



Faculty of Engineering

Department of Textile Engineering

**“EVALUATION OF ABSORBENCY & pH OF  
PHARMACUTICAL SURGERY PRODUCTS”**

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**This report submitted in partial fulfillment of the requisite for the  
degree of Bachelor of Science in Textile Engineering**

Advance in Wet Processing Technology.

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## **DECLARATION**

We hereby declare that, this project has been done by us under the supervision of **Mr. Sumon Mozumder, Assistant Professor**, Department of Textile Engineering, Faculty of Engineering, and Daffodil International University. We also declare that, neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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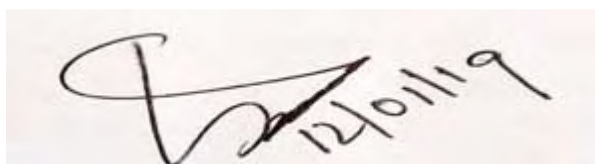
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## LETTER OF APPROVAL

This thesis report prepared by **Tarun Halder** of bearing **ID: 161-23-4587** and **M.H.M Amitof** bearing **ID: 161-23-4609** And **Md.RubelIslam** of bearing **ID: 152-23-4406** is approved in partial fulfillment of the requirement for the degree of BACHALER OF SCIENCE IN TEXTILE ENGINEERING. The said students have completed their project work under my supervision. During the research period I found them sincere, hardworking and enthusiastic.



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Finally, we would like to express a sense of gratitude to our beloved parents and friends for their mental support, strength and assistance throughout writing the project report.

## **DEDICATION**

This project report is dedicated  
to our beloved parents

## **ABSTRACT**

This study was effort to determination of the Evaluation of absorbency and pH values of pharmaceutical surgery products. Absorbent Cotton is also known as Surgical Cotton or Cotton Wool and mainly used for medical purposes in hospitals, nursing homes, dispensaries and at home (for first aid) etc. Because of its property of high fluid absorbency, it is better known among masses as absorbent cotton. 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 objectives of this thesis work are to identifying what kind of test of the pharmaceutical gauge fabric, Absorbent fabric and cotton strips. Those fabrics are many kind of tests that's immersion test, drop test, wicking test, pH test. In this project work, we were trying to know about how to test Immersion, drop, wicking and pH test. At first we were find out the absorbent of the cotton fabric A, B, C, D, and E. In this time we also found the pH test of the absorbent cotton. From those test we known to about how many water absorbs thus different types of pharmaceutical cotton & found their ph values, that was some different from on to another. Secondly, we were tested Gauge fabric's immersion test, drop test, wicking test and pH values test that was different from on to another sample fabrics like as A,B,C,D and E. And finally, we were tested to the cotton strips Immersion, drop and pH values from A, B, C, D and E different types of fabric sample.

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# **CHAPTER-1**

# **INTRODUCTION**

# CHAPTER-1

## INTRODUCTION

Medical Textiles are the products that used primarily for first aid and medical applications; it is used in clinical and hygienic purposes. It is used medical markets and consumer purpose that consists of all health and hygienic textile materials used in different applications. Its unite value considerable variations in terms of product performance as such like it shape a group of products. Because of disposable items products that are the nature of their many medical appeal. In the terms of volume is increased use of composite appeal for the textiles will provide consumption of major fiber growth. Such as This study was effort to determination of the Evaluation of absorbency and pH values test of pharmaceutical surgery products. Absorbent Cotton is also known as Surgical Cotton mainly used for medical purposes in hospitals, nursing homes, dispensaries and at home etc. Because of its property of high fluid absorbency. 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.




The objectives of this thesis work are to identifying what kind of test of the pharmaceutical gauge fabric, Absorbent fabric and cotton strips. Those fabrics are many kind of tests that's immersion test, drop test, wicking test, pH test. In this project work, we were trying to know about how to test Immersion, drop, wicking and pH test.

