

ROAD MAP FOR
Domestic Manufacturing of 'COTTON WOOL ABSORBENT

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SECTION – 1

BACKGROUND

India's post-independence plans emphasized industrialization as a very important instrument for sustained growth. After independence the people entertained high hopes from the government for the betterment. Industrial policy 1948 and industries (Development and Regulation) Act 1976 gave the idea of the attitude of the government with regard to the development industries. The process of reforms initiated during 1980s got further push with the process of economic reforms and liberalization announced in 1990-91. With the enactment of MSMED (Micro Small and Medium Development Enterprises) Act 2006, the services sector was included in the definition of MSMEs. The act also extended the scope to million enterprises. The role and importance MSMEs is very significant towards poverty eradication, employment generation and rural development and creating regional balance in promotion and growth of various developmental activities. Many new initiatives taken up by the government in the form of Making in India, Invest India, Stand up India, E-biz Mission Mode Project and Aatmanirbhar Bharat Abhiyaan (Self reliant India movement-through five pillars Economy, Infrastructure, System, Vibrant Demography and Demand)) under the national e-governance plan are facilitating investment and ease of doing business in the country. In the view of the vast employment potential of the MSMEs and their contribution in GDP and in exports industrial production and removing or decreasing regional imbalance in economic growth, there have been continuous efforts by the government for promoting the MSMEs.

It is seen that India is one among many countries has larger trade deficit creating trade imbalances and depending on imports. The Government has got ambitious plans to formulate suitable policy and programmes for encouraging investments in industry in the country.

In this direction DC (MSME) has rightly taken note of prevailing unwanted imports taking place among the products of 358 items exclusively reserved for purchase from MSMEs. It is indeed expected that these items are supposed to be manufactured domestically in the country and the policy is existing to compulsorily purchase these items from MSMEs by central government agencies as a measure of market support. But the irony is that these items are lavishly imported even though they can be manufactured locally by our own MSMEs. Moreover, considering the demographic strength of our nation, creating suitable job for millions of youth is a paramount responsibility of the nation. As a twofold strategy, following the clarion call of "vocal for local" of our Honorable Prime Minister which emphasizes and encourages the products to be manufactured domestically, using locally available resources, thereby reducing imports and generating employment opportunities. This will lead to achieve one of the objectives of "Aatmanirbhar Bharat Abhiyaan".

As part of this mission, O/o DC (MSME), New Delhi has assigned the task of preparing a road map for domestic manufacturing of "Cotton Wool absorbent" which is being imported considerably.

The demand for surgical cotton is directly related with the hospital, dispensaries, nursing homes, health care center etc. Progressive increase in health amenities offered by government and coming up of new hospital and health care center in private sector, even small towns are contributing to the growth of absorbent cotton industry. Government hospitals and nursing homes are the largest consumers of surgical cotton. With the development of medical facilities and growing awareness towards personal hygiene, the surgical cotton industry registered steady growth rate in the past, and is packing up pace with spread of education and upward economic growth of town and villages. In coming years the demand of surgical cotton will increase so there is wide scope for new entrants to venture into this project.

SECTION – 2

COMMERCIAL DETAILS

In this section, commercial details for domestic manufacturing of Cotton Wool absorbent is described.

2.1	Nomenclature of the Product :Cotton Wool	
2.2	HSN Code of the Product	30059010 Wadding, gauze, bandages and similar articles
2.3	NIC Code of the Product	21006 Manufacture of medical impregnated wadding, gauze, bandages, dressings, surgical gut string etc
2.4	Cluster Already existing on the product (if any)	Medical Textile Clusters are largely exists along-with spinning mills in the states like Gujarat, Maharashtra, Telangana, Andhra Pradesh, Haryana, Madhya Pradesh, Rajasthan, Karnataka, Punjab and Tamil Nadu
2.5	Possibility to create / Establish cluster on the Project	Yes, one cluster at each region mentioned above
2.6	Probable Area or Districts where the products / Product manufacturing or Project can be established	State Capital / Raw material available intensive area. The specific area suitability is to be ascertained from the Textile Commissioner, MoT, GoI
2.7	Number of Industries registered as MSME is available in the manufacturing of the Product	2,741 units from 35 States for NIC code 21006 – Manufacture of medical impregnated wadding, gauze bandages, Dressings, surgical gut string etc with leading by Maharashtra, UP and New Delhi.
2.8	Number of Industries available in large scale industries	Details are not available in public domain. However, considering the market size and scope for this item, existence of large industries manufacturing Cotton Wool Absorbent alone is meager
2.9	Data about the imports	2017 - 18 : 971.48 2018 - 19 : 620.63 2019 - 20 : 1291.87 Value : lakhs Rs ;Source : {(DC (MSME))}
2.10	Data available for the export well against this product for the past 2 year (DC Website)	2017 - 18 : 15.12 2018 - 19 : 0.832 2019 - 20 : 5.50 Value : lakhs Rs; Source : {(DC (MSME))}

