RN-820 Rice Grain Freshness Tester

Ver. 108b

User’s Manual

SAFETY ISSUES

This product may cause accidental loss and damage if the following cautions for use are not followed. Safety is fully considered in the product design, but we ask you that you please read this manual in order to get the best, most realiable results from the instrument.

Observe cautions for safety
Please read and observe the cautions in this manual.

Do not attempt to use in case of malfunction
In case of malfunction or mechanical failure, please contact our repair service personnel.

About the symbols
To avoid accidents due to incorrect operation, the following symbols are used in this manual:

/!/ May lead to injury or material loss if the careful attention is not given.

(!) Indicates the contents need to be fully understood for safe operation.

TERMS OF SERVICE

Please read the following terms of service before installing the instrument and the software.
By installing the software, you assent to the following conditions of use. If you do not assent, stop using the instrument immediately, delete all files provided and return them.

THE CONDITIONS OF USE FOR THE RN-820 RICE GRAIN FRESHNESS TESTER

1. This product is a copyright production of Kett Electric Laboratory Inc. All rights reserved by the company.
2. The company prohibits ay modification in any form, in part or in whole.
3. The company is not responsible for any loss and damage due to incorrect operation i.e., operation tat varies from the directions for use in this manual. The company is not responsible for any damage due to modification done by unauthorized parties.
4. The company may alter the hardware and /or software without notice and approval of the user.
5. There may be cases where the display screens and the file structure shown in this manual are slightly different from yours due to version upgrades, etc.

The name and the logo marks of Microsoft and Windows are the registered trademarks or trade marks of Microsoft Co. in the U.S.A. and in other countries. Other company names and product names that appear in this manual are registered trade marks or trade marks of the companies, respectively.

For any questions about the use of Microsoft Windows XP or Windows 2000, please refer to their respective user's manuals.

PC REQUIREMENT

1) Windows XP (Home Edition or Professional.
   The administrator of the PC should be the only user.
2) USB 1.1 or later, with at least two ports.
   The scanner must be DIRECTLY connected to the USB port. If you are using

USB 2.0, you must have the correct PC drivers.

The USB interface must be completely compatible with USB 1.1 or later.

3) Hard disk capacity of 100MB or more.

4) CD-ROM driver installed.

C O N T E N T S

1. FUNCTIONS AND FEATURES OF THE RN-820 RICE RAIN FRESHNESS TESTER

This photograph represents a simulated measurement image and thus differs from an actual measurement situation. The laptop PC is not provided in the RN-820 production package.

The RN-820 is a rice freshness evaluator. It scans and records the visual image of every single grain colored with the acid (pH) test chemical solution to determine the freshness of the grains. This grading method is an application of the acid test chemical, and thus the results may not be identical with those of other tests.

The RN-820 Can:
Evaluate the freshness of every singe grain.
Evaluate the freshness according to the 5-grade classification used by the Japan Grain Inspection Association.
Display measurement results graphically.
Save the results as image data.

2. ACCESSORIES

Your PC must meet the system requirements specified above.

Scanner
Rice grain liner plate
Blind mask
Trays (3)
Petri dishes (5)
Color correction plate (a set of two)
Template
Exclusive freshness test chemical “Freshness Meister” Two 500ml bottles
Lens cleaner
Tweezers
Spoon
Stick
Measurement cup
AC adaptor
Power cable
USB cable
RN-820 Software
User’s manual

OPTIONS

Compact rice miller “Pearlest”

The “Pearlest” is a compact rice milling machine that whitens brown rice in a short time, providing a sufficient bran-free sample for the freshness test.

3. SPECIFICATIONS

Model: RN-820
Measurement Method: Capturing the scanned images of the color-reacted grains in the acidity indicator to evaluate them using the image processing software
Grains to measure: Non-glutinous rice

For glutinous rice and wash-free (boil-ready) rice, the freshness grade classification based on the Japan Grain Inspection Association cannot be used. However, the acidity indicator test can aid in the user's quality inspections.

