

Minebea

*DATA PROCESSOR FOR
LTS-*NB type Load Test Stand
SR-09-001EN (STANDARD TEST)*

Instruction Manual

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1. General

This data processor sends/receives the data from the Load Test Stand type Load measuring instrument and PC (Personal computer) and controls the instrument and makes various kinds of tests efficiently. Moreover, drawing graphs and various kinds of analysis with the received data, after that prints out the results and outputs them into various files as well.

2. Instruments targeted to operate

*Personal computer

Installed OS	windows Xp、 Vista,7,8,8.1,10 (32bit,64bit)
Memory	Windows Xp: Above 512MB Windows Vista,7,8,8.1,10: Above 2.0GB
HardDisk	Space area above 1.0GB
USB port	Required in the case of USB communication cable is used.
CD-ROM drive	Required during installing is made.
Mouse, Key board	
*Monitor	The resolution is a color display of 1280×1024 or more.
*Color printer	Necessary for printing out, but operation can be made if a printer is not prepared.
*Targeted Load measuring instrument	Load measuring instrument : LTS-*NB
*USB cable	A communication cable between PC and Load measuring instrument

*** This software doesn't guarantee the operation with all PC.**

3. Attached documents

Instruction manual	1 set
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4. Specifications

4 - 1 . Kinds of test

- ①Tension test ②Compression test ③3 points bending test
- ④4 points bending test

4 - 2 . Overall specifications

Maximum number of tests	50 pcs
Maximum number of input dimensions of tests	100 pcs

4 - 3 . Input parameter

- 1) Stored folder name for report file
- 2) Report file name
- 3) Condition created section, creator
- 4) Inspector name
- 5) Temperature, humidity
- 6) Setting test force amplifier and load cell
P/N (Type), Rated capacity, Range, Polarity (Used only when TU3E and ALL types are selected.)
- 7) Setting a displacement transducer (Sold separately.)
Rated of displacement transducer, Gage length, Polarity, Removed displacement point
- 8) Kinds of tests
Tension, Compression, 3 points bending, 4 points bending
- 9) Test direction
UP, DOWN
- 10) Break detection
OFF, STOP, RETURN
- 11) Rapid return
ON, OFF

12) Test speed

Type	Set test speed (mm/min)
LTS-*NB-S500	50,100,200,300,400,500
LTS-*NB-S400	40,75,100,200,300,400
LTS-*NB-S300	30,50,100,150,200,300
LTS-*NB-S200	15,20,50,100,150,200
LTS-*NB-S100	10,20,30,50,75,100
LTS-*NB-S50	5,10,20,30,40,50
LTS-*NB-S20	1.5,2,5,10,15,20

13) Detectable break sensitivity

Input range : 0.1 to 9.9 %

14) Limit setting

MAX CONTROL : LOAD/POSITION

MAX control : STOP/RETURN

MAX point set value

15) Displacement of limit setting at software side

The limit setting for detecting displacement (POSITION) at the side of software.

*When only the MAX. CONTROL is LOAD for the limit setting, setting can be effective.

16) Sample setting

Sample form, Initial sample length, Space between the compression boards(effective in Tension and compression test), Common sample name, Dimension table, Bending jig lower edge span (effective in 3 points bending test), Bending jig upper edge span (effective in 3 points, 4 points bending test)

17) Sample dimensions (Input values may differ depending to the sample forms.)

Sample form	plate	rod	pipe	yarn	Coil spring	others
Input value 1	width	Dia-meter	External diameter	denier	External diameter	Sectional area(Geometrical moment of inertia)
Input value 2	Thick-ness		Internal diameter	Specific gravity	Liner diameter	(Modulus of section)

18) Dimension table for sample (Effective only when dimension table for sample setting is applied). Sample dimensions (Input value may differ depending on the sample forms.)

Sample name, natural constant 1

19) Sampling frequency

(As for the height speed import function, it'll become optional function sold separately.)

20) Optional setting for acquired data

21) Setting analysis item (16 items at max.)

22) Setting statistical items (8 items at max.)

23) Setting analysis condition

24) Optional calculation formula (16 formulas at max.)

25) Optional setting

26) Graph scale setting

4 - 4 . Analysis Items

1) Sample dimension (2 points at max.)

2) Sectional area

3) Geometrical moment of inertia

4) Modulus of section

5) The max. Point (Test force, stress, elongation, strain, displacement, height)

6) Break point (Test force, stress, elongation, strain, displacement, height)

7) Bending destructive test force

- 8) Upper yield point (Test force, stress, elongation, strain, displacement,height)
- 9) Lower yield point (Test force, stress, elongation, strain, displacement,height)
- 10) Elastic modulus (3 points at max.)
- 11) Inclination of Elastic modulus (3 points at max.)
- 12) Spring constant (3 points at max.)
- 13) Proof stress point (Test force, stress, elongation, strain, displacement, height)
- 14) Displacement point (6 Points at max. (Test force, stress, elongation, strain, displacement,height))
 - *SS curve monitor, re-analysis can be made on 2 points only
- 15) Test force point (6 points at max. (Test force, stress, elongation, strain, displacement, height))
 - *SS curve monitor; re-analysis can be made on 2 points only.
- 16) Initial tensile resistance
 - When the sample form is Yarn, this can be processed and calculated.)
- 17) Loose value
- 18) Zero point of displacement (Test force, stress, elongation, strain, displacement, height)
- 19) Denier
- 20) Specific gravity
- 21) Initial sample length
- 22) Sample length
 - Tension application: Initial sample length (between chucks) + Loose vale
 - Compression application : Initial sample length (Space between the compression boards) – Loose value
- 23) Thickness of sample
- 24) Sample name
- 25) N value
- 26) Energy
 - The area from the test start to test end can be calculated.
- 27) Natural constant for sample 1
- 28) Optional calculation formula (16 formulas at max.)
 - By using the analysis items shown as above and natural constant for sample, you can set optional calculation formula (reverse Polish notation).

4 - 5 . Statistical process items (In one(1) lot)

- 1) Average value
- 2) Standard deviation σ (N-1)
- 3) The maximum value
- 4) The minimum value
- 5) Median
- 6)The maximum — the minimum
- 7) Coefficient of variation
- 8)3 times of Standard deviation
- 9) JIS K6301 average
- 10) ΣX
- 11) ΣX^2
- 12) Number of pieces

4 - 6 . Printing items

Test condition set value (main item), analysis item, statistics process item, re-analysis value of collected data, random draw of graphs and individual graph of collected data

5. Definition of process of test result

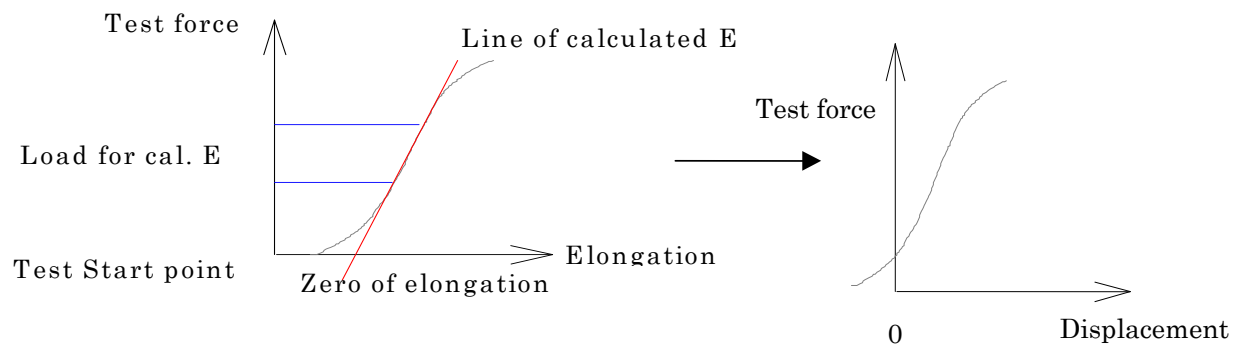
5-1. Zero point of elongation

Zero point of elongation shall be the starting point of analysis, and it can be calculated by the 3 methods shown below:

5-1-1. Test start point

Test start point shall be decided as a zero point of elongation.

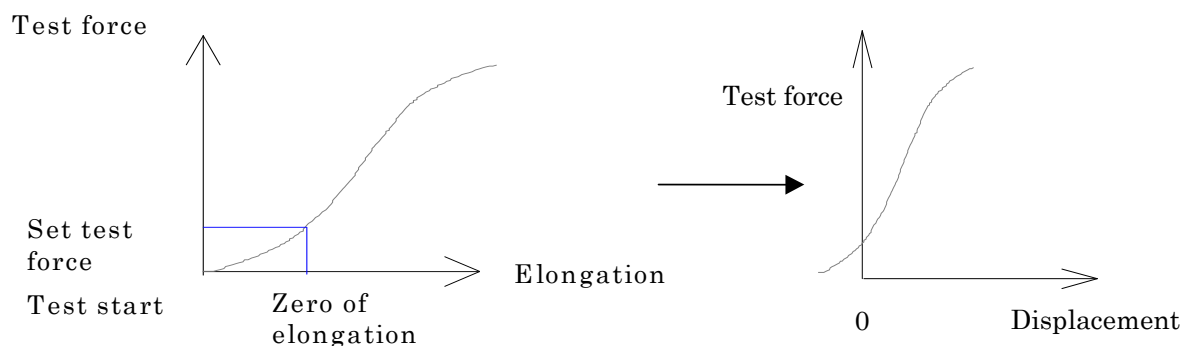
5-1-2. Regression point



When the calculation of elastic modulus is made, zero of displacement shall be decided as an intersection point of "Line of calculated E" and "Zero of test force".

When the calculation of Elastic modulus can't be obtained, the initial test force point shall be decided as the zero of displacement.

5-1-3. Initial test force point



The zero of displacement shall be decided by the displacement of set test force value.

5-2. Calculation of Sectional area, Geometrical moment of Inertia and Modulus of section.

Depending to the form of sample, calculation can be made by the following sample formula.

Width W Diameter D

Thickness T Outside diameter A Inside diameter B

5-2-1. Sectional area

Plate $W \times T$

Rod $\frac{(D^2 \times \pi)}{4}$

Pipe $\frac{(A^2 - B^2) \times \pi}{4}$

Others Input the section area.

5-2-2. Geometrical moment of inertia (I)

Plate $\frac{(W \times T^3)}{12}$

Rod $\frac{(A^4 \times \pi)}{64}$

Pipe $\frac{(A^4 - B^4) \times \pi}{64}$

Others Input the geometrical moment of inertia.

5-2-3. Modulus of section (Z)

Plate $\frac{(W \times T^2)}{6}$

Rod $\frac{(D^3 \times \pi)}{32}$

Pipe $\frac{(A^4 - B^4) \times \pi}{32 \times A}$

Others Input the modulus of section.

5 - 3 . Calculation of stress, elongation (strain), displacement (elongation)

Test force	P	Sectional area	A
Initial length of sample	G	Displacement	E
Down span	S	Up span	U

5-3-1. When the test kind is either tension or compression

Stress	$\frac{P}{A}$
Strain, elongation	$\frac{E}{G} \times 100$ (Elongation is for tension purpose only)

5-3-2. When the test kind is 3 points bending.

Stress	$\frac{S \times P}{Z \times 4}$
Strain	$\frac{(12 \times E \times I)}{(S^2 \times Z)} \times 100$

5-3-3. When the test kind is 4 points bending.

(In case of no measuring device of displacement transducer)

Stress	$\frac{(S - U) \times P}{Z \times 4}$
Strain	$\frac{(S - U) \times 12 \times I \times E}{(S^3 - 3 \times S \times U^2 + 2 \times U^3) \times Z} \times 100$

5 - 4 . Calculation of Elastic modulus

5-4-1. When the test kind is either tension or compression

$$\frac{G \times P}{A \times E}$$

5-4-2. When the test kind is 3 points bending.

$$\frac{S^3 \times P}{48 \times I \times E}$$

5-4-3. When the test kind is 4 points bending.

$$\frac{(S^3 - 3 \times S \times U^2 + 2 \times U^3) \times P}{48 \times I \times E}$$

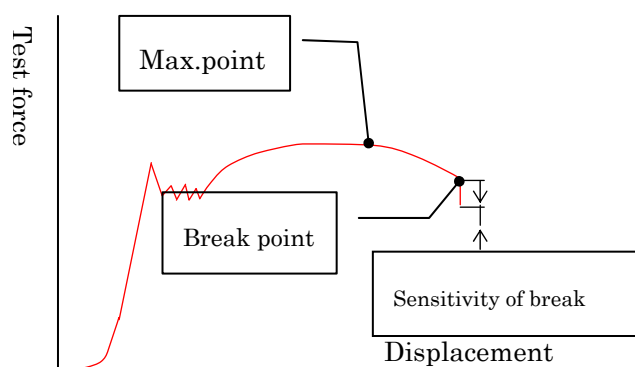
5-4-4. When the sample form is yarn

Fineness: d Liner density: F
Initial tensile resistance $(P \times G) / (E \times F)$

Apparent Young's modulus
 $1000 \times F \times \text{Initial tensile resistance (N/tex)}$
 $1000 \times F \times \text{Initial tensile resistance (N/dtex)} \times 10$
 $9 \times F \times \text{Initial tensile resistance (gf/D)}$

Inclination of Young's modulus (P/E) can be calculated from the inclination of group of data equivalent to the Elastic modulus calculation range (set with the test condition) by the method of least squares.

5 - 5 .The maximum point, break point



The maximum point

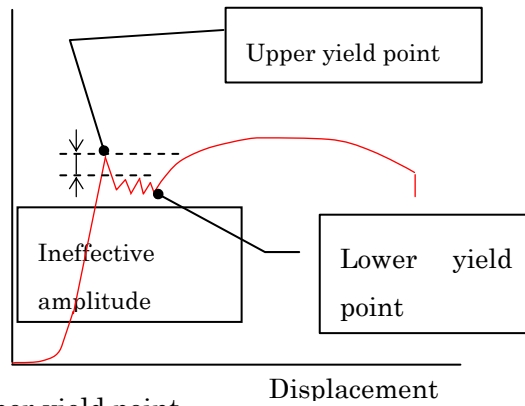
Shall be the point that the maximum test force is occurred.

When the same test force is papered at 2 points or more, the last occurred point shall be decided as the one.

Break point

Compared with the test force just before in the sampling, it is decided as the sampling point just before when the decrease is exceeding to the sensitivity of break (set with from 0.1 to 9.9 % against full scale of the range).

5 - 6 . Upper yield point, lower yield point



Upper yield point

The upper yield point is considered to be the maximum point before the parallel section of test sample is beginning to yield during the test.

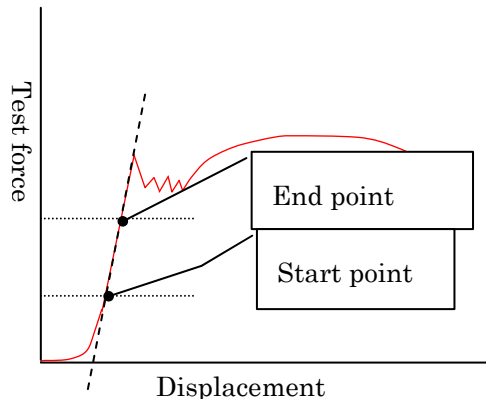
When the **% of test force is decreased against the full scale each (test force) from the peak point after test start, it is considered as the peak point before.

Lower yield point:

The lower yield point is considered to be the minimum point after the parallel section of test sample is beginning to yield during the test .(Excludes inertial effect.)

After obtaining the upper yield point, and also when the test force exceeds the upper yield point, it is considered as the bottom point before.

5 - 7 . Elastic Modulus, inclination of Elastic modulus



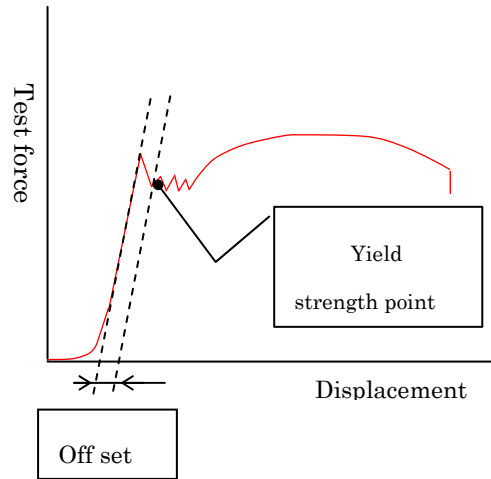
Elasticity:

The performance to go back to the former shape after the object applied deformation due to the external force.

Elastic Modulus:

Should be the limit of strain of stress/strain to hold the Hooker's law. Calculates from the sampling data from the set starting point of slope analysis to obtain Elastic modulus and the end point by using the method of least squares. For both of the start of calculation and end point, selection from test force, displacement, strain and stress can be made. When you set as "Automatic", you can calculate from the maximum inclination as the "Inclination of Elastic modulus".

5 - 8 . Proof stress point



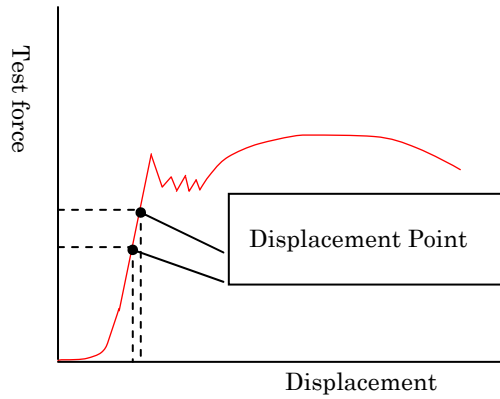
The off-set value against the inclination of Elastic modulus can be set with the % of Initial sample length.

Can be obtained by the off-set method specified in JIS.

The yield strength point is supposed to be the point of intersection from the inclination of calculated Elastic modulus and the line that has transplanted with parallel by the portion of input off-set value. The value going to input is the percentage (%) of Initial length of sample. If the Elastic modulus can't be obtained, calculation will not be made.

(Fixes as 0.2% GL other than specified.)

