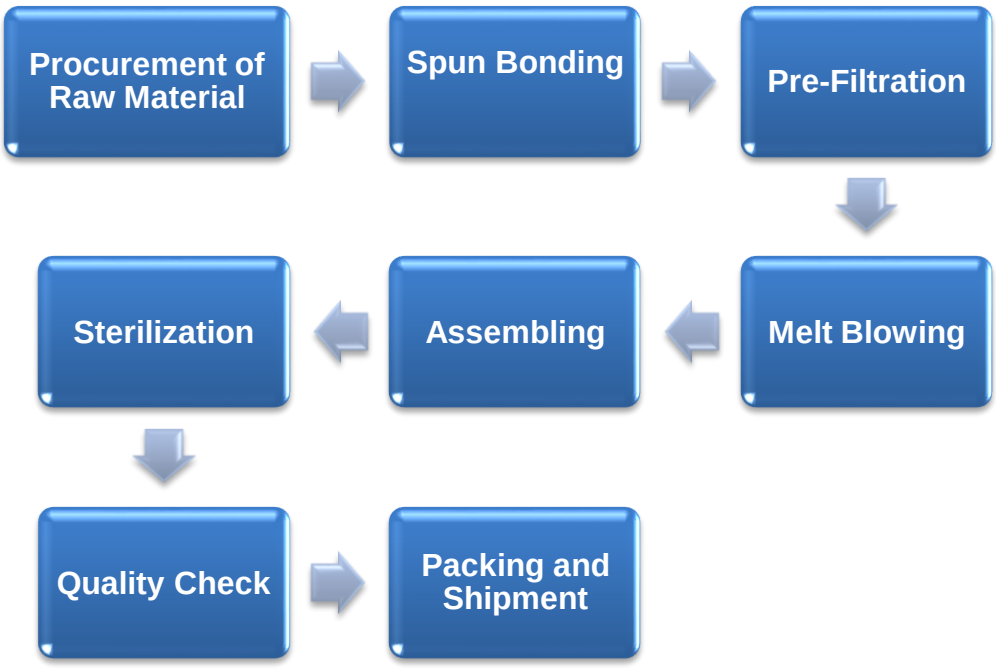
For manufacturing surgical masks, a semi-automatic disposable plane mask machine is used having manufacturing capacity of 100-150 pieces per minute; as shown in Figure 2.

Figure 2: Disposable Surgical Mask Manufacturing Machine

5.1. Process Flow for Manufacturing N-95 Face Mask

Figure 3 shows manufacturing process for N95 Masks.

Figure 3: Process Flow for N-95 Face Mask



All the manufacturing process of N95 masks is performed by a single automated machine, this machine is shown in Figure 1. Raw material is placed on the respective input area of machine and it automatically produces 30-35 units within a minute. The brief description of process flow is as follow:

Procurement of Raw Material

For manufacturing this type of mask, non-woven fiber, elastic, nose pins and filters are the main raw materials. There is no complex nature of material required for manufacturing N95 masks and all these materials are easily available from local markets of Pakistan. Figure 4 shows the raw materials required for mask manufacturing.

Figure 4: Raw Materials for N95 Mask Manufacturing

Filters

Non Woven fabric

Elastic

Nose Pins

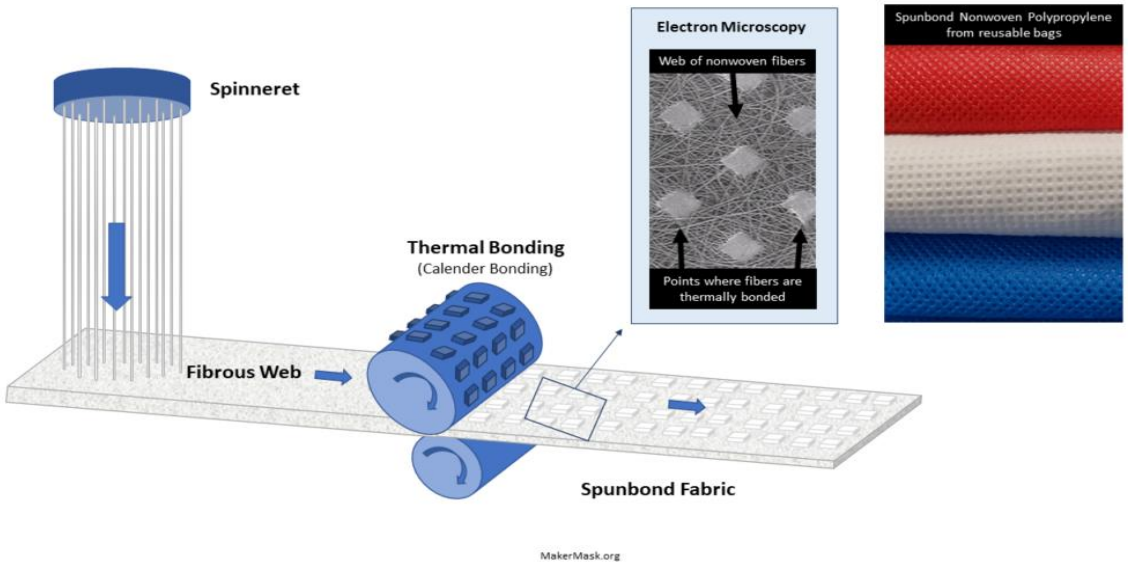
Spun Bonding

Spun bonding is a manufacturing process that is used for creating a type of fabric called non-woven fabric which is made from polymers such as polypropylene. A medical N95 respirator consists of multiple layers of nonwoven fabric, often made from polypropylene. The two outward protective layers of fabric, covering the inside

and outside of the mask, are created using spun bonding. Spun bonding uses nozzles blowing melted threads of a thermoplastic polymer (often polypropylene) to layer threads between 15-35 micrometers on a conveyor belt, which build up into cloth as the belt continues down the line.

The two outer layers of the respirator, between 20 and 50 grams per square meter in density, act as protection against the outside environment as well as a barrier to anything in the wearer's exhalations. Spun bonding of N95 masks is shown in Figure 5.