We were find out the absorbent of the cotton fabric A, B, C, D, and E. In this time we also found the pH test of the absorbent cotton. From those test we known to about how many water absorbs thus different types of pharmaceutical cotton & found their ph values, that was some different from on to another. We were tested Gauge fabric's immersion test, drop test, wicking test and pH values test that was different from on to another sample fabrics like as A,B,C,D and E. We were tested to the cotton strips Immersion, drop and pH values from A,B,C,D and E different types of fabric sample.

## 1.1 Objectives of the study

The broad objective of this thesis work is to evaluation of absorbency and pH values of pharmaceutical surgery products.

Some **specific objectives** of the projects work is given below:

-  To evaluate water absorbency of various products by immersion test, drop test and wicking test.
-  To evaluate pH of various types of surgical products by used pH paper.
-  To compare among different types of surgical products.

So, during our project work we always try to ensure & maintain these objectives.

## **CHAPTER-2**

# **LITERATURE REVIEW**

## CHAPTER-2

### LITERATURE REVIEW

#### 2.1 Absorbent fiber

Cotton is using for made 100 percent most effective bath towels for the reasons more deft absorbency of its own property. Cotton is able to absorb up to 27 times its weight in liquid water. Cotton's absorbency is also usefulness for clothes used in shake. A number of reasons for cotton's absorbent properties ensue due to, including its specific molecular structure and the structure of water.



Figure: 2.1 Absorbent cotton fibers

**Table 2.1:** Chemical composition of cotton fiber

Components	Quantity %
Cellulose	94%
Protein	1-1.3%
Mineral elements	1%
Pectin Element	0.9-1%
Oil, Wax, Fat	0.6%
Total sugar	0.3%
Pigments	Trace

### **2.1.1 Structure of water**

In this reasons cotton is so much absorbent for the reasons of its & water own structure. One atom of oxygen linked to two atoms of hydrogen is use to made water molecules. Such as cotton molecules is creates attraction that a magnetic or dipolar fix and also allows the atoms together into a water droplet which water to bond with or join to any near molecules then catch an opposite charge. Each oxygen atom has show a negative charge, each hydrogen atoms have a positive charge.

### **2.1.2 Structure of Cotton**

More difficult series of atoms for simpler water molecules, cotton is made up of that's joined into that are expressed polymer molecules. pure cellulose is make of polymer molecules join up in repetitive patterns or chains that's are called pure cellulose. According to cotton creating, that makes a substance for cotton absorbent. Contains a negative charge by reason cellulose makes cotton absorbent, that's helps grip dipolar of water molecules and absorb to each other. Cotton's show another hydrophilic properties.





### **2.1.3 Surgical joint consisting a drug-charged biodegradable polymer layer**

A joint, by the reasons for the surface of wound that is together with a drug-charged polymer layer to biodegradable, it such coated layer that has been developed Seoul National University of Seoul, South Korea by researchers from. Biodegradable material portrayed in US allowance 9 295 463, that can be charged with drug of range, it is such like as anti-cancer vicegerent, anti-irritant drugs & antibiotics, that ascertain topical disposal of the drug. Thereby progressing medicine effects. A drug-charged biodegradable polymer layer the joint qualify the distribution of a drug without mechanical strength for lowering by make including a film, then it is winding around the rear of the joint, another way is directly coating the surface of the joint with drug-charged. Biodegradable polymer layer has a non-wet system. The biodegradable polymer can be built up a wide range of materials. It is suggest from that researchers.

### **2.1.4 Absorbent article containing a bacterial composition**

SCA hygiene products has been promoted by the bacterial formation an absorbent item, such like a adult incontinence guard, sanitary napkin, diaper, panty liner, or tampon that catch bacterial formation, which embrace bacteria to form a lactic acid carrying, is in a lipid stage. Lactic acid carrying bacteria belong to the class lactobacillus are significant for hold a healthy microbial flora in the female uro-genital areas and act as pro-biotic bacteria with an irreconcilable effect versus pathogenic microbial species, this is note the company of Gothenburg, Sweden. Thereby exile colonization by harmful microorganisms. They restrict and colonization by other micro-organisms to holding decent appropriate for colonization by creating bio-films and rival for available nutrients. Hydrogen peroxide is a prohibit specific production, such as organic acids & bactericide including acetic acid & lactic acid, that pH has lower, This lower pH prohibit colonization by other microorganisms.

