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## 2D PRINT SURFACE FOR A 3D PRINTER

HP INC

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## 2D print surface for a 3D printer,

This publication relates to the field of printing and imaging in a 3D printer.

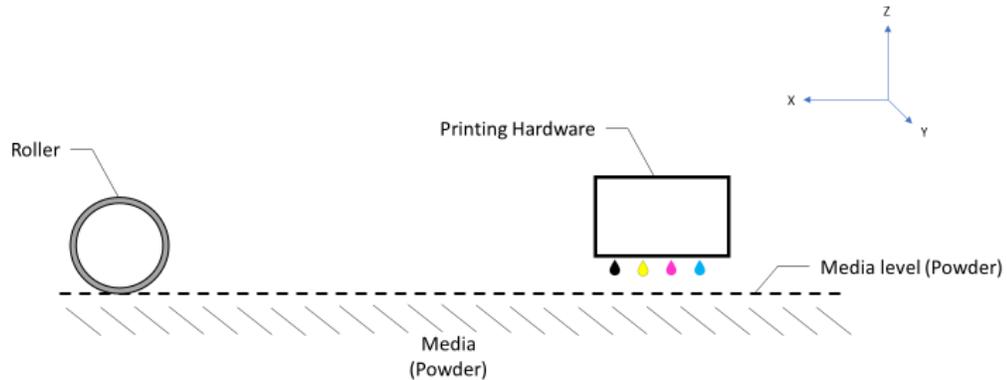
### Introduction

In a 3D printer, media is placed onto a flat surface and an image is printed which can then be analysed to calibrate the printing process for better print quality. Three variable points of adjustment allow the surface to be positioned at a desirable distance away from the printing hardware. Media can be retained flat and its presence can be detected on the adjustable surface with the use of a vacuum.

### Solution Description

In 3D printing operations where images are printed on a media such as a bed of powder it is necessary to have a tool that can serve as a representative surface where media, such as paper, can have an image printed onto it.

In Figure 1, printing hardware moves along the x-axis and is spaced evenly across a powder level established by a roller when printing an image in a 3D operation. To achieve a representative image on paper, a flat surface is adjusted at three points until it is at the same level as the powder. Figure 2, which now looks at the printing hardware from the side, shows this surface before adjustment and as a result the image will not be printed at the same distance as images printed on powder.



