

**EKE, UROUPA VICTOR**

**15/ENG06/023**

**DEPARTMENT: MECHANICAL ENGINEERING**

**COURSE TITLE: TECHNOLOGICAL POLICY AND PLANING**

**CORSE CODE: ENG 582**

**A feasibility study for the set-up of a surgical hand gloves production firm for the use of the ABUAD community.**

**I. PROJECT SUMMARY**

- A. Name of the firm: **Gifted Hands Global**
- B. Location: Both the Head Office and Plant facilities are located at **Km. 8.5 Afe Babalola Way, Ado-Ekiti.**
- C. Project Description: Medical and surgical device manufacturers worldwide produce a multitude of items that are intended for one use only. The primary reason is infection control; when an item is used only once it cannot transmit infectious agents to subsequent patients. Like medicines and other health technologies, they are essential for patient care – at the bedside, at the rural health clinic or at the large, specialised hospital.  
  
Surgical gloves are also known as Medical gloves. These gloves are medical safety accessories that ensure sanitary hospital conditions by limiting patients' exposure to infectious matter. They also serve to protect health professionals from disease through contact with body fluids. Medical gloves are traditionally made of latex and powdered with cornstarch. Since cornstarch can impede healing if it gets into tissues (as during surgery), non-powdered gloves are being increasingly used during surgery and other sensitive procedures. Latex Surgical Gloves are highly flexible and comfortable to wear. Over the years, the demand for our Latex Surgical Gloves has increased consistently in the national market. Latex surgical gloves are made from natural rubber latex which provide excellent tactile sensitivity and comfort. Latex material is known to have very high elasticity meaning the gloves can stretch well to allow easy donning.

## **II. GENERAL INFORMATION**

### **A. Project Management**

1. During the pre-operating period, appropriate permissions and manufacturing licences would be acquired so as to ensure the smooth running of the operation on commencement. Workers & Operators would mainly be sourced from within the ABUAD community.
2. During the operating period, unit heads will be assigned over group of workers to relay information to the plant manager for quick action. Flow charts and process diagrams would be employed so as to ensure the continuous and smooth operation.
3. The employed workers will undergo rigid On-The-Job training g from higher qualified personnel so as to quickly raise their skill level. Incentives would also be available for extra hours and high risk jobs around the facility.

### **Roles**

#### **1. President:**

He is in-charge of the overall company and his decision is final since he is solely in charge of the decision making.

#### **2. Vice President:**

In charge of accessing all information before reaching the president and deem which ones are attention worthy or not. Supervision is often carried out and progress report is being submitted directly to him by the head of other departments.

#### **3. Marketing:**

They are in charge of market prediction and management of all advertisement related to the hand gloves as they seek to push the product aggressively into the market. Price variation, demand and supply forecast, market analysis, advertisement are being controlled by the marketing team with the aim of maximizing sale and profit.

#### 4. Sale:

They are in charge of all the sales and they manage all the distribution channels. They ensure that the product is of standard quality through good quality control procedures. They control the price, demand and supply of the hand glove as their goal is to achieve maximum profit with minimum cost.

#### 5. Services:

They are in charge of goods, production and distribution and they strive to ensure that the customers stay happy at all times. They are in charge of producing high quality product while keeping good customer relations.

### **III. ECONOMIC ASPECTS**

#### A. Market Study

##### 1. Demand

The demand for surgical gloves is influenced by several related factors. As the surgical gloves are consumed by surgeons during surgeries, the demand is influenced by the following factors:

- i. Prevalence of diseases requiring surgery
- ii. Development in health care, hospital facilities and operation theatres.
- iii. Medical education and growth of surgeons in society.

The demand goes up when medical facilities, number of surgeons and surgeries taken place show improvement.

The main factors that drive the medical drive market is the growing awareness of health and safety measures that have to be employed in order to stop spread of diseases. Patients and health medics have recognised the increasing need for gloves globally. The healthcare and the medical industry is growing at a fast rate thus increasing the growth of surgical gloves market as it is the staple product required in this industry.

Surgical gloves may be disposable, but in the operating room they are indispensable. Despite lingering effects of a down economy and declining medical equipment and supply sales, the market for surgical gloves continues to grow.

There exists immense opportunities for growth in the global surgical latex gloves market the fact that dozens of pairs of medical gloves are utilised in a single day in hospitals and laboratorial settings, and the inherent intrinsic indispensability of the product among surgeons, practitioners, and healthcare workers.

## 2. Supply

The company will be able to tap into the already existing demand by the ABUAD community and effectively meet this demand. Since it is locally manufactured, there will be little or no competition allowing us to dominate the market with our product. The gloves will be handed out free of charge and we will also offer incentives for students who gather and recycle used gloves to help prevent littering and environmental pollution.

