

The FUTREX-1100 is specifically designed for personal body fat testing in the home. It is not intended to be used by physicians or health/fitness professionals to assess clientele for percentage of body fat.

If you are interested in professionally testing percent body fat, please contact Futrex for information on the Futrex's Professional Body Composition Analyzers.

301-791-9220

# FUTREX<sup>®</sup>

# 1100

## Personal Body Fat Tester

**USER'S MANUAL**  
VERSION 1.1

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# TABLE OF CONTENTS

INTRODUCTION.....	2
FUTREX-1100 MEASUREMENT TECHNIQUE .....	3
EXPECTATIONS .....	4
PART NAMES	
Main Body With Optical Standard .....	5
Optical Standard.....	5
Main Body - Optical Section.....	6
BATTERY INSTALLATION .....	6
HOW TO MEASURE PERCENT BODY FAT .....	7
Locating Proper Measurement Spot .....	7
Turning the Unit On .....	7
Measurement Setup Sequence	
Changing Height.....	7
Changing Weight.....	8
Zero Adjusting the Instrument .....	8
Making the Percent Body Fat Measurement.....	8
TESTING MORE THAN ONE INDIVIDUAL.....	11
CONSERVING BATTERY LIFE .....	11
ADJUSTING THE BODY FAT READ-OUT .....	11
SELECTION OF ENGLISH OR METRIC UNITS .....	12
HOW TO USE THE BICEPS LOCATOR.....	12
HOW TO USE THE FITNESS WHEEL.....	14
WARNING MESSAGES.....	15
CARE OF THE FUTREX-1100 .....	16
GENERAL SPECIFICATIONS.....	18
PROGRESS CHART .....	19
CALORIE EXPENDITURE TABLE.....	20
METROPOLITAN HEIGHT AND WEIGHT TABLES .....	21

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## **INTRODUCTION**

**Congratulations! You have made a purchase which can have a profound effect upon your future health.**

**Numerous studies have shown that percent body fat has a significant correlation to both health and life expectancy. For example, the Framingham studies of the National Institutes of Health (N.I.H.) provide convincing evidence that high body fat significantly increases the risk of heart attacks, strokes, and even some types of cancer.**

**High body fat is usually caused by a combination of poor diet and lack of exercise. In order to decrease body fat, many people chase the elusive "perfect diet". However, it is not possible to significantly decrease one's percent body fat by diet alone. Some regular exercise is necessary to decrease body fat; however, such exercise need not be strenuous.**

**The FUTREX-1100 unit performs three important functions:**

- If you are above the recommended percent body fat, it provides a continuous monitoring of your progress toward achieving a healthy percent body fat;**
- If you already have a healthy body fat level, the unit assists you in maintaining this healthy state;**
- If you are a competitive athlete it guides your training to ensure peak performance.**

**A WORD OF CAUTION: Any diet and exercise program should only be started after consulting with a medical professional.**

## **FUTREX-1100 MEASUREMENT TECHNIQUE**

In the 1960's, the U.S. Department of Agriculture (U.S.D.A.) discovered that near-infrared light, just outside the visible part of the spectrum, could provide quantitative chemical analysis of the contents of agricultural products. This measurement technique can be easily illustrated by placing a flashlight in the palm of your hand in a darkened room. The white light that enters the hand becomes a reddish glow when it leaves the hand due to the presence of blood in the hand, i.e., the color of the exiting light provides a non-destructive, instantaneous determination that there is red blood in the hand.

The FUTREX-1100 uses a very similar approach. Extensive research at the U.S.D.A. has determined that human body fat absorbs light at specific wavelengths in the near-infrared portion of the spectrum. The FUTREX-1100 emits these near-infrared wavelengths. Also, the FUTREX-1100 contains an optical sensor to measure how much of this energy is absorbed by your body fat. Internal to the FUTREX-1100 is a powerful micro-computer which interprets this absorption of near-infrared light by your arm, in combination with knowing your height and weight, and displays your percent body fat.

