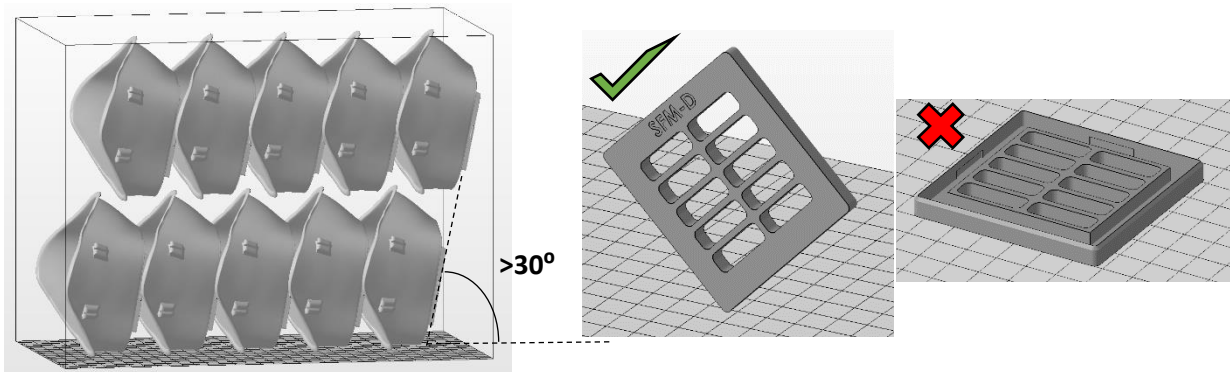


# Manufacturing Guidance for 3D Printing Nylon Surgical Masks with HP Multi Jet Fusion Printers (300/500 Series, 4200, or 5200 Series)

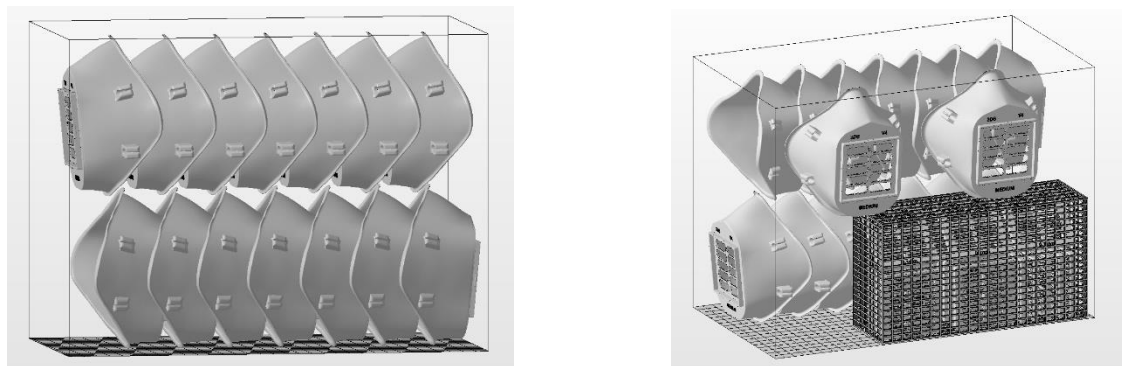
## Build Orientation Guidelines

- Masks should be oriented as a stack for improved packing efficiency, as shown below. To minimize part warpage due to thermal effects, it is generally recommended that no two surfaces are closer than 5mm apart. Additionally, flat faces such as the filter side of the mask and the filter cover should be oriented at least  $30^\circ$  from horizontal to minimize stair-stepping effects. It is recommended that these guidelines be followed when first printing masks using a Multi Jet Fusion printer.



## Optimizing Build Orientation

- For more efficient packing of the build platform, a minimum of 1mm between surfaces has been found to produce acceptable quality masks using a similar orientation to the one shown below. More optimal build orientations may exist, but have not been tested, and the recommendations from the previous section should be followed before attempting other build orientations to improve packing efficiency.



- Grouping the filter covers together in a cage can speed up post-processing by allowing parts to be cleaned together instead of individually

## Machine Parameters

- The parameters below are recommended for HP 3D High Reusability (HR) Color Boost (CB) PA12 material on the HP MJF 580 color printer. Optimal settings on other MJF machines may vary and default settings should be used initially.

Material Blend Ratio	20% Fresh / 80% Recycled
Print Profile	Monochrome <sup>1</sup>
Cooling Profile	Fast cool and reclaim
Thermal Scaling Parameters	X: 3.5%, Y: 3.5%, Z: 2.3% (Default)

<sup>1</sup>Printing in color may cause bleeding of the colorant during the disinfection process

## Post Processing

- Remove parts from build chamber after cooling and reclamation (Build chamber may still be hot, use heat-resistant gloves).
- Lightly brush off excess powder.
- Blast parts with glass bead media to remove remaining nylon material.
- Finish cleaning parts by blasting with compressed air.
- If necessary, break filter covers out of cage and finish blasting as necessary.
- Soak parts in isopropanol for 30 minutes (Only necessary if parts require disinfection before leaving the site of manufacturing)
- Rinse with deionized water