## B. Marketing Program

1. No pre-existing practice or competitors exist in this space (ABUAD). The company is a pioneer in this field.
2. For ease of access to the gloves, they will be sold and distributed in highly active areas with large student traffic such as Colleges, Cafeterias and Hostels to name a few.
3. The university will be responsible for sensitising its students about the use and the need of the gloves.
4. Packaging

Table 1: Packaging Details

Wrapper	1 pair
Pouch	1 pair
Inner Box	50 pairs
Master Carton	500 pairs (10 inner boxes)
20 feet container	2,34,500 pairs (469 cartons)
40 feet HC container	5,69,500 pairs (1139 cartons)

**IV. TECHNICAL FEASIBILITY**

A. Product (s)

1. Description of the product(s) including specifications relating to their physical, mechanical and chemical properties.

The gloves are blue in colour and are less likely to tear or rip as we avoid cost cutting and material reformulations that often leads to the production of inferior products or health risks. Our glove variable includes material, comfort, durability, fit and personal preference.

Latex gloves are made from rubber and it is our choice of material since they are very tactile and are therefore highly preferred for sensitive applications like surgery. Also, it offers durability, flexibility and comfort.

Table 2: Physical Property

Characteristics	Before Aging	After Ageing (70+/- 2°C for 166 +/- 2hrs)
Tensile strength (Mpa) min	24 Mpa Min	18 Mpa Min
Ultimate elongation (%) min	750% Min	560% Min
Strenght at 500% elongation (Mpa) max	5.5 Mpa	NA
Force at break (N) min	12	9

2. Uses of the product(s)

- i. Used for surgical operations
- ii. Used in the food industry to prevent chemical skin burns on their hands.
- iii. Used in various homes for domestic purposes
- iv. Used by all concerned medical staff during procedures like handling and dressing of wounds.
- v. As a sterile container for surgical specimens to be sent to the pathology lab

B. Manufacturing Process

1. Description of the process

Rubber trees are usually ready to be tapped after about seven years of growth. A steel tapping knife is used to remove thin strips of bark from the tree at a downward

curve. This directs the milky-white sap to a spile, or spigot, which channels it into a cup affixed to the tree. Tapping is done in the early morning, because sap coagulates faster later in the day, when temperatures are higher, and reduces the flow.

### **The production line**

Production uses ceramic or aluminum hand-shaped molds, or formers that are first extensively washed in hot water and chlorine to ensure there is no residue from previous batches. Next the formers, suspended on a continuous moving chain, are dipped into a mixture of calcium nitrate solution and calcium carbonate nitrate is a coagulant, while the carbonate helps the gloves release from the formers.

After drying, the molds are dipped into the latex compound, with the duration of the dip determining the mil thickness of the gloves. The freshly molded gloves are next leached in a mixture of hot water and chlorine, which removes residual latex proteins and chemicals to help reduce the severity of any allergic reactions to latex.

The gloves are then dried and cured, which is where Charles Goodyear's enormously important discovery enters the process. Vulcanization converts the gloves to an elastic state by causing a reaction between rubber molecules in the latex and chemicals that have been added, and gives gloves their elasticity so they are less likely to tear.

After drying, the gloves are rinsed again to leach out more latex proteins, then the cuffs are beaded, or rolled, to make them easier to don and doff. After a dip into cornstarch and a final drying, pneumatic air jets strip the finished gloves from the formers, or workers remove them by hand. The gloves are hot-air tumbled to remove any remaining powder.

The molds are given another thorough chemical wash and rinse, and the process begins anew.

### **The quality-control phase**

Gloves are tested to ensure quality and to ensure it meets up to the standards. The pinhole leak test is one of these methods. Workers fill the gloves with one liter of water, then close and hang the gloves to check for leaks.

The tests adhere to guidelines regarding acceptable quality limits (AQLs). These standards designate a percentage to evaluate a batch of gloves. An AQL of 2.5% means that statistically, only 2.5 gloves for every hundred will fail a quality test. If a batch's failed gloves exceed this percentage of the total batch, all the gloves in that batch fail. The results of these tests determine whether the gloves will be industrial or medical grade; the latter are subject to more rigorous testing.

## **V. FINANCIAL FEASIBILITY**

A. Total Project Cost- All items considered and assumptions made.

It has an estimated cost of about 500 million naira

B. Initial Capital Requirements- All items considered and assumptions made.

At least half the money was sourced for and the other half contributed by investors after stating the initial capital at hand which was about 150 million naira.

C. Sources of Financing

- i. Large donation from friends and associates.
- ii. Loans from banks with attractive interest rates.
- iii. Revenue from Abuad tuition fee
- iv. Investors
- v. Initial capital

D. Financial statement



1. Projected income statements for 10 years

Business has been looking good and it is projected to rise over the next couple of years.