Digital-M Melting Point
User Manual

DRAWELL
Artist of Science

Please read the manual before installation and operation.

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Catalogue

 **WARNING:** Those responsible shall be aware that the protection provided by the instrument itself may be weakened if the manufacturer is not used.

 **Warning:** Carefully treat the various solutions used in the analysis according to the laboratory safety regulations.Refer to the corresponding material and safety data sheet.Whenever you wear experimental clothing, goggles, and rubber gloves.scald scald when handling heat reagents.

 **Warning:** Risk of electric shock.Only professional personnel can open the cover and panel.

I. Features and uses

The melting point is an important physical property of the matter.In the field of chemistry, melting point determination is the basic means to identify the nature of substances, and it is also one of the important methods for determining purity, content, type and other parameters.

Our independent research and development and production of automatic melting point instrument is the first perfectly integrated into the android system and video technology melting point meter, can intuitively and easily display the temperature curve, optical signal and real-time video images, and realize the preservation, recording, watermark, playback functions, can observe through the video solid and liquid changes, color changes and subtle sliding.The unique layered insulation design not only effectively resists external environmental interference to ensure stability and accuracy, but also has a faster heating and cooling speed to reduce the waiting time.Instruments can be widely used in chemical, pharmaceutical, industrial, food, cosmetics and other fields, and are necessary instruments for producing powder oil and wax substances and measuring the melting points of other non-crystalline substances.

Characteristic:

Large screen HD super large capacitive touch screen

720P HD camera, 9 x optical magnification, sample detail amplification, sample detail changes are clearly visible

Linear heating rate 0.10℃ -20.00℃ pole adjustable

It can store customer experimental methods, historical measurement data, videos, and maps

Connect to a USB printer, thermal printer, or U disk export experimental report

Built-in Wifi connects to networks wirelessly, using cloud services

Complete compliance with the pharmacopoeia GLP requirements

FDA 21CFR11, has audit tracking, electronic signature, data tamper-proof output, user level management, free permission distribution and other functions

The whole machine has passed the TART quality certification standard of the laboratory analytical instrument

II. Part name

The structural composition of the instrument is shown in Fig:

Graph a instrument view

1.Upper cover and test holes (see Graph b for details)
2. Capacitive touchscreen
3.Ventilation into the gas hole

Graph b, upper cover and test holes

The user may load the tested sample into the capillary (100mm length, inner diameter 1.0~1.3mm, wall thickness 0.10~0.15mm) in a standard loading method, and then insert the capillary into the water-filled glass sleeve into the heating hole of the heating furnace (see Figure b).

III. Function introduction

1.Boot animation

When turning on, the interface is shown in Graph 1, automatically boot and display the boot animation.

graph 1

2. login interface

After the boot animation is completed, to the interface is shown in

graph 2.Please select and fill in the correct user name and password in the corresponding input box, and then click Login " (factory default maximum permissions user name admin, default password 888888).

graph 2

The 3. test interface

The test parameter interface is call method, sample number, sample name, heating rate, starting temperature, termination temperature, test method, coordinate axis length, display initial melting time, initial melting point fluctuation size, fluctuation number of initial melting point, fluctuation size of final melting point, and fluctuation number of final melting point (Fig. Graph 3).

graph 3

[Call method]: The drop-down box selection method;

[Sample number]: You can enter English, Chinese, numbers, or symbols;

[Sample Name]: You can enter English, Chinese, numbers, or symbols;

[Start temperature]: The input values range from 0 to 399.99;

[Heating rate]: The available input values can range from 0.10 to 20.00 (including 0.10 and 20.00);

[Termination temperature]: The input value can range from 0~399.99 and must be greater than the starting temperature. After the termination temperature is reached, the instrument will automatically cool down to the starting temperature and wait for the subsequent operation of the user.When terminating the

temperature blank, automatically calculate the maximum available value;

