BATIK MASK MANUFACTURING TECHNOLOGY AS AN APPEARANCE EQUIPMENT AND FOR THE PREVENTION OF THE SPREAD OF COVID-19

AGUS NURSALIM*, BANDI SOBANDI, DEWI M. SYA'BANY

Visual Arts Education Study Program, Faculty of Arts and Design Education,
Universitas Pendidikan Indonesia, Bandung, Indonesia,
Pendidikan Indonesia, Bandung, Indonesia
*Corresponding author: agusnursalim@upi.edu

Abstract

This research aims to determine batik mask models made from anti-bacterial cotton fabric that serves to filter particles, and droplets of COVID-19 unless the mask also serves as a fashion. The research method used is a design method with anthropometric and ergonomic approaches. Data collection using observation and documentation techniques. The technology of making batik masks 'Garuda Kuat' is done through two steps; First, make the batik motif design 'Garuda Kuat' with a symbolic background of local culture. Both batik cloth and Vaseline are combined with intrageneric. The study results have been made mask design with the concept of 'Garuda Kuat' hoping that Indonesia can overcome the COVID-19 pandemic. Mask products will still be sought after by the public because masks prevent the spread of invisible dirt. Mask products can meet the production to the Standards National of Indonesia (SNI) to filter out droplets, as well as life-threatening particles and viruses. This is because it is based on the laboratory test results of the Ministry of Trade. This study implies that batik masks are expected to increase the income of batik artisans who are members of Small and Medium Enterprises (MSMEs).

Keywords: Batik mask, Health protocol, The spread of COVID-19.

1. Introduction

Coronavirus Disease 2019 (COVID-19) is a new disease that can cause respiratory distress and pneumonia. This disease is caused by infection with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2). Gen COVID-2019 has mutated a lot into a new coronavirus variant, project, a genome-wide association study (GWAS) using the statistical genetics concept of super variants to uncover possible risk loci contributing to COVID-19 mortality [1, 2]. Coronaviruses are a viral family including alpha, beta, gamma, and delta coronaviruses [3]. Nevertheless, in the past year, the government has made strong efforts to anticipate the spread of this virus by bothering to deal with COVID-19. A task force has been set up specifically to deal with this pandemic by mapping the space of new variants of COVID. It is envisaged that this study would contribute to a deeper understanding of COVID-19's impact on the feeling of community in Southeast Asia, particularly from stakeholders' perspectives [4] .

The transmission process of the virus can be through breathing or limbs contaminated with the virus. Hands infected with the virus in this context can spread respiratory infections if in contact with the mouth and nose [2]. The virus is not only transmitted through the touch of limbs but also from the droplet through sprinkling particles to targeting the site infection, thereby reducing the potential for systemic side effects nose [2], The virus is not only transmitted through the touch of the limbs but also from the droplet through sprinkling particles to targeting at the site of infection, thereby reducing the potential for systemic side effects [5]. even though SARS-COV-2 vaccinations are being researched and approved, herd immunity or accessibility vaccines are not yet widely available. Therefore, preventing the virus's spread in the community and healthcare settings is essential. Wearing a respirator mask is one of the preventive methods indicated to minimize the spread of COVID-19. The study developed commercial and custom face masks and made batik masks from anti-bacterial fabrics to maintain better breathing with different fabric pores and breathing patterns [5].

Controlling the spread of SARS-CoV-2 requires preventive behavior [6]. Compared to other preventative measures such as keeping social distance and washing hands, some people may not see masks as a step in the right direction. Compared to persons who do not have chronic conditions, adults with chronic diseases had a greater risk of COVID-19-related mortality [7]. Adults who suffer from COVID symptoms are more inclined to follow the guidelines of COVID-19 prevention strategies. Specific demographic groups and geographic areas, such as people without symptoms or adults living in rural areas, are recommended for public health communications. A double mask should be used to prevent the new virus version, Varian delta [5].

The COVID-19 epidemic has resulted in a large increase in mask demand, and their use has grown ubiquitous worldwide to combat an unprecedented pandemic. The efficacy of the filter layer, which is generally made of polypropylene and can be damaged because it is not made of fabric, determines the structure of the mask. All devices have filtering capabilities at any distance rather than at a closer distance [5]. Fabric material for the mask can achieve filtering efficiency up to a size of 0.3 µm. In this experiment, eight different types of mask material fabrics of varying structural morphology. From other fabrics, materials are characterized by the size and distribution of their pores by mercury porosimetry and analysers of the surface

area of the fabric. It was then explored first to understand the importance of tight pores [8]. Cloth samples of mask material are characterized by scanning electron microscopes so that the morphology of the fabric's surface and the efficiency of decreased pressure and respiratory resistance [9]. In a mix of single and double layers, several PP-MB-NW fabric samples were tested against particle sizes of 0.3, 0.5, and 1 μm [10]. Models that had low pore meters, high solid fraction volume, and permeability [11], and low air had high filtration efficiency (> 90%) against particles of 0.3 μm with a decrease in high pressure (16.3-21.3 mm WC) and respiratory resistance (1.42-1.92 mbar) when compared to other samples [9]. This study will pave the road for the proper sort of filter fire fabric, namely PP-MB-NW, to be used in mask development, and it will be highly useful in fabricating masks during the pandemic time with the desired PFE [12].

