



# Developing a prototype personal respirator for health-care workers treating COVID-19

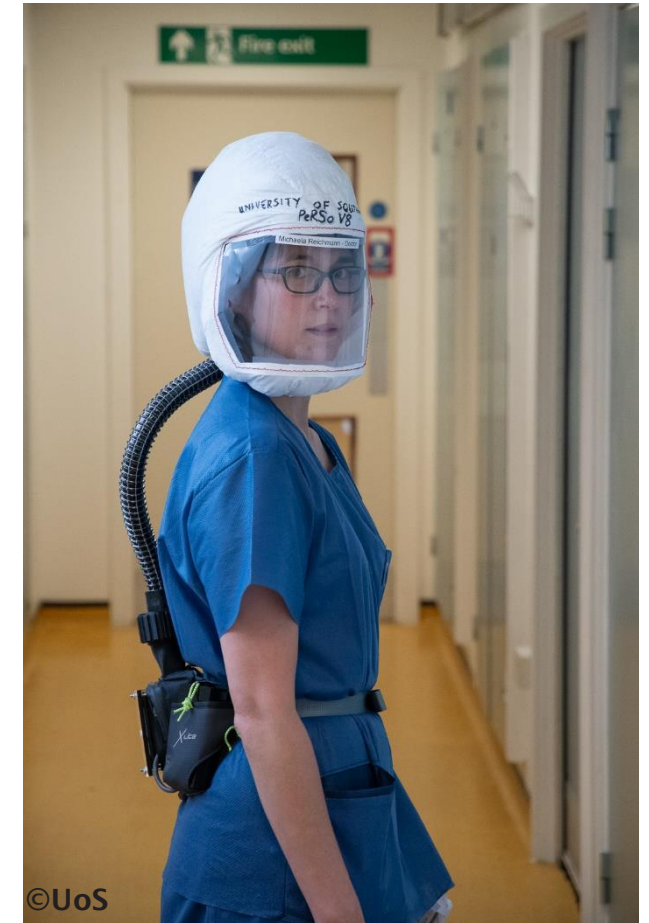
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S Foster and M Wells, McLaren Racing Ltd

Associated raw data for publication at <https://engrxiv.org/rvcs3/>

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# Warning

- **PeRSo is a prototype and this Specification is for information purposes only. It has not been properly tested for safety, efficacy or durability whether for single, multiple or repeated use. We have not obtained CE certification, regulatory approval or validated PeRSo units as a whole, and/or the constituent components, so as to comply with the relevant Standard for personal respiratory equipment. Final quality assured PeRSo units intended use is in a health care setting. PeRSOs should not be used in an industrial or manufacturing environment, drilling, welding, close to flames, chemicals or fumes or otherwise where existing, if similar looking, products would be more suitable.**
- **Individuals should not rely on the information in this specification and attempt to self-assemble their own PeRSo. They should seek to purchase a quality assured PeRSo device from a reputable manufacturer who provides safety warnings, use instructions, gives product liability assurances, guarantees and has effective product liability insurance in place. There is an increased risk of contamination by individuals untrained in specialist donning, doffing and cleaning protocols. Any individual's use of self-made PeRSo is entirely at their own risk.**
- **Manufacturers taking forward the production of PeRSo do so at their own risk. Manufacturers will need to develop their own manufacturing specification and undertake or obtain the necessary quality assurance, regulatory approvals, CE marking and/or compliance to the appropriate Standard prior to supplying or selling any PeRSo or releasing onto the market. Manufacturers should also undertake their own intellectual property freedom to operate checks and have in place appropriate product liability insurance.**
- **Organisations using PeRSo or related devices should establish careful protocols for “donning”, “doffing” and cleaning to prevent these devices being a source of contamination to individuals.**

# Disclaimer

Except as represented here the Specification for the PeRSO Prototype is provided “AS IS”. The University of Southampton gives no assurance, guarantee or warranty, express or implied, that any PeRSO device manufactured or assembled following this specification: will be safe to use; will be of merchantable quality; will be fit for any particular purpose; will protect individuals from contracting COVID-19 or any other infectious disease or virus whilst using it; or that individuals using it will not suffer personal injury or death. The University of Southampton does not warrant or in any way assert that the manufacture, sale or use of PeRSOs will not infringe the intellectual property of any other person or organization. The University of Southampton hereby disclaims any and all warranties, express or implied, and excludes, to the maximum extent permitted by law, any and all liability for any loss, harm, damage, injury or death suffered by any person caused by, or resulting from, their reliance on the information, designs and Specifications provided.