A study by the U.S. Department of Agriculture determined that measurements taken at the mid-biceps of the dominant arm (usually the hand you write with) will represent the overall percent body fat of the entire body.

The near-infrared absorption technology used in the FUTREX-1100 has been shown to be well within the accuracy of  $\pm 4.5\%$  on the average population. Additionally, due to the smaller number of test variables, the repeatability of near-infrared is superior to all of the other body fat determination methods.

## **EXPECTATIONS**

Everyone's body responds to diet and exercise differently. For example, the "average person" who loses one pound of weight due to dieting, actually loses approximately 3/4 of a pound of fat and 1/4 pound of lean. However, if that same "average person" loses one pound of body weight due to exercise, he actually loses approximately 1-1/4 pounds of fat and gains 1/4 pound of lean (muscle). Thus, the benefit of exercise is obvious.

You should be aware that when you start an exercise program there will not be an immediate reduction in your percent body fat. This is because the body will first lose water. As you continue your program, you will begin to lose body fat. It usually takes several weeks before noticeable loss in percent body fat occurs.

To help you track your progress, it is suggested you use the table on page 19 of this manual.

Fortunately, your percent body fat can be readily controlled using a combination of reasonable eating habits coupled with moderate exercise. However, the key to body fat control is knowledge, i.e. periodically measuring your body fat and comparing it to recommended values. Such knowledge is like a rudder on a ship, it allows you to steer in the right direction.

The FUTREX-1100 provides this important knowledge in the privacy of your home.

## PART NAMES

Main Body with Optical Standard Attached

Optical Standard

CAUTION:NEVER TOUCH THE INTERNAL SURFACE OF THE OPTICAL  
STANDARD!!

## Main Body - Optical Section

### BATTERY INSTALLATION

Remove the battery cover on the rear of the unit. Remove the cellophane wrapping on the battery. Insert one 9 volt battery into the battery holder clip. Replace the battery cover.

**WARNING:** The battery will only fit on the battery clip one way. However, if you force the battery on to the clip in the opposite way to which it was designed, severe damage to the FUTREX-1100 will occur.

## **HOW TO MEASURE PERCENT BODY FAT**

### **STEP 1: Locating the Proper Measurement Spot.**

The body fat measurement is made on your dominant arm, i.e., the arm of the hand which you write with. Using the FUTREX BICEPS LOCATOR, find the measurement point. (Description of how to use this device is on page 12.)

### **STEP 2: Press the ON/ENTER key to turn the unit on.**

The display will read either 60.0 or the height of the person measured last, followed by either *in* or *cm*, i.e. inches/centimeters. (See page 12 on how to change height/weight readings to lb/in or kg/cm.)

### **STEP 3: Measurement Set Up Sequence:**

#### **CHANGING THE HEIGHT**

Height is entered into the FUTREX-1100 by pressing the HEIGHT/WEIGHT key when either *in* or *cm* is showing in the display. Press the HEIGHT/WEIGHT key to increase the displayed number. To decrease the number, simultaneously press the FUNCTION/MEASURE key and the HEIGHT/WEIGHT key.

The height should be entered to within 0.5 inch (1 cm).

When the correct height is displayed, press the ON/ENTER key. This will store the height into the FUTREX-1100 computer's memory. The height will be held in memory even if the unit is turned off.

## **CHANGING WEIGHT**

Weight is entered into the FUTREX-1100 by pressing the HEIGHT/WEIGHT key when either *lb* or *kg* is showing on the display. Press the HEIGHT/WEIGHT key to increase the displayed number. To decrease the number, press the FUNCTION/MEASURE and HEIGHT/WEIGHT keys simultaneously.

The weight should be entered to within 2 pounds (1 kg).

When the correct weight is displayed, press the ON/ENTER key. This will store the weight into the FUTREX-1100 computer's memory. The weight will be held in memory even if the unit is turned off.