2.11	<p>Scope for the number of units, number of years for establishment</p> <p>One or two units in every state where cotton growing takes place like Gujarat, Maharashtra, Telangana, Karnataka, Andhra Pradesh, Haryana, Madhya Pradesh, Rajasthan, Punjab and Tamil Nadu.</p> <p>The demand is poised to increase gradually as there can be more need in demand from health, hospital and hygiene life style etc.,</p>
2.13	<p>Growth in India</p> <p>India produces the widest range of cotton; perhaps no other cotton producing country in the world has this distinction. The demand of Surgical Absorbent Cotton is directly related with the increase in population and expansion of public health services. Government hospitals and large nursing homes are the largest consumer for cotton wool. the area under surgical cotton cultivation in India was 97 percent in 1947, it fell to 42 percent in 1990, 28 percent in 2000 and about 1 percent in 2012, and it is now estimated to be much less than 1 percent. Meditech in India is expected to grow at a CAGR of 9.1% from US\$ 600 million in 2014 to US\$880 million in 2020. As a whole, any entrepreneur can venture in this project without risk and earn profit. Continuous scope for Medical, health and treatment and hygiene consciousness developing in minds of general public</p>
2.14	<p>The Demand in the domestic market</p> <p>Estimated market size for Medical Textile Industry in India for the year 2020 was Rs 4000 - 4500 Crores. Major growth drivers of Indian medical textiles segment are growing needs for better and convenient primary wound dressing materials, use of smart textiles in healthcare field, increasing number of surgeries in India (~ 5 million to ~ 8 million patients by 2020), growing disposable income increases accessibility towards medical textile products, increasing consciousness among people with regard to personal care and hygiene, aging population (96 million to ~168 million by 2026), developments happening in the textile scaffolds, increasing usage of contact lenses (18-30-year-old consumers especially females).</p> <p>Initiatives which will impact on the consumption are universal health coverage scheme, 100% FDI is allowed under automatic route, Support to PPP model to improve availability of healthcare services, tax support for hospitals setup in rural areas (under 80-IB), incentives and tax holidays for medical travel facilities</p>
2.15	<p>Demand of the Export market</p> <p>Industries in India produce the widest range of cotton; perhaps no other cotton producing country in the world has this distinction. Progressive increase in health amenities offered by Government and coming up of new hospitals and health care centres in private sector even at small towns are contributing to the growth of absorbent cotton industry.</p> <p>The demand for absorbent cotton is directly related with the development and expansion of health facilities in the country. The Federal and Regional Governments have given high attention for expansion of health facilities to increase the coverage. Hence, considering the population growth and the high attention given by the Federal and Regional Governments, the demand for absorbent cotton is assumed to grow by 10%, annually. As a whole there is a good scope for new entrants to invest in this business.</p> <p>Surgical medical textile has export potential due to exponential growth in population and their health care needs.</p>

Indian exporters of HS Code: 30059010 have been aggressively marketing themselves in the foreign markets. They have received good response from several countries and so are upbeat about their prospects. Exporters' confidence and performance is well reflected in India's exports.

India exporting to Nepal, Maldives, Angola, Kenya, Peru, Papua Gana, Madagascar are the largest buyers. The neighboring countries and other countries of various treaty countries are to be looked into opening and expanding business for medical textile items.

Medical textiles are generally shipped by air cargo only as it is an emergency stock need to be kept for daily requirement and future requirements.

SECTION - 3 TECHNICAL DETAILS

3.1	Sector in which the product is classified	Manufacture of Medical Textiles
3.2	End users of the product / sector	Medical hospital, Health and hygiene care sector and cleaning, first aid, cosmetic applications and arts & crafts etc. Primary Health Center / Hospital of Defense forces Central Reserve Police Force, RPF, Health Care Centers under Central Public Sector Undertakings and State
3.3	International Specification	Not available
3.4	Indian Specification	
S.No	Standards	Description
1	IS :16468- 2016	Governing Indian specification
2	667:1981	Methods for identification of textile fibres (first revision)
3	1390 : 1983	Methods for determination of pH value aqueous extracts of textile materials (first revision)
4	4905 : 1968	Methods for random sampling

5	10150 : 1981	Guide for sterilization of products
6	14944 : 2001	Surgical dressing – Methods of tests

3.5. Flow process chart for the manufacture:

Absorbent cotton or surgical cotton is used at each level from medical to corporate and also individual level. This item is regulated under drug control act. Hence, it should be manufactured to meet its requirements for quality control standards. Apart from used as a dressing material, it is also used for padding for items of clothing, quilts etc. The absorbent cotton should be chemically inert and soft to give maximum protection and should not cause irritation. These properties can be achieved by manufacturing the product as per standard method of manufacture. The raw cotton is processed by series of steps which render the cotton hydro-phallic in character and free from external impurities needed to be fit for use in surgical dressings and personal hygiene.

Cotton is a soft, staple fiber that grows in a form known as a boll around the seeds of the cotton plant, as shrub native to tropical and subtropical regions around the world, including the Americas, India and Africa. The cotton fibres as it comes from natural sources have natural impurities including its seeds as such it is to be processed through mechanical operations with set of machines whereby these impurities adhered to the fibres are removed. Other impurities which are inherent chemically is to be removed by chemical processing known as bleaching and after bleaching with peroxide is subjected to sterilization by Gamma radiation, these fibres are further subjected to hydro extraction, drying, lapping, carding, rolling and cutting. These rolls are wrapped around at one end or both the end with fine quality cotton n fabric in order to ensure hygiene and safety applications.

3.6. Qualitative parameters of the product :

Surgical cotton is also known as absorbent cotton” or “cotton wool”. Surgical/Absorbent cotton is cleared de-oiled and bleached cotton packed in different sizes. Since Surgical/Absorbent cotton is a material which comes in direct contact with the human body, its quality is very important and should satisfy the required pharmaceutical parameters. The fiber of Surgical/Absorbent cotton is very elastic. It consists of 98%-99.5% of cellulose which has a diameter of 16.30 and a length of 12-40 mm.

Since, it is mainly used for medical purposes in hospitals, nursing homes, and dispensaries & at home (for first aid) etc. because of its high fluid absorbency. It is better known among masses as absorbent cotton. Absorbent cotton consists of non woven fleeces of fibres, roughly parallel, knot free cotton fibers, up to 30 mm in length to less than 20 mm. It is sterile & is therefore suitable for use in dressings. The raw cotton is processed by series of steps, which render the cotton hydrophilic in character & free from external impurities needed to be fit for use in surgical dressings & personal hygiene. It is almost plain cellulose and constitutes one of the basic raw materials of the various cellulose industries, including plastics, rayon & explosives. Uses and Applications Absorbent cotton or surgical cotton is used at each level from medical to corporate, and also individual level. This item is regulated under the Drugs Control Act. Hence, it should be manufactured to meet its requirements for quality control standard.

3.7. Details of the product license to be obtained :

BIS, Drug Controller General of India, New Delhi, NABL Accreditation for the testing laboratory is required.

3.8. Machinery & Equipment required for the manufacturing

➤ Blow-room machine

Natural cotton as it comes from cultivated land have natural impurities like cotton seed, leaves, foreign materials and some inherent impurities like wax/ resin etc. Cotton bolls after harvesting / plucking are transported and subjected mechanical processes like opening and cleaning processes through series of opening and beating lines.

➤ Bleaching range

The cotton opened in the blow room machine is to be subjected to chemical processing ie bleaching by treating the fibres in chemicals normally hydrogen peroxide or sodium hypo chloride in order to remove natural wax/ resin in the cotton fibre in order to improve its absorbency and natural yellow colour

➤ Hydro extractor

Hydro extraction process is carried out to remove water from cotton fibre developed during bleaching by charging the lot from bleaching and by centrifugal action at an high speed.