Thus mask products are much sought after by the public [13]. They search for further information such as type, correct use instructions, and where to buy, as well as do-it-yourself alternatives to personal protective equipment [14]. Self- or community-protection measures should be accompanied by definitions and recommendations, and translated versions should be available because Masker is a product to prevent COVID-19 transmission [15]. Batik mask products except to avoid transmission at once can be for appearance [16]. The purpose of the research was to figure out how to identify a good fabric material that would reject droplets and filter out dangerous particles and viruses using laboratory testing on garments and textiles. To create a mask, design has been used design research methods with anthropometry and ergonomics approaches.

The novelty of this study is the selection of mask materials from materials that have resistance to the suction power of liquid and bacterial droplets and dirt that is not visible virtually. In addition, the concept of the batik motif symbolically reflects the resistance of the mask to the spread of the pandemic.

2. Literature Review

In addition to discussing the manufacture of batik masks as a droplet deterrent fashion, this research will also discuss masks as a means of preventing COVID-19 transmission.

Although not identical, luxury fashion companies strongly consider mask models in developing their statements [17]. To discover the techniques used by batik artisans in making batik masks, researchers must observe and explore the understanding and art system to find the knowledge base used in making motifs on batik masks and the cultural values contained in the motifs on batik masks [18]. It does not rule out the possibility that other cultural elements will also be studied because they are related. Depart from determining the prevalence of wearing masks to avoid COVID-19 and comply with acceptable mask use procedures for the proper use of face masks among the general people, where wearing medical masks is becoming a "cultural" phenomenon [19]. When it comes to fashion buying these days, some fashionistas use social media platforms such as YouTube, Instagram, and Facebook to research and compare brands before purchasing.

According to the structural model equation (SEM), the marketing mix was found to have a considerable effect on attitudes, subjective norms, and control of consumer perceived behavior, which ultimately leads to purchasing intentions, according to the structural model equation (SEM) [19]. In online shopping, it is

necessary to pay close attention to some facts of events in major cities related to social media as a channel for shopping: 90% of people live in cities using their mobile phones to process online shopping transactions; Spain is one of the European Union countries where mobile phones have had the most influence; 60% of Spaniards have made at least one purchase through mobile phone. In short, major fashion companies must take the trend of the COVID-19 pandemic very seriously to continue to innovate progress to provide satisfaction to their customers, found that the perception of positive perception of COVID-19 in the prediction there is pleasure and usefulness in the world. Clients, resulting in increased satisfaction with the fashion brand's Instagram account and, as a result, a stronger desire to pursue the deals offered by those accounts [20]. It's worth noting that fashion marketers are currently focusing their efforts on Generation Z.

On the other hand, the government must consider the potential impact of this pandemic; the network of the spread of this epidemic requires extra attention [21]. Generation Z has managed to become a group that was previously the target of marketers, millennials. This Z generation was born between 1980 and 2000, characterized by their proficiency in digital communication. The simple reason for both is that Generation Z was born when mobile phones were already available. This generation, which ranges in age from 13 to 17, receives their first mobile phone on average at the age of 12, compared to the previous generation, which received their first mobile phone from their parents between the ages of 16 and 20; they use the most (78 percent) digital devices, including mobile phones, tablets, laptops, and televisions; and they use mobile phones for instant messaging and watching videos online.

Through improved knowledge and practice of COVID-19 prevention strategies, testing, and screening, the global community is working to limit and finally stop the spread of COVID-19, which has taken thousands of lives and sickened tens of thousands. Several studies have been conducted to assess the impact of wearing a mask on COVID-19 prevention. Numerous studies [3, 4]. In addition, the presence of information media in the form of accurate and neutral reports is allegedly useful for driving, reducing impacts, and protecting the community from pandemic outbreaks [22]. Support mask use as a preventive measure, while others found no significant link between mask use and COVID-19 [23]. According to the World Health Organization, the best way to prevent and slow the spread of COVID-19 is to accurately and widely inform the public about the disease, its causes, mode of transmission, and simple prevention methods such as hand washing with soap or hand sanitizers, maintaining social distance, and staying at home. Preventive COVID-19 measures, such as staying at home, are sedentarism strategies that reduce physical activity [24]. Poor hand hygiene, overcrowding, and close physical contact such as handshaking, on the other hand, contribute to the virus's rapid transmission in a short period.

To stop the spread of COVID-19, personal hygiene, and public health actions must be implemented, particularly among priority high-risk groups. As a result, increasing community awareness of COVID-19 symptoms and prevention strategies will help to limit the outbreak's spread. According to a study done in the United States of America on COVID-19 awareness, attitudes, and behaviors, seven out of ten participants (71.7%) properly identified three COVID-19 symptoms, and 69.8% correctly identified three techniques. COVID-19 preventative principles are emphasized upon discharge, and as much as feasible, follow-up is done via

telemedicine COVID-19 prevention is highlighted. Follow-up is done via telemedicine as much as possible [25]. Fever, cough, sore throats, and shortness of breath were identified as symptoms of COVID-19 by 73.8 percent of health workers in China and the United Arab Emirates. In comparison, 98 percent of health workers suggested washing hands with soap and water, maintaining social distancing, and wearing face masks could help prevent disease transmission. A multifaceted strategy that combines all three and continued hygiene and distancing protocols is likely the most effective [26]. Fever, tiredness, dry cough, and myalgia as the main clinical symptoms of COVID-19 by 96 percent of Chinese inhabitants.