## **STEP 4:Zero Adjusting the Instrument**

The letters *Std* will appear on the display after the weight is entered. This indicates that the Optical Standard needs to be read. Place the Optical Standard on the unit with "FUTREX-1100" facing towards the front of the unit. Ensure that the cap is **FIRMLY** seated on the FUTREX-1100. Press the ENTER key.

The display will briefly show --- and then 1. This indicates that the FUTREX-1100 has been "zero adjusted" and is ready to read your body fat. Remove the Optical Standard.

## **STEP 5:Making the Percent Body Fat Measurement**

Place the FUTREX-1100 firmly on the point located in Step 1. This is the midpoint of the biceps.

<p>For accurate readings, the instructions below must be followed exactly.</p>
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**The FUTREX-1100 MUST be pressed down until the sensor window is touching the skin. This pressure will cause the Ambient-Light Blocking Foam Barrier to be completely compressed. If adequate pressure is being applied, a slight rectangular mark will be left on the surface of the skin when the FUTREX-1100 is removed.**

**The biceps MUST be relaxed. You should be seated and have the arm to be measured resting on a table or the arm of a chair. The hand should NOT be made into a fist; the palm should be open and facing upwards. RELAX the arm. If the arm is not relaxed an incorrect reading will occur.**

**The front of the FUTREX-1100 should be facing upwards so that the surface of the display is facing your shoulder. The unit should be perpendicular to the surface of your arm.**

**NOTE TO NEW USERS: As with any measurement instrument, results improve as the operator gains experience in using the instrument. Thus, it is strongly recommended that a new owner practice measurements on himself or an associate. It is suggested that you do at least 15 measurements to obtain a consistent technique.**

**The 1 on the display indicates that the FUTREX-1100 is ready to make the first of two readings. The FUTREX-1100 takes two independent measurements in order to most accurately obtain your body fat. With the FUTREX-1100 held firmly in place, press the FUNC MEASURE key. Hold the unit steady until a 2 appears on the screen.**

**Raise the FUTREX-1100 off the arm and then set it back on the same place on the biceps. With the FUTREX-1100 held firmly in place, press the FUNC MEASURE key. Hold the unit steady until your percent body fat appears on the screen.**

**The significance of your body fat can be ascertained by using the FITNESS WHEEL. See page 14.**

## **TO CONSERVE BATTERY LIFE**

The unit will automatically shut off if a reading is not taken for three minutes.

The height and weight of the last person measured will be retained in the computer's memory when the unit is turned off.

## **ADJUSTING THE BODY FAT PERCENT READ-OUT**

The FUTREX-1100 has been calibrated to provide body fat percentages based upon studies from two prestigious hydrostatic facilities.

Some users may desire to have the FUTREX-1100 reading traceable to another form of body composition analyzer. For those users, the following adjustment procedure has been provided.

With the FUTREX-1100 turned off, press the FUNCTION/MEASURE key. Continue holding the key down while pressing the ON ENTER key. Notice the arrows to the left of the  $\nabla 0.00$  display. Release the FUNCTION/MEASURE and the ON/ENTER keys.

If you want to increase the body fat reading, press the HEIGHT/WEIGHT key.

If you want to decrease the body fat reading, press the FUNCTION/MEASURE key while simultaneously pressing the HEIGHT/WEIGHT key.

Press the ON/ENTER key when the desired adjustment value is on the display. This will store the value in the computer's memory, thus all future percent body fat readings will include this correction.

Press the ON/ENTER key again and the FUTREX-1100 will return to the measurement mode.

### **SELECTION OF ENGLISH OR METRIC UNITS**

The FUTREX-1100 allows you to enter height and weight in either English (inches/pounds) or Metric (centimeters/kilograms) units. The following procedure changes the height and weight measurement units.

Turn on the FUTREX-1100.

The measurement unit presently being used is located to the right of the numeric display.

While holding the ON/ENTER key down, press the FUNCTION/MEASURE key to toggle between the measurement units. Release the FUNCTION/MEASURE and ON/ENTER keys when at the desired unit.

