



# Final Testing Results

Project #13675

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## Test #1) Rear Viewing Angle

### Specifications:

The rider must see a horizontal rear image encompassing 10 degrees (marginal) and 25 degrees (ideal).

### Procedures:

A team member wearing the helmet stands a measured distance from a white board. Another team member walks behind the one wearing the helmet and marks the extent of vision. This distance is measured and the angle calculated.

### Data Collection

Measured Distance from white board:

Zach: 54"

Olivia: 54"

Distance along the board teammate is visible:

Zach: 39"

Olivia: 36"

**Angle 1 = 39.7 degrees**

**Angle 2 = 36.9 degrees**

## Test #2) Rear Viewing Distance

### Specifications:

Vehicles behind cyclist must be visible at 130 ft. (marginal) and 200 ft. (ideal).

### Procedure:

Team member wearing helmet stands on end zone line of football field and attempts to identify another team member who is standing 130 ft. away. This distance is increased in 10 ft. increments until image is not identifiable.

### Data Collection:

Viewable at (circle either yes or no):

130 ft. -  Y / N

140 ft. -  Y / N

150 ft. -  Y / N

160 ft. -  Y / N

170 ft. -  Y / N

180 ft. -  Y / N

190 ft. -  Y / N

200 ft. -  Y / N

210 ft. -  Y / N

220 ft. -  Y / N

230 ft. -  Y / N

240 ft. -  Y / N

250 ft. -  Y / N

**Team successfully saw car from 270 feet at which point they ran out of room.**

## Test #3) Wind Speed Resistance

### Specifications:

Operate in wind speeds of 45 mph (marginal) and 60 mph (ideal).

### Procedure:

Create a mount to secure helmet within wind tunnel. Subject helmet to speed increments of 5 mph from 0 to 60 mph or until wind alters the system.

### Data Collection:

Mirror position does not deform under wind loading of

0 mph: **X**

5 mph: **X**

10 mph: **X**

15 mph: **X (minimum)**

20 mph: **Yes**

25 mph: **Yes**

30 mph: **Yes**

35 mph: **Yes**

40 mph: **Yes**

45 mph: **Yes**

50mph: **Yes**

55 mph: **Yes**

60 mph: **Yes**

**Maximum windspeed without deformation was observed at 100 mph. Wind tunnel max with front arm vibration was observed at 130 mph.**

## Test #4) System Weight

Top mirror = 80.5 g

Gooseneck = 20.5 g

Front Mirror = 19.5 g

- Front mirror backing = 13.9 g
- Acrylic = 5.6 g

Gooseneck feet (x2 w/ dual lock) = 1.5 g

Arms (x2) = 5.5g

Snapfits (x2 w/ dual lock) = 2.0 g

Rubber Disks (x2) = 1.5 g

Screw = 2.0 g

Four pieces dual lock = 2.0 g

**Total = 183 g = .403 lb.**