Another study in Bangladesh found that 98.7% of students believed that hand washing with soap and water, avoiding touching your nose, mouth, and eyes with unwashed hands, using a face mask/tissue when coughing or sneezing, and wearing a clean surgical mask while sick with COVID-19 were the best ways to prevent COVID-19. We used the number of new COVID-19 cases reported by the US Centres for Disease Control and Prevention (CDC) [27]. and state population numbers in 2019 to determine monthly COVID-19 case rates [28, 29]. Figure 1 describes UNIQLO women's mask products worn by the community where they can be washable. Recently one of the Japanese fashion brands launched a face mask on September 21, 2020, to answer the public's need for a safe and comfortable mask during the pandemic period. AIRism was first launched in Japan in June 2020.

**Fig. 1. Women's cloth mask children
UNIQLO AIRism mask washable on the market.**

3. Materials and Methods

In this study, researchers conducted a study on one main description, namely the knowledge system because, to dissect the techniques used by the Small Business Micro Small Medium (MSMEs) batik artisan community in making batik mask motifs, we must observe and dive deeper knowledge used in the process of making

batik motifs and cultural symbolic values contained in the art of batik motifs. Even so, it does not rule out the possibility that other cultural elements will also be studied because they are related to each other. In addition, we conducted laboratory trials of batik mask products made from anti-bacterial and absorbent cotton very small (see Fig. 4) at the Textile and Fabric Testing Center. Testing was conducted to meet the standard (SNI) of anti-COVID-19 mask products. Data collection is done through field studies and interviews with batik cloth manufacturers and artisans by exploring and clarifying comprehensively how to make batik motifs and the basis of knowledge and art used in batik motifs. Make batik motifs. In addition, the researcher also conducted interviews with cultural practitioners in batik-producing regions in Indonesia, to explore and clarify the symbolic values that exist in batik motifs. The data collection results were analysed using source triangulation techniques to comprehensively examine the relationship between symbolic systems and batik motif culture. Batik mask designs and motifs are associated with fashion or fashion design. The method of making a mask is done with the following steps.

3.1. Program design and creation methods

Design Program and method of creation proposed following the scope of the program (See Fig. 2):
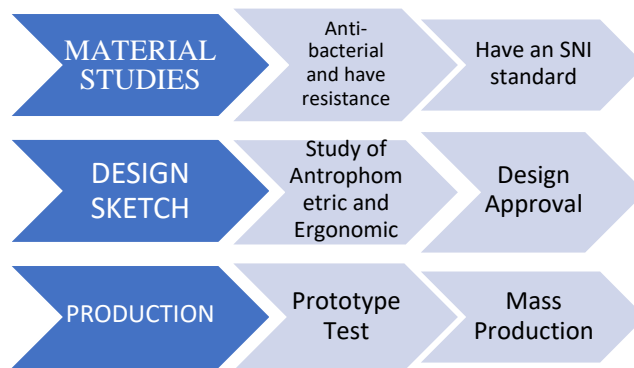

Fig. 2. Production methods.

3.2. Mask raw materials

Some countries began to promote the usage of masks as part of a campaign to combat the spread of COVID-19 [27]. The Centres for Disease Control (CDC) has recommended surgical masks and N95s that take precedence for medics who are at the forefront of handling COVID-19 should wear masks [28]. However, masks are recommended for those worn by paramedics if wearing non-medical masks, what kind of fabric is appropriate to prevent germs or viruses? Researchers from the United States Argonne National Laboratory and the University of Chicago evaluated a variety of materials. These researchers tested materials or fabrics in the laboratory to investigate their mechanical and electrostatic filtration properties [17] . Many layers and fabric mixtures work well in filtering out particles, but masks with obscene materials can damage everything [18]. Several fabrics are made of cotton, silk, chiffon, flannel, and various synthetics. Their mixes and combinations are beneficial in limiting the spread of viruses [19]. They discovered that

combining different publicly available textiles to make cloth masks could significantly protect against aerosol particle transmission [12]. In a series of experiments conducted intensely, the team used space with aerosol mixtures for several samples present in the air [20]. The researchers tested a variety of particle sizes, from about 10 nanometres to 10 micrometers.23 In short by comparison, human hair is about 50 micrometres in diameter and there are 1,000 nanometres in one micrometre. COVID-19 particles are between 80-120 nanometres in diameter. So, the particles to test these fabrics are very small. These small aerosol particles can even cause infection, and the possibility of exposure to larger particles can also occur. Therefore, researchers making sure the material can filter on a small scale is a good way to ensure larger particles will get clogged [9]. The team found a hybrid fabric coated in multiple fabrics, capable of filtering out most particles [9]. Cotton with silk, cotton with chiffon, or cotton with flannel are hybrid fabrics [21]. Filtration efficiency is about 80 percent for particle sizes less than 300 nanometres and 90 percent for particles over 300 nanometres.

3.3. Anthropometric studies

The concern of all parties ranging from health workers, policy makers and the community to implement health protocols along with strengthening infrastructure and production of medical equipment is very much needed in dealing with Covid-19 [30, 31]. Fikenzer reports et al. [32] regarding the use of FFP2/N95 masks for normal people felt uncomfortable. For this reason, it is necessary to find the development of alternative masks carried out through a standardized face mask testing process so that it can produce products that are able to filter particles, bacteria, and viruses [33]. Based on this view, the use of cloth masks as an alternative that can be developed in dealing with the Covid-19 pandemic.

Masks are a product that has been around for a long time. Before the COVID-19 epidemic, masks were commonly employed for various purposes. However, with the COVID-19 outbreak, masks have become a necessity. As a result, businesses must clearly define their brand identities [34]. For this reason, it is considered necessary to have studies related to the design of cloth masks in the future that take into account conformity and leakage issues efficiently as protective materials [35].

