

CUT assists government with Covid-19 medical needs

The Centre for Rapid Prototyping and Manufacturing (CRPM), the Product Development Technology Station (PDTS), the Centre on Quality of Health and Living (CQHL), and CUT Innovation Services (CUTIS) are currently involved with government in different processes related to challenges associated with Covid-19.

"Our rapid research and innovative response to assist government with the Covid-19 pandemic, is proof of our commitment to work together in solidarity and unity to restrain the spread of the coronavirus and reduce the risk related to the community transmission phase. Furthermore, a Covid-19 research and innovation grant of R1m has been made available by CUT to support these entities in their endeavours," says Prof Henk de Jager, Vice-Chancellor and Principal from CUT.



Image Supplied.

Two major problems resulting from the outbreak have been identified, namely the lack of appropriate personal protective equipment (PPE) for hospital staff in the "hot zones", and the need for non-invasive ventilation helmets/masks that provide patients with positive pressure and reduce the spread of the virus in the hospital.

CUT is assisting by printing 3D masks for non-invasive ventilation for use by Covid-19 patients. The project works on the concept of continuous positive airway pressure (CPAP) or bilevel positive airway pressure (BIPAP) systems.

The PDTS and CRPM are also assisting in manufacturing much-needed hospital equipment, such as oxygen connectors and splitters, to increase the capacity of the hospitals.

Some hospitals have requested assistance with possible spare parts they may need, and several old ventilators have been sourced from Universitas and Grootte Schuur hospitals, which will be used to reverse-engineer, and attempt to develop and manufacture ventilators to support hospitals nationally in this severe shortage of ventilators.

Several other hospital items (such as connectors, splitters and mouthpieces/masks) have been developed and manufactured by the CRPM and PDTs teams. Many of these items were manufactured through a novel approach of rapid tooling for injection moulding in appropriate polymers, which is not possible in additive manufacturing (AM), either because of the material or quantities needed.

Ongoing projects to assist hospitals in the Central Free State include Clinician PPE, non-invasive ventilation helmets, oxygen connectors ("Christmas tree connectors"), oxygen splitter connections and flutter devices.

CUT is currently participating in a number of active research discussion groups, which connect virtually, namely:

- Medical supplies
- Rapid manufacturing
- Ventilator development

The above will also include a Covid-19 Agile rapid manufacturing team, contributing to a team consisting of individuals from CUT, North-West University (NWU), the Council for Scientific and Industrial Research (CSIR), the Vaal University of Technology (VUT), Aerosud and Progressus Digital, to focus on an approach for urgent product development, and assessment of designs submitted by groups wanting to have a product manufactured (e.g. a valve, connector, etc.), or any new product related to Covid-19, for both design and possible manufacturing thereof within the group.

The Centre for Applied Food Security and Biotechnology (CAFSaB), ACS Promotions and Pro Ocre are also contributing by collaborating in the production of sanitisers for the Free State Department of Education. The team consists of experts within the field of Environmental Health, together with partners from business. ACS Promotions will be issuing 10 000 litres of ethanol, whilst CUTIS is providing the team with the required one thousand 500-ml bottles required for packaging.

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