

## Law Enforcement Officer Anthropometry Data Dictionary

[Measurements are reported in the Metric system by mm and kg and the English system by inch and lb.]

### Measured without Gear (Standing)

- (01) **Buttock height, standing:** The vertical distance between a standing surface and the level of the buttock point, right lateral landmark, is measured with an anthropometer at the right side of the thigh. The subject stands erect with the heels together and the weight distributed equally on both feet.
- (02) **Chest breadth, standing:** The maximum horizontal breadth of the chest at the level of the chest point anterior landmark is measured with a beam caliper. The subject stands erect, looking straight ahead with the heels together and the weight distributed evenly on both feet. The subject places both hands on the hips while the beam caliper is placed at the height of anterior chest point landmark, and then the subject lowers the arms.
- (03) **Chest circumference, standing:** The maximum horizontal circumference of the chest at the level of chest point, anterior is measured with a tape. The subject stands erect, looking straight ahead. The shoulders and upper extremities are relaxed. The measurement is taken at the maximum point of quiet respiration.
- (04) **Chest depth, standing:** The horizontal distance between the chest point anterior landmark and the back at the same level is measured with a beam caliper. The subject stands erect, looking straight ahead. The shoulders and upper extremities are relaxed. The measurement is taken at the maximum point of quiet respiration.
- (05) **Crotch height, standing:** The vertical distance between the standing surface and the crotch is measured with an anthropometer. The subject stands erect, looking straight ahead. The heels are together, and the weight is distributed equally on both feet. A 10-mm value is added for clearance.
- (06) **Foot breadth, horizontal, standing:** The maximum breadth of the right foot is measured with a Brannock Device<sup>®</sup>. The subject stands with the right foot on the device and the left foot on a board of equal height with the weight distributed equally on both feet. The heel of the right foot lightly touches the back of the device, and the medial side of the right foot is parallel with the long axis of the device. The vertical slide of the device is moved until it lightly touches the fifth metatarsophalangeal protrusion landmark.
- (07) **Foot length, standing:** The maximum length of the right foot is measured with a Brannock Device<sup>®</sup>. The subject stands with the right foot on the device and the left foot on a board of equal height with the weight distributed equally on both feet. The heel of the right foot lightly touches the back of the device, and the medial side of the right foot is parallel with the long axis of the device. A block is placed against the tip of the longest toe to establish the measurement on the scale of the device.
- (08) **Hip circumference, standing:** The horizontal circumference of the trunk at the level of the buttock point, posterior, right and left lateral landmarks, is measured with a tape. The subject stands erect

with the heels together and the weight equally distributed on both feet.

- (09) **Stature:** Vertical distance from the standing surface to the highest point of the head (vertex). The subject stands erect with feet placed on pre-marked footprints with approximately ten centimeters apart at the inside of the heel and 33 degrees rotation at the toes.
- (10) **Thigh circumference, standing:** Circumference of the right thigh at its juncture with the buttock. The subject stands erect with legs spread apart just enough so that the thighs do not touch.
- (11) **Thumbtip reach, standing: The horizontal distance from a back wall to the tip of the right thumb is measured on a wall scale.** The subject stands erect in a corner, looking straight ahead with the feet together and the heels 20 cm from the back wall. The buttocks and shoulders are against the wall. The right arm and hand, palm down, are stretched forward horizontally along a scale on the side wall. The thumb continues the horizontal line of the arm, and the remaining fingers curve around to form a fist. The subject's right shoulder is held against the rear wall.
- (12) **Waist circumference at omphalion, standing:** Horizontal circumference of the waist, passing over all omphalion landmarks, is measured with a tape. The subject stands erect with heels together. The measurement is taken at the maximum point of quiet respiration.
- (13) **Waist height at omphalion, standing:** The vertical distance between a standing surface and the anterior omphalion landmark is measured with an anthropometer. The subject stands erect looking straight ahead. The heels are together with weight distributed equally on both feet. The shoulders and upper extremities are relaxed. The measurement is made at the maximum point of quiet respiration.
- (14) **Weight, standing:** Weight of the subject. The subject stands on the scale fully erect with weight distributed equally on both feet.

#### **Measured without Gear (Seated)**

- (15) **Bideltoid breadth, sitting:** The maximum horizontal distance between the lateral margins of the upper arms on the deltoid muscles is measured with a beam caliper over officer gear. The subject sits erect, looking straight ahead. The shoulders and upper arms are relaxed and the forearms and hands are extended forward horizontally with the palms facing each other. The measurement is taken at the maximum point of quiet respiration.
- (16) **Buttock-knee length:** The horizontal distance between a buttock plate placed at the most posterior point of either buttock and the anterior point of the right knee. The subject sits erect with arms relaxed on the lap. The thighs are parallel and the knees flexed 90° with the feet in line with the thighs.
- (17) **Buttock-popliteal length, sitting:** The horizontal distance between a buttock plate placed at the most posterior point on either buttock and the back of the right knee (the popliteal fossa at the dorsal juncture of the calf and thigh) is measured with an anthropometer. The subject sits erect with arms relaxed on the lap. The thighs are parallel and the knees flexed 90° with the feet in line with the thighs.