Grain number to be measured at one time: 72 grains
Result evaluation: The 5-grade freshness classification based on the criteria of the Japan Grain Inspection Association
The grades classification can be altered by the user.
Display contents: Evaluation result: The grade and the acidity indicator result of the sample, the average and that of single grain.
Graph: Circle graph displaying the acidity distribution + Histogram
Scanned Image: Color images of each individual grain
Numerical Data: Statistical data of the sample grains
Ambient temperature for use: 5~35C (15~30C recommended)
Ambient humidity for use: 10~80% without condensation
Power: AC100V±10% 50/60 Hz
Dimensions: 276(W) x 450 (D) x 116(H) mm (Scanner body)
Weight: Approx. 3.1 kg (Scanner body)
Accessories: Scanner (USB 2.0 compatible), rice grain liner plate, blind mask, Trays (3), Petri dish (5), color correction plate, template, exclusive freshness test chemical solution "Sendo Meister", 500ml (2 bottles), lens cleaner, tweezers, spoon, stick, measurement cup, AC adaptor, power cable, USB cable, RN-820 software, user's manual
Option: Our company's compact rice milling machine, the "Pearlest"

4. SOFTWARE INSTALLATION PROCEDURE

Turn the PC power on.
The software installation procedure is as follows.

4-1. INSTALING THE EPSON SCANNER DRIVER

Start up the “SETUP.exe.” in the folders “EPSON_Driver” and select “GT8700_GT8300_TWAINS5.7f” in the CD-ROM.
For details about the scanner, refer to “GT8300UF” at the EPSON web site.

Reboot if necessary.

4-2. INSTALLING THE RN-820 SCANNER DRIVER

This is requested for the RN-820 software to command the EPSON scanner.

Start up the “SETUP.exe” in the CD-ROM.
Follow the directions that appear on the screen.

4-3. INSTALLING RN-820 “SENDO MEISTER” SOFTWARE

This is requested to install the RN-820 software in your Windows PC.

Start up the “SETUP.exe.” in the CD-ROM.
Follow the directions that appear on the PC screen.
Once you have installed the software, you will see “KETT Sendo Meister” displayed in the “Start menu” of the PC.

5. CONNECTING THE SCANNER

5-1. INSTALLATION

The image capture with the scanner is done by scanning a petri dish filled with the acidity test solution. Please verify tat the installation ground is completely level.

5-2. UNLOCK THE TRANSPORTATION SAFETY LOCK

Release the transportation safety lock by sliding the lever to the “off” position.

CAUTION

When you move the scanner, be sure to lock it back. Damage may occur to the scanner if left unlocked while in transportation.

5-3. CONNECT THE POWER CABLE

Connect the power cable with the AC adaptor. Insert the other cable end of the adaptor into a 100V power outlet.

Noise will be heard if you connect the power cable with the transportation safety lock still in the “on” position. Pull out the cable immediately, unlock the lock and connect again.

5-4. CONNECT THE PC

Connect the scanner and the PC with the supplied USB cable. Once connected, a “New hardware found” message will pop up and the PC automatically proceeds with installation.

Always be sure to connect the scanner directly to the PC via its USB port. Using USB a hub or other hardware between them may lead to failure of registration or function.

5-5. SETUP THE SCANNER BIAS

NOTE: THE FOLLOWING STEP IS REQUIRED FOR STARTING UP THE “KETT FRESHNESS (SENDO) MEISTER” FOR THE FIRST TIME ONLY

Start up the “KETT Sendo Meister”.

Select “Other” and go to “Detailed Settings”. Once you have installed the software and are starting up for the first time, you need to enter the scanner BIAS. Enter the correction coefficient printed on the sticker on the scanner’s back.

Once you have entered the correction coefficient, it is not necessary to repeat this step. The example here shows the coefficient as “0.13”.

Click the “Close” button to complete set up.

The scanner is now ready to use.

6. OPERATION

6-1. PREPARATION FOR MEASUREMENT

1) Starting up “KETT Freshness (SENDO) Meister”.

Start up the “KETT Freshness (SENDO) Meister” in WINDOWS.

NOTE:

For the measurement accuracy, wait for the temperature of the scanner body to become equal to the ambient temperature. The recommended temperature for use is 15~30C.

2)Color Correction

For measurement accuracy, be sure to perform the color correction procedure daily before measurement.

＊Open the scanner cover and remove the blind mask.
＊Clean the glass surface of the scanner with the supplied lens cleaner.
＊Place the template over the scanner glass. The face of the template is indicated on the template.
＊Note the two holes, one small and one large, in the template.
＊Place the two color correction plates over the two holes according to their size.
＊Place the sticker side up and on the far side. The number on the sticker must be readable.
＊Select “Other” and then “Color correction” to open the dialogue box.
＊Enter the number on the correction plate case in “Enter the number”. (First time only.)
＊Close the scanner cover.
＊Click the “Measurement” button.
＊The correction will be completed in approximately five minutes.
＊Click the “Close” button to complete the procedure and close the box.

6-2. MEASUREMENT PROCEDURE

1) Start up the “KETT Freshness (SENDO) Meister” in WINDOWS.