### **HOW TO USE THE BICEPS LOCATOR**

In order to achieve measurement accuracy and repeatability, the measurement should always be done at the same place on the arm -- the midpoint of the biceps. The *dominant* arm should be used; this is the arm of the hand which you write with. To locate the correct measurement site:

Unfold the BICEPS LOCATOR into a single straight ruler.

Place the edge of the BICEPS LOCATOR labeled *TO UNDERARM* at the lower edge of the crease of the underarm (i.e., the antecubital fossa).

The arm must be relaxed with the elbow slightly bent. Measure the length of the arm between the underarm crease and the center of the elbow crease (i.e. the acromion), using the scale printed on the BICEPS LOCATOR.

Note the number on the ruler next to the elbow crease. Locate this same number on the ruler starting from the *TO UNDERARM* end. Place a small pen mark on the side of the arm adjacent to the BICEPS LOCATOR. The proper measurement point is the "belly" of the muscle adjacent to the pen mark you have made. This is the point at which the sensor of the FUTREX-1100 should ALWAYS be placed when making measurements.

## **HOW TO USE THE FITNESS WHEEL**

The Framingham Study and other medical studies have demonstrated that unduly high percent body fat increases the risks of heart attack, stroke, diabetes, certain forms of cancer, and other diseases. The FUTREX FITNESS WHEEL provides a simple method for determining your category of fitness based on a statistically large group of individuals.

For most people, it is highly desirable to be in the EXCELLENT or GOOD range. An exception could be participation in an athletic training program under proper medical supervision.

The *RISKY* category indicates that the percent body fat is below the level that is normally considered desirable.

To use the FITNESS WHEEL:

- Set the arrow on the wheel to your percent body fat.
- Locate the proper window for your sex.
- Locate your age within the window.
- Note the color displayed in the window next to your age.
- Match the color with your fitness category on the FITNESS WHEEL.

## **WARNING MESSAGES**

### **+Blinks on and off**

Indicates that the battery is low. The battery should be replaced as soon as possible. The height and weight that are stored in the FUTREX-1100 will have to be re-entered when the battery is removed.

### **+On**

Indicates that the battery needs to be changed. Replace the battery immediately. The height and weight that are stored in the FUTREX-1100 will have to be re-entered when the battery is removed.

### **LLL** Appears in the display

An extremely low reading and therefore erroneous reading has occurred (below 1%).

### **HHH** Appears in the display

An extremely high reading and therefore erroneous reading has occurred (above 50%). This is normally due to light leaking in under the Ambient-Light Barrier Foam.

## **CARE OF THE FUTREX-1100**

**Do NOT use in a high humidity area, e.g. saunas or shower rooms.**

**Do NOT use under high intensity light or direct sunlight.**

**If you are perspiring heavily, wipe off the upper arm prior to making a measurement.**

**Avoid touching the unit's optical section, especially the area around the infrared emitting diodes and the sensor. If this area becomes soiled or oily, simply wipe the surface with a clean damp cloth.**

**Optical Standard:**

**Do NOT touch the optical standard surface (the center area of the cap which covers the optical section). Avoid dust, oil, or scratches on the optical standard. Damage to the Optical Standard will cause erroneous readings.**

**ALWAYS place the standard carefully on a table out of harms way when not being used.**

**OPTICAL STANDARD**

**CAUTION:NEVER TOUCH THE INTERNAL SURFACE OF THE OPTICAL STANDARD!!**

## **GENERAL SPECIFICATIONS**

**MEASUREMENTS:Measuring principle:**

Near-infrared interactance spectroscopy technique based upon technology from the United States Department of Agriculture.