5 - 9 . Test force point, displacement point



Test force point :Calculates the set point of displacement and elongation set by the optional test force, stress (test force point).
 Calculated the point of test force,
 Displacement point: displacement (test force point) set by the optional elongation and displacement (test force).

5 - 1 0 . Bending break test force (Suitable standard : JIS A5209)

The Bending break load P , per 1 cm of width can be calculated from the following formula. (At the time of 3 points of bending test)

$$P = \frac{F}{b} \times \frac{I}{90}$$

P : Bending break test force per 1cm of width (N/cm,(kgf/cm)

F : Break test force (N),(kgf)

b : Width (cm) of sample (tile)

I : Span (mm)

5 - 1 1 . Statistics process

Average value	$\frac{\sum_{i=1}^n x_i}{n}$
Standard deviation	$\sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$
Standard deviation *3	$\left(\sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} \right) * 3$

The max. value Calculates the max. value.

The min. value Calculates the min. value.

The max. – min. The max. value – (minus) the min. value

Median The middle positioned value when lined in order of sizes.

EX: 25 will be the median, in the case of 10,15,25,30 and 40 data.

Note: When the number of data is even number, it'll be the average value between the two.

EX: When the case of 10,15,25 and 30, the median will be as follows:

$$(15+25)/2=20$$

Average of JIS K6301	No. of samples = 1 x_i No. of samples = 2 $(x_1 * 0.1 + x_2 * 0.9)$ No. of samples = 3 $(x_1 * 0.1 + x_2 * 0.2 + x_3 * 0.7)$ No. of samples = 4 $((x_1 + x_2) * 0.1 + x_3 * 0.3 + x_4 * 0.5)$ No. of samples > 4 $((x_{n-3} + x_{n-2}) * 0.1 + x_{n-1} * 0.3 + x_n * 0.5)$
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Coefficient of variation	$\frac{\sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} * 100}{\frac{\sum_{i=1}^n x_i}{n}}$	(Standard deviation*100/average)
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$$\Sigma X^2 \quad \sum_{i=1}^n x_i^2$$

$$\Sigma X \quad \sum_{i=1}^n x_i$$

No. of data Calculates the No. of data (No. of samples).

6. Application

6 - 1 . Preparation

Connect between the USB port located on the side of main body of LTS-*NB type (Load Test Stand) Load measuring instrument and the USB port located at the Personal computer with an USB cable.

6 - 2 . Supplying power

Supply power for the LTS-*NB type Load measuring instrument and Data processor according to the following steps.

The POWER SW on the rear side of the main body "AC power supply" ON

Data processor

Display	"POWER" ON
Printer	"POWER" ON
Personal computer	"POWER" ON

7. Operating procedures

7 - 1 . Various kinds of notes for this software

As for “Close” button

The “Close” button on the upper right corner of the windows, can not be used on the base of program.

- Main menu
- Test window
- Report analysis window

Descriptions of function key and short-cut key

The F1, F2..... and F12 described in the instruction manual indicate the function key each, so specified work can be performed by pressing the each function key. (In case the F10 key is pressed for the first time, another functions might not work effectively. So take care of it fully.)

The access key such as N · L and R written in the manual will work specifically by pressing it with the “Alt” key together simultaneously.

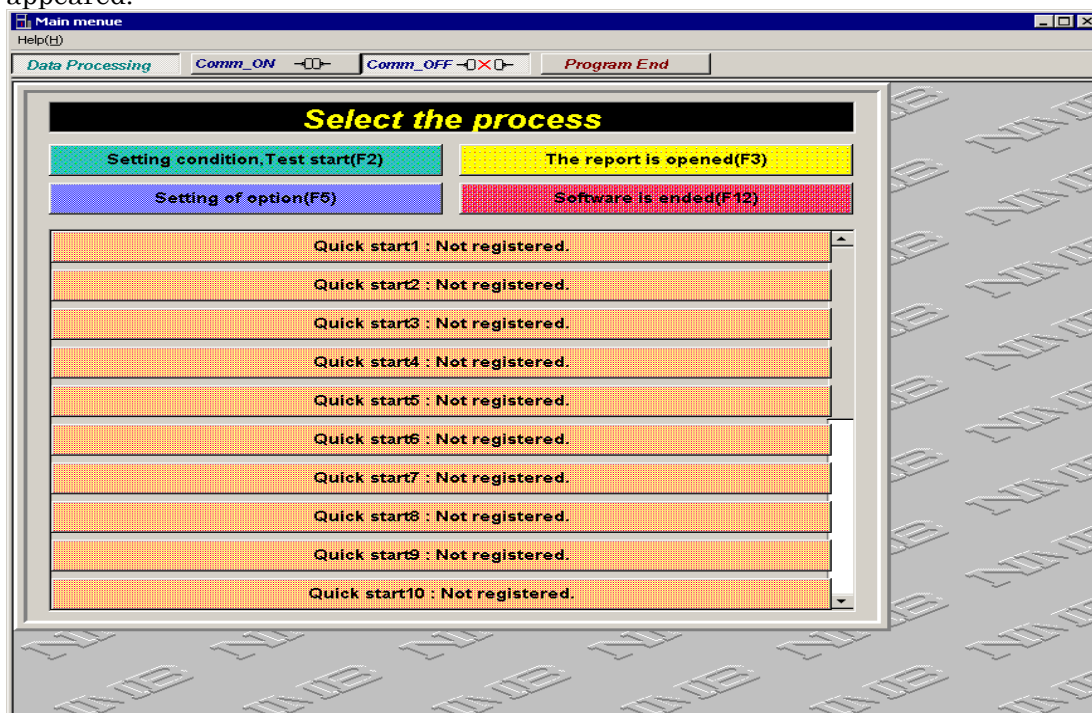
7 - 2 . Starting up the data processor

After starting up the PC, apply double clicks on the icon for “Standard test” on the disk top.



The data processor will start up, and the following will appeared.

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Note: Either the first start-up or change of folder is made; the following message might be appeared. The SR-09-001EN.INI file has descriptions on the folder of data file (storage location) or like that, but the message is the case when there is a difference between the descriptions and the stored real location (folder) where the software has started up. In this case, the descriptions of SR-09-001EN.INI file will be changed to the really stored location automatically where the software has started up. So if there may have some inconvenience, select the "Setting option" on the menu in order to change the folder.



1).Selection of test condition, test start (F2)

Creating the test condition newly, making correction, registration, and registration for Quick start can be made and also specifying test condition and starting test can be made as well.

2).Opening the report (F3)

The collected report data can be analyzed, printed out, copy and deletion shall be made. Moreover, it's possible to make test by using the test condition stored in the file.

3).Setting option (F5)

Setting communication condition, report/stored folder of test condition, display color of graph and printer shall be set.

4).End the software (F12)

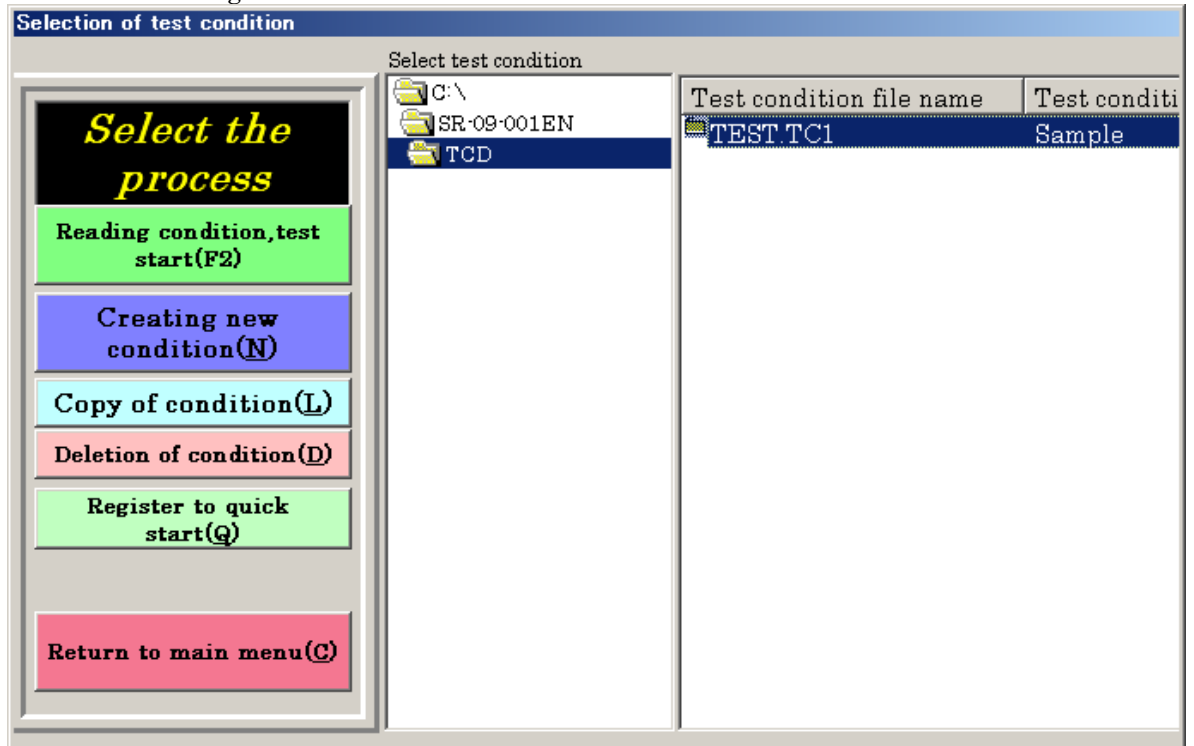
Ends the data processing software.

5).Quick start : Non registration

By registering the test condition (20 kinds at maximum), test can be started directly without setting the test condition.

7 - 3 .Creating condition, test start (F2)

Click on the “Creating condition, and test start (F2)” and the window for selecting test condition can be entered.



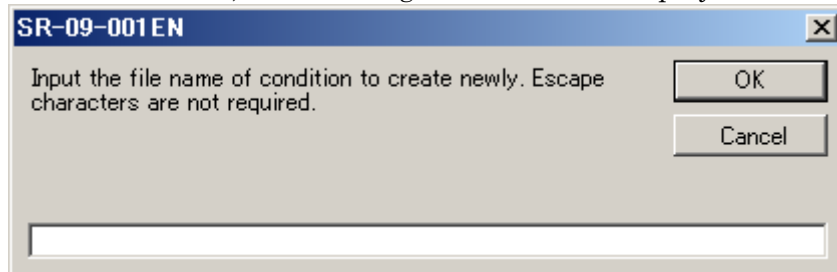
1).Reading condition, test start (F2)

Used for repairing / registering test conditions created previously, and also used for making tests. Select the test condition file and then click on the “Reading conditions, test start (F2)”, and it shifts to the setting window for test condition.

Besides, the same operation can be available by clicking on the optional test condition file name twice.

2). Creating new conditions (N)

Used when creating new test conditions. By clicking on the “Creating new conditions (N)”, the following window can be displayed.



Input the Condition file name, and execute as the following procedures. Since the escape character “. TC1” is attached to the file name automatically, it’s not necessary to input the escape character.

[OK] : Fixes the file name and shifts to the setting window for test condition.

[Cancel] : Returns to the selection window for test conditions.

— — — — **Caution** — — — —

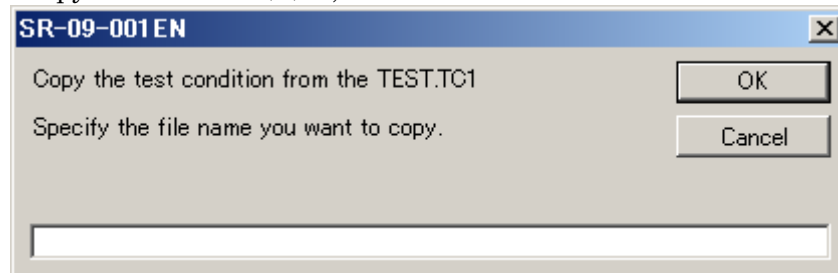
Take care that the following marks can’t be used.

¥ / : , ; * ? ” < > |

3) Copy of condition (L)

Used when the test condition file created previously is required to copy by using another file name.

Select the test condition file, the source of copy and then click on the “Copy of condition (L)”, then the window shall be shown as follows.



Input the file name for destination of copy, then execute the following steps. Since the escape character “. TC1” will be attached to the file name automatically, it’s not necessary to input to the escape character.

[OK] : Fixes the file name and copy has created, shifts to the setting window for test condition.

[Cancel] : Returns the selection window for test conditions.

— — — — **Caution** — — — —

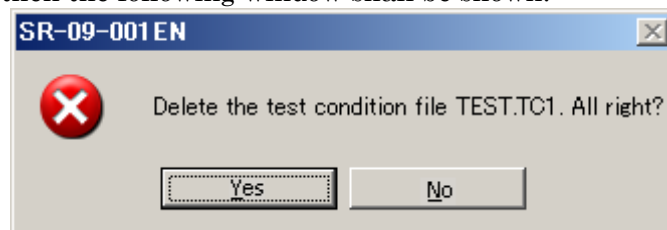
Take care that the following marks can’t be used. However, the same name as the origin of copy can’t be set.

¥ / : , ; * ? ” < > |

4) Deletion of condition (D)

Used when deleting the test condition file that has created previously

Select the test condition file you want to delete and click on the “Deletion of condition (D)”, then the following window shall be shown.



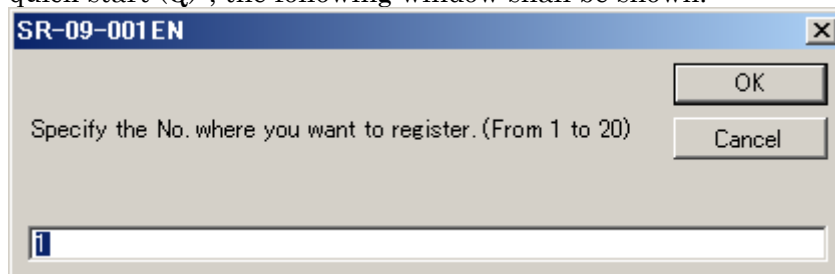
Execute as follows:

[YES] : Deletes the selected file, and returns to the selection window for test condition.

[NO] : Stops the deletion and returns to the selection window for test condition.

5)Registration for quick start (Q)

Used when the test conditions applied frequently are registered for the quick start.
Select the test condition file to register for quick start, and click on the “Registration for quick start (Q)”, the following window shall be shown.



Input the number of quick start(1 ~20), then execute as follows:

[OK] : Registers for the quick start that inputted, and returns to the setting window for test condition.

[CANCEL] : Suspends the registration for quick start, and returns to the setting window for test condition.

When you make registration for the quick start number registered previously, then you can make it overdrawn.

6>Returns to the main menu (C)

Returns to the main menu.

7)Sort of files

By clicking on the column header on the list of test condition(The headline of test condition file names), you can change the order of the list of files (the order of names, kinds).

7-3-1.Common setting window for test condition



1)To the list window (C)

By clicking on the “To the list window (C) ”, closes the test conditions opened at present, and returns to the selection window for test condition.

2)Return (Q)

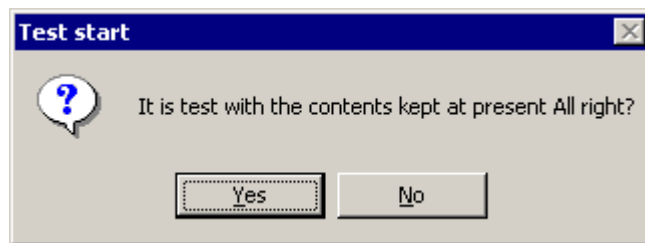
By clicking on the “Return (Q) ”, prior to one setting window for test condition of wizard, can be returned.

3)Next (N)

By clicking on the “Next (N)”, after one setting window for test condition of wizard can be proceeded. When creating condition newly, set it by one condition to the another with “To the next”, and “To the next” in order. By the wizard bar for test condition, you can set with the irregular order (skipping or the like).

4)Test start (S)

By clicking on the “Test start (S)”, the following window can be displayed so that the test can be started with the present condition opened. Besides, either the case of changed condition or the case of creating newly, register the test conditions with the “End (W)”, then execute this operation.



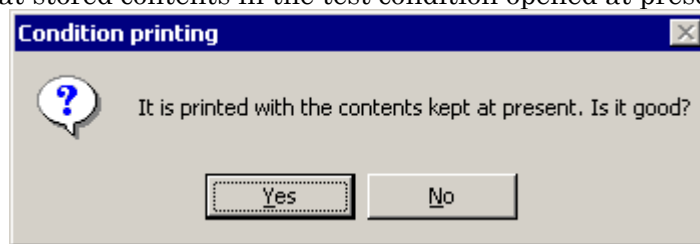
Execute as follows:

[YES] : Shifts to the test start.

[NO] : Returns to the selection window for test condition.