➤ Dryer

After hydro extraction, the lot is be dried out to remove moisture in drying machine by passing it through dryer at high temperature.

➤ Lapping machine

This is a preparatory process for carding process. This machine is meant for making the cotton lot into sheet of desired weight and length so that the carding process can carries out.

➤ Carding machine

This is the crucial process by which the lapp get further opened, remove short fibres and individualize the entangled fibres and further making into thin sheet of desired width, weight and length.

➤ Rolling machine

Under this process, the big rolls from carding process are made into small rolls and wrapping a kakhi paper along-with entire length of the roll in order to suit the requirement of end users.

➤ Cutting machine

The cutting of rolls into small pieces is required. In this process a disc saw cuts the roll into small pieces with predetermined lengths by pushing roll from one end .

➤ Packaging machine

Packing is done to outer side of the rolls with all particulars like trade name and technical details

3.9. Test facilities required for the product :

Testing of physical & chemical properties plays important role as the final material goes into use for medical purposes. Almost each manufacturing facilities must poses laboratory for testing of final products. Basic testing & Pharmacopoeial standards and **testing facilities** required for cotton wool are listed **below**.

Absorbent cotton wool I.P Standard :

Consists of trichomes or good quality new combers obtained from the seed coat of various species of the genus Gossypium which is cleaned, purified and bleached without any colouring matter.

Description :

White, carded fibre of average staple length 10 mm or more and containing NMT traces of leaf residue, seed coat and other impurities.

Offers appreciable resistance when pulled and does not shed too much dust when shaken gently.
Absorbent cotton wool I.P

1) Identification :

- i).The fiber turn violet on treatment with iodinated Zinc Chloride Solution
- ii) On examination under a microscope, the fibre consists of a single cell (4 cm long,40mm wide), in the form of a flattened tube with thick and rounded matter and often twisted
- iii) Occasional isolated foreign fibres are seen

2) Acidity / Alakalinity :

Macerate 15 gm in 150 ml of water for 2 hrs

Decant water and carefully squeeze residual liquid out with a glass rod.

To 25 ml of the extract, add 0.1 ml of dilute phenolphthalein solution or 0.05 ml of methyl orange solution Neither solution should show a pink colour

3) Surface active agents :

Take a 25 ml graduated glass-stoppered cylinder

Rinse it with Sulphuric acid and then with water

Add portions of the extract prepared for previous test

Shake 30 times vigourously (in 10 seconds)

Allow to stand for 1 minute Shake again for 30 times After 5 minutes, the height of froth does not exceed 2 mm above the surface of the fluid

4) Neps :

Neps are small knots on fibres caused by uneven growth or formed during processing.

Spread uniformly between two glass plates as a thin layer (0-5 gm for an area of 450 sq. cm)

View with the naked eye under transmitted light , the sample does not show more neps than about an average of 250 for 3 tests

5) Test of absorbency:

i) Test for sinking time

Weigh a dry cylindrical copper wire basket (8 cm high,5 cm dia, copper wire diameter 0.4 mm, mesh aperture 1.5 to 2 cm)

Take 5 portions each of approximately 1 gm, pack loosely in the basket and weigh again

Drop the basket from a height of 10 cm into a beaker (12 cm dia) containing water to a depth of 10 cm

Measure the time taken to sink below the surface of the water

Absorbent cotton wool requires NMT 10 seconds

6) Test for water holding capacity :

To the sample as above allow the water to drain for 30 seconds by keeping the long axis in the horizontal position

Transfer it to a tared beaker and calculate retained water

1 gm absorbent cotton wool retains NLT 23 gms of water

7) Fluorescence :

Examine a layer of about 5 mm thick cotton under UV lamp at 365 nm

It shows only a slight brownish-violet fluorescence and a few yellow particles

NMT a few isolated fibres show an intense blue fluorescence

8) Colouring Matter :

An alcohol extract of about 10 gm of the material, obtained with the help of a percolator. When examined against a white background shows a faint yellow tinge but no bluish or greenish tinge is apparent

9) Water soluble substances : Should not be more than 0.5%

10) Ether soluble substances : Should not be more than 0.5%

11) Sulphated ash : Not more than 0.5%

12) Loss on drying : Not more than 8.0%

3.10. Technology existing for manufacturing the product :

Technology presently adopted by the industries in this segment is considered to be modern in nature except one or two sub segment like bleaching and packaging. These sub sectors are to be made

more recent technologies adopted elsewhere in western countries are to be considered for intervention so that there can be optimization of the processes.

3.11 Suggested modern technology for implementation or available in the market

NA

3.12 Raw material required and availability

Most of the raw materials are available within the country as India produces the widest range of cotton and perhaps no other cotton producing country in the world has this distinction. Our country stands at 2nd position among all cotton- producing countries in the world. The area in which cotton is grown is more than 125 lakh hectares and the total production of cotton is around 450 lakh bales (1 bale : 170 Kgs). The leading cotton producing states are Gujarat, Maharashtra, Telangana, Karnataka, Andhra Pradesh, Haryana, Madhya Pradesh, Rajasthan, Punjab and Tamil Nadu.

3.13 Covering raw material standards Indian / International Standards

The method of testing and evaluating the properties of textiles are different in each country or region and the detection method and test standard are generally designated by Governments and by buyer. If the textile is exported to a certain country or region, it also meets the local testing standards like EN for European countries, AATCC and ASTM for the Americas and BS for England etc.

