

COVID-19 Update at DOST-ITDI

AMCen-MATDEV Evaluates Air Filter Alternatives for UST Hospital's Ventilators

BICUTAN, TAGUIG CITY – The University of Santo Tomas (UST) Hospital sought the help of the AMCen-MATDEV Team of the DOST-Industrial Technology Development Institute (ITDI) in evaluating the characteristics of alternative types of air filtration materials for their respirators. This was to determine which among the available air filter alternatives has the closest characteristics or performance to the type of filter the hospital typically uses in their respirators and ventilators – critical instruments given this COVID-19 crisis.

AMCen, or the Advanced Manufacturing Center, is DOST's 3-D printing technology center, a joint project of ITDI's Materials Science Division (MSD), and the Metals Industry Research and Development Center (MIRDC). MSD-ITDI focuses on materials development or MATDEV from local sources for 3D printing while MIRDC is into Research on Rapid and Advanced Prototyping for Product Innovation and Development using Additive Manufacturing Technologies.



According to Dr. Meyvell G. Atanoso, the UST Hospital typically uses bacterial/viral filter, also known as a Heat and Moisture Exchange (HME) filter, in their ventilators and respirators. However, the difficulty of acquiring HME filters amidst this health crisis has prompted the hospital to search for an alternative filter that performs similarly to HME filters.

Thus the hospital then shipped samples of the HME filter to the AMCen-MATDEV Team in mid-April 2020, along with samples of particulate matter (PM) 2.5 filter, high-efficiency particulate air (HEPA) filter, and the common surgical mask for comparison.

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Led by Senior Science Research Specialist Marianito T. Margarito, the Team then conducted optical microscopy to compare each filter based on the size of its pores and size of its fibers. Based on the results of the analysis, HEPA filter proved to be most effective in filtering air among the three alternatives to the HME filter.

However, based on their study, the Team also recommended to Dr. Atanoso that an electrostatic filter is an even better alternative to HEPA filter due to the former's electrostatically charged fibers. After three weeks the UST Hospital acquired a supply of electrostatic filters and submitted some samples for evaluation by the Team.



Mr. Margarito and Dr. Atanoso (3rd & 4th from left)
with AMCen-MATDEV Team

The Team is now working with ITDI's Advanced Device and Materials Testing Laboratory (ADMATEL) in analyzing the new samples using their equipment. In the meantime, UST Hospital is using HEPA filters until their supplies last. Afterward, the Team says, the hospital may switch to electrostatic filters based on the results of their characterization. (Reginald Roy U. Dela Cruz // DOST- ITDI S&T Media Service)

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