5)Condition printing (P)

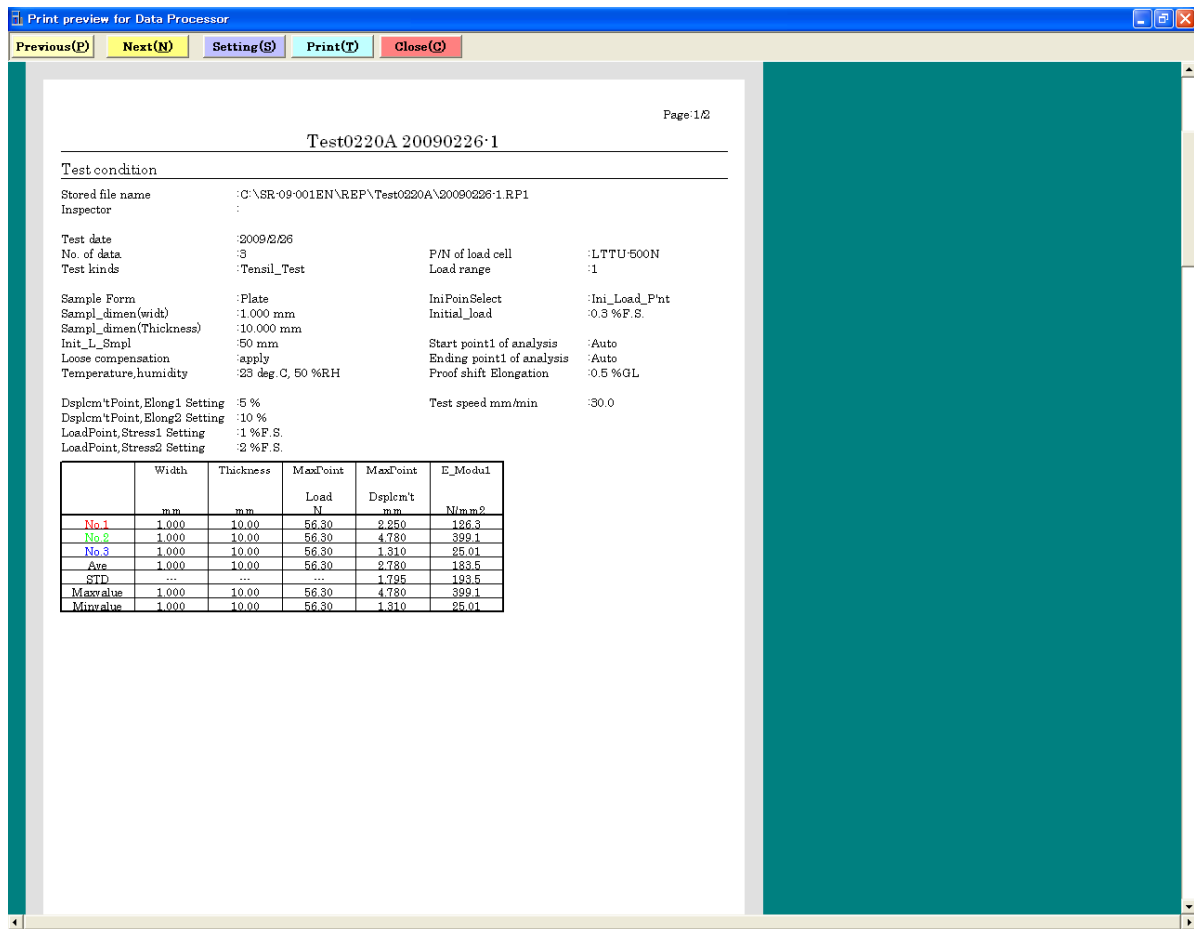
By clicking on the “Condition printing (P)”, the following window can be displayed so that stored contents in the test condition opened at present can be printed out.



Execute as follows:

[YES] : Shifts to the printing preview displayed by the following procedures.

[NO] : Returns to the selection window for test condition.



Execute as follows:

[Print (T)] : Executes printing through the printer, and returns to the selection window for test condition.

[Close (C)] : Returns to the selection window for test condition.

6)End (W)

By click on the “End (W) ”, test condition can be registered and after that, you can enter to test window.

7) Test condition Wizard bar

When clicking on the optional item of test condition Wizard bar shown in the right figure, you can shift to the setting window for test condition related to the item.



8) List view

Item	Set_value
Sample Form	Plate
Init_L_Smpl_Space_com...	50
Common sample name	
Dimension table	Use

By clicking double on the setting item on the List view shown above, setting window can be shown in the following steps.



You can make selection and/or input set value with the compo box shown, and execute as follows:

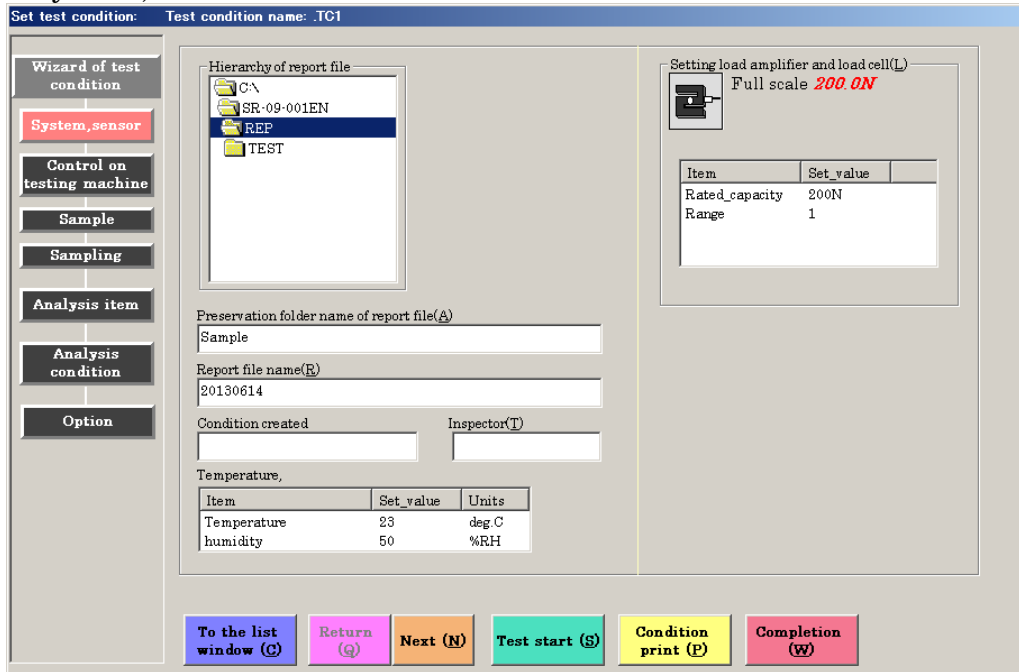
[OK (O)] : Fixes the set value, and closes the set window.

[Close (C)] : Suspends the set value and closes the set window.

Optional setting item	Contents	Explanation o
<input type="checkbox"/> File output of 1 pce of sample	(file name-**S1T)After measurement of 1 sample is over, data of S-S ...	Text file is sto
<input type="checkbox"/> File output of 1 pce of sample	(file name-**WMF)After measurement of 1 sample is over,data of S-S...	Text file is sto
<input type="checkbox"/> File output of all samples	(file name.SAT)After one lot is over, all of the S-S curve is output into L...	Text file is sto
<input type="checkbox"/> File output of all samples	(file name.WMF)After one lot is over, all of the S-S curve is output into t...	Text file is sto
<input type="checkbox"/> File output of test result window	(file name.RPT)After one lot is over,test result data is output into the te...	Text file is not
<input checked="" type="checkbox"/> Prior to test start	Displays the dialogue box to check the setting for the testing machine.	
<input type="checkbox"/> Makes statistics process at the...	When ON, it makes statistics process at the time of re-analysis, but ta...	
<input type="checkbox"/> Makes statistics process at the...	When ON, it makes statistics process at the end of 1 sample test, but...	

By clicking on the item on the List view shown above, you can set effective/ineffective the function of its item. On the effective item, the check mark shall be displayed.

7-3-2.System, sensor



1) Hierarchy of report file

You can check that which hierarchy the report file will be stored or not.
 On the above figure, the report file will be stored under the C:\SR-09-001EN\REP within the report file registered folder.

2) Preservation folder name of report file(A)

Set the folder name where the report file will be registered.
 You can input up to 128 characters (256 half characters).

— — — — **Caution** — — — —

Take care that the following marks can't be used.

¥ / : , ; * ? " < > |

Take care not to make a long file name, because it'll out of the window and that make the manipulation worse. (Of course, you can check the file name by scrolling.)

In the case of "Creating new condition", the file name of test condition will be set as the default in this item.

3) Report file name (R)

Set the report file name. (Can be changeable prior to test.)

You can input up to 128 characters (256 half characters).

— — — — **Caution** — — — —

Take care that the following marks can't be used.

¥ / : , ; * ? " < > |

Take care not to make a long file name, because it'll out of the window and that makes the manipulation worse. (Of course, you can check the file name by scrolling.)

In the case of "Creating new condition", the created date (YYYY/MM/DD) will be set as the default in this item.

4) Condition created

Input the name of created section for the test condition and creator's name.

Take care that it'll be out of printing when you input more than 42 (full characters). (84 half characters)

5) Inspector name (T)

Input the inspector's name.

Take care that it'll be out of printing when you input more than 42 full characters, (84 half characters)

6) Temperature, humidity (Z)

Input test temperature and test humidity.

As for the default, test temperature, and test humidity will be 23.0 °C, and 50.0% each.

7) Setting load amplifier and load cell (L)

Select the setting for test force amplifier for the Load measuring instrument (LTS-B) and also select the installed load cell on the Load measuring instrument.

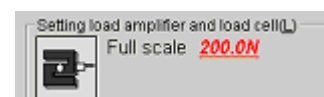
① Rated capacity

Set the capacity of load cell.

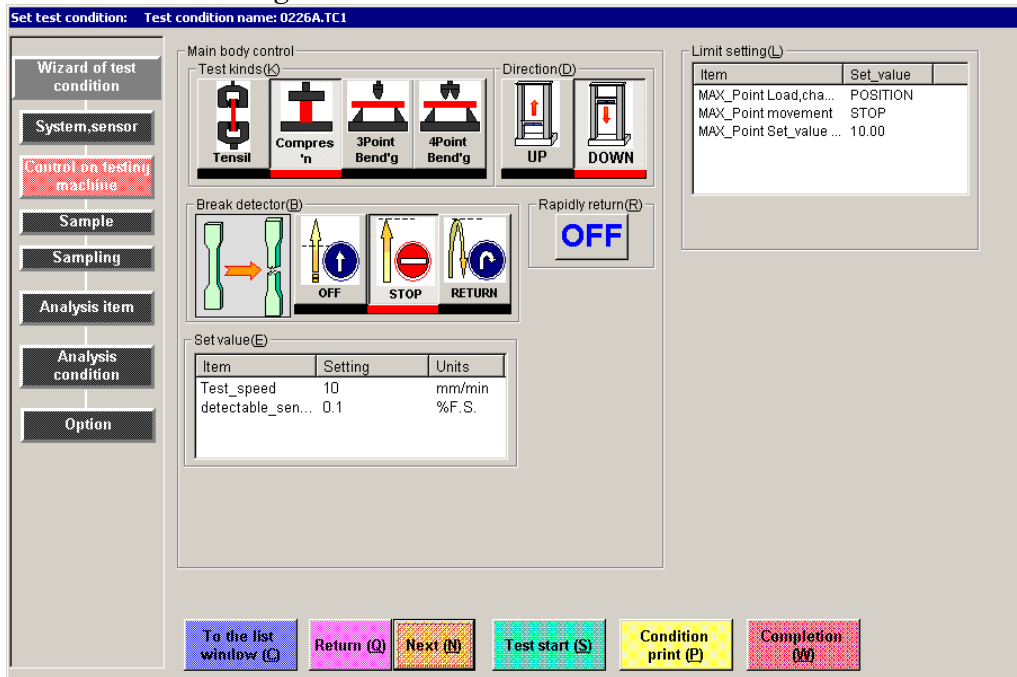
② Range

Set the range of test force.

The maximum test force value within the set range will be shown as the right.

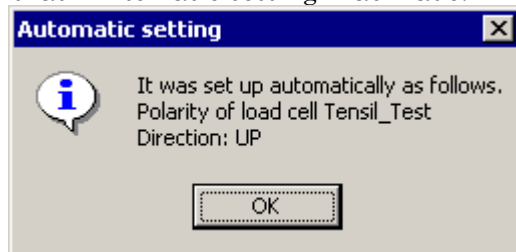


7-3-3. Control of testing machine



1) Kinds of test (K)

Make selection among Tension, Compression, 3 points bending and 4 points bending. At the time of setting, the following confirmation message that “Automatic setting” has made.



*The automatic setting can be made as follows:

Tension:

Polarity of load cell: tension, testing direction: UP

Compression, 3 points bending, 4 points bending:

Polarity of load cell: compression, testing direction :DOWN

2) Test direction (D)

Set the test direction for the Load measuring instrument.

(DIRECTION) .

3) Break detection (B)

Select the operation of movable crosshead when the sample is broken.

OFF : Without detecting break, the test keeps on going.

STOP : After detecting break, the movable crosshead will stop.

RETURN : After detecting break, the movable crosshead will reverse
And return to the POSITION 0 mm.

4) Rapid return (R)

After the test is over, select the speed at the time that the movable crosshead returns to the position of test start (POSITION 0 mm).

ON : Set the speed of return zero to "Rapid speed".

OFF : Set the speed of return zero to "Test speed".

5) Set value (E)

① Test speed

Set the test speed.

Type	Set test speed (mm/min)
LTS-*NB-S500	50,100,200,300,400,500
LTS-*NB-S400	40,75,100,200,300,400
LTS-*NB-S300	30,50,100,150,200,300
LTS-*NB-S200	15,20,50,100,150,200
LTS-*NB-S100	10,20,30,50,75,100
LTS-*NB-S50	5,10,20,30,40,50
LTS-*NB-S20	1.5,2,5,10,15,20

② Break detect sensitivity

Set the sensitivity of Break detect function.

Setting input range is 0.1~9.9 % F.S.

6)Limit setting (L)

Set the Limit (CONTROL section of measuring instrument) of the Load measuring instrument..

①Change of the MAX point, test force or displacement

Select the control at the MAX point.

②Operation at the MAX point

Select the operation of the movable crosshead after arriving to the MAX point.

③Set value at the MAX point

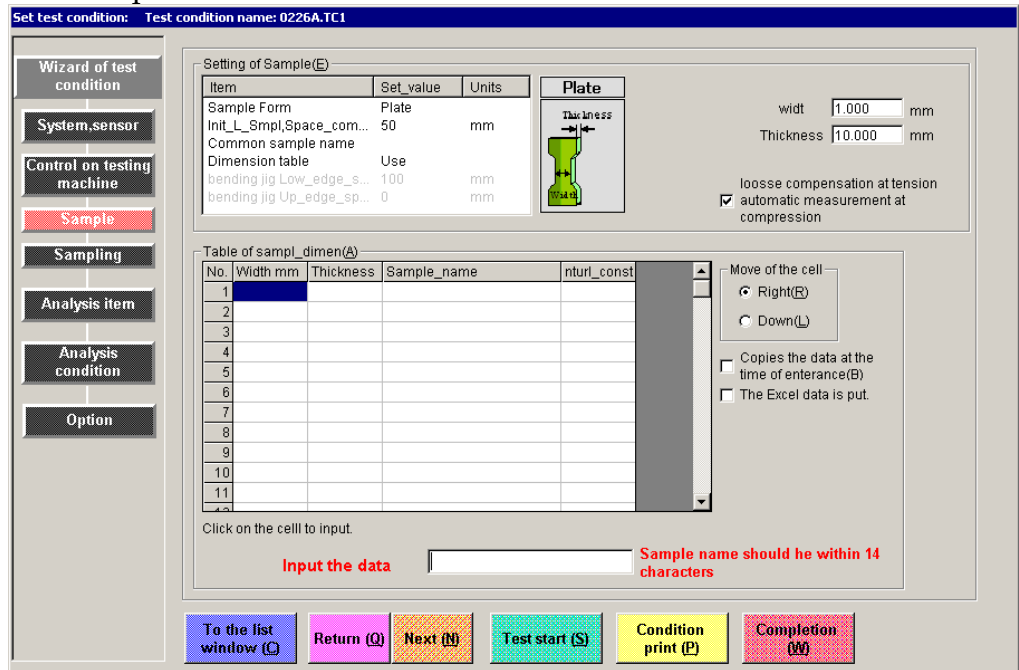
Set the MAX value (the CONTROL MAX value of testing machine).

④Limit setting for displacement at software side

It's the limit for displacement by software. When the POSITION value arrives to the set value, the test will end automatically. Use it as a safety stopper.

*For the limit setting for displacement by software, setting can be available only when the change of MAX point test force/displacement is selected as LOAD (test force).

7-3-4. Test piece



1) Setting of Sample (E)

① Sample form Make selection from Plate, Rod, Pipe, Yarn, others and coil spring.

② Initial length of sample, Space between the compression boards (In the case of coil spring is free length.)

In the application of tension test, input the value of “Between the chucks” or “Gage length”.

In the Compression test, when the “Automatic measured dimension” is not selected, input “Sample length” instead.

In Compression test, when the “Automatic measured dimension” is desired, input the value of “Space between the compression boards of”.

③Common sample name

When the setting on “Dimension table” of sample is set as “Not used.”

At the time of measurement start, this setting will become the sample name of all.

It’s possible to change each sample name during the actual test or at the end of test. You can also input each sample name for the “Dimension table” beforehand.

Normally, this sample name is used for the kinds of sample, sample number, comments after test and so on. However, there will be no problem even if you don’t input it.

④Dimension table

When you set “Use”, it makes each set value inside of “Dimension table” to the dimension of each sample, and name. Be sure to input the value on the “Dimension table” and after that let the test started.

When “Don’t use” is set, it makes to change the set value of common sample dimension at the right side of the window to the dimensions of each sample, and change the set value of common sample name to each sample name.