Indian standards

Performance Requirements for Absorbent Cotton (Clause 5)

Sl No.	Characteristic	Requirement Ref to	Method of Test,	
			IS No. (4)	Annex (5)
(1)	(2)	(3)	(4)	(5)
i)	Fibre identification	Test shall be positive for cotton	IS 667	—
ii)	Foreign fibres	Occasionally a few isolated fibres may be present when examined under a microscope	—	—
iii)	Neps, <i>Max</i>	250	—	B
iv)	Fluorescence	Examine a layer about 5 mm in thickness under ultraviolet light at 365 nm. It should display only a slight brownish-violet fluorescence and a few yellow particles	—	—
v)	Loss on drying, percent, <i>Max</i>	8, when determined on 5 g by drying in a oven at 100 - 105°C	—	—

vi)	Absorbency:		IS 14944	—
	a) Sinking time, s, <i>Max</i>	10	—	—
	b) Water holding capacity, <i>Min</i>	23 g of water/g	—	—
vii	pH of aqueous extract	6.5 to 7.5	IS 1390	—
vii	Extractable colouring matter	not more intensively coloured than reference solution	—	C
ix)	Water soluble substance, percent, <i>Max</i>	0.5	IS 14944	—
x)	Ether soluble substance, percent, <i>Max</i>	0.5	IS 14944	—
xi)	Sulphated ash, percent, <i>Max</i>	0.4	IS 14944	—
xii	Surface active substances	Any foam present must not cover the entire surface of the Liquid	—	D
xii	Sterility (Only for sterile cotton)	Shall comply	IS 10150	—

SECTION – 4 SCHEMES AND CONSULTANCY

Many schemes are formulated and implemented by Central Governments and state Governments for starting/ operating and marketing (domestic / export) industries in the country by product specific ministry/ departments/ research associates. In the case of textile industries Ministry of Textiles in the central Governments/ department of commerce & Industries in the state Governments and many Textile & Textiles Industries Associations are set up in the country to look after various activities including policies and programmes formulation for developing and R& D, quality control & achievements and marketing of textile products etc. Existing scheme applicability and their details are given below

Information is the key for success and one who has timely and relevant information is in the lead to exploit any opportunity. Information at hand related to commercial and technical aspects strengthens the motive of an individual to enter into a venture. And availability of a preliminary project report envisages the decision making power of an entrepreneur. In other way, it simplifies the decision making process of starting an enterprise and kindles to look forward for existing government support and facilities. Hence, this section explains the hand holding support provided by certain government agencies, existing financial schemes and marketing support for MSME sector.

4.1 Existing Financial Schemes

The following schemes are suggested for availing financial support from the financial institutions and some schemes are having the provision of incentives as a measure of encouragement. Various state

governments are also providing investment incentives to promote industries. Hence, an entrepreneur must be mindful of the different schemes while planning to start one.

- i. Irrespective of project cost limitation, the best scheme to avail financial support for any MSEs is through Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) for smooth flow of institutional credit to micro and small enterprises. Credit facility up to Rs 200 lakh can be covered on outstanding basis on the credit extended by member lending institution and in the case of Regional Rural Banks and select financial institutions Rs 50 lakh lending can be covered. This credit guarantee provides some relief for MLIs to agree for credit support to an entrepreneur without hesitation since 75 % of credit portion is covered in the eventuality of closure of the firm.

In short, it is a Collateral free credit with payment of extra fees-Guarantee fees

- Collateral Free Loan
- Nodal bank SIDBI and other banks has to claim subsidy- maximum amount is 2 crore and extent of guarantee covered from 75% to 85% according to the category and amount of loan.
- Annual Guarantee fee @ 1.80% PA and Annual service charges @0.75 % PA

- ii. An excellent scheme for a project investment not exceeding Rs.25 lakh is Prime Minister Employment Generation Programme (PMEGP). As per this scheme, margin money to be invested is only 5 to 10 % of the project cost depends upon the social category and the balance is provided as a composite loan for this activity. Secondly, financial support is provided with an incentives component ranging from 15 – 35 % depends on the location and social category with a rider to grant this incentive subject to successful management of the enterprise for a minimum period of 36 months and repayment of installments.

This scheme will be very much suitable for a beginner particularly one who wants to start in a rural area.

- iii. Promotion of inclusive growth is the government's policy and providing equal opportunity for the weaker section of the society is important. Because of glass ceiling phenomena women and person from downtrodden community are neglected in the progress path and are neglected by the society. They are not getting their due diligence in getting financial support from the banks. In order to remove this malady, government has introduced a scheme called Stand-Up India and this scheme envisages any of the aspiring women and Scheduled Caste and Scheduled Tribe prospective entrepreneur to avail a credit support above Rs.10 lakh to Rs.100 lakh to start a green venture. The prevailing condition of providing credit support to one women and either one SC or ST entrepreneur by each branch of commercial Banks brightens the chances of getting this facility.

4.2 Marketing Support

- i. Public Procurement Policy-2012 clearly supports the procurement of minimum amount of the annual procurement target of every departments and CPSUs coming under the purview of Central Government from MSME sector is a great boon for assuring a particular percentage of sale.

Under this, all Micro and Small Enterprises having Udyam Registration Number are eligible for exemption of earnest money and cost of tender document. Every Central Ministry /Department / PSUs shall set an annual target as

- 25% procurement from MSE Sector by value of procurement
 - 4 % for units owned by SC/ST entrepreneurs
 - 3% for units owned by women entrepreneurs
- ii. This product is one of the 358 reserved items to be purchased from MSME sector by the central government agencies/ departments as a purchase preference advantage of this product can be exploited to increase revenue on a continues basis.
 - iii. Vendor Development Programmes organized by MSME-DI and other organization is an unique opportunity to find out suitable buyer. Participating in exhibition and trade fair organized by various government and private organizations at district and national level is a great exposure to get recognition for market support.

4.3 MSE-Cluster Development Programme (MSE-CDP)

- Common Facility Centre by Creation of tangible assets for tackling common issues of group of industries like

Common Raw Material Bank, Training, quality control labs, R&D, setting up of high productive intermediate process

Financial assistance for Setting up Common Facility Centre

- Total project cost Rs 20 Crores.
- GOI grant 70% of project cost.
- SPV to be formed with minimum 20 units

In modified MSE-CDP scheme, the beneficiaries, the SPV and beneficiaries are across the county.

4.4 Zero Defect Zero Effect Scheme (ZED)

- Aimed to reduce wastages substantially, increase productivity, expand their market as IOPs, become vendors to CPSUs, have more IPRs, develop new products and processes etc.
- MSME will subsidized 80% of Micro, 60% of Small, 50% of Medium Enterprises' Certification Fee:
- Average 70% of Fee (Assessment Fee Rs. 10,000/- & Rs 80,000/- per enterprise respectively for Desktop Assessment and ZED rating Complete Assessment).
Nodal agency: Quality Council of India (QCI).