Figure 5: Spun Bonding



Pre-Filtration

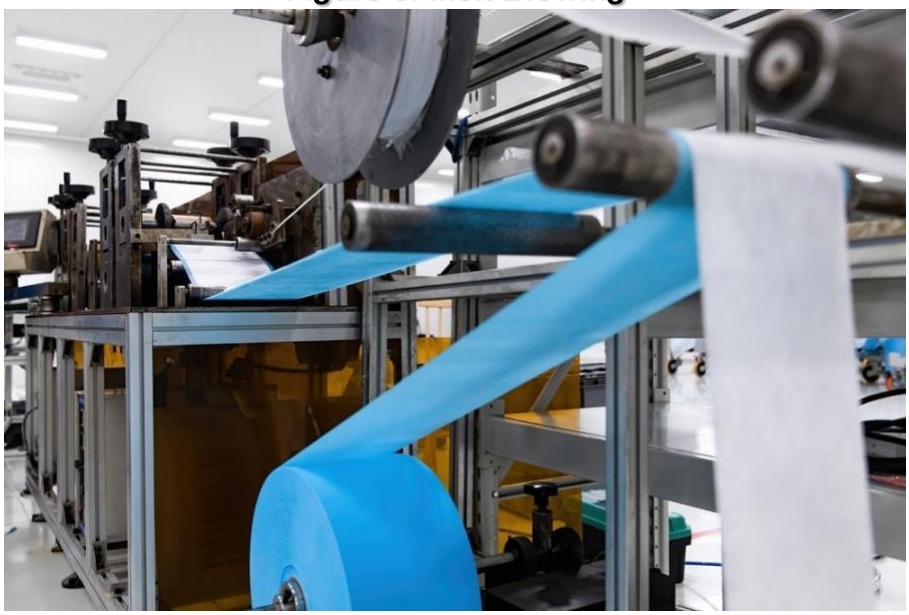
In this process, pre-filtration layer is added between the spun bond layers at a density of 25 grams per square meter. The pre-filtration layer is usually a needled nonwoven fabric. Nonwoven material is needle punched to increase its cohesiveness, which is accomplished by sending barbed needles repeatedly through the fabric to hook fibers together. The pre-filtration layer is then run through a hot calendaring process, in which plastic fibers are thermally bonded by running them through high pressure heated rolls. This makes the pre-filtration layer thicker and stiffer, so it can be molded to form the desired shape and stay in that shape as the mask is used.

Melt Blowing

In this process, the filtration efficiency of is determined. this process, a high efficiency melt-blown electret (or polarized) nonwoven material is used as a last layer. Melt blowing is a process similar to spun bonding, in which multiple machine nozzles use air to spray threads of melted synthetic polymers onto a conveyor. These fibers are much smaller, with a width of less than a micron. As the conveyor

continues, the threads build up and bond by themselves as they cool, creating the fabric. However, sometimes melt-blown fabric is also thermally bonded to add strength and abrasion resistance, although the material then begins to lose some of its fabric characteristics. Melt blowing process is shown in Figure 6.

Figure 6: Melt Blowing



Assembling

In this step, the full mask is made by assembling all layers. This machine combines the layers through ultrasonic welding and adds straps and metal strips to provider the feature of the mask getting properly adjusted over the user's nose. Assembling process for N95 mask is shown in Figure 7.

Figure 7: Assembling

Sterilization

At the end, the respirators are sterilized for making them more friendly for user protection and to fight against germs and bacteria. Sterilization refers to the process that removes, kills, or deactivates all forms of life (in particular referring to microorganisms such as fungi, bacteria, spores, unicellular organisms such as Plasmodium, etc.) and other biological agents like prions[5] present in a specific surface, object or fluid.

Quality Check

After production, following tests are performed on N-95 as part of quality checks:

Particle Penetration Test: This test shows the filtration efficiency for the most penetrating particle size (0.1 to 0.3 micron).

***Airflow Test*:** The N95 FFR (Filtering Face piece Respirator) efficiency test requires a continuous airflow through an entire FFR with a vacuum pump. This flow rate is equivalent to a breathing minute volume under high working exertion and is therefore a worst-case condition for most uses of an N95.

Breathing Resistance Test: In the breathing resistance test, the pressure drop over a face mask is assessed during breathing in and out. In this way, the pressure drop of a material can be assessed to check its suitability for face mask production.

Packing and Shipment

The face mask is then packed in carton and shipped towards the desired location. Shipment of N95 face mask is shown in Figure 8.

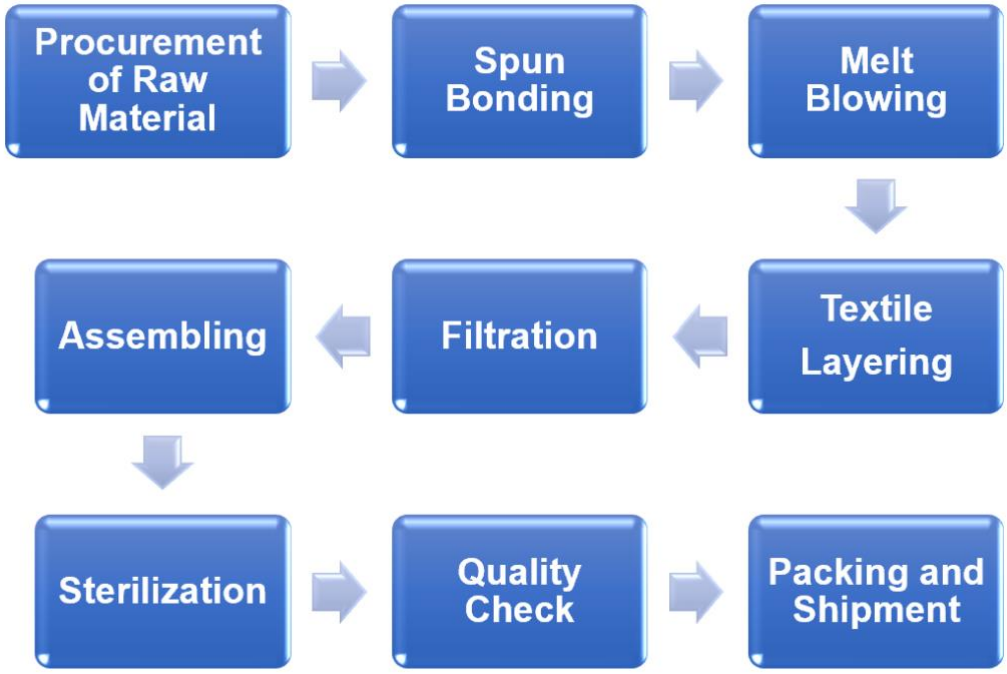
Figure 8: Shipment

[5] Prions are misfolded (toxic) proteins with the ability to transmit their misfolded shape onto normal variants of the same protein.

5.2. Process Flow for Manufacturing of Surgical Mask

Figure 9 shows manufacturing process of surgical face masks.

Figure 9: Process Flow for Surgical Face Mask



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-woven fabric is used due to better bacteria filtration and air permeability while remaining less slippery than woven cloth.

