CELLBOND ATD

58 cm CEN Headform Cellbond Specifications

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Introduction

This presentation describes the modified size J headform prototype in semi rigid urethane for shock absorption and penetration tests, with falling headform/helmet assembly off board and with DTS SLICE NANO data acquisition system.

The current circumference of the head is 58 cm. It was decided to use the head shape for the skull from EN960 Size J.

Size J has a circumference of 57.5cm so, the shape for the skull was scaled up 1.82%.

Specifications

- *Material: FD-70 semi rigid urethane*
- *Headform size: 58 cm*
- *Mass = 4.34 Kg*
- *Centre of gravity DATUM: Tragus Point*
  - *CGx = 9.34 mm ± 2.54 mm*
  - *CGy = 0.00 mm ± 2.54 mm*
  - *CGz = 26.80 mm ± 2.54 mm*
- *Moments of inertia;*

$$I_{XX}(Kg \cdot cm^2) = 208.07 \pm 5\%$$
$$I_{yy}(Kg \cdot cm^2) = 223.24 \pm 5\%$$
$$I_{zz}(Kg \cdot cm^2) = 156.44 \pm 5\%$$

- *Soft urethane skin cover: TBD*

Specifications: Instrumentation

Off board headform:

V1:

- NAP 6aω (Nine accelerometer array package – method to obtain 6DOF head kinematics using 3-2-2-2 nine accelerometers configuration)

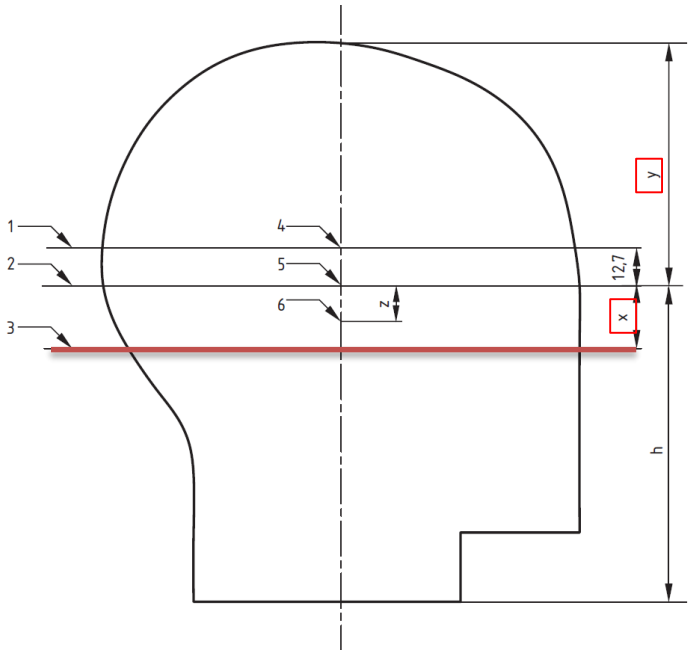
V2:

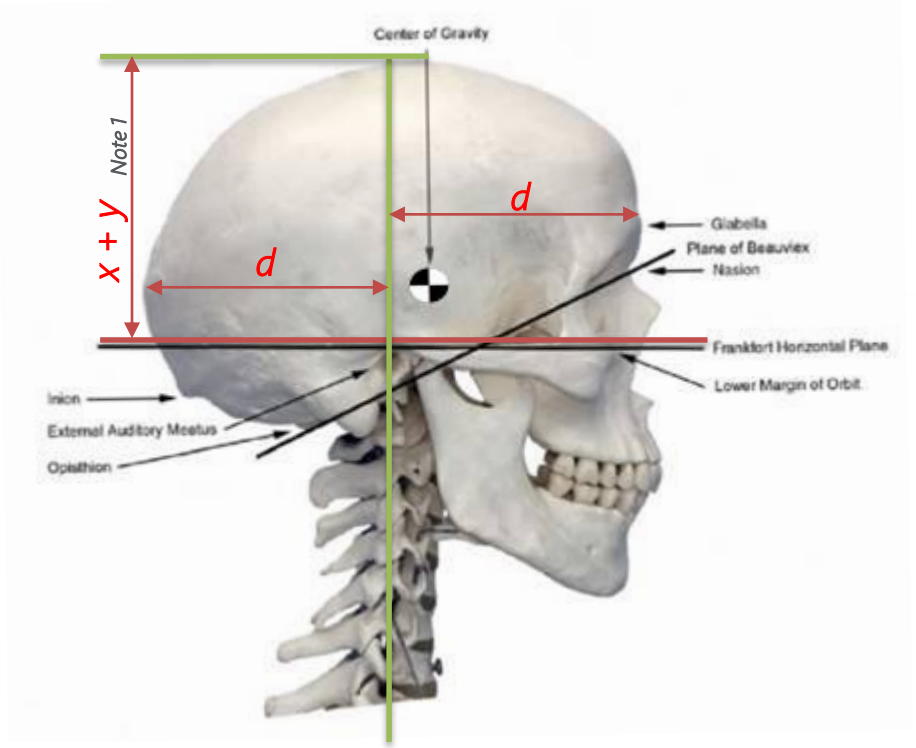
- Coplanar 6aω Six accelerometers + three ARS configuration.
- TOTAL 9 channels

On board headform:

- DTS Slice Nano DAS / DTS Slice 6 option

Specifications: How to define Tragus Point

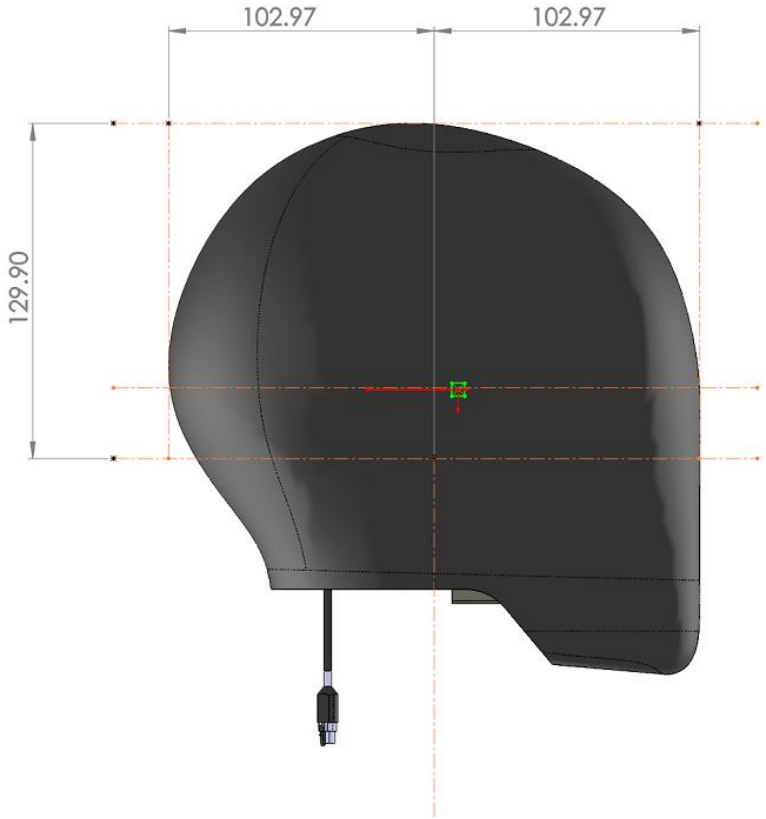




Note 1

Dimensions taken from Table 1 (EN960).