The use of masks for motorcyclists has been studied. Ramadan also carried out the design of anthropometric-compliant masks in 2018. Research and development related to the COVID-19 pandemic continues. The DMF-T index can be used to determine a person's physical anthropometry. Weight, height, and age are taken into account when calculating body mass index for people of all ages using an anthropometric index based on z scores [36].

3.4. Ergonomic studies

Therefore, the main thing to consider is comfort. The first thing that comes to our mind about wearing masks is comfort and comfort [23]. The comfort factor becomes extremely crucial in product design. Fast fashion shops had to adapt their items to satisfy the needs of male and female customers as work dresses changed. Casual gear made for comfort and versatility was added to fulfil the needs of male and female customers [37]. Zara introduced a new product category dubbed "New

comfort" to their clothing line, which includes athleisure, loungewear, and activewear, which have become the new stay-at-home uniforms, as well as facemasks that are both soft and breathable. Consumers were shifting away from fashionable clothing and toward basic items in neutral colours and soft materials, prioritizing comfort above style. Another noticeable trend was the "Zoom-friendly top," sometimes known as smart-casual, which referred to a more sophisticated but comfy top composed of soft materials [38]. Finally, Consumer's Quality products have a high level of comfort. For that in the design process, you must consider ergonomic factors. In particular, among the technologies that can create such convenience with the integrated use of the industrial Internet of Things (IIoT) and tools to test the comfort in improving management.

3.5. Mask design

Here is the process of making masks, as explained further in Fig. 3.

Fig. 3. The process of making a mask.

3.6. Mask materials

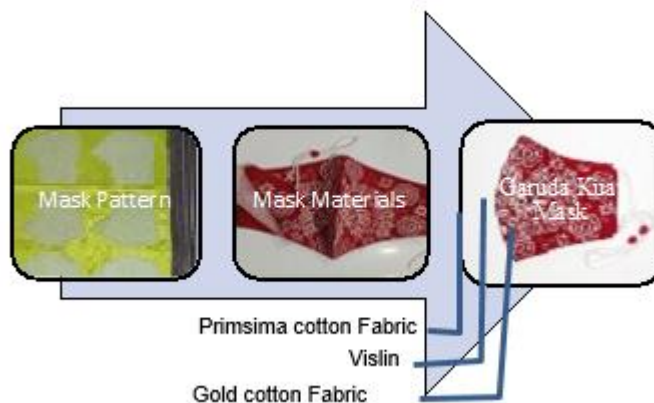The selection of mask materials can be seen in Fig. 4.

Fig. 4. The selection of mask materials.

4. Results and Discussion

4.1. Mask testing

For particle filtration efficiency, the area of the test material and face speed are important. The 3.14 cm2 specimen was obtained from a PP-MB-NW sample, taking into consideration the surface area of a normal face mask of roughly 15.0 cm2 as

published elsewhere, to assess the individual filtering effectiveness of distinct PP-MB-NW. The flow rate for a given specimen is computed based on the area of the mask, and it is 4.5 LPM, which is typical of 95 LPM. Filter performance was assessed on three samples from each PP-MB-NW. The % efficiency for each melted person and its combination is computed using the average penetration value.

4.2. Result of SNI test in the laboratory of the textile Bandung

The particle filtration efficiency test (Fig. 4) demonstrates how different layers of mask material react to different particle sizes, with a focus on the core layer, which is cotton material, against transparent particle sizes of 0.3 m. The NaCl34 test rig was used to determine filtration efficiency and fabric pressure reduction. Compressors, air receivers, dry air units, flow meters, control valves, air ducts, aerosol producers, particle counters, and digital manometers were among the test equipment used. (Fig. 5) [6, 9]. Dry and clean air is acquired from the compressor through a HEPA filter and given to the air regulator. The flow meter and flow control valve are adjusted to provide the needed airflow. Aerosols with diameters ranging from 0.3 to 10 m are made with NaCl. NaCl test aerosols are created by atomizing compressed air using a glass nebulizer. When operating at an air pressure of 1.76 kg cm^2 (roughly), the generator/pump produces submicron NaCl aerosols with a Median Mass Diameter (MMD) of 0.3 μm [9].
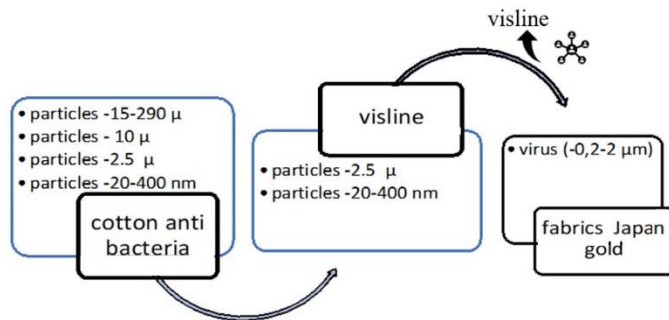

Fig. 5. Scheme of how a strong "GARUDA MASK" WORKS that shows the importance of fabric coating different from the national standard of Indonesia (SNI) emphasis on the smallest particle.

The laboratory test results of the "GARUDA KUAT" batik motif mask are shown in Table 1 and Fig. 6 for the laboratory test results at the Central Trade Office.

Table 1. Result of batik mask laboratory tests.