All the manufacturing of surgical masks is performed by a single automated machine, the machine is shown in Figure 2. Raw material is placed on the respective input area of machine and it automatically produces 30-35 units within a minute. The brief description of process flow of surgical mask is as follows:

Procurement of Raw Material

Surgical face masks are made with non-woven fabric, which has better bacteria filtration and air permeability while remaining less slippery than woven cloth. Masks can also be made of polystyrene, polycarbonate, polyethylene, or polyester. For manufacturing this type of mask, at first, raw material such as non-woven fiber, elastic and nose pins are procured. All these materials are easily available and can be procured from local market.

Figure 10 displays the raw materials required for manufacturing of surgical face mask.

Figure 10: Raw Materials for Surgical Face Mask

Non Woven Fabric

Nose clips

Elastic

Spun Bonding

In the first step, the mask material is gone through spun bond process. It involves extruding the melted plastic onto a conveyor. The material is extruded in a web, in which strands bond with each other as they cool. Now the mask material is prepared.

Figure 11 shows spun bonding of surgical face mask.

Figure 11: Spun Bonding for Surgical Face Mask

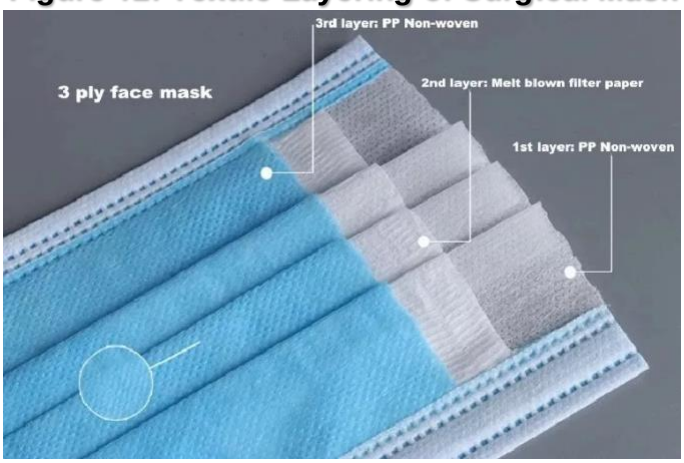
Melt Blowing

Melt blowing is a one-step process and one of the most practical processes for producing microfiber nonwovens directly from thermoplastic polymers. In this process, hot/high velocity air blows the extruded filament from a die tip towards a moving conveyer belt or a cylinder. Melt blowing produces very fine synthetic nonwovens from a wide range of polymers and allows a fair control of the fiber structure and morphology that makes it ideal for filtration purposes. Melt blowing has a high output, and the low price of the filter, makes these products widely available for civil use.

Textile Layering

Medical 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 electret serves as a barrier against germs. Figure 12 displays the textile layering of surgical mask.

Figure 12: Textile Layering of Surgical Mask

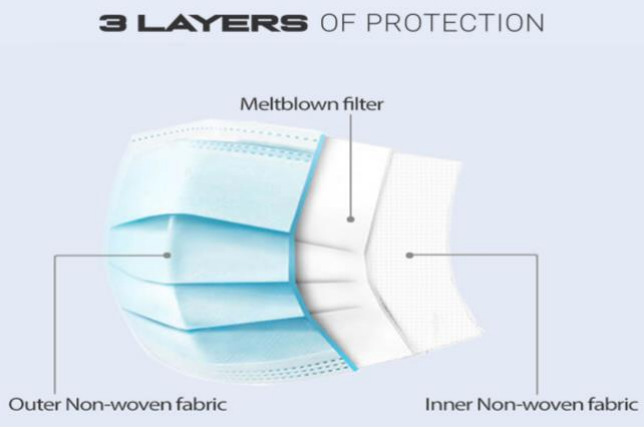


Filtration

After all the layers are made, the next step is to add filters in the mask. 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 is manufactured, the web's structure, and the fiber's cross-sectional shape.

Figure 13 displays the filters of surgical mask.

Figure 13: Filters for Surgical Mask



Assembling

Machine line on which a mask is made assembles the nonwovens from bobbins, ultrasonically welds the layers together, and stamps the masks with nose strips, ear loops, and other pieces. Now the face mask manufacturing is completed. Assembly of surgical mask is shown in Figure 14.

Figure 14: Assembly of Surgical Mask

Sterilization

During the entire production process of the surgical mask, not only the processing contact of the machine, but also the contact of many artificial links, the mask will inevitably be contaminated by bacteria. Oxygen ethane (EO) sterilizer is used for disinfection. The masks are placed in an environment of 400 mg / L of ethylene oxide, and alkylation is applied to the hydroxyl group to make the microbial

macromolecules inactive to achieve the purpose of sterilization. However, ethylene oxide is not only flammable and explosive, but also toxic to the human body. Therefore, the masks are kept for 7 days for analysis after disinfection. After the EO residual amount is lower than the required value, it is ready for packing.

Quality Check

Once surgical masks are made, these must be tested to ensure their safety in various situations. Following five tests they must be performed on surgical masks. The capital expenditure related to these tests is not included in this study.

Bacteria Filtration Efficiency in Vitro (BFE): This test works by shooting an aerosol with staphylococcus aureus bacteria at the mask at 28.3 liters per minute. This ensures the mask can catch the percentage of bacteria it is supposed to tolerate. We have not included the cost of machine for this test in our project cost.

Particle Filtration Efficiency: Also known as the latex particle challenge, this test involves spraying an aerosol of polystyrene microspheres to ensure the mask can filter the size of the particle it is expected to tolerate. We have not included the cost of machine for this test in our project cost.

Breathing Resistance: To ensure the mask will hold its shape and have proper ventilation while the wearer breathes, breathing resistance is tested by shooting a flow of air at it, then measuring the difference in air pressure on both sides of the mask.

Splash Resistance: In splash resistance tests, surgical masks are splashed with simulated blood using forces similar to human blood pressure to ensure that the liquid cannot penetrate and contaminate the wearer.

Flammability: Since several elements of an operating room can easily cause fire, surgical masks are tested for flammability by being set on fire to measure how slowly it catches and how long the material takes to burn.

Packing and Shipment

The face masks are packed in cartons and dispatched to markets. Figure 15 shows packing and shipping of surgical face mask.