Specifications: Tragus Point



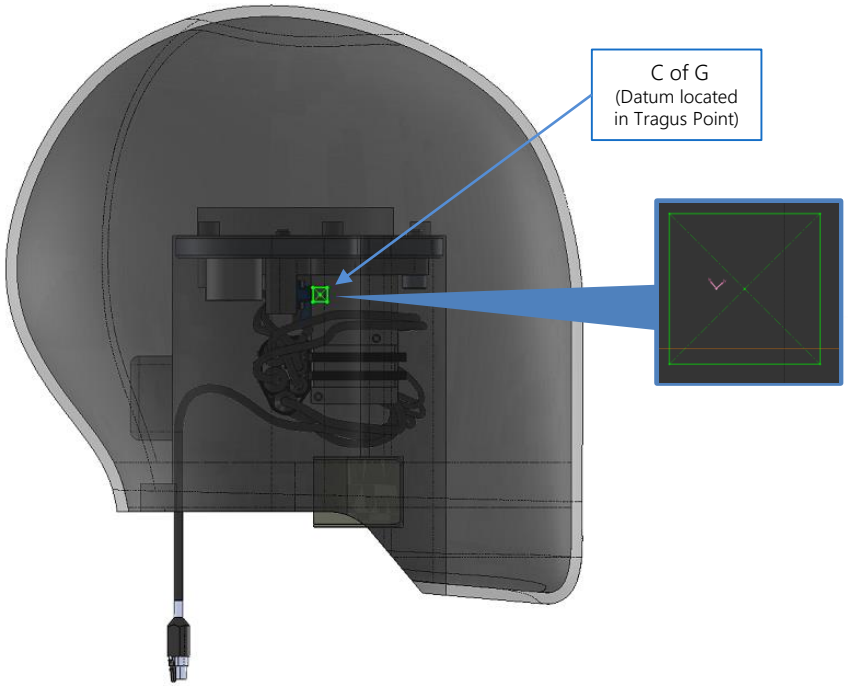
x + y = 129.90 mm

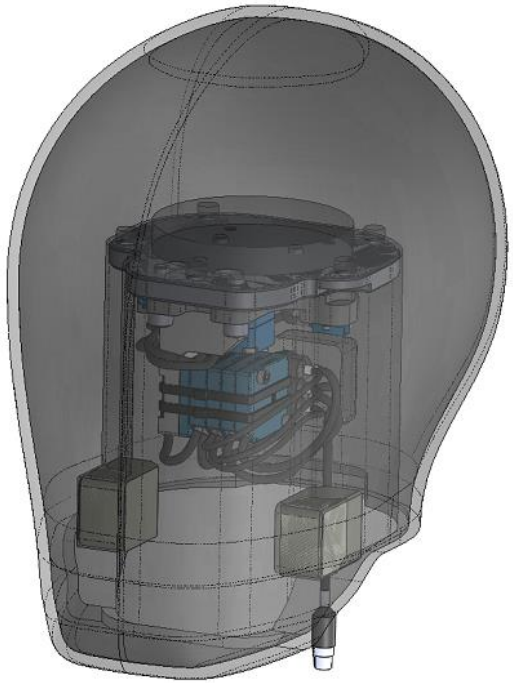
x = 27.5 mm

y = 102.4 mm

d = 192.97 mm

Off board - NAP 6aω scheme





TARGETS

Mass = 4340 grams ± 140 grams

C of G: ±2.54mm	MOI: ± 5%
X = 0 ±5mm	Ixx = 208.07 $kg \cdot cm^2$
Y = 0 ±5mm	Iyy = 223.24 $kg \cdot cm^2$
Z = 0 ±5mm	Izz = 156.44 $kg \cdot cm^2$

Mass = 4397.74 grams

C of G: ±2.54mm	MOI: ± 5%
X = -0.95 mm	Ixx = 172.15 $kg \cdot cm^2$
Y = 0.30 mm	Iyy = 212.64 $kg \cdot cm^2$
Z = 0.02 mm	Izz = 163.61 $kg \cdot cm^2$

Ballast weights to be adjusted.