### **US prerogative 9 248 214 disclose an absorptive article that**

-  Delivers lactic acid-producing bacteria to the uro-genital area.
-  Is convenient to use.
-  Results in the efficient transfer of the bacteria to the area where they are applied.
-  Can be stored for long time periods without loss of viability of the bacterial cells.

### **2.1.5 Medical Textiles**

In the lipid stage the amount of air humidity that contact the bacterial cells radiated. The lipid stage is reducing show the hydrophobic character. Thereby in the bacterial composition bacteria is increasing in the survival time. In a lipid stage the additional advantage that has transfer of the bacteria to the skin or uro-genital area is promoted, SCA hygiene products say lactic acid diffuse bacteria. Bacterial composition is transferred to the skin when the product is used exposed to body heat and then lipid stage is soften. It is delivery to the skin after the bacteria come in contact with moisture. The company interpret, they are reactivated, to start grow and fulfill their probiotic action. The bacterial composition is fruitful on a carrier member located on a wearer-facing side of the absorbent formation and on top of the top sheet. The lipid stage is bearing to integrity preparation consist. An impenetrable to the lipid stage carrier member is of a material, such like a laminate, polymer film, metal foil, which prevent any important disposal of the lipid stage into the absorptive structure. It is probability to reducing of the bacterial composition for the fruitful to the bacteria on the skin.

### **2.1.6 Silicone gel-coated dressing**

KCI, USA has been displayed a lesion substrate dressing that features was a silicone-coated. The dressing material featured according to the San Antonio, Texas, USA, company of in US allowance 9,295,748 is tacky upper & lower silicone coatings on the substrate by characterized, produce a different tackiness with each coating having, the coating was a cross-linked, tacky And hydrophobic silicone gel. It is attackable into the substrate porous. It can be, example a net, formed in woven fabric, knitted textile fabric or nonwoven fabric or a molded net.

## **2.2 Combined compression and absorption dressing**

A combined compression and absorption wound dressing or bandage is published in US allowance 9 271 877 by IBWMT intelligent Ownership Holdings.

✚ A constriction bandage will be short stretch.

✚ That is complete with the constriction bandage wound dressing for absorptive.

The dressing constriction first & second absorptive layers of a nonwoven fabric component by volume 70% viscose fibers and 30% there are three-layer quadrate laminar pad. The mat or fire-boat are use to form of first absorbent layers. The viscose fiber has length fineness of (3–10 mm) and polyester fibers have a length fineness of (2.0–2.5) denier. Therewithal, viscose fiber and polyester fibers each of the fibers absorbent layers has 100 gm/m weight per unit area of around. The polyester fibers inner layer (16) is a 100% short-stretch weft-knitted yarn weight of 70 gm and its count 40. The wound dressing thus has a total thickness (1.5-2.5 mm) and a total weight per unit area of around 270 gm. In this process are bonded the three layers together by using of needle-punching process that produces punches per square centimeter is (300– 500), the outer layers is (18, 20), but the absorbent layers are depends on heat treatment.

### **2.2.1 Water-insoluble absorbent materials for advanced wound care**









The advanced wound care market produce absorbent materials that are useful in the manufacture of absorbent item, wound care material have been developed in particular dressings for, special fibers & (SFM) materials. The US allowance 9 221 963 absorbent materials are described in sulphonated polysaccharides. One type of alkyl sulphonate group is in chief water insoluble cellulose alkyl sulphonates in that is called cellulose discarded. At first, UK Coventry company is introduced the cellulose alkyl sulphonate has cellulose ethyl sulphonate group, that accomplished, where one of its salts is joined ethyl sulphonate group or hydroxyl groups on the units of the cellulose anhydroglucose. The cellulose alkyl sulphonate is reinforcing fiber the cellulose alkyl sulphonate, or it can be optionally applied to fibrous celluloses antimicrobial agents with a high degree of crystalline that are particularly suitable include such as lyocell cotton or regenerated cellulose fibers.