4.5 Intellectual Property Rights scheme for MSME

- To enhance awareness of MSMEs about Intellectual Property Rights (IPRs).
- To take measure for the protecting their ideas and business strategies.
- Assists to SMEs in technology up-gradation and enhancing competitiveness and for effective Utilization of IPR Tools by MSMEs.

Reimbursement for Trademark Rs10,000; Domestic Patent Rs 1 lakh; International Patent Rs 5 lakhs and GI 2 Lakhs

4.6 Lean Manufacturing Scheme

To enhance the manufacturing competitiveness of MSMEs through the application of various Lean Manufacturing (LM) Techniques by ;

- Reducing waste
- Increasing productivity
- Introducing innovative practices for improving overall competitiveness
- Inculcating good management systems
- Imbibing a culture of continuous improvement.
- Mini Cluster of MSE units 8 (+or -2) is to be formed
- SPVs is to be registered and for implementation of lean
- SPV has to contribute 20% of consultant fee and rest 80% will be GOI grant.
- For 10 units maximum consultant fee is Rs 36 lakhs tentative as the consultant fee on bidding basis.
- Implementation period will be of 18 months.

Nodal Agency : QCI and NPC

4.7 Procurement and Marketing Support Scheme

- Domestic exhibitions organised by Government, industry association, re-imburement of stall charges of minimum size of stall up-to Rs 30,000.
- Eligibility–MSE engaged in manufacturing and service sector.
- Benefit can be availed 2 times in a year.
- International exhibition-MSE can participate in the international exhibition as per the list/calendar approved by ministry of MSME.
- Re-imburement For stall charges 1.25 lakh; For air fare 1 lakh; For freight Rs 25,000

4.8 Proposed Scheme

- Swavalamban Silai School initiative of SIDBI:** This initiative of SIDBI in association with USHA since 2019, is aimed at promoting women entrepreneurship in rural areas of the country to promote entrepreneurship culture through training of rural women. The training component includes design, stitching, maintenance, repairing and handling of sewing machines for self-reliance. A total of 1700 rural women have been trained by this initiative and 1700 silai schools have been setup in 1638 villages across 24 districts of 7 states (Uttar Pradesh, Bihar, Jharkhand, Rajasthan, Telangana, Himachal Pradesh & Uttarakhand). Most of the schools are represented by women hailing from below poverty line and SC/ST. Since 2019, they have earned a cumulative income of Rs.400 lakh through stitching, trainer/learner's fee & machine repair. Aspirational women of the villages are looking at these inspirational homepreneurs as role models to embark on Swavalamban (entrepreneurial) journey.

This may be explored for the possibility of encouraging these Swavalamban Silai Schools with the support of SIDBI-USHA to manufacture Anklets Web as a regular income generation method.

4.9 Consultancy Services

- MSME Development Institutes and Branch MSME Development Institutes spread across the country are the one stop centers for providing wide range of information such as availability of developed plots, build in sheds, techno-economical, financial schemes and incentives etc.
- Some of the MSME-DIs have their in house training facilities and provide skill development in certain field. Also organize regular entrepreneurship development training programmes to the needy at a nominal cost.
- Enterprise Development Centres established in the MSME-DIs provide hand holding support from Pre-start stage to Growth stage through regular interaction and follow up actions.
- MSME Technology Centres at four regions and MSME Testing Stations established at prominent location in the country act as prime centres for testing assorted industrial products at an affordable cost.

- v. District Industries Centres located in each district across the country are also providing information and actively implement the state and central government schemes.

Sector specific Government organization (Textile Commissioner and Textiles committee), Research Associations are established to look into specific guidance for project guidance, Testing and starting the business across the country by the Government. The office of textile Commissioner takes activities like collection and analyse statistical data on textile production, consumption & export and formulate policies, development of textile machinery industry etc. The textile Committee offers regulatory and non regulatory testing services to trade and industry though its laboratories, it also participating in various committees of BIS in formulations standards for testing.

Details of these organizations are as below,

S.No	Organisation	Contact No	Mail id & Website
1	Office of the Textile Commissioner Nishta Bhavan, New CGO Building 48, New Marine Lines Mumbai-400 020	Phone : 022-22001050 Fax: 022-22004693	www.txindia.gov.in
2	Textile Committee P.Balu Road, Off. Veer Savarkar Marg Prabhadevi Chowk, Prabhadevi Mumbai-400 025	Phone : 022- 66527506/07	www.tc.nic.in
3	The Director Ahmedabad Textile Industries Research Association (ATIRA) P.O. Ambawadi Vistar Ahmedabad - 380 015	Phone : (079) 26307921, 26307922, 26307923	www.atira.in
4	The Director Bombay Textile Research Association (BTRA) Lal Bahadur Shstri Road, Amrut Nagar Ghatkopar West, Mumbai- 4000086	Phone: 022-62023636 Fax: 022-25000459	Email:info@btraindia.com www.btraindia.com
5	The Director, The South India Textile Research Association (SITRA) 13/37, Avinashi Road, Coimbatore Aerodrome Post, Coimbatore – 641 014		www.sitra.org.in
6	The Director General	Phone : 0120-2807390- 95/2783586/592/638/095	E mail : mail@nitratextile.org

	Northern India Textile Research Association (NITRA) Sector 23, Raj Nagar Ghaziabad- 201002	Fax: 0120-2783596	www.nitratextile.org
7	Central Institute for Cotton Research (CICR) Indian Council of Agricultural Research (ICAR) Post Bag No.2, Shankar Nagar PO Panjari, Wardha Rd, Nagpur, Maharashtra 440010	Director (07103) 27553 Office : 07103- 275537, 275538, 275539, 275549, 275617 Fax :07103- 275529	Email cicrnagpur@gail.com www.cicr.org.in

SECTION – 5

PROJECT REPORT ON COTTON WOOL ABSORBENT

1. INTRODUCTION

Under this report, the capacity of production of Surgical Absorbent Cotton is 300 TPA. Absorbent cotton also known as surgical cotton or cotton wool is mainly used for medical purposes in hospitals, nursing homes, Dispensaries etc., because of high fluid absorbency power, it is better known as absorbent cotton.

The project recommends producing Surgical Absorbent Cotton of different varieties. Further it also recommends producing as per regulations under Drug Control Authorities of respective state government in India.

