IWShield

Sustainable and Rapidly Manufacturable Face Shield

Background

After the outbreak of SARS-CoV-2, many people preferred home-office solutions to protect themselves from catching the virus. But in so-called system relevant sectors like public healthcare, that is not an option. These people have to get access to a comfortable and effective way to protect themselves, as they are in direct contact with many people every day. In Germany over 5,4 million people work in the fields of medical care, school education, and retail. That's more than 12 % of Germany's working population. If all of those people need protection at the same time, one question comes into mind: How can we respond fast enough without neglecting environmental-friendly solutions?

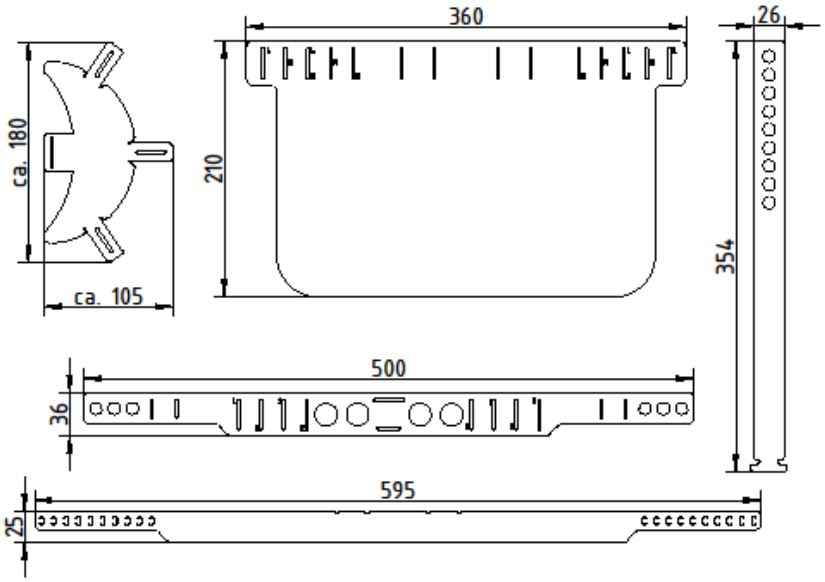
Achieving manufacturing flexibility

This is where the Intense Wearable Shield („IWShield") comes into play. The IWShield is a reusable, comfortable-to-wear, and ultra-lightweight (50 grams total) face shield with built-in adjustability, which is made completely out of polymeric sheet material. Due to its mono-material design, it can be manufactured in a single process step which makes production and distribution less expensive and lightning-fast. Additionally, the recycling process becomes easier and more efficient, because separation is not necessary. The parts of the IWShield can be manufactured in many different ways, such as punching or laser cutting. Therefore, thermosetting as well as thermoplastic polymers can be used, preferably recycled ones, as long as they are chemical resistant to disinfectants. This allows manufacturers to use the material and process which they have at hand in situations of super-high demands, but also makes decentralized production possible, as anyone with a laser cutter or a punch can be a part of their local supply chain.

The design approach

The assembly is really convenient, as the whole design is based upon slot-base arrangements. With a little bit of practice the IWShield is assembled in under 90 seconds. The design makes it possible to create a sturdy and rigid face shield in just a few simple steps. It offers a secure hold and does not shake when you move your head, yet no elastic component is needed, unlike to other conventional face shields. A piece of Velcro tape or string is sufficient. The ribbons will follow the natural curvature of your head, without giving you any feeling of pressure, like other face shields do, when you have to tighten them down using a rubber band. Especially the ribbon, which goes over your head relieves any kind of mechanical stress from your temples, which can occur when using 3D-printed or injection moulded parts. Due to the adjustability of the IWShield, it should fit on nearly every form or size of head with a comfortable amount of space between your face and the shield itself. This makes it not only more pleasant to wear in daily use, but also prevents the moisture of your breath from condensing in your field of view.

The IWShield combines a mono-material design and manufacturing flexibility with low material usage and sustainability, to create a sturdy face shield that you could wear for hours without even noticing it.



Parts of the IWShield

Technical Information

This face shield is not an approved medical device. Therefore, no statements can be made about its medical usability, suitability or safety, especially regarding COVID-19. Shield does not offer protection against infection. Liability is therefore excluded.

Features

- adjustable to head size and form (S, M, L)
- can be used without head ribbon, if desired
- optional shield cover, which prevents penetration of droplets or liquids from above
- self-fastening design without elastic components
- reusable after cleaning
- modular design enables replacements of single components

Technical description

suitable materials	sheet material made out of a polymer that is: ▪ transparent ▪ biocompatible ▪ resistant against cleaning agents and disinfectant ▪ flexible enough for later assembly ▪ thermosetting or thermoplastic
suitable material thickness	shield: 0,15 – 0,8 mm ribbons: 0,5 – 0,8 mm
suitable manufacturing methods	▪ thermoplastic polymers: laser cutting or punching ▪ thermosetting polymers: punching
weight	approx. 50 – 100 g (depending on material and thickness)

Assembly instructions

Note: The individual parts must first be assembled and cleaned.

A video tutorial shows you step by step, how the individual parts of the IWShield are assembled. To do this, you can visit the URL below or scan the adjoining QR Code.

s.fhg.de/iwshield-video

Contact & further Information

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Links:

https://www.iws.fraunhofer.de/en/news/2020-05-14_news_iws-shield.html
https://www.iws.fraunhofer.de/en/business_fields/ablation_cutting/high_speed_laser_processing/projects_system_developments/iwshield.html

For general questions or inquiries, please contact:

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