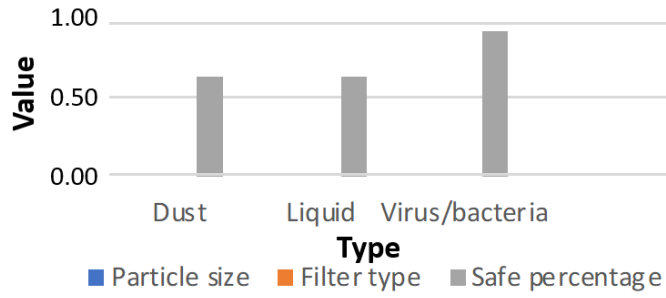| Type of particles	Particle size (μm)	Filter type	Safe percentage
Liquid	15-290 10	Primisima antibacterial cotton cloth	65%
Liquid	2.50 20-400	Visline	65%
Virus/bacteria	0.20-2	Japanese gold cotton fabric	95%

**Fig. 6. Diagram result of batik mask test
at textile and batik center laboratory.**

Certification of GARUDA KUAT Mask test results has been published by the Laboratory of The Textile Center with the following results (as shown in Figs. 7 and 8 as well as Table 2).
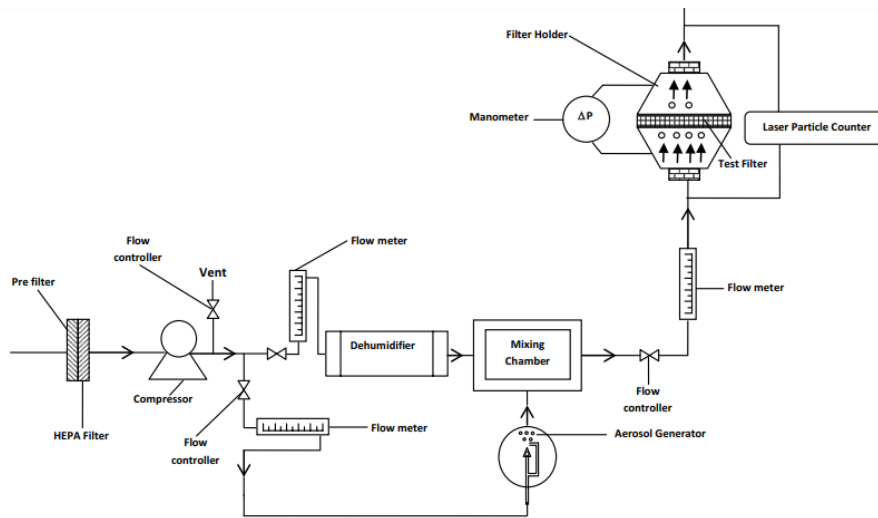

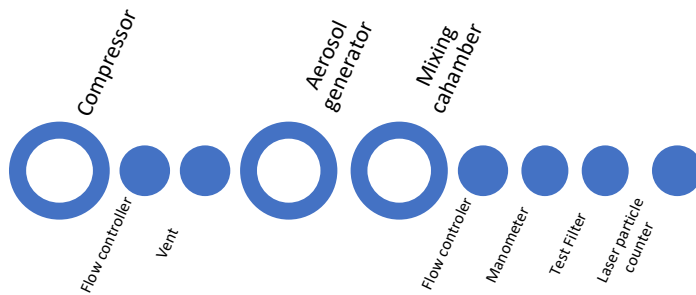**Fig. 7. Schematic of the aerosol filtration efficiency [9].**

**Fig. 8. Schematic of the aerosol filtration efficiency test setup
(Microsoft Office 2007 was used to create this diagram).**

Table 2. Standard SNI test mask Covid-19.

Test type	Test results	Test methods
Translucent Air Power cm^3/cm^2/s	24	JSL, 109:2010
Absorption (How to Drop), Second	>60	SNI 0279: 2013
Free Formaldehyde Levels, mg/kg	ND	SNI ISO 14184-1: 2015
Colour Wear Resistance:		
a. Washing 40ºC	4-5	SNI ISO 105-C6: 2010
b. Acidic and alkaline sweat	4-5	SNI ISO 105-E O4
Colour Desecration	4-5	SNI 8105: 2015

Finally, this study can give additional information for the improvement of science and technology, especially facing issues with pandemic conditions, in which additional information regarding COVID-19 has been well-documented in many areas in previous studies [39-60].

5. Conclusion

Batik masks that have been made with anti-bacterial fabric to prevent transmission of the virus serve as a particle filtering medium. COVID-19 droplet is also used as completeness in the appearance of dressing. It is known that fabrics with pore dimensions between 17-3000 Å and a total area in the pores of 11.79 demonstrate a high level of filtering efficiency Filtration efficiency was good in samples with an average and maximum pore size in the range of 8.80 to 18.65 nm. According to the statistics above, cotton and silk fabrics have low pore diameters, large solid fraction volume, and low air permeability. It filters out even the tiniest particles with remarkable efficiency. It's tough to judge a respiratory mask's effectiveness based on just one microstructural metric. The cumulative influence of these microstructural characteristics, on the other hand, is interrelated with one another, controlling the filtering effectiveness of cotton textiles. At the same time, the batik motif on the mask is symbolically determined by the concept of local culture where the mask is made because batik clothing has a symbolic concept of local wisdom. This study will be beneficial because it will provide information and a better understanding of the core layer of respiratory masks and guidelines for selecting the right mask filter material to achieve high filtration efficiency in fighting COVID-19 droplets while maintaining a pleasing appearance when wearing batik clothing.

Acknowledgments

References

1. Xue, Y.; Bao, Y.; Zhang, Z.; Zhao, W.; Xiao, J.; He, S.; and Li, X. (2021). Database resources of the national genomics data center, China national center for bioinformation in 2021. *Nucleic Acids Research*, 49(D1), D18-D28.