*Figure 1: Printing on powder during 3D operation*

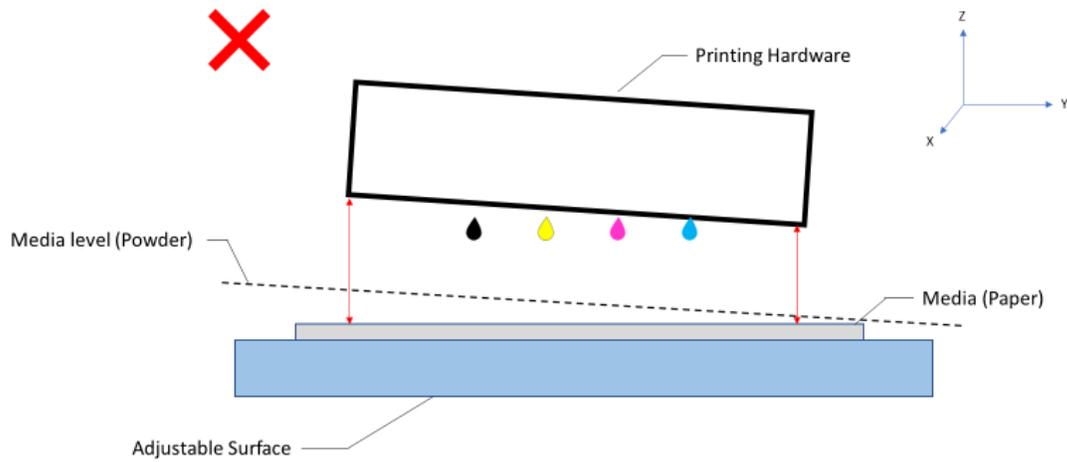


Figure 2: Paper not properly spaced

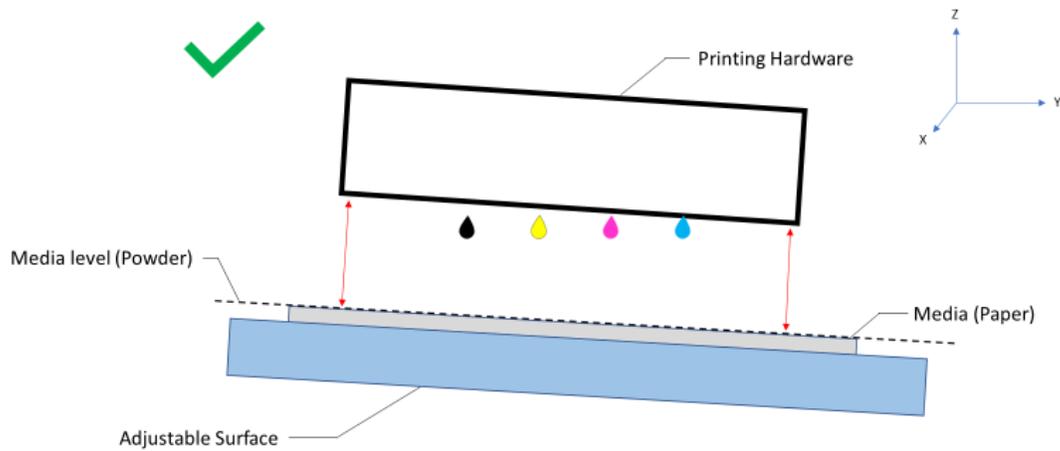
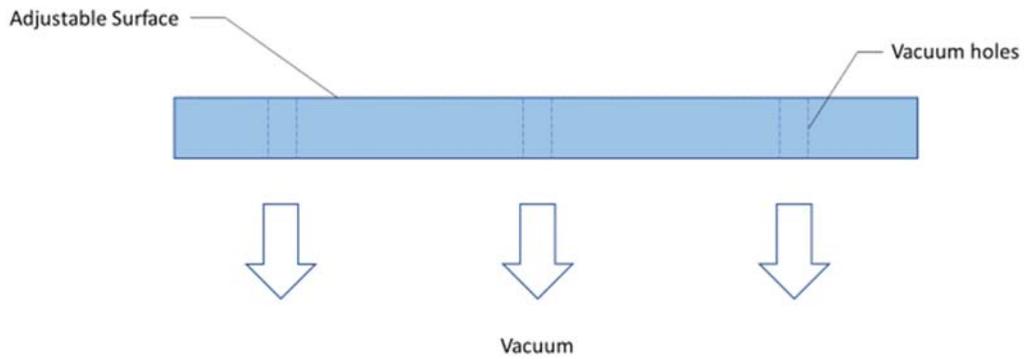


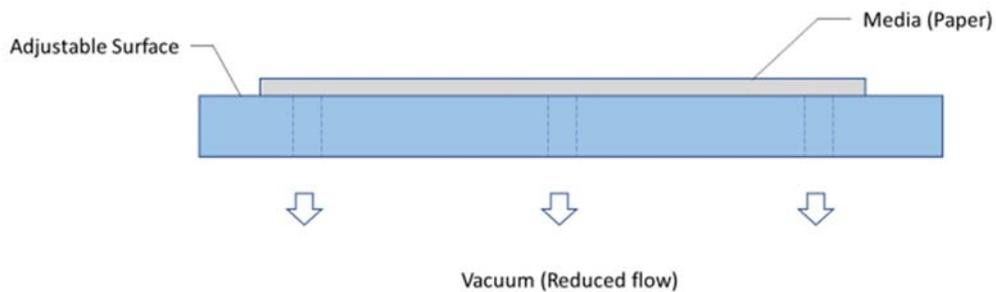
Figure 3: Paper is properly spaced

Figure 3 shows the surface after adjustment. Paper is at the same level as powder and properly spaced from the printing hardware. When the surface is adjusted to this configuration an image printed on paper will now be representative of images printed during 3D operation.

Wavy paper or raised edges are not desirable during prints. It is critical to maintain paper flat and secure against the adjustable surface to print a good image. To address this, vacuum holes along the adjustable surface serve as a method to retain paper flat if a vacuum is present. Figure 4 shows a vacuum being pulled through the holes. When paper is placed on the surface it will be sucked flat against it if the vacuum is maintained.



*Figure 4: Vacuum presence*



*Figure 5: Reduced flow with media*

To prevent printing on the adjustable surface or other locations where ink is not desirable it is necessary to have a method of detection when paper is placed on the surface. If a vacuum is present, media can be detected due to reduced airflow. Figure 5 shows reduced flow due to media blocking the vacuum holes, as opposed to no media being present. It is possible to distinguish between different accessories placed on this surface depending on how many holes they cover and how much the flow is reduced. This allows the 3D printer to verify if the correct accessory is present in other operations that might require the use of the adjustable surface.

***Disclosed by Miguel Alvarez, Hsue-Yang Liu and Michael Deleon, HP Inc.***