1 Motivation and Objective

Additive Manufacturing (AM) is an umbrella term that encompasses all fabrication techniques where the final geometry of the part is obtained through superposition of material in a layer by layer basis [1]. Developed in the 1980s, this manufacturing technique permits immensely shorter part development cycles since the transition from a 3D computer aided design (CAD) to part fabrication only requires one intermediate step: the use of a slicing engine that converts the geometry of the object into machine instructions [1]. For this reason, AM technologies were initially employed exclusively for prototype development and were referred to as Rapid Prototyping techniques (RP). However, recent innovations in the field have caused AM to be perceived as a legitimate manufacturing technology since it is also capable of reproducing complex geometries unattainable through other means.

While these factors represent great advantages over traditional part fabrication methods, AM comes with its own set of limitations and disadvantages. First and foremost, the use of a stratified build approach tends to produce extremely anisotropic parts. Secondly, the geometric accuracy of the object produced is highly dependent of process parameters, particularly of the thickness of the layers. Finally, as of the time of this writing, AM lacks the standardization and scrutiny that are associated to most traditional manufacturing techniques [1].

Fused Filament Fabrication (FFF), also known under the trademark Fused Deposition Modelling (FDM^{TM}), represents perhaps the most prevalent AM technique in the market due to the advent of the low-cost, desktop 3D printers in the early 2010s [**Capote2017**].