### **2.2.2 Use to the different types of pharmaceutical products**

In the medical sector are use to be the different types of textile products, that are really involved into the textile sector, such as bandage fabric, gauge fabric, strip bandage fabric, protectable gown etc. Thus product is made by the textile material, such as yarn, fiber and fabric. In the modern textile sector is directly innovated to the medical or pharmaceutical products. Medical textile is also use to the nursing, to make upholstery product like napkin, baby diaper, pad also. Textile material is use to different way, in the medical sector. In the present medical textile market is so much innovated. Somehow, we say that textile is very important for the medical sector.

### **2.2.3 Characteristics of materials for medical use**

The biomedical polymers for major requirements

-  To be non toxicity.
-  Will not any allergenic response.
-  Should ability to be disinfected.
-  Show to the mechanical properties.
-  To be Strength.
-  To be Elasticity.
-  More Durability.
-  Should bb biocompatibility.

### **2.2.4 Different types of fibers used for medical and healthcare application**

Textiles materials that are used in medical applications include fibers, yarns, fabrics and composites. Depending upon the application, the major requirements of medical textiles are absorbency, tenacity, flexibility, softness and at times bios ability or biodegradability. Fibers used in medical field may vary from natural fiber such as cotton, silk, regenerated wood fluff (absorbent layer), to, manmade fibers like polyester, polyamide, polyethylene, glass etc.

The various applications of different fiber in medical field are shown as follows.

**Table 2.2.4** Applications of different fiber in medical field

Fiber	Medical Textile field
Cotton	Uniforms, surgical hosiery, beddings, sheets, pillow cover, Surgical clothing gowns.
Polyester	Surgical cover drapes, Gowns, cover stock masks, blankets.
Viscose	Masks, Caps, wipe.
Glass	Caps mask.
Polyethylene	Surgical covers, drapes.

A number of crucial issues regarding medical products in general and healthcare and hygiene products in particular have been identified and debated amongst clinicians, environmentalist, drug companies etc. For a long time. The issues such as.

- ✚ Antibacterial or antimicrobial fibers against finishes or coatings for infection control.
- ✚ Methods of disposal of clinical waste i.e. Landfills against incineration and other forms of medical and clinical waste disposal.
- ✚ Natural against chemical or manufactured fibers.
- ✚ Disposable against reusable or durable fabrics.

### **2.2.5 Healthcare & hygienic products**

An important area of textile is the healthcare and hygiene sector among other medical applications. The range of products available for healthcare and hygiene is vast, but they are typically used either in the operating theatre or in the hospital wards for hygienic, care and safety of the staff and patients. They could be washable or disposable.

### **2.2.6 Operating theatre**

This includes surgeon's gown, caps and mask, patient drapes and cover cloth of various sizes.

#### **Surgical gown:**

It is essential that environment of operating theatre is clean and strict control of infection is maintained. A possible source of infection to the patient is the pollutant particle shed by the nursing staff, which carries bacteria. Surgical gowns should act as barrier to prevent release of pollutant particles into air. Traditional surgical gowns are woven cotton goods that not only allow the release of particles from the surgeons but also a source of contamination generating high levels of dust (lint). Disposable non woven surgical gowns have adopted to prevent these sources of contamination to patients and are often composite materials of nonwoven and polyethylene films.

#### **Surgical masks:**

They should have higher filter capacity, high level of air permeability, lightweight and Non allergic.

