

Yeadon Measurements For use with the **yeadon** python module by C. Dembia (fitze)

Key:

● denotes a joint centre

L (on the left) denotes a level at which a stadium solid or circle is defined (except for **Ls8**)

L (on the right) denotes a length measurement

Ls1L-Ls5L measured from **Ls0**; **Ls6L-Ls8L** measured from **Ls5L**

La2L-La4L measured from **La0**; **La5L-La7L** measured from **La4L** (some for **b**)

Lj1L,Lj3-5L measured from **Lj0**; **Lj6L,Lj8L-Lj9L** measured from **Lj5L** (same for **k**)

p denotes a perimeter measurement, must have $2w < p < \pi \cdot w$

w denotes a width (medio-lateral, or side to side) measurement

d denotes a depth (anterior-posterior, or front to back) measurement

level, name, measurements needed

Ls8¹ top of head **L**

Ls7 above ear **L,p**

Ls6 beneath nose **L,p**

Ls5² acromion **L,p**

Ls4³ shoulder joint centre **L,w,d**

Ls3 nipple **L,p,w**

Ls2 lowest front rib **L,p,w**

Ls1 umbilicus **L,p,w**

Ls0 hip joint centre **L,p,w**

La0 shoulder joint centre **p**

La1⁴ mid-arm **p**

La2 elbow-joint centre **L,p**

La3 maximum forearm perimeter **L,p**

La4 wrist joint centre **L,p,w**

La5 base of thumb **L,p,w**

La6 knuckles **L,p,w**

La7 fingernails **L,p,w**

Lj0⁵ hip joint centre

Lj1 crotch **L,p**

Lj2⁶ mid-thigh **p**

Lj3 knee joint centre **L,p**

Lj4 maximum calf perimeter **L,p**

Lj5 ankle joint centre **L,p**

Lj6⁷ heel **L,p,d**

Lj7⁸ arch **p**

Lj8 ball **L,p,w**

Lj9 toe nails **L,p,w**

segment, name, solids⁹

P pelvis **s0-s1**

T thorax **s2**

C chest-head **s3-7**

A1 left upper arm **a0-a1**

A2 left forearm-hand **a2-6**

B1 right upper arm **b0-b1**

B2 right forearm-hand **b2-b6**

J1 left thigh **j0-j2**

J2 left shank-foot **j3-j8**

K1 right thigh **k0-k2**

K2 right shank-foot **k3-k8**

Notes:

Total mass can be measured and provided to "correct" the densities used.

1 s0 is the only semi-ellipsoidal solid (with circular cross section)

2 two stadia at this level, one for s4 and one for s5. s4 stadium's parameters are calculated from Ls4's stadium. Ls5 perimeter measured around neck

3 depth is measured in lieu of perimeter since arms interfere

4 La1L is set as half of La2L

5 stadium (circle) parameter calculated from Ls0's stadium

6 Lj2L is set as the average of Lj1L and Lj3L

7 Lj6's (and Lk6's) stadia are the only stadium oriented anterior-posteriorly

8 Lj7L is set as the average of Lj6L and Lj8L

9 Yeadon's 1990 paper indexes the solids from 1, while this formulations indexes from 0

Yeadon, M. R. (1990c). The simulation of aerial movement-ii. a mathematical inertia model of the human body. Journal of Biomechanics, 23:67-74.

Unit conversion

Name:

Date:

measToMeters (number to convert from measurement units into meters):

Measurement input

Torso

Ls1L:
Ls2L:
Ls3L:
Ls4L:
Ls5L:
Ls6L:
Ls7L:
Ls8L:

Ls0p:
Ls1p:
Ls2p:
Ls3p:
Ls4p:
Ls5p:
Ls6p:
Ls7p:
Ls8p:

Ls0w:
Ls1w:
Ls2w:
Ls3w:
Ls4w:

Ls4d:

Left arm

La2L:
La3L:
La4L:
La5L:
La6L:
La7L:

La0p:
La1p:
La2p:
La3p:
La4p:
La5p:
La6p:
La7p:

La4w:
La5w:
La6w:
La7w:

Left leg

Lj1L:
Lj3L:
Lj4L:
Lj5L:
Lj6L:
Lj8L:
Lj9L:

Lj0p:
Lj1p:
Lj2p:
Lj3p:
Lj4p:
Lj5p:
Lj6p:
Lj7p:
Lj8p:
Lj9p:

Lj8w:
Lj9w:

Lj6d:

Right arm

Lb2L:
Lb3L:
Lb4L:
Lb5L:
Lb6L:
Lb7L:

Lb0p:
Lb1p:
Lb2p:
Lb3p:
Lb4p:
Lb5p:
Lb6p:
Lb7p:

Lb4w:
Lb5w:
Lb6w:
Lb7w:

Right leg

Lk1L:
Lk3L:
Lk4L:
Lk5L:
Lk6L:
Lk8L:
Lk9L:

Lk0p:
Lk1p:
Lk2p:
Lk3p:
Lk4p:
Lk5p:
Lk6p:
Lk7p:
Lk8p:
Lk9p:

Lk8w:
Lk9w:

Lk6w:

Density Correction

to ignore, set to 0

Total mass (kg):