



# Design and Analysis of Continuous Positive Airway Pressure Valve Using a 3D Printing and Computational Fluid Dynamic

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Received: March 10, 2021; Revised: May 5, 2021

**Abstract:** The non-invasive ventilatory support in the Coronavirus (COVID-19) treatment uses also a mask as an interface between the medical device and the patient. The choice of this interface is one of the fundamental elements for the successful implementation of these techniques. The use of suitable equipment is also essential for their success, especially in continuous positive pressure with the mask (CPAP-continuous positive airway pressure) or during non-invasive two-level pressure ventilation. The criteria such as the ease of use and the required performance must be brought together in the medical equipment. With this aim, we will design a new version of the CPAP valve using the 3D printer, we used also the ANSYS software for the analysis and computation of the flow (CFD).

**Keywords:** *continuous positive airway pressure system; non-invasive ventilation; 3-dimensional printing; computational fluid dynamic.*

**Mathematics Subject Classification (2010):** 93A10, 93C95, 70K99.

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