2. Hu, J.; Li, C.; Wang, S.; Li, T.; and Zhang, H. (2021). Genetic variants are identified to increase risk of COVID-19 related mortality from UK Biobank data. *Human Genomics*, 15(1), 1-10.

3. Morenikeji, O.B.; Bernard, K.; Strutton, E.; Wallace, M.; and Thomas, B.N. (2021). Evolutionarily conserved long non-coding RNA regulates gene expression in cytokine storm during COVID-19. *Frontiers in Bioengineering and Biotechnology*, 8(January), 1-14,

4. Praveena, S.M.; and Aris, A.Z. (2021). The impacts of COVID-19 on the environmental sustainability: a perspective from the Southeast Asian region. *Environmental Science and Pollution Research*, 28(45), 63829-63836.

5. Ball L.; Alberti, S.; Belfortini, C.; Almondo, C.; Robba, C.; Battaglini, D.; and Ferretti, M. (2021). Effects of distancing and pattern of breathing on the filtering capability of commercial and custom-made facial masks: An in-vitro study. *PLoS ONE*, 16(4 April), 1-10.

6. Salameh, B.; Basha, S.; Basha, W.; and Abdallah, J. (2021). Knowledge, Perceptions, and Prevention Practices among Palestinian University Students during the COVID-19 Pandemic: A Questionnaire-Based Survey. *Inquiry (United States)*, 58, 1-11.

7. Carrillo-Diaz, M.; Lacomba-Trejo, L.; del Valle-González, A.; Romero-Maroto, M.; and González-Olmo, M.J. (2021). Anxiety and facial self-contacts: possible impact on COVID-19 transmission in dental practice. *BMC Oral Health*, 21(1), 1-9.

8. Islam, J.Y.; Vidot, D.C.; and Camacho-Rivera, M. (2021). Determinants of COVID-19 preventive behaviours among adults with chronic diseases in the USA: An analysis of the nationally representative COVID-19 impact survey. *BMJ Open*, 11(2), 1-9.

9. Pandey, L.K.; Singh, V.V.; Sharma, P.K.; Meher, D.; Biswas, U.; Sathe, M.; Ganesan, K.; Thakare, V.B.; and Agarwal, K. (2021). Screening of core filter layer for the development of respiratory mask to combat COVID-19. *Scientific Reports*, 11(1), 1-14.

10. Coclite, D.; Napoletano, A.; Gianola, S.; del Monaco, A.; D'Angelo, D.; Fauci, A.; and Iannone, P. (2021). Face Mask Use in the Community for Reducing the Spread of COVID-19: A Systematic Review. *Frontiers in Medicine*, 7, 1-38.

11. Choi, S.; Park, R.; Hur, N.; and Kim, W. (2020). Evaluation of wearing comfort of dust masks. *PLoS One*, 15(8 August), 1-13.

12. Tomikawa, S.; Niwa, Y.; Lim, H.; and Kida, M. (2021). The impact of the 'COVID-19 life' on the Tokyo metropolitan area households with primary school-aged children: A study based on spatial characteristics. *Journal of Urban Management*, 10(2), 139-154.

13. Lee, K.P.; Yip, J.; Kan, C.W.; Chiou, J.C.; and Yung, K.F. (2020). Reusable face masks as alternative for disposable medical masks: Factors that affect their wear-comfort. *International Journal of Environmental Research and Public Health*, 17(18), 1-16.

14. Wei, J.; Guo, S.; Long, E.; Zhang, L.; Shu, B.; and Guo, L. (2021). Why does the spread of COVID-19 vary greatly in different countries? Revealing the efficacy of face masks in epidemic prevention. *Epidemiology and Infection*, 149(e24), 1-9.

15. Galido, A.; Ecleo, J.J.; Husnayain, A.; and Su, E.C.Y. (2021). Exploring online search behavior for COVID-19 preventive measures: The Philippine case. *PLoS One*, 16(4 April), 1-12.

16. Chughtaita, A.A.; Seale, H.; and MacIntyre, C.R. (2020). Effectiveness of cloth masks for protection against severe acute respiratory syndrome coronavirus 2. *Emerging Infectious Diseases*, 26(10), e1-e5.

17. Pelikánová, R.M.G.; Němečková, T.; and MacGregor, R.K. (2021). CSR statements in international and Czech luxury fashion industry at the onset and during the COVID-19 pandemic-slowing down the fast fashion business?. *Sustainability* (*Switzerland*), 13(7), 1-19.

18. Mejjad, N.; Cherif, E.K.; Rodero, A.; Krawczyk, D.A.; Kharraz, J.; El Moumen, A.; and Fekri, A. (2021). Disposal behavior of used masks during the covid-19 pandemic in the Moroccan community: Potential environmental impact. *International Journal of Environmental Research and Public Health*, 18(8), 1-19.

19. Machida, M.; Nakamura, I.; Saito, R.; Nakaya, T.; Hanibuchi, T.; Takamiya, T.; and Inoue, S. (2020). Incorrect use of face masks during the current COVID-19 pandemic among the general public in Japan. *International Journal of Environmental Research and Public Health*, 17(18), 1-11.

20. Ong, A.K.S.; Cleofas, M.A.; Prasetyo, Y.T.; Chuenyindee, T.; Young, M.N.; Diaz, J.F.T.; and Redi, A.A.N.P. (2021). Consumer behavior in clothing industry and its relationship with open innovation dynamics during the covid-19 pandemic. *Journal of Open Innovation: Technology*, *Market*, *and Complexity*, 7(4), 1-23.