2. PRODUCT AND ITS APPLICATION

Absorbent cotton or surgical cotton is used at each level from medical to corporate and also individual level. This item is regulated under drug control act. Hence, it should be manufactured to meet its requirements for quality control standards. Apart from used as a dressing material, it is also used for padding for items of clothing, quilts etc. The absorbent cotton should be chemically inert and soft to give maximum protection and should not cause irritation. These properties can be achieved by manufacturing the product as per standard method of manufacture. The raw cotton is processed by series of steps which render the cotton hydrophilic in character and free from external impurities needed to be fit for use in surgical

dressings and personal hygiene.

The process of making the raw cotton into user friendly products by incorporating new physical and chemical properties through series of operations is the main objective of this project profile. . The cotton fibres as it comes from natural sources have natural impurities including its seeds as such it is to be processed through mechanical operations with set of machines whereby these impurities adhered to the fibres are removed. Other impurities which are inherent chemically is to be removed by chemical processing known as bleaching and after bleaching with peroxide is subjected to sterilization by Gamma radiation, these fibres are further subjected to hydro extraction, drying, lapping, carding, rolling and cutting. These rolls are wrapped around at one end or both the end with fine quality cotton n fabric in order to ensure hygiene and safety applications. Absorbent cotton is cleaned, de-oiled and bleached and packed in different sizes. Since absorbent cotton is a material which comes in direct contact with the human body, its quality plays very important role and should satisfy the required pharmaceutical parameters.



Either virgin cotton or waste cotton can be used as raw material. Combed waste cotton is desirable in case of waste cotton. The fiber of absorbent cotton is very elastic. It consists of (98-99.5%) cellulose which has a diameter of 16.30 μm , and a length of 12-40 mm. Absorbent cotton is mainly used for sanitary purposes and surgical operations as well as for ordinary daily use.

The absorbent cotton should be chemically inert and soft to give maximum protection and should not cause irritation. These properties can be achieved by manufacturing the product as per standard method of manufacture. The raw cotton is processed by series of steps which render the Cotton hydro- phallic in character and free from external Impurities needed to be fit for use in surgical dressings and Personal hygiene.

Absorbent cotton is also used for making Conventional type of sanitary napkins or pads besides medical Purposes. And fairly good quality of cotton wool is consumed in Beauty parlors for removing make up and dirt etc. Absorbent Cotton also known as surgical cotton or cotton wool is mainly used for medical purposes in hospitals, nursing homes, Dispensaries etc., because of high fluid absorbency power, it is better known as absorbent cotton. The absorbent cotton should be chemically inert and soft to give maximum protection and should not cause irritation. These properties can be achieved by manufacturing the product as per standard method of manufacture.

3. **DESIRED QUALIFICATION FOR PROMOTER**

The promoter should ideally be having formal qualifications in the field of Pharmacy (Bachelor or Diploma). Further he / she should have experience of working in a unit manufacturing such products

4. **INDUSTRY OUTLOOK / TREND**

The segment of absorbent and packing gauze surgical dressings is expected to grow worldwide owing to factors such as increasing incidences of road accidents and sports related injuries. Globally raising aging population and the growing prevalence of chronic diseases. In addition, the swift healing times brought about by the usage of wound dressings make them useful during emergency care. The rising incidence of wound 00infections raises the sale of wound dressings, thus having a positive impact on the market.

5. **MARKET POTENTIAL AND MARKETING ISSUES, IF ANY**

It is estimated that demand for surgical and absorbent cotton is growing at the rate of 10 percent per annum across the world. The demand for absorbent cotton in India is estimated to be about 2 million bales (of 170 kg each) per year.

Besides the Indian market, there is enormous export potential for surgical cotton in countries such as the US, EU and Japan. Within the next 5 years, 3 –million bales will be required to fulfill the domestic demand and more would be needed for the export market.

Although, the area under surgical cotton cultivation in India was 97 percent in 1947, it fell to 42 percent in 1990, 28 percent in 2000 and about 1 percent in 2012, and it is now estimated to be much less than 1 percent. The absorbent cotton varieties are now confined to marginal lands, saline tracts, and drought prone areas. The price of surgical cotton is high because of the shortage of short staple absorbent cotton.

Until 2005, India had at least 2 million hectares of land under absorbent cotton cultivation

which used to cater to the needs of the surgical cotton sector. The market price for absorbent cotton was low because of abundant availability of short staple surgical cotton.

Market exploitation is the biggest challenge faced by the surgical cotton growers in India, today. Another factor affecting the surgical cotton growers is the lack of proper ginning machinery suitable for short staple cotton, especially the *Gossypium arboreum* race from *cernuum*.

That is why, the small scale industries that manufacture absorbent cotton find it difficult to source short staple cotton. For example, the industries in Maharashtra and Madhya Pradesh are sourcing short staple cotton at high price from Rajasthan or the Northeastern part of India. So there is an imminent need to create an interface and a common platform between Indian cotton farmers as well as absorbent cotton industry.

The demand for absorbent cotton is also met through import.

The demand of Surgical Absorbent Cotton is directly related with the increase in population and expansion of public health services. The demand for Surgical Absorbent Cotton increases with the increase in population and number of hospitals, dispensaries, nursing homes, health care centers etc. Progressive increase in health amenities offered by Government and coming up of new hospitals and health care centers in private sector even at small towns are contributing to the growth of absorbent cotton industry. Government hospitals and large nursing homes are the largest consumer for cotton wool.

With the development of medical facilities and growing awareness towards personal hygiene, the surgical absorbent cotton industry registered steady growth rate in past and is picking up pace with the spread of education and upward economic growth of towns and villages.

Due to the reasons mentioned above the end use approach have been utilized to estimate the demand for the product. Accordingly, data obtained on the number of health facilities and their corresponding requirement has been utilized. Based on a study made by IPS, the average requirement of absorbent cotton by different types of health facilities is as follows:

- Hospitals @ 27 kg per month
- Clinics @ 3 kg per month and
- Health centers, @ 1 kg per month

With increasing awareness on use of hygienic healthcare materials the demand for sterilized surgical absorbent cotton is increasing. This supports overall demand prospects of Surgical Absorbent Cotton.

The demand for surgical cotton is rapidly increasing in India as more people are getting access to basic health care and the number of people who can afford more complex medical facilities, like surgeries, transplants, etc. has increased in the country.