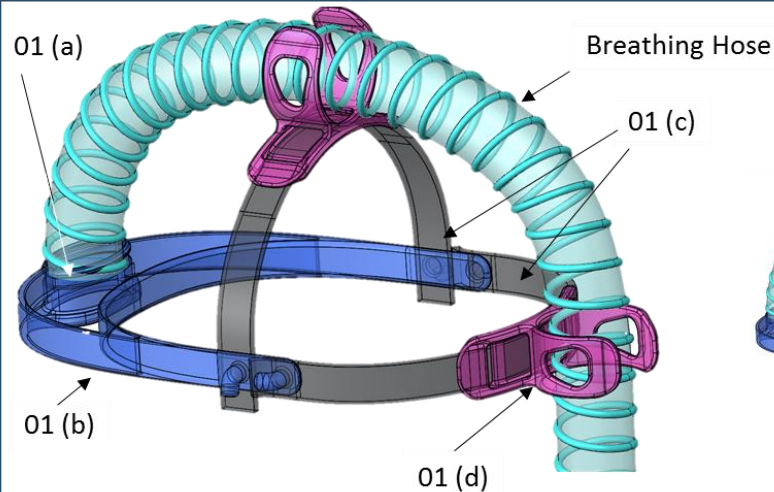
# Prototype 2 (25/3/20)

## Key to CAD Components:

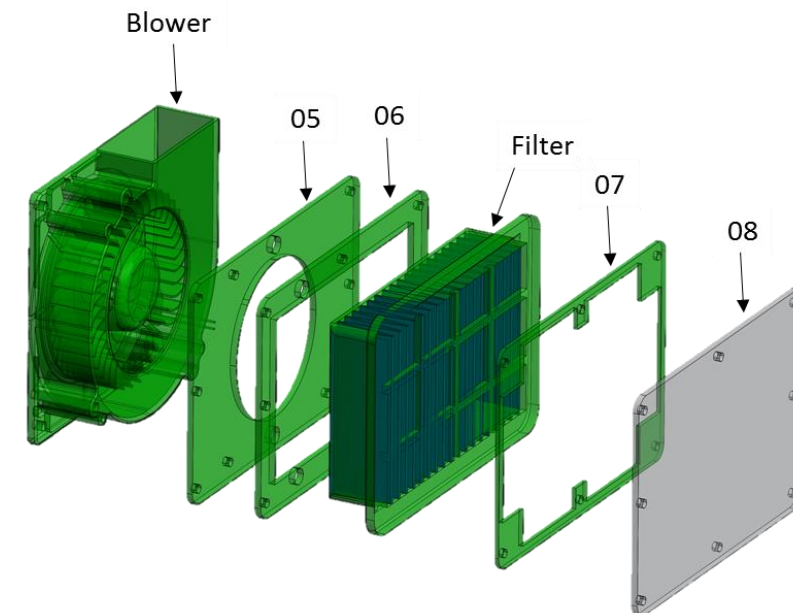
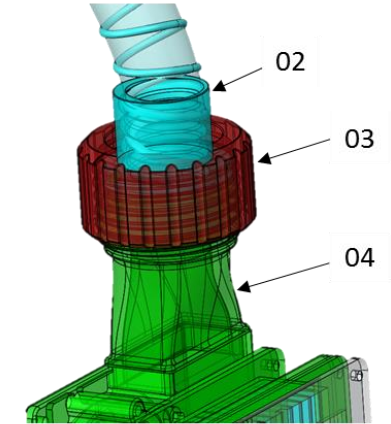
CAD components to fit between separately-sourced blower fan, filter and breathing hose parts.

Parts may need to be modified to interface with different parts as available to you (breather hose, blower and filter).

Please see paper for suggested materials and manufacturing methods.



| File Identifier:<br>'PeRSO_CAD0xx_Mk2' | Component   |
|--|---|
| 01                                     | Headset. Includes:<br>(a) Diffuser<br>(b) Head Band<br>(c) Adjustable Straps<br>(d) Hose Clip |
| 02                                     | Insert with Helix Connector   |
| 03                                     | Lock Ring Connector   |
| 04                                     | Fan Duct Connector  |
| 05                                     | Filter Mounting Plate   |
| 06                                     | Filter Mount Socket   |
| 07                                     | Filter Cover Spacer   |
| 08                                     | Filter Cover (Protective Sheet)   |



