

# INFLUENCE OF THE PART COOLING DURING THE PRINTING PROCESS ON THE QUALITY OF POLYMER PARTS PRODUCED BY FFF/FFD METHOD

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## Abstract

*Experimental investigation of the influence of the part cooling direction on the printed part quality was carried out, as well as intensity of the wind flow. One of the key reasons for this kind of experiment is that most widely used commercial 3D printers produce parts that have uneven quality along its geometry when using out of the box air deflector. Experiments were carried out on the Anycubic i3 3D printer using PLA filament that requires adequate air flow for proper curing of the part. During printing process, custom made air deflectors were used. In addition to the original air deflector, which is in the direction of one axis (+X), three other constructions of the deflector were used, which were previously printed on the printer itself. First air deflector direct air flow in two directions (+Y and -Y). Other two were ring-shaped made therefore directed air flow all around the printing zone with 12 and 30 holes equally distributed in a circle. The experiments were performed on the test part using identical values of print parameters in order to minimize additional factors that causes variability of the print quality (nozzle temperature = 200 °C, bed temperature = 60 °C, printing speed = 80 mm/s, layer height 0.2 mm). The experiments showed that best results can be achieved using a ring-shaped air deflector with 12 holes and with 100% air flow. This type of air deflector is recommended to use in further works, instead of out of the box air deflector.*

## Keywords

Fused Filament Fabrication, Air deflector, Air flow, PLA, Print quality

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