**Table 2.2.7:** Healthcare and hygiene products

Product application	Fiber type	Fabric type
Surgical clothing gowns	Cotton, polyester, viscose rayon, polypropylene	Nonwoven, Woven
Surgical covers Drapes cloth	Polyester, polyethylene Polyester, polyethylene	Nonwoven or woven Nonwoven or woven
Caps masks	Viscose rayon, polyester, viscose, glass	Nonwoven Nonwoven
Surgical hosiery	Polyamide, polyester, cotton, elastomeric yarns	Nonwoven Knitted
Clothing uniforms Protective clothing	Cotton, polyester Polyester, polypropylene	Woven Nonwoven

### **Surgical caps:**

These are made from nonwoven materials based on cellulose.

### **Hospital ward:**

This includes beddings, clothing, mattresses covers, incontinence products, clothes and wipes e.g. in hospital cross infection should be prevented and hence traditional woolen blankets replaced by cotton leno woven blankets.

### **2.2.8 Super absorbent fibers for healthcare and hygiene products**

They absorb up to 50 times their mass of water, whereas the conventional wood pulp and cotton linter absorbents absorb approximately 6 times their mass of water. The superabsorbent fibers offer advantage as compared to superabsorbent powders due to their physical form, or dimensions, rather than their chemical structure. Whilst they do absorb fluids to a similar level as powder, they do, however, do it faster. This is due to the small diameter of the fibers ( $\approx 30\mu$ ), which gives a very high surface area for contact with the fluid.

### **2.2.9 Surgical drapes and cover cloths**

These are used to cover patients or to cover working areas around patients. It should be completely impermeable to bacterial and also absorbent to body perspiration and secretion from wound.

#### **Artificial kidney:**

- ✚ Fabric, which is used to remove waste products from patient's blood.
- ✚ Made with hollow hair sized cellulose fibers or hollow polyester fibers slightly larger than capillary vessels.
- ✚ Tiny instrument, about the size of a two-cell flashlight.

#### **Artificial liver:**

Made of hollow viscose to separate and dispose patient's plasmas and supply fresh plasma

#### **Artificial heart:**

- ✚ Chambered apparatus about the size of human heart.
- ✚ Slapstick backing makes the fabric impervious to emerging gas that is not desirable in the blood.

#### **Mechanical lung:**

- ✚ Supply to fresh oxygen and to remove carbon dioxide from patients blood.
- ✚ Use to make with a vug polypropylene fiber or a hollow silicone membrane.

## 2.3 Why textile implants?

- ✚ Specific surface design.
- ✚ Mechanical characteristic adapted to the environment.
- ✚ 2d- and 3d-structures.
- ✚ Material combinations.

### 2.3.1 Surgical dressing

These are devoted for coverings, adsorbent, protective and supports for diseased or damaged parts. Following the surgical dressing product thus are given bellow.

- ✚ Absorbent.
- ✚ Bandages.
- ✚ Primary wound dressing.
- ✚ Protective.
- ✚ Adhesive tapes.

### 2.3.2 Absorbent

Similar to wound pads used in surgery. Manufactured from well bleached, carded and cleaned cotton fabrics. Absorbent lint is cotton of plain weave, warp nap raised on one side, by a process known as ends per inch 36, picks per inch 32 , used as an external absorbent and protective dressing and for the applications of oilmen's and lotions, as antiseptic adsorbent and protective dressing in first aid treatment.

### 2.3.3 Bandages

These are narrow cotton or linen, plain weave cloth of low texture, either woven or knitted. There are different types.

- ✚ Plaster of Paris bandages- By mixture of calcium sulphate cotton cloth is saturated.
- ✚ Cotton & rubber elastic net bandages- for smirch & embrace.
- ✚ Orthopedic cushion bandages.
- ✚ Cotton & rubber elastic net bandages- for net fabric of absence construction.