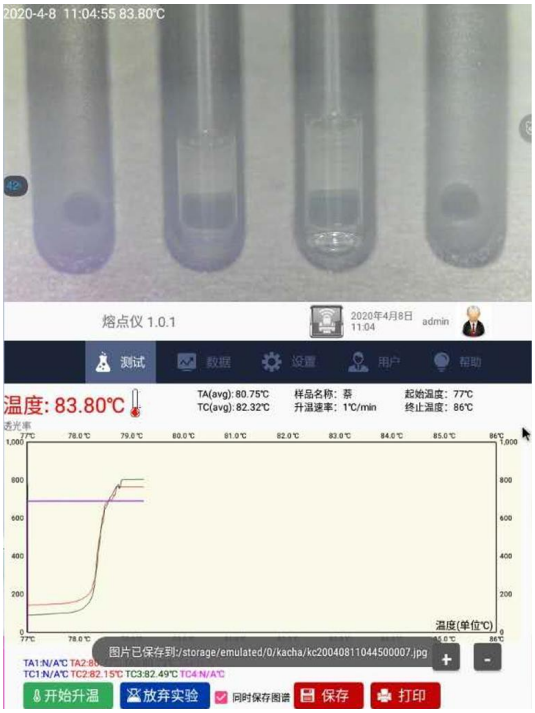
[Test method]: Automatic or manual selection (Note: different models);

[Axeline length]: Specify the abscissa maximum of the atlas, with only 10,15, and 20 minutes optional (automatic test parameters only);

[Display the initial melting time]: The default is 0, which means that after the initial melting conditions are met, the initial melting is recorded immediately. If the input is negative, it indicates how many seconds before the initial melting, such as positive, and how many seconds the initial melting is recorded after the initial melting delay;

4. automatic test interface

At the test interface, after setting parameters such as starting temperature and heating rate are completed, if the interface enters the automatic detection interface, the interface is shown in Graph 4.



graph 4

TA1 to TA 4 indicate the initial melting point value of the corresponding sample in the sample groove, respectively;
Mean initial melting point value from TA:TA1 to TA3;
T C 1 to T C4 indicate the melting point values of the corresponding samples in the sample groove, respectively;
Mean final melting point value from TC:T C 1 to T C4;

[Start heating]: This button is allowed to click when the current temperature is stable within 0.2℃ of the set starting temperature to heat up at the specified heating rate, that is, the test starts;
[Abandup experiment]: Click this button will abandon this experiment.
[Save]: Click this button The instrument will save the test results;
[Print]: Click this button and the instrument will print this data.

matters need attention:

- **If the maximum time of automatic detection sample is 20 minutes, which exceeds the abscissa time length or**

maximum value set by the parameter for 20 minutes, the map will no longer show. If the sample does not complete the whole melting process within 20 minutes during the measurement, it is recommended for users to adjust the parameters according to the situation;

Before each test, if the sample tank inserts the water injection glass sleeve into the parameter setting page, ensure that the parameters are set correctly and click the "OK button" to jump to the corresponding test page. After the actual temperature reaches the preset starting temperature of 0.1℃ (a buzzer prompts), then put the capillary to be tested (if the sample capillary is put before entering the automatic detection interface, which will cause detection abnormality), press [Start Heating] button for sample melting point test.At this time, the melting process of the tested sample can be observed by the video above the interface, and the instrument will also automatically display the melting curve of the sample, and automatically record the melting value of the sample.

- **If the map is saved in the system setting as "Yes", the map or video of the experiment will be automatically recorded after the test ends.**

5. manual test interface

After the parameter setting such as starting temperature and heating rate, if entering the manual detection interface, the interface is shown in Graph 5.

graph 5

[Start heating]: This button is allowed to click when the current temperature is stable within 0.2℃ of the set starting temperature to heat up at the specified heating rate, that is, the test starts;
[Abandup experiment]: Click this button will abandon this experiment.
[Save]: Click this button The instrument will save the test results;
[Print]: Click this button and the instrument will print this data.

matters need attention:

- **When the termination temperature of the manual detection sample is not set, the maximum temperature can be automatically selected according to different models, with no time constraint and no map display;**

  Before each test, if the sample tank inserts the water injection glass sleeve, go to the parameter set page to ensure that the parameters are set correctly and click the "OK button" to jump to the corresponding test page. After the

actual temperature reaches the preset starting temperature of 0.1℃ (a buzzer prompts), then put the capillary (if the sample capillary and then enter the manual detection interface will cause abnormal detection), press [Start Heating] key for sample melting point detection.At this time, the melting process of the tested sample can be observed through the video above the interface, and the TA button is manually clicked to record the melting value of each channel sample.