21. Mahmoud, A.B.; Ball, J.; Rubin, D.; Fuxman, L.; Mohr, I.; Hack-Polay, D.; and Wakibi, A. (2022). Pandemic pains to Instagram gains! COVID-19 perceptions effects on behaviours towards fashion brands on Instagram in Sub-Saharan Africa: Tech-native vs non-native generations. *Journal of Marketing Communications*, 28(8), 864-888.

22. Zhang, X.; Zhang, Z.K.; Wang, W.; Hou, D.; Xu J.; Ye, X.; and Li, S. (2021). Multiplex network reconstruction for the coupled spatial diffusion of infodemic and pandemic of COVID-19. *International Journal of Digital Earth*, 14(4), 401-423.

23. Sugimura, M.; Chimed-Ochir, O.; Yumiya, Y.; Ohge, H.; Shime, N.; Sakaguchi, T.; and Kubo, T. (2020). Effectiveness of cloth masks for protection against severe acute respiratory syndrome coronavirus 2. *Emerging Infectious Diseases*, 26(10), 1-5.

24. Ali, A.M.; and Kunugi, H. (2020). COVID-19: A pandemic that threatens physical and mental health by promoting physical inactivity. *Sports Medicine and Health Science*, 2(4), 221-223.

25. Barret, J.P.; Chong, S.J.; Depetris, N.; Fisher, M.D.; Luo, G.; Moiemen, N.; and Matsumura, H. (2020). Burn center function during the COVID-19 pandemic: An international multi-center report of strategy and experience. *Burns*, 46(5), 1021-1035.

26. Stuart, R.M.; Abeysuriya, R.G.; Kerr, C.C.; Mistry, D.; Klein, D.J.; Gray, R. T.; and Scott, N. (2021). Role of masks, testing and contact tracing in

preventing COVID-19 resurgences: A case study from New South Wales, Australia. *BMJ Open*, 11(4), 1-10.

27. Ditekemena, J.D.; Nkamba, D.M.; Muhindo, H.M.; Siewe, J.N.F.; Luhata, C.; Van Den Bergh. R.; and Colebunders, R. (2021). Factors associated with adherence to COVID-19 prevention measures in the Democratic Republic of the Congo (DRC): Results of an online survey. *BMJ Open*, 11(1), 1-9.

28. Johansson, M.A.; Quandelacy, T.M.; Kada, S.; Prasad, P.V.; Steele, M.; Brooks, J.T.; and Butler, J.C. (2021). SARS-CoV-2 Transmission from People without COVID-19 Symptoms. *JAMA Network Open*, 4(1), 1-8.

29. Fischer, C.B.; Adrien, N.; Silguero, J.J.; Hopper, J.J.; Chowdhury, A.I.; and Werler, M. M. (2021). Mask adherence and rate of COVID-19 across the United States. *PLoS One*, 16(4 April), 1-10.

30. Yaqoob, S.; Siddiqui, A.H.; Harsvardhan, R.; Ahmad, J.; Srivastava, V.K.; Verma, M.K.; Verma, P.; and Singh, A.N. (2020). An overview of novel coronavirus sars-cov-2 spanning around the past, present and future perspectives. *Journal of Pure and Applied Microbiology*, 14(1), 775-788.

31. Hong, H.G.; and Li, Y. (2020). Estimation of time-varying reproduction numbers underlying epidemiological processes: A new statistical tool for the COVID-19 pandemic. *PLoS One*, 15(7 July), 1-15.

32. Fikenzer, S.; Uhe, T.; Lavall, D.; Rudolph, U.; Falz, R.; Busse, M.; Hepp, P.; and Laufs, U. (2020). Effects of surgical and FFP2/N95 face masks on cardiopulmonary exercise capacity. *Clinical Research in Cardiology: Official Journal of the German Cardiac Society*, 109(12), 1522-1530.

33. Forouzandeh, P.; O'Dowd, K.; and Pillai, S.C. (2021). Face masks and respirators in the fight against the COVID-19 pandemic: An overview of the standards and testing methods. *Safety Science*, 133(July 2020), 1-11.

34. Zwakala, K.M.; and Steenkamp, P. (2021). Identity-based brand differentiation: Brand identity prism application in South African banks. *Journal of Contemporary Management*, 18(1), 121-141.

35. Konda, A.; Prakash, A.; Moss, G.A.; Schmoldt, M.; Grant, G.D.; and Guha, S. (2020). Aerosol filtration efficiency of common fabrics used in respiratory cloth masks. *ACS Nano*, 14(5), 6339-6347.

36. Rengkuan, R.Y.E.; Wowor, P.M.; and Mintjelungan, C.N. (2017). Gambaran status karies dan status gizi pada murid TK Kartika XX-16 Manado. *E-GIGI*, 5(2), 177-183.

37. Bilinska-Reformat, K.; and Dewalska-Opitek, A. (2021). E-commerce as the predominant business model of fast fashion retailers in the era of global COVID 19 pandemics. *Procedia Computer Science*, (192), 2479-2490.

38. Germonpre, P.; Van Rompaey, D.; and Balestra, C. (2020). Evaluation of protection level, respiratory safety, and practical aspects of commercially available snorkel masks as personal protection devices against aerosolized contaminants and SARS-CoV2. *International Journal of Environmental Research and Public Health*, 17(12), 4347.

39. Machmud, A.; and Minghat, A.D.B. (2020). The price dynamics of hand sanitizers for covid-19 in Indonesia: Exponential and cobweb forms. *Indonesian Journal of Science and Technology*, 5(2), 175-184

40. Putra, Z.A.; and Abidin, S.A.Z. (2020). Application of SEIR model in covid-19 and the effect of lockdown on reducing the number of active cases. *Indonesian Journal of Science and Technology*, 5(2), 185-192.