Specifications: chin strap location

- *Chin strap position*

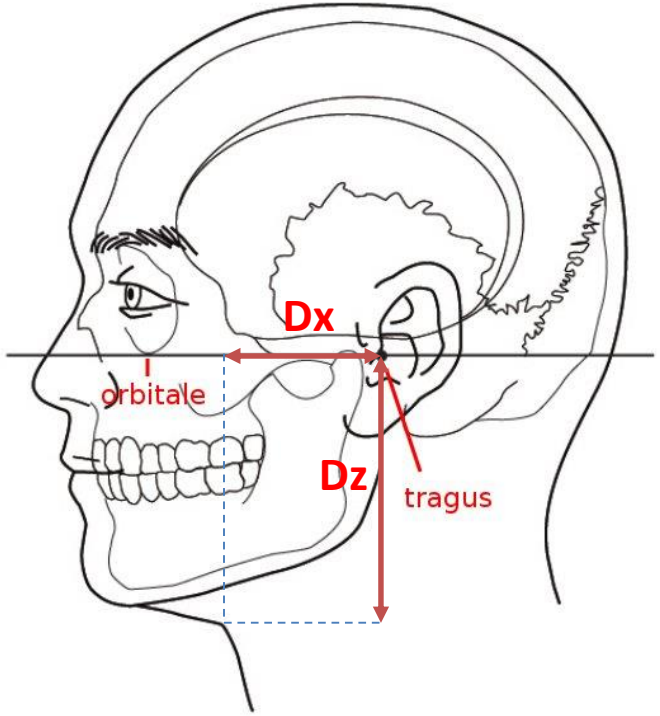
  Dx = 4.1 cm

  Dz = 10.8 cm

- *Attachment method: foam*

  Foam density: TBD

  Size: 40mm x 36mm x Throat width

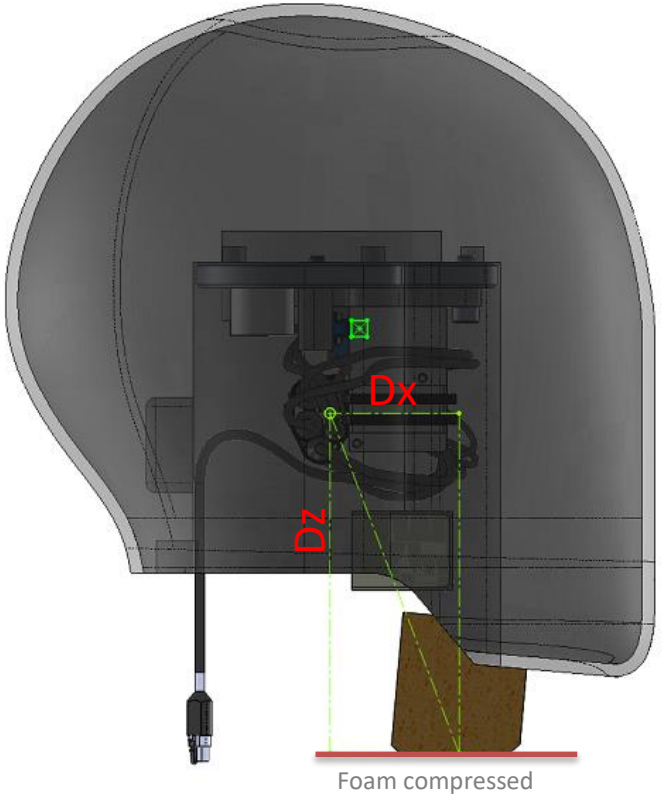


Specifications: chin strap location

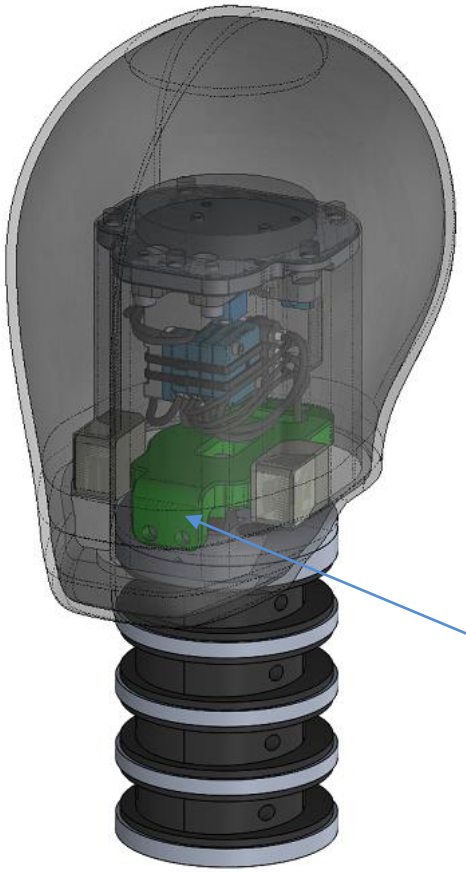
- *Chin strap position from Tragus Point:*

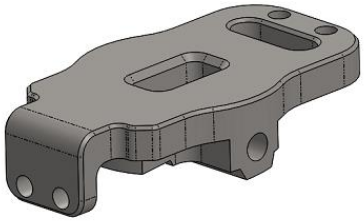
  Dx = 4.1 cm

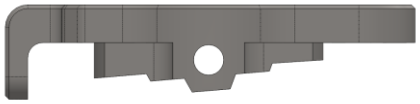
  Dz = 10.8 cm



HIII 50th Neck Attachment