- **If the video is saved as "Yes" in the system setting, the video of the experiment will be automatically recorded after the test ends.**

The 6. database interface

Click the left [data] key in order to enter the database interface, as shown in Graph 6.This interface is used to display and query the data saved by the user, and can associate the corresponding video file and map files of each test data.

The more new the saved data, the higher the top, that is, the larger the serial number value, the newer the data displayed, click the data, you can check the data details.

graph 6

[Print]: Select the corresponding data, press the print button, select the print way to print the data (can serial print, WiFi print list, WiFi print details);

[When exporting the PDF]: connection disk on the U, generate the selected test data for a PDF report and export to the U disk;

[When exporting the CSV]: connection disk on the U, use the selected test data to generate a CSV report and export it to the U disk;

[Retrieval]: popup the screening conditions filling window for users to find out the qualified test data (all the data is displayed by default. If you want to display all the data again, please expand the retrieval conditions);

[Delete]: With the data deletion permission, you can delete the data;

[Cloud Backup]: Upload all the test data to the server;

[←]: Turn the page up;

[→]: Turn down to the page;

At the last "video" and "map" columns of each line of data in the test list, display "Yes" means that the item data has a bound video or map, display "no" indicates no bound video or map, and helps to filter out the associated video or map records for further operation.

The 9. user management interface

Click [User] on the left and [User Management] above to enter the user management interface, as shown in Graph 7.

graph, 7

An account with permission to create a new user can be added on the current page, and no permission account can only be viewed.After entering the user name and password, click [OK] for the pop-up to ask about the permissions given to the new account.Complete the permission assignment click [Save];

The 12. Basic Setup interface

At the Setup interface, select the [function settings] option and enter the interface as shown in Graph 8.

graph, 8

On this page, time, language (including Simplified Chinese and English).

The 13. method library interface

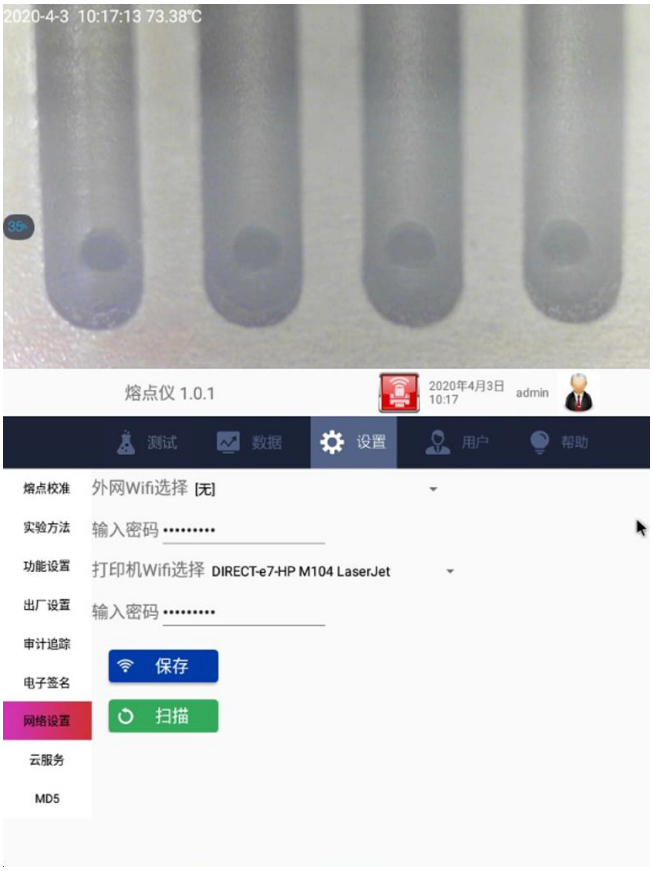
At the setup interface, select the [Experimental Methods] option and enter the interface as shown in Graph 9.

graph, 9

The parameters that can be set here are the same as the parameter setting rules of the test page. The saved method can be called by the method drop-down box selection under the parameter settings page of the test page.

14. network setting interface

At the settings interface, select the [Network Settings] option and enter the interface as shown in Graph. 10.



graph 10

The searched wireless network name is displayed on the left side.After you click the name of the wireless network that you want to connect to enter the password correctly, a black point appears at the front of the wireless network name on the connection.When the wireless network connected to the Internet can be selected for cloud service operation, and the A 4 experiment report is printed with the specified laser printer when the connection is called "DIRECT-95-HP LaserJet M104W" Wireless AP.

