FUTURA Egg-Shell-Tester V. 2.0

User Manual

Date: October-01-2014

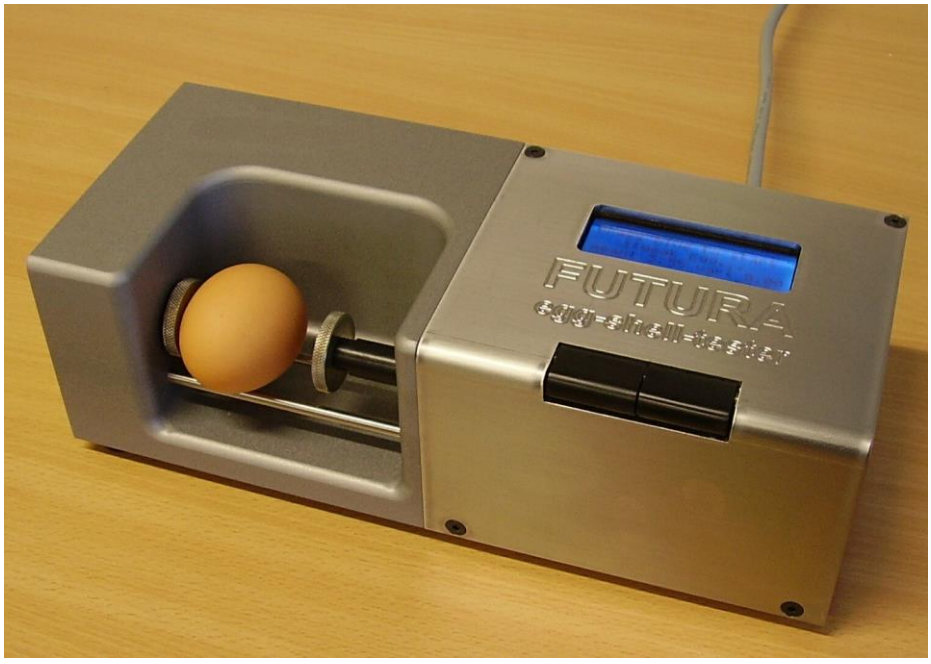


Figure 1: Front view of FUTURA Egg-Shell-Tester

Contents

Introduction:

The FUTURA Egg-Shell-Tester (FEST) serves as a measuring device for the breaking strength of hen´s eggs. It can be used as a stand-alone device or connected either to a printer or a PC.

First-time operation:

Unpack the FUTURA Egg-Shell-Tester and place it on a suitable surface. At the bottom of the device are 4 screws. If necessary, adjust the proper position of the device with these screws.

For operation a power supply is needed, e.g. 230V 50Hz. The device itself needs a DC voltage of 12V and has a power consumption of about 1A. This voltage is provided by an included external power supply. If the machine is operated on an electricity network other than the German 230V 50Hz standard, a different external power supply is needed.

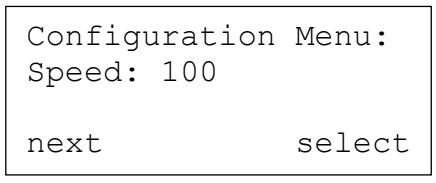
You can get a suitable printer for this device from FUTURA. The printer will be delivered with a cable for the connection between printer and the egg-shell-tester.

Alternatively you can connect the Egg-Shell-Tester to a PC. A corresponding connector cable and software will be supplied. The device can also be used with the FUTURA data collector and the FUTURA 3/A software. Please refer to the FUTURA 3/A user-manual.

The above motioned software for the FUTURA Egg-Shell-Tester generates a text file each series of measurements you can import into e.g. Microsoft Excel.
If you use the FUTURA Egg-Shell-Tester in conjunction with the data collector and the FUTURA 3/A software, the measured data is written into a Firebird SQL database. This data is transmitted via the FUTURA 3/A into your Excel software.

Configuration:

To enter the setup menu, hold the left button pressed down while you start the Egg-Shell-Tester until the display shows "Enter menu...". Shortly after the first menu page will open:



The first option is "Speed" and the current value of this option is 100.

Press the left button "next" to scroll through the various options.

Available options:

Speed: Controls the speed of the motor. Possible values are from 15 (slow) to 100 (fast; factory default).

Minimum: Optionally you can set a Minimum value in Newton. Measurements below this value are not included in the statistics. Possible values are from 0 N (no minimum; factory default) to 75 N.

Datamode: Here you can select the output mode for the serial interface:
00: Output for printer (factory default)
01: „123,45<cr><lf>" in Newton for FUTURA 3/A
02: „2345 g" in Gramm, without <cr><lf>
03: „35<cr><lf>" in Newton
04: „345<cr><lf>" → 34.5 in Newton

Debugmode: Option for troubleshooting. 00 = off (factory default)
01 = on

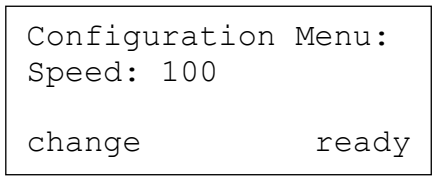
Elastmode: Switches the system into elasticity mode.
"00" Breaking strength measurement (factory default)
"01" Elasticity measurement

Elastmin: Start value of the elasticity measurement. Values between 05 N (default) and "Elastmax" (see below) are possible.