Within the next 5 years, 3-3.5 million bales will be required to fulfill the domestic demand and more would be needed for the export market.

Besides the Indian market, there is enormous export potential for surgical cotton in countries such as the US, EU and Japan,

There is also a rise in demand for Indian surgical cotton in Middle East and African region. Witnessing the rapid rise in demand for surgical cotton **The Central Institute for Cotton Research (CICR)** has recently implemented a project of high-density cotton cultivation to increase cotton yield in shallow soils where BT cotton is not cultivated.

6. RAW MATERIAL REQUIREMENTS

Surgical cotton is made from a special cotton variety called as Bengal Desi Cotton grown extensively only in India (18 districts near Ganganagar in Rajasthan) and adjoining areas in Pakistan. Almost all major surgical cotton manufacturers in world look forward to procuring this cotton as it has almost all the characteristics required for good quality surgical cotton like liquid absorbency, fiber quality (strictly 18 inches), minimum wax and micronaire value of 5.

The Central Institute for Cotton Research (CICR) here is now working towards partnering with farmers and absorbent cotton manufacturers for promoting organic desi cotton as raw material.

The CICR has already started producing desi cotton seeds to be distributed to a select group of farmers — who are going to have assured buyers offering good price.

Another advantage with desi cotton is its low input cost. "It requires fewer inputs since it has traditionally come to withstand hard Indian conditions," Kranthi said. If organic cotton is devoid of chemicals, it is ideally the most-suited cotton for manufacturing absorbent cotton. "And anything organic has a great demand in Europe, so the produce will also have a great export potential,"

Ideally, surgical cotton requires coarse textured lint with a fibre length of approximately 18 mm so that these can easily be arranged into layers for surgical use. Micronaire is an index of fineness or coarseness of the fibre and the preferred micronaire value for surgical use is 6.5 to 8.0.

"CICR has a rich repository of desi cotton that will be utilised for popularising this type of cotton. Several varieties like Lohit, LD-133, RG-8, LD-327, DS-21, LD-491, HD-11 have been released by the public sector in the past with fibre quality parameters suitable for surgical cotton,

7. **MANUFACTURING PROCESS**

The manufacturing process basically involves opening and cleaning of pressed cotton bales, boiling it at 90 degrees Celsius with water and chemicals to give it white colour (raw Bengal desi cotton is almost brownish), and removing water completely, drying it, lapping, carding, rolling, cutting and packaging. An improvised the cleaning process to remove sulphated ash, biggest contaminant in cotton and the vacuum process for draining water before drying the cotton.

The process is described in detail as follows

a) Opening and cleaning of Raw Cotton:

Raw cotton received in bale or otherwise is opened in opener where it is loosened and simultaneously dust / foreign particles are also removed. Loosened cotton is then put into a keir where chemicals such as caustic soda, soda ash, detergent, etc. are added along with adequate water and steam boiled for about 3- 4 hours. By this process most of the natural waxes and oils are removed while remaining foreign matter get soften and disintegrated. The treated cotton is transferred to washing tanks where it is washed thoroughly.

b) Bleaching:

Washed cotton is bleached to remove brownish colour developed due to chemical treatment. Bleaching is done by using bleaching agent such as sodium hypochlorite or hydrogen peroxide. The bleaching process improves whiteness, wetting properties and assists in disintegration of any remaining foreign materials.

c) Removal of Chemicals:

The bleached cotton is thoroughly washed again to remove the chemicals. A little quantity of dilute hydrochloric acid or sulphuric acid is also added to neutralize excess alkali. If required, it's again washed with water. The water of cotton is removed with the help of hydro-extractor. It is then sent to a wet- cotton opening machine.

d) Drying:

The cotton so obtained is dried by passing through dryer or alternatively subjected to sun drying where provision for dryer is not there.

e) Lapping:

The dried cotton is sent to blower room where it is thoroughly opened and made into laps.

f) Carding:

The laps are then fed into carding machine wherein cotton is warped around rollers in thin layers.

g) Rolling:

Cotton so obtained is compressed and rolled into suitable role size along with packaging paper.

h) Weighing and cutting:

The rolls are then weighed and cut according to required weight and sizes and labeled properly before packing in polythene sheets and heat sealed.

i) Quality Control & Specification:

This item is covered under Drug Control Act. Hence, it should be manufactured to meet its requirements.

8. MANPOWER REQUIREMENTS (Indicative)

Sr. No.	Designation	Number	Approx. Salary (Rs. Per month)
1	Manager	1	25000
2	Chemist	1	15000
3	Supervisor	1	15000
4	Blow Room Operator	1	10000
5	Boiler Attendant	1	10000
6	Storekeeper	1	10000

7	Clerk – cum – Accountant	1	10000
8	Skilled Worker	20	160000
9	Unskilled Worker	35	150000
10	Packers	5	15000
11	Peon – cum – Watchman	2	8000
	Sub total		4, 28, 000
	Perquisites @ 15 %		64,000
	Total		4,92,000/-

9. **IMPLEMENTATION SCHEDULE (Indicative)**

Sr. No	Activity	Time
1	Preparation of Project Report	Six weeks
2	E M Registration & approval from Drug Control Authority	One month
3	Financial/Loan from Banker or Financial Institutions	Two months
4	Power connection/Building construction	Six months
5	Machinery procurement & Trial run.	One month
6	Recruitment of Staff & Labour	Two months
7	Actual commercial production	One month

10. **COST OF PROJECT (Indicative)**

The total cost of project is estimated as below:

Sr. No	Component	Particulars	Cost (Rs. Lakhs)
1	Land	550 @ Rs. 700/-	3.80
2	Building	400 Sq. mtrs @ Rs 4,000/	16.00
3	Plant & Machinery	As per details	73.00
4	Other Assets	-	1.00
5	P & P Expenses	-	0.50
6	Contingencies	-	5.70
7	WC Margin (1 month basis)	-	4.00

		Total	104.00
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11. **MEANS OF FINANCE**

- Term Loan (75%) : Rs.78.00 lakhs
- Promoter's contribution(25%) :Rs. 26.00 lakhs

12. **WORKING CAPITAL CALCULATION**

Particulars	Duration	Estimated cost (Rs. Lacs)
Raw materials/ Packing materials	1 month	4.00
Working expenses	1 month	2.00
Finished goods	15 days	3.00
Receivable	15 days	3.00
	Total	12.00