Setting the common sample dimensions →



⑤Lower edge span for bending jig

Input the value between the lower edges for bending jig. (In the case of 3-points bending test, 4-points bending test)

⑥Upper edge span for bending jig

Input the value between the upper edges for bending jig. (In the case of 4-points bending test only)

2) Sample dimensions

Dimensional set values for the dimensions of common sample and Dimension table can be changed according to the below table as follows:

Sample form	plate	rod	pipe	yarn	Coil spring	others
Sample dimension 1	width	Dia-meter	Outer diameter	denier	Outer diameter	Sectional area(Geometrical Moment of Inertia*1)
Sample dimension 2	Thickness		Inside diameter	Specific gravity	Liner diameter	(Modulus of section*2)

*1 When the kind of test is “3-points/4 points of bending” and the sample form is “Others”, then the sample dimension 1 will become “Geometrical Moment of Inertia”

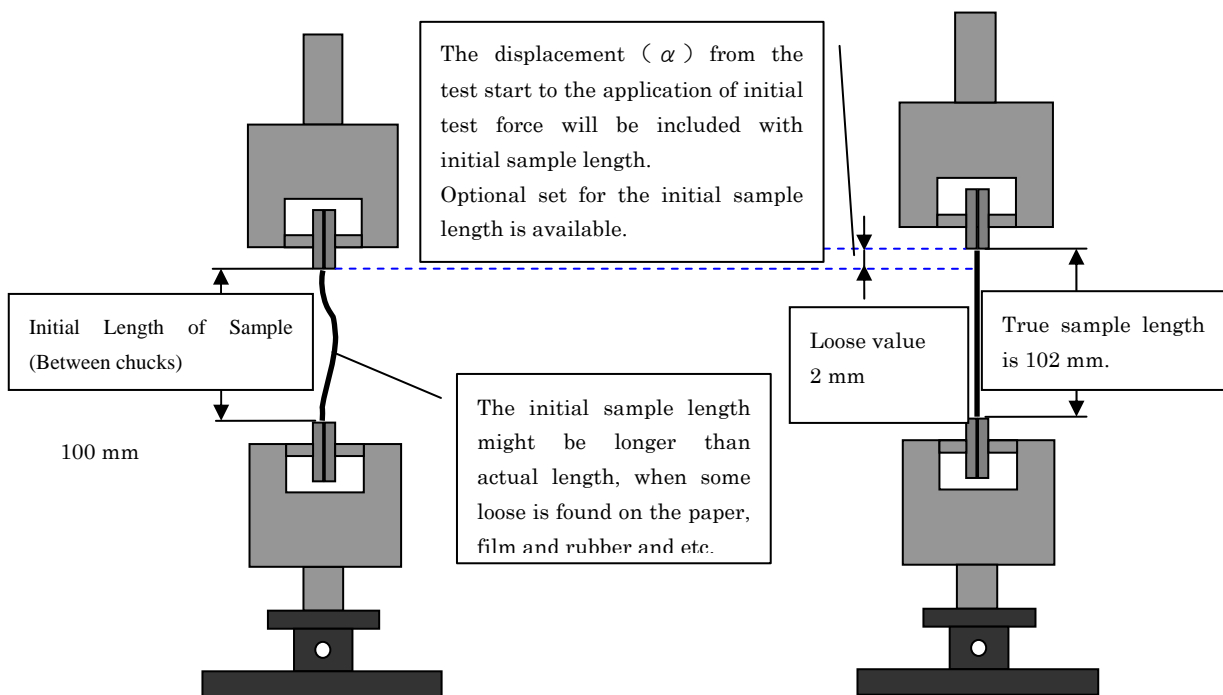
*2 When the kind of test is “3-points/4-points of bending” and the sample form is selected “Others”, then the sample dimension 2 will become “Modulus of section”.

3) In Tension application: Compensation for loose,

In Compression application: Automatic measured dimensions (T)

【Tension】 When the deflection is appeared at the time of installing sample, sample length shall be compensated.

$$\text{True sample length} = \text{Initial sample length} + \text{Loose value}$$



EX.)

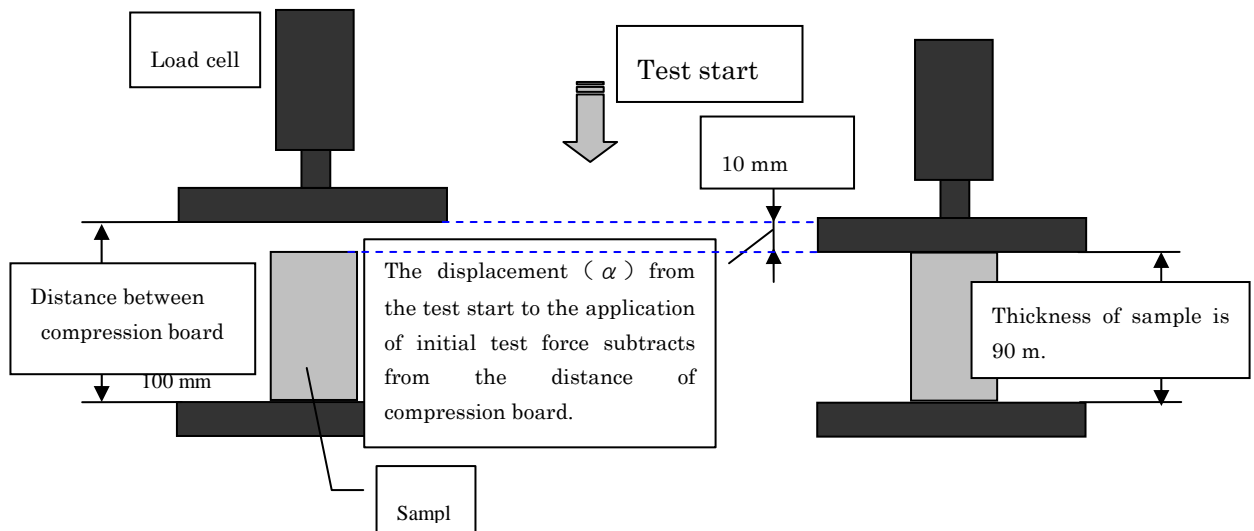
The elongation(strain) when the Sample (test piece) displaces 100 mm.

With no loose compensation : $(100/10) \times 100 = 100\%$

Loose compensation is applied : $(100/100+2) \times 100 = 98\%$

In compression application: Automatic measurement can be made on the thickness (height) of sample (test piece). There is no unevenness because the measurement can be applied with the constant force.

Sample thickness=Distance between the compression board – Shift value until test force is applied.



4) Dimension table for sample (A)

When the setting of “Dimension table” for sample set is selected to “Use”, the set value will become effective.

■ Setting method for Dimensional table

1) By the key input, the dimension of sample, name and so on can be set.

1. Click on the cell with the mouse where you want to input on the Dimensional table.
 2. Input values or characters on the “Data input column”, or press the “ENTER” key.
 3. On the cell clicked on, the input data is written.
- ※ When you want to make a correction, click on the cell you want to correct, and repair the data displayed on the “Data input column”, then press the “ENTER” key.
 - ※ The item “Cell after input” is the one for you to set the cursor to which direction the cell will shift, after inputting the data on the “Data input column”, and after the “ENTER” key is pressed on.
 - ※ The item of “Copy the above data when Entered” displays the cell data of just

above the present position of cursor on the “Data input section”. When inputting the same data as above, or changing only one copy, you don’t have to make key input.

- 5) Make a copy of data created with the Excel, and paste it on the Dimensional table.
- ① Make a check on the item of “Paste the Excel data”.
 - ② When checked, the display on the “Data input column” will disappeared. (Becomes in the pasting mode exclusively.)
 - ③ From the Excel sheet created Dimensional dada, make copy for the portion only you want to paste.
 - ④ On the Dimensional table, click on the cell with the mouse where you want to start pasting the Dimension data.
 - ⑤ After clicked on, by pressing the “Ctrl+V” key makes the data pasted from the specified starting cell.
 - ⑥ After pasting, when you want to correct the data, take off the check on the “Pastes the Excel data” and change it by using the data input column.
- ※ When creating the dimension data on the Excel, create it by keeping the following formula.
The data created with different formula can’t be pasted on the dimension table properly.

Formula :

Creates the data from the right in order, “Dimension 1, Dimension 2, Sample name and natural constant 1”.

EX) On the 1st line, there written as “Dimension 1, Dimension 2, Sample name and natural constant 1”, but they are only for the purpose of showing the line item, so you don’t have to input on them.

Moreover, when copying the data, take care not to include unnecessary columns and lines.

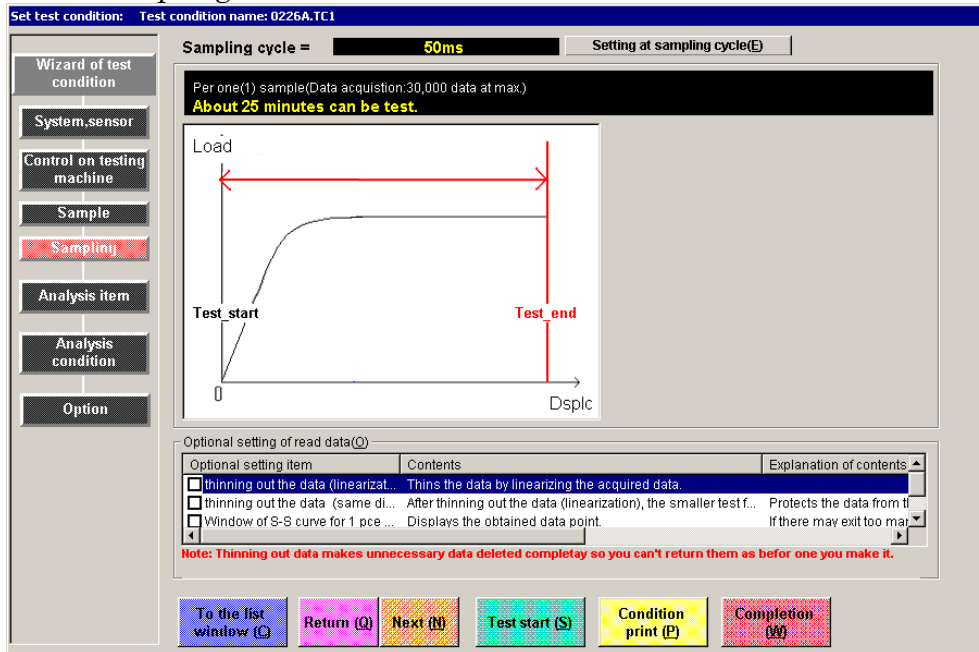
	A	B	C	D	E	F
1	Width	Thickness	Sample name			
2	2.5	1.2	SAMPLE1			
3	2.5	1.2	SAMPLE2			
4	2.56	1.3	SAMPLE3			
5	2.61	1.1	SAMPLE4			
6	2.52	1.2	SAMPLE5			
7	2.5	1.2	SAMPLE6			
8	2.5	1.2	SAMPLE7			
9	2.56	1.3	SAMPLE8			
10	2.61	1.2	SAMPLE9			
11	2.52	1.2	SAMPLE10			
12	2.5	1.3	SAMPLE11			
13	2.5	1.1	SAMPLE12			
14	2.56	1.2	SAMPLE13			
15	2.61	1.2	SAMPLE14			
16	2.52	1.3	SAMPLE15			
17	2.5	1.2	SAMPLE16			
18	2.5	1.2	SAMPLE17			
19	2.56	1.3	SAMPLE18			
20	2.61	1.1	SAMPLE19			
21	2.52	1.2	SAMPLE20			
22	2.5	1.2	SAMPLE21			
23	2.5	1.2	SAMPLE22			
24	2.56	1.3	SAMPLE23			
25	2.61	1.2	SAMPLE24			
26	2.52	1.2	SAMPLE25			
27	2.5	1.3	SAMPLE26			
28	2.5	1.1	SAMPLE27			
29	2.56	1.2	SAMPLE28			
30	2.61	1.2	SAMPLE29			
31	2.52	1.2	SAMPLE30			
32						
33						

For the input of sample name, you can input until 7 characters (14 half characters).
(There may have the case that characters will be out during printing.)

* As for the natural constant 1

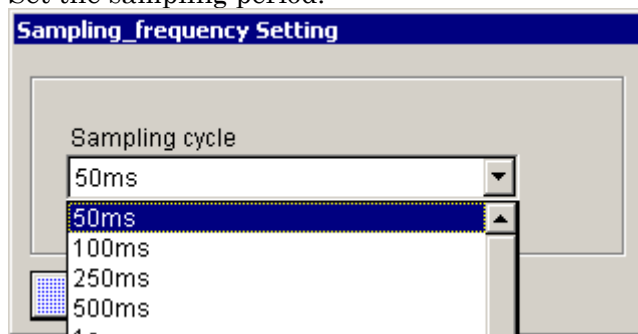
The natural constant 1 that has set for each sample shall be reflected to the natural constant 1 applied to the optional calculating formula. The calculation can be possible by using the different constant depending to the each sample.

7-3-5.Sampling



1) Setting sampling period (E)

Set the sampling period.



When one test takes time such as in the case of test speed is slow, set the sampling period longer. By changing the sampling period, the maximum test time for one sample shall be displayed.

* The maximum number of data that can be acquired per one test shall be 30000.

2) Optional setting for the acquired data (Q)

① Thinning out the data (linearization)

When the number of sampling data is many, and succeeded data can be connected with a line segment (the same line segment), only the first and the last data of the line shall be considered as the data, so the data in the halfway shall be deleted by thinning out the data.

This method is very effective when the number of data is too many in the bending test or so.

The data once detected will never revived again, so take a full consideration on the application.

After copying the Report file with “Copy by another name” and when this process has made, you can make re-analysis with the former data being left.

② Thinning the data out (The same displacement)

After thinning the data out (linearization), and moreover plural number of data are continued with the same displacement, deletes all of the other data by leaving the lowest (least) data of test force. By using this process you can prevent the data from drawing stepped form. But, take care fully, this process can not be applied without making the “Thinning the data out”(linearization).

③ SS curve window for (1) sample

You can plot with the × mark on the acquired data on the graph of individual graph. However, if the number of data is so many, the graphs are difficult to see.

7-3-6. Analysis items

Set test condition: Test condition name: 0226A.TC1

Wizard of test condition

System, sensor

Control on testing machine

Sample

Sampling

Analysis item

Analysis condition

Option

Item	Analysis point	Setting	Units	Format	Print	another_n...	another_n...	another_n...	another_n...
No.1	Sampl_dimen1		mm	Auto	Print				
No.2	Sampl_dimen2		mm	Auto	Print				
No.3	MaxPoint	Load	N	Auto	Print				
No.4	MaxPoint	Dsplcm't	mm	Auto	Print				
No.5	E_Modu1		N/mm2	Auto	Print				
No.6									
No.7									
No.8									
No.9									
No.10									
No.11									

A set column is set and an analytical item is set pushing double-clicking or the ENTER key. An analytical item is changed by right-clicking, right-clicking

Item	Setting	Print
No.1	average	Print
No.2	STD_deviation	Print
No.3	Maxvalue	Print
No.4	Minvalue	Print
No.5		
No.6		
No.7		

Double-clicking or a ENTER key is stamped, and sets up a statistics item the setup column. A statistics item is changed by the right-button click.

Analytical point set graph(G)

Please select No. by which wants to insert an analytical point, and click the

To the list window (C)
Return (Q)
Next (N)
Test start (S)
Condition print (P)
Completion (W)

1) Setting analysis item (K)

Select the specified line on the “Setting the column of analysis item”, and then click it on double, or by pressing the “Enter” key make the analysis item set/changed.

Analysis item No.1 Setting

Setting analysis

Analysis

Analysis:

Analysis:

Printing format:

other_Name2:

Another_Name3:

Another_Name Unit:

Print

Print(P)

Non(N)

OK(O)
Cancel(C)

By clicking on the right side of the mouse on the “Analysis setting column”,

Item	Analysis point	Setting	Units	Format	Print	another_n...	another_n...	another_n...	anoth
No.1	Sampl_dimen1		mm	Auto	Print				
No.2	Sampl_dimen2		mm	Auto	Print				
No.3	MaxPoint	Load	N	Auto	Print				
No.4	MaxPoint	Dsplcm't	mm	Auto	Print				
No.5	E_Modul1		N/mm2	Auto	Print				
No.6									
No.7									
No.8									
No.9									
No.10									
No.11									

Automatic set
 All clear
 Change
 Insertion
 Deletion
 Batch conversion (Unit of test force) > or the ENTER key. An analytical item is changed by right-clicking.
 Batch conversion (Unit of displacement) >

A set column is set and right-clicking

the pop up menu will be shown.

① Automatic set

Set the default on the analysis item (sample dimension 1, sample dimension 2, the maximum point (test force), the maximum point (displacement), elastic modulus 1).

② All clear

All of the analysis times shall be cleared.

③ Change

Changes the analysis items selected.

④ Insert

Inserts the analysis items to the selected lines.

⑤ Delete

Deletes the analysis items for the selected lines, and raises the below lines to upwards.

⑥ Butch conversion(Unit of test force)

The unit of test force for the analysis item being set shall be converted in a lump to the specified units (selection from kN, N, mN, tf, kgf and gf).

⑦ Butch conversion(Unit of displacement)

The unit of displacement for analysis item being set shall be converted in a lump to the specified unit (selection from mm and cm).

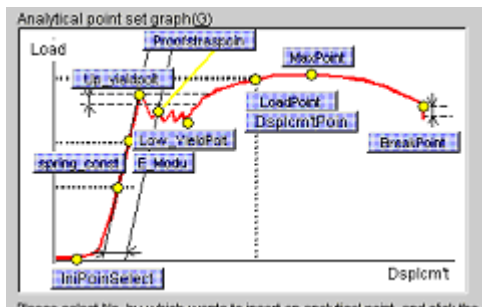
2). Analysis point set graph (G)

By clicking on the button of each analysis point on the graph, you can set the analysis point. Click on the line you want to set.

Item	Analysis point	Setting	Units	Format	Print
No.1					
No.2					
No.3					
No.4					
No.5					
No.6					

Click on the analysis point on the setting graph of analysis point you want to set.

(The following case is the maximum point.)



The maximum point shall be set as follows.

As necessity requires, change the unit or like that.

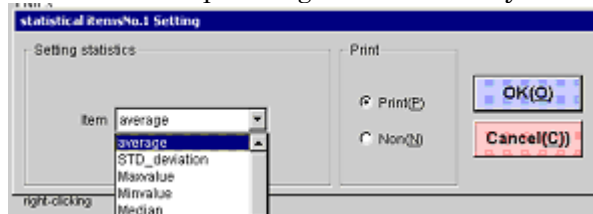
Setting analysis						
Item	Analysis point	Setting	Units	Format	Print	and
No.1	MaxPoint	Load	N	Auto	Print	
No.2						
No.3						
No.4						
...						