The right DHCP enabled indicates the automatic assignment of the IP address, otherwise enter the IP address manually.

The left wireless network is invalid when wired through the back RJ45 network port.

The 15. melting point calibration interface

At the settings interface, select the [melting point calibration] option and enter the interface as shown in Graph 11.

graph 11

[Start correction]: Click this button to jump to the parameter setting interface of the test page, which is the same as the ordinary sample measurement method. After the test, click the confirmation correction or abandon the correction. If you click the confirmation correction, the system assists to fill the average of the measured melting point value into the test temperature box in Figure 16;

[Add / Replacement]: After filling in the legal test temperature and standard temperature, click this key; if you select automatic

replacement, the system compares the value to the value in the existing correction list, select the optimal replacement scheme and ask for confirmation before replacement; if you select manual replacement, you need to specify a row in the already existing correction list to replace, and ask for confirmation before replacement;

[Automatic Replacement / Manual Replacement]: Automatic replacement selects the best replacement by the system; manual replacement requires to specify the row you want to replace.

The 16. audit tracking interface

At the settings interface, select the [Audit Tracking] option and enter the interface as shown in Graph 12.

This table records the key operations of all users, similar to the system log, you can use the external U disk to export this audit tracking log, the export file type is the Excel. encrypted using MD5

Audit tracking records include: date, time modification, test database content deletion, system upgrade, boot time (accurate to minute), fault and error detection, light detection strength adjustment, sensor calibration, permission configuration, video files, cloud backup, upload, download, delete, user new, user delete, modify user password, user permission change, login user name, new test method, delete test method, modify test method, modify automatic login name, input password failure.

graph 12

[Export]: Click this button to export the audit tracking record table to the external U disk behind the instrument in the MD5 encryption Excel type (unsuccessful export without U disk);

17. fault handling interface

Click [Help] on the right to enter the fault processing interface, as shown in Graph 13.The content is the troubleshooting list.Different fault names are explained in the list and appropriate processing methods are recommended.

graph 13

18. update interface

Click [Help] on the right and select the [Upgrade] tab to enter the software update interface as shown in Graph 14.Internet updates make sure you click the update button to upgrade.The U disk update must place the update file under the root directory, then insert the USB interface on the back of the instrument, and then click the U disk update button to complete the upgrade.

graph 14

IV. Operation steps and use methods

1. capillary sample preparation

Place the samples to be tested in a mortar and dry.Take a long dry, clean glass tube of about 100mm and stand upright on magnetic or glass plates.The capillary containing the tested sample was placed from the top mouth to fall freely and repeatedly eight times so that the sample powder was tightly assembled at the bottom of the tube at a height of about 3mm-5mm.

2. melting point instrument test

2.1 Automatic test paradigm of secondary acid: sample final melting point of 153℃

Step 1: Turn on the power switch and preheat the instrument for 20 minutes.

Step 2: enter the main interface, select the test, enter the sample name: secondary acid, starting temperature 148℃, heating rate 1℃ / min, stop temperature 155℃, and the four optical signal

setting parameters of final and range α, β, τ are set or select the default scheme, and then enter the corresponding interface by [automatic detection] (**note: before automatic detection, ensure that there is no capillary in the furnace**).

Step 3: When the actual temperature stabilizes to 148℃ (**the buzzer prompts more than 4 sounds**), put the capillary of the sample to 148℃. (**Note: after putting the sample, the furnace temperature will decrease slightly, so the buzzer prompts more than 4 sounds**) after the temperature is stable. When the sample reaches, the instrument will automatically display the final melting value.

Step 4: When all the results are available, you can save data or press [print] to print data.If the sample is tested again, you only need to repeat the second step. If you want to change the tested sample, press [Return] and retreat to the test interface for the corresponding parameter setting.

2.2 Manual test paradigm of secondary acid: sample final melting point of 153℃

Step 1: Turn on the power switch and preheat the instrument for 20 minutes.

Step 2: enter the main interface, select the test, enter the sample name: secondary acid, start temperature 148℃, heating rate 1℃ / min, stop temperature 155℃, and then enter the corresponding interface by pressing [manual detection].

