DIY SOLUTIONS FOR MEDICAL PROTECTIVE CLOTHING AND MASKS
Whatever the virus, be it SARS or Novel Coronavirus Pneumonia, Medical Protective Clothing plays a vital role in reducing the spread. The quality of Medical Protective Clothing is always improving as production technology advances. This article comprehensively explains what Medical Protective Clothing is, how it is produced, and the quality requirements it should meet.
CHAPTER 1

Basic Introduction to Medical Protective Clothing

1.1 Medical Protective Clothing: Definition and Application

1.2 Structure and Common Categories of Medical Protective Clothing
चिकित्सा सुरक्षामाफु कपड़े: परिभाषा और प्रयोग

1.1

चिकित्सा सुरक्षामाफु कपड़े वह हैं जो चिकित्सा में निर्देशन, अन्य नियम, नियमित नियम और चिकित्सा सुरक्षा कथन में प्रयोग होते हैं। यह चिकित्सा का कार्य करने वाले, डॉक्टर, नर्स, टेम्परीनों के लिए विशेष रूप से जोड़ी, यह डॉक्टरों, नर्सों, साव्यज्ञों को शरीर के अंतर्गत में प्रवेश करने के लिए विशेष रूप से जोड़ी।

चिकित्सा सुरक्षामाफु कपड़े की परिभाषा है: पररभसासा और प्रयोग

1.2

चिकित्सा सुरक्षामाफु कपड़े की संरचना और सामान्य बैगियाँ

Medical Protective Clothing comprises a combination of hats, tops and trousers. There are two kinds of Medical Protective Clothing: Isolation Gowns and Protective Clothing. Medical Protective Clothing is more durable with a higher protection grade and better protection performance than an Isolation Gown. The purpose and protection principles of these two types of clothing are given in the table below.

| भिन्नता | अंतर
| --- | --- |
| अंतर | सूची
| Areas of use | Purpose of clothing |
| गर्मियाँ कए कपड़े कपड़े होते हैं जो छठे विभिन्न नियमों में दिखाई मिलते हैं की अंतर्गत, दर्जन देने के लिए एंटिवासर कपड़े लिखित हैं। | बुझी रमण एवं निष्पादन के स्थानों को बदलने के लिए, या एंटिवासर रमणों के स्थानों के लिए। |
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| उपयोग के विशिष्ट उद्देश्य | बुझी रमण एवं निष्पादन के स्थानों को बदलने के लिए, या एंटिवासर रमणों के स्थानों के लिए। |

Source: https://www.testex.com
## CHAPTER 2

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Common Raw Materials and Performance Capabilities of Medical Protective Clothing

The materials most commonly used in the fabrication of disposable Medical Protective Clothing are polypropylene textile adhesive fabric, new polyester fiber, polymer coated fabric, SMS nonwovens and polyethylene breathable film/nonwoven composite. At present, most manufacturers use polytetrafluoroethylene (PTFE) material to make Medical Protective clothing. PTFE is a high performance polymer which can not only resist water pressure but can also release water vapor through micropores. The related properties of these materials are as follows:

### Materials

<table>
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<th>Protective Related Performance</th>
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<tr>
<td>Polypropylene fabric</td>
<td>breathable film/nonwoven composite. This material can go through both antimicrobial and antibacterial treatments. However, the hydrostatic pressure resistance is relatively low, and the virus particle blocking efficiency is poor. As such, this material can only be used as sterile disposable surgical clothing, material for disinfection bags, and other general protective articles.</td>
</tr>
<tr>
<td>New polyester fiber</td>
<td>This material is similar properties to traditional textiles and can receive both antistatic and antibacterial treatments. However, the hydrostatic pressure resistance is relatively low and the virus particle blocking efficiency is poor. As such, this material can only be used as sterile disposable surgical clothing, material for disinfection bags, and other general protective articles.</td>
</tr>
<tr>
<td>Polymer coated fabric</td>
<td>There are many kinds of coatings for protective fabrics, such as PVC, polyethylene and so on. Polymer coated fabrics provide a barrier against water and bacteria and they are also wearable. However, moisture permeability is poor, and they can be uncomfortable to wear. At the high-end of coated fabrics is PTFE, which is not only incredibly waterproof but is also a moisture-permeable composite fabric.</td>
</tr>
<tr>
<td>SMS nonwovens</td>
<td>These fine fiber diameters of this material results in a soft, fuzzy material which hangs well. The filter resistance is good, as is the hydrostatic pressure resistance. However, it has low strength and the wear resistance is poor.</td>
</tr>
<tr>
<td>Polyethylene breathable film</td>
<td>This material is used in the fabrication of disposable Medical Protective Clothing usually consists of a hat, top, and trousers. The main processes required to fabricate the clothing are cutting, stitching, provision of elastic fittings to ensure tightness at the openings, and adhesive pressing tape for sealing joints. The main pieces of equipment required to fabricate these items are the sewing machine and the glue-pressing machine.</td>
</tr>
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### Construction of the Clothing