The application areas are cover of bio-medical textile fields. Include biomedical textile products that are used to the several purposes:

1. Use to grow new tissue -example, tissue engineering scaffold
2. It is use to Replace for injured tissue with implantable prosthesis -example, artificial artery or heart valve.
3. Use to prevent the damage part -example, corpus, back support for the neck.
4. For use deliver a drug -example, nicotine patch.
5. Use for Prevent infection -example, face mask.
6. Use for surgical aids -example, suture.
7. Also use for medicate an external injury -example, wound dressings, wound cure properties and haemostatic bandages improved.

# **CHAPTER-3**

# **METHODOLOGY**

## CHAPTER-3

### METHODOLOGY

#### 3.1 Materials

In this project, we are used different types of medical textile. At first we are collected five type's samples. That is gauze fabric, absorbent loss cotton and strip bandage of medical textile. We collected this sample from different kind of company.

We have taken the following samples for our test process time

**Table 3.1:** Sample specification of the product brands

Sample No.	Type of product	Name of product	Name of test
01	Gauge fabric	Product-A	Immersion test, Drop test, Wicking test, pH test
		Product-B	
		Product-C	
		Product-D	
		Product-E	
02	Absorbent fabric	Product-A	Absorbency test, pH test.
		Product-B	
		Product-C	
		Product-D	
		Product-E	
03	Cotton strip	Product-A	Immersion test, Drop test, pH test
		Product-B	
		Product-C	

		Product-D	
		Product-E	

Sample of the tested different brand products:

Gauge fabric:



Product-A



Product-B



Product-C



Product-D



Product-E

### Absorbent loose cotton fibers:



Product-A



Product-B



Product-C



Product-D

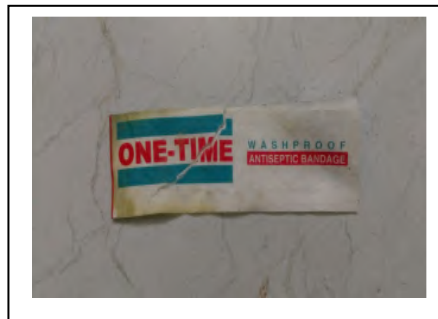


Product-E

### Strip bandages fabrics:



Product-A



Product-B



Product-C

Figure: 3.1 Sample of tested products

### **3.2 Method of testing**

- Wicking test
- Immersion Test
- Drop test
- Absorbency test
- pH test

#### **3.2.1 Wicking test**

At first sample is collect And cut the sample 18cm× 5cm from the collected sample. In a beaker 1% direct red dye is taken. After that sample is 1 cm down bottom side into the solution. Now the sample is hung from a wood stick supported by immersing that 1 cm portion into the dye liquor. Then we measured the point up to which the color solution in absorbed straight above by the sample in 5 minute time.

#### **3.2.2 Immersion test**

At first we take (1×1) Cm<sup>2</sup> fabric is cut from the sample & it is left on water surface. Then count the time by help of stop watch, the time of the fabric from immersing is produce. The standard immersing time is 5 seconds. Exp sample immersing time is 4.7 it is called moderate scouring.

#### **3.2.3 Drop test**

In a pipette 0.5% direct is taken and drop are dropped on the fabric surface and the absorption of the water drop is observed visually. The standard time from the absorption of one drop is 0.5-0.8 second up to 1 second. If the sample required is 6 seconds, so sample is not good.

#### **3.2.4 Absorbency test**

In this process we are used test material cotton fiber of medical textile, firstly we take 5gm sample weight after take 200 ml water then fall down cotton fiber into the water time duration 5 minute. After that cotton fiber squeeze then again sample weight measured.

### 3.2 5 pH test

At first we taken pH paper and put down into water few second and finally match pH box color box then we find required pH was 6.5

### 3.3 Instruments

**GSM Cutter:** By the use of GSM cutter we can cut the GSM of a fabric. It is widely used in any section where GSM is cut and measured.