Step 3: When the actual temperature stabilizes to 148℃ (**the buzzer prompts more than 4 sounds**), put the test sample and observe the melting process of the test sample from the video above the instrument. When the test sample reaches the initial melting degree, click the [initial melting] key in the corresponding position in Figure 10. When the test sample reaches the final melting degree, click the [Final melting] key in the corresponding position in Figure 10.

Step 4: When all the results are available, you can save data or

press [print] to print data.If the sample is tested again, you only need to repeat the third step again. If you want to change the tested sample, press [Return] and return to the test interface for the corresponding parameter setting.

3. melting pointometer correction

3.1 Correction paradigm

The sample final melting point was corrected for 153℃ of secondary acid

The first step: enter the calibration interface in the setting, set the test parameters of standard sample hexadiic acid, input the sample melting point 153℃, start temperature 146℃, heating rate 1℃ / min, stop temperature 156℃, and then press [automatic detection] or [manual detection] to enter the corresponding interface.If the correction method is conducted by automatic detection, the setting parameters of the four light signal set of the final and range α, β, τ can be adjusted according to the specific samples (the correction samples are three standard samples, and the parameters can choose the default scheme).

Step 2: with the third step of the test sample (see the detailed instructions of 2-1-1 and 2-1-2 on page 10 of this manual for specific operation).

Step 3: If there is no abnormality after the test results, press [Correction] to save the correction test results, and press the third step again to test again.Press the [Return] key to exit the correction interface.

matters need attention:

- **At the correction time, if the final melting temperature between the measured sample and the starting temperature is less than 5℃, it is recommended to recorrect and set the starting temperature above 5℃ below the final melting**

temperature.(Example: Under the above setting spare parts, the actual final melting temperature of the standard sample 153℃ is 151.5℃ at correction, when the starting temperature needs to be reset below 144.5℃ and re-corrected.）

- **The correction can be corrected at 1 point (up to three points), with one point valid at 0℃ -100℃, 100-200℃, 200-400℃ if the user corrected multiple times within the same range.**

3.2 Standard set recommended for standard samples

Set the test parameters of the standard sample naphthalene, and enter the sample melting point of 80.6℃ (specific values can be based on the value indicated on the attached certificate), starting temperature 76℃, heating rate 1℃ / min, and stop temperature 85℃,

Set the test parameters for the standard sample secondary acid, input the sample melting point 153℃ (specific values can be based on the value indicated on the attached certificate), start temperature 146℃, heating rate 1℃ / min, and stop temperature 156℃,

Set the test parameters of the standard sample anraquinone and input the sample melting point 217.1℃ (specific values can be based on the values indicated on the attached certificate), starting temperature 212.1℃, heating rate 1℃ / min, and stop temperature 222℃,

matters need attention:

- **The instrument is calibrated before leaving the factory and is not corrected in a short period.**
- **If the user has an exception during the correction process, you can restore the factory to restore the original data of the instrument. The instrument can be corrected with from 1 to 3 standard samples.**

V. Daily maintenance

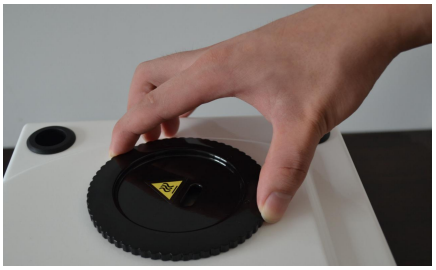
1. instruments shall be used in dry and ventilated rooms and avoid water contamination to prevent moisture.The instrument adopts a three-core power plug, and the ground end shall be connected to the earth, and cannot be replaced by the middle line.

The glass sleeve and capillary used by 2. instruments allow only the products provided by the factory, avoid third party glass sleeve or capillary in case of incorrect size fracture or deviation test results, and fine capillaries shall be selected.

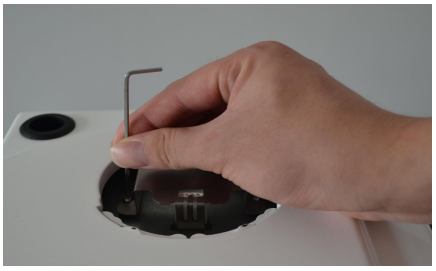
If the 3. does not use the instrument for a long time, it is recommended to turn off the power switch at the rear of the fuselage, and unplug the power cord.