41. Anggraeni, S.; Maulidina, A.; Dewi, M.W.; Rahmadianti, S.; Rizky, Y.P.C.; Arinalhaq, Z.F.; Usdiyana, D.; Nandiyanto, A.B.D.; and Al-Obaidi, A.S. (2020). The deployment of drones in sending drugs and patient blood samples covid-19. *Indonesian Journal of Science and Technology*, 5(2), 193-200.

42. Razon, B.C. (2020). Covid 19: Impetus for "community spirits" among Filipinos. *Indonesian Journal of Science and Technology*, 5(2), 201-208.

43. Hamidah, I.; Sriyono, S.; and Hudha, M.N. (2020). A bibliometric analysis of covid-19 research using VOSviewer. *Indonesian Journal of Science and Technology*, 5(2), 209-216.

44. Paranjay, O.A.; and Rajeshkumar, V. (2020). A neural network aided real-time hospital recommendation system. *Indonesian Journal of Science and Technology*, 5(2), 217-235.

45. Hashim, S.; Masek, A.; Abdullah, N.S.; Paimin, A.N.; and Muda, W.H.N.W. (2020). Students' intention to share information via social media: A case study of covid-19 pandemic. *Indonesian Journal of Science and Technology*, 5(2), 236-245.

46. Ana, A. (2020). Trends in expert system development: A practicum content analysis in vocational education for over grow pandemic learning problems. *Indonesian Journal of Science and Technology*, 5(2), 246-260.

47. Dirgantari, P.D.; Hidayat, Y.M.; Mahphoth, M.H.; and Nugraheni, R. (2020). Level of use and satisfaction of e-commerce customers in covid-19 pandemic period: An information system success model (ISSM) approach. *Indonesian Journal of Science and Technology*, 5(2), 261-270.

48. Mulyanti, B.; Purnama, W.; and Pawinanto, R.E. (2020). Distance learning in vocational high schools during the covid-19 pandemic in West Java province, Indonesia. *Indonesian Journal of Science and Technology*, 5(2), 271-282.

49. Sangsawang, T. (2020). An instructional design for online learning in vocational education according to a self-regulated learning framework for problem solving during the covid-19 crisis. *Indonesian Journal of Science and Technology*, 5(2), 283-198.

50. Hasanah, L.; Hakim, W.L.; Aminudin, A.; Sahari, S.K.; and Mulyanti, B. (2020). A design and performance analysis of a telemetry system for remote monitoring of turbidity of water during the covid-19 pandemic. *Indonesian Journal of Science and Technology*, 5(2), 299-307.

51. Zuhairoh, F.; and Rosadi, D. (2020). Real-time forecasting of the COVID-19 epidemic using the Richards Model in South Sulawesi, Indonesia. *Indonesian Journal of Science and Technology*, 456-462.

52. Muryanti, L.; Fitria, L.N.; Hanaya, G.; and Triawan, F. (2021). Foldable bed design concept for covid-19 patient: A machine design case study. *ASEAN Journal of Science and Engineering*, 1(2), 113-126.

53. Al Husaeni, D.F.; and Nandiyanto, A.B.D. (2022). Bibliometric using VOSviewer with publish or perish (using google scholar data): From step-by-step processing for users to the practical examples in the analysis of digital

learning articles in pre and post covid-19 pandemic. *ASEAN Journal of Science and Engineering*, 2(1), 19-46.

54. Pingak, C.T.R.; Octaviani, M.A.; Yuenan, G.C.; and Triawan, F. (2022). Bed-stretcher for burial process of covid-19 corpse: A preliminary design and strength analysis. *ASEAN Journal of Science and Engineering*, 2(1), 105-114.

55. Chandra, C.E.; and Abdullah, S. (2023). Jakarta COVID-19 forecast with Bayesian PIRD multiwave model. *ASEAN Journal of Science and Engineering*, 3(3), 227-242.

56. Nasution, A.R.; and Nandiyanto, A.B.D. (2021). Utilization of the google meet and quizzes applications in the assistance and strengthening process of online learning during the Covid-19 pandemic. *Indonesian Journal of Educational Research and Technology*, 1(2), 31-34.

57. Huwaidi, F.; Nandiyanto, A.B.D.; and Muhammad, N. (2021). The urgency of online learning media during the Covid-19 pandemic at the vocational school in Indonesia. *Indonesian Journal of Educational Research and Technology*, 1(2), 35-40.

58. Ammatulloh, M.I.; Permana, N.; Firmansyah, R.; Sa'adah, L.N.; Izzatunnisa, Z.I.; and Muthaqin, D.I. (2022). Strengthening character education of students through civics caring apps based on m-learning during the covid-19 pandemic. *Indonesian Journal of Educational Research and Technology*, 2(2), 87-96.

59. Abubakar, B.D.; Kayode, F.E.; Abiodun, M.H.; Samson, A.B.; and Abdulrasaq, A. (2022). Social media efficacy on prevention and control of covid-19 pandemic in Ilorin South local government area, Kwara state. *Indonesian Journal of Educational Research and Technology*, 2(3), 195-204.

60. Asriyanti, A.; Septiani, T.D.; Siagian, M.S.P.; and Triawan, F. (2021). Portable coffin lowering device for covid-19 corpse handling: Education, design process, and strength analysis. *Indonesian Journal of Multidiciplinary Research*, 1(1), 41-54.