Figure 15: Packing and Shipping of Surgical Face Mask

5.3. Installed and Operational Capacities

The proposed unit will have maximum operational capacity of manufacturing 4.48 million N95 masks and 15.68 million surgical masks in a year. It is assumed to operate for 280 days for 8 hours per day in single shift. The operational capacity will increase at the rate of 5% per annum to reach the maximum operational capacity of at 85% in year 10. Table 1 shows details of maximum annual capacity and the operational capacity utilized during first year of operations.

Table 1: Installed and Operational Capacity

Product	Ultrasonic Machine Capacity/Hour (No of Masks)	No of Machines	Capacity per Year (No. of Masks)	Initial capacity Utilization @40% (No of Masks)
N-95	2,000	1	4,480,000	1,792,000
Surgical Mask (3-Layer)	7,000	1	15,680,000	6,272,000

6. CRITICAL FACTORS

Before making the decision to invest in N95 and Surgical Masks Stitching/Manufacturing unit, one should carefully analyze the associated risk factors. Important considerations in this regard include:

- Availability of skilled labor
- Availability of raw materials
- Modern production facility
- Strict compliance quality standards
- Knowledge of the market and;

- Expertise in distribution and logistics channels

7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

According to statistics of Allied Market Research, globally this industry is expected to grow at a rate of 11% per annum up to 2027. As the trends are towards growth the future prospects of this industry are promising and bring good opportunity to invest in this sector to earn good profits.

The N95 and surgical mask manufacturing business is proposed to be established in Karachi, Lahore, Islamabad, Peshawar, Rawalpindi, Quetta, Faisalabad, Sialkot, Hyderabad, Gujranwala, Multan or any other major city of Pakistan. The large cities will be suitable for the proposed business due to presence of large customer base. Furthermore, majority of public and private sector health hospitals/clinics/dispensaries exist in those cities, public/private sector schools/colleges/universities are also located in these cities. All these factors generate a demand for N95 and surgical masks; since wearing mask is considered to be the "New Normal" from 2019 onwards.

These locations are also suitable for establishment of the masks stitching units, because skilled labor is readily available, procurement of raw material is easy, access to distribution channels or developing new distribution channels is easy and these cities also have the industrial estates required for establishing the proposed unit.

Considering all the above factors, the above-mentioned cities are geographically more suitable for potential investment in N95 and Surgical Mask Stitching Unit.

8. POTENTIAL TARGET MARKETS

The demand for masks is generally driven by public and private sectors health institutes (hospitals, dispensaries and maternity & child welfare centers). The outbreak of the COVID-19 pandemic has also played an important role in the increasing the demand of respiratory masks. There was a shortage of N95 masks locally and internationally due to supply chain disruptions, arising from recurring lockdowns.

In Pakistan, manufacturing of respiratory masks was not done on commercial scale before COVID-19. Mask manufacturing industry is mostly unstructured and comprises of many small and medium businesses (SMEs) or even smaller units operating as cottage industry. However, during COVID-19, some large respiratory mask orders were received by the textile industry of Pakistan.

The potential target market for respiratory mask has two segments:

- Private and public sector health professionals
- General public

In 2019, the number of health facilities in different provinces of Pakistan is given in Table 2.[6]

Table 2: Number of Hospital in Pakistan

Provinces of Pakistan	Hospitals	Dispensaries	Maternity & Child Welfare Centres
Federal	9	81	4
Punjab	389	1286	284
Sindh	473	2819	220
Khyber Pakhtunnkhwa	277	983	153
Balochistan	134	574	95
Total	**1,282**	**5,743**	**756**

The number of registered health sector professionals working in private and public health sector of Pakistan are given in Table 3.[7]

Table 3: Registered Medical and Paramedical Personnel

Description	Number of Professionals
Doctors	245,987
Dentists	27,360
Nurses	116,659
Midwives	43,129
Lady Health Visitors	21,361
Total	**454,496**

The general public of Pakistan is be the main demand driver for face masks, to be used for protection from COVID-19. In Pakistan, there were 928,588 confirmed cases of COVID-19 and the number of COVID-19 related mortalities were 21,102.[8]

There are a total of 224 higher education institutes operating in Pakistan (public sector (137) and private sector (87) having total enrolment of 1.9 million approximately.[9] Due to COVID-19, the Government of Pakistan has made wearing of masks mandatory in educational institutes which becomes another big potential target market for the proposed mask stitching unit.

[6] https://www.pbs.gov.pk/sites/default/files//tables/rename-as-per-table-type/Hospital%20Dispanceries.pdf
[7] Economic Survey of Pakistan2020-21
[8] Economic Survey of Pakistan (as on 04 June 2021)
[9] Economic Survey of Pakistan2020-21

9. PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of N95 and surgical mask stitching unit. Various assumptions relevant to revenue and costs along with the results of the analysis are outlined in this section.

The projected Income Statement, Cash Flow Statement and Balance Sheet are attached as annexures of this document.

All the figures in this financial model have been calculated after carefully taking into account the relevant assumptions and target market.

9.1 Project Economics

The financial feasibility analysis provides the information regarding projected Internal Rate of Return (IRR), Net Present Value (NPV) and Payback period of the study, which is shown in Table 29.

Table 4: Financial Feasibility Analysis

Description	Project
IRR	68%
NPV (PKR)	48,922,106
Payback Period (years)	2.02
Projection Years	10
Discount rate used for NPV	20%

9.1.1 Financial Feasibility 50% Debt

The financial feasibility analysis provides the information regarding projected IRR, NPV and payback period of the study on the basis of Debt: Equity Model (50:50), which is shown in Table 5.

Table 5: Financial Feasibility Analysis with 50% Debt

Description	Project
IRR	73%
NPV (PKR)	70,561,829
Payback Period (years)	1.86
Projection Years	10
Discount rate used for NPV	16%

9.2 Initial Project Cost

Table 6 provides fixed and working capital requirements for establishment and operations of the N95 and surgical mask stitching unit.

Table 6: Initial Project Cost estimates

Description of Costs	Amount (PKR)
Land	-
Building Renovation Cost	429,500
Machinery & Equipment	5,820,000
Office Equipment	576,500
Furniture & Fixtures	355,000
Office Vehicles	1,242,500
Pre-operating costs	332,538
Security against Building Rent	202,500
Total Capital Cost - (A)	**8,958,538**
Working Capital	
Equipment spare part inventory	9,700
Raw material inventory	2,574,133
Prepaid Building Rent	67,500
Upfront insurance payment	87,300
Cash	500,000
Working Capital Requirement – (B)	**3,238,633**
Total Project Cost – (A+B)	**12,197,172**

9.2.1 Land

The N95 and surgical mask stitching unit will be established in a rented building to avoid the high cost of land. Suitable location for setting up of unit like this can be easily found on rent. Therefore, no land cost has been added to the project cost. Total space requirement for the proposed unit has been estimated as 2,250 sq. feet (10 Marla). The breakup of the space requirement is provided in Table 7.