* As for printing format

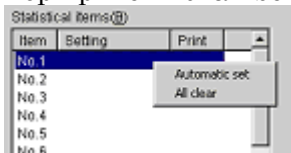
- 「Auto」 Calculates to 4 digits significant figures.
- 「0」 ... Calculates to Integer number by sounding off the first decimal place.
- 「0.0」 ... Calculates to the first decimal place by sounding off the second decimal place.
- 「0.00」 ... Calculates to the second decimal place by sounding off the third decimal place.
- 「0.000」 ... Calculates to the third decimal place by sounding off the 4th decimal place.
- 「0.0000」 ... Calculates to the 4th decimal place by sounding off the 5th decimal place.
- 「0.00000」 ... Calculates to the 5th decimal place by sounding off the 6th decimal place.
- 「#0」 ... Calculates with 10 increments.
- 「#00」 ... Calculates with 100 increments.
- 「#000」 ... Calculates with 1000 increments.
- 「#0000」 ... Calculates with 10000 increments.

3) Statistics items (B)

Select the specifying line on the “Setting column of analysis item” and pressing it double on it or pressing the “Enter” key make the analysis item set/changed.



By clicking on the right side of the cursor on the analysis setting column, the following Pop up menu shall be appeared.



① Automatic set

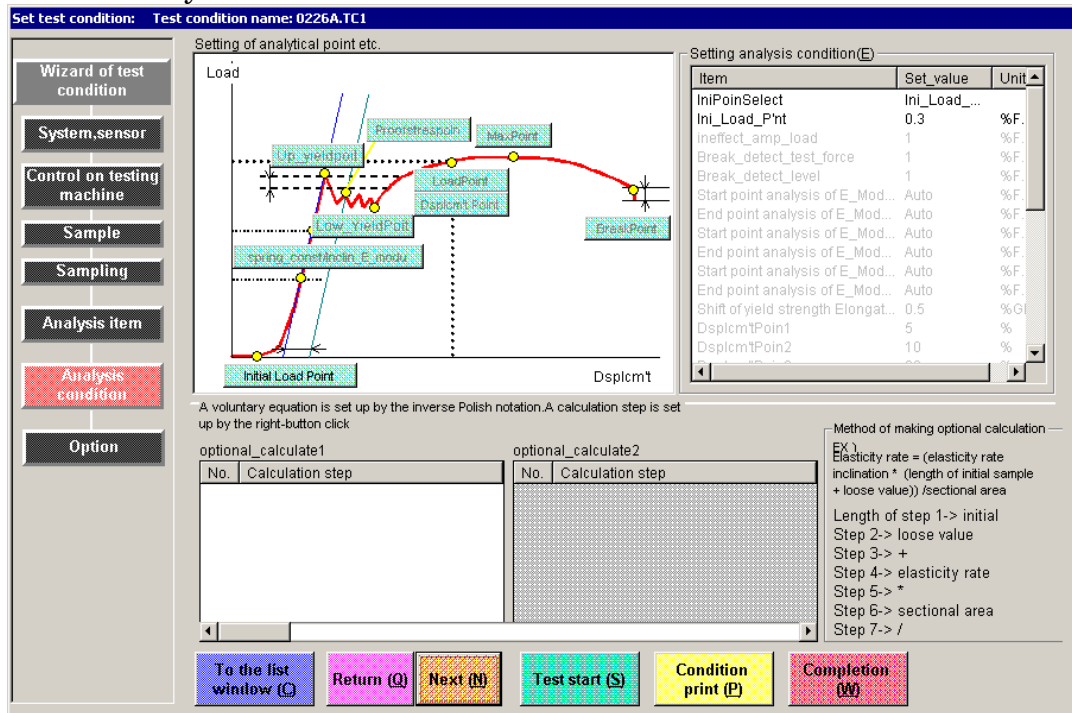
Set the default on the analysis item (average value, standard deviation, the maximum value, the minimum value).

② All clear

All of the analysis times shall be cleared.

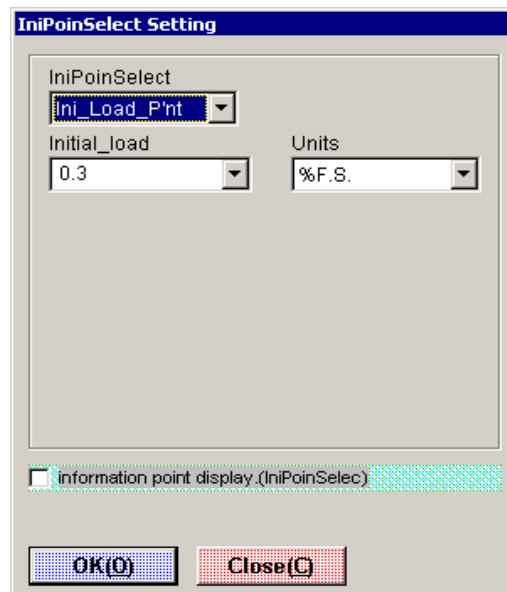
* As for the calculation method for each item, refer to “4. Specification” and “5. Definition of process of test result”.

7-3-7. Analysis condition



1) Setting of analysis point etc./Setting analysis condition (E)

Setting on the analysis condition can be made by whichever graph on the above figure (left side) or setting analysis condition column at the right side of above, and also changing can be available. Other than the zero point of displacement, set in “7-3-6 Analysis item” only can be effective.



You can set as Display/No display of information mark on the individual graph by

setting with the graph.

The following will show the button on the graph.

① Zero point of displacement (Displacement zero)

Select the Displacement zero from “from initial test force point”, “test start point”, and “regression point”. The analysis can be made on the zero point of displacement as a standard.

② Initial test force point (Initial Load Point)

The initial test force is considered as the exceeding point than the set test force after test start. Set by the percentage (%) of test force, stress or % of full scale of range.

③ Ineffective amplitude width test force (Up. yield point, Low. yield point, common setting)

When calculating the upper yield point or lower yield point, this button prevents from calculating a minute fluctuation of graph as the upper yield point or lower yield point by ignoring the amplitude width less than the width of ineffective amplitude of test force.

Set the value by the percentage (%) of test force, stress or % of full scale of range.

④ Break detector test force (Break point)

Within the range of the maximum point to test end point, when the continuous two data become under Break detector test force, it is called as a Break point. Set the value by the percentage (%) to test force or test force range of full scale.

⑤ Break detector level (Break point)

When the break point can't be found on the setting of break detector test force, the break point is defined as the point when the data become under the Break detector level within the range of the maximum point and the ending point of test. Set the value with the percentage (%) of test force or range of full scale. NOTE* But, when the break point can't be found neither the break detector test force nor Break detector level, the test end point shall be defined as the Break point.

- ⑥ Starting analysis point of Elastic modulus (spring constant), analysis end point
(Spring constant Incl. E. modu.)

Set the start point and the end point when analyzing the Inclination of Elastic modulus and spring constant. Set the value with % of displacement, test force, stress or full scale of range.

If you can't understand the set value, select "Automatic". Then the numerical value can be set again after the measurement and you can analyze by the batch again.

- ⑦ Proof stress shift elongation (Proof stress point)

The numerical value when analyzing the proof stress point should be set.

As for the default, 0.2, 0.3 and 0.5 are prepared, you can set the optional elongation (strain) (%GL).

- ⑧ Test force point, displacement point (Load point, Dsplcmt point)

The test force point analyzes displacement, elongation (strain) against the set test force. The displacement point analyses the test force value for the set displacement and elongation (strain).

When the same sampling data set as "Displacement, elongation and strain" and "Test force" are not found, it interpolates from each data of before and after that have set to "Displacement, elongation and strain" and "Test force".

The "Re-analysis" on the test window can't do the interpolation process for the test force point and displacement point, so we recommend to obtain the test force point, displacement point with the setting of this interpolation process.

- ⑨ Setting overwriting graph and scale of horizontal axis

Set the horizontal axis scale for overwriting graph. When "Automatic" is selected, scaling can be made so that the waveform of each sampling at the end will become the maximum scale as possible.

- ⑩ Setting overwriting graph and scale of vertical axis

Set the scale of vertical axis of overwriting graph. When "Automatic" is selected, scaling can be made so that the waveform of each sampling at the end will become the maximum scale as possible.

- ⑪ Overwriting inching value

Set the horizontal inching value for overwriting graph. When the "automatic" is selected, scaling can be made so that the waveform of each sample at the end will become the maximum scale as possible.

⑫ Overwriting start position

Select the position where the overwriting graph will start to draw. Make selection from the initial test force point or test start point.

⑬ N number

Statistical calculation can be made in every N number.

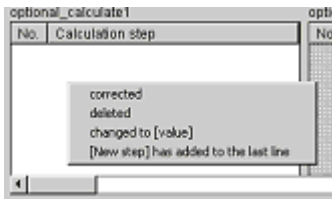
When the N number is 0 (zero), statistical calculation can be made with all of the samples of 1 (one) lot got together.

For specifying the N number will be from "0" or "3 to 50".

2) Optional calculation formula 1, calculation formula 2

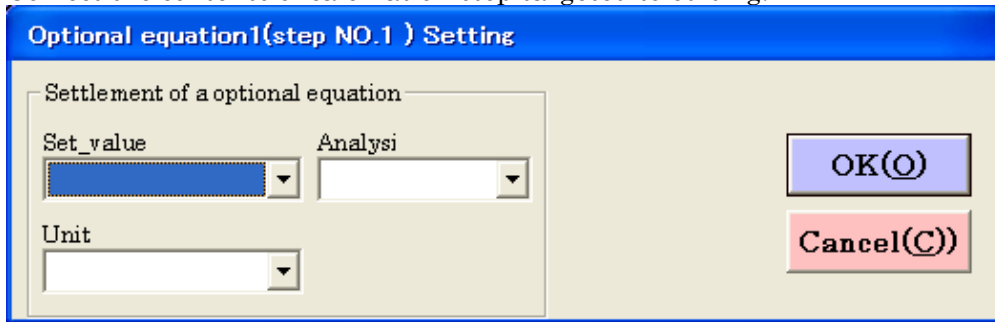
By clicking on the optional calculation formula display column, you can set the target of edit from the calculation formula 1 to 16.

Also, by clicking on the either calculation step within the column of target of edit, you can set the step as a target of edit. By clicking on the right on the selected optional calculation formula column, the following Pop up menu will be displayed.



① Correction

Correct the contents of calculation step targeted to editing.



By the above window, selection of Analysis item, Function and Operator that shall be used for the optional calculation can be made. Make selection on “Analysis point”, “Kind” and “Unit”, and then proceed as below.

Besides, when selected “Function” and “Operator” for the analysis point, it’s not necessary to select “Kind” and “Unit”.

[OK (O)] : Fixes the set value and closes the setting window.

[Close (C)] : Suspends the set value and closes the setting window.

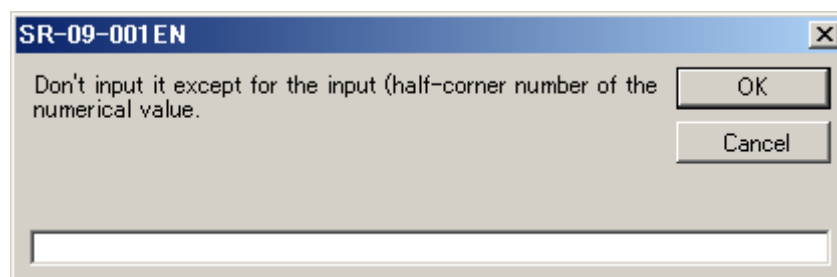
② Deletion

Deletes the calculation step targeted for editing.

③ Change to values

Set the values to the calculation step targeted for editing.

(Never input values other than half numeric values. If inputted, it’ll treated as zero (0).)



By the above window, setting values to be applied on the optional calculation can be provided. Set values and execute as follows:

[OK (O)] : Fixes the set values and closes the setting window.

[Close (C)] : Suspends the set value, and closes the setting window.

④ Addition to the new step on the last line

Adds new step next to the last line, and set the calculation step. Setting of analysis item can be provided for the calculation step.

【Setting procedures for the optional calculation form】

① Executes [Add to the new step on the last line], and sets the calculation step.

② Contents of ① shall be added to the No.1.

③ Repeat the ①, so as to set the necessary calculation step in order.

④ When input of some values on the calculation step is required, executes [Change to values] and changes the contents of calculation step to the values.

【Setting method of optional calculation formula】

The calculation formula can be set by the Reverse Polish notation.

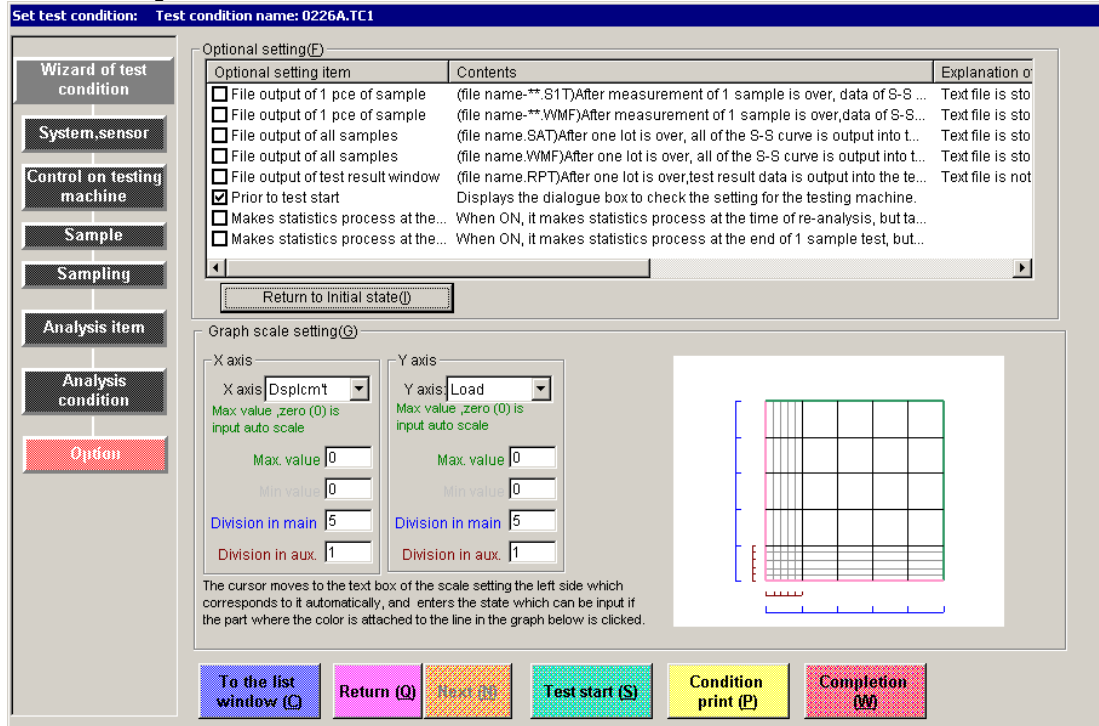
When the normal calculation formula is $(1 + 2) \times (3 + 4)$,

this formula shall be "1 2 + 3 4 + x" in Reverse Polish notation.

This is displayed in the calculation step, it'll become as follows:

No	Calculation step
1	1
2	2
3	+
4	3
5	4
6	+
7	×

7-3-8. Options



1) Optional setting (F)

For the optional setting item, check the contents and its explanation, and then make checks on the necessary items.

① File output of 1 pcs of sample

After the test of one sample has over, acquired raw data can be output as test file.

Output as “Report file name-**.S1T file” in the TEXT folder within the registered folder of report file. Since the raw data is output in the TAB format, you can make it opened with the software of EXCEL and so on.

② One sample of WMF file output

After completing test for one sample, the SS curve data can be output with Windows metafile.

Output as “Report file name-**.WMF file” in the SS_DATA folder within the registered folder of report file. You can make pasting and processing on the software of WORD, EXCEL and so on.

③ File output of all sample

After the lot end, the raw data acquired all of the tests for the lot can be output as the test file. Output as “Report file name .SAT file” in the TEXT folder within the registered folder of report file. It takes a lot of time if the number of data is too many.

④ File output of all sample

After ending a lot, all of the SS curve data acquired in the lot can be output as Windows metafile. Output as “Report file name-**.WMF file” in the SS_DATA folder within the registered folder of report file. You can make pasting and processing on the software of WORD, EXCEL and so on.

⑤ File output of test result window

After ending a lot, the contents of test result window can be output as the TEXT file. Outputs as the file name. CSV file in the TEXT folder within the Report file registered folder. Since the data is output as the TAB format, you can open the software of EXCEL and so on.

⑥ Prior to test start

When transferring the test condition setting window to the test window, the message window will be displayed in order to check the setting on the measuring instrument.

⑦ Makes statistics process at the time of re-analysis

After re-analysis is executed, analysis process on analysis item value can be executed after analysis, and make the test result window renewed.

⑧ Makes statistics process at the end of 1 sample test.

Every time after one sample test has over, it makes analysis process, and makes the test result windows renewed.

⑨ Return to the Initial state (I)

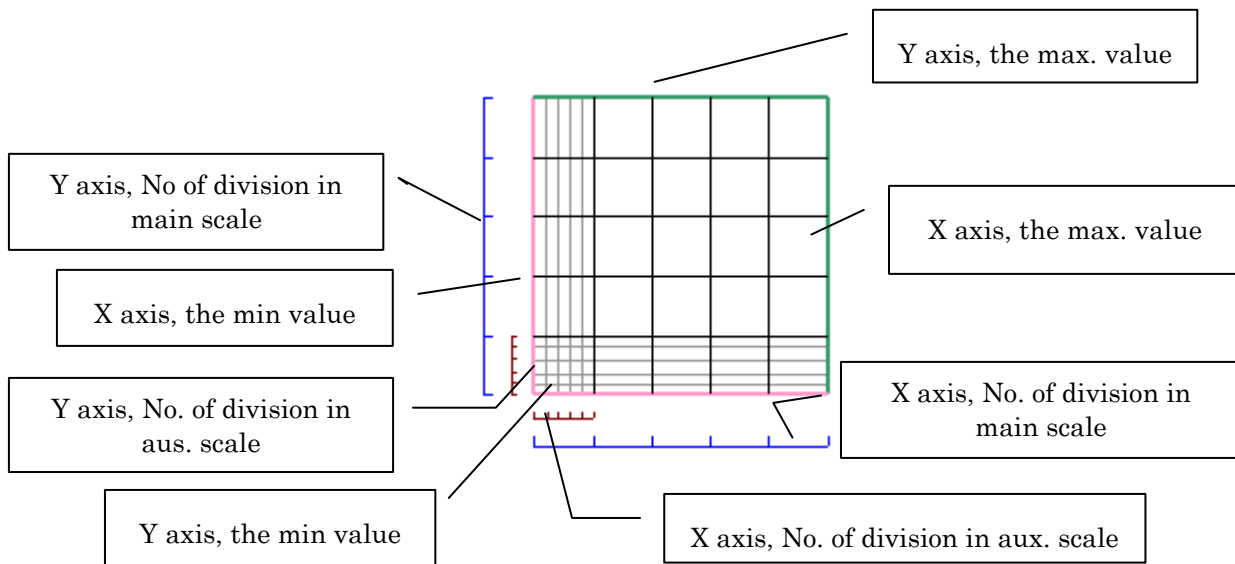
By executing the button, the optional setting can be returned to the default value.