**Measuring range: 2.5% to 50%**

**POWER SOURCE:One 9 volt battery**

**DIMENSIONS:4 x 2 1/4 x 11 1/4 in  
10 x 5.7 x 3.2 cm**

**WEIGHT:5 1/4 ounces  
150 grams**

**STANDARD ACCESSORIES:Video Tape  
IBM Software  
Fitness Wheel  
Biceps Locator  
User's Manual  
9 volt battery**

**PROGRESS CHART**

<b>WEEK OF</b>												
<b>BODY FAT %</b>												
<b>WEIGHT</b>												
<b>CATEGORY FROM FITNESS WHEEL</b>												

The following table provides calorie expenditures as a function of activity type and duration

**Activity Table with Calorie Expenditures  
CALORIES EXPENDED BASED ON 150 LBS BODY WEIGHT**

ACTIVITY Minutes	6	1	10	20	30	40	50	60	90
Sleeping		1.2	12	24	36	46	60	72	108
Sitting, reading		1.2	12	24	34	48	60	72	108
Dressing or Washing		3.1	31	62	93	125	156	187	280
Standing		1.4	14	29	43	58	72	86	129
Walking Downstairs		6.7	67	134	202	269	336	403	605
Walking Upstairs		17.5	175	350	526	701	876	1051	1577
Walking, 30 min/mile		3.5	35	70	105	139	174	209	314
Walking, 15 min/mile		6.2	62	125	187	250	312	374	561
Jogging, 10.9 min/mile		10.8	108	216	324	432	540	648	973
Running, 8.6 min/mile		14.2	142	283	425	566	708	850	1275
Sprinting, 5 min/mile		19.7	197	394	591	787	984	1181	1772
Cycling, 10.9 min/mile		5.0	50	101	151	202	252	302	453
Cycling, 4.6 min/mile		10.7	107	214	321	427	534	641	962
Domestic work		4.1	41	82	123	163	204	245	368
Making beds		3.8	38	77	115	154	192	230	345
Washing floors		4.6	46	91	138	182	228	274	411
Washing windows		4.2	42	84	126	168	210	252	378
Preparing a meal		3.8	38	77	115	154	192	230	345

**NOTE: This table is based upon 150 lb. (68 kg)**

**To convert to your weight, multiply by the ratio of your weight to 150 (e.g. if you are 200 lb., use 200/150 or 1.33 times the values in this table).**

MEN				WOMEN			
Height (in)	Small Frame	Medium Frame	Large Frame	Height (in)	Small Frame	Medium Frame	Large Frame
62	128 - 134	131 - 141	138 - 150	58	102 - 111	109 - 121	118 - 131
63	130 - 136	133 - 143	140 - 153	59	103 - 113	111 - 123	120 - 134
64	132 - 138	135 - 145	142 - 156	60	104 - 115	113 - 126	122 - 137
65	134 - 140	137 - 148	144 - 160	61	106 - 118	115 - 129	125 - 140
66	136 - 142	139 - 151	146 - 164	62	108 - 121	118 - 132	128 - 143
67	138 - 145	142 - 154	149 - 168	63	111 - 124	121 - 135	131 - 147
68	140 - 148	145 - 157	152 - 172	64	114 - 127	124 - 138	134 - 151
69	142 - 151	148 - 160	155 - 176	65	117 - 130	127 - 141	137 - 155
70	144 - 154	151 - 163	158 - 180	66	120 - 133	130 - 144	140 - 159
71	146 - 157	154 - 166	161 - 184	67	123 - 136	133 - 147	143 - 163
72	149 - 160	157 - 170	164 - 188	68	126 - 139	136 - 150	146 - 167
73	152 - 164	160 - 174	168 - 192	69	129 - 142	139 - 153	149 - 170
74	155 - 168	164 - 178	172 - 197	70	132 - 145	142 - 156	152 - 173
75	158 - 172	167 - 182	176 - 202	71	135 - 148	145 - 159	155 - 176
76	162 - 176	171 - 187	181 - 207	72	138 - 151	148 - 162	158 - 179

The Metropolitan Life Insurance Tables are reproduced in order to give you a general idea of what your weight should be for your sex, age, and frame. These tables are based upon a statistical compilation of millions of U.S. inhabitants, and are generally accepted as a reasonable guide for determining your desirable weight.

**WARNING!!!** If your weight significantly differs from the tables, it is advised that you consult with a medical professional.

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