Table 7: Breakup of Space Requirement

Break-up of Area	% Break-up	Area (Sq. ft.)
Office Area	22%	500
Processing Hall	54%	1200

Store	9%	210
Conference Room	5%	120
Kitchen	5%	120
Wash Room	5%	100
Total Area	**100.00%**	**2,250**

9.2.2 Building

There will be no cost of building since the unit will be started in the rented premises. However, there will be a renovation cost required to make the building ready to use for the business. The proposed unit requires an electricity load of around 22-25 KW for which an electricity connection B1 under the Industrial supply tariff three phase will be required. Cost of such electricity connection has not been considered in this document since electricity connection is generally available in such buildings, which are offered for rent. Building rent of PKR 67,500 per month has been included in the operating cost. Table 8 provides details of building renovation cost.

Table 8: Renovation Cost Details

Cost Item	Unit of Measurement	Total Liter / Area / Number	Cost / Unit / sq. ft.	Total Cost
Paint Cost	Littre	225	500	112,500
Labor Cost	Feet	22,500	8	180,000
Wall Racks	Units	8	15,000	120,000
Curtains	Units	4	3,000	12,000
Blinds	Units	1	5,000	5,000
Total (PKR)				**429,500**

9.2.3 Machinery and Equipment Requirement

Table 9 provides details of machinery and equipment required for the proposed project.

Table 9: Machinery Cost Details

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Ultrasonic Machine-N-95 Mask	1	3,500,000	3,500,000
Ultrasonic Machine- Surgical Mask	1	1,200,000	1,200,000
Sterilization Machine	28	35,000	980,000

Quality Testing Kits	14	10,000	140,000
Total			**5,820,000**

9.2.4 Office Equipment Requirement

Table 10 shows the cost details of the office equipment required for the unit.

Table 10: Office Equipment Cost Details

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Air Conditioners	2	90,000	180,000
Laptop / Computer	2	80,000	160,000
Printer	1	40,000	40,000
LED/LCD 32	1	40,000	40,000
Water Dispenser	2	20,000	40,000
Ceiling Fan	7	4,500	31,500
Exhaust Fan	10	2,000	20,000
Bracket Fan	8	4,000	32,000
Wi-Fi Router and Connection	1	5,000	5,000
Security System (8 Cams 2 mp)	8	2,000	16,000
DVR	1	12,000	12,000
Total			**576,500**

9.2.5 Furniture & Fixtures Requirement

Table 11 provides details of furniture and fixtures.

Table 11: Furniture & Fixtures Cost Details

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Office Tables	4	25,000	100,000
Reception Counter	1	50,000	50,000
Executive Tables	1	30,000	30,000
Executive Chairs	1	20,000	20,000
Office Chairs	12	10,000	120,000
Sofa Sets	1	35,000	35,000
Total			**355,000**

9.2.6 Office Vehicle Requirement

Table 12 provides details of the vehicles required along with their cost for the proposed project.

Table 12: Office Vehicles Cost Details

Cost Item	No.	Unit Cost (PKR)	Registration Fee @ 1%	Total Cost (PKR)
Carry van	1	1,150,000	11,500	1,161,500
Motorcycle	1	80,000	1000	81,000
Total				**1,242,500**

9.2.7 Pre-Operating Cost

Table 13 provides details of estimated pre-operating costs.

Table 13: Pre-Operating Cost Details

Costs Item	No.	Months	Unit Cost (PKR)	Cost (PKR)
Owner	1	2	70,000	140,000
Ultrasonic machine operator N95 skilled	1	1	35,000	35,000
Security Guard	1	1	40,000	40,000
Utilities				117,538
Total Cost (PKR)				**332,538**

9.2.8 Security against Building Rent

Table 14 provides details of security against rented building.

Table 14: Security against Building Details

Cost item	Unit	No.	Unit Cost (PKR)	Cost (PKR)
Security against Building Rent	Months	3	67,500	202,500
Total Cost (PKR)				**202,500**

9.3 Breakeven Analysis

Table 15 shows calculation of break-even analysis.

Table 15: Breakeven Analysis

Description	First Year Values (PKR)	Ratios
Sales (PKR)	81,536,000	100%
Variable Cost (PKR)	66,749,283	82%
Contribution (PKR)	14,786,717	18%
Fixed Cost (PKR)	6,329,035	8%
Contribution Margin	18%	
Unit produced (N95)	1,792,000	
Unit produced (surgical)	6,272,000	
Contribution Margin Per unit (N95)	5.7	
Contribution Margin Per unit	0.73	
Breakeven		
Breakeven Revenue (N95)		19,810,247
Breakeven Revenue(surgical)		3,279,767
Breakeven Units (N95)		566,007
Breakeven Units (surgical)		3,279,767
Breakeven Capacity (N95)		13%
Breakeven Capacity (surgical)		21%

9.4 Revenue Generation

Table 16 provides details for revenue generation of the N95 and surgical stitching masks during the first year of operations.

Table 16: Revenue Details

Products	Current Operational Capacity @ 60% per Year	Sale price Per unit (PKR)	Total Revenue Annual (PKR)
N95 mask	1,792,000	35	62,720,000
Surgical mask	6,272,000	3.0	18,816,000
Total			**81,536,000**

9.4.1 Cost of Goods Sold

Based on 60% capacity utilization, the calculation of cost of goods sold during the first year of operations is shown in Table 17.

Table 17: Cost of Goods Sold Estimate

Cost Item	Total Cost (PKR)
Material cost- N-95 Mask	50,176,000
Material cost- Surgical Mask	11,603,200
Direct Utilities cost	1,144,483
Direct Labor	2,160,000
Machinery Maintenance - Cost	116,400
Total	**65,200,083**

9.4.2 Variable Cost Estimate

Variable costs of the project have been provided in Table 18.