2) Graph scale setting (G)

On the items of “X axis : , Y axis : ”,select the target of each axis from the list.

When the “Use” is selected on the system, on the sensor window and setting for extensometer, “Elongation” is added to the item.

Set the scale of graph for the SS curve (individual graph) displayed on each sample.



By clicking on the line of image of window, the cursor will shift automatically to the test box at the left side corresponding to the click.

- When zero (0) is input to the Max. value on the X axis and also zero is put to the Max. value on the Y axis, the graph will scale automatically.
- For the number of divisions in main scale and also for the number of divisions in auxiliary scale, input the integer within the range of 0 to 100. When the value is input out of the input range, the set value will return to the default value.

7-3-9.Test

1)General

① Test that created the test condition file newly

Click on the "Creating condition/Test start (F2)" from the main menu.



Click on the "Creation of condition newly (N)" on the test condition selection window.



Creating test condition on the test condition setting window.



Click on the "Completion (W)" on the test condition setting window after completion of creating test condition, then store the test condition.

After registration, you can advance to the test on the condition.



(When you have advanced to the test.) Test condition

②Test that used existing test condition file

Click on the "Condition creation/Test start (F2)" button.



Select the test condition file going to test on the test condition selection window, then click on the "Condition reading, Test start (F2)". (Or test condition file is double-clicked.)



Confirm the test condition on the test condition setting window.



After confirming the test condition, when you advance the test with the condition, click on the "Test start (S)" on the test condition setting window.

After confirming the test condition, when you want to change the condition, change the test condition. Then click on the "Completion (W)" and store the test condition and advance the test with the condition.



Test window

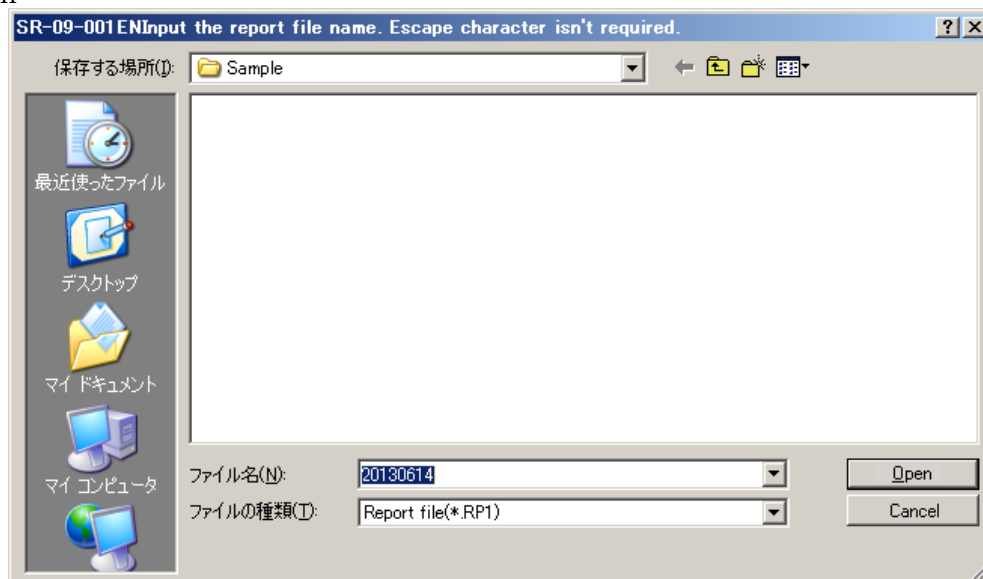
③ Test using the Quick start

From the main menu, click on the Quick button that the test condition going to make test from now has registered.



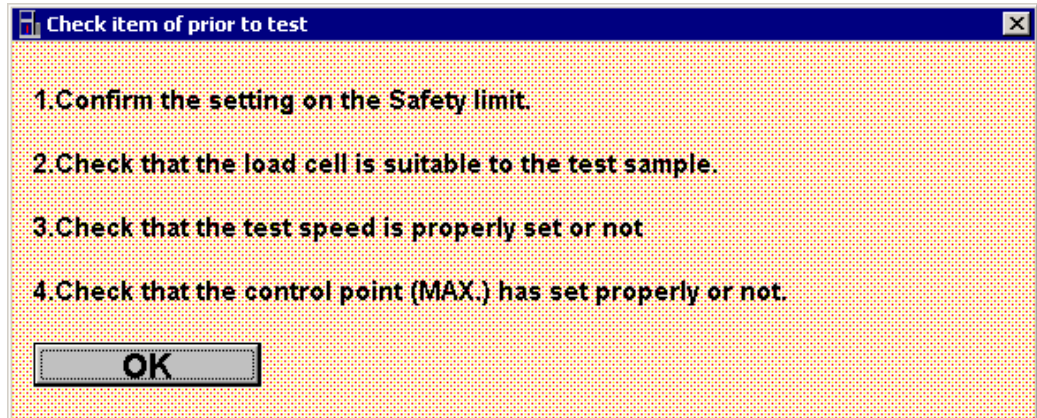
Test window

2)Operation



The following window shall be shown before shifting to the window.

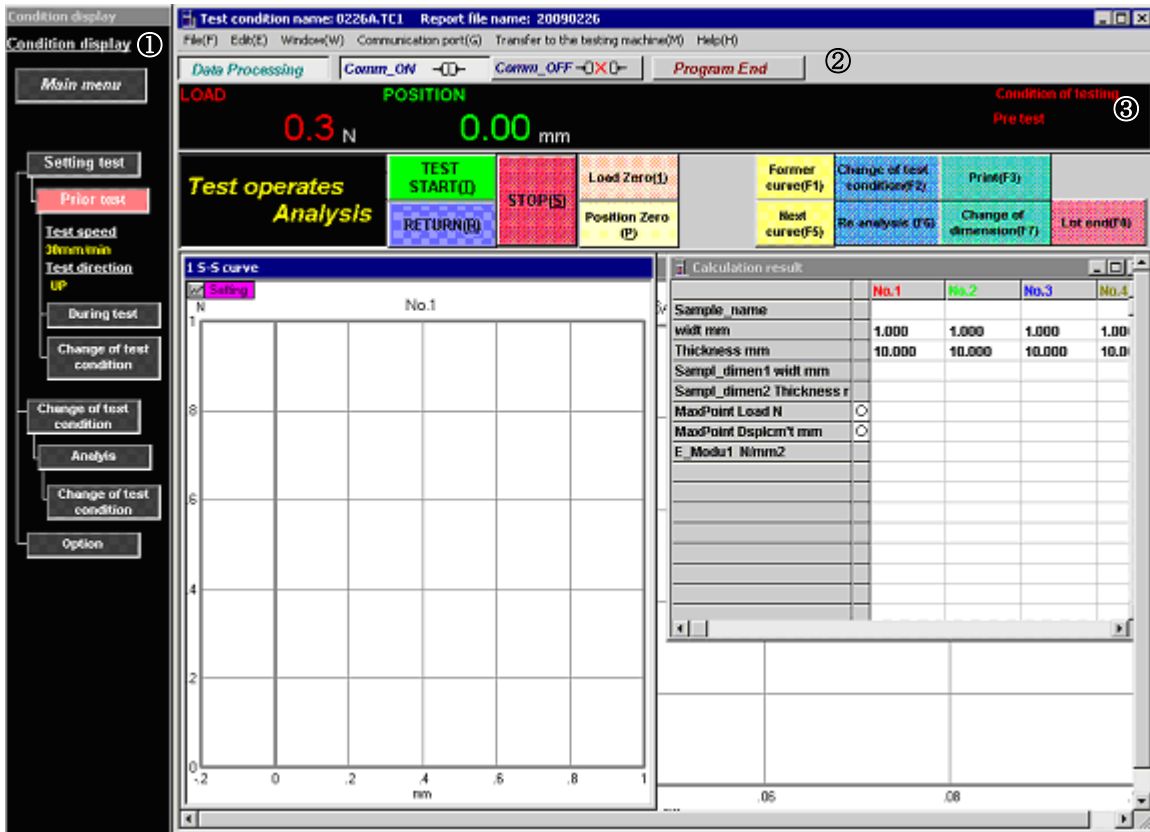
This the window for confirmation window of report file name and report file registered folder. You can change the Report file name. Proceed to the "Store (S)" to the next.



Just prior to shifting test window, the window of "Check item of prior to test" will be displayed for the purpose of confirmation of setting on the Load Test Stand. Confirm the setting of main body of Load Test Stand according to the contents of window.

Besides, if this display is not required, it'll become no display by removing the check on the optional setting on test condition "Prior to test".

7-3-10. Test window



① Condition display

Displays present condition of window. (Both of test speed and test direction shall be displayed prior to test and also during the test.)

② Menu bar

File (F)

SS data file (D) — Reading of SS data file (R)

Reads the SS data file, and displays the graphs on the test window and also report window. Also, analysis, creating report and printing shall be made through the read data.

The following files can be treated as SS data file.

*.SSD : SS data binary file for SR type data processor

*.S1T : SS data text file for SR type data processor

*.0** : SS data text file for TGD type data processor

End (X)

The lot ends and it returns to the main menu.

File (F)Edit (E)

Forwards to the SS data clipboard (T)

An individual graph and test condition are output to the clipboard.

Forwards to all SS data clipboard (A)

The overwritten graph shall be output to the clipboard.

Window (W)

Returns to the initial window. (I)

The size of each window and layout for an individual graph, test result and the overwritten graphs are returned to the initial condition (default)

1 Overwritten graph

Displays the overwritten graph to the front.

2 Test result

Displays the test result to the front.

3 ~n th S-S curve No. of imported data =*****

Displays n th individual graph is displayed on the front.

(Number of imported data shows the number of raw data.)

Communication port (G)

Communication ON (O)

The communication port between the Load Test Stand and the PC is opened.

(The same function as the communication ON button.)

Communication OFF (C)

The communication port between the Load Test Stand and the PC is closed.

(The same function as the communication OFF button.)

Forwards to the Load Test Stand (M)

Load amplifier (L) – Zero adjustment (1)

Makes zero adjustment on the present LOAD range.

Displacement amplifier (D) – Zero adjustment (1)

Makes zero adjustment on the present displacement range. (When a displacement amplifier is used.)(Sold separately.)

Position zero (P)

Makes zero reset on the POSITION value.

Help (H)

Version information (A)

Displays version information of the software.

Comm ON button

Makes the communication port opened between the Load Test Stand and the PC.

(The same function as the “Communication port (G)” and “Communication ON (O)” on the menu bar.)

Comm OFF button

Makes the communication port closed between the Load Test Stand and the PC .

(The same function as the “Communication port (G)” and “Communication OFF (C)” on the menu bar.)

Program end button

Ends the data processor software. (When the program is ended without ending the lot, the data will not saved.)

③ Parameter display



LOAD

The present test force shall be displayed.

(The LOAD display value on the control section of Load Test Stand shall be displayed.)

POSITION

Displays the position value at present.

(Displays the POSITION display value on the control section of Load Test Stand.)

Condition of Load Test Stand

Displays the present condition of Load Test Stand and test.

④ Command button

TEST START (T)	STOP (S)	Load Zero (L)	Former curve (F1)	Change of test condition (F2)	Print (F3)	
RETURN (R)		Position Zero (P)	Next curve (F5)	Re-analysis (T6)	Change of dimension (F7)	Lot end (F8)

TEST START (T)

With this button clicked on, the test will be started.

By pressing the “START” on the control section of Load Test Stand, test can be started also.

RETURN (R)

Returns the movable crosshead to the POSITION 0 mm.

STOP (S)

Stops the test.

Load Zero (L)

Adjusts zero for the present LOAD range.

Position Zero (P)

Zero reset of POSITION value can be made.

Former curve (F1)

The previous individual graph of the individual graph displayed at present will be shown on the front.

Next curve (F5)

The next individual graph of the individual graph displayed at present will be shown on the front.

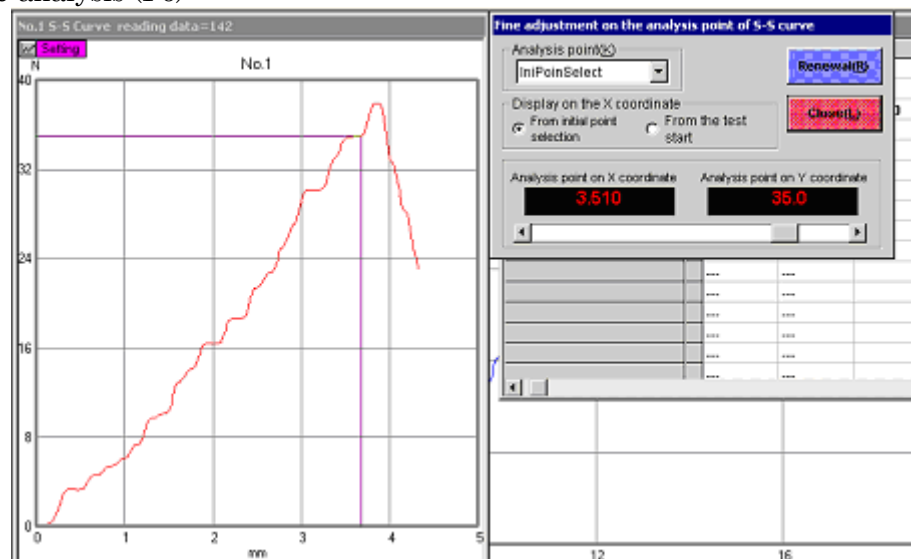
Change of test condition (F2)

Changes the test condition. After changing the test condition, the test data that has been acquired up to now will be analyzed on new conditions and you can confirm the test results.

Moreover, the test data to make the test in the next will be reflected to the test condition that has changed. (But, “Stored folder name of report file”, “Optional control” and “Zero detection” will not be set. Moreover, after obtaining the SS curve data, change of “Setting Test force amplifier, load cell” can’t be made.

As for the change of test condition during test or confirmation of report, you can’t overwrite the original test condition file. In due course, take care of it.

Re-analysis (F6)



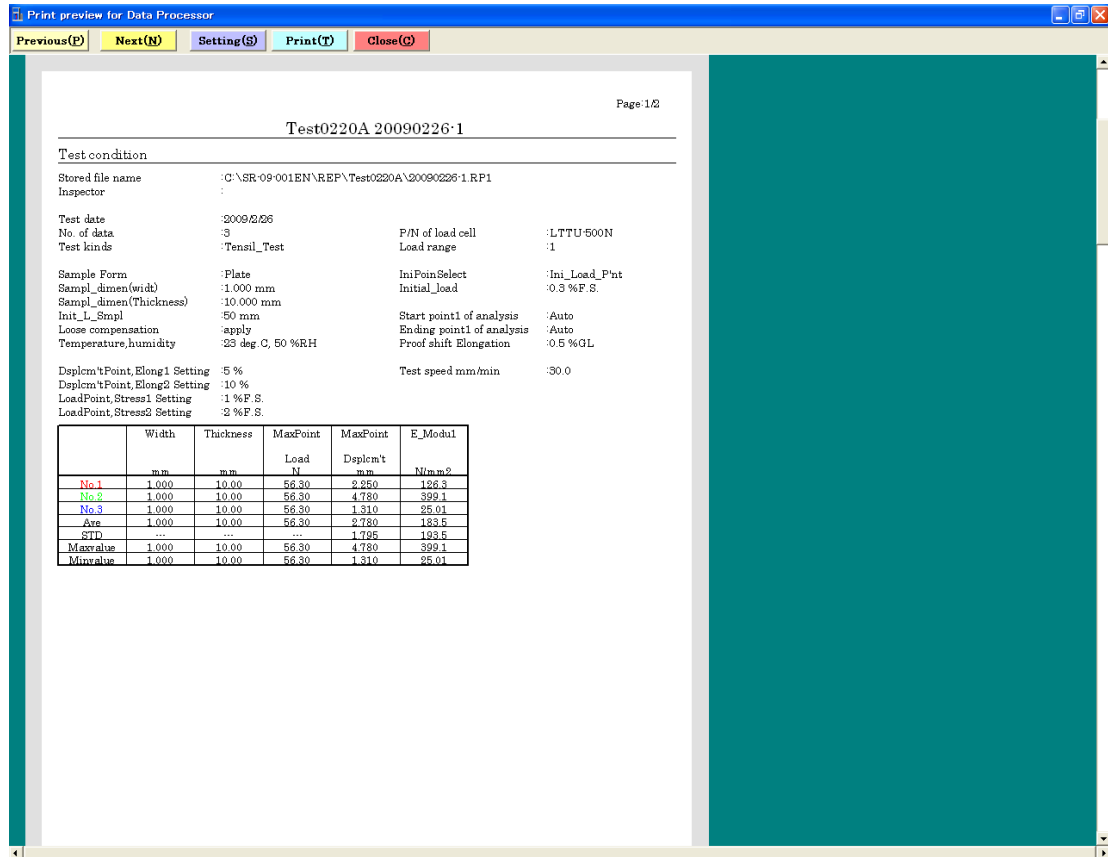
When an analysis point is selected on the window of re-analysis, and by setting

the X coordinate display and analysis range (By moving the scroll bar on the starting point of analysis and ending point of analysis, the corresponding location to the point will be shown on the individual graph.), and by clicking on the “Renewal(R)” button, re-analysis can be made with the new analysis condition.