2) Preparation of the scanner

Open the scanner cover.

Perform color correction when the ambient temperature and/or humidity have significantly changed.

Place the bind mask over the glass surface of the scanner.

The glass surface must be clean. A contaminated surface will impair measurement accuracy.

The blind mask has a protection sheet at the time of shipping. Remove this sheet before using.

3) Preparation of the measurement sample

Name the sample and enter it. (Refer to 7-1.)

“Sample name” is the default. The name of the sample will be used in the visual image file name (refer to 7-1) and Excel data. (Refer to 7-3.)

Pour 25ml of acidity test solution very carefully in the petri dish, trying not to make bubbles. Bubbles may be recognized as foreign objects, which can prevent measurement of grains containing bubbles.

Place the tray carefully in the petri dish.

Again, try not to make bubbles in the dish.

Dipping the far side of the tray grips first is a good way to avoid bubbles.

If the holes of the tray make bubbles, break or Remove them with the supplied tweezers for a good scanned image.

Line up the sample on the rice grain liner.

A) Pour the sample on the grain liner plate, holding the cut edge and shake so that the sample grains sit in place.

B） Once the grains are lined in place, tilt the plate to let the extra grains fall off from the cut edge.

For accurate measurement, wait until the sample grain temperature becomes equal to the ambient temperature. The recommended temperature for use is 15~30C.

Small broken grains are not suitable because of their size. Removing small broken grains is recommended.

If static electricity makes the grain sticky, wipe the Plate with a damp cloth or a tissue paper.

Place the grain liner on the tray.

The cut edge sits on the grip side of the tray.

Pull the lever to deposit the sample into the tray.

Grains that float may be unable to measure.

Use the supplied stick to push them down.

4) Measuring the sample

Place the prepared sample (Procedure 3) on the scanner glass.

Place it so that the grip side of the tray sits on the far side of

the scanner. Be careful not to spill the sample. Keep the tray level when moving it. When moving the tray over the scanner, hold the petri dish and do not touch the tray. The sample may slip between the tray and the petri dish and the scanner may fail to recognize the tray.

Close the cover carefully.

Click the “Measurement” button to start the measurement.

If a “Tray not found” message is displayed, verify the following:

i. The tray is correctly placed on the scanner glass.

ii. The direction of the tray on the scanner is correct.

iii. The scanner glass is clean.

iv. The petri dish is clean.

v. The tray is making contact with the petri dish. (No grain are stuck between the two.)

The measurement is done in approx. 10 minutes.

The processing measurement status will be displayed every other minute.

Leave the scanner cover closed during measurement.

The measurement result will be displayed immediately after the measurement has finished.

You can copy and paste the result into EXCEL and save the data. (Refer to 7-3.)

The scanned picture image will be saved if you have checked to “Save the picture” box in the measurement settings. (Refer to 7-1.)

Discard the sample grains and clean the tray and petri dish. (Refer to 8-4.)

To close the measurement, click the “X” button on the far up right corner of the screen or click “Operation” and then “Close”.

5) Measurement results screen

There are three kinds of measurement results screens provided. Select by clicking the tubs on the screen.

Acidity (pH) measurement screen

Tubs

1. pH ratio - A circle graph (“pie-chart”) showing the sample ph ratio.
2. Total evaluation - The rank (grade) of the sample, and the average pH level.
3. Statistical information Statistical data about the sample.

   Displayed items: averaged, pH, maximum pH, minimum pH, average deviation, total grain umber, ratio of the sample grain grades
4. pH histogram - Detailed ph histogram of the ph ratio.
5. Sample name box to enter - A blank box to enter the sample name.
6. “Measurement” button - Click to start the measurement.
7. “Excel” button – To able pasting into EXCEL
8. “Cancel” button - Click to abort the measurement.

Test result evaluation (grades)

S (“A” in the Japan Grain Inspection Association’s evaluation) Very good
A (“B” in JGIA’s evaluation) Good
B (“C” in JGIA’s evaluation) Fair
C (“D” in JGIA’S evaluation) Somewhat inferior
D (“E” in JGIA’s evaluation) Inferior

“pH” image screen

1. Total evaluation - The grade classification, grades, averaged pH value

2. Statistic information Statistical data about the sample

Displayed items: Total grain number in total, grain number in each grade

3. Color image Spherical images of the grains and their pH values

Each sphere is colored according to its grade. The displayed value on each sphere is the acidity (pH) of the grain.

4. pH grade list Example of each grade displayed by color.