Elastmax: Final value of the elasticity measurement. Values between "Elastmin" and 80 N are possible. The factory default is 20 N.

Exit: Exit the menu.

If you want to change an entry, tap the left button ("next") until the entry you want to change is displayed. Now press the right button ("select") and the bottom of the screen will show "change" and "ready".



With each push of the left button ("change") the value is incremented by 1. If the maximum value is exceeded the value is reset to the minimum (e.g. if at speed: 98 the left button is pushed four times, the resulting values are: 99, 100, 15, 16).
When pressing the right button the current value is saved and the next menu option is displayed.

Operation with printer:

Connect the printer to the FUTURA Egg-Shell-Tester with the printer cable (9-pin male to 25-pin male).

Connect the printer using the supplied AC adapter to a power socket (230V / 50Hz) and turn on the printer. Located on the control panel of the printer are to two LEDs. Both LEDs should glow when the printer is in use. If the right LED (SEL) does not glow, you have to set the printer to SEL pushing the SEL button. If the SEL-LED is dark, you can release a line feed with the LF-button. Only when the SEL-LED is glowing the printer accepts data from the Egg-Shell-Tester.

Now connect the FUTURA Egg-Shell-Tester to the power supply and switch it on. The power switch of the Egg-Shell-Tester is on the back side of the device.

If everything is correctly connected, the printer now prints the initial text lines to start a measuring row. When this is finished, the Egg-Shell-Tester is ready to operate.

After initialisation the message „Press left to start“ is displayed.

Now you can press the left key on the Egg-Shell-Tester to start a new measurement.

Before you start the measurement, put an egg on the guide rods as you can see in fig. 1.

You can measure the breaking strength across the equator as shown in fig. 1 or along the poles of the egg. Simply place the egg in the appropriate position in the FUTURA Egg-Shell-Tester.

After you have pressed the left key on the Egg-Shell-Tester, the mechanism starts moving. The right piston moves towards the left and presses the egg against the force sensor located on the left side of the Egg-Shell-Tester. When the piston reaches the egg, the egg breaks and the result is shown on the display of the Egg-Shell-Tester and is send to the printer.

If the force needed to break the egg is too high, you get the message „overload“.
If the egg is too weak or was broken before, you get the message „weak egg“. This result will not influence the statistics.

If the measurement was successful, you get the following message:

```
Press left to start
   1: 2.8kg  27.53N
mean: 2.84 var: 0.0
weak: 0 no: 0 ol:0
```

Here, we see the result of the first measurement. The result was 27.53 Newton or 2.8 kg. The mean value is also about 2.8 kg and the variance is 0.

To start the next measurement, you have to remove the broken egg and put the next egg in the Egg-Shell-Tester. After this, simply press the left key again.

Please note that after the measurement, the piston only retracts approx. 1cm. Normally this should be sufficient to insert the next egg of a series of measurements. If the space should not be sufficient, you retract the piston further by pressing the right key shortly.

Now you can test an almost arbitrary number of eggs. After some measurements the display of the Egg-Shell-Tester will look like the following:

```
Press left to start
  23: 4.5kg 44.15N
mean: 4.03 var: 0.37
weak: 2 no: 0 ol:0
```

After each measurement the result is also printed on the printer or transferred to a PC.

To finish a series of measurements, hold the right key down for about 3 seconds. As a result you will get a printout of the statistics and afterwards a new measuring row will be started.

```
**************************************
*    FUTURA Egg-Shell-Tester V2.00    *
* FUTURA Werner Fuerste D-49393 Lohne *
*         Tel. +49 4442 3357          *
**************************************
Datum     :
Legedatum :
Stall     :
Herde     :
Woche     :
Bediener  :
---------------------------------------
1:   4.35kg    42.67N
2:   4.83kg    47.39N
3:   5.20kg    51.05N
4:   4.50kg    44.15N
5:   4.99kg    49.00N
6:   4.92kg    48.22N
7:   6.36kg    62.44N
8:   5.04kg    49.40N
9:   6.06kg    59.49N
10:  5.73kg    56.21N
---------------------------------------
total     :     10
good      :     10
weak      :      0
no egg    :      0
overload  :      0
mean value:      5.20kg    51.00N
variance  :      0.39kg     3.81N
```

If you want to switch off the Egg-Shell-Tester, you should move the piston to the right position. This can simply be done by starting a measurement without an egg in the machine. The machine tries to break the egg, moves the piston to the left, gives the message “no egg” and moves the piston to the rightmost position. Afterwards you can switch off the machine.