However, the analysis process will not be made with the changed analysis results. When you want to make analysis process at the same time, make check on the “Make analysis process at the time of re-analysis” at the optional setting on the test condition, or after clicking on the “Lot end (8)” button, click on the “After calculation of analysis, Test window (4)”.

※ Re-analysis can't be used when the X axis of individual graph is specified as “Time”.

Print (F3)



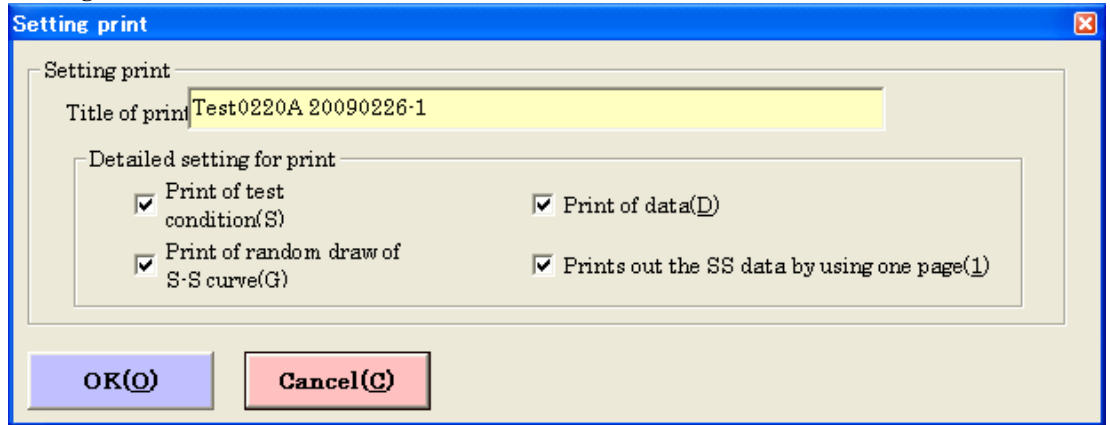
Previous (P)

When the printing becomes 2 pages or more, it'll display the previous page, not the present page.

Next (N)

When the printing becomes 2 pages or more, it'll display the next page, not the present page.

Setting (S)



Print title

Input the desired print title on the test box.

The title input here, will be effective until the input is applied newly.

The graph title (the title on the graph) will change together.

※ The default of print title is “Test condition file name”, “Report file name”.

Detailed setting of print

”Test condition (S)”, ”Data print (D)”, ”SS print (G)”

Makes the checked items targeted to print.

”Printing using with 1 page of SS data (1)”

When the check is made, the overwritten graph will be printed out on another one page. When the check is removed, it points out with test condition and data together.

Test0220A 20090226-1

Print title

Test condition

```

Stored file name : D:\WORK_TMP\SR-07-001\Vec1_100EN\SR-07-001_Ese\REP\Test0220A\20090226 1.R
Inspector :
Test date : 20090226
No. of data : 5          PIN of load cell : LTTU500N
Test kinds : Tensil_Test  Load range : 1
Sample Form : Plate          IniPinSelect : Ini_Load_Pnt
SampL_Size(widt) : 1.000 mm  Initial_Load : 0.3 %F.S.
SampL_Size(Thicknes) : 10.000 mm
Init_L_ScpL : 50 mm          Start point1 of analysis : Auto
Loose compensation : apply    Ending point1 of analysis : Auto
Temperature, humidity : 23 deg. C, 50 %RH  Proof shaft Elongation : 0.5 %OL

Deplce^n^Point, Elong1 Setting : 5 %          Test speed mm/min : 30.0
Deplce^n^Point, Elong2 Setting : 10 %
LoadPoint, Stress1 Setting : 1 %F.S.
LoadPoint, Stress2 Setting : 2 %F.S.
    
```

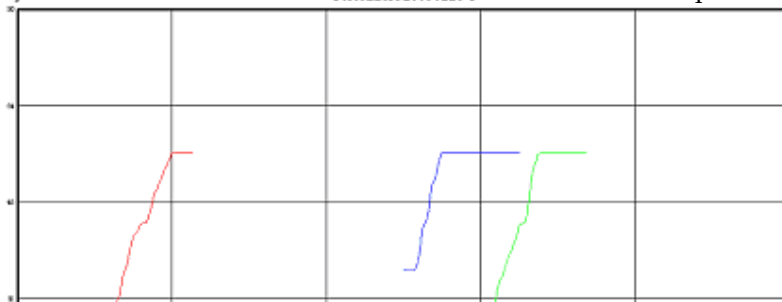
Test condition

	Width	Thickness	MaxPoint	MaxPoint	E_Modul
	mm	mm	Load	Deplce^n^t	MPa
No.1	1.000	10.00	56.30	2.250	156.1
No.2	1.000	10.00	56.30	4.130	150.1
No.3	1.000	10.00	56.30	1.310	15.01
Ave	1.000	10.00	56.30	2.730	153.5
Std	-	-	-	1.199	123.3
Minvalue	1.000	10.00	56.30	4.130	150.1
Maxvalue	1.000	10.00	56.30	1.310	15.01

Data

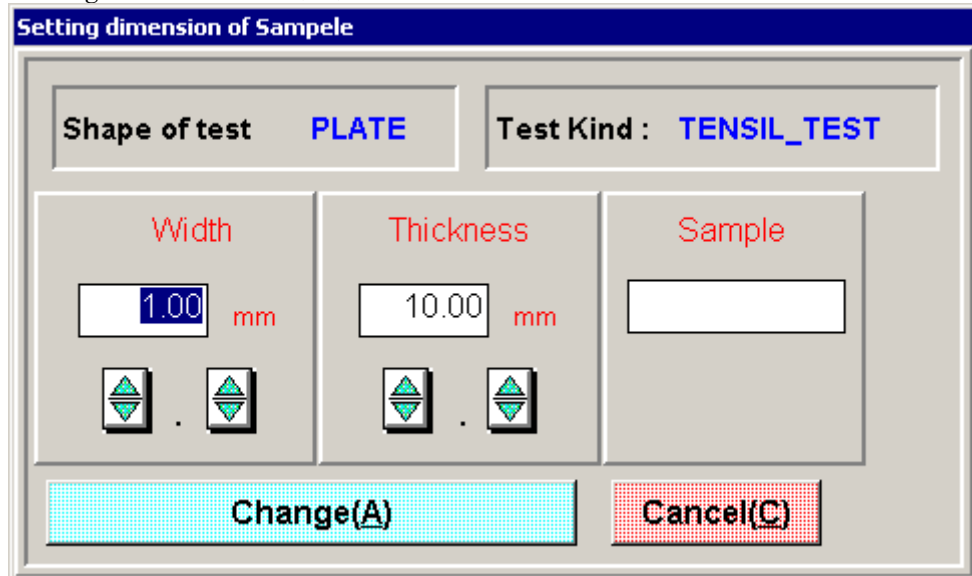
Test0220A 20090226-1

Graph title



SS data

Change of dimension (F7)

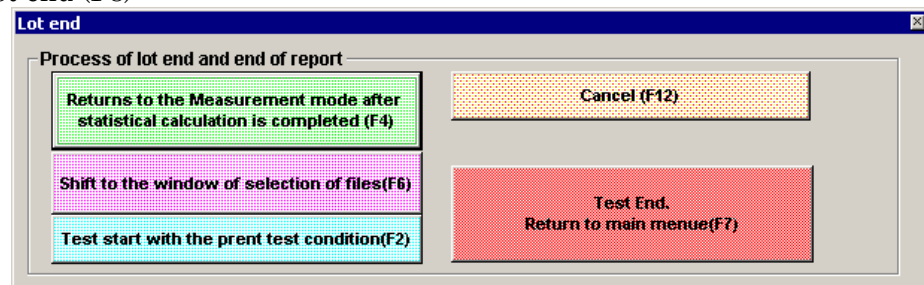


You can change sample dimensions and sample name going to make test in the next. When changed here, the dimensions on the test result window can be changed.

Destruction of data (F4)

The test result and raw data tested at the end will be deleted.

Lot end (F8)



”Returns to the Measurement mode after statistical calculation is completed (F4)”

Makes re-calculation of statistical process.

”Shift to the window of selection of files (F6)”

Ends the test and shifts to the test condition selection window.

”Test start with the prent test condition (F2)”

Make test of next lot with the same test condition.

”Cancel (F12)”

The lot end is cancelled, and returns to the test window.

”Test end, Return to the main menu (F7)”

The test ends and returns to the main menu.

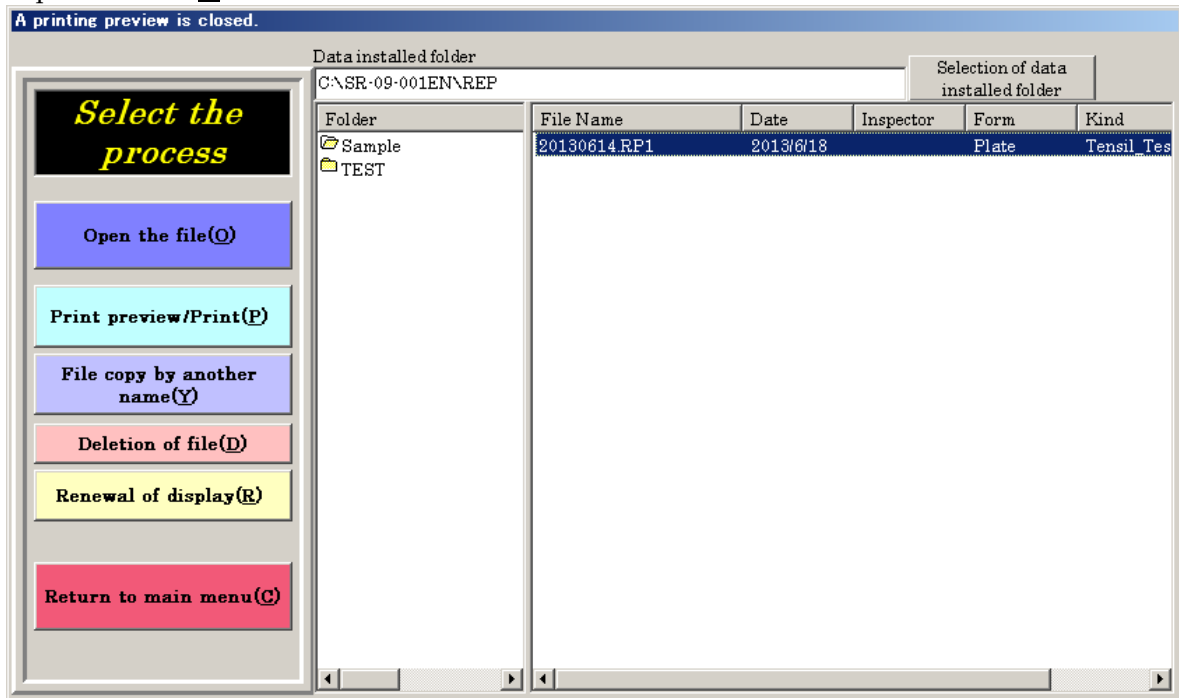
7 - 4 .Open the report

The report means the test result data analyzed based on the acquired raw data. Due to the report file, you can check the test result and also make additional test, print and re-analysis.

7-4-1. Report selection window

By clicking on the “ Open the report (F3) ” on the main menu, the following window shall be shown.

1) Open the file (O)



Select the report file and click on the "Open the file (O)", then it'll shift to the report window. Besides, the same operation shall be made by clicking the optional report file twice.

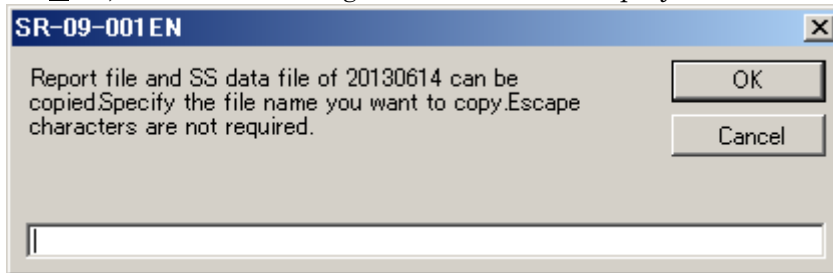
2) Printing pre-view, print (P)

Select the report file and click on the "Printing pre-view, print (P) ", the preview window shown in the chapter "7-2-12 Test window ④ Command button, Print (F3) " can be displayed. The same operation should be made.

3) File copy by another name (Y)

Report file can be copied in the same stored folder with another name.

Select the report file of source of copy and then click on the “File copy with another name (Y)”, then the following window shall be displayed as follows.



Input the file name of copy destination, then execute as follows:

[OK] : Confirms the file name and makes copies and then shifts to the report selection window.

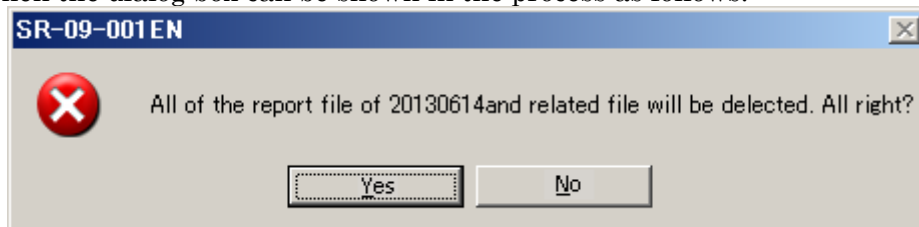
[Cancel] : Returns to the report selection window.

Take care that the following marks can't be used. Besides, the same file name as the source can't be set.

¥ / : , ; * ? " < > |

4) Deletion of file (D)

Select the report file that you want to delete, and click on the “Deletion of file (D)”, then the dialog box can be shown in the process as follows.



Execute as follows:

“YES” : Deletes the selected file and returns to the report selection window.

“NO” : Suspends the deletion and returns to the report selection window.

5) Renewal of display (R)

Makes the display renewed to the latest file information.

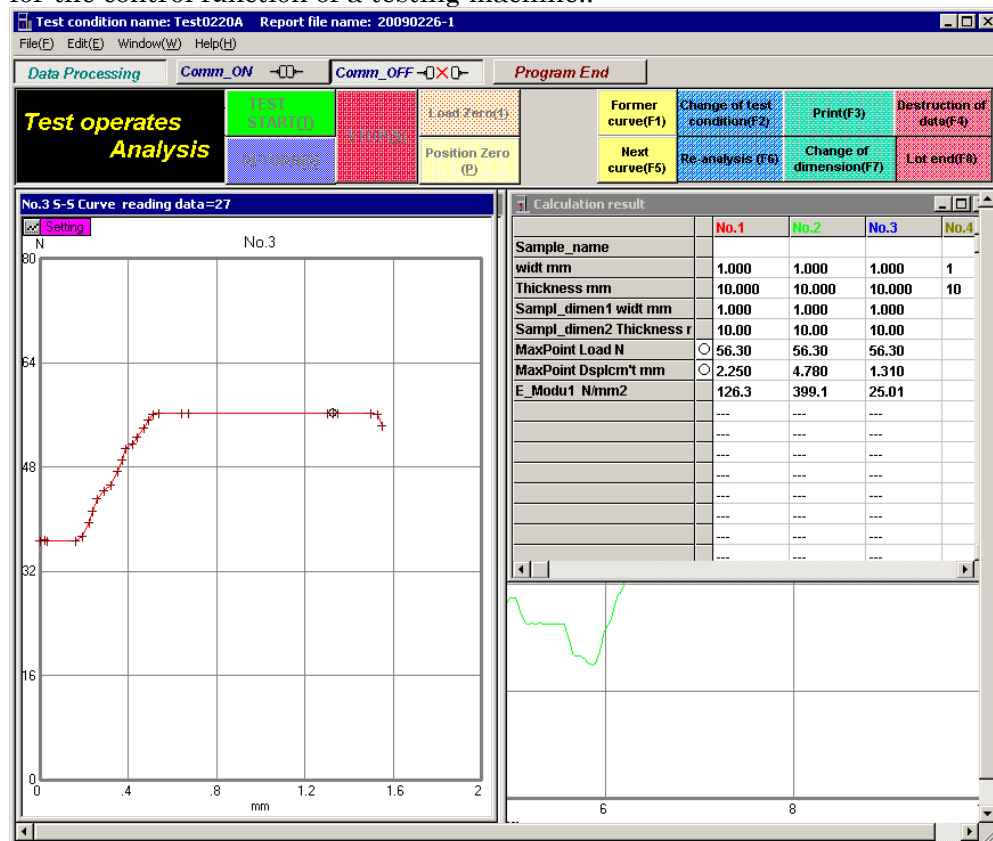
(Without using the data processor software, you want to check the latest conditions after operation of file by using the explorer and so on.)

6) Returns to the main menu (C)

Closes the report selection window, and returns to the main menu.

7-4-2. Report analysis window

The report analysis window had the same function of test window, except for the control function of a testing machine..



1) Additional test

From the report analysis window, when you want to make test with the same condition (additional test) from the report file window opened at present, you can shift to the test window by clicking on the “Communication ON” button on the menu bar.

(However, when the number of test pieces is reached to 50 pieces, you can't make this test.)

2) Print

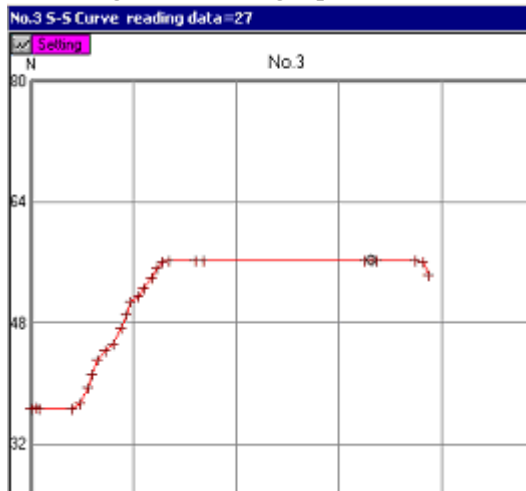
Refer to the item” 7-3-12 Test window”.

3) Re-analysis

Refer to the item “7-3-12. Test window”.