- (18) **Elbow rest height, sitting:** The vertical distance between a sitting surface and the olecranon, bottom landmark on the flexed right elbow, is measured with an anthropometer. The subject sits erect, looking straight ahead. The shoulders and upper arms are relaxed, and the forearms and hands are extended forward horizontally with the palms facing each other. The measurement is taken at the maximum point of quiet respiration.
- (19) **Eye height, sitting:** The vertical distance between a sitting surface and the ectocanthus landmark is measured with an anthropometer. The subject sits erect with the head in the Frankfurt plane. The shoulders and upper arms are relaxed, and the forearms and hands are extended forward horizontally with the palms facing each other. The thighs are parallel, and the knees are flexed 90° with the feet in line with the thighs. The measurement is taken at the maximum point of quiet respiration.
- (20) **Grip strength, sitting:** The maximum force of a subject's grip is measured with a dynamometer. The subject sits erect in a chair and holds the dynamometer in their predominant hand. The subject then squeezes the dynamometer for 3 seconds with his/her maximum force and relaxes. The subject repeats grip test for a total of three force measurements for the maximum force.
- (21) **Hand breadth:** The breadth of the right hand between the landmarks at metacarpale II and metacarpale V is measured with a sliding caliper. The subject places the palm on a table with the fingers together and the thumb abducted. The middle finger is parallel to the long axis of the forearm. The two distal phalanges of the fingers lie on a flat surface 8 mm higher than the table.
- (22) **Hand length:** The length of the right hand between the stylium landmark on the wrist and the tip of the middle finger is measured with a Poech sliding caliper. The subject places the palm on a table with the fingers together and the thumb abducted. The middle finger is parallel to the long axis of the forearm. The two distal phalanges of the fingers lie on a flat surface 8 mm higher than the table.
- (23) **Head arc length:** The surface distance along the contours of the head from the nuchale landmark to the glabella landmark is measured with a tape.
- (24) **Head breadth:** The maximum horizontal breadth of the head above the plane of attachment of the ears is measured with a spreading caliper. For female with braids or cornrows, the measurement includes the styled hair
- (25) **Head circumference:** The maximum circumference of the head above the attachment of the ears is measured with a tape passing just above the ridges of the eyebrows and around the back of the head. For female with braids or cornrows, the measurement includes the styled hair.
- (26) **Head length:** The distance from the glabella landmark to the opisthocranium landmark is measured with a spreading caliper. For female with braids or cornrows, the measurement includes the styled hair.
- (27) **Hip breadth, sitting:** The distance between the lateral points of the hips or thighs (whichever are broader) is measured with a beam caliper. The subject sits erect with the feet and knees together.
- (28) **Knee height, sitting:** The vertical distance between a footrest surface and the suprapatella

landmark is measured with an anthropometer. The subject sits with the thighs parallel, the knees flexed 90°, and the feet in line with the thighs.

- (29) **Nuchal height, sitting:** The vertical distance between a sitting surface and the nuchale landmark at the back of the head is measured with an anthropometer. The subject sits erect with the head in the Frankfurt plane. The shoulders and upper arms are relaxed, and the forearms and hands are extended forward horizontally with the palms facing each other. The thighs are parallel, and the knees are flexed 90° with the feet in line with the thighs. The measurement is taken at the maximum point of quiet respiration.
- (30) **Popliteal height, sitting:** The vertical distance from a footrest surface to the back of the right knee (the popliteal fossa at the dorsal juncture of the calf and thigh) is measured with an anthropometer. The subject sits with the thighs parallel, the feet in line with the thighs, the knees flexed 90°, and the arms are relaxed at the sides.
- (31) **Sitting height, sitting:** The vertical distance between a sitting surface and the top of the head is measured with an anthropometer. The subject sits erect with the head in the Frankfurt plane. The shoulders and upper arms are relaxed, and the forearms and hands are extended forward horizontally with the palms facing each other. The thighs are parallel, and the knees are flexed 90° with the feet in line.
- (32) **Waist breadth, sitting:** The maximum horizontal breadth of the waist between the Tenth rib and the iliocristale landmarks is measured with a beam caliper. The subject is in the anthropometric sitting position with the head in the Frankfurt plane and the arms relaxed at the sides. The measurement is taken at the maximum point of quiet respiration.
- (33) **Waist breadth height, sitting:** The vertical distance between a sitting surface and the height of the maximum horizontal breadth of the waist between the Tenth rib and the iliocristale landmark is measured with an anthropometer. The subject is in the anthropometric sitting position with the head in the Frankfurt plane and the arms relaxed at the sides. The measurement is taken at the maximum point of quiet respiration.
- (34) **Waist Front length, omphalion, sitting:** The surface distance between the suprasternale landmark and the anterior omphalion landmark is measured with a tape. The subject is in the anthropometric sitting position with the head in the Frankfurt plane and the arms relaxed at the sides. The measurement is taken at the maximum point of quiet respiration.