Medical Protective Clothing usually consists of a hat, top, and trousers. The main processes required to fabricate the clothing are cutting, stitching, provision of elastic fittings to ensure tightness at the openings, and adhesive pressing tape for sealing joints. The main pieces of equipment required to fabricate these items are the sewing machine and the glue-pressing machine.
In response to the large number of medical workers infected while at work, the World Health Organization (WHO) has stated that appropriate protective equipment should be selected to control the spread of the highly contagious virus. In order to comply with WHO regulations, Medical Protective Clothing should block the passage of microorganisms, particulate matter and fluids, while being able to withstand disinfection treatment, be durable, wear- and tear-resistant, and puncture-proof as well as resistant to fiber strain. The fabric used for such clothing should not include any toxic ingredients and should be cost effective, comfortable, and safe.

Quality Requirements for Medical Protective Clothing

3.1 What are the Common Quality Standards?
3.1

What are the Common Quality Standards?

- **EN 14126**
  - Protective clothing
  - Performance requirements and tests methods for protective clothing against infective agents

- **EN 13795**
  - Surgical drapes, gowns, and clean-air suits, used as medical devices, for patients, clinical staff and equipment
  - General requirements for manufacturers, processors and products, test methods, performance requirements, and performance levels.

- **NFPA 1999**
  - Standard on protective clothing and ensembles for emergency medical operations

- **ISO 16603**
  - Determination of the resistance of protective clothing materials to penetration by blood and body fluids. Test method using synthetic blood.

- **ISO 16604**
  - Determination of resistance of protective clothing materials to penetration by blood-borne pathogens. Test method using Phi-X174 bacteriophage.

- **NFPA 1999**: Pay attention to the overall protective performance of protective clothing, liquid barrier performance testing use over the Liquid Integrity method of ASTM F1559, and the specimen seam is required to have a certain strength and resistance to microbial penetration.

- **ISO 1603, ISO 1604**: The performance requirements for disposable protective clothing materials are similar, and the same detection methods are adopted in the synthetic blood penetration test and microbial penetration test.

- **EN 13725**: Pay attention to the protective performance test of disposable surgical clothing under both dry and wet conditions.

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**Mask Template**

(See specifications overleaf)
**Mask Template**

**Simple Surgical Style 3 Pleats**

- **Face Mask, 2 Layers, Teenage/Adult Mask**
- **Elastic:** 2 x 23 cm
- **Fabric:** Width 21 cm x Length 41 cm

**Recommended Fabrics**

- Gore-Tex is both a breathable and a water repellent/waterproof fabric.
- Some Micro-Fiber Taffeta fabrics are also breathable and water repellent/waterproof. Please check the manufacturer's guidelines. It is advisable to test the breathability of the fabrics prior to buying/cutting.

Spraying fabric with waterproofing spray is not recommended due to the close proximity of the chemicals to the respiratory system.

inner and lining fabrics such as cotton, double gauze, and fabrics with absorbing properties are recommended. They must be sufficiently permeable to allow the wearer to breathe comfortably.

Additional layers can be added to improve protection. The outer fabric should ideally be water repellent or waterproof. The inner layer, should you choose to include one, should be a filter-like material.

Source: [https://www.shanniemakes.com](https://www.shanniemakes.com)

**SEAM ALLOWANCE:** 10 mm

- **FOLD LINE**
- **FOLD DOWNWARDS**

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असुवीकरण

यह दस्तावेज संयुक्त राष्ट्र द्वारा अधिकारिक रूप से प्रकाशित नहीं किया गया है। दस्तावेज में उपयोग किए गए पुस्तांकीय साधन और इसकी विवाद सुची का अर्थ वह नहीं है कि संयुक्त राष्ट्र अंतर्राष्ट्रीय विकास संगठन (UNIDO) के संचालक ने देशों, शहरों या शहरों की नामित स्थिति, और उनके अधिकारियों, सीमाओं या उनके साधकयाओं व विकास की पृष्ठ की है। केवल "विकास", "नृीयसमान" और "विकासशील" शब्द एक सामाजिक-वित्तीय प्रक्रिया के मानदंड द्वारा शासित होते हैं और आवश्यक रूप से विशेष देशों या क्षेत्रों द्वारा पहचाने विकास के प्रदर्शन पर किसी भी राष्ट्र के अनुप्रयोग नहीं होते हैं। कंपनी के नाम या वाणिज्यिक प्रदर्शनों का उल्लेख UNIDO द्वारा पुष्टि के मामले नहीं है। व्यक्त किए गए विचार, देश और अनुमान लेखकों की जिम्मेदारी है और तदनुसार, UNIDO के विचारों या समर्थन को प्रतिबिंबित करने के रूप में नहीं लिया जाना चाहिए।

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