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14 years of bringing S&T good news

Inside

Tech behind the REwear Face Mask

By Julie Anne H. Baculio, DOST-X

The Department of Science and Technology–Philippine Textile Research Institute (DOST-PTRI) disseminated a Face Mask Resource Kit that would help people differentiate various qualities of face masks.

The toolkit explained the differences of N95 masks, surgical masks, and cloth masks to heighten the public's knowledge on the masks' advantages and disadvantages.

"This resource kit is a sincere response to the need for information on face masks," DOST-PTRI Director Celia B. Elumba emphasized.

As stated in the toolkit, ordinary cloth masks filter lesser quantities of particles than the N95 and surgical masks. Both N95 and surgical masks are fluid resistant, thus giving the wearer higher protection than the cloth masks. Surgical masks, on the other hand, can filter at least 80% of particles compared to cloth masks, which can only filter 50%.

However, in the context of severe shortage of personal protective equipment (PPE) when surgical masks or respirators are not available, the US Center for Disease Control and Prevention proposed the use of homemade cloth masks as the last interim solution until the standard PPE supply is restored.

DOST-PTRI embarked on creating facemasks that would be as wearable and washable as cloth masks, and as effective as N95 and surgical masks. The REwear (Re-useable, Washable and Re-wearable) Facemask Made Smart is aimed to be produced by the textile research institution together with its private sector partners.

The REwear Facemask is a two-piece, three to four-layer mask. The outer layer is made of water repellent fabric and the inner layer is made of absorbent fabric. These masks will also undergo a water-repellent textile finishing technology under the DOST-PTRI's Smart Textiles R&D Program.

"This finishing is based on silane compounds which are prepared into a nanosol then applied onto a natural-fiber blended textile such as cotton fabrics," as stated in the toolkit. This makes the outer layer water repellent, which allows the liquid droplets (respiratory droplets) that may carry the virus to slide down the REwear mask instead of being absorbed, thus it helps prevent the transmission of virus.

Currently, the research institute calls for fabric donations for the production of the REwear Face Masks. Fabric specifications include knitted or plain woven fabrics (Construction), preferably greige (unfinished woven or knitted fabric) fabrics, bleached, unbleached, no resin or additional finishes (Quality), pure cotton or any cotton-based fabrics with no less than 50% cotton fabric content (Composition), 40" to 60" (Width), 21 meters continuous fabric (Minimum Length), and 200-300 grams per square meter gsm (Fabric Density).

The public may contact DOST-PTRI at +639 05 424 5823 or email at Fabric2REwear@gmail.com for possible fabric donations. Also, the Facemask Resource Kit can be downloaded in DOST PTRI website by clicking the REwear Logo on the right uppermost corner of the homepage.

Beat COVID-19 with the new DOST app

Putting science at your fingertips

By Allan Mauro V. Marfal, *DOST-STII*

The Department of Science and Technology (DOST) mobile app will be available for download in Google Play with Android and soon in iOS.

"At DOST, our goal is to provide a useful, responsive and mobile-friendly access to science, technology and innovation services, programs, projects, events, and information available to the public," said DOST Secretary Fortunato T. de la Peña.

"As our fellow Filipinos battle the effects of the coronavirus disease 2019 or COVID-19, our mobile app would help in informing the public about the efforts of DOST and the entire scientific community against this pandemic."

Appropriately named the DOST: Science for the People app, users will get a 24/7 access to all information about the different services, research and development (R&D) projects, programs, and knowledge products. The app will also give access to COVID-19 related efforts of DOST such as the development and production of the COVID-19 Test Kits and the quick response efforts by DOST agencies through production and distribution of face shields, improvised personal protective equipment (PPE), disinfecting solutions and food packs. Users will also be informed about the RxBox developed by Filipino researchers from UP Manila and UP Diliman, with support from DOST-Philippine Council on Health Research and Development (DOST-PCHRD). The RxBox is a biomedical device capable of measuring a patient's temperature, blood pressure, heart rate, oxygen saturation, uterine contractions, and electrocardiogram readings. There is also available information about DOST-PCHRD's clinical trials on virgin coconut oil's potential to possess antiviral properties against COVID-19.

"Our DOST agencies and regional offices have been very active in distributing PPEs such as face shields, reusable face masks and disinfecting solutions to the country's front liners," says Secretary de la Peña. "Some of the PPEs were improved by DOST technology such as face masks that can repel liquid and Ready-to-Eat (RTE) food packs formulated by certified nutritionists."

The app was generated through the partnership of the DOST with Bizooku Philippines Inc. which will give DOST an additional platform for media engagement. The Bizooku Philippines Inc. generates applications and works with clients to organize and manage available information for a meaningful user experience. The generated application provides real-time design and content updates, making it ideal for community engagement.

