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LIFE

Louisiana glass, 3D artists making ventilators splitters and face shields amid coronavirus

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Sanctuary Arts School and Glass Studio, in Shreveport, is leading a statewide initiative to donate emergency-use equipment to hospital workers and first responders caring for coronavirus COVID-19 patients.

Ark-La-Tex 3D Technology, also in Shreveport, is collaborating with the nonprofit to produce 3D printed attachments for face shields. Sanctuary will be distributing splitters for ventilators which would allow multiple patients to use one machine.

Hospitals across the United States have declared the need for more equipment to protect their medical staff and care for patients with COVID-19.

The artists are creating the pieces for medical professionals to use when personal protection equipment and ventilators have run out and it's a matter of life or death, time and urgency, said Eric Hess, co-founder of Sanctuary Arts School and Glass Studio.

“In a time of emergency, you do what you need to do to protect your medical community and protect the patients,” Hess said. “These doctors don't have the supplies and are basically doing whatever they need to do to survive and continue to provide the best care they can in the community.”

Make glass in case of emergency

The concept is spurred from a 2006 study, "A Single Ventilator for Multiple Simulated Patients to Meet Disaster Surge" by medical professionals Greg Neyman and Charlene Babcock Irvin for the Society for Academic Emergency Medicine.

The study concluded: "A single ventilator may be quickly modified to ventilate four simulated adults for a limited time. The volumes delivered in this simulation should be able to sustain four 70-kg individuals. While further study is necessary, this pilot study suggests significant potential for the expanded use of a single ventilator during cases of disaster surge involving multiple casualties with respiratory failure."

MORE: Louisiana coronavirus: A third of state's 2,750 ventilators won't help. Here's why Hess was in self-quarantine when a friend shared information about a glass artist making ventilator splitters in Boulder, Colorado. After further research and discussion, Hess and his business partner, Michelle Pennington, decided to make the emergency supplies would be a way to help and possibly save lives.

"Glass artists all over the country now are starting to develop these," Hess said.

The splitter is a Y-shaped attachment made from durable, medical-grade glass rods or tubes using the framework technique. Splitters connect to ventilator hoses and may supply oxygen to two to four patients at once and may be used multiple times.

Ark-La-Tex 3D Technology is using a heavy-duty, biodegradable plastic to create headpieces that connects to a clear face shield. The designers will add the clear face shield, as well, to deliver a completed shield, said Matt Hopper, co-owner.

Several orders are in motion for Louisiana hospitals as the medical industry prepares for the worst as cases of coronavirus persist.

William Breaux is the manager of respiratory care at West Jefferson Medical Center in Marrero, outside of New Orleans. He and fellow staff and board members are considering alternatives in the case of a shortage and plan to test the glass ventilator splitter.

"This is going to give us another option if we don't have enough ventilators," Breaux said.

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In a hypothetical situation, if there is one ventilator left, a doctor may have to tell a 70-year-old patient that the last ventilator is going to a 27-year-old patient, Breaux said. The splitter is to avoid the worst-case scenario.

"It's better than going, 'I'm sorry, I don't have a ventilator for you and you're going to die,'" said Breaux. "It may come to that. We don't know what's going to happen."

It will be up to the medical facilities to determine if the products are something they can use. It's a novel concept and they must consider liability; however, the pandemic has called for unprecedented measures.

"This is what we call thinking outside the box," Breaux said. "This is not something that probably would be approved."

A physician will have to be willing to try it in an emergency circumstance, which has a high probability during the pandemic, he said.

On March 26, New York Gov. Andrew Cuomo announced the approval of a policy allowing two coronavirus patients to use a single ventilator. The New York-Presbyterian Hospital's split-ventilation protocol was approved by the New York State Department of Health, according to ABC News.

Although controversial, it's better than nothing when it comes down to saving a patient's life.

"It's not approved but we're doing a lot of things that we wouldn't normally do because of what's going on," Breaux said.

Medical supplies and demand

In addition to the splitters, the Louisiana artists are creating face shields using 3D-printed frames.

There are more than 3,000 out for order, including equipment for first responders and service professionals, such as firefighters, police, EMTs, social workers, and senior living staff throughout the state. Hess expects requests will quickly top 30,000 items.

Orders include 200 face shields for LSU anesthesiologists with up to 6,000 needed to supply all the doctors, Hess said. Two orders of 200 and 250 face shields will be sent to groups of nurses in New Orleans.

MORE: Louisiana suffers deadliest coronavirus day with 54 new deaths, more than 1,200 new cases

The orders continue to come in and the artists are stepping up production to meet the demand, and possibly extend services to hospitals outside of the state.

New Orleans is a high priority as they have a higher number of COVID-19 cases and facing a shortage of equipment, Hess said.

Sanctuary enlisted framewerkers throughout Louisiana to make the splitters—and possibly other glass-based items needed by the medical community during the coronavirus pandemic.

Frameworking is different from glass blowing. The artists make the splitters by hand using a miniature flame and glass to manipulate the medical-grade borosilicate glass. The technique allows the artist to be precise in the glasswork, Hess said.

Ark-La-Tex 3D Technology has four machines in production in its shop and a fellow 3D print designer is loaning another two to three printers. Bossier Parish Community College's Division of Technology, Engineering and Mathematics and Louisiana State University-Shreveport's Technology Lab will produce some of the items using several of their printers. About a dozen machines will be going at one time, Hopper said. The goal is to have hundreds made hourly to meet demands, Hess said.

“The more 3D printers we have the more we can produce these items,” Hess said.

In the outreach initiative, medical professions are asked for a list of other needed items, so the artist may determine if they can assist in making other products.

“We also have the ability to print other parts as needed. We're on standby depending on what the hospitals and doctors are asking for,” Hopper said.

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The equipment is of no cost to the hospitals. All artists are donating their time, labor, and materials.

Public donations are requested to continue production. Proceeds will be used to cover glass and plastic material and distribution costs.

“We're just trying to make sure the artists don't deplete their funds by buying the glass and the plastic and the materials they need to produce the (equipment) for the hospitals,” Hess said.

Ark-La-Tex 3D Technology has worked with medical professionals before on projects. The team has partnered with Shriners Hospital for Children in Shreveport to make a couple of 3D printed prosthetic hands, Hopper said. The local company also strategized how to create 3D scans of amputee parts to transform into 3D models to create a form-fitting cast that can be then be used for prosthetics, such as arms and legs.

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The project is outside of Sanctuary's traditional functions, but Hess is driven to support those on the front lines of the pandemic.

"I'm really worried about the mental situation in the future of these doctors," Hess said. "Imagine being somewhere in medical care and not only are you concerned about you and bringing these diseases home to your family, but you're there and you run out of a ventilator and all of a sudden someone's gasping for air and you can't help them. You have no more ventilators. I can't even begin to imagine what these people in the medical community are going to have to deal with emotionally."

Donations may be sent to Sanctuary Arts School and Glass Studio via PayPal at paypal.me/sanctuaryartsschool.

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