4) Setting individual graph and overwriting graph

① Setting individual graph



Whichever you click on the “Setting” button at the upper left on the individual graph or clicking on double on the individual graph, you can get the window as below.

Display setting for graph

<p>X axis (Maximum value is an auto-scale by 0 in)</p> <p><input checked="" type="radio"/> mm(Dsplcm^t)(M) <input type="radio"/> %(N) <input type="radio"/> s(J)</p> <p>Maxvalue <input type="text" value="2"/></p> <p>Min. value <input type="text" value="0"/></p> <p>Main division <input type="text" value="5"/></p> <p>Sub division <input type="text" value="1"/></p>	<p>Y axis (Maximum value is an auto-scale by 0 in)</p> <p><input checked="" type="radio"/> Load(L) <input type="radio"/> Stress(S)</p> <p>Maxvalue <input type="text" value="80"/></p> <p>Min. value <input type="text" value="0"/></p> <p>Main division <input type="text" value="5"/></p> <p>Sub division <input type="text" value="1"/></p>
---	---

Drawing from the Initial point selection(G)

Drawing of information point(I)

Prohibition from re-calculation when the test condition has changed(E)

Graph ▾

Printing graph on the present display (P)	Metafile output with the present display (W)
Text output of data (I)	Output to clip board (B)

Character string of title

- X axis parameter setting

The display format of X axis can be selectable from the parameters in below:

mm (displacement) (M): displacement, % (N): strain, s(J) : time,
mm (elongation) (K) : elongation

- Y axis parameter setting

The display format of Y axis can be selectable from the parameters in below:

Test force (L) ,Unit of test force (S)

- The maximum value (X, Y axis)

Input the maximum value for each axis. (Automatic scale with Zero (0) input)

- The minimum value (X, Y axis)

Input the minimum value for each axis.

- Main division (X, Y axis)

Input the number of divisions for the main scales for each axis. (The main division is divided with full lines in the graph, and display of scale can be shown.

- Sub division (X, Y axis)

Input the number of divisions for the auxiliary scales for each axis. (The auxiliary division is divided with broken lines in the graph, and display of scale can't be seen.

- Drawing from initial point selection (G)

The graph can be drawn from the zero of displacement being set at present.

- Drawing of information point (I)

The information mark set as the analysis item can be drawn on the graph.

- Prohibition from re-calculation when the test condition has changed (E)

Re-calculation on specified S-S curve graph shall not be made when re-calculation is processed due to the change of test condition.

(Stores the calculation results before the change of test condition.)

- Enlargement factor of graph

Enlarge the graph with the specified factor. (1: Normal display,2:Enlargement (x2) display)

- Printing graphs at the present display (P)

The individual graph set at present can be seen on the Print pre-view combined with test condition (partial) and test results together. Can be printed with the Printing pre-view window.

- Metafile output with the present display (W)

The graph data of individual graph being set at present (the data that output with graph on the printing shown above.) can be output with Windows metafile.

The location of output is within the SS_DATA folder in the report file stored folder, and output file name is “Report file name—**. WMF”.

(** will be 00 for No.1 of individual graph and 01 for No.2....)

- Text output of data

The raw data for the individual graph set at present can be provided with Text file output.

The location of output is within the TEXT folder in the report file stored folder, and output file name is “Report file name—**. SIT”. (** will be 00 for No.1 of individual graph and 01 for No.2.)

- Output to clip board

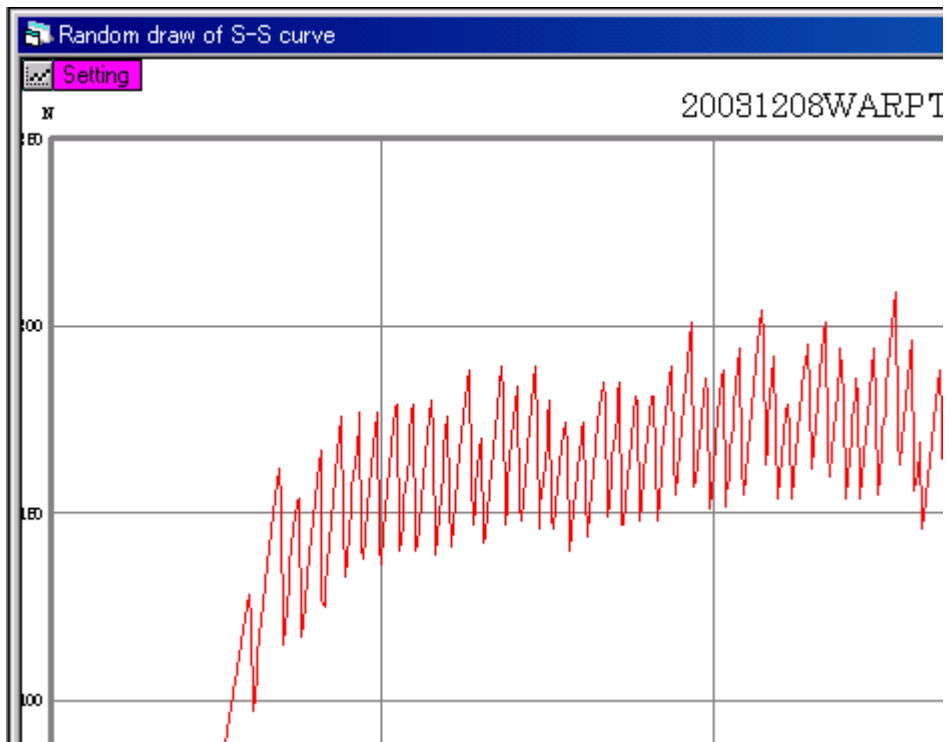
The graph data of individual graph set at present can be output to the clip board.

- Graph title

Input the graph title for the individual graph. (But, the graph title that changed can't be stored.)

② Setting overwriting graph

Setting overwriting graph features the common functions with the setting individual graph partly. For the common functions, please refer to the item of “7-3-2. Report analysis window 4) Individual graph and overwriting graph setting ① Individual graph setting”.



Whichever clicking on the “Setting” button at the upper left on the overwriting graph window or clicking on double on the overwriting graph, you can get the window as below.

Display setting for graph

X axis(Automatic scale with the input value)
 mm(Dsplcm't)(M) %(N) s(J)

Y axis(Automatic scale with the input value)
 Load(L) Stress(S)

scale width(X)
Inching width

height of scale(Y)

Drawing from the Initial point selection(G) Drawing average S-S curve(A)

Drawing of information point(I)

Printing graph on the present display (P) **Metafile output with the present display (W)**

Text output of data (T) **Output to clip board (B)**

Character string of title

OK(O) **Cancellation(C)**

- Scale width X
Input the maximum value on the X axis of overwriting graph.
- Inching width I
When the graphs exist plural numbers, input the interval between the graph and graph.
- Height of scale Y
Input the maximum value on the Y axis of the overwriting graph.
- Drawing of average SS curve (A)
Draw the average graph of all of the individual graphs on the last number of overwriting graph.(The drawing line is black.)
- Character string of title
Input the graph title of the overwriting graph.

7-5. Setting options (F5)

Optional setting

Setting communication condition(T)

Port No. 1

OK(O)

Close(C)

Indication of folder(F)

Report data stored folder C:\SR-09-001EN\REP

Test condition stored folder C:\SR-09-001EN\TCD

Folder selection

Display Color of graph

Setting display color of graph and analysis result

printer

Selection of printer used normally(P)

Before printing, sent the command of feeding paper to the printer.

Setting communication condition, indication of test condition and stored folder of report data, setting of graph and display color of analysis results, setting printer, kinds of testing machine and various setting of zero point detection function can be performed.


1) Setting communication condition

① Port No.

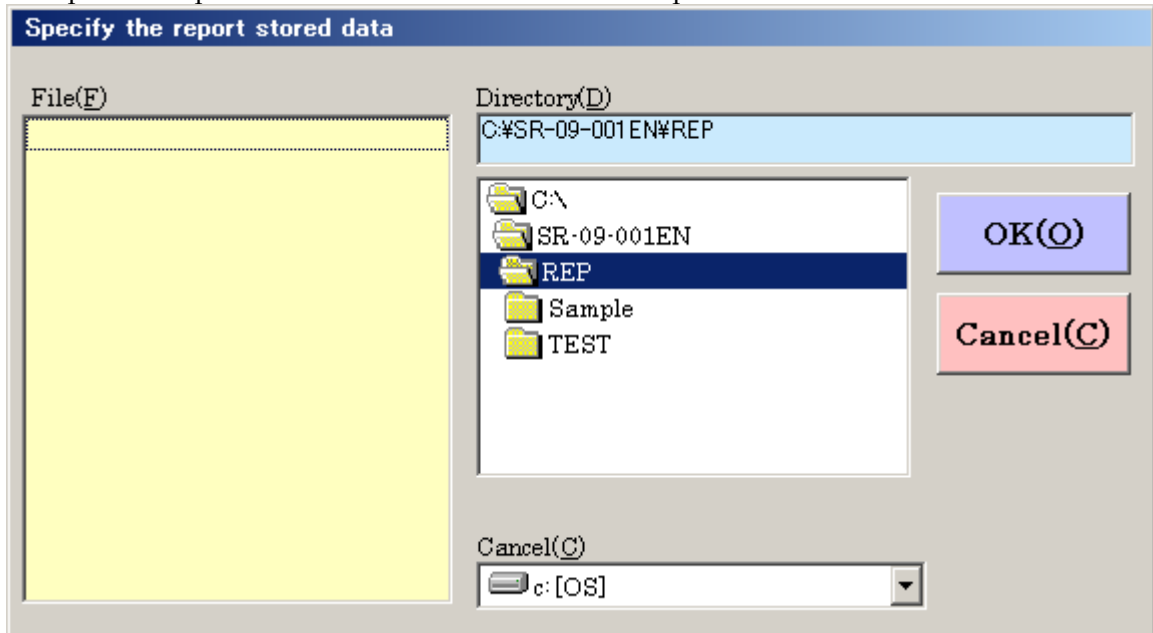
Selects the communication port No. of PC to communicate with the testing machine.

2) Indication of folder

Set the folder to store the report data and test condition file.

Input directly on the test box, or set on the report stored folder window which can be displayed by clicking on the  button of folder selection located on the right side of the window of test box.

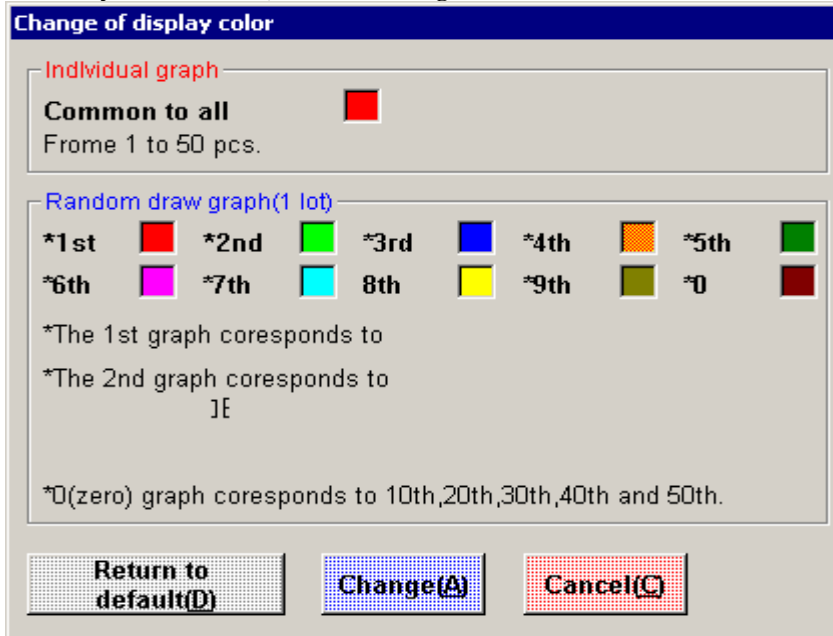
Up to 1000 pieces of files can be stored for the report and test condition stored folder.



3) Display color of graph

Set the display color of individual graphs and overwriting graphs.

By clicking on the button on the optional setting window “Setting of display color of graph and analyzed results”, the following window can be shown.



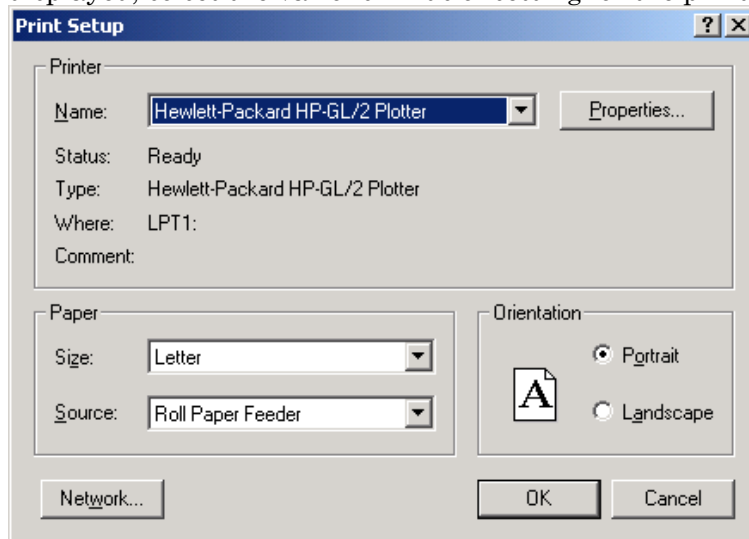
When you clicked double on the setting section for display color of graph to change the color (square part), the following window shall be displayed. Then select the specified color and click on the OK button and also click on the “Change (A)” button on the “Change of display color window”, the display color of graph can be changed.



4) Printer

① Selection of printer used normally

By clicking on the “Selection of printer used normally”, the following window can be displayed, so set the various kinds of setting for the printer applicable on this window.



② Page break before print (P)

When a white page shall be appeared on the 1st printed paper, remove the check.

7 - 6 .End the software (F12)

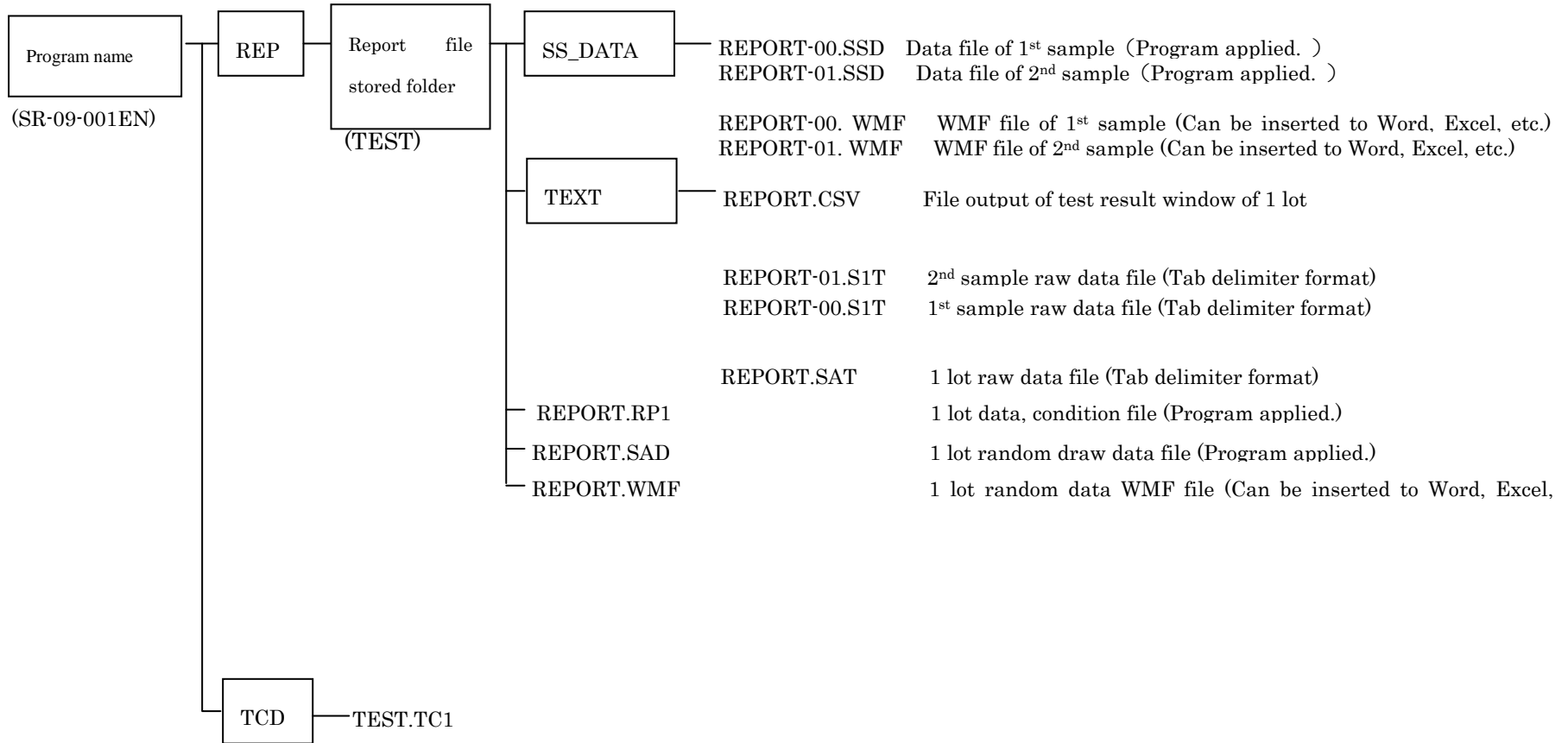
By clicking on the “End of software” on the main menu, the data processor software for the universal testing machine shall be completed.

7 - 7 .Acquired data

Acquired data and so on are stored in the hierarchy as follows:

The followings are the case when 2 pcs of sample test have applied through the program SR-09-001EN with the condition file name, test condition name: TEST, lot name: TEST01.

(Report file : REP, test condition file : TCD *Each stored folder is changeable optionally.)



●The contents of this manual may subject to change without notice.

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