Scanned image screen

1. Individual evaluation - The acidity (pH) value of the grain specified by the cursor
2. Scanned image - Scanned image of each grain.

7. OTHER FUNCTIONS

7-1. SAVING THE SCANNED IMAGE

To save the scanned images, click “Other” and go to “Detailed Settings” to open the setting

screen. Check off “Save Scanned Image”.

The scanned image will be saved with the sample name that you have entered in the measurement preparation stage. (Refer to 6-2 (3))

To chose the desired file location to save, click “Other” and go to “Detailed Setting” to open the setting screen. Click “Browse” to select the folder of the destination, or enter the destination directly.

To open saved files, refer to 7-2, “Opening a saved file.

7-2 OPENING A SAVED FILE

To open a file, click “Operation” and go to “Open file” to Open the file selection screen. Select the desired file.

7-3 COPYING AND PASTING THE MEASUREMENT RESULTS INTO EXCEL SPREADSHEETS

If your PC has Microsoft EXCEL installed, you can copy and paste the measurement result into an Excel file.

After measurement is done, click the “EXCEL” button.

EXCEL starts up and the data will be transferred.

The data you can copy and paste are:

1)“Statistical Information” - Statistical data of the sample.

2)“pH Histogram” - Detailed histogram of the pH (acidity) ratio.

3)“Color Image” - A spherical model of each grain and its acidity (pH).

4)“pH Ratio” - A circle graph (“pie-chart”) of the sample’s ph ratio.

7-4. THE GRADE CLASSIFICATIONS OF KETT FRESHNESS EVALUATION SOFTWARE “SENDO MEISTER”

The “Sendo (Freshness) Meister” software has five different classifications. The default setting is based on the Japan Grain Inspection Association’s criteria. To alter the classification pattern, follow the following operations: Click “Other” and go to “Detailed Stetting” to open the setting screen. Select the desired classification you want in “Classification” and check it. To change the range for evaluation of each grade, select the spot and change the numerical values. The JGIA’s range cannot be changed.

8. MAINTENANCE

8-1. STORING THE ACIDITY TEST SOLUTION

Keep the bottle in a cool and dark place.

Do not use expired solution. The expiration date is printed on the bottle label.

8-2 IF THE SOLUTION SPILLS

Immediately clean up with a soft cloth. Clean the glass surface of the scanner if necessary.

8-3 IF THE SOLUTION COMES INTO CONTACT WITH SKIN OR CLOTHES

The “Sendo Meister” solution is not harmful to human skin. However it may be difficult to wash out a stain if left for many hours. Wash with soap or detergent immediately. Do not drink the solution.

8-4 CLEANING THE TRAY AND THE PETRI DISH

Rinse and dry both the tray and the petri dish after measurement.
Do not leave either in the solution more than an hour. The color may stain them and will be difficult to wash out, and a colored or stained tray or dish cannot be used for accurate measurement.
To shorten the dry time, dip them in ethyl alcohol after cleaning with water.
Cleaning is necessary if the tray and petri dish are to be used repeatedly.

Prepare new tray and petri dish in the following cases.

Clean the tray when it is colored reddish and difficult to wash the color out

Change the petri dish when the bottom side shows flaws or when it is colored reddish and the color is difficult to wash.

INQUIRERIES AND REPAIRS

For inquiries and repairs, contact the dealer or our Tokyo or branch office. Please note the following.

If malfunction is observed:

Check the instruction booklet and the user's manual of your PC and other hardware to verify the settings and operations.

Inquiries

Please confirm the following before contacting us:

1. The product name.
2. The serial number of the product.
3. The situation where the trouble occurred.

Please make a note of your PC configuration such as OS, memory anount, hard disk capacity, devices connected other than the scanner, if any, and a detailed description of the trouble status at present, including any error or status messages displayed on the screen.

When shipping for repair

Please confirm the followings when you ship the instrument for repair:

1. Please retain a note of the product name, the serial number (to be found on the box or the scanner cover) and the date of shipping.
2. Please enclose the following with the instrument:
   - **i.** The warranty card of the product, with the user name and other required information fully written in. (**Not necessary if the warranty period is expired.)**
   - ii. A return address including name and fax number, if any, and the phone number where you can be contacted during business hours. Note the description on the malfunction and ambient circumstance during the operation.
   - **iii.** There is no cost for repairs during the warranty period, per the conditions stated in the warranty regulation. (**Check with the warranty card for the date of expiration.)**
   - iv. Before sending the unit, be sure to remove any personal or business information (memos, pot-it, notes, etc.) from the unit. This information would be lost if it turned out to be necessary to replace the entire unit.

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