Operation with a PC:

Operation with a PC is generally identical to the printer. Connect the FUTURA Egg-Shell-Tester to a PC where the FUTURA Egg-Shell-Tester software is installed and start the program.
You get the results on the screen of the PC similar to the results on the printer. Additionally, the data is stored in text files which can simply be imported to Microsoft® Excel®.

Operation with the FUTURA 3/A System:

Please refer to the FUTURA 3/A user manual.

Elasticity-Mode (deformation measurement):

The operation of the instrument in Elasticity-Mode does not differ fundamentally from the measurement of breaking strength.

To activate the Elasticity-Mode set the value "Elastmode" in the settings to 1. In addition the settings "Elastmin" and "Elastmax" define the start and end force of the measurement in Newton (Caution: Too high Elastmax values can lead to broken eggs).

During the elasticity measurement the egg is not broken. Although repeated measurements of the same egg with high Elastmax values can break the egg.
The results of the measurement are displayed in Newton per second:

```
Press left to start
  13:     415 N/s
mean: 492 var: 372
        no: 0 weak:0
```

Average and variance are displayed as "mean" and "var" the same way they are during the breaking strength test. The same goes for "no egg" and "weak Egg". An "Overload" cannot occur due to the type of measurement.

If you completed a series of measurements by pressing and holding the right button, a summary is printed on the printer. The protocol looks for example as follows:

```
**************************************
*    FUTURA Egg-Shell-Tester V2.00    *
* FUTURA Werner Fuerste D-49393 Lohne *
*         Tel. +49 4442 3357          *
**************************************
Datum     :
Legedatum :
Stall     :
Herde     :
Woche     :
Bediener  :
--------------------------------------
1:     884 N/s
2:     894 N/s
3:     889 N/s
4:     890 N/s
5:     885 N/s
--------------------------------------
total     :       5
good      :       5
weak      :       0
no egg    :       0
mean value:     884 N/s
variance  :      14 N/s
```

Calibration:

The Egg-Shell-Tester should be calibrated at regular intervals, for example every 2 months. In addition a calibration is recommended after each change of location or should any Transport, repair, etc. take place.

In order to calibrate the equipment, you need a 1kg alignment weight. It is important that this calibration weight is not too high. Possibly you must remove the right piston, by unscrewing it carefully.

Attention: Do not try to remove the piston on the left side of the egg-shell-tester. By doing so you could damage the measurement gauge.

In order to calibrate the equipment, you must first switch it off. Make sure that the stamp is moved completely to the right side of the Egg-Shell-Tester. If necessary, remove the right stamp´s head part. You can hold the axle with an 11mm wrench and carefully unscrew the head.

Now, you have to place the Egg-Shell-Tester on its left side on a flat surface, so that the measurement gauge is at the bottom and the movable stamp at the top.

Now, hold the right (upper) key and switch the Egg-Shell-Tester on while the key is pressed.

You get the message: „enter calibration“. Now release the key.
The next message displayed is: „Calibration, auto zero“
After a few seconds the message „Calibrate 1kg, Press right key“ and a value, e.g. 7203 appears. This value represents the internally used value for the force. It can vary slightly, about +- 10, e.g. from 7197 to 7208.

Now place the 1kg calibration weight to the stamp of the measurement gauge. The internal measurement value should now change, e.g. to 15350. This value can also vary slightly. The calibration weight should not have contact to the supporting bars or the housing of the egg-shell-tester.

If everything is ok, press the right key for a short moment. The calibration is performed automatically.

Finally you get the message "Calibration OK" and the device starts normally. The calibration data is now stored internally.

Maintenance:

Normally no maintenance work is necessary. After each measurement the equipment should be cleaned with a dry cloth. Any cleaning products or solvents leaking into the casing may damage the equipment. If there is a problem with your Egg-Shell-Tester or if any part the equipment seems to be defect, please contact your supplier or send it for repairs to FUTURA.

Appendix:

Specifications:

Designation:	Futura Egg-Shell-Tester V2.0
Power supply:	12V DC, 0.7A, external power supply
Power consumption:	about 9 Watt
Protection:	IP40, protection against contact
Operating Temp.:	10 ° C to 45 ° C, Storage 0 to 60 ° C
Humidity:	max. 90% non-condensing
Dimensions:	300 x 100 x 130 mm (w, h, d)
Weight:	5.5 kg
Accessories:	AC adapter (output 12V/1A, input 100-240V/50-60Hz)
	manual
	carrying case
Optional:	roll printer with data cable
	data cable for PC
	adaptor RS232 to USB
	software CD
	footswitch
	calibration weight 1kg

Safety:

This device fulfills the conditions of 2004/108/EC (Electromagnetic Compatibility) and 2006/95/EC (Low Voltage) as amended by 93/68/EC (CE marking).

Supplier:
FUTURA – Werner Fürste
An der Wehr 11
D - 49393 Lohne
Tel.: +49 (0) 4442 3357
Fax: +49 (0) 4442 71505
Mail: mail@futura-fuerste.de
www.futura-fuerste.de