

Be Self-Reliant in the Production of Key Medical Necessities with 3D Printing

Source: 3D Printing Studio



The final design of the nasal and throat swab after testing many different designs.

Challenge

Sudden disruption in the global supply chain due to COVID-19 has resulted in a shortage in the supply of test swabs to Australia. Coupled with the sudden surge in demand for COVID-19 test kits, there's a need to locally develop and manufacture cost-effective and reliable nasal swabs for the test kits.

Solution

Additively manufactured nasal swabs with biocompatible and sterilizable EOS PA 2200 on an EOS P 396 system

Results

Medically safe, reliable nasal swabs to collect human cells for lab testing

Cost-effective localized production

Time-to-market within 4 weeks

Tool-less manufacturing with low cost per part during the pandemic

Non-labor intensive manufacturing process is crucial during COVID-19

Mass Production of Medical Nasal Swabs With 3D printing in Australia Ends Reliance on Overseas Supply

The COVID-19 pandemic has put companies' global supply chains to the test in unprecedented ways. Many companies faced an initial supply shock when their global suppliers were disrupted due to limitations in travel and controlled trade for key medical necessities. Governments, businesses and individual consumers suddenly struggled to procure key medical products and materials, and were forced to confront the fragility of their global supply chain.

In order to meet the sudden demand for key medical supplies, many countries and businesses have turned to local manufacturers and alternate manufacturing technologies like additive manufacturing to help address the sudden surge in demand for new products such as PPE (face shields, eye protectors etc.), ventilators and nasal swabs. There's an urgent need to design new medical devices that are reliable and can be efficiently mass manufactured with 3D printing.

In Australia, 3D Printing Studios quickly worked with the state government and health departments to produce medical nasal and throat swabs for use in COVID-19 test kits.



Short Profile

3D Printing Studios is an Australian-based company equipped with the latest 3D technologies.

Their vision is to help: "Bringing Your Ideas to Life"

Their purpose is to aid: "Mass Personalization"

They take pride in helping customers realize innovative ideas that ensure sustainability and competitiveness in all industries. They aim to help customers improve product design, while simultaneously cutting down on cost and time to market.

Further information
www.3dprintingstudios.com

*The final medical nasal and throat swabs ready to be used in the COVID-19 test kits.
(Source: 3D Printing Studios)*

Challenge

Due to the outbreak of COVID-19, there has been a sudden disruption in the global supply chain for key medical supplies, resulting in shortages of test swabs to Australia. Coupled with the sudden surge in demand for COVID-19 test kits, the Australian government reached out to local manufacturers for support. As the traditional manufacturing of nasal swabs may require the development of hard tooling, which can take several iterations and months to complete, additive manufacturing has been considered to help address the immediate short-term demand surge for PPE and nasal swabs.

Solution

3D Printing Studios is leveraging their experience with additive manufacturing to help speed up the design and production of nasal swabs for COVID-19 test kits. The biocompatible material EOS PA 2200 was selected due to the known stability and reliability of its mechanical properties after sterilization by autoclave or radiation process.

Additive manufacturing enables agile design and quick evaluation cycles of the nasal swabs. This quickly compresses the time required for product development, engineering production trial and functional lab trials of the test kits.

In addition, the EOS P 396 system was selected to manufacture the nasal swabs, as this AM technology was most cost-effective when compared to other additive manufacturing technologies.

Results

3D Printing Studios is working with the state government and health departments to produce medical nasal & throat swabs used in COVID-19 test kits.

"We have been able to 3D print nasal swabs used for testing COVID-19 and other communicably transmitted diseases by using EOS AM systems. These swabs have a special head design with flocking added and have recently been shown to successfully collect sufficient human cellular material and mucus used in COVID-19 and other testing processes."

*Howard Wood & Stuart Grover
Owners of 3D Printing Studios*

South Australian Pathology, an organization providing diagnostic and clinical pathology services throughout South Australia for the public health sector, has tested the latest 3D printed swabs and has given the green light on their use. This will make 3D Printing Studios the first Australian supplier of these essential products in the fight against COVID-19.

The whole process of developing and testing the 3D printed nasal swabs only took a few weeks. The final nasal swab design not only collects the human cellular material from the nasal passage, it also allows for testing of other communicable diseases.

"We've tried several different 3D printed designs obtained from Harvard Medical School and finally came up with a simple design that is flocked with a safe nylon material," said Howard Wood. "The design, coupled with the EOS P 396 system, will allow us to produce thousands of these medical swabs per day."

Howard Wood and Stuart Grover, the owners of 3D Printing Studios, are delighted to be the first Australian company to manufacture medical nasal swabs. This will reduce the need to import these vital products and once again start bringing manufacturing back to Australia.

- Additive manufacturing enables agile design cycles. A total of 11 design iterations were tested, with only 4 weeks from project initiation to final production confirmation. Upon clinical trial and evaluation, the revised design samples are provided within 2 days.
- The nasal swabs can be customized for product functionality with regard to size and flexibility. No hard tooling cost incurred during product development and production.
- Minimum manpower involvement and direct interaction during COVID-19 period, as the digital design discussions and text evaluation feedback were done online. Only two production personnel were required on site. Overnight production with minimum supervision was possible due to the reliability of the EOS products.
- The high productivity of the EOS P 396 system means that 5 000 nasal swabs can be produced per day.

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