13. **LIST OF MACHINERY REQUIRED (Indicative)**

Sr. no.	Machine	Quantity	Apprx. Cost (Rs. Lakhs)
1	High pressure Keir(MS) inside coated with acid resistant epoxy coating, fitted with pump, steam pipe, capacity 2000 kgs. Charge of cotton with all accessories.	1	3.00
2	Carding machine (Revolving flat high production) 1016 mm width with dust extruder, electronic stop motion, brush rolls, stripping brush rolls and other accessories.	2	20.00
3	Two compartment continuous cotton dryer with steam heating arrangements at 100 psi provided with trolley, electrical heaters and electric control Panel	2	8.00

4	Porcupine cleaners 1200 mm working with 406 mm dia porcupine type cylinder with strikers having two striking edges, centrally adjustable grid bars and reduction gear, electric motor(5 HP) for materials transport with accessories	2	8.00
5	Centrifugal Hydro-extractor with S.S. Basket dia 1000 mm fitted with motor and other accessories	1	2.00
6	Wet cotton opener working width 1000 mm fitted with motors and accessories	1	1.00
7	Vertical opener with 7 steel discs and three separate centrally adjustable settings for beater and grid bars fitted with motor 5 HP complete with Accessories	1	2.00
8	Single souter and lap machine 1065 mm working width with Kirschener beater, centrally adjustable grid bars, high pressure device for loading calendar rollers and lap racks, etc. for making lap holder for continuous operations with 10 HP motor starter	2	12.00
9	Rolling and winding machine 1320 mm on face, complete with motor starter and other accessories	2	2.00
10	Small band saw type machine with motor for rolls Cutting	2	0.50
11	Coal/wood fired boiler 1000 kg/ hrs. Evaporation capacity, 50 psi complete with feed pump and accessories	1	4.00
12	Water overhead tank of 10,000 liters capacity and tube well fitted with accessories	-	2.00
13	Water treatment plant for treating process water required for boiler and keir		1.50
14	Water and pipe connection with insulation, various M.S. tanks and concrete tanks for washing purpose etc.		0.50
15	QC and Testing equipments such as pH meter, Soxhlet-extractor, chemical balance, crucibles, furnace, oven, etc.		2.50
16	Pollution Control and Energy Conservation Equipments		2.00
17	Electrification, etc.		2.00
	Total		73.00

Indicative sources:

- a. Ganesh Engineering, Udhna, Surat
- b. Hi- Tech Engineering, Ganapathy ,Coimbatore, TN
- c. Swati Industries, Rithala, Delhi

14. **PROFITABILITY CALCULATIONS**

- ▯ Installed Capacity : 300 TPA

- ▯ Total Sales turnover @ Rs.1,00,000/- : 300.00 lakhs
- ▯ Cost of production & other expenses: 250.00 lakhs
- ▯ Profit : Rs. 50.00 lakhs

Profitability Projections

Particulars	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Capacity utilisation (%)	60	75	80	80	80
Sales	180.00	225.00	240.00	240.00	240.00
Expenses	150.00	187.50	200.00	200.00	200.00
Gross profit	30.00	37.50	40.00	40.00	40.00
Profit to Sales (%)	16.66	16.66	15.00	15.00	15.00

Key Assumptions and The basis of profitability calculation:

As mentioned above, the unit will have capacity of 300 TPA of Surgical absorbent cotton . The capacity build up is taken considering the sales related from OEM/ Retail network that is built up by the entrepreneur based on his prior experience in the industry.

The sales prices of surgical absorbent cotton vary. Accordingly an average sales price of Rs. 100,000/- per ton has been assumed. The cost of production, inclusive of major cost heads such as raw materials, labour & power has been considered based on prevailing industry standards and assumed @ 65%.

On indicative basis, power Costs are considered at Rs 5/- per Kwh and fuel cost is considered at Rs. 80/- to 85 per litre. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 12 % depending on type of industry. All these are wherever applicable.

It may be kindly noted that basis / assumptions for such kind and size of the projects in a profile can be on indicative basis only. At the same time it does provide a reasonably accurate scenario.

15. **BREAKEVEN ANALYSIS**

Fixed Cost X 100 Rs. 35, 00,000/- X 100

BEP = 54.00 %

Fixed Cost + Profit Rs. 35, 00,000 /-+ Rs. 300,0000/-

16. STATUTORY/ GOVERNMENT APPROVALS

This item (if to be utilized directly)is covered under Drug Control Act. Hence, it should be manufactured to meet its requirements.

The Drugs and Pharmaceutical Industry in general is highly regulated in India. Regulatory authorities at the Central level and the State level monitor the same.

At the Central level, the Central Drugs Standard Control Organisation (CDSCO), Ministry of Health & Family Welfare, Government of India is the apex organisation. At the state level the Food and Drugs Control Authority (FDCA) is the regulatory authority.

MSME & GST registration, IEC Code for Export of end products and local authority clearance may be required for Shops and Establishment, for Fire and Safety requirement and registration for ESI, PF and Labour laws may be required if applicable. Promoter has to take approval from Pollution Control Board.

17. BACKWARD AND FORWARD INTEGRATION

As backward integration, Entrepreneur may think of going for the production of cotton cultivation

SECTION- 6 CONCLUSION

Estimated market size for Medical Textile Industry in India for the year 2020 was Rs 4,000 – 4,500 Crores. Major growth drivers of Indian medical textiles segment are growing needs for better and convenient primary wound dressing materials, use of smart textiles in healthcare field, increasing number of surgeries in India (~ 5 million to ~ 8 million patients by 2020), growing disposable income increases accessibility towards medical textile products, increasing consciousness among people with regard to personal care and hygiene, aging population (96 million to ~168 million by 2026), developments happening in the textile scaffolds, increasing usage of contact lenses (18-30-year-old consumers especially females).

Initiatives which will impact on the consumption are universal health coverage scheme, 100% FDI is allowed under automatic route, Support to PPP model to improve availability of healthcare services, tax support for hospitals setup in rural areas (under 80-IB), incentives and tax holidays for medical travel facilities. The Government's anxious plan for country's self-reliance and discouraging imports from other countries will give required thrust to boost / encourage new investments in this health care sector.