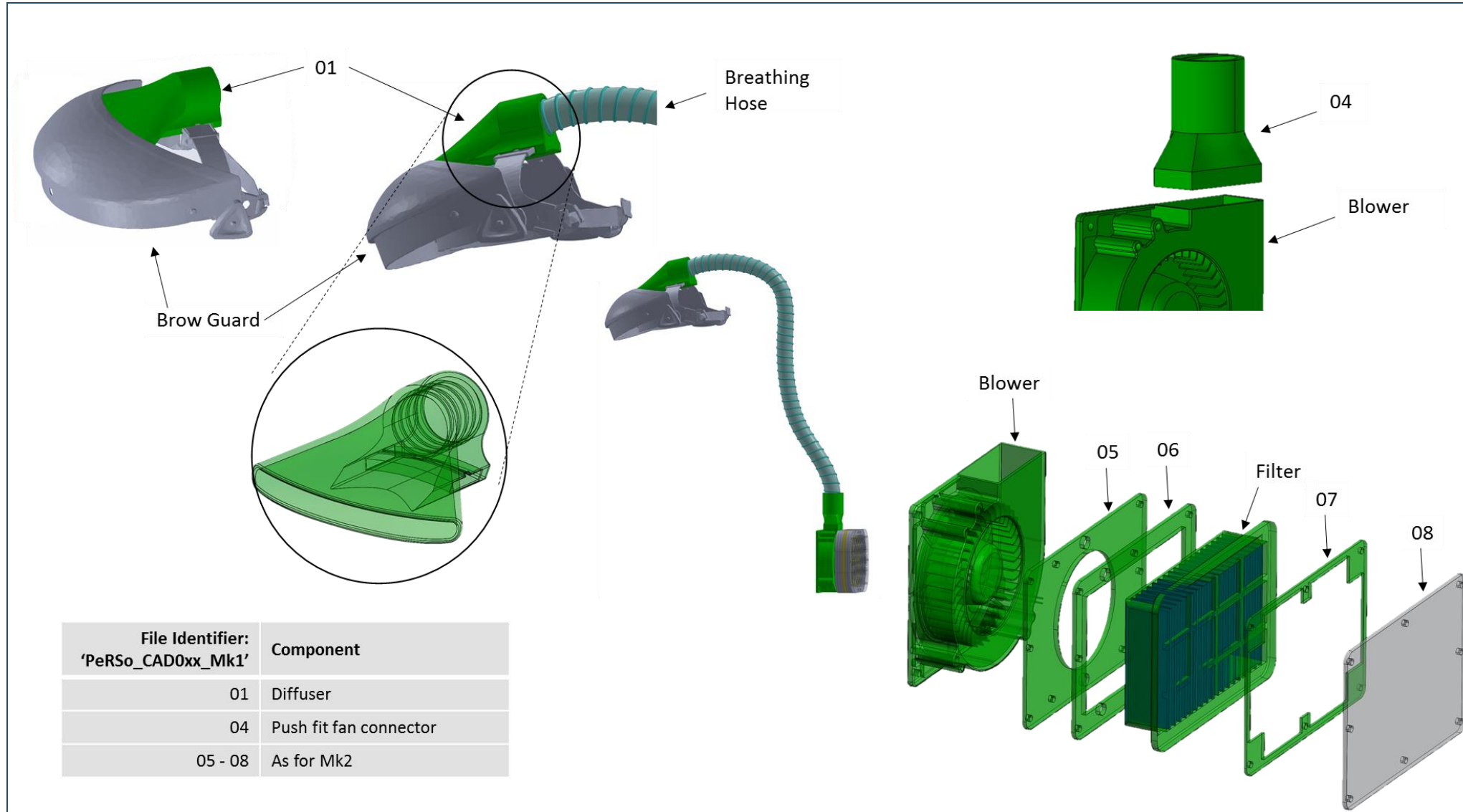
# Plus selected parts from Prototype 1 (20/3/20)

## Key to CAD Components:

Additional CAD components to fit between separately-sourced blower fan, breathing hose and 'brow guard' headband parts.

Parts may need to be modified to interface with different parts as available to you (headband, breather hose, blower and filter).

Please see paper for suggested materials and manufacturing methods.