The DOST app features "Our Fight Against COVID-19" as the landing image, with buttons available for news, infomercials, and the call for donations activities. As the user swipes up the app, frontline services such as scholarships and application for funding opportunities may be viewed. For easier user experience, the main menu contains categories that will be helpful to the user. The "Be Cool" button contains the latest technologies produced by research and development (R&D). The "Be Healthy" button contains health and nutrition technologies produced by Filipino health researchers and nutritionists. The "Be Innovative" button are R&D technologies that can be adopted by industry members. The "Be Upscale" button contains funding opportunities available to academe and industry members. The "Be Safe" includes latest announcements and updates from DOST-PHIVOLCS and DOST-PAGASA. Lastly, the "Be Smart" Button contains more information about scholarships and technologies related to youth and education.

At the bottom of the app, a news button is available which contains the latest programs, projects, events and activities of DOST.

"Optimizing the use of technology and communication is a key component in bringing science to the people," said Secretary de la Peña. Through the DOST app's highly personalized features, user engagement and enhanced online experience are ensured.

ABOUT US

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DOST bares specimen collection booths design to the public

By Beatrice Marie S. Basi, *DOST-PCIEERD*

To aid in mass testing to better combat the COVID-19 pandemic, the Department of Science and Technology (DOST) released the design of their supported specimen collection booth (SCB) to the public.

In a virtual presser led by DOST Secretary Fortunato de la Peña, DOST said it is giving the design for free to fabricators and engineers to help augment the government's drive to beat COVID-19.

"We believe that opening up the SCB design to the public will support the government's drive to conduct mass testing and immediately provide help to those afflicted with COVID-19," he said.

The design of the structure was created by the Future Aviation and Maritime Enterprise, (FAME) Inc., a Development Startup Grant Awardee of the DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIEERD). The booth design was made available to fabricators or engineering groups since 28 April through DOST offices and the DOST-PCIEERD website www.pcieerd.dost.gov.ph.

In anticipation of more tests to be conducted all over the country, there is a need to increase the number of SCBs for testing. The booth specifications recommended by DOST and approved by DOH must be strictly followed and adhered to by would-be fabricators.

The design of the Specimen Collection Booth includes the following: (1) booth structure made of angle bars for the frames, plywood walls and clear water-proof acrylic window. The booth measures 1m x 1.5m x 2.25m (L-W-H); (2) 0.5 horsepower window type aircon and a roof-mounted ventilator with filter; (3) a heavy-duty 4" caster wheel is provided for mobility; (4) slanted specimen table, which is ergonomically designed to provide enough leg space for both the patient and the tester; (5) pressure sensor to maintain positive pressure and prevent outside contamination from getting inside the booth; and (6) bluetooth speaker for a clear and audible conveyance of instructions to the patient.

Inside the booth are two monobloc chairs; semi-disposable untexturized nitrile gloves; disposable clear plastic gloves; disinfectant dispenser; and plastic bag for disposing used plastic gloves.

The booth also features the FAME-designed temperature scanner, an additional accessory of the SCB where the temperature of patients may be obtained and recorded in the cloud for easy monitoring of hotpots in areas where the SCB is installed. The temperature scanner is developed and owned by FAME, Inc. and may be sourced directly from them.

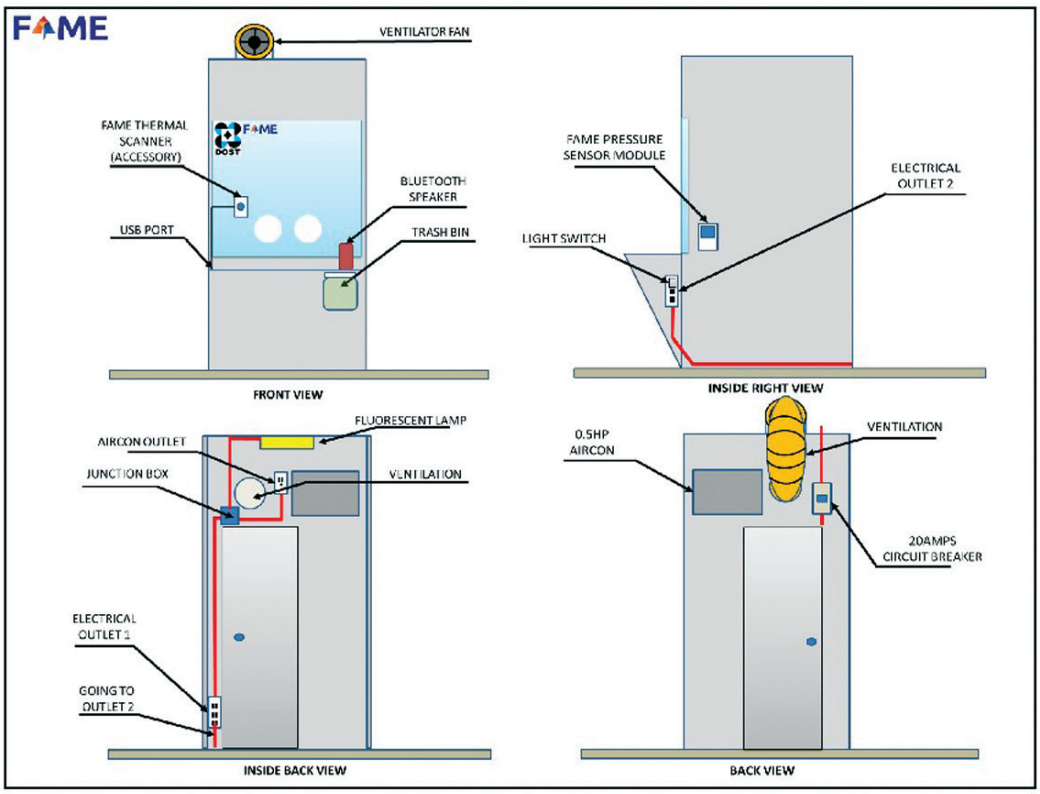
DOST is distributing 132 SCBs across the country to help in the mass testing efforts of government. The SCBs were jointly funded by DOST-PCIEERD and the DOST – Philippine Council for Health Research and Development (PCHRD).