#### **Measured in Gear (Standing)**

- (01) **Boot breadth, standing:** The subject stands with the weight distributed equally on both feet in the turnout gear. The maximum horizontal distance across the right boot perpendicular to its long axis is measured between the inside and outside of the boot.
- (02) **Boot length, standing:** The subject stands with the weight distributed equally on both feet in the turnout gear. The distance between the back-most point of the right heel of the boot and the most anterior part of the boot is measured parallel to the long axis of the foot.
- (03) **Chest depth, standing:** The horizontal distance between the level of the nipple, or bust point,

and the back at the same level in officer gear is measured with a beam caliper. The subject stands erect, looking straight ahead. The shoulders and upper extremities are relaxed. The measurement is taken at the maximum point of quiet respiration.

- (04) **Chest width, standing:** The maximum horizontal breadth of the chest at the level of the nipple, or bust point, while capturing the body armor, is taken with a beam caliper. The subject stands erect, looking straight ahead with the heels together and the weight distributed evenly on both feet. The subject places both hands on the hips and takes a deep breath and holds it. The measurement is taken at maximum inspiration of the chest.
- (05) **Stature, footwear, standing:** The vertical distance from a standing surface to the top of the head is measured with an anthropometer. The subject wears boots and stands erect with the head in the Frankfurt plane. The heels are together with the weight distributed equally on both feet. The shoulders and upper extremities are relaxed. The measurement is taken at the maximum point of quiet respiration.
- (06) **Weight in gear:** The weight of the subject is taken to the nearest tenth of a kilogram. The subject stands on the platform of a scale with the weight distributed evenly on both feet. The subject wears officer gear including tools in pockets.

#### **Measured in Gear (Seated)**

- (07) **Abdominal extension depth, sitting:** The horizontal distance between the abdominal point, anterior and the back at the same level is measured with a beam caliper over officer gear. The subject sits erect, looking straight ahead. The measurement is taken at the maximum point of quiet respiration.
- (08) **Acromion-trochanter surface length, sitting:** The contour distance from the left acromion landmark to the right trochanter landmark measured with a tape over officer gear. The subject is in the anthropometric sitting position. The measurement is taken at the maximum point of quiet respiration.
- (09) **Bideltoid breadth/width, sitting (Maximum torso breadth):** The maximum horizontal distance between the lateral margins of the upper arms on the deltoid muscles is measured with a beam caliper over officer gear. The subject sits erect, looking straight ahead. The shoulders and upper arms are relaxed and the forearms and hands are extended forward horizontally with the palms facing each other. The measurement is taken at the maximum point of quiet respiration.
- (10) **Bi-trochanter surface length, sitting (curve):** The maximum distance from the right trochanter landmark to the left trochanter landmark measured above the legs with a tape over officer gear. The subject is in the anthropometric sitting position. The measurement is taken at the maximum point of quiet respiration. The path of the tape should mimic the path of an automobile seat belt.
- (11) **Buttock-shoe tip length, sitting:** The horizontal distance between the most posterior point of the right buttock and the anterior point of the right boot is measured with an anthropometer. The subject sits erect. The thighs are parallel and the knees flexed 90° with the feet in line with the thighs. A vertical plane is placed at the anterior point of the right boot to help measure the horizontal distance from the buttock plate.

- (12) **Hip breadth, sitting:** The distance between the lateral points of the hips or thighs (whichever is broader) is measured with a beam caliper over officer gear. The subject sits erect with the feet and knees together.
- (13) **Shoulder-grip length, sitting:** The horizontal distance between the back of the shoulders and the center of a dowel in the grip of an extended arm is measured with a beam caliper over officer gear. The subject is in the anthropometric sitting position with the head in the Frankfurt plane with right arm extended forward horizontally holding a vertical dowel rod.
- (14) **Thigh clearance, sitting:** The vertical distance between a sitting surface and the highest point on top of the right thigh in officer gear is measured with an anthropometer. The subject sits with the thighs parallel, knees flexed 90°, and the feet in line with the thighs.
- (15) **Waist breadth, sitting:** The maximum horizontal breadth of the waist between the Tenth rib and the iliocristale landmarks is measured with a beam caliper over officer gear. The subject is in the anthropometric sitting position with the head in the Frankfurt plane and the arms relaxed at the sides. The measurement is taken at the maximum point of quiet respiration.