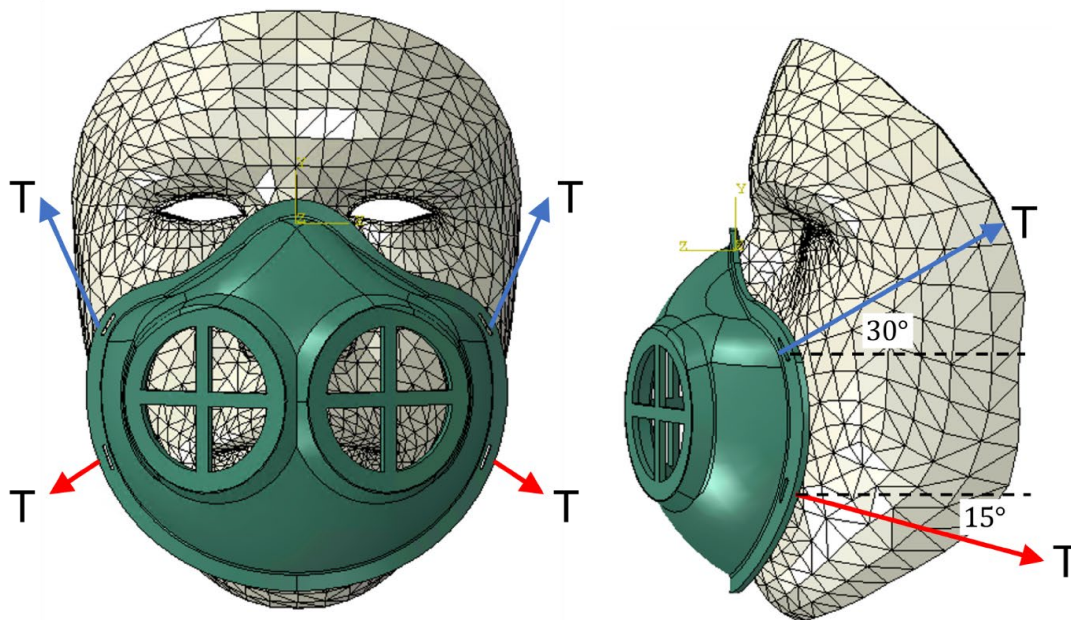


1 **Supplementary Information**

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Figure S1. Illustration of the applied loads via mask straps.

