

# Use of 3d printing to defeat Covid-19 Virus

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**Abstract-** In this paper I have mentioned different uses of 3d printing technology that how people are using their machines to defeat from Covid-19 Virus. In this current situation of Covid-19 to protect people from virus Additive Manufacturing plays a vital role by producing different parts and products and save many persons in the whole world. Additive manufacturing is also known as a 3d printing technology of Industrial Revolution 2.0.

Nowadays, products are manufactured with the help of Additive Manufacturing Technology. In this process we can directly produce a 3d product for our design without making any kind of Die or Mold so it is convenient for small batch production with a low manufacturing cost in a less time.

**Keywords -** 3d Printing Technology, Additive Manufacturing Technology, Industrial Revolution 2.0, Covid-19 Virus, FDM Technology.

## 1. INTRODUCTION

3D Printing Technology also known as an Additive Manufacturing Technology in this Industrial Revolution 2.0 Era. There are several different types of processes such as Fused Deposition Modelling (FDM) Technology, Selective Layer Sintering (SLS), Stereo lithography (SLA), Digital Light Processing (DLP), Material Jetting, Binder Jetting, Direct Metal Laser Sintering (DMLS), and Selective Layer Melting (SLM). From the above processes one of the widely used process is FDM Technology which is less costly and easily affordable by each and every one. This process use a thermoplastic polymers filament. This plastic is extruded from a heated extruder nozzle to a certain temperature, by a predetermined path layer by layer and it creates a Three Dimensional Model.<sup>1</sup> This method is invented in May 1980's by a well-known scientist Dr. Kodama, in Japan and known as the earliest 3d printing technology process called Rapid Prototyping (RP) Technologies. This technology is used in different fields like Aerospace, Architecture, Fashion, Automotive, Jewelry, Food, Medical, Engineering, Art/Sculpture/Design etc.

## II. USE OF 3D PRINTING IN MEDICAL INDUSTRY

3d Printing has many different uses in medical fields such as it is used to replace human organ transplants, to speed up surgical procedures, to produce cheaper surgical tools, to produce prosthetic limbs, Bio printing tissues etc.<sup>2</sup> In this current situation of Covid-19 virus Medical field, Nurses, Doctors are working too hard to defeat against this virus and save people's life. With the use of 3d

printing technology there are many different products which can save person's life and also reduce risk of spreading virus. This all equipment's are explained in the detail below.

### 2.1 Face Shield

In this Covid-19, a critical situation for the world many Doctors, Police staff, Nurses etc. are working in open environment with a big responsibilities and help in curing patients from this disease. They should take necessary care of themselves by wearing mask so we have designed a Face shield which will give more protection by stopping many bacteria and help them to work very easily in this environment.



Figure 1: Face Shield

### 2.2 Face Mask Clip

To protect ourselves from Virus government has made a Face Mask compulsory to all. So if we all wear this masks till a long time then due to the rubber it hurts our ears and we get a pain in our ears. So to protect this we can use this 3d printed Face Mask Clip and by using this we can easily wear mask till a long time very easily without any kind of pain. This Clip is only 1 gram weight so very less material will be used and can be manufactured in only 3 minutes. So we can develop large number of parts in less time.



Figure 2: Face Mask Clip

### 2.3 Covid-19 Smart Key

This is a 3d printed Smart Key which can be used to Pull Door Handles, Press Lift Buttons, Touch Buttons, Keyboards, and Surfaces etc. Also it has a key ring so can be easily carried with our car keys and easily fits into a pocket due to its robust design. After using this key can easily sanitized with a sanitizer or can be washed with a shop.



- ① Touch Buttons, knobs, keyboards, surfaces
- ② Contact and pull door handles
- ③ Loop for keyring
- ④ Bump to force pulling or pushing with thumb
- ⑤ Bump to prevent your fingers from contaminated surface
- ⑥ Cover to prevent contamination within your pocket

Figure 3: Smart Key



Figure 4: Smart Key Uses

### 2.4 Anti-Corona Press Ring

This ring can be easily wearable in fingers and can be developed in different sizes. This can be used to touch any buttons without spreading any kind of virus.



Figure 5: Anti-Corona Ring

### 2.5 Corona Door Handle

This is a very simple 3d printable design which can be easily fitted to door handles. We can use our hand or elbows to open the doors so less virus can be spread with this method. This design has a hole which will fit M6x25mm screws which can be easily available in market.

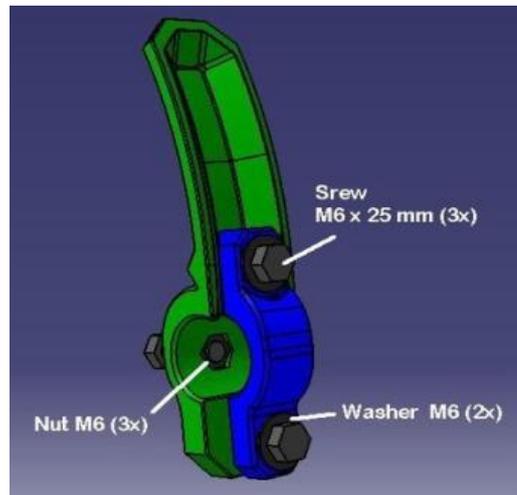


Figure 6: Handle Design



Figure 7: Door Handle

## 2.6 Gas Mask Adaptor

We all are aware of Scuba Diving Mask. So this are two simple design parts which can be easily printed using 3d printing technology and converted this mask into Respiratory Mask. So we can get this Scuba Diving Mask from the market and we can convert this mask at home and can be used to protect us from the covid-19 virus.



Figure 8: Scuba Diving Mask



Figure 9: Converted Scuba Diving Mask

## 2.7 Covid-19 Mask

As we know there is a very much shortage of N95 masks in the market. So this is a design which we can print in our printer and used this mask to protect ourselves by

wearing this mask. This mask contains a connector, Filters, Holder and a Cap with a threads. This filter can be available in market stores which we can put inside the connector and close it with the Cap. So it will help us to filter the air and we can have a fresh air to breathe.



Figure 10: Face Mask

## III. CONCLUSION

To conclude we can say that the above designs are easily printed using any kind of 3d printers within a short time. By using this gadgets 3d printing technology also can be known as a lifesaving technology. This all designs can be easily available online and it's totally free so anyone can download this.

## 4. REFERENCES

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