VI. Treatment method of glass sleeve fracture

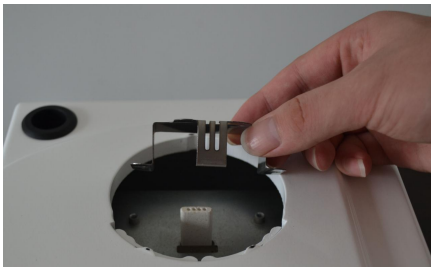
During the test, if capillary fracture in the furnace, please it in the following diagram:



1. grip furnace cover 2. Turn counter-clockwise for 90 °



3. Open the furnace cover 4. Release the screws on the furnace core bracket



5. takes the oven core holder

VII. Common faults and treatment methods

fault phenomenon	analysis of causes	Exclusion method
The screen does not reflect after turning on	1. Power supply is not in place The internal screen wiring harness of 2.Instrument is pulled loose 3. Blown fuse	1, plug the power plug or close the master switch 2, returned to the factory for maintenance 3, returned to the factory for maintenance
Power-on self-inspection and report the fault	The corresponding hardware may fail	Try to restart and observe again, and still report the error, and you will return to the factory for maintenance
Atlas and video save failed	1.Automatic profile save option is No 2. Internal storage space	1. Autoprofile save is set to Yes 2. removes useless association files to make space
[Start warming] The key is invalid	1、The start temperature temperature	1, goes to the parameter settings page to set the

	control has not been performed 2、The current temperature is not stable within the 0.1℃ range of the set start temperature	appropriate starting temperature and heating rate, click OK 2, waits for the current temperature to stabilize
Automatic test results are abnormal	1、There are foreign body or water pollution in the glass casing 2、The parameter setting page click [confirm] for the capillary or glass sleeve 3、The brightness of the light source is wrong or long time	1、Clean the sample tank and reinject water 2、Remove the capillary, put into the glass sleeve and reagain 3、Return to plant for maintenance
The melting point results are not allowed	1、Platinum resistance aging 2、There are foreign bodies in the heating furnace sample tank 3、temperature departure	1、Return to plant for maintenance 2、Clean the sample slot 3、The melting point calibration is performed
Only the help pages are available after the account logs in	At least one failure occurred in the startup	Try to restart and observe again, and still report the error, and you

	self-inspection	will return to the factory for maintenance
Poor reproducibility	1、Inloading method or batch 2、Capillary sizes are inconsistent 3、Glass sleeve size is not compliant 4、The water injection height in the glass casing is not compliant	1、In strict accordance with the norms 2、Strictly pick up compliance capillaries 3、Use the original factory original matching glass sleeve 4、Ensure sure the capillary casing is 22mm±1.5mm before the test

VIII. Precautions

1. tested samples are sampled as required and melted in a cleaning container. Fill height of samples must be 9mm 1mm.The same batch, the same sampling method, the same sampling method are highly consistent samples to ensure consistent measurement results.
2. If the melting point of the sample is high, the melting value instrument will automatically cool down to the starting temperature before being detected. Please expand the coordinate axis time and improve the termination temperature setting parameters before detection.
3. The starting temperature of some samples affects the melting point measurement results and should be operated according to the specifications.
4. The linear heating rate of is different, and the measurement results are inconsistent, requiring appropriate specifications.The higher the general rate, the higher the reading value.The melting point read values of each gear rate can be unified with experimental correction values.Samples with unknown melting point value can be heated up at a high rate or measured manually first, stop the temperature setting blank, and then automatically detected after circling the range.
5. When using the instrument, pay attention to light, away from acid-alkali solution, avoid use in strong light.
6. When the glass sleeve is broken or damaged in the sample tank, it shall be cooled and power off.(Refer to the above instructions for detailed operation methods)
7. When data needs to export, insert the U disk, please wait a moment before the system recognizes the external U disk for operation.

IX. After-sales service matters and producer responsibilities

The whole machine is guaranteed for one year from the date of sale (subject to the date of the invoice issued), but the following circumstances are not within the warranty scope:

1, exceeds the warranty period;

2, causes instrument damage due to improper human use;

3, disassembled the instrument without the manufacturer's permission;

4, causes damage to the equipment due to improper transportation and storage.

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