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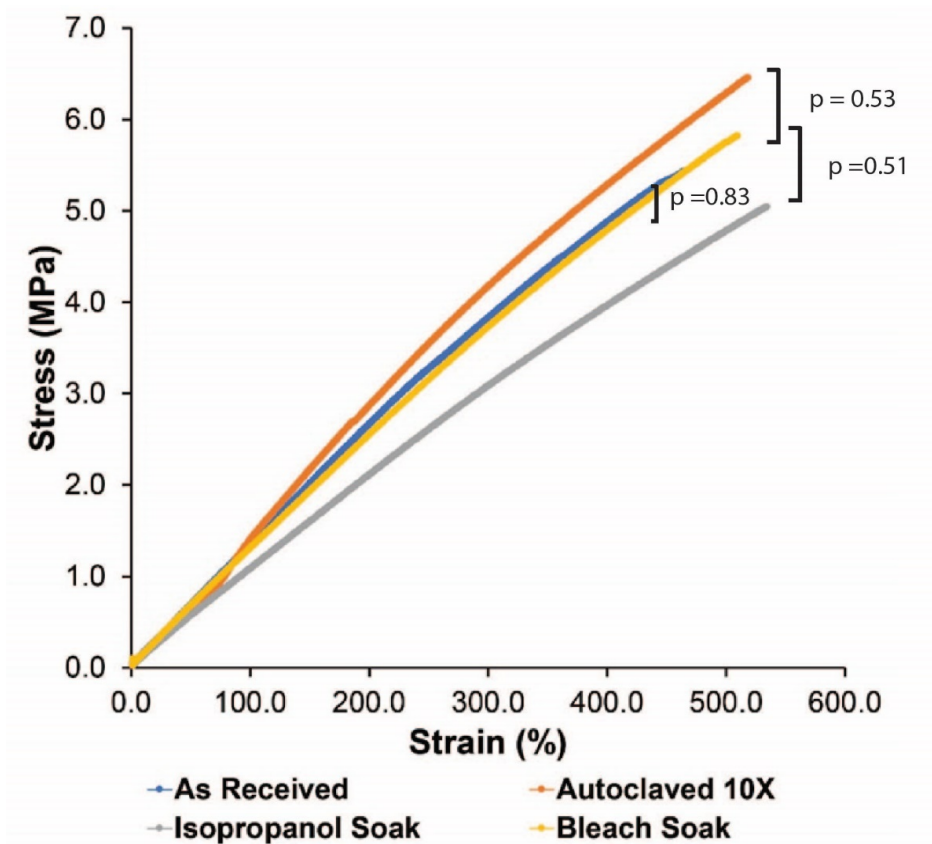
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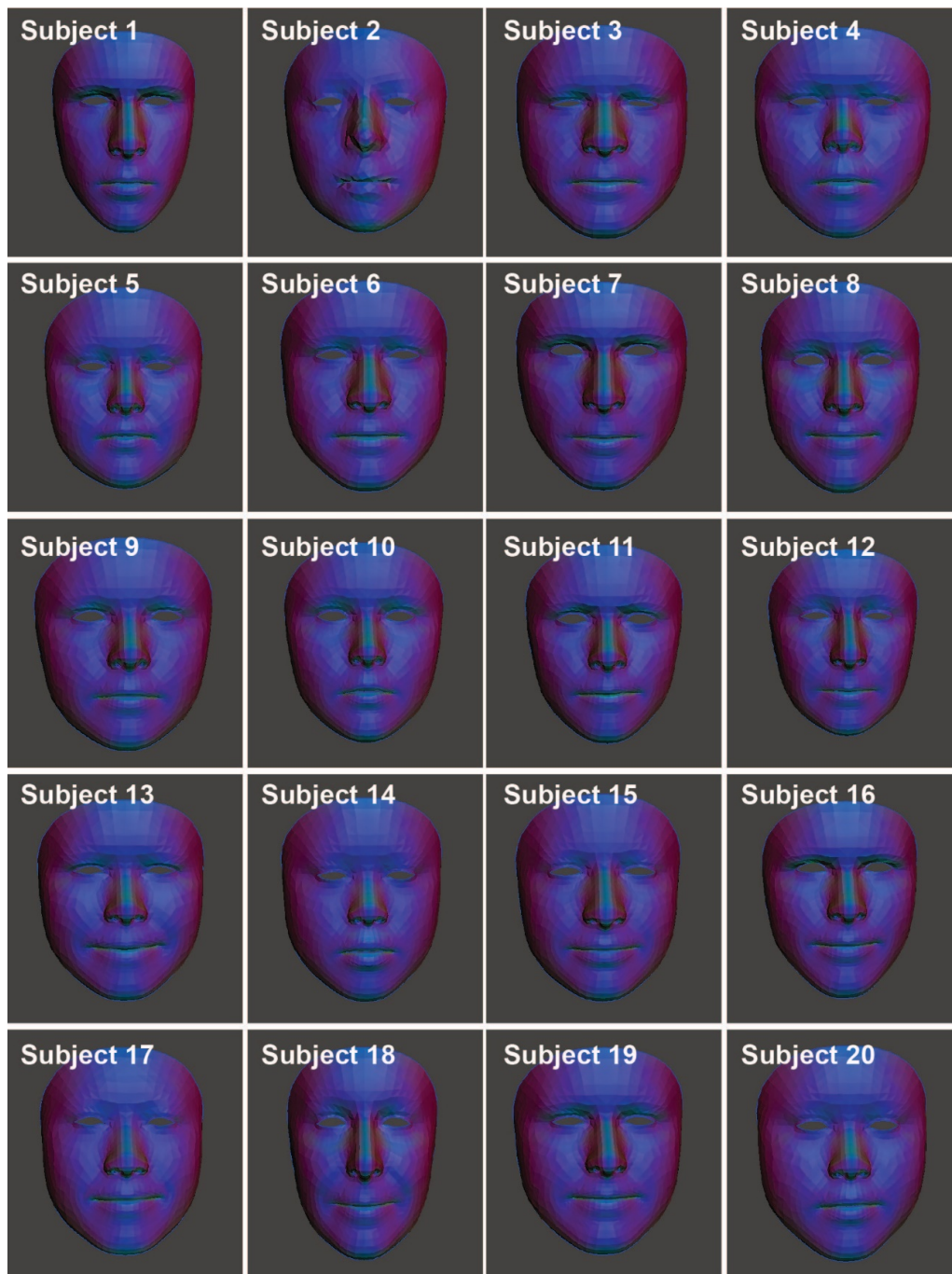
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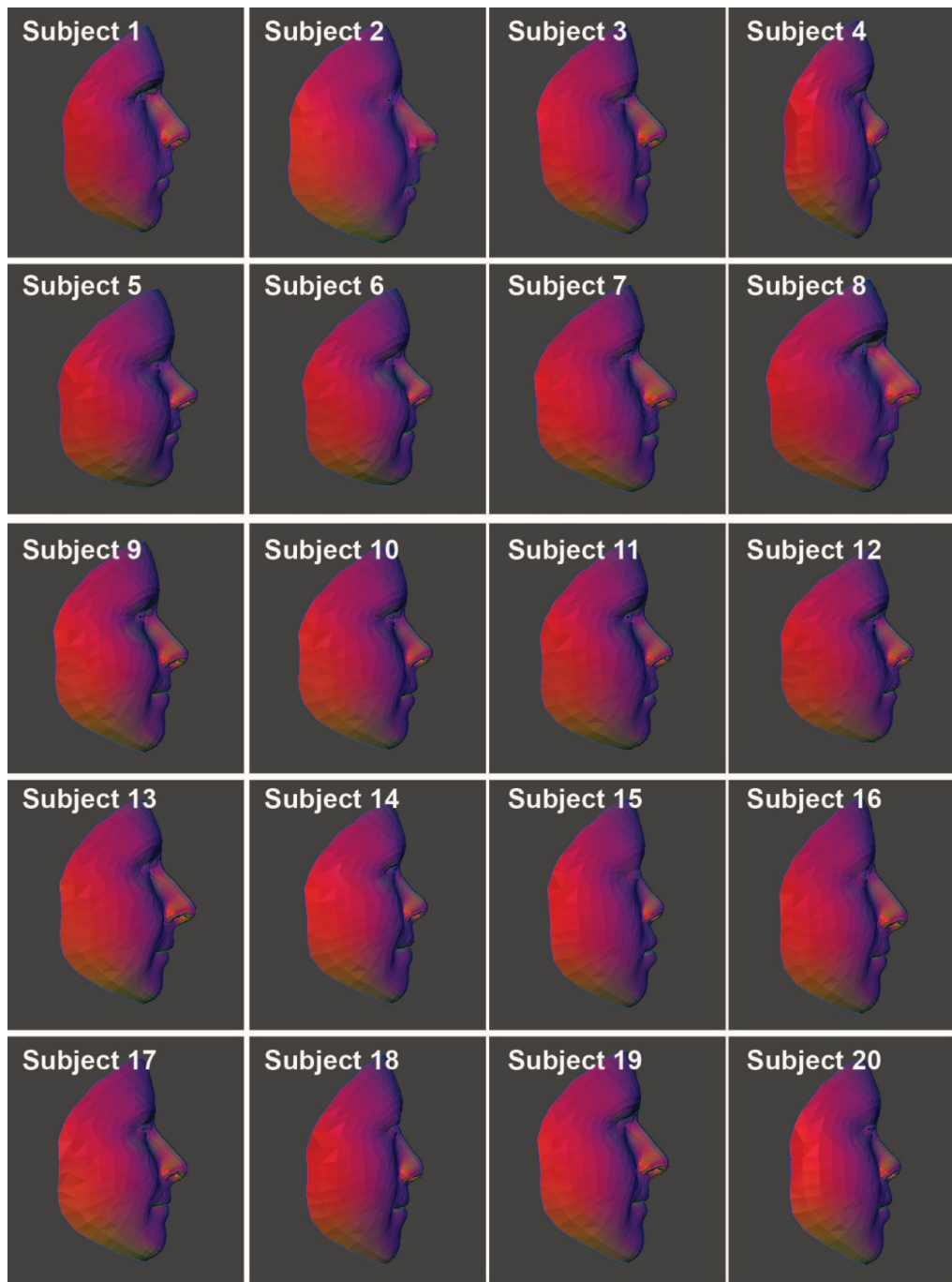
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28 **Figure S2.** Mechanical testing on samples cut directly from masks exposed to a variety of
29 sterilization methods including 10 cycles of autoclaving, 10-minute soak in 10% bleach solution,
30 and 10-minute soak in isopropanol.