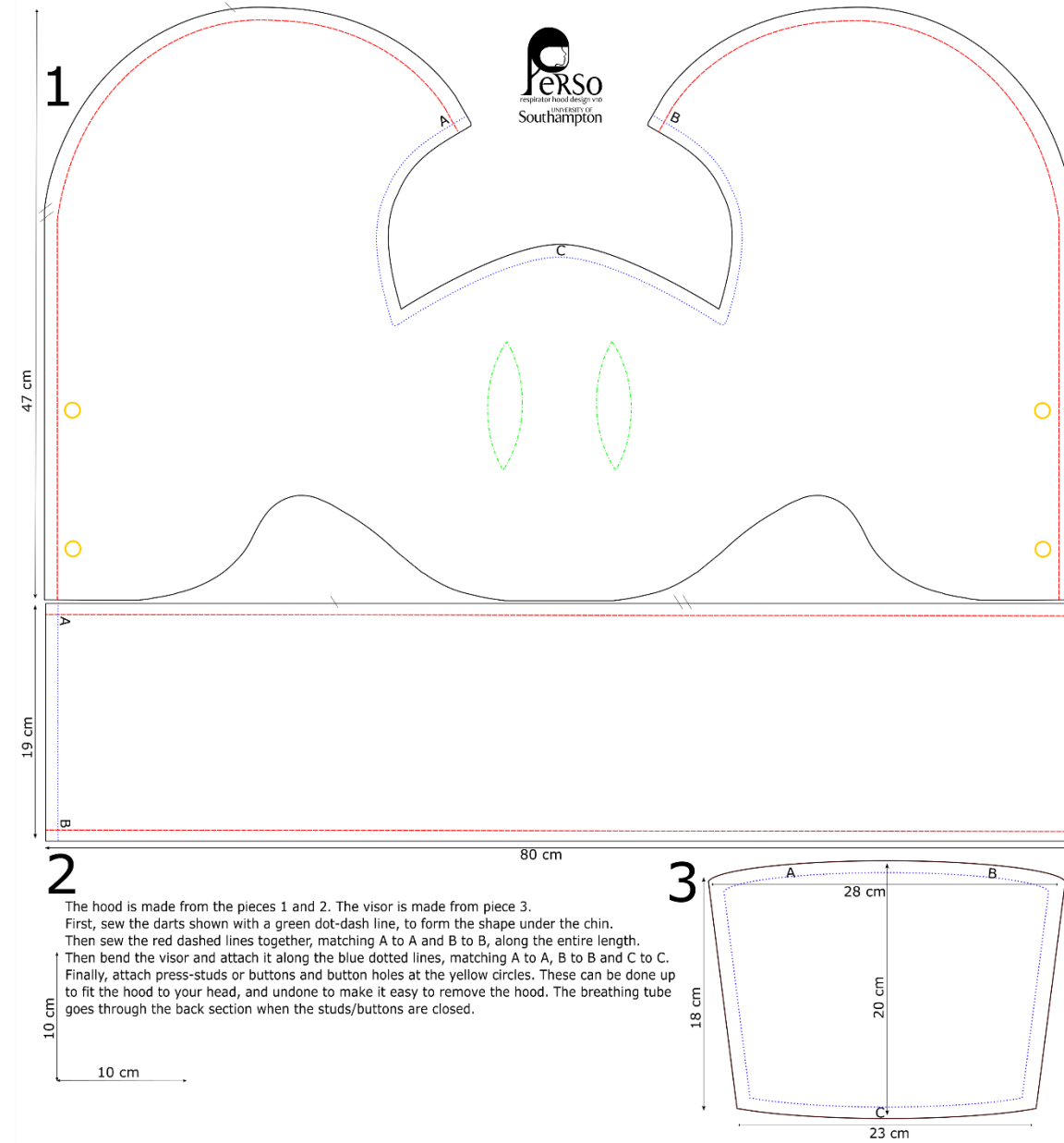




# Prototype Hood v10 (04/5/20)

## Key to Pattern:

- File Identifier: PeRSO\_Hoodv10
- Hood design files are provided as a full pattern (right) which may be printed, and as a .dxf file without annotation, for CNC scalpel or laser cutting.
- Ensure scale when printing, though the reader may consider adjusting size.
- Please see the paper for suggestions on materials and assembly with headband and harness.



# Hood Assembly Suggestions

1. Fabric parts cut
2. Mark seams and darts on main panel
3. Darts stitched for shape, shown from inside (a) and outside (b)
4. Sew top panel, and sew or tape in visor
5. Attach press-studs, so that the wearer can bring fabric together around neck and breathing hose
6. Assembled and donned hood

1



2



3a



3b



4



5



6