Figure 3.3.1 GSM Cutter

**Electrical Balance:** It is widely used for measuring weight. By electrical balance we can be measured weight easily.



Figure 3.3.2 Electrical Balance

**Counting Glass:** We can be easily measured by the use of counting glass for the woven and knit fabric of ends per inch (EPI) and picks per inch (PPI). We can also measure very easily, by using this instrument find the fabric wales per inch (WPI) and courses per inch (CPI).

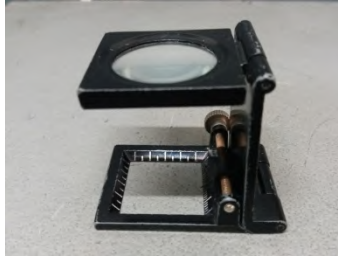


Figure 3.3.3 Counting Glass

**Needle:** Needle is use to count the threads which into the fabric.



Figure 3.3.4 Needle

**Measuring Scale:** We can easily measure the length of thread by using measuring scale.



Figure 3.3.5 Measuring Scale

**Measuring Tape:** By using measuring tape, we can very easily to measure the length and diameter of fabric.



Figure 3.3.6 Measuring Tape

**Scissor:** By using scissor, we can easily cut length and width the fabric sample.



Figure 3.3.7 Scissor

# **SAMPLE ATTACHMENT**

### Sample of immersion test:



Sample A



Sample B



Sample C



Sample D



Sample E

### Sample of Drop test:



Sample A



Sample B



Sample C



Sample D



Sample E

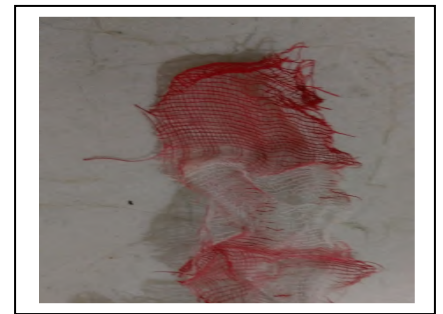
### Sample of wicking test:



Sample A



Sample B



Sample c



Sample D



Sample E

### Sample of pH test:



Sample A



Sample B



Sample C



Sample D



Sample E

### Sample of absorbency test:



Sample A



Sample B



Sample C



Sample D



Sample E

## **CHAPTER-4**

# **DISCUSSION OF RESULTS**

## CHAPTER-4

### DISCUSSION OF RESULTS

#### 4.1 Find the results after the wicking tests process for the different types gauge fabrics

After the complete of wicking test, we found the different types of results of different types gauge fabrics. In this test we are used 5 types gauge fabrics that show different types results. That's shown below by the table.

**Table 4.1:** Wicking test

Name of the product	After wicking test
Product-A	6 cm
Product-B	4.5 cm
Product-C	1.5 cm
Product-D	0.5 cm
Product-E	8 cm

Here is used 5 types of products that's wicking test report is different. In this test we find that the products-E (After wicking tests 8 cm) is excellent from the other products. This test report also show that the products-D & product- C wicking test is very bad from other products.

#### 4.2 Find the results after the immersion tests process for the different types gauge fabrics

In this test procedure, we are used different type of gauze fabrics, firstly we cut the sample of (1X1) cm<sup>2</sup> size and it is left on water surface. With the help of stop watch, the time of the limitation. Here is used 5 different types gauge fabric. That is shown different results. In this test which fabric immures in low time that fabric has excellent immersion properties. that's shown below by the table.

**Table 4.2:** Immersion test

Name of product	After immersion
Product-A	Immersion not good ( 1 min)
Product-B	Bad (above 2 min )
Product-C	Excellent (3sec)
Product-D	Very poor (more than 1 min)
Product-E	Very poor (more than 1.15 min)

Here, is used five types of fabric that is shown different results. For the results of products-A that is show 1 min, so this results is not good. Products-D and products-E are same so they are very poor. In this test the product-B is bad that is not immerse, but the product-C is excellent, because this product immerse time is (3 seconds), so product-C is excellent.