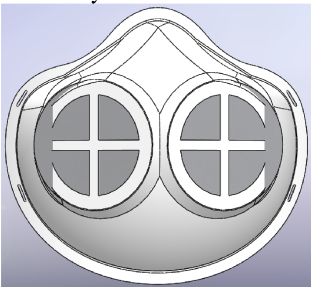


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32 **Figure S3.** Front view of 3D facial reconstruction of participants faces in fit trial of the iMASC
33 system.
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36 **Figure S4.** Side view of 3D facial reconstruction of participants faces in fit trial of the iMASC
37 system.
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49**Table S1.** Array of N95 and N95-comparable technologies.

Type	Ex SUS Dollars (USD)/Unit	Pros	Cons	Recommended Sterilization Method
Disposable FFR 	3M 8210Plus \$1.02 USD mcmaster.com/5450T42	<ul style="list-style-type: none"> Ease of fit/use Low cost per use compared to HFRR and FFRR Some models come with exhaust valve 	<ul style="list-style-type: none"> Not reusable If exhaust valve is available, it's not filtered No eye protection 	N/A
iMASC system 	Mask: < \$7.00 USD Filter: \$0.50 USD	<ul style="list-style-type: none"> Low cost Ease/accessibility of manufacturing Potentially autoclavable 	<ul style="list-style-type: none"> No exhaust valve for humidity/ease of use relief No eye protection 	Autoclave, Clorox wipe, IPA wipe, detergent and sterilization agent wash
Half-Face Reusable (HFRR) 	Mask: \$58.98 USD mcmaster.com/5541T16-5541T162 Replacement Cartridge: \$14.32/pair USD mcmaster.com/54445T229 Replacement Filter: \$2.65/pair USD mcmaster.com/54445T189	<ul style="list-style-type: none"> Powered air compatible with select models Exhaust valve reduces humidity and breathing resistance Flange/gusset provides comfortable seal skin 	<ul style="list-style-type: none"> Expensive Exhaust valve not filtered No eye protection 	Detergent and sterilization agent wash
Full-Face Reusable (FFRR) 	Mask: \$168.47 USD mcmaster.com/5541T28 Replacement Filter: \$2.65/pair USD mcmaster.com/54445T189	<ul style="list-style-type: none"> Best coverage Powered air compatible with select models Exhaust valve reduces humidity and breathing resistance Comfortable seal to skin 	<ul style="list-style-type: none"> Expensive Exhaust valve not filtered Potential visual obstruction due to fogging 	Detergent and sterilization agent wash

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