Mass = 6092 grams

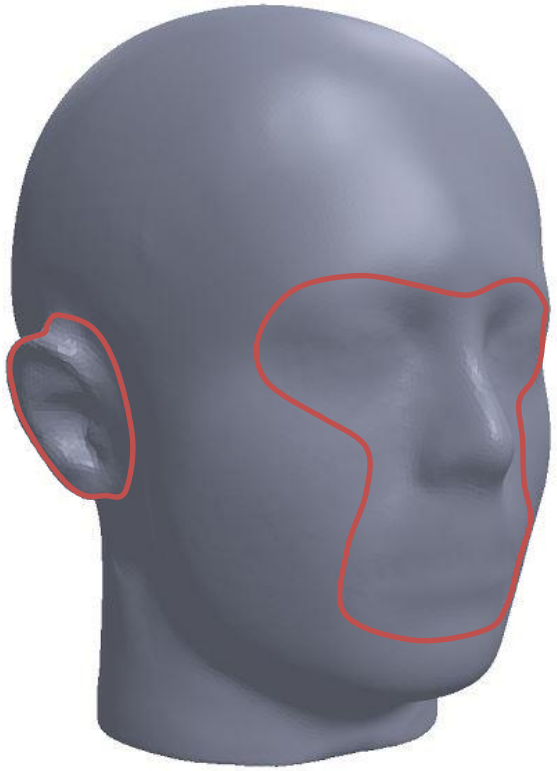
C of G: ±2.54mm

X = -3.27 mm
Y = 0.22 mm
Z = -32.50 mm

MOI: ± 5%

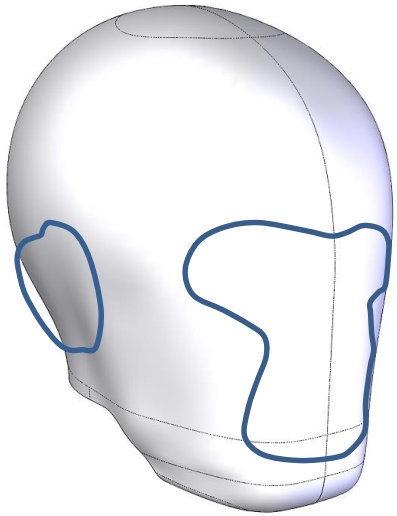
Ixx = 397.97 $kg \cdot cm^2$
Iyy = 442.63 $kg \cdot cm^2$
Izz = 179.87 $kg \cdot cm^2$

Facial Features



Full head features will have a massive impact on MOI.

An option to minimize the impact of the head features on the MOI would be using only the necessary face features and blend them into the existing CEN prototype.



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