University of Colorado
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1. Summary

This report provides results from testing conducted by the Bioengineering Department on the Anschutz Medical Campus in Aurora Colorado. Test procedures were adapted from the American National Standards Institute (ANSI) standard Z87.1-2003 [1] and guidelines compiled for the Journal of Occupational and Environmental Hygiene [2]. This test does not assess mechanical impacts.

1.1. Test Articles

Test articles reported on are described in Table 1.

Table 1: Test articles.

Test Article	Part #/Lot #	Number of Samples	Material	Date
Prusa RC2/3 v2	Not Provided	2 Shields 2 Halos 2 Rubber Bands	PETG	4/8/2020

2. Additional Results

2.1. Spray Testing

After initial spray testing on 4/8/2020, an alternative shield configuration was recommended for additional spray testing. As previously, the shield was sprayed three times at eye-level from three sides. Liquid penetration was observed on the forehead area of the test mannequin in both shield configurations (Figures 1 & 2). It appeared that droplets made it over the gap between the forehead and halo (Figure 1). The degree of liquid penetration observed was reduced in the secondary spray test with the inverted shield configuration.

Spray Test 1: 4/8/2020 Spray Test 2: 4/9/2020

Figure 1: Top view spray testing comparison.

Spray Test 1: 4/8/2020

Spray Test 2: 4/9/2020

Figure 2: Front view spray testing comparison.

Additional Conclusions

Openings in the shield allowed liquid penetration. When the halo was in a flipped configuration for Spray Test 2, the elevated shield reduced liquid penetration from droplets traversing the forehead-halo gap. Given that liquid penetration was still observed, the previous recommendations for functionality are the same: openings at the shield attachment points and at the forehead-halo gap should be sealed to prevent liquid penetration. Additionally, if one halo configuration is preferred, it should be included in instructions for use and/or demonstrated through visual user cues on the device (ie. “This Side Up!”).

3. References

[1] American National Standards Institute. "ANSI Z87. 1-2003 Standard Practice for Occupational and Educational Eye and Face Protection." (2003).

[2] Roberge, Raymond J. "Face shields for infection control: A review." Journal of Occupational and Environmental Hygiene, 13.4 (2016): 235-24