### 4.3 Find the results after the Drop tests process for the different types strip bandages fabrics

In this drop test process, we are used gauge fabric & cotton strip. Both fabric drop test are shown to more redouble property. Their drop test shown property is different. Some product show circular shape that's are excellent & other some products are shown to not circular shape in a desired time of the desired pharmaceutical products. That's shown below by the table.

**Table 4.3:** Drop test of strip bandage fabric

Name of the product	Required dropped time	Shape of after drop
Product-A	3sec	Absorbency good but not circular
Product-B	7sec	Absorbency good but not circular
Product-C	4sec	Very good & circular
Product-D	10sec	Not good, but circular
Product-E	7sec	Absorbency excellent, but not circular.

Here, used products are different types of gauge fabric & cotton strips. The products-C that show the very good drop test property. That was shown to vary good & circular in the time (4 sec). Products-A and Products-B absorbency good, but not circular. In other side the product-E absorbency excellent, but not circular.

#### 4.4 Find the results after the Absorbency tests process for the different type's cotton fiber

In this process we are used test material cotton fiber of medical textile, firstly we take 5gm sample weight after take 200 ml water then fall down cotton fiber into the water time duration 5 minute. After that cotton fiber squeeze then again sample weight measured. In this test, we are used different types brands cotton fiber, that's shown their different absorbency property. If cotton fiber contain absorb 70 times water from its weight that's called good. Here given some cotton fiber after absorbency check report, that's shown below by the table.

**Table 4.4:** Absorbency test of loose cotton

Name of the product	Weight of the sample	After absorbency sample weight	After absorbency sample weight %
Product-A	5gm	68gm	7.3%
Product-B	5gm	61 gm	8.1%
Product-C	5gm	78.19gm	6.4%
Product-D	5gm	67.55gm	7.40%
Product-E	5gm	62.28gm	8.0%

Here, are used five type of absorbency cotton fiber pharmaceutical product, that's absorbed water in huge time from their original weight. In the test product-C is more absorb water that is 78.19 gm more from the original weight. In this test other products absorbency is very good, so finally told that thus products absorbency is good to excellent.

#### **4.5 Find the results after the gauge fabric, Absorbent fabric & cotton strips bandages tests process for the different type's cotton fiber**

At first pH paper put on the tested material surface such as gauge fabric, Absorbent fabric & cotton strips. After few minute latter check the result, by using pH check box. And finally find out the results of the thus pharmaceutical products.

**Table 4.5:** pH check of the tested products

Name of the product	After check pH value
Product-A	6.5
Product-B	7.5
Product-C	6.5

Here, used different types of pharmaceutical product that show to thus pH value check report. After check, we saw that the product-A 7 Product-C pH value is 6.5 and Product-B pH value was 7.5

# **CHEPTER-5**

# **CONCLUSION**

## **CHEPTER-5**

### **CONCLUSION**

After completed of this thesis work, we can gather knowledge about the “Evaluation of absorbency and pH values of pharmaceutical surgery products”. In the beginning of work about these topics we don’t know the specific information. But now we gained more knowledge about the pharmaceutical surgery products for pH & absorbency test. After test we known to that cotton fabric 27 gunny time absorb contain from the before weight. In the time of this thesis work we known how to absorbency test, drop test, wicking test & pH test.

- ✚ After wicking test we find that the products-E (After wicking test 8 cm) is excellent from the other products. This test report also show that the products-D & product- C wicking test is very bad from other products.
- ✚ After test we realized that Products-D and products-E are same so they are very poor. In this test the product-B is bad that is not immerse, but the product-C is excellent, because this product immerse time is (3 seconds), so product-C is excellent.
- ✚ Drop test process, we are used different types of gauge fabric & cotton strip. After drop test process, we found the results that was some products was show the circular & very good absorbency property & some products very bad absorbency & not circular.
- ✚ After absorbency test, we saw that cotton fiber more water absorbs that was 70 more times from its original weight.

Finally, we can say that after completed the project work experience which was more explore knowledge for our future life in the textile job sector.

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