DOST-PCIEERD Executive Director Enrico Paringit said it will continue to be on the lookout for innovations that can help win the war against COVID-19.

"We will be relentless in our pursuit in finding ways to fight this menacing disease and save more lives. We will remain to make innovation work for the people and ensure a competitive edge for our frontliners," he said.

Likewise, DOST-PCHRD Executive Director Dr. Jaime C. Montoya extends his appreciation to all researchers who tirelessly find solutions to problems related to COVID-19.

"At this time of great uncertainty, Filipino ingenuity has once again emerged to find solutions to curb COVID-19. We thank all the researchers who showed overwhelming energy, resilience, and commitment. Together, we will get through this and DOST-PCHRD will continue its mission to find research-based solutions that will address the most pressing problems the country is facing," he emphasized.



Features of the Specimen Collection Booth designed by FAME, Inc.

DOST-FPRDI produces bamboo-framed face shields

By Apple Jean C. Martin-de Leon, *DOST-FPRDI*

Responding to the need for more personal protective equipment (PPE) amid the COVID-19 outbreak, the DOST-Forest Products Research and Development Institute (DOST-FPRDI) produced bamboo-framed face shields for distribution to frontline services in Laguna.

"Our team had to improvise with the materials at hand because the enhanced community quarantine made it challenging to procure supplies," explained DOST-FPRDI Director Romulo T. Aggangan.

The frames of the face shields were made from bamboo (kauayan-tinik) — a perennial, woody-stemmed grass known for its versatile uses. Bamboo grows very well locally and is a favored raw material for handicraft and furniture production.

According to Aggangan, at least 300 face shields were produced and turned over to the University of the Philippines Los Baños, some barangays in Los Baños (LB), Laguna and rural health units in the area, among others. Another batch will be produced in the coming weeks.

"The DOST-FPRDI is one with the science community in finding ways to protect our frontliners and the public from COVID-19. Currently, we are exploring other possible uses of forest products to help combat this global pandemic. The use of R&D and scientific facts is all the more needed to cope in these challenging times," he ended.

The bamboo-framed face shields produced by a team led by DOST-FPRDI's Froilan B. Samiano, Audel V. Mosteiro, Noel M. Medrano, Val DV Valderama and Engr. Cesar O. Austria *(Photo by Audel V. Mosteiro)*

Turn-over of face shields to some barangays in Los Baños, Laguna *(Photo by Muriel B. Dizon)*

inFOCUS

FASSSTER adds a module for surveillance of COVID-19. The Feasibility Analysis of Syndromic Surveillance using Spatio-Temporal Epidemiological Modeler (FASSSTER) will undergo enhancements to create a predictive model for COVID-19 which allows forecasting of possible cases in a given area at a specified period of time. Data generated from this model will support the decision making of the Department of Health, local government units, and healthcare facilities, in terms of resource planning and other measures to mitigate the spread of the virus. Developed by Dr. Ma. Regina Justina E. Estuar of Ateneo de Manila University and her team, with support from the Department of Science and Technology's Philippine Council for Health Research and Development (DOST-PCHRD), FASSSTER serves as a hub for different data sources, providing a rich layout of integrated information that facilitates understanding of the spread of diseases. At the moment, FASSSTER is used for creating predictive models and visualizing possible scenarios of outbreaks of Dengue, Typhoid Fever, and Measles, at specified time periods. It uses data from the Department of Health's Philippine Integrated Disease Surveillance and Response (PIDSR) system, Electronic Medical Records, and SMS-based reports of primary care facilities. The latest addition to the technology is its TUGON feature, an SMS-based reporting feature which allows staff from Rural Health Units and Barangay Health Stations to report cases of Dengue, Measles, and Typhoid Fever through text commands. *(Information from Catherine Joy C. Dimailig, DOST-PCHRD)*