Table 18: Variable Cost Estimate

Description of Costs	Amount (PKR)
Material cost- N-95 Mask	50,176,000
Material cost- Surgical Mask	11,603,200
Direct Labor	2,160,000
Direct Utilities cost	1,144,483
Machinery Maintenance Cost	116,400
Travelling expense	276,000
Communications expense (phone, mail, internet, etc.)	414,000
Office vehicles running expense	528,000
Office expenses (stationery, entertainment, janitorial services, etc.)	331,200
Total	**66,749,283**

Table 19: Material Cost – N95 Mask

Cost Item	Units	Cost per unit (PKR)	Amount (PKR)
N95 Mask	1,792,000	28	50,176,000

Table 20: Raw Material Cost for N95 Mask

Cost Item	Basis	Price per Kg/Piece (PKR)	Consumption Per Unit(Grams/Piece)	Price Per Unit
Non Woven Fabric	Kg	480	25	12
Elastic	Kg	900	5	4.5
Nose Pin	unit	600	5	3
Filter	Piece	6	1	6
Packing Material	Piece	2.5	1	2.5
Cost per Unit				**28**

Table 21: Material Cost – Surgical Mask

Cost Item	Units	Cost per unit	Amount (PKR)
Surgical Mask	6,272,000	1.85	11,603,200

Table 22: Raw Material Cost for Surgical Mask

Cost Item	Basis	Price per Kg/Piece (PKR)	Consumption Per Unit(Grams/Piece)	Price Per Unit (PKR)
Non Woven Fabric	Kg	200	4	0.8
Elastic	Kg	900	0.5	0.5
Nose Pin	Unit	600	1	0.6
Cost per Unit				**1.85**

Table 23: Direct Labor

Post	No. of personnel	Monthly Salary (PKR)	Annual Salary (PKR)
Ultrasonic Machine Operator- N-95 – Skilled	1	35,000	420,000
Labor-Unskilled	2	20,000	480,000
Ultrasonic Machine Operator- Surgical Mask – Skilled Labor	1	35,000	420,000
Labor-Unskilled	1	20,000	240,000
Packing - N-95 Mask	1	25,000	300,000
Packing - Surgical mask	1	25,000	300,000
Total			**2,160,000**

Table 24: Machinery Maintenance Cost

Description of Costs	Machinery Cost (PKR)	Maintenance Rate	Amount (PKR)
Maintenance Cost	5,820,000	2%	116,400
Total			**116,400**

Table 25: Vehicle Running Expenses

Particulars	Motorcycle(s) (PKR)	Carry Van (PKR)	Total (PKR)
Fuel cost	9,000	30,000	39,000
Service Charges	500	2,000	2,500
Oil & Tuning	1,000	1,500	2,500
Monthly expenses/ Motorcycle	10,500	33,500	44,000
No of Vehicles	1	1	2
Monthly vehicle running cost	10,500	33,500	44,000
Yearly Cost	**126,000**	**402,000**	**528,000**

Table 26: Variable Cost Assumptions

Description of Costs	Details
Travelling expense	10% of administration expense
Communications expense (phone, mail, internet, etc.)	15% of administration expense
Office expenses (stationery, entertainment, janitorial services, etc.)	12% of administration expense

9.4.3 Fixed Cost Estimate

Table 27 shows the estimated fixed cost of the project.

Table 27: Fixed Cost Estimate

Description of Costs	Amount (PKR)
Management Staff	2,760,000
Administration benefits expense	246,000
Building rental expense	810,000
Indirect Utilities	97,978
Promotional expense	203,840

Insurance expense	87,300
Professional fees (legal, audit, consultants, etc.)	407,680
Depreciation expense	1,242,050
Amortization of pre-operating costs	66,508
Bad debt expense	407,680
Total	**6,329,035**

Table 28: Management Staff

Post	No. of personnel	Monthly Salary (PKR)	Annual Salary (PKR)
Owner/Operational Manager	1	70,000	840,000
Marketing and Sales Officer	2	40,000	960,000
Admin & Finance Officer	1	40,000	480,000
Office Boy	1	20,000	240,000
Security Guard	1	20,000	240,000
Total			**2,760,000**

Table 29: Fixed Cost Assumptions

Description of Costs	Details
Administration benefits expense	5% of administration expense
Promotional expense	0.25% of revenue
Insurance expense	1.5% of machinery cost
Professional fees (legal, audit, consultants, etc.)	0.5% of revenue
Bad debt expense	0.5% of revenue
Depreciation expense	
Building Renovation cost	10% of Renovation Cost
Machinery/Furniture & Fixtures/Equipment/Vehicle	15% of Cost

9.5 Human Resource Requirement

The proposed unit shall require the workforce as provided in Table 30.

Table 30: Human Resource

Personnel	Number of Personnel	Salary Per Month Per-Resource (PKR)	Annual Salaries
Owner/Operational Manager	1	70,000	840,000
Ultrasonic Machine Operator-N-95 – Skilled	1	35,000	420,000
Labor-Unskilled	2	20,000	480,000
Ultrasonic Machine Operator-Surgical Mask - Skilled	1	35,000	420,000
Labor-Unskilled	1	20,000	240,000
Packing - N-95	1	25,000	300,000
Packing - Surgical mask	1	25,000	300,000
Marketing and Sales Officer	2	40,000	960,000
Admin & Finance Officer	1	40,000	480,000
Office Boy	1	20,000	240,000
Security Guard	1	20,000	240,000
Total	**11**		**4,920,000**

10. CONTACT DETAILS

The contact details of some major suppliers of machinery and equipment used in N95 and surgical mask stitching unit is given in Table 31.

Table 31: Contact Details

Supplier Name	Origin/City	Contact No	Email
KingMilan	China	0086-13390830898	sales@4008874458.com
KingMilan	China	0086-13390833831	sales@4008874458.com
Long age traders	Lahore,	0321 9687932	
Unique Cables	Lahore,	0300 8497447	
Faida Enterprises	Lahore	0333 1211927	
Paragon Impex	Karachi	0302 3380000	
Al Najeeb Medical Equipment Suppliers	Quetta	0301 3232844	www.atyourservice.pk
Muhammad Bilal Saeed	Faisalabad	0300 7666561	
Standard Supply Agencies	Peshawar	091 2214422	www.ssa.com.pk

11. USEFUL LINKS

Table 32: Useful Links

Name of Organization	E-mail Address
Small and Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
National Business Development Program (NBDP)	www.nbdp.org.pk
Government of Pakistan	www.pakistan.gov.pk
Ministry of National Health Services Regulations and Coordination	www.nhsrc.gov.pk
National Command And Operation Center	ncoc.gov.pk/
World Health Organization	www.emro.who.int/countries/pak/index.html
Government of Punjab	www.punjab.gov.pk
Trade Development Authority of Pakistan	www.tdap.gov.pk
Security and Exchange Commission of Pakistan	www.secp.gov.pk
State Bank of Pakistan	www.sbp.gov.pk
Federal Board of Revenue	www.fbr.gov.pk
Federation of Pakistan Chambers of Commerce andIndustry (FPCCI)	www.fpcci.com.pk
Pakistan Medical Commission	www.pmc.gov.pk

12. ANNEXURES

12.1 Income Statement

Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	**81,536,000**	**99,341,424**	**119,540,847**	**142,409,011**	**168,249,773**	**197,399,046**	**230,228,026**	**267,146,735**	**308,607,908**	**355,111,262**
Cost of sales										
Material cost- KN-95 Mask	50,176,000	61,133,184	73,563,598	87,636,314	103,538,322	121,476,336	141,678,785	164,397,991	189,912,559	218,530,008
Material cost- Surgical Mask	11,603,200	14,137,049	17,011,582	20,265,898	23,943,237	28,091,403	32,763,219	38,017,035	43,917,279	50,535,064
Direct Utilities cost	1,144,483	1,244,702	1,353,696	1,472,235	1,601,154	1,741,361	1,893,846	2,059,684	2,240,044	2,436,197
Direct Labor	2,160,000	2,318,400	2,488,416	2,670,900	2,866,766	3,076,995	3,302,642	3,544,835	3,804,790	4,083,808
Machinery Maintenance - Cost	116,400	126,061	136,524	147,856	160,128	173,418	187,812	203,401	220,283	238,566
Total cost of sales	65,200,083	78,959,396	94,553,817	112,193,203	132,109,606	154,559,514	179,826,305	208,222,946	240,094,955	275,823,643
Gross Profit	16,335,917	20,382,028	24,987,030	30,215,808	36,140,167	42,839,532	50,401,722	58,923,789	68,512,953	79,287,619
General administration & selling expenses										
Management Staff	2,760,000	2,962,400	3,179,643	3,412,816	3,663,090	3,931,716	4,220,042	4,529,512	4,861,676	5,218,199
Administration benefits expense	246,000	264,040	283,403	304,186	326,493	350,436	376,134	403,717	433,323	465,100
Building rental expense	810,000	891,000	980,100	1,078,110	1,185,921	1,304,513	1,434,964	1,578,461	1,736,307	1,909,938
Indirect Utilities	97,978	106,557	115,888	126,036	137,073	149,075	162,130	176,327	191,767	208,559
Travelling expense	276,000	296,240	317,964	341,282	366,309	393,172	422,004	452,951	486,168	521,820
Communications expense (phone, fax, mail, internet, etc.)	414,000	444,360	476,946	511,922	549,463	589,757	633,006	679,427	729,251	782,730
Office vehicles running expense	528,000	571,824	619,285	670,686	726,353	786,640	851,931	922,642	999,221	1,082,156
Office expenses (stationery, entertainment, janitorial services, etc	331,200	355,488	381,557	409,538	439,571	471,806	506,405	543,541	583,401	626,184
Promotional expense	203,840	248,354	298,852	356,023	420,624	493,498	575,570	667,867	771,520	887,778
Insurance expense	87,300	74,205	61,110	48,015	34,920	21,825	8,730	149,617	127,174	104,732
Professional fees (legal, audit, consultants, etc.)	407,680	496,707	597,704	712,045	841,249	986,995	1,151,140	1,335,734	1,543,040	1,775,556
Depreciation expense	1,242,050	1,242,050	1,242,050	1,242,050	1,242,050	1,242,050	842,350	2,157,067	2,157,067	2,157,067
Amortization of pre-operating costs	66,508	66,508	66,508	66,508	66,508	-	-	-	-	-
Bad debt expense	407,680	496,707	597,704	712,045	841,249	986,995	1,151,140	1,335,734	1,543,040	1,775,556
Subtotal	7,878,235	8,516,440	9,218,715	9,991,262	10,840,872	11,708,479	12,335,548	14,932,596	16,162,954	17,515,376
Operating Income	8,457,682	11,865,589	15,768,315	20,224,547	25,299,295	31,131,054	38,066,174	43,991,193	52,349,999	61,772,244
Gain / (loss) on sale of machinery & equipment	-	-	-	-	-	-	1,455,000	-	-	
Gain / (loss) on sale of office equipment	-	-	-	-	-	-	144,125	-	-	
Gain / (loss) on sale of office vehicles	-	-	-	-	-	-	310,625	-	-	
Earnings Before Interest & Taxes	8,457,682	11,865,589	15,768,315	20,224,547	25,299,295	31,131,054	39,975,924	43,991,193	52,349,999	61,772,244
Earnings Before Tax	8,457,682	11,865,589	15,768,315	20,224,547	25,299,295	31,131,054	39,975,924	43,991,193	52,349,999	61,772,244
Tax	2,080,188	3,272,955	4,638,910	6,198,591	7,974,753	10,015,868	13,111,573	14,516,917	17,442,499	20,740,285
NET PROFIT/(LOSS) AFTER TAX	**6,377,494**	**8,592,633**	**11,129,406**	**14,025,956**	**17,324,543**	**21,115,186**	**26,864,351**	**29,474,276**	**34,907,500**	**41,031,959**

12.2 Balance Sheet

Balance Sheet

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
Current assets											
Cash & Bank	500,000	3,421,770	12,501,650	22,914,196	35,848,131	51,637,934	70,629,085	80,103,867	107,030,314	138,525,797	187,158,781
Accounts receivable		10,052,384	11,149,978	13,492,743	16,147,594	19,150,199	22,539,996	26,360,573	30,660,088	35,491,725	40,914,195
Raw material inventory	2,574,133	2,452,120	3,235,573	4,216,631	5,440,204	6,960,823	8,844,629	11,171,751	14,039,168	17,564,145	9,105,417
Equipment spare part inventory	9,700	11,346	13,270	15,521	18,154	21,234	24,836	29,049	33,977	39,741	-
Pre-paid building rent	67,500	74,250	81,675	89,843	98,827	108,709	119,580	131,538	144,692	159,161	-
Pre-paid insurance	87,300	74,205	61,110	48,015	34,920	21,825	8,730	149,617	127,174	104,732	-
Total Current Assets	3,238,633	16,086,074	27,043,256	40,776,948	57,587,829	77,900,725	102,166,857	117,946,395	152,035,414	191,885,301	237,178,393
Fixed assets											
Building/Infrastructure	429,500	386,550	343,600	300,650	257,700	214,750	171,800	128,850	85,900	42,950	-
Machinery & equipment	5,820,000	4,947,000	4,074,000	3,201,000	2,328,000	1,455,000	582,000	9,974,457	8,478,289	6,982,120	5,485,951
Furniture & fixtures	355,000	301,750	248,500	195,250	142,000	88,750	35,500	608,408	517,146	425,885	334,624
Office vehicles	1,242,500	1,056,125	869,750	683,375	497,000	310,625	124,250	2,523,227	2,144,743	1,766,259	1,387,775
Office equipment	576,500	490,025	403,550	317,075	230,600	144,125	57,650	988,020	839,817	691,614	543,411
Advance Against Building Rent	202,500	202,500	202,500	202,500	202,500	202,500	202,500	202,500	202,500	202,500	202,500
Total Fixed Assets	8,626,000	7,383,950	6,141,900	4,899,850	3,657,800	2,415,750	1,173,700	14,425,462	12,268,395	10,111,328	7,954,261
Intangible assets											
Pre-operation costs	332,538	266,031	199,523	133,015	66,508	-	-	-	-	-	-
Total Intangible Assets	332,538	266,031	199,523	133,015	66,508	-	-	-	-	-	-
TOTAL ASSETS	**12,197,172**	**23,736,055**	**33,384,679**	**45,809,814**	**61,312,137**	**80,316,475**	**103,340,557**	**132,371,856**	**164,303,809**	**201,996,629**	**245,132,654**
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable		5,161,389	6,217,380	7,513,109	8,989,477	10,669,272	12,578,168	14,745,117	17,202,793	19,988,113	22,092,180
Total Current Liabilities	-	5,161,389	6,217,380	7,513,109	8,989,477	10,669,272	12,578,168	14,745,117	17,202,793	19,988,113	22,092,180
Other liabilities											
Total Long Term Liabilities	-	-	-	-	-	-	-	-	-	-	-
Shareholders' equity											
Paid-up capital	12,197,172	12,197,172	12,197,172	12,197,172	12,197,172	12,197,172	12,197,172	12,197,172	12,197,172	12,197,172	12,197,172
Retained earnings		6,377,494	14,970,127	26,099,533	40,125,489	57,450,031	78,565,217	105,429,568	134,903,844	169,811,344	210,843,303
Total Equity	12,197,172	18,574,665	27,167,299	38,296,704	52,322,660	69,647,203	90,762,388	117,626,740	147,101,016	182,008,516	223,040,475
TOTAL CAPITAL AND LIABILITIES	**12,197,172**	**23,736,055**	**33,384,679**	**45,809,814**	**61,312,137**	**80,316,475**	**103,340,557**	**132,371,856**	**164,303,809**	**201,996,629**	**245,132,654**

12.3 Cash Flow Statement

Cash Flow Statement

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Operating activities											
Net profit		6,377,494	8,592,633	11,129,406	14,025,956	17,324,543	21,115,186	26,864,351	29,474,276	34,907,500	41,031,959
Add: depreciation expense		1,242,050	1,242,050	1,242,050	1,242,050	1,242,050	1,242,050	842,350	2,157,067	2,157,067	2,157,067
amortization of pre-operating costs		66,508	66,508	66,508	66,508	66,508	-	-	-	-	-
Accounts receivable		(10,052,384)	(1,097,595)	(2,342,765)	(2,654,851)	(3,002,605)	(3,389,797)	(3,820,577)	(4,299,515)	(4,831,637)	(5,422,471)
Finished goods inventory		-	-	-	-	-	-	-	-	-	-
Raw Material Inventory	(2,574,133)	122,013	(783,453)	(981,058)	(1,223,573)	(1,520,620)	(1,883,806)	(2,327,121)	(2,867,417)	(3,524,977)	8,458,728
Equipment Spare parts Inventory	(9,700)	(1,646)	(1,925)	(2,251)	(2,633)	(3,080)	(3,602)	(4,213)	(4,928)	(5,764)	39,741
Pre-paid building rent	(67,500)	(6,750)	(7,425)	(8,168)	(8,984)	(9,883)	(10,871)	(11,958)	(13,154)	(14,469)	159,161
Advance insurance premium	(87,300)	13,095	13,095	13,095	13,095	13,095	13,095	(140,887)	22,443	22,443	104,732
Accounts payable		5,161,389	1,055,991	1,295,729	1,476,368	1,679,795	1,908,897	2,166,949	2,457,676	2,785,320	2,104,066
Other liabilities		-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(2,738,633)	2,921,770	9,079,880	10,412,546	12,933,935	15,789,803	18,991,151	23,568,893	26,926,447	31,495,483	48,632,984
Financing activities											
Issuance of shares	12,197,172	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing activities	12,197,172	-	-	-	-	-	-	-	-	-	-
Investing activities											
Capital expenditure	(8,958,538)	-	-	-	-	-	-	(14,094,112)	-	-	-
Cash (used for) / provided by investing activities	(8,958,538)	-	-	-	-	-	-	(14,094,112)	-	-	-
NET CASH	500,000	2,921,770	9,079,880	10,412,546	12,933,935	15,789,803	18,991,151	9,474,782	26,926,447	31,495,483	48,632,984

13. KEY ASSUMPTIONS

13.1 Operating Cost Assumptions

Table 33: Economic Rate

Economic Rates	2020	2019	2018	Average
Inflation rate	11.2%	8.1%	5.6%	8.3%
Electricity growth rate	7.1%	14.3%	4.9%	8.8%
Water price growth rate	7.1%	14.3%	4.9%	8.8%
Gas price growth rate	7.1%	14.3%	4.9%	8.8%
Wage growth rate	11.2%	7.0%	3.8%	7.3%
Office equipment price growth rate	13.9%	6.7%	3.4%	8.0%
Office vehicles price growth rate	13.6%	8.1%	10.3%	10.7%

Source: Economic Survey of Pakistan

Table 34: Operating Cost Assumptions

Description	Details
Operating costs growth rate	8.3%
Administration benefits expense	5% of administration expenses
Travelling expenses	10% of administration expenses
Communication expenses	15% of administration expenses
Office expenses (stationery, janitor, etc.)	12% of administration expenses
Promotional Expense	0.25% of revenue
Machinery & equipment insurance rate	1.5% of cost of machinery
Professional fees (legal, audit, consultants, etc.)	0.5% of revenue
Bad debt expense	0.5% of revenue

13.2 Revenue Assumptions

Table 35: Revenue Assumptions

Description	Details
Sale price growth rate	8.3%
Capacity utilization	40%
Capacity utilization growth rate	5%
Maximum capacity	85%

13.3 Financial Assumptions

Table 36: Financial Assumptions

Description	Details
Project life (Years)	10
Debt: Equity	0:100
Discount Rate (100%Equity)	20%
Discount Rate (50:50, Debt: Equity)	16%

13.4 Cash Flow Assumptions

Table 37: Cash Flow Assumptions

Description	Details
Account Receivable Days	45
Account Payable Days	30

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