

3-D printers saving the lives of coronavirus victims

March 17 2020, by Peter Grad



The original valve (left) and its 3-D printed twin. Credit: Cristian Fracassi

Medical valves manufactured with portable 3-D printers are saving the lives of coronavirus victims at a hospital located in what is considered Italy's Ground Zero for the deadly viral infection.

When the founder of Issanova, a startup 3-D printing firm with a staff of 14 learned that a local [hospital](#) was running short of critical breathing devices used to help [hospital patients](#) suffering from the [deadly virus](#), he sprang into action. He consulted with a fellow engineering expert and the two raced to the desperate hospital located in the small town of Chiari. There, they examined the [medical device](#), called a Venturi [valve](#).

That was on Friday the 13th. By Saturday, after a few hours designing blueprints for the device, they began producing the first of 100 Venturi valves on a 3-D printer that would immediately be shipped to the hospital to help save lives.

At the moment, Italy is suffering from the [virus](#) more than any other country in the world, with 2,158 confirmed deaths and 27,980 confirmed infected with the virus as of March 16. On Sunday alone, 368 new deaths were reported.

"We were told the hospital was desperately looking for more valves," Cristian Fracassi, CEO of the 3-D printing firm Isinnova, said. "They're impossible to find at the moment, production can't keep up with demand."

The hospital's valve supplier would not release blueprints of the [device](#), so Fracassi turned to fellow engineer Alessandro Romaioli and the two examined the devices and reverse-engineered the design within hours. They rushed the first units to the hospital the same day. At one point, they brought 3-D printers to the hospital to speed delivery of the critical

valves.

Romaioli [told BBC News](#), "They tested it on a patient and they told us that it worked well and so we ran again back to our office and we started to print new valves."

The valves are inexpensive—roughly a dollar apiece—but they are produced slowly, taking about an hour each to complete. Isinnova has only six 3-D printers, so Fracassi contacted fellow firms to join in the effort.

Countries around the world are stepping up restrictions, closing schools, theaters, restaurants and public arenas and are issuing strict warnings to citizens to avoid crowds, wash their hands thoroughly and avoid touching their faces.

According to the Worldometer web site that is tracking the impact of the virus, as of 2 p.m. Tuesday, [there are](#) 194,584 reported cases of COVID-19 infection, 7,894 deaths caused by the virus, and 81,080 recoveries.

The Venturi valve is named after its inventor, the Italian 18th century physicist Giovanni Battista Venturi. The component connects oxygen masks to respirators used by patients with respiratory complications.

More Italian hospitals are expected to place calls for emergency replacement valves and the production procedure is sure to be examined closely by [health officials](#) globally.

"We haven't slept for two days